

BUILDING A MODEL OF
HOLISTIC HEALING ENVIRONMENTS
FOR CHILDREN'S HOSPITALS

*With Implications for the Design and Management
of Children's Hospitals*

by

Fiona de Vos

A dissertation submitted to the Graduate Faculty in Psychology
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy, The City University of New York.

2006

© 2006

FIONA DE VOS

All Rights Reserved

Approval page

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Date

Professor Roger Hart, Chair of Examining Committee

Date

Professor Joseph Glick, Executive Officer

Professor Gary Winkel

Professor David Chapin

Professor Lee Rivlin

Selim Iltus, Ph.D.

THE CITY UNIVERSITY OF NEW YORK

Abstract

BUILDING A MODEL OF HOLISTIC HEALING ENVIRONMENTS FOR CHILDREN'S HOSPITALS

With Implications for the Design and Management of Children's Hospitals

by

Fiona de Vos

Advisor: Professor Roger Hart

The primary goal of this dissertation is to develop a conceptual model of children's hospitals as holistic healing environments. The primary focus of the model is to maintain to the maximal degree possible the qualities of everyday life for children and their families. This is based on the principle of reducing stress while in the hospital and easing transitions into and out of the hospital.

To build a conceptual model from the synthesis of current knowledge, a preliminary model with seven dimensions of healing was created based on an extensive analysis of the literature on healing. In addition, interviews and observations at a children's hospital were conducted with parents, patients, and staff to complement what was found in the literature. This model was then used to design a study of the transition from an old to a new children's hospital

building. Interviews, participant observation, behavioral mapping, and questionnaires were used to assess how patients, parents and staff experienced the old and the new hospital as a healing environment and to quantify and compare indicators of healing such as mobility and activity of patients. The data found in the case study were used to more richly conceptualize a holistic healing environment for children, to modify the dimensions, and thereby to revise the model. The revised model integrates the needs and concerns for patients, parents and staff into one model of a holistic healing environment. The revised model contains nine dimensions: meeting basic physiological needs, feeling safe and secure, maximizing agency and control, facilitating social support, enabling everyday behavior, providing distraction and engagement, normalizing the environment, and supporting parents and staff in their caring roles.

The significance of this study is that by conceptualizing what a holistic healing environment in a children's hospital consists of, and what the primary design-healing relationships are, designers now have a coherent and comprehensive behavioral base for designing healthcare environments with positive effects on the healing process.

*Dedicated to Paul's memory
and Foppe's future*

Acknowledgments

In January of 2002, Bruce Komiske, then Executive Director of the Children's Hospital Foundation at Westchester Medical Center (WMC), asked if I wanted to conduct a comparison study of the existing and the new children's hospital. We had met ten years ago while I was working as an intern at the Graduate Center of the City University of New York (CUNY) on an evaluation of the Hasbro Children's Hospital where he was president. Because of this great opportunity for research at WMC, I decided to make this study part of my Ph.D. I will always be grateful to Bruce for this incredible research opportunity, the faith he put in me, his inspiring ideas, infectious energy, and warm friendship.

The decision to enroll at the Graduate Center and pursue a Ph.D. was encouraged by Professor Roger Hart, my advisor. When I visited him in January 2002 to tell him about the research opportunity his reply was: "Just go up to the seventh floor, get your application forms and we will talk again." Thanks to Roger's support, encouragement and guidance from the very beginning I completed this thesis in three and a half years. He never ceases to challenge me with his original and theoretical thinking and awaken me with his professional and personal values. I cherish the memories and our friendship.

My warm thanks are due to my dissertation committee members, Professors Gary Winkel and David Chapin, for their inspiring support. Their guidance has been of great value in this study. I'm honored that Professor Lee Rivlin and Dr. Selim Iltus were my outside readers on my dissertation committee and I would like to thank them also.

Special thanks are due to Judith Kubran, for always having time to listen and offer comforting words, and to Professor Martin Ruck for his availability and help in any area, no matter how far afield.

I thank Jana Cooperman, Jasper van Vugt, Ania Palega, Mara Heppen, Barbara Schneeman, and Dorian Luey for their help and support in shaping my research and the gathering of data. Working with them in different stages of this research helped me to stay critical and focused, and made this sometimes lonely endeavor a lot more fun.

This project could not have succeeded without the support and help of the many people at WMC. First of all, I would like to express my gratitude to all patients, parents and staff who took the time to share their stories with me. Their thoughts and ideas are the essence of this thesis.

Also, I would like to gratefully acknowledge the support of Marge Lillienthal, Carey Goltzman, Jan Mittan, Eileen Weis, Trish Hiller and her staff, Michael Gewitz, John and Brenda Fareri, Steve Marchwinski, Evan Anderman, Erin Facelle, Sue Malfa, Adrienne Trombetta, Martha, Andrea Howatt, Sandee Martensen and all other employees at WMC who helped me along the way.

I thank Ronald Hamel, my former advisor from the University of Amsterdam for his enduring interest in my work throughout the years. Thanks to him, I had the pleasure of working with one of his students. Also, when I needed statistical help over the summer, Ronald referred me to Professor Harry Vorst. Thanks to both Harry and my good friend Reinout Wiers, I managed to get through the statistical challenges while working on my thesis in Amsterdam.

This journey, far away from home, would not have been as memorable, interesting or enjoyable without the support and encouragement from, and much needed fun time with, my loyal New York friends and relatives who made me feel at home in New York. I am also grateful for the support of my dear friends and relatives back home. They helped me immensely by giving me encouragement and friendship. I'm grateful to those who visited me to share and witness a glimpse of my life in New York.

A special thank you goes to the Netherlands America Foundation who awarded me a Fulbright scholarship.

My uncle, Peter Poliakine, deserves a very big thank you. With incredible diligence and dedication, he proofread and edited my work over the past three years, often under great pressure. Even more so, I'm grateful for the time we had to explore and enjoy New York City together. I shall always cherish all those wonderful moments with you.

I gratefully thank my parents and sister for their unconditional support and encouragement for as long as I can remember. Your love, devotion, and sincere interest are an inexhaustible source of inspiration. Thank you for always believing in me.

With great admiration, I want to thank Mark, my love. Every single day during the past three years, your love and support – emotional and intellectual during the course of this dissertation – enveloped me in my New York studio, even though we were separated by the ocean. Mark, thank you for embarking on this journey with me and making this dream come true!



A message from a patient in the Treasure Tree at Maria Fareri Children's Hospital

Table of contents

APPROVAL PAGE	III
ABSTRACT.....	IV
ACKNOWLEDGMENTS	VII
TABLE OF CONTENTS	XI
LIST OF FIGURES.....	XVI
LIST OF TABLES.....	XVIII
SECTION I ■ INTRODUCTION	1
CHAPTER 1 ■ BACKGROUND AND RATIONALE FOR THIS STUDY.....	1
<i>Background</i>	1
<i>Rationale for Study</i>	4
CHAPTER 2 ■ RESEARCH AIMS AND DESIGN	10
<i>Research Statement</i>	10
<i>Research Questions</i>	10
<i>Research Design</i>	11
SECTION II ■ DEVELOPING THE MODEL	14
CHAPTER 3 ■ LITERATURE ANALYSIS ON DIMENSIONS OF HEALING ENVIRONMENTS.....	14
<i>Literature Analysis</i>	14
CHAPTER 4 ■ FORMATIVE RESEARCH: INTERVIEWS AND OBSERVATIONS IN A CHILDREN’S HOSPITAL	18
<i>Introduction</i>	18
<i>The Location</i>	18
<i>The Participants</i>	19
<i>The Methods</i>	19
<i>Discussion of the Interviews and Observations</i>	20

CHAPTER 5 ■ INTEGRATION OF THE FINDINGS TO REVEAL DIMENSIONS OF HEALING ENVIRONMENTS AND TO CONSTRUCT A PRELIMINARY MODEL.....	24
<i>Dimensions of Healing</i>	24
<i>The Patient Chart</i>	26
<i>The Parent Chart</i>	33
<i>Preliminary Model</i>	39
SECTION III ■ MODIFYING THE MODEL IN A CASE STUDY	42
CHAPTER 6 ■ METHODS FOR APPLYING AND MODIFYING THE MODEL	42
<i>The Hospital Site</i>	42
<i>Participants</i>	43
<i>Description of the Research Methods</i>	45
Orientation and Participant Observation.....	45
Site Analysis.....	46
Interviews.....	46
Behavioral Mapping.....	47
Questionnaires.....	47
Around the Move.....	48
State of the Art.....	48
<i>Development of Instruments</i>	49
<i>Research Team</i>	49
<i>Data Analysis</i>	50
CHAPTER 7 ■ DATA COLLECTED AT THE OLD HOSPITAL	53
<i>Introduction</i>	53
<i>WMC in the News</i>	53
Implications for Research.....	55
Description of the Units and the Facilities WMC.....	56
<i>Orientation and Participant Observation</i>	61
<i>Results of the Interviews</i>	62
Daily Routines and the Hospital Rules.....	63
<i>Results of Behavioral Mapping</i>	65
Observations of Privacy.....	65
Observations of the Use of Corridors, Playrooms, and Family Lounge.....	67

Obstacles in the Corridors.....	76
<i>Results of the Questionnaires WMC</i>	77
Questionnaires Patients WMC.....	78
Questionnaires Parents WMC	78
Questionnaires Staff WMC	79
<i>Summary of the Old Hospital</i>	80
CHAPTER 8 ■ PARTICIPANT OBSERVATION AT THE TIME OF THE MOVE.....	82
<i>Introduction</i>	82
<i>Preparing for the Move</i>	83
<i>Staff Morale</i>	84
<i>The Move</i>	85
<i>Conclusions</i>	89
CHAPTER 9 ■ DATA COLLECTED AT THE NEW HOSPITAL.....	91
<i>Introduction</i>	91
<i>About the MFCH</i>	92
Description of the Units and the Facilities MFCH	93
<i>Participant Observation Notes</i>	100
<i>Results of the Interviews</i>	103
<i>Results of Behavioral Mapping</i>	104
Observations of Privacy.....	104
Observations of the Use of Corridors and Playrooms	107
<i>Results of the Questionnaires MFCH</i>	118
Questionnaires Patients MFCH.....	119
Questionnaires Parents MFCH	119
Questionnaires Staff MFCH	120
<i>Summary of the New Hospital</i>	121
CHAPTER 10 ■ COMPARISON OF THE OLD AND THE NEW HOSPITAL AND DISCUSSION	123
<i>Introduction</i>	123
<i>Comparison of the Results from Behavioral Mapping and Questionnaires</i>	123
Data from the Patients and Parents by Dimension.....	124
Summary of the Data from Patients	154
Summary of the Data from Parents.....	156

Data from the Staff by Dimension and Unit.....	157
Summary of the Data from Staff.....	173
<i>Comparison of the Sites</i>	177

SECTION IV ▪ REVISED MODEL OF HEALING ENVIRONMENTS AND ITS IMPLICATIONS FOR DESIGN..... 179

CHAPTER 11 ▪ MODIFYING THE DIMENSIONS OF A HOLISTIC HEALING ENVIRONMENT	179
<i>Introduction</i>	179
<i>The Revised Chart and Model</i>	181
<i>The Dimensions of the Model Revised</i>	196
Minimizing Disruptions to Basic Physiological Needs.....	197
Maximizing Sense of Safety and Security.....	201
Maximizing Agency and Control.....	204
Facilitating for Social Support.....	212
Facilitating Everyday Behavior	216
Providing True Distraction and Engagement	219
Moving Towards a Normalized Environment.....	220
Supportive and Effective Staff.....	225
<i>Conclusions and Conceptualization of a Holistic Healing Environment</i>	232
The Importance of Incorporating Staff into the Model.....	238
Implications for Hospital Management.....	239

SECTION V ▪ REFLECTIONS: METHODOLOGICAL CRITIQUE AND SUGGESTIONS FOR FUTURE RESEARCH..... 241

CHAPTER 12 ▪ METHODOLOGICAL CRITIQUE.....	241
<i>The Challenge of Defining One's Role as a Hospital Researcher</i>	241
<i>Limitations of Study</i>	243
<i>Methodological Critique</i>	244
Concessions: Revisions from Original Proposal.....	244
Comments on Methodology	246
CHAPTER 13 ▪ DIRECTIONS FOR FUTURE RESEARCH.....	249
<i>Medical and Economic Benefits</i>	249
<i>Other Directions</i>	250

APPENDIX A ■ FORMATIVE RESEARCH: INTERVIEWS & STAFF CHART	253
A-I ■ INTERVIEW PARENTS.....	253
A-II ■ INTERVIEW PATIENTS.....	256
A-III ■ INTERVIEW STAFF.....	258
A-IV ■ THE STAFF CHART: SUMMARY OF THE LITERATURE REVIEW AND DATA FROM FORMATIVE RESEARCH.....	259
 APPENDIX B ■ INSTRUMENTS STUDY.....	 263
B-I ■ FLOOR PLANS NICU AND PEDIATRIC UNITS WMC AND MFCH	263
<i>NICU WMC Second Floor.....</i>	<i>264</i>
<i>Pediatric Units WMC Third Floor.....</i>	<i>265</i>
<i>MFCH First Floor.....</i>	<i>266</i>
<i>NICU and PICU MFCH Second Floor.....</i>	<i>267</i>
<i>Pediatric UNITS MFCH Third Floor.....</i>	<i>268</i>
B-II ■ INTERVIEWS RULES AND ROUTINES AT THE HOSPITAL.....	269
<i>What are the Rules?.....</i>	<i>269</i>
<i>The Daily Routines of the Hospital.....</i>	<i>270</i>
B-III ■ BEHAVIORAL MAPPING TOOLS.....	272
<i>Overview Mental Pictures Taken for Observations on the Third Floor of WMC.....</i>	<i>272</i>
<i>Overview Mental Pictures Taken for Observations on the Third Floor of MFCH.....</i>	<i>273</i>
<i>Instructions Observations.....</i>	<i>274</i>
<i>Behavioral Mapping Coding Sheet.....</i>	<i>276</i>
B-IV ■ QUESTIONNAIRES.....	278
<i>General Introduction.....</i>	<i>278</i>
<i>Questionnaire Patient.....</i>	<i>279</i>
<i>Questionnaire Parents.....</i>	<i>283</i>
<i>Questionnaire Staff.....</i>	<i>288</i>
 BIBLIOGRAPHY	 291

List of figures

Figure 1: Suggested preliminary model of a holistic healing environment for patients and parents	40
Figure 2: Images of the Westchester Medical Center.....	53
Figure 3: Images of the NICU hallway and patient room on the second floor of the WMC.....	57
Figure 4: Images of the SCU on the third floor of the WMC.....	58
Figure 5: Images of the PICU on the third floor of the WMC.....	59
Figure 6: Images of Infant and Toddlers on the third floor of the WMC.....	60
Figure 7: Images of 3 North on the third floor of the WMC.....	60
Figure 8: Images of 3 South on the third floor of the WMC	61
Figure 9: Images of an inpatient room on the third floor of the WMC	66
Figure 10: Images of the corridors of the third floor of the WMC.....	69
Figure 11: Images of the Infant and Toddler Playroom on the third floor of the WMC.....	71
Figure 12: Images of the School-Age Playroom on the third floor of the WMC	73
Figure 13: Images of the Family Lounge for PICU parents on the third floor of the WMC.....	75
Figure 14: Images of obstacles in the corridors on the third floor of the WMC	77
Figure 15: Images of the new Maria Fareri Children’s Hospital	92
Figure 16: Images of the NICU on the second floor of the MFCH.....	95
Figure 17: Images of the PICU on the second floor of the MFCH.....	96
Figure 18: Images of the pods on the third floor of the MFCH.....	97
Figure 19: Images of the nursing stations on the third floor of the MFCH	97
Figure 20: Images of family areas on the third floor of the MFCH	98
Figure 21: Images of the Ronald McDonald House on the third floor of the MFCH	99
Figure 22: Images of Art and the Art Studio on the third floor of the MFCH.....	100
Figure 23: Images of an inpatient room on the third floor of the MFCH.....	105
Figure 24: Images of the corridors of the third floor of the MFCH.....	108

Figure 25: Images of the Infant and Toddler playroom on the third floor of the MFCH.....	111
Figure 26: Images of the School-Age playroom on the third floor of the MFCH.....	113
Figure 27: Images of the Art Studio on the third floor of the MFCH.....	115
Figure 28: Images of the CIC Room on the third floor of the MFCH.....	117
Figure 29: Comparison of observations of the doors reflecting privacy regulation.....	133
Figure 30: Number of people observed in the old and the new corridors.....	143
Figure 31: Range of activities by patients observed in the old and the new hospital	144
Figure 32: Observed number of patients in the old and the new playrooms.....	146
Figure 33: The Revised Model: the Nine Dimensions of the Integrated Patient Chart of Holistic Healing Environments, including the needs and concerns for staff	182
Figure 34: A typical child's everyday behavior settings (in North America and Europe).....	234
Figure 35: Adequate behavior settings in a children's hospital for bedridden children	235
Figure 36: Adequate behavior settings in a children's hospital for mobile children	236
Figure 37: Achieving additional behavior settings through electronic means in a children's hospital	237

List of Tables

Table 1: Example of the table with the literature summary.....	17
Table 2: The Patient Chart: summary of the literature review and data from Formative Research.....	26
Table 3: The Parent Chart: summary of the literature review and data from Formative Research.....	33
Table 4: Overview of number of participants for interviews and questionnaires	44
Table 5: Overview of the total number of interviews conducted at WMC.....	63
Table 6: Overview status of doors, curtains and occupancy beds at WMC.....	67
Table 7: Actual number of patients, their gender and age range during observations at WMC	68
Table 8: Overview of observations of the use of the corridors at WMC	70
Table 9: Overview of the observations of the Infant and Toddlers Playroom on the third floor WMC.....	72
Table 10: Overview of the observations of the School-Age Playroom on the third floor WMC	74
Table 11: Overview of the observations of the Family Lounge on the third floor of the WMC.....	76
Table 12: Overview of the number of questionnaires at WMC.....	78
Table 13: Specification of number of patient questionnaires at WMC.....	78
Table 14: Overview of total number of semi-structured interviews conducted at MFCH.....	104
Table 15: Overview status of doors, blinds doors and windows and occupancy beds at MFCH.....	106
Table 16: Actual number of patients, their gender and age range during observations at MFCH.....	107
Table 17: Overview of observations of the use of corridors at MFCH.....	110
Table 18: Observations of the Infant and Toddler playroom third floor MFCH.....	112
Table 19: Overview of observations of the School-Age playroom third floor MFCH.....	114
Table 20: Overview of observations of the Art Studio third floor MFCH.....	116
Table 21: Overview of observations of the CIC Room third floor MFCH.....	118
Table 22: Overview of the number of questionnaires at MFCH.....	119
Table 23: Items and reliabilities for variable ‘Sleep’ for Patients.....	125
Table 24: Items and reliabilities for variable ‘Sleep’ for Parents	125

Table 25: Means, SD and effect size new mean ‘Sleep’ for Patients	126
Table 26: Means, SD and effect size new mean ‘Sleep’ for PICU and third floor Parents.....	126
Table 27: T-test for equality of means: ‘Meansleep’ for Patients	127
Table 28: T-test for equality of means: ‘Meansleep’ for Parents	127
Table 29: Items and reliabilities for variable ‘Control in the Room’ for Patients.....	128
Table 30: Items and reliabilities for variable ‘Control in the Room’ for Parents	128
Table 31: Items and reliabilities for variable ‘Privacy’ for Patients	128
Table 32: Items and reliabilities for variable ‘Privacy’ for Parents.....	128
Table 33: Items and reliabilities for variable ‘Being Informed’ for Patients.....	128
Table 34: Items and reliabilities for variable ‘Knowing’ for Parents	129
Table 35: Means, SD and effect size new means ‘Control’, ‘Privacy’ and ‘Knowing’ for Patients.....	130
Table 36: Means, SD and effect size new means ‘Control’, ‘Privacy’ and ‘Knowing’ for Parents by unit.....	131
Table 37: T-test for equality of means: ‘Meancontrol’, ‘Meanprivacy’, ‘Meanknowing’ for Patients	132
Table 38: T-test for equality of means: ‘Meancontrol’, ‘Meanprivacy’, ‘Meanknowing’ for Parents	132
Table 39: Items and reliabilities for variable ‘Social Support in Hospital’ for Patients	135
Table 40: Items and reliabilities for variable ‘Social Support in Hospital’ for Parents	135
Table 41: Items and reliabilities for variable ‘Connection to Outside’ for Patients	135
Table 42: Items and reliabilities for variable ‘Connection to Outside’ for Parents	136
Table 43: Items and reliabilities for variable ‘Support from Parents’ for Patients	136
Table 44: Items and reliabilities for variable ‘Space for Family and Friends’ for Patients	136
Table 45: Means, SD and effect size new means ‘Support’, ‘Parents’, ‘Space’ and ‘Outside’ for Patients	138
Table 46: Means, SD and effect size new means ‘Support’ and ‘Outside’ for Parents by unit	138
Table 47: T-test for equality of means: ‘Meansupport’, ‘Meanparents’, ‘Meanspace’, ‘Meanoutside’ for Patients.....	140
Table 48: T-test for equality of means: ‘Meansupport’, ‘Meanoutside’ for Parents	140
Table 49: Items and reliabilities for variable ‘Mobility’ for Patients	141
Table 50: Means, SD and effect size new mean ‘Mobility’ for Patients	142
Table 51: T-test for equality of means: ‘Meanmobility’ for Patients	142

Table 52: Items and reliabilities for variable ‘Things to Do Compared to Home’ for Patients.....	147
Table 53: Items and reliabilities for variable ‘Room Compared to Home’ for Patients.....	148
Table 54: Items and reliabilities for variable ‘Room Compared to Home’ Parents	148
Table 55: Items and reliabilities for variable ‘Basic Needs’ for Parents	148
Table 56: Items and reliabilities for variable ‘Aesthetics’ for Parents.....	148
Table 57: Means, SD and effect size new means ‘Compared to Home to Do’ and ‘Room’ for Patients	150
Table 58: Means, SD and effect size new means ‘Aesthetics’, ‘Compared to Home Room’ and ‘Basic Needs’ for Parents	150
Table 59: T-test for equality of means: ‘Meantodo’, ‘Meanroom’ for Patients.....	151
Table 60: T-test for equality of means: ‘Meanaesthetics’, ‘Meanroom’, ‘Meanbasicneeds’ for Parents	152
Table 61: Items and reliabilities for variable ‘Overall’ for Patients.....	152
Table 62: Items and reliabilities for variable ‘Overall’ for Parents.....	152
Table 63: Means, SD and effect size new mean ‘Overall Rating’ for Patients.....	153
Table 64: Means, SD and effect size new mean ‘Overall Rating’ for Parents.....	153
Table 65: T-test for equality of means: ‘Meanoverall’ for Patients.....	154
Table 66: T-test for equality of means: ‘Meanoverall’ for Parents.....	154
Table 67: Items and reliabilities for variable ‘Functionality’ for Staff.....	158
Table 68: Items and reliabilities for variable ‘Coopertation’ for Staff.....	158
Table 69: Means, SD and effect size new means ‘Functionality’ and ‘Cooperation’ by unit for Staff.....	159
Table 70: T-test for equality of means: ‘Meanfunctionality’ and ‘Meancooperation’ by unit for Staff.....	160
Table 71: Items and reliabilities for variable ‘Efficiency Station’ for Staff.....	161
Table 72: Items and reliabilities for variable ‘Safety Needs’ for Staff.....	161
Table 73: Means, SD and effect size new means ‘Efficiency Station’ and ‘Safety Needs’ by unit for Staff.....	162
Table 74: T-test for equality of means: ‘Meanefficiency’ and ‘Meansafety’ by unit for Staff	163
Table 75: Items and reliabilities for variable ‘Functionality Patient Room’ for Staff.....	163
Table 76: Means, SD and effect size new means ‘Patientroom’ by unit for Staff.....	164
Table 77: T-test for equality of means: ‘Meanpatientroom’ by unit for Staff.....	164

Table 78: Items and reliabilities for variable ‘Facilities on Floor’ for Staff	165
Table 79: Items and reliabilities for variable ‘Facilities off Floor’ for Staff.....	165
Table 80: Means, SD and effect size new means ‘Onfloor’ and ‘Offfloor’ by unit for Staff.....	166
Table 81: T-test for equality of means: ‘Meanonfloor’ and ‘Meanofffloor’ by unit for Staff.....	167
Table 82: Items and reliabilities for variable ‘Facilities Residents’	168
Table 83: Means, SD and effect size new means ‘Residents’	168
Table 84: T-test for equality of means: ‘Meanresidents’ third floor	169
Table 85: Items and reliabilities for variable ‘Facilites Patients’ for Staff.....	169
Table 86: Means, SD and effect size new means ‘Patientfacilities’ by unit for Staff.....	170
Table 87: T-test for equality of means: ‘Meanpatients’ by unit for Staff	170
Table 88: Items and reliabilities for variable ‘Overall Satisfaction’ for Staff.....	171
Table 89: Items and reliabilities for variable ‘Overall Evaluation’ for Staff.....	171
Table 90: Means, SD and effect size new means ‘Satisfaction’ and ‘Evaluation’ by unit for Staff.....	172
Table 91: T-test for equality of means: ‘Meansatisfaction’ and ‘Meanevaluation’ by unit for Staff ...	173
Table 92: The Integrated Patient Chart of Holistic Healing Environments	183

SECTION I ■ INTRODUCTION

Chapter 1 ■ Background and Rationale for this Study

BACKGROUND

Hospitals have made quite a journey from the earliest healing temples in Egypt to the hospitals as we know them today. The Greeks, for instance, had healing temples combined with shrines and health spas where healthy diet, exercise and being surrounded with art, music and sculpture were believed to help the sick achieve harmony of mind and body. Over time, hospitals degraded to overcrowded, filthy, and less appealing places. Less than a century ago, no one with any class or clout voluntarily went to a hospital because it was a place of disposal and death (Lindheim, 1979, p.462). Florence Nightingale, in the late 1800's, dramatically improved the worst hospital conditions by cleaning and airing the wards resulting in a drastic decrease of the mortality rates. She wrote in her book *Notes on Hospitals* in 1858: "The very first requirement in a hospital is that it should do no harm" (in Lindheim,

1979, p.467). Nightingale specified criteria for the design of pavilions that would maximize sunlight and external ventilation and limited the number of patients. Less than a century later, new building technology drastically changed the image of hospitals again. Large, impersonal, institutional but highly technological buildings were the result.

Fortunately, the wisdom used more intuitively in ancient Egypt and Greece, and later by Florence Nightingale, has found its way back into hospitals. Especially over the last half century, the number and sources of publications on the impact the built environment has on how patients experience and react to the medical treatment they undergo has grown significantly. Hospitals today are less likely to focus on only the medical needs of patients but include their psychological and social needs as well. Architects, interior designers, sociologists, psychiatrists, doctors, nurses, and (environmental) psychologists have all written about architecture as a component of the therapeutic process. The empirical studies that have been conducted on the therapeutic or healing effects of design in healthcare environments have shown that the physical environment can directly impact our wellbeing (Ulrich, 1984; Rubin, Owens & Golden, 1998). However, few studies have focused on how patients and their relatives deal with the changes in their daily lives while in a hospital or how hospitals support them in their efforts to continue some daily routines when in hospitals frequently or for extended periods of time. A continuation of everyday activities becomes even more important when the patients are children. Over the years, options such as rooming-in for parents, flexible visiting hours, Child Life programs, and a wider range of facilities to support families have become more prevalent. In other words, the boundaries of what characterizes the traditionally strict institutional environment of a hospital have become more flexible. Unfortunately, the impact of these changes is rarely measured.

Although there have been important changes in making hospitals more focused on the concerns of patients and families, there has been no comprehensive attempt to understand the aspects of the physical environment that define hospitalization from the more holistic perspective of a “healing environment.” Such a holistic perspective must focus on how better to support families during the transition in and out of the hospital and how better to support children and parents in maintaining a more normal life during their stay in the hospital. Conceptualizing what a healing environment consists of from a holistic perspective and defining environmental elements will allow us to create better healthcare environments with positive effects on the healing process during and after hospitalization. The aim of this dissertation was to develop a ‘model’ of healing environments for children and their families. The basis for this model is the synthesis of an extensive literature review, supplemented and modified by information gathered from a case study in a children’s hospital.

The development of a model of healing hospital environments for children and their families was based partially on the unique opportunity to compare an existing traditional children’s hospital to a new healing children’s hospital. The Westchester Medical Center (Valhalla, NY) built a new children’s hospital, which opened its doors in September 2004, immediately adjacent to the existing one to replace the existing pediatric floors. By mapping the characteristics of the environment and tracking the changes in experiences and functioning of patients, families, and staff before, during, and after their move from one hospital to the other, one can get a better understanding of the impact the environment has on real people. A move is a big change in the life of an organization and is likely to bring things to the surface that otherwise stay unnoticed. Following the move closely provided insights into the aspects that surface when people face change and when they settle into a new environment.

Comparing both hospitals enabled me to define aspects of the environment that work for patients, parents, and staff in both the old and the new hospital, and the potential added value of a healing hospital environment.

The case study consisted of two steps. The first step was to assess the quality of healing in the existing WMC. This baseline study was conducted before June 2004, when the move into the new building was still being planned. The second step was to assess the quality of healing in the new MFCH and compare it to the data collected at the baseline.

RATIONALE FOR STUDY

The first goal was to analyze and synthesize the existing literature on healing and healing environments in order to build a model based upon current knowledge. Going over the literature, I was struck by how incoherent, fragmented, and often speculative the literature on healing environments is. In addition, very few publications are research based. In the following subsection I will present a summary of the state of the art knowledge on healing environments to illustrate this assertion.

Fragmented and Speculative

Despite the different and important contributions of various fields, there seems to be very little mutual awareness among the different professions of each other's work, resulting in an inefficient use of available data and knowledge. For instance, relevant work done by the pioneers of social science in this field who studied the impact of the healthcare environment on social and psychological wellbeing and behavior (Holahan, 1978; Lindheim, 1979; Olds, 1981; Sommer & Ross, 1958; Ulrich, 1991a; Winkel & Holahan, 1985) is very rarely cited in

publications by architects and designers (Nagasawa, 2000; Rogers, 2002; Scher, 1997) or doctors (Gross, Sasson, Zarhy & Zohar, 1998; Horsburgh, 1995).

The preponderance of research designed to assess the impact and quality of the healing environment are single case study evaluations with mostly qualitative data (Bakos, Bozic & Chapin, 1987; Brown & Taquino, 2001; Carpman, 1990; Kari, Donovan, Li & Taylor, 1999; Preiser, Rabinowitz & White, 1988; Yeaple, Iltus, de Vos & Sabo, 1995). Experimental research to measure the effect of the environment on health-outcomes in hospitals is very difficult and costly because of the problems of controlling for variables, random assignment, sample size, and ethical issues. Consequently, scientifically valid research with sound empirical findings is extremely rare (Rubin & Owens, 1998). There is a need in the field to develop clear standardized environmental indicators of health and wellbeing that can be used in different health care settings (Rubin et al., 1998; Weber, 1996).

The literature shows that what matters most to patients and family members in a hospital setting is an environment that: is convenient and accessible, promotes control by them, is conducive to a sense of wellbeing, promotes connections to staff, is confidential and private, shows caring for families, is considerate of impairments, facilitates connection to the outside world, and is safe and secure (e.g. Olds, 1981; Ulrich, 1991b; Winkel & Holahan, 1985). Healthcare environment guidelines developed by various disciplines provide practical and valuable insights but they rarely explain the basis of guidelines and how to prioritize design decisions, which make them difficult to apply or to build on for further research (Carpman, Grant & Simmons, 1985; Malkin, 1993).

Beyond the Building Itself

Most research across the various disciplines has assessed the quality of healing within the boundaries of the hospital itself showing how the hospital environment can be improved to reduce stress. Stress is considered to be a major obstacle to healing (Ulrich, 1991a & 1992; Winkel & Holahan, 1985). Poor design increases stress and works against wellness while supportive design can minimize stress for all users of healthcare environments. From a psychological standpoint, stress can result in as a sense of helplessness or in feelings of anxiety and depression. Physiologically, stress causes changes in the body, such as increased blood pressure, higher muscle tension, and high levels of circulating stress hormones. Behavioral impacts of stress can include verbal outbursts, social withdrawal, passivity, and sleeplessness (Ulrich, 1991).

In addition, institutional settings typically constrain our behavior and limit our freedom of choice, control over our daily rhythms of behavior, freedom of movement, and privacy, etc. (Rivlin & Wolfe, 1979 & 1985). Therefore, changing the physical elements of an institution without revising policies and procedures or the organization of the hospital may result in a more pleasant environment but it will not truly change the character of the institution itself (Rivlin, Bogert & Cirillo, 1981). A holistic approach to healing environments that will enhance the quality of everyday life in hospitals will have to incorporate not only physical changes but also organizational changes to minimize these institutional characteristics.

One important aspect of the institutional environment is how it can close off the social world of children. In a traditional children's hospital for instance, physical medical care is the main focus; patients have limited access to the outside world (e.g. school, friends, and siblings), limited information about their illnesses, and limited choices about their daily

routines (e.g. dinner with family, choice, and freedom to play). The behavior setting of the hospital is highly deterministic and therefore limits the extent to which patients and family have control over their lives. The healing environment of such hospitals typically consists of design elements that improve the image of the building by making it look less institutional and increase comfort and reduce stress for patients while in the hospital by providing a more pleasing environment and positive distractions.

Participatory Approach

Komiske adds another valuable perspective to hospital design. In an article (2003a) he underlined the importance of “Design as a Strategic Investment.” He emphasizes the importance of adding strategic value of good design to any hospital CEO’s business plan. Statistics from one children’s hospital four years after occupancy showed what good design can do for an institution without additional cost. Data from previous hospitals he had managed revealed increases in market share, outpatient visits, inpatient days (increase in number of patients), patient satisfaction, monthly volunteers, house staff applicants, annual giving, and print columns. According to Komiske, ‘good design’ involves incorporating state of the art design principles and participation by all users in the design process. Komiske raises another important issue, that of user participation in the design process. Clearly, there is a growing awareness in the literature of the importance of bringing the people who will eventually use the facility into the design process.

Some publications suggested hospital guidelines based on theories from developmental and child psychology (Olds & Daniel, 1987), while other studies stress the importance of patient, staff, and visitor participation in the design process and base their guidelines on user input (Carpman, 1990; Chen & Sanoff, 1988). While a participatory design process might be more

complex to orchestrate, it nevertheless does have significant benefits (Carpman, 1990). A study by Bakos, Bozic, Chapin and Neuman (1980) showed that the effects of environmental changes in a facility for geriatric patients had measurable, positive effects on elderly resident's behavior especially for the ones that took part in the participatory design process.

A participatory design process helps clarify design objectives and makes better-informed design decisions. It lowers construction costs because errors can be avoided. Because staff members are involved, it stimulates positive behavior and attitudes and it can help create a sense of community among staff.

Measurable Outcomes

Despite the fragmented nature of the literature, a broad basis clearly is present and sufficient material seems to be available to foster healing in health care environments. Olds and Daniel (1987), for instance, did an excellent job of presenting a more holistic account of wellbeing in children's hospitals but it was based more on the integration of literature and theories from psychology than on systematic research. However, knowledge gathered by various disciplines will only become effective if the decision makers (e.g. hospital administrators and architects) in the design process are equally aware of the importance of these findings (Komiske, 2003a). When decisions need to be made in the design process, time, costs, and benefits will come into play and will have a dominant role. Because the potential economic benefits (Ulrich, 1992; Komiske, 2003b) in creating healing environments are less obvious than the social and psychological benefits, a research-based effort to create a true healing environment is often not undertaken. Therefore, the outcomes of environmental social science research must be linked to potential economic benefits (a primary concern of most

clients) to use the data effectively and ensure that opportunities to create healing places will be not missed.

Conclusion

Over the years, many literature reviews have discussed the contributions of various disciplines to our understanding of the impact of the hospital environment on staff, patients and, to a certain extent, their parents (e.g. Devlin & Arneil, 2003; Dilani, 2002; Gadbois, Bourgeois, Guillaume, & Urbain, 1992; Olds & Daniel, 1987; Shepley, 1998; Shumaker & Pequegnant, 1989). However, as pointed out in this chapter, the literature is fragmented and non-accumulative in nature. Therefore, this dissertation will not review the literature in a traditional sense but instead will focus on integrating and summarizing the existing literature in an overview (see Section II). The analysis of the literature on healing will be used to build a conceptual model of a holistic healing environment from the synthesis of current knowledge.

Chapter 2 ■ Research Aims and Design

RESEARCH STATEMENT

I believe that certain symptoms experienced by patients and families, such as increased stress, anxiety and pain, are not necessarily part of the illness, but rather caused by a misfit between the hospital environment and the patients' and families' needs and concerns. These needs and concerns involve physical, social, and psychological aspects. If the hospital environment is to be truly healing, it must be designed with all of these aspects in mind. The extent to which this happens determines the quality of healing. To maximize the quality of healing, a holistic approach to optimizing healing environments is suggested in this study. The medical care of patients is taken as a given in this study. Consequently, the healing environment, as discussed in this research, does not include the medical needs of patients or their treatment.

RESEARCH QUESTIONS

My research was built around the following sets of questions:

1. How can a hospital environment approximate everyday life?

The following questions were developed to define the qualitative criteria for creating a healing children's hospital as a whole, for the various units within the hospital and for the different users of the building.

- A. What aspects are considered to be important in creating healing environments that minimize disruptions to everyday life while hospitalized?
- B. How can the hospital environment better support patients in creating healing environments that minimize disruptions to everyday life in the hospital?
- C. What aspects are considered to be important in creating healing environments that minimize disruptions to everyday life for parents while their child is hospitalized?
- D. How can the hospital environment better support family focusing on minimizing disruptions to everyday life during the child's hospitalization?
- E. What physical adjustments to the hospital building are needed to fulfill these requirements?

RESEARCH DESIGN

A multi-phased research design was created in order to develop and apply the model. This involved:

1. Developing the Model. Two major sources were used to develop the model.
 - a) Literature Review: The literature on healing was integrated in order to build a conceptual model of healing from the synthesis of current knowledge.
 - b) Formative Research: The dimensions of healing, the Charts, and a preliminary model were identified through interviews and observations at a children's hospital.

2. Applying the Model in a Case Study. The preliminary model and methods were applied in a single case study of the transition from an old to a new children's hospital. This involved:
 - a) Research on an Old Hospital: interviews, behavioral mapping, and questionnaires were used to assess how patients, parents and staff experienced the old hospital.
 - b) Research on the Transition: participant observation was used to monitor the aspects that surfaced while patients, parents, and staff prepared for the transition and moved into the new hospital.
 - c) Research on a New Hospital: interviews, behavioral mapping, and questionnaires were used to assess how patients, parents and staff experienced the new hospital. These data were compared to the data found in the old hospital.
3. Revising the Model of Healing Environments and Applying it to Design. Based on the data found in the case study, the dimensions, the Charts and the model of healing environments were revised and related to environmental elements of a hospital.

Furthermore, in the process of executing this research I undertook to:

- *Involve the users in hospital evaluation.* To understand how wellbeing and healing during and after hospitalization can be improved, longitudinal and participatory research with patients, parents, families and staff is needed to understand how 'everyday life' can be better supported while in a hospital environment (Vickery, 2003; Chawla & Heft, 2004).

- *Develop clear indicators of healing environments that can be used in other settings.* A model is needed that will help to organize and prioritize design principles that can promote health and wellbeing and that are not just unique to one hospital setting. This would improve the applicability and accessibility of indicators of healing environments (Zeisel, Hyde & Levkoff, 1994; Zeisel, Silverstein & Hyde, 2003).
- *Improve the communication of research findings.* The design implications suggested in the literature rarely reach, or are not understood by, other important parties in the process such as architects and medical staff (Tétrault & Passini, 2003). More attention should be paid to the communication of research findings to administrators of health care environments, so that they can make better informed decisions.

In the following section – Developing the Model – the Literature Analysis and Formative Research will be discussed. The analysis of the literature on healing environments was used to build a conceptual model of holistic healing environments that minimize disruptions to children’s everyday life from the synthesis of current knowledge. In addition, initial interviews and observations at a children’s hospital were conducted to complement what was found in the literature. This formed the base for the development of the Charts, the model and instruments of a holistic healing environment. The Charts, model and instruments were applied in a single case study of the transition from an old to a new hospital.

SECTION II ■ DEVELOPING THE MODEL

Chapter 3 ■ Literature Analysis on Dimensions of Healing Environments

LITERATURE ANALYSIS

In order to build a more integrated and conceptual model of how healthcare institutional environments can better achieve healing and wellbeing, the literature reviewed to identify dimensions of healing environments drew broadly from disciplines such as environmental, developmental and social psychology, medicine, marketing, pediatric psychology, social work, and the Child Life profession.

The term 'healing environment' is a relatively new concept which one will find only in more recent publications (Malkin, 1999; Ulrich, Simons & Miles, 2003). The concept, however, as discussed in the introduction, could also be found in the earliest healing temples in ancient

Egypt and Greece. Studies of the impact of institutional environments on human behavior have been performed by various disciplines over the last 45 years. The literature reviewed and used to build the model covers a timeframe from the earliest publications on therapeutic environments describing the impact of seating arrangements in psychiatric hospitals on social behavior, (Sommer & Ross, 1958) to very recent publications introducing a more holistic perspective on healing (Winterberg, 2003).

The literature review draws upon work in different disciplines and uses their published papers describing the interaction between the hospital environment and people's wellbeing, such as environmental psychology (*Environment and Behavior, Journal of Environmental Psychology*), medicine (*Journal of American Medical Association, General Hospital Psychiatry, Anaesthesia, The New England Journal of Medicine, Psycho-oncology, Journal of Child Psychiatry, Supportive Care in Cancer*), nursing (*Annual Review of Nursing Research, Journal of Pediatric Nursing, Journal of Perinatal and Neonatal Nursing*), and architecture (*Journal of Architecture Planning Research, Design Studies, Journal of Health Care Design*).

Pediatric psychology, for instance, can provide insight into how the environment could enhance the quality of life of patients and families in addition to the different psychological interventions that are being discussed (Houtzager, Grootenhuis & Last, 2001; Krol, Grootenhuis, Destrée-Vonk, Lubbers, Koopman & Last 2003; Langeveld, Stam, Grootenhuis & Last, 2003; Stam, Grootenhuis & Last, 2001). Indicators of stress, anxiety and coping, and instruments to measure these indicators can be helpful tools in assessing the effectiveness and quality of the changed environment.

The literature shows that it is important to consider developmental dimensions in creating design guidelines for hospital environments (Olds & Daniels, 1987). This becomes

increasingly important when children are hospitalized for a long time or frequently spend time in hospitals because they suffer from chronic disease (Winterberg, 2003). Such children need a nurturing environment where development is supported and stimulated to allow for a normal development even during hospitalization (Erikson, 1956). Therefore, the model must include what we can learn from the qualities of everyday settings for children that could be applied to hospital environments to make them less institutional by providing age appropriate play environments and restorative places (Bagot, 2004; Korpela, Kytta & Hartig, 2003; Kytta, 2002).

In addition, people's perceptions of the hospital environment need to be understood ecologically (Bronfenbrenner, 1977). This means that we not only have to take into consideration the hospital but also all of the other settings and levels of analyses that influence the hospital setting. These range from the child's home, school, and peer environment, and the parents' work situation and the care of siblings, to the hospital's administrators and economic and political situation.

After an extensive search for literature related to healing and healing environments for children, the articles and books found were analyzed for topics relevant to this study. Anything directly or indirectly related to healing or healing environments was extracted from the sources. An overview was generated with a summary of each publication. This overview included a brief description of the article (i.e. its specific topic), the implications for the design-healing relationship, and the reference of the publication. See the Table 1 for an example of this overview.

Table 1: Example of the table with the literature summary

Design Healing Relationship	Topic as described in literature	References
Visual relationship between room and staff	Knowing you can call someone and that they will hear you/come	Picker Institute, 1998
Access to window for orientation, contact with outside world	Contact with outside world, feeling connected and knowing what is going on/ day/ weather	Horsburgh, 1995; Verderber et al., 1987
...	...	Etc.

Based on this literature summary, themes were organized into clusters. This engendered the emergence of common themes by which the publications could be grouped into common categories. Common themes were, for instance, privacy, control, access to the outside world, access to nature, positive distractions, etc. Some publications fit into more than one category. The synthesis of the literature has been organized into an overview (Charts) around common themes. To complement what was found in the literature on healing environments for children, additional research (interviews and observations) was carried out at a children's hospital. This research will be discussed in the next chapters.

Chapter 4 ■ Formative Research: Interviews and Observations in a Children's Hospital

INTRODUCTION

The purpose of the early interviews and participant observation at the WMC was to gather additional information to complement the Charts that were formed based on the literature syntheses. Because most of the literature deals with how to improve the hospital *building*, I felt it necessary to give patients, parents, and staff a chance to speak freely and comprehensively about their concerns regarding the hospital as a healing *environment*. Therefore, the interviews and observations focused mainly on how patients and their families deal with the transition into and out of the hospital and on how their daily life is being disrupted. In addition, the interviews addressed how patients and parents thought the hospital could better support their transition into and out of the hospital, how they experience the current hospital environment, and what could be done to help them maintain daily life during hospitalization.

THE LOCATION

The formative study focused on the Children's Hospital of the Westchester Medical Center (WMC) at Valhalla, a tertiary pediatric hospital in New York State. As this study began, two pediatric floors of the main hospital at WMC constitute the Children's hospital. For more information on the location see Chapter 7.

THE PARTICIPANTS

The participants in this formative study were a small group of patients ages 14 to 18 (N = 10), parents of patients (N = 20), and staff (N = 15) from WMC. The pediatric hospital has patients ranging in age from newborns to 18-years-olds. As a volunteer on the floor, I had access to the patients and their families. At the beginning of the day, I would ask a Child Life specialist to tell me which patients and which parents I could approach that day. This was so that I would not approach a patient or parent who was incapable (emotionally or otherwise) to participate in this study. The sample of patients and parents, therefore, is a convenience sample as is the sample of staff with whom I spoke. Getting access to the patient population was difficult because most of the children were either too young or too sick to be interviewed, mentally handicapped, or their parents were not there to sign the consent form. Most interviews with patients took place with their parents present.

THE METHODS

The methods used for this formative study at the children's hospital included 1) site analysis, 2) participant observation, and 3) semi-structured interviews.

- 1) Analysis of the sites of the two pediatric floors included a written description of the current space, the use of the space, an overview of the special programs and activities for children and parents, the collecting of existing architectural drawings of the children's hospital, and taking photographs of the different spaces.
- 2) Participant observation was carried out to get a better understanding of the use of the space on the pediatric floor, its qualities and limitations, unintended use, wear and tear, and so forth. The participant observation involved shadowing the nurses for a few hours

in each unit of the pediatric floors to gain understanding about their routines (total of 16 hours of shadowing). Different aspects of the environment (without the patients) were photographed. Throughout the participant observation, ethnographic field notes were written. In total I spent approximately 150 hours on the floor.

- 3) To discover how the hospital environment could better suit the needs and concerns of patients and their families, semi-structured, open-ended interviews were administered to patients (10 interviews), parents (20 interviews) and staff (15 interviews). Questions focused on how the respondents experienced and perceived the hospital environment and what could be done better to approximate everyday life for the children and the families while in the hospital (e.g. how they stayed in touch with home, work, school and how they arranged for the care of other children, etc.). All interviews were done during the day. See Appendix A for the interview guides.

DISCUSSION OF THE INTERVIEWS AND OBSERVATIONS

The interviews with patients, parents, and staff focused on how they thought the institutional qualities should change in order to better minimize disruptions to children's everyday life (e.g. more flexible rules, family-centered care, diversity of environments) for patients and parents, such as the ability to stay in touch with home, friends, school and work. The following briefly summarizes the most important themes derived from the interviews and observations.

In a more traditional hospital the child typically enters a strange institutional environment, is removed from loved ones and normal patterns of activity, is surrounded by strange people and strange equipment, and has a reduced degree of control over decisions. Consequently,

the moment a child enters the hospital, his or her world changes dramatically. Similarly, after leaving the hospital, he or she will have to readapt to their former life. Long-term patients and patients with chronic diseases can be expected to be the most affected by these frequent disruptions to their daily lives. Being in and out of hospitals will disrupt their daily life and development. Keeping up with school, learning social skills, or playing with friends, for example, is often difficult.

The Findings

The interview results pointed out that children do like to stay in touch with school and their friends and siblings. If this is not possible, it is often experienced as upsetting or stressful. Visits from friends and family, having a parent stay over, and having access to a phone and email were cited as important ways to stay in touch with their everyday life. Meeting other patients and having a place to go to with them or friends was mentioned as well. A room with couches (“like in [the TV-series] Friends” as mentioned by one of the patients), a place to pray, music, books, computers, and video games were often mentioned. Another important issue was privacy while in bed talking to doctors and nurses, during procedures, while using the bathroom, being wheeled down corridors, or talking to family and friends. Some patients preferred a single room over a double room but all of them mentioned that sharing was only a good thing if you had a roommate of roughly the same age. Most patients who were in the hospital for a longer period of time liked to do schoolwork because they did not want to fall behind.

The lives of parents, siblings, friends, and family members can also change dramatically from spending significant amounts of their time with loved ones in a hospital. Parental support now often happens within the constraints of the building with limited facilities to make their

stay easier. Combining visits to the hospital with work, the care of the siblings of the hospitalized child, a spouse or partner, running a household, and maintaining a social life puts enormous pressure on the family, and consequently on the patient. A continuation of daily life becomes stressful and difficult for the whole family.

The most striking thing the parents who stayed with their child mentioned was that they did not want to leave their child alone, even for a second. They felt they had to be there for their child the whole time especially in case a nurse or doctor would come by. Parents also mentioned that it was important for them to get enough sleep and (healthy) food to stay fit in order to be able to take care of their child while staying in the hospital. This often did not happen. They might, for instance, have friends and neighbors supporting them by cooking meals but then not have a place in the hospital to store or heat the food. Access to a phone and email was considered crucial in order to stay in touch with home, work, and friends, and also to find more information online about their child's illness or treatment. Parents also often mentioned that they would work from the child's room if internet access were only available in the room. For parents living far away from the hospital (many of them lived more than two hours away), a change of clothes is a luxury. The nurses sometimes take clothes from parents home to wash or parents get clothes donated from Child Life. This, however, often makes parents feel even more dependent. A place to wash their clothes would add to the feeling of control and an overall sense of wellbeing.

The sample of staff interviewed consisted of nurses, an attending physician, a resident, a social worker, Child Life specialists, a teacher, and volunteers. I wanted their thoughts on how the environment could be improved to support patients and parents better and minimize disruptions to everyday life while in the hospital. The majority of the staff

mentioned that the hospital no longer meets the needs of patients and parents. Now that Family Centered Care has become part of daily practice, the rooms have become too small to accommodate both a patient and a parent, and the facilities, such as bathrooms, showers, furniture for parents, and family lounge, are no longer adequate. Some of the staff described the environment as being disrespectful to patients and their families, defining it as dirty and old looking, with broken chairs and phones, and no place to talk privately with staff or to grieve, etc.

In addition to the interviews, I spent considerable time on the pediatric floors, doing participant observation and keeping field notes. This allowed me to become familiar with staff and the environment and helped me gain an understanding of the daily routines on the floor, the rules and procedures, and the use of the spaces such as the bedrooms, playrooms, family lounge, and corridors. As a result, the interview-data were supplemented by the observations on the floor.

All topics discussed with the patients, parents, and staff and the findings of the observations were added by theme to the existing literature review table in a separate column. From this table, two comprehensive Charts were generated, one with all the topics relevant to the patients and one relevant to the parents. These Charts were used to conceptualize the overarching dimensions of healing environments to be discussed in the next chapter.

Chapter 5 ■ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

DIMENSIONS OF HEALING

The information gathered from the literature research, field notes, participant observation, interviews, and photographs was compared to extract common themes, concepts, and topics. Consistency among the data from the various sources served as an indicator of the credibility and reliability of the research. Wherever possible, I shared my interpretations of the data with the participants to verify my analysis.

The goal of the Formative Research was to develop comprehensive Charts in order to reveal the state of contemporary understanding regarding healing environments. The development of these Charts was an iterative process, constantly moving back and forth between the literature and the research findings, searching for common themes and indicators of healing. Ultimately, this resulted in the definition of seven overarching dimensions by which both the literature and research findings were organized.

The Patient Chart and Parent Chart containing the synthesis of the literature and the findings of the interviews and observations were each critically analyzed in order to define the most frequently occurring and common themes that can be used to build a model of healing environments for children's hospitals. The literature and research findings were discussed on an ongoing basis with colleagues at both the university and the children's

hospital. Their feedback helped to identify and cement the Seven Dimensions of a healing environment that were extracted from the findings. The dimensions relate to the reduction of stress and the increase of wellbeing during hospitalization for patients. The research revealed that this necessarily also includes the reduction of stress and increase of wellbeing for parents. The Seven Dimensions are listed below:

1. *Basic Physiological Needs*: aspects that are considered to be prerequisites for psychological wellbeing such as getting adequate sleep and food.
2. *Agency and Control*: relates to desired behaviors to increase the degree of control over and access to aspects such as knowledge, privacy, decisions, independence, freedom, etc.
3. *Feeling Safe and Secure*: relates to the need for sense of security: e.g. knowing the place is secured, having lockable storage for valuables, knowing your child is being watched.
4. *Social Support*: relates to maximizing the ability of family, friends and peers to improve or shore-up the patient's emotional state.
5. *Distraction and Engagement*: relates to the need for children to have meaningful things to do and to continue, insofar possible, daily activities so that they can take their mind off being sick.
6. *Everyday Behavior*: focuses on important aspects of daily life related to wellbeing including freedom of choice and mobility, routines, and rhythms, etc.
7. *Normalized Environment*: focuses on all aspects to de-institutionalize the environment to make it a less stressful and fearful place by enhancing comfort and beauty.

The Seven Dimensions were used as a framework to order the data. This resulted in two comprehensive Charts (one for patients, one for parents) presented below. The first column contains the seven overarching dimensions of healing as mentioned above. The next column

describes a behavior that is related to the concept in the first column. The third column describes the design healing relationship, in other words, what the healing power of a design decision is. The fourth column presents the topics as they were mentioned in the articles. Literature references are presented in the next column. The final column contains the findings from the observations and interviews at the Westchester Medical Center.

THE PATIENT CHART

Table 2: The Patient Chart: summary of the literature review and data from Formative Research

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
<i>Patients 0 to 18 years</i>					
Basic Physiological Needs	Getting adequate sleep and rest	Feeling and being rested helps recovery prerequisite for psychological wellbeing	Comfort & Quietness	Olds et al., 1987	Noisy
	Adequate eating, meeting appetite	Helps recovery prerequisite for psychological wellbeing	Choice of food, appealing food	F. de Vos, 2004	Limited choice on menu, often not appealing to child
	Getting adequate pain relief	Avoid needless suffering	Availability of pain medication, relaxation etc	F. de Vos, 2004	Part of mission of hospital
	Control over pain (adolescents)	Self-administering of pain medication		F. de Vos, 2004	Part of mission hospital
	Having control	Perceived control as related to restrictions of institutional environments	Locus of control, depression, vigor, life satisfaction	Rivlin & Wolfe, 1979; Rivlin, 1981; Schutte et al. 1992;	Organizational implications: Restrictions in more subtle ways
		Reduce psychological social uncertainties	Medical equipment, unfamiliar elements privacy, etc.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich 1991b; Winkel & Holahan, 1985	Little control now Share room, moves, no personal space, Not knowing what happens

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Patients 0 to 18 years					
Agency & Control		Control over noise	Material that absorbs noise	F. de Vos, 2004	Shared rooms, noisy machines, crowding, etc.
	Having control over privacy & confidentiality	Exchange information while being protected from others (visual, acoustic etc)	Consulting rooms, private rooms	Picker Institute, 1998; Scher, 1997; Winkel & Holahan, 1985	Big problem, HIPPA violation, around bed, at nursing station,
	Privacy while being transported	Not being exposed to visitors when wheeled through hospital (trauma and ER patients)	Separate elevators & corridors, personal identifiers not exposed	Horsburgh, 1995; Yeaple et al., 1995	Corridors shared, separate elevators Stressful for patient and visitors
	Control over privacy				
	General	Control over privacy while in room	Curtains, doors, space	Kari, 1999; Olds et al., 1987; Wolfe, 1978	Door open or not
	Using toilet or pan in bed	Embarrassment to be seen-heard (<i>adolescents</i>)	Toilet near bedroom	Hutton, 2002; Kari, 1999; Wolfe, 1978	Curtains in PICU
	Showering or being washed	Embarrassment to be seen naked (<i>adolescents</i>)	Shower curtain as extra boundary	Hutton, 2002; Kari, 1999; Wolfe, 1978	Doors can be locked / Curtains closed while in bed (PICU)
	Grooming	Appearance (hair, clothes, etc.) (<i>adolescents</i>)	Laundry, hairdresser	Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978	Doors can be locked
	Use of telephone	Not being heard by others while on the phone (<i>adolescents</i>)	Private room with phone/ or private place to call	Hutton, 2002; Olds et al., 1987	Share room now, no lounge?/ no phone in PICU
	Being alone	Unwinding (<i>adolescents</i>)	Private room & places/ curtains	Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978	Room being shared
	Control over daily rhythm	Control over when to rest, sleep, play, get out of bed	Light, curtain, TV, playroom,	Kari, 1999; Proshansky et al., 1976	Determined mostly by medical and hospital routines,
	Need to feel competent	Different levels (age) of stimulation and accomplishment	Choice of doing things yourself if possible (e.g. wash, bathroom)	Olds et al., 1987; Winkel & Holahan, 1985; Yeaple et al., 1995	Limited age appropriate environments

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Patients 0 to 18 years					
Agency & Control	Having visual connections to staff	Knowing you can call someone and that they will hear you/come	Visual relationship between room and staff	Picker Institute, 1998; Yeaple et al., 1995	Long corridors, two nursing stations, no visual relationship, communication system
	Having access to windows	Contact with outside world, feeling connected and knowing what is going on/ day/ weather	Access to window for orientation, contact with outside world	Horsburgh, 1995; Verderber et al., 1987; Yeaple et al., 1995	One third of the patients have access to a window
		Perceptual and cognitive links to external environment	Impact of poor or no view on staff and patient	Verderber et al., 1987	Now curtains are pulled often, blocking window view / blinds closed for reflection
	Need for control on having choices & independence	Having choices and knowing why things happen		Kari, 1999; Olds, 1981/ 1987; Scher, 1997; Winkel & Holahan, 1986	Limited
		Who enters & leaves the room, etc.		F. de Vos, 2004	Share rooms often, so little control
		Not being moved around too much	Organizational	F. de Vos, 2004	Changing of rooms
		Control light and temperature		Olds et al., 1987	Limited
	Easy to orient and find one's way	Reduce uncertainty and confusion provide coherence	Clear cues such as entrance	Carpman et. al, 1985; Evans & McCoy, 1998	Straightforward floor, but no landmarks
		Space cognition and orientation	Human scale, spatial design, signs	Horsburgh, 1995; Nagasawa, 2000; Scher, 1997; Williams, 1988	No landmarks
		Convenient and accessible	Parking, entrance, elevators, floor, etc.	Picker Institute, 1988	Parking difficult One entrance easy to find
	Easy to move around when impaired	Considerate of impairments to increase independence	Thresholds, buttons, signs, maneuver space, no obstacles	Picker Institute, 1998; Scher, 1997; Yeaple et al., 1995	Narrow door-ways, small rooms, many obstacles, no maneuver space

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Patients 0 to 18 years					
Agency & Control	Keeping personal possessions (identity)	Personalize surroundings (display books, games, photos, cards, etc.)	Shelves, (lockable) closets in bedroom, teen lounge	Shepley, 1998	No locks, not enough space
	Having access to information	Agency / Knowing what is going on	Having several resources	Bearison, 1994; Scher, 1997	No library, no internet & limited support groups
		Learning from other patients	Support from peers	Bearison, 1994	Only one place to meet other patients
		Understanding who is who in the health team		F. de Vos, 2004	Seems clear to patients
	Control over social isolation vs. interaction	Dayroom: sociopetal seating better than sociofugal patterns for dayrooms / lounges	Seating pattern dayroom and interaction	Gross et al. 1998; Holahan, 1978 Sommer & Ross, 1958, Volker, 2002	Possibly applicable
		Bedroom size and social interaction	Need for privacy. More social interaction in smaller rooms	Ittelson et al., 1970	Not applicable: Only double and private rooms
	Control over eating: being able to eat what /when you want	Increase control over when and what you eat. Getting own snacks/drinks	Kitchenette with drinks and snacks & Pantry with fridge and stove /microwave	Olsen, 1984; Shepley, 1998	fridge and microwave for patients on floor cafeteria 1 st floor
Secure & Safe & Feeling	Keeping personal valuables	Keeping personal belongings	Lockable storage	Picker Institute, 1998; Yeaple et al., 1995	People bring own locks, or parents bring things to car
	Having (visual) connections to staff	Feeling connected and seen	Pod like units	Picker Institute, 1998; Yeaple et al., 1995	Long corridors
	Knowing the place is being watched	Control over entrances & surveillance	Controlled access Security/camera's. Visual openness	Picker Institute, 1998; Yeaple et al., 1995	Main entrance control, But different accesses. At nights eerie
	Access to psychological help	Therapeutic help, being able to talk freely to someone (Social worker, volunteer/ psycho-therapist)	Counseling room Quiet/play room	F. de Vos, 2004	Patients talk to nurses and family
	Having family support	Having parents be with you 24/7	Facilities for parents	Olds et al., 1987; Picker Institute, 1998,	On pull-out chair if available

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Patients 0 to 18 years					
Social Support	Staying in touch with friends/school/peer network	Support network of friends in hospital or from distance	Provide facilities for friends, lounge ; Internet (email & web cam); phone	Eiser, 1990; Kari, 1999; Picker Institute, 1998; Ulrich, 1991; Winterberg, 2003	Rooms too small, too crowded, too noisy / no lounge / no chairs / no computer facilities
	Having Family support	Impact on psych. and physiological (stress) and behavioral (social withdrawal) wellbeing	Rooming-in for and facilities for parents	Olds et al., 1987; Picker Institute, 1998; Scher, 1997	On pull-out chair if available
	Having contact with other patients / support groups	Meeting other patients for support, to talk or play with	Age appropriate (play) rooms / lounge / informal meeting	Bearison 1994; Eiser, 1990; Hutton, 2002; Kari, 1999; Shepley, 1998; Winterberg, 2003	No lounge for teenagers, play rooms for Infant & Toddlers and pre-school
	Having someone to talk to	Personal attention and comfort if parents are not there	Nurse/volunteer, Child Life, chaplain, etc.	Horsburgh, 1995; Scher, 1997,	Nurses and doctors most often mentioned
	Community support	Feeling supported and cared for by community	Events, clown, beanies, pinwheel etc	F. de Vos, 2004	Regular events
Provide Distractions	Provide positive distractions /engagement in normal activities	Psychological, physiological & behavioral wellbeing, reduce Anxiety and distress	Provide appropriate stimulation	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich, 1991 a+b; Yeaple, 1998	Child Life Volunteers Activities
		Provide appropriate stimulation five senses	Music, art, olfactory	Malkin, 1993	Not for all senses
	Having access to restorative places and art	Place to unwind, release stress, etc.	Garden, playground Playroom, private space	Arneill & Devlin, 2002; Evans & McCoy, 1998; Korpela et al., 2002; Olds et al., 1987; Scher, 1997;	Limited access: playrooms, fish tank lobby...
Behavior	Range of activities	Diversion, availabilities of e.g. games, toys, books, video's, computers, arts	Range of facilities From bed and at desks	Krol et al., 2003; Olds et al., 1987	Limited facilities in room and on floor

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)	
Patients 0 to 18 years						
Everyday	Staying in touch with school (education)	Schoolwork and electronic learning opportunities	Classroom/ bedroom/ teachers	Eiser, 1990; Kari, 1999; Krol et al. 2003; Langeveld et al., 2003; Shepley, 1998	No place for homework exams no internet	
	Staying in touch with outside world	Peer friends	Phone/ email /TV/radio	Hutton, 2002; Olds et al., 1987; Winterberg, 2003	Very limited: phone does not work always, not internet	
	Being able to get fresh air/ go outside	Physical access to nature to help recovery	Garden, balcony, open window, courtyard	Olds, 1987; Scher, 1997	No nature, no access to outside	
	Having access to nature	Visual access to nature	Plants, pictures of nature, windows	Horsburgh, 1995; Malkin, 1993; Picker Institute, 1998; Ulrich, 1991b	Limited access. No pictures/plants Aquarium	
Behavior	Need for purposeful activity and movement	Being active, distracted, and avoid boredom, motivate patients to be engaged	Different facilities and goals to walk to	Krol et al. 2003; Olds, 1981/ 1987	Limited on floor	
	Everyday	Feeling free to express oneself	Having positive emotions: laugh, smile,	Events & positive distractions (e.g. movies, clowns Celebrate birthday	Winterberg, 2003	Family and friends make patients smile
			Having negative emotions: being angry, sad		F. de Vos, 2004	Needles and pain make them angry
			Being able to make noise & be loud		F. de Vos, 2004	Not really possible here
Freedom to express one's culture	Eating, drinking, religious habits	Place to pray, chaplain etc	Winterberg, 2003	No specific places		
Normalized Environment	Find symbolic meaning a child friendly environment	Qualities to improve healing, use scale and world that represents child	Make it less institutional, all levels of stimulation	Evans & McCoy, 1998; Horsburgh, 1995; Winkel & Holahan, 1985;	Typical hospital	
		Paying attention to environment influences perceived quality	Waiting room environment Impression environment makes	Arneill & Devlin, 2002	Little respectful to users	

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Patients 0 to 18 years					
Normalized Environment		Better appraisal of environment better mood & satisfaction	Waiting room appraisal	Leather et al. 2003	Institutional
		Special unit for Infant & Toddlers, preschool, adolescents	Being with kids same age / gender Peer support, sense of belonging	Olds et al., 1987; Shepley, 1998	Not always in room with same age range/ gender
	Create comfort and beauty	pleasing colors and lighting	Make it less institutional: child friendly materials and finishes	Evans & McCoy, 1998; Olds, 1981/ 1987; Picker Institute, 1998; Williams, 1988	Overall little color, Murals in corridor (very institutional)
		Non-institutional furniture	Colorful, comfortable and child appropriate	Arneill & Devlin, 2002; Olds, 1981/ 1987	Old institutional furniture
		Use of non-toxic products (no PVC)		Olson, 2002	Possibly applicable
		Facilities for parents and friends	Chairs, ability to get drinks etc	Olds et al., 1987; Picker Institute, 1998; Shepley, 1988;	Limited chairs Limited facilities
	Avoid negative distraction	Minimize noise with materials and less noisy machines	Make it less institutional: child friendly materials and finishes	Olds, 1981/ 1987; Picker Institute, 1998; Ulrich, 1991 a+b; Williams, 1988;	Machines make lot of noise, crowding corridors and nursing station, shared rooms
	Create diversity of rooms	Kitchen, activity room for more mobility	Traditional vs. progressive inpatient floor	Olsen, 1984; Voelker, 1994; Williams, 1988	Institutional
	Create access to windows	Windows reduce anxiety, depression, delirium in ICU	ICU survivors and their memories	Keep et al. 1980	A few windows in PICU overlooking roof
		Recovery after surgery: view of nature vs. brick wall from window	Less medication, less neg. comments, faster recovery	Ulrich, 1984	Only 1/3 of patients have window, of which half overlook roof (reflections!)
	Reduce Environmental, physical psychological and social stressors (PICU)	Minimize medical smell and sound and visual elements	(age 7-17) Unfamiliar elements PICU; pain and discomfort; illness, knowledge, privacy; disruption in relationships	Tichy et al., 1988	Old equipment, very visible

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 2: The Patient Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behavior in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
<i>Patients 0 to 18 years</i>					
	Well maintained environment	Show respect, prevent vandalism and destruction	Fix broken things, keep it clean, well painted	Gross et al., 1998	Badly maintained
	Compared to home	Different aspects		F. de Vos, 2004	Valued as worse than home

THE PARENT CHART

Table 3: The Parent Chart: summary of the literature review and data from Formative Research

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
<i>Parents, Siblings & visitors</i>					
Needs Physiological Basic	Getting adequate sleep and rest	Stay fit to support child/psychological wellbeing	Beds and quietness	Olds et al., 1987	Limited possibilities, noisy, no privacy
	Adequate eating, meeting appetite	Availability of/choice of food prerequisite for psychological wellbeing	Choice of food, healthy food	Olds et al., 1987	No food from hospital, Sometimes without eating (cafeteria is expensive)
	Stay fit and healthy	Stay fit and sane to support child	Fitness facilities	F. de Vos, 2004	Walk the stairs
	Being able to wash, groom and use bathroom	Feel clean and fresh	Shower with facilities in room or on floor	Olds et al., 1987	Very limited facilities and use and often too dirty to use
Control	Having control	Perceived control as related to restrictions of institutional environments	Locus of control, depression, vigor, life satisfaction	Rivlin, 1979/ 1981; Schutte et al. 1992;	Organizational implications: Restrictions in more subtle ways

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 3: The Parent Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
Parents, Siblings & visitors					
Agency &		Reduce psychological and social uncertainties	Medical equipment unfamiliar elements privacy, etc.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich 1991a+b; Winkel & Holahan, 1985;	Little control now Share room, moves, no personal space, Not knowing what happens
		Control over noise	Material that absorbs noise	F. de Vos, 2004	Shared rooms, noisy machines, crowding, etc.
Control	Having control over privacy & confidentiality	Exchange information about child while being protected from others (visual, acoustic etc)	Consulting rooms Private rooms, privacy while in room: doors, curtains	Picker Institute, 1998; Scher, 1997; Winkel & Holahan, 1985	Big problem, HIPPA violation, around bed, at nursing station
	Being able to take care of self and child while staying on floor	Parents will not leave a critically ill child alone	All crucial facilities should be on floor	F. de Vos, 2004	Very limited facilities
	Privacy while on the phone	Not being heard by others while on the phone	Private room with phone/ or private place to call	Olds et al., 1987	Share room now, no lounge?/ no phone in PICU
	Control over daily rhythm / routines of child	Control over when to rest, sleep, eat	Light, curtain, TV, and decisions	Proshansky et al. 1976	Limited extent to which parents can define daily rhythm
	Having visual connections to staff	Knowing you can call someone and that they will hear you/come	Visual relationship between room and staff	Picker Institute, 1998; Yeaple et al., 1995	Long corridors, two nursing stations, no visual relationship Call button
	Having access to windows	Contact with outside world, feeling connected and knowing what is going on/ day/ weather	Access to window for orientation, contact with outside world	Horsburgh, 1995; Verderber et al., 1987; Yeaple et al., 1995	1/3 of patients access to window
Agency &	Need for control, having choices & independence	Having choices and knowing why things happen		Olds, 1981/ 1987; Scher, 1997; Winkel & Holahan, 1985	Parents feel well informed
		Who enters & leaves the room etc		F. de Vos, 2004	Limited control because room is shared
		Not being moved around too much	Organizational	F. de Vos, 2004	Changing of rooms
		Control light and temperature		Olds et al., 1987	Limited

Table 3: The Parent Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
Parents, Siblings & visitors					
Agency & Control	Easy to orient and find one's way	Reduce uncertainty and confusion provide coherence	Clear cues such as entrance	Carpman & Grant, 1985; Evans & McCoy, 1998	Straightforward floor, but no landmarks
		Space cognition and orientation	Human scale, spatial design, signs	Horsburgh, 1995; Nagasawa, 2000; Scher, 1997; Williams, 1988	No landmarks
		Convenient and accessible	Parking, entrance, elevators, floor, etc.	Picker Institute, 1988	Parking difficult Clear entrance?
	Keep personal possessions	Bring in things from home to personalize space and be comfortable	Storage for family, display area, locks	F. de Vos, 2004	No place to lock things (in car) Limited storage
	Having access to information	Increase agency	Library, support groups, internet	Olds et al., 1987	Limited
		Understanding who is who in the health team		F. de Vos, 2004	Parents seem to be comfortable with that
	Having a place to mourn/ pray/ have private conversations		e.g. chapel, family room, consult room, place to mourn, etc.	Olds et al., 1987; Yeaple et al. 1995	Very limited facilities
	Control over social isolation vs. interaction	Bedroom size and social interaction	Need for privacy. more social interaction in smaller rooms	Ittelson et al., 1970	Possibly applicable
	Control over Eating	Prepare food yourself Eat healthy	Kitchenette, pantry, fridge	F. de Vos, 2004	Limited access, for patients only
	Secure & Safe	Keeping personal valuables	Keeping personal belongings in safe place	Lockable storage	Picker Institute, 1998; Yeaple et al., 1995
Having visual connections to staff		Feeling connected and seen	Pod like units	Picker Institute, 1998; Yeaple et al., 1995	Long corridors
Knowing the place is being watched		Control over entrances & surveillance	Controlled access, security, camera's Visual openness	Picker Institute, 1998; Yeaple et al., 1995	Main entrance control But different accesses At nights eerie

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 3: The Parent Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
Parents, Siblings & visitors					
Feeling	Being cared for	Access to therapeutic help, being able to talk freely to someone (Social worker/ volunteer, etc.)	Counseling room Quiet room	F. de Vos, 2004	Family lounge just for PICU Too small, often crowded
		Getting food, drinks, blankets, towels, pillows, etc.	Supplies for parents in family lounge	F. de Vos, 2004	Pinwheel project & Child Life give out things No blankets, etc.
	Knowing someone is with your child	Comfort to leave room for a while or when unable to be with child		Olds et al., 1987	Nurse, Child Life or volunteer will stay with child
		Parents will not go far so facilities should be near	Facilities (vending, coffee machine) on floor	F. de Vos, 2004	Now downstairs for food and drinks in cafeteria
Support	Staying in touch with friends/ relatives/ work	Support network of relatives/ work/ home front in hospital or from distance	Provide facilities for friends, lounge ; Internet (email & web cam); phone	F. de Vos, 2004	Rooms too small, too crowded, too noisy / no lounge / no chairs / no computer facilities
		Having family support	Being able to see partner and other children while in hospital	Private rooms and family lounge	Eiser, 1990; Shepley, 1998; Winterberg, 2003
	Having contact with other parents / support groups	Meeting other patients and parents For parents and siblings	Parent lounge, informal meeting Community wide	Bearison, 1994; Eiser, 1990; Houtzager et al., 2001	No lounge for parents
		Having someone to talk to	Personal attention and comfort Nurse, Volunteer, Child Life, etc.	Adequate space to talk away from child	Horsburgh, 1995; Scher, 1997
	Community support	Feeling supported and cared for by community	Events, clown, beanies, pinwheel etc.	F. de Vos, 2004	Regular events
Provide Distractions	Provide positive distractions /engagement in normal activities	Psychological, physiological & behavioral wellbeing, reduce anxiety and distress	Provide appropriate stimulation	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich, 1991a+b; Yeaple, 1998	Child Life Volunteers Activities
		Provide appropriate stimulation five senses	Music, art, smells	Malkin, 1993	No stimulation for all five senses

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 3: The Parent Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
<i>Parents, Siblings & visitors</i>					
	Having access to restorative places and art and music	Place to unwind, release stress, etc.	Garden, playground Playroom, private space	Arneill & Devlin, 2002; Evans & McCoy, 1998; Olds et al., 1987; Scher, 1997	Limited access: playrooms, fish tank lobby...
	Range of activities	Diversion, availabilities of e.g. games, toys, books, video's, computers, arts	Range of facilities From bed and at desks	Olds, 1987; Krol et al. 2003	Limited facilities in room and on floor
Behavior Everyday	Staying in touch with outside world	Having support of family and friends, community	Family lounge, fridge for food, chairs	F. de Vos, 2004	Now somewhat limited, rooms too small
	Continuation of daily activities	Maintain daily routines	Home, work, friends and family and celebrate birthdays	F. de Vos, 2004	Hospital phone limited access internet cafeteria
		Wash clothes	Laundry facilities	Olds et al., 1987	Staff will take things home to wash
		Make meals for self and child	Cooking facilities	Olds et al., 1987	Just fridge for patients and microwave
		Being able to work	Desk, chair, computer	F. de Vos, 2004	No facilities
		Getting exercise, staying fit	Fitness room	Olds et al., 1987	Walk the stairs
	Being able to go outside /access to nature	Get fresh air alone or with child	On floor	F. de Vos, 2004	Garden too far and not visible
Freedom to express one's culture/religion	Honor cultural differences and life-style		Olds et al., 1987	No specific facilities	
	Find symbolic meaning a child friendly environment	Paying attention to environment influences perceived quality	Waiting room environment Impression environment makes	Arneill & Devlin, 2002	Little respectful to users
		Better appraisal of environment better mood & satisfaction	Waiting room appraisal	Leather et al. 2003	institutional

Chapter 5 ▪ Integration of the Findings to Reveal Dimensions of Healing Environments and to Construct a Preliminary Model

Table 3: The Parent Chart: summary of the literature review and data from Formative Research (cont'd)

Dimensions of a holistic healing environment	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Current findings from study at WMC (F. de Vos, 2004)
<i>Parents, Siblings & visitors</i>					
Normalized Environment	Create comfort and beauty	Pleasing colors and lighting	Make it less institutional: child friendly materials and finishes	Evans & McCoy, 1998; Olds, 1981/ 1987; Picker Institute, 1998; Williams, 1988;	Overall little color, Murals in corridor (institutional?)
		Non-institutional and comfortable furniture	Colorful, comfortable and appropriate	Arneill & Devlin, 2002; Olds, 1981/ 1987	Shabby often broken furniture
		Use of non-toxic products (no PVC)		Olson, 2002	Possibly applicable
		Facilities for parents and friends	Chairs, ability to get drinks etc	Olds, 1987; Picker Institute, 1998; Shepley, 1988;	Limited chairs Limited facilities
	Avoid negative distraction	Minimize noise with materials and less noisy machines	Make it less institutional: user friendly materials and finishes	Olds, 1981/ 1987; Picker Institute, 1998; Ulrich, 1991a+b; Williams, 1988;	Machines make lot of noise, crowding corridors and nursing station, shared rooms
	Create diversity of rooms	Kitchen, activity room for continuation of daily activities		Olsen, 1984; Voelker, 1994; Williams, 1988	Institutional
	Create access to windows	Windows reduce anxiety, depression, delirium in ICU	ICU survivors and their memories	Keep et al. 1980	Few windows in PICU, overlooking roof
	(PICU) Reduce Environmental, physical psychological and social stressors	Minimize medical smell and sound and visual elements (other sick kids)	Seeing other sick / dying children	Tichy et al., 1988	Old equipment, very visible
	Well maintained environment	Show respect, prevent vandalism and destruction	Fix broken things, keep it clean, well painted	Gross et al., 1998	Badly maintained
	Compared to home	Different aspects		F. de Vos, 2004	Experience as worse than home

The development of a similar Chart for staff was not part of the pilot study, but was developed in a later stage. See Appendix A-IV for the Staff Chart.

PRELIMINARY MODEL

The framework of the Seven Dimensions expressed in the Charts is the first step in the construction of a model of healing environments. The two Charts will be used to develop indicators and instruments for my dissertation, which will focus on the further development of a more holistic approach to healing. This section presents a first pass to conceptualize a model of a holistic healing environment based on the Seven Dimensions.

The model focuses on how to preserve, support, and maintain the lives of patients and their families during hospitalization. The conceptualization of this model is shown in Figure 1. In contrast to a traditional hospital, a holistic healing environment is less deterministic, and focused on supporting and facilitating every day routines for patients and their families. The dark arrows represent how the Seven Dimensions, as explained in Table 2, directly influence the patient's wellbeing. The dotted arrows represent how the Seven Dimensions indirectly influence the patient's wellbeing. As shown in Table 3 the Seven Dimensions of a holistic healing environment are geared to better support parents to help them better support their child.

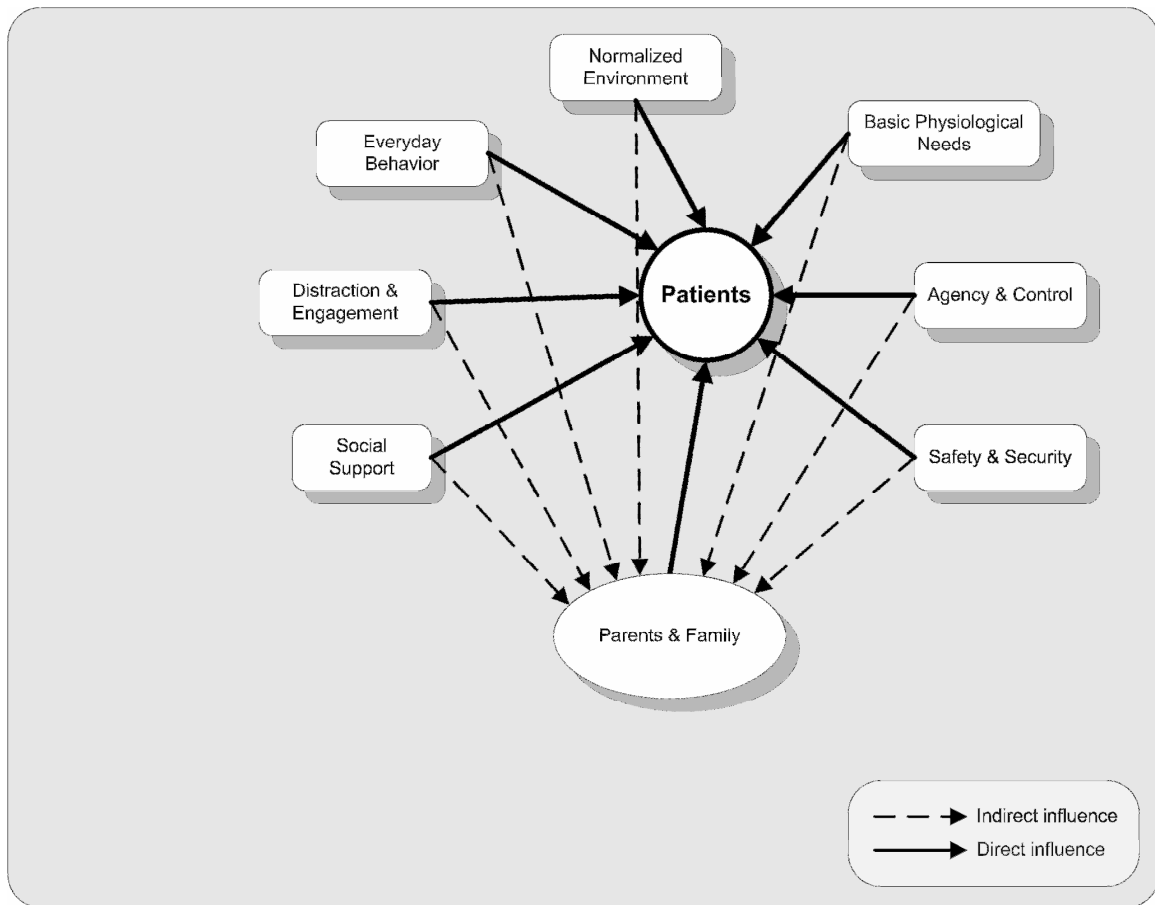


Figure 1: Suggested preliminary model of a holistic healing environment for patients and parents

The model illustrates the desirability to meet the Seven Dimensions for both patients and parents to minimize disruptions to everyday life while in the hospital. The whole person – with their social, psychological and physical needs and concerns – is the focus, not just the medical needs of a patient. The model depicts how the parents’ wellbeing influences their ability to support their child, and thus impacts the patients’ wellbeing. Therefore, the design of buildings should fully facilitate the needs and concerns of all users, taking the Seven Dimensions into consideration. In this model the healing environment is no longer limited to the hospital building but emphasizes the need for patients and families to be able to

maintain some semblance of everyday life and connection to the outside world while in the hospital.

SECTION III ■ MODIFYING THE MODEL IN A CASE STUDY

Chapter 6 ■ Methods for Applying and Modifying the Model

THE HOSPITAL SITE

This dissertation focused on the Children's Hospital of the Westchester Medical Center (WMC) and its replacement, the new Maria Fareri Children's Hospital (MFCH) at Valhalla, NY. Two pediatric floors of the main hospital at WMC constituted the Children's Hospital until September 2004. This hospital was built more than 25 years ago and was originally designed for adult rather than pediatric care. Because the old building no longer met the specific demands of pediatric care and the needs and concerns of patients and their families,

the new Maria Fareri Children's Hospital and Trauma Center was built. The new hospital, built adjacent to the old one, opened its doors September 2004.

The WMC and the MFCH serve as the only tertiary pediatric center in seven counties of lower New York State, three counties of northern New Jersey, and Fairfield County, Connecticut. Their pediatric services play an important role for children in this region (pediatric occupancy rate over 90 percent in 2000). About a hundred sub-specialists treat over 22,000 children each year providing back-up to the extensive network of more than a thousand community pediatricians in the region. Among the fifteen specialty divisions of the Department of Pediatrics are: pediatric intensive care unit, highest level (IV) neonatal intensive care unit, pediatric burn center, level I trauma center with pediatric commitment, cystic fibrosis center, pediatric cardiovascular program, neo-surgery, and a pediatric oncology program. All fulltime pediatric attending physicians have faculty appointments at New York Medical College, the third largest private medical university in the United States (Source: Foundation Center MFCH). The old WMC and the MFCH operate with a 'no turn down policy' and consequently never reject requests by regional hospitals to transfer patients for tertiary care for any reason including payer coverage or ability to pay. The proportion of patients who are covered by Medicaid is about 40% from the nine counties in the service area and nearly 50% from Westchester County alone.

PARTICIPANTS

Even though this dissertation focuses on the experiences and perspective of patients and parents in the WCH and MFCH, a wide spectrum of perspectives (e.g. nurses, doctors, Child

Life, administrators) were taken into consideration in order to define how to improve the child’s and family’s stay in and around the hospital.

Recruitment of patients (age 8 to 18), and parents, guardians, or other family members (of patients from 0 to 18) was initially done (at WMC) with the assistance of the Director of Child Life and her staff. Because they work with the children and families on a daily basis, they could identify patients and family members who were able, both physically and emotionally, to participate in this study. By contrast, in the new hospital, because the space was so much more spread out, it was much more difficult to find Child Life staff. Instead, I would often consult a nurse on the unit to identify a parent or patient.

Participants were needed for interviews and questionnaires both in the WMC and MFCH. A total of 18 patients, 32 parents 43 staff members were interviewed and a total of 62 patients, 217 parents and 231 staff members filled out a questionnaire. See Table 4.

Table 4: Overview of number of participants for interviews and questionnaires

Method	Number of participants	WMC	MFCH	Total
Interviews	Patients	10	8	18
	Parents	20	12	32
	Staff	22	21	43
Questionnaires	Patients	30	32	62
	Parents	82	135	117
	Staff	105	126	131

Even though parent, patient, and staff recruitment was based on convenience sampling, every attempt was made to have equal gender and age ratios for patients and to have a variety of cultural backgrounds for patients and parents. Also, a Spanish version of the questionnaires for parents was developed and used.

Participation for this study was completely voluntary. All participants were asked to sign Informed Consent Forms and, in the case of children, their parents or guardian were asked to approve their participation in the research.

DESCRIPTION OF THE RESEARCH METHODS

A variety of qualitative and quantitative approaches were adopted in this dissertation with the overall goal of gathering in-depth data to gain a range of perspectives and insights about the topics of this study. The extensive literature search for existing methods did not yield many usable instruments. The instruments found in the literature were mainly used as a reference or to generate ideas for the instrument developed for this study. Where needed, instruments were pilot tested and revised in order to address aspects relevant to the conceptual framework discussed in Section II.

To assess and compare the different aspects and qualities of the healing environment at both the WMC and the MFCH, the following methods were used in both hospitals: 1) orientation and participant observation, 2) site analysis, 3) semi-structured and informal interviews, 4) behavioral mapping, 5) questionnaires. A description of these methods is provided below.

Orientation and Participant Observation

While waiting for IRB approval, I spent an average of two days a week on two floors of the WMC to familiarize myself with the hospital and its staff, patients, routines and for the purpose of letting people get to know me. With the hospital's permission, I shadowed nurses of the different pediatric units for an average of two to three hours at a time to gain

understanding of their routines, tasks, and interactions with patients and parents. I made field notes after each visit at the hospital.

Participant observation was carried out over a period of two years both in the old and the new hospital to get a better understanding of the use of the space, its qualities and limitations, unintended use, wear and tear, and cluttering. Field notes were taken of these observations, supplemented with over 3,000 digital photographs. The pictures never included patients or parents unless written consent was given beforehand. The photographs will serve to illustrate the data described here.

Site Analysis

Analysis of both the old and the new site included a detailed description of the current space (e.g. square footage, the different kind of spaces and its qualities, and the number of beds), the use of the space, an overview of the number of patients and staff members, special programs and activities for children and parents, the daily routines and rules on the floor, the collecting of architectural drawings of the children's hospital, and taking pictures of the different spaces. In addition, I gathered information about the organization, daily rhythms, and routines in the hospital, focusing on rules and policies, etc. Floor plans of both hospitals were digitized for presentation of the data.

Interviews

To discover how the hospital environment could better suit the needs and concerns of patients, their families and staff, open-ended interviews have been used in the Formative Research (see Section II). Additional semi-structured interviews were held in the new

hospital beginning a few months after occupancy to learn how patients, parents, and staff experience and perceive the new hospital environment (e.g. What do they like about their room/workspace, what do they not like, where do they go if they can get out of bed, what suggestions do they have for changes or improvements of their room, the bathroom, Child Life room, etc.). In addition, short, informal interviews were held throughout the research process whenever an opportunity arose to talk to someone or when something needed clarification.

Behavioral Mapping

Behavioral mapping techniques (Ittelson, Rivlin & Proshansky, 1970) were conducted in both the old and new hospital to assess the mobility of patients and the activities in which they were engaged while moving around the floor or while in the playrooms. A greater mobility of patients and a wider range of their activities are seen as indicators of a healing environment. In addition, systematic observations were carried out to see how privacy was regulated in the rooms by looking at the use of doors and curtains.

Questionnaires

Questionnaires were used to assess the quality of the WCH and MFCH as a healing environment for patients, parents, and staff. The Charts developed in the Formative Research (Section II) and an additional Chart made for staff (see Appendix A-IV) were used to develop questionnaires for patients, parents, and staff. Each of the items found in the literature, when applicable to this hospital, became part of the questionnaire. In addition, the nurse managers of the different units were asked to critique and refine the questionnaires for

missing items or themes. The questionnaires were administered in each patient's own room on the pediatric floors. Staff members were asked to fill out a questionnaire at a time and place that was convenient for them. Often the questionnaires were handed out at staff meetings by the nurse managers or head residents. Filling out the questionnaires by the different users took approximately 10 to 15 minutes for staff members and a range of 15 minutes to 1.5 hours for parents or patients.

Around the Move

The move of the pediatric floors of WMC to the new MFCH took place in September 2004. Just before, during, and directly after the move, I collected additional qualitative information to gain a better understanding of the impact the move may have had on the occupants. I gathered information by doing participant observation and conducting informal interviews and conversations with patients, parents, and staff. Field notes were kept and photographs taken to track the changes made in the hospital by the users to accommodate their needs and concerns. The information gathered just before, during and after the move will be discussed in Chapter 8.

State of the Art

Even though an extensive literature analysis was conducted for the first part of this study, additional material from current publications was collected throughout the study. In addition, through daily Google Alerts, I kept track of any publications posted on the web between December 2002 and July 2005 related to four topics; *children's hospitals*, *healing by design in hospitals*, *Westchester Medical Center*, and *Maria Fareri Children's Hospital*. The ongoing

literature review and the articles found on Google were incorporated into the discussion of the data in Section IV.

DEVELOPMENT OF INSTRUMENTS

The instruments used in this study were developed based on the findings in the Formative Research. The themes in the Charts were used to develop the questionnaires. Where applicable, available existing measures were used. All questionnaires were first given to the nurse managers and Child Life staff for feedback and comments before pilot testing them with the users. Their comments and additions to the questionnaires were very valuable. All questionnaires were then pilot tested with the different user groups to make sure that the questions and topics were understood and that the length of the questionnaire was manageable. The process of developing the questionnaires took about three months.

The behavioral mapping instruments to document privacy regulation on the floor and the activities of patients on the floor were developed over a period of two months. It took considerable time to develop an instrument that was reliable and easy to use. The instrument was used as an example in a class on behavioral mapping by Lee Rivlin at the Graduate Center. This created a great opportunity to discuss the problems that arose while testing the instruments. Input from fellow students, as well as from Professor Rivlin, helped to refine the behavioral mapping instruments.

RESEARCH TEAM

Throughout the research process, different people helped me gather data in both the old and the new hospital. In order to work as a volunteer with the patients on the floor, one has to

get medical clearance, state approval, and attend a general orientation to learn about hospital rules, safety issues, and hygiene. In the old hospital, this process could take anywhere between three and six months, while in the new hospital this was dramatically shortened to three weeks.

The research assistants helped with the development of the instruments, conducted some of the interviews, collected behavioral mapping data, and administered questionnaires. In addition, their observations in the hospital were discussed and integrated into the research where applicable.

DATA ANALYSIS

The different sources of information described above were compared to discover consistent themes or topics expressed by the participants. Triangulation of five different sources of data collection (interviews, informal observations, behavioral mapping, questionnaires, and images) enabled a high degree of confidence in the conclusions. Wherever possible, I shared my interpretations of the data with the participants to verify my analysis. Analyses of the data included:

- For the Formative Research, a general review of all the information was gathered (e.g. literature review, observational field notes, interview transcripts, maps, and photographs) to gain an overall sense of the data. This resulted in the development of initial themes in the data, the Charts, as well as notes on questions and insights that arose.
- Feedback was obtained on the initial themes found in the data by presenting the data back to the participants where possible, to verify the validity of the data and of the

- researcher's interpretations. This was accomplished primarily in informal conversations with staff, parents, and patients in the hospital.
- Initial themes (the Charts) were used to develop a working model and to formulate working hypotheses. The themes, the model, and the Charts were used to develop the questionnaires and the behavioral mapping techniques.
 - Observers were trained and an inter-rater reliability of at least 95% was assured and maintained between observers.
 - Data from the questionnaires were entered into Excel and descriptive statistics were generated for each of the questions and presented in charts where applicable. Responses to open ended questions were coded.
 - The items of the questionnaires from the old hospital for each of the three user groups were grouped conceptually according to the defined scales. SPSS was used to generate reliability indices for these scales. A corrected item-total correlation of 0.25 or larger was maintained for each of the items. Items with a corrected item-total correlation of less than 0.25 were eliminated. The same items were grouped for the new hospital questionnaires to calculate reliability indices for the new situation.
 - For the scales of the three questionnaires new mean scores were calculated with SPSS. Correlations between the means and correlation of the items and means were checked to test the internal validity of the instruments.
 - SPSS was used to generate t-tests for independent groups to compare the new means of the old and the new hospital. Because of the anonymity of the respondents a dependent t-test could not be used. Bonferroni's (or stepwise) corrected alpha for multiple

significance tests was used to test the different dependent variables of each questionnaire. Because of the relatively small sample sizes an adjustment of $p = 0.10$ was used. An alpha of smaller or equal to 0.05 was considered significant; an alpha between 0.05 and 0.10 was considered a trend toward a significant difference. In addition, Cohen's effect size was calculated for all mean differences.

Chapter 7 ■ Data Collected at the Old Hospital

INTRODUCTION

This chapter presents an overview of the data collected over a period of one year (September 2003 till September 2004) on the pediatric floors of the Westchester Medical Center. During that year, I spent around 450 hours on the pediatric floors and my two research assistants spent approximately 350 hours. The results of the data gathered for each of the methods described in the previous chapter are presented below. A summary of these data is offered at the end of this chapter. A comparison of these data to the data found in the new hospital will be given in Chapter 10.



Figure 2: Images of the Westchester Medical Center

WMC IN THE NEWS

The medical center, which traces back to 1917 when the federal government used the site during World War I, remained strictly a government entity until 1997 when the Westchester

Medical Center separated from the county government. While about half of its 15-member board is still appointed by the county executive, the hospital became an independent, public-benefit corporation free of official government oversight. The hospital, with more than 3,000 employees, is an important component of the regional economy.

Since the center's separation from the government, many of its different units such as the cardiac, pediatrics, and cancer programs were able to grow significantly. The building, however, still showed hints of the past everywhere: institutional long corridors and colors, harsh lighting, and handcuffed and chained prisoners from the neighboring county prison shuffling through the corridors with police officers on either side.

Despite the development of the programs, the increase in number of patients, its academic orientation, and the ability to raise over \$27 million through donations for the new children's hospital, the medical center operated with deep deficits. Like other hospitals in New York, the medical center has been affected by rising costs and poor and slow reimbursement for services it is mandated to provide. Since 2002, the hospital has lost tens of millions of dollars annually (*The Journal News.com*, May 8, 2005).

As a former county hospital, WMC retained to its mission as a safety net for the poor. The cost of treating patients almost always exceeded the insurance payments. The hospital has a burn unit, neo-natal intensive care services, an organ transplant program, and a trauma center with a trauma helicopter. The helicopter has to stay at the ready whether it flies once or many times in any given period.

Explains Mr. Berman, the hospital board's chairman as quoted in *The New York Times*: "We had a burn patient who had \$2 million in skin grafts. She had no insurance and didn't qualify

for Medicaid. She fell through the cracks. We swallow that cost.” (NYtimes.com, March 8, 2005).

From September 2003 to October 2004, the financially ailing hospital eliminated more than 300 jobs. The three rounds of layoffs affected all layers of employees in the hospital. In addition, departments were outsourced, a new interim management team and president were appointed, board members changed, nurses and doctors took more stable positions elsewhere, an advertising campaign “Who cares about the Westchester Medical Center” was started, and constant bad publicity in local and national newspapers all contributed to a very unstable climate.

Implications for Research

The turmoil described above reached its peak during the time that this research was conducted and must be taken into account in examining the data or reaching conclusions about it. For example, one of the most noticeable consequences of the financial crisis was the generally poor morale of staff members. They were very upset about the lay-offs, sad to see colleagues go, and uncertain about their own futures.

In addition, the fact that the new children’s hospital was being built at all led to many questions and concerns among the staff about how one could spend so much money on a new facility while the hospital was in so much debt. Staff members often expressed their frustrations, concerns, and anger about this brand new, super-luxurious hospital that was being built.

Description of the Units and the Facilities WMC

The study focused on the neo-natal (40 beds) and pediatric units (65 beds) of the WMC located on the second and third floors of the hospital. The majority of patients were admitted through the Emergency department (ER) or transferred from another hospital. The ER was a shared facility with adults. Besides the second and third floors, patients would sometimes be allowed downstairs in the lobby to see the fish tank or to visit the cafeteria and store. A more detailed description of the neonatal units (NICU and SCU) and the pediatric units (PICU, 3 North and 3 South) will be given below. A floor plan of the NICU on the second floor and the pediatric units on the third floor will be given in Appendix B-I.

NICU and SCU

The Neonatal Intensive Care Unit (NICU) with 26 beds was located on the second floor. NICU was adjacent to the labor and delivery rooms which made quick transportation of infants to the NICU unit fast and relatively simple. Mothers who stayed at the hospital after delivery were in the maternity unit next to the NICU which also made it convenient for them to visit their newborns.

The NICU consisted of four patient units, one isolation room, a small consultation room that was also used as a breast pump room for mothers, a staff lounge, and workspaces for staff and residents. The four patient units were small, noisy, and packed with equipment; the staff facilities were tiny and overcrowded. The rooms were occupied with four to eight incubators depending on the size of the room. There were chairs on which parents could sit while visiting but absolutely no place for them to sleep, eat, shower, or wait. There was no

access to daylight anywhere in the unit. Figure 3 shows pictures of the NICU hallway and one of the patient rooms with six incubators.



Figure 3: Images of the NICU hallway and patient room on the second floor of the WMC

The Special Care Unit (SCU) with 14 beds was located on the north side of the third floor. The SCU is the step-down unit where infants who are less than critically ill would be moved. Usually, this is the last step before an infant goes home. The SCU consisted of four patient units each with three to four cribs, a nurse lounge, a breast pump room for mothers, and a workspace for staff. Two of the four patient units and the nurse's lounge had windows to the outside. There were chairs for parents to sit on while visiting but no place for them to sleep.

The NICU and SCU together were certified for 40 beds. However, they were often significantly over capacity, sometimes taking care of 44 or more infants. The two units together had a total of 5,000 square feet and an average of 30 square feet per bed. Figure 4 shows pictures of the SCU breast pump room for mothers and one of the patient rooms with six incubators.



Figure 4: Images of the SCU on the third floor of the WMC

PICU

The Pediatric Intensive Care Unit (PICU) with 14 beds was located on the third floor of the WMC. The PICU consisted of three rooms, two with four beds each, and one larger room with four beds and two isolation rooms, each with one bed adjacent to the larger PICU room. In the two smaller rooms, the four beds were separated by curtains. In the larger room, the beds were separated by a wall between them but were open to the center. All three rooms and both the isolation rooms had windows to the outside. Each bed had a TV. There were straight chairs next to each bed for parents to sit but no sleeping facilities. At PICU there were neither telephones, nor bathrooms, nor showers for parents to use.

Outside the unit, on the corridor, there was a small family lounge specifically for parents from the PICU. There was a nursing station in each of the three rooms and a staff lounge adjacent to the larger room. The PICU covered an area of 3,500 square feet. Figure 5 shows pictures of the PICU's larger room with nursing station and of one bed with a chair for a parent in the four bedded room.



Figure 5: Images of the PICU on the third floor of the WMC

General Pediatrics

The general pediatric floor consisted of two long corridors with two nursing stations and patient rooms along side the exterior corridors. There were two units, 3 North (19 beds) and 3 South (32 beds). Formerly, 3 North was the unit for the younger children (up to 4 years) and Infant and Toddlers. The Infant and Toddler area consisted of four two-bed rooms. Two of the rooms had a window and at each bedside there was a pull-out chair for parents to spend the night. All beds were separated by a curtain. In one of the rooms there was a shower for parents to use and one of the rooms had a bathroom. Each room had one telephone and one TV which had to be shared by two families. There was a nursing station and a small lounge (a converted closet) for nursing staff off this unit. Figure 6 shows pictures of Infant and Toddlers nursing station and of a two-bed patient room.



Figure 6: Images of Infant and Toddlers on the third floor of the WMC

The first general pediatric unit, 3 North, had two two-bed rooms, three isolation rooms, and one four-bed room. All rooms had a window, a bathroom and shower, and in the general vicinity of each bedside, there was a pull-out chair for parents to spend the night. There was a phone and TV at every bedside. At the 3 North area there was one pantry for patient and parent use, a nursing station, a pharmacy, offices for nurse managers, Child Life staff and physicians, a playroom for infants and toddlers, and a room for medical equipment and soiled materials. Figure 7 shows pictures of 3 North's nursing station and of a patient isolation room.



Figure 7: Images of 3 North on the third floor of the WMC

The second unit at general pediatrics, 3 South, was formerly the unit for children aged 4 to 18 years old. There were fifteen double rooms and two isolation rooms. All rooms had a window, a bathroom and shower, and in the general vicinity of each bedside there was a pull-out chair for parents to spend the night, and there was a phone and TV at every bedside. At the 3 South area there was one pantry for patient/parent use, a nursing station, a nurses lounge, offices for nurse managers, a conference room, a playroom for school-age children, a room for medical supplies, and two storage rooms. Figure 8 shows pictures of 3 South's nursing station and of the bed area in a two-bed patient room.



Figure 8: Images of 3 South on the third floor of the WMC

ORIENTATION AND PARTICIPANT OBSERVATION

During the first three months, while waiting for my IRB approval from the Westchester Medical College, the Westchester Medical Center, and the Graduate Center at CUNY, I spent approximately 120 hours on the pediatric floors getting to know the staff, familiarizing myself with the pediatric units, and procedures and routines on the floors. With permission of the hospital, I shadowed eight nurses from the different pediatric units, two Child Life staff members, and a volunteer. After briefly introducing myself and explaining why I was there and what my research was about, I just sat or stood at the specific unit and observed

what was going on. Some nurses would explain what they were doing and why while others were more quiet. During those valuable hours, I gained insight into how the nurses used the space, what aspects worked for them, and which did not. I learned about the constant noise, the small workspaces, and the lack of privacy for the staff. Because I had no agenda (no interview, no observation protocol), this turned out to be some of the most valuable time spent on the floors. The notes written at the end of each day became an important part of the development of the interviews and questionnaires.

After the shadowing, through participant observation, I tried to learn what aspects of the hospital environment enabled or obstructed people in the things they did or wanted to do. The observations focused on what aspects of the environment needed to change to better approximate everyday activities for patients and parents such as the ability to stay in touch with home, friends, school, and work. A discussion of the findings will be given in Chapter 10 when compared to the findings in the new hospital.

RESULTS OF THE INTERVIEWS

The interviews at the WMC were used to conceptualize how to approximate everyday life during hospitalization and what physical adjustments to the building would be needed to better meet this requirement according to patients, parents, and staff.

Interviews with staff focused on how their work environment could be improved. Interviews were conducted in the patient rooms on the pediatric floor(s). Staff members were asked to participate in an interview at a time and place that was convenient for them. The interviews took between 20 and 40 minutes, depending on the energy of the patients and parents or time available by staff. The data gathered from the early semi-structured interviews were

discussed in the Formative Research in Section II. The interviews with staff (N = 8) concerning the rules and routines on the floor are presented below. See Table 5 for an overview with the number of interviews.

Table 5: Overview of the total number of interviews conducted at WMC

Interviews	N	Gender	Age
<i>Patients</i>	10	Male = 4	10 – 18
		Female = 6	12 – 18
<i>Parents</i>	20	Male = 8	n/a
		Female = 12	
<i>Staff</i>	24	Female = 20	n/a
		Male = 4	

Daily Routines and the Hospital Rules

To be able to place the research findings in a context and to better understand what was happening on the floors, we asked staff members about the daily routines for nurses and patients and about the floor rules. We interviewed two nurses and two Child Life staff about routines on the pediatric floor and the three nurse managers and a nurse about the rules. See Appendix B-II for the interview guides about Rules and Routines.

Routines of Staff

Nurses work in 12 hour shifts, from 7:00 AM to 7:00 PM and 7:00 PM to 7:00 AM. Staff sign-out takes place between 7:00 – 7:30 AM and 7:00 – 7:30 PM. The attending physicians see their patients once a day anywhere from the early morning till the evening. They do sign out from 7:00 – 9:00 AM and 4:00 – 5:30 PM. During sign-out, the attending physicians talk about individual patients, inform the next shift about happenings during their shift, and hand over their reports. Residents see patients throughout the day.

Routines for Patients and Parents

Patients usually awaken around 8:00 AM. They get breakfast between 8:00 and 8:30 AM (7:45 AM for diabetic patients). If there are enough nurses or nursing assistants, patients will be showered or washed between 9:00 and 12:00 Noon. Lunch is served from 12:00 – 12:30 PM (11:30 for diabetic patients) and dinner from 5:00 – 5:30 PM (4:30 PM for diabetic patients).

Patients who did not get showered or washed during the day were assisted by the night shift around 10:00 PM. Patients go to bed between 8:00 and 10:00 PM depending on their age and condition.

Parents are allowed to stay with their child all day and all night seven days a week but only one may sleep at the bedside. If they do not stay the night, many will come in before work at 8:00 AM and after work around 7:00 PM. Siblings may visit any time they want as long as they are healthy and older than two years of age. Only two visitors are allowed at the bedside at any one time.

Hospital Rules

Hospital policies and procedures are written down in a binder kept at the two main units (3 North and 3 South) of the inpatient floor. The department's mission and philosophy is "to restore the child to the fullest physical, mental and social wellbeing of which they are capable through teamwork of all disciplines and family participation."

In addition to what is written in the binder, we asked about the rules for patients. In particular we wanted to understand what the rules were regarding patients' movement in and around the hospital.

The nurse managers told us that if patients want and are able to get out of bed they are allowed to do so. They are encouraged to be as mobile as possible unless their treatment requires them to remain in bed. Physicians need to give their approval. Also, the physician is supposed to give approval for the patient to go to the fish tank in the lobby or to go outside. It happens though that staff members do not always wait for physicians' approval since this is not on the physicians' priority list and will let patients go on their own authority. Patients who are 18 years or older (and based on patient orders and appropriateness) may go downstairs by themselves if they want. Patients aged 13 to 17 years old may not go downstairs by themselves but do have freedom to go where they want on the floor.

For reasons of patient privacy, patients were not encouraged to sit at the nursing station since they might overhear and become aware of issues that concern other patients. They may be near the nursing station at 3 South but not *in* the nursing station. At 3 North this was less of a problem because the patients are younger and will not understand what is being said about the other patients. It was also less busy there.

RESULTS OF BEHAVIORAL MAPPING

Observations of Privacy

To gain a better understanding of how privacy was regulated on the pediatric floor of the WMC, we observed whether patient doors were kept open or closed. Over a period of three months, we observed three times a day between 10:00 AM and 7:00 PM for twenty days. Inter-rater reliability among the three observers was 99%.

Figure 9 shows pictures of the typical two-bed patient rooms of 3 South. One shows the curtains between the beds to control privacy and the other shows the view from the patient bed to the door.



Figure 9: Images of an inpatient room on the third floor of the WMC

Doors Open or Closed

A door was counted as open if we could clearly see the patients or the curtains in the room. In total, there were 26 doors to patient rooms on the third floor. Three of these doors, one of which was always kept closed, afford access to the Pediatric Intensive Care Unit (PICU) and were not included in the observations. Five others afford access to isolation rooms which would be closed if a child had to be in isolation.

Twenty-three doors were observed three times daily over 20 days for a total of 1380 observations. During this period, doors were open 76% of the time and closed 24% of the time. In general, the status of the doors did not vary much during the day. Once open or closed they generally stayed that way. See also Table 6.

Bedside Curtains Open or Closed

If the doors were open, the number of bedside curtains in the rooms that were pulled to regulate privacy around the bed was counted. The sum of all curtains in the one- two- and four-patients rooms was 41 curtains. Of the 1053 times the doors were open, 66% of the curtains were counted as closed and 34% as open. Again, the status of the curtains did not vary much during the day. They were more likely to stay the way they were during a day of observations. See Table 6.

In addition, if a door was open, the number of patients occupying the room, whether present or not, was counted. Of the 1053 times the door was open, 84% of the time the bed was occupied and 16% of the beds were unoccupied (not assigned to a patient). See Table 6.

Table 6: Overview status of doors, curtains and occupancy beds at WMC

Observation	Status	N	%
<i>Doors</i> N = 26	Door open	1138	73%
	Door closed	422	27%
	Total	1560	100%
<i>Curtains</i> N = 57	Curtain open	922	38%
	Curtain closed	1530	62%
	Total	2452	100%
<i>Occupied beds</i> N = 57	Beds occupied	2047	83%
	Beds empty	406	17%
	Total	2453	100%

Observations of the Use of Corridors, Playrooms, and Family Lounge

To understand how and by whom the family lounge, the playrooms, and the corridors of the pediatric floor were being used, we observed these areas five times a day during 17 days. The inter-rater reliability between the three observers was 100%.

Based on the database of the hospital, the number of boys and girls during the three months of observations was 56% boys and 44% girls. The age distribution during the months of observations was 31% (0 – 1 years), 18% (2 – 5 years), 26% (6 – 12 years), and 25% (13 – 18 years). See Table 7.

Table 7: Actual number of patients, their gender and age range during observations at WMC

Patients	Gender and Age	N	%
<i>Gender</i> <i>N = 980</i>	Girls	432	44%
	Boys	548	56%
	Total	980	100%
<i>Age</i> <i>N = 980</i>	0 – 1 years	304	31%
	2 – 5 years	181	18%
	6 – 12 years	250	26%
	13 – 18 years	245	25%
	Total	980	100%

Use of the Corridors

If children were allowed to leave their beds, they were often allowed to walk around the third floor or play in one of the playrooms. To gain a better understanding of the frequency of patients on the floor and their activities while outside of their rooms, we observed who was in the corridors and, if they were patients, what they were doing. To increase the accuracy of the observations and secure inter-rater reliability, twenty spots were defined on the unit where a ‘mental picture’ was taken. Whoever was in the mental picture at that one moment would be noted immediately afterwards on the charts. See Appendix B-III for the map of the floor with the places the mental pictures were taken marked and the instruments used.

Twenty mental pictures were taken five times a day over seventeen days resulting in a total of 1700 mental pictures (twenty pictures times five times a day times seventeen days) taken

in the corridors. Of those, in 51% of the times, one or more people were observed and in 49% of the times there was no one in the mental picture. Figure 10 shows pictures of the corridors on the third floor.



Figure 10: Images of the corridors of the third floor of the WMC

A total of 2286 people were observed in the corridors, of whom 87% were staff, 10% parents and family, 3% patients, and 1% siblings or friends. Of the 60 patients observed in the corridors, 62% were boys and 38% girls. This is a relatively high percentage of boys and low percentage of girls compared to the actual number of boys and girls in the hospital at that time (see Table 7). The ages ranged from newborns to eighteen years with 20% being younger than one, 47% being between two and five, 20% between six and twelve, and 13% between the ages of thirteen to eighteen. The postures of the patients were walking or being carried (N = 18), being pushed in wheelchair or stroller (N = 14), sitting outside a room or near a nursing station (N = 9), being pushed on a gurney or bed (N = 8), standing (N = 7), cycling (N = 2) and walking with a dog (N = 2). The patients were engaged in the following activities: no focused activity (N = 38), engaged in conversation (N = 12), playing with toys/materials (N = 4), sleeping (N = 3), drinking or eating (N = 1), reading (N = 1), and walking with a dog (N = 1). Of all the patients observed in the corridors, eleven walked with

IV poles, four were in a wheelchair, and three patients were wearing a mask. The other 67% did not use masks, IVs, or a wheelchair. See Table 8 for an overview of the data.

Table 8: Overview of observations of the use of the corridors at WMC

Corridors	Observation	N	%
<i>Occupancy</i>	Occupied	865	51%
	Empty	835	49%
	Total	1700	100%
<i>Users in Corridor</i>	Parent/visitor	227	10%
	Staff	1982	86%
	Sibling/friends	17	1%
	Patients	60	3%
	Total	2286	100%
<i>Gender Patients</i>	Girls	23	38%
	Boys	37	62%
	Total	60	100%
<i>Age Patients</i>	0 – 1 years	12	20%
	2 – 5 years	28	47%
	6 – 12 years	12	20%
	13 – 18 years	8	13%
	Total	60	100%
<i>Postures Patients</i>	Walking or being carried	18	30%
	Being pushed (stroller)	14	23%
	Sitting	9	15%
	Lying on gurney	8	13%
	Standing	7	12%
	Cycling	2	3%
	Walking therapeutic	2	3%
	Total	60	100%
<i>Activities Patients</i>	No focused activity	38	63%
	Conversation	12	20%
	Play with toys	4	7%
	Sleeping	3	5%
	Games/puzzles	1	2%
	Reading	1	2%
	Walk with dog	1	2%
	Total	60	100%
<i>Special Needs</i>	Masks	3	5%
	IVs	11	18%
	wheelchair	4	7%
	Other	2	3%
	Total	20	33%

Rounding of figures may cause total percentages to exceed 100%

Use of Infant and Toddler Playroom

The Infant and Toddler playroom on the third floor was meant for infants and toddlers (patients) and their parents. It was a relatively small room with a low table and chairs for children and toys such as a kitchen for fantasy play and loose materials. The room was not used very often. During the 85 times (five times a day over 17 days) we observed the play room, it was empty 86% of the time, and occupied 14%.

A total of 27 people were observed in the playroom, of whom 33% were patients, 30% parents and family, 30% staff, and 7% siblings or friends. Of the nine patients who were in the playroom, were two boys and seven girls. The ages ranged from newborns to eighteen years, with 22% (N = 2) being younger than one, 22% (N = 2) being between two and five, and 56% (N = 5) between the ages of thirteen and eighteen. The postures of the patients involved sitting (N = 7), standing (N = 1), and walking (N = 1). The patients were engaged in the following activities: formal teaching (N = 4), play with toys or materials (N = 3), talking (N = 1), and drawing (N = 1). Of the 9 patients, two wore a mask.

Figure 11 shows pictures of the Infant and Toddlers Playroom on the third floor. One depicts the interior of the playroom, the center picture shows the rules, the last picture shows how the room is used for other purposes such as a school exam.



Figure 11: Images of the Infant and Toddler Playroom on the third floor of the WMC

The relatively high number of older children is explained by the fact that it was used by the teachers to take official school exams with patients. The four times we observed a teenager in a room, the room was being used for an exam. The infant and toddler playroom was used for exams because it was occupied by patients less often than the school-age playroom. Using the school-age playroom for exams would have prevented more children from playing. See Table 9 for an overview of the data.

Table 9: Overview of the observations of the Infant and Toddlers Playroom on the third floor WMC

Playroom Infant & Toddlers	Observation	N	%
<i>Occupancy</i>	Occupied	12	14%
	Empty	73	86%
	Total	85	100%
<i>Users room</i>	Parent/visitor	8	30%
	Staff	8	30%
	Sibling/friends	2	7%
	Patients	9	33%
	Total	27	100%
<i>Gender Patients</i>	Girls	7	78%
	Boys	2	22%
	Total	9	100%
<i>Age Patients</i>	0 – 1 years	2	22%
	2 – 5 years	2	22%
	6 – 12 years	0	0%
	13 – 18 years	5	56%
	Total	9	100%
<i>Postures Patients</i>	Sitting	7	78%
	Standing	1	11%
	Walking	1	11%
	Total	9	100%
<i>Activities Patients</i>	Formal teaching	4	45%
	Play with toys	3	33%
	Conversation	1	11%
	Art activities	1	11%
	Total	9	100%
<i>Special Needs</i>	Masks	0	0%
	IVs	2	22%
	Wheelchair	0	0%
	Total	2	22%

Rounding of figures may cause total percentages to exceed 100%

Use of the School-Age Playroom

The school-age playroom on the third floor was meant for older patients on the floor and their parents. It was a fair-sized room with a low and high table and chairs, a TV, and some toys always on display and some behind locks. A few times a week, the room was used for Child Life activities such as art activities, a clown performance, or for special events. Of the 85 observations, five times a day for 17 days, the playroom was empty 59% of the time and occupied 41%. The TV was on only 12% of the time. Figure 12 shows pictures of the interior of the School-Age Playroom and the rules of the room.



Figure 12: Images of the School-Age Playroom on the third floor of the WMC

A total of 123 people were observed in the playroom of whom 42% were patients, 34% parents and family, 21% staff, and 3% siblings or friends. Of the 52 patients who were in the playroom, 56% were boys and 44% girls. The ages ranged from newborns to eighteen years, with 8% being younger than one years of age, 52% being between two and five, 25% between six and twelve, and 15% between the ages of thirteen and eighteen. The most frequently occurring postures among patients were sitting (N = 45) and standing (N = 5). The most common activities in which patients were engaged were playing with toys (N = 19), playing a game or puzzle (N = 13), and attending a special event (N = 7). Other

activities included conversation (N = 5), no focused activity (N = 3), reading (N = 2), art activity (N = 2), and sleeping (N = 1). Of all the patients observed in the playroom, thirteen came in with IV poles, one was in a wheelchair, and one patient was wearing a mask. The other 71% did not use masks, IVs, or a wheelchair. See Table 10 for an overview of the data.

Table 10: Overview of the observations of the School-Age Playroom on the third floor WMC

Playroom School-Age	Observation	N	%
<i>Occupancy</i>	Occupied	12	41%
	Empty	75	59%
	Total	85	100%
<i>TV on or off</i>	TV on	10	12%
	TV off	75	88%
	Total	85	100%
<i>Users Room</i>	Parent/visitor	42	34%
	Staff	25	20%
	Sibling/friends	4	3%
	Patients	52	42%
	Total	123	100%
<i>Gender Patients</i>	Girls	23	44%
	Boys	29	56%
	Total	52	100%
<i>Age Patients</i>	0 – 1 years	4	8%
	2 – 5 years	27	52%
	6 – 12 years	13	25%
	13 – 18 years	8	25%
	Total	52	100%
<i>Postures Patients</i>	Sitting	45	87%
	Standing	5	10%
	Walking	1	2%%
	Being pushed (stroller)	1	2%
	Total	52	100%
<i>Activities Patients</i>	Play with toys	19	36%
	Games/puzzles	13	25%
	Special Event	7	13%
	Conversation	5	10%
	No focused activity	3	6%
	Reading	2	4%
	Art activity	2	4%
	Sleeping	1	2%
	Total	52	100%
<i>Special Needs</i>	Masks	1	2%
	IVs	13	25%
	Wheelchair	1	2%
	Total	15	29%

Rounding of figures may cause total percentages to exceed 100%

Use of the Family Lounge

The family lounge on the third floor was meant as a place for the parents of the patients in PICU to sit, wait, rest, or relax away from the unit. It was a small room with two couches, a chair, a coffee table, a TV, and two public phones. The family lounge was always open. The family lounge was observed five times a day for 17 days for a total of 85 observations. Of those, the family lounge was occupied 62%, and empty 38%. The TV was on 69% of the time and off 31%. Figure 13 shows pictures of the family lounge for PICU parents.

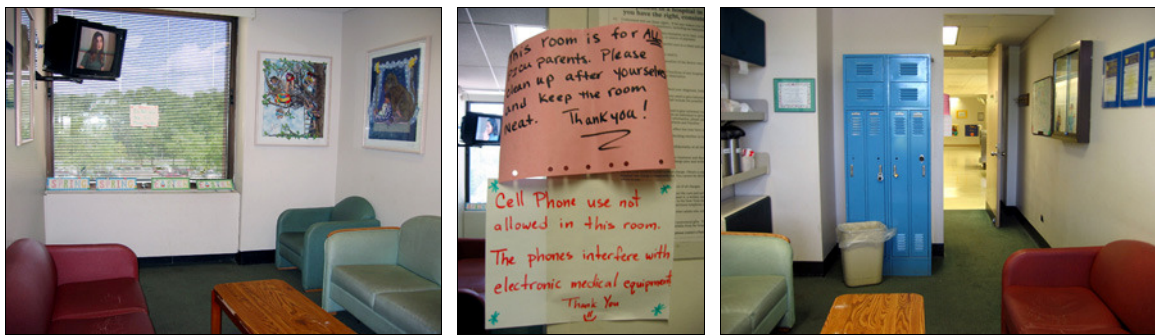


Figure 13: Images of the Family Lounge for PICU parents on the third floor of the WMC

A total of 112 people were observed in the room, of whom 85% were parents and family, 9% staff, 5% siblings or friends, and only 1% patients. We noted the postures of all users (66% sitting, 19% standing, 14% lying down, 1% walking) and their activities (25% engaged in conversation, 21% watching TV, 16% sleeping, 14% no focused activity, 8% on the telephone, 5% eating or drinking, 4% reading, 4% staff cleaning, and 2% other activities). See Table 11 for an overview of the data.

Table 11: Overview of the observations of the Family Lounge on the third floor of the WMC

Family Lounge	Observations	N	%
<i>Occupancy</i>	Occupied	53	62%
	Empty	32	38%
	Total	85	100%
<i>TV on or off</i>	TV on	59	69%
	TV off	26	31%
	Total	85	100%
<i>Users room</i>	Parent/visitor	95	85%
	Staff	10	9%
	Sibling/friends	6	5%
	Patients	1	1%
	Total	112	100%

Obstacles in the Corridors

Because there was such a shortage of storage space, certain parts of the corridors on the pediatric floor would get cluttered. Because we observed patients' use of and activities on the floor, we counted the number of objects (obstacles) that were in the corridors twice a day over 20 days. Obstacles included objects such as cleaning carts, carts with books, linen carts, garbage bins, infant scales, cribs, gas, file cabinets, fun centers, chairs for infants, strollers, a cart with cups and pacifiers. An average of 81 obstacles per day was found on the third floor making the corridors sometimes difficult for patients to maneuver. The inter-rater reliability between the three observers was 98%. Figure 14 shows pictures the obstacles that were found in the corridors on the third floor.



Figure 14: Images of obstacles in the corridors on the third floor of the WMC

RESULTS OF THE QUESTIONNAIRES WMC

Questionnaires were administered at the old hospital to three user groups: patients, parents, and staff. A total of 30 patients, 82 parents, and 105 staff members filled out a questionnaire (see Table 12). All participation was anonymous.

A reliability analysis was calculated for the scales covered in the three different questionnaires. The scales for patients and parents were related to the Seven Dimensions suggested in Chapter 5. The scales for staff were related to the staff Chart presented in Appendix A-IV. Based on the corrected item-total correlation, items were eliminated if a value was smaller than 0.25. Based on the internal reliabilities and the conceptual importance of the scales, the number of scales for further analysis was reduced. Scales with internal reliabilities smaller than 0.5 were considered low, reliabilities between 0.5 and 0.7 were considered moderate, and reliabilities greater than 0.7 were considered high. For the scales selected for further analyses the mean scores were calculated and then renamed. An explanation of the scales, the items of which they consist, their reliabilities, and their relation to the dimensions will be shown and discussed in Chapter 10. The main findings for each user group will be discussed below.

Table 12: Overview of the number of questionnaires at WMC

WMC	N
<i>Patients</i>	30
<i>Parents</i>	82
<i>Staff</i>	105

Questionnaires Patients WMC

Thirty patients between 6 and 21 years old filled out the questionnaires with an average age of 15 years ($M = 15$, $SD = 3.2$). Of the thirty patients, 51% were girls ($N = 16$), and 49% boys ($N = 14$). For 50% of the respondents, it was their first time in the WMC. Of the 50% who had been to the WMC before, the average number of visits was 2.6 ($M = 2.6$, $SD = 3.6$). The majority of the patients who responded (90%) stayed in 3 South. See Table 13.

Based on the internal reliabilities and the conceptual importance of the scales, the twenty scales were reduced to twelve for further analysis. All but two of the 47 items of the twelve scales had a corrected item-total correlation of 0.25 or larger.

Table 13: Specification of number of patient questionnaires at WMC

WMC	N	Gender	Mean Age	SD Age
<i>Patients</i>	30	Male = 14	15.9 years	3.5 years
		Female = 16	14.1 years	2.8 years

Questionnaires Parents WMC

The parent questionnaire was filled out by 82 parents. The majority (76%) of the questionnaires were filled out by mothers, 22% were filled out by fathers, and 2% by relatives. Parents who filled out the questionnaires were divided over the different pediatric units as follows: Inpatient Units-third floor (80%), Neonatal Intensive Care Unit plus Special

Care Unit (11%), Pediatric Intensive Care Unit (9%). Of the parents, 80% were staying in a room with another patient. The average age of the child being hospitalized was 6.5 years old ($M = 6.5$, $SD = 6.5$). Forty-five percent of the parents had stayed with their child at PICU at some point during their stay at the hospital. For 66% of the patients, this was their first stay at this hospital.

Based on the internal reliabilities and the conceptual importance of the scales, the twenty scales were reduced to ten for further analysis. All of the 42 items of the ten scales had a corrected item-total correlation of 0.25 or larger.

Questionnaires Staff WMC

Questionnaires were developed based on the literature review and interviews with staff at the WMC. Questionnaire drafts were shared with the nurse-managers and child-life specialists for their suggestions. A total of 105 questionnaires were collected at the WMC from nurses (72%), residents (15%), ancillary staff (7%), nursing assistants (4%), and other staff (2%). The average years staff worked in this hospital was 8.5 years ($M = 8.5$, $SD = 6.7$) and 7.7 years for the specific unit on which they were currently working ($M = 7.7$, $SD = 6.3$). Staff members who filled out the questionnaires were divided among the different pediatric units as follows: Inpatient Units-third floor 45%, Neonatal Intensive Care Unit plus Special Care Unit 37%, and the Pediatric Intensive Care Unit 18%.

Based on the internal reliabilities and the conceptual importance of the scales, the thirteen scales were reduced to eleven for further analysis. All but two of the 67 items of the eleven scales had a corrected item-total correlation of 0.25 or larger.

SUMMARY OF THE OLD HOSPITAL

Clearly, the NICU and pediatric floors at the WMC no longer met the demands of pediatric and Family Centered Care. In the NICU and the SCU, the space was cramped, noisy, hard to clean, and there were no facilities, except for some chairs, for parents to be with their infants. Staff had very limited workspace, no daylight, and was constantly apologizing to parents for the poor environment.

In the four to six bedded rooms in PICU, patients and parents had absolutely no privacy. For patients who were most critically ill, parents could not spend the night other than by sitting up in an uncomfortable chair. Again, there were no facilities for parents, only a small family lounge that looked more like a bus stop. There was no place to grieve or for consultation with parents, so outside of the PICU doors on the corridor, one would often see crying parents, siblings and families, making the situation even more stressful for them, but also for others walking by.

The pediatric floor consisted mainly of double rooms. The rooms were small, but at least there were pull-out chairs in most rooms, allowing a parent to sleep with her child. There was very little privacy, and as the observations showed, the majority of the patients kept the bedside curtains closed blocking the view from the corridor and from a roommate. There was no visual connection between the rooms and nursing stations, so the majority of the doors were kept open to keep some connection with what was happening outside of the room.

On the floor there were very few places for patients to go. The observations showed that the total number of patients seen in the corridors was relatively small and, of the patients that were seen, the majority were not engaged in a focused activity. Most patients were just

wandering around the corridors because there was nothing to do. Consequently, the mobility of patients was low as was the engagement of patients in activities. In addition, due to the lack of storage space, the floors were cluttered with equipment, carts, cribs, etc. making the corridors even less appealing.

The Infant and Toddler playroom on the floor was rarely used. First of all, the room was not visible from the corridor, other than through a sign, and the room was quite small. Secondly, because of the lack of space on the floor, the room was often used for other purposes such as staff meetings, private calls (cell phone) by staff and parents, or to take school exams with patients. The School-Age playroom was used more often. Again, the room was out of sight but bigger and nicely decorated. This room was often used by Child Life for special events such as boat building, art projects, or a visiting clown or magician. However, the playroom was closed after five in the afternoon and on the weekends, leaving the patients with no place to go.

Even though the staff would try very hard to accommodate the needs and concerns of families, the environment was not very supportive. Despite the poor facilities, staff was doing an excellent job. In the interviews and questionnaires, it was explicitly mentioned by most parents how much they loved the staff and how much they appreciated the wonderful job they were doing.

Chapter 8 ■ Participant Observation at the Time of the Move

INTRODUCTION

A move is a big change in the life of an organization and is likely to bring things to the surface that otherwise stay unnoticed. That is why I collected additional qualitative information to gain a better understanding of the impact the move had on its occupants. The goal was to gain understanding of the impact such a dramatic change of environment had on occupants and gain insight into how people occupied and mastered a building, how the occupants adjusted to their new environment, and how they made it fit their needs. I gathered information by doing participant observation and by having conversations with patients, parents, and staff to hear their stories.

I intended to follow and interview one or two families intensively while moving from one building to the next to get their reflections on the old building through interviews, see their reactions while moving into the new one, and get their feedback once they entered their new room. I intended to do the same with a few staff members. In addition, I was going to take pictures of the new building right before the move and in the weeks after to trace the changes made to the environment by its occupants.

Unfortunately, as is probably true with any move, the days before the move were hectic with contractors and staff members working around the clock to prepare the units for occupancy. Staff members were too busy (and tense) to be asked questions and the Child Life staff did

not have the time to help me find a family whom I could follow and with whom I could talk. Besides, many of the families that would have qualified had already been selected to talk to the press at the opening. Even though I took many pictures before the move it was rare to find a unit that was completely finished because work continued on up until the very last moment. So instead of in-depth interviews with families and staff, I became a participant, assisting people with whatever needed to be done such as filling NICU cabinets with supplies, finding people, moving things, preparing inpatient rooms, etc. What follows is an impression of the move and the days surrounding it as reflected in my field notes.

PREPARING FOR THE MOVE

The hospital administration and Foundation Center did a very conscientious job to prepare for the move. To attempt a seamless transition to the new facility, the planning process was started early 2003. Twenty-four transition teams were created covering the different areas in the hospital to prepare for the move. Each team was asked to become knowledgeable about the new facility and to create individual “Move Plans” to answer all the questions necessary for a successful move.

The teams were encouraged to include parents of children who have been patients in the existing hospital. The teams would meet monthly to discuss issues concerning the new hospital and the move. They would take hard-hat tours through the facility, plan mock-ups where applicable, and focus on issues such as improvement in operations, incorporation of the philosophy of Family Centered Care, make a plan for the move, re-writing of appropriate departmental policies and procedures, departmental equipment plan, orientation plan, departmental budget, and their role in the opening events.

I attended some fifteen of these meetings and took minutes to gain a better understanding of the move process and the issues at hand. By doing so, I learned about the concerns medical staff had about moving into the building, the preparation it takes to prepare for a smooth move, the importance of involvement of nurses in the process, and the importance of preparing an organization for the culture change it will go through.

STAFF MORALE

As mentioned in Chapter 7 staff had lived through a time of tension because of the financial crisis of the hospital, the lay-offs, and the bad publicity. Staff morale was relatively poor, but was not further impacted by the postponing of the move. This changed, however, once they finally moved into the new building. According to one of the nurse managers:

The postponing of the move did not affect the morale of the staff, but when things were not in place and finished when we finally moved in, it did have a negative impact on the morale. That was upsetting and stressed staff out.

Another nurse manager said:

The move itself went ok, but I was anxious because things were not in place. The med rooms were not equipped, things weren't working, we had no patients name boards (I went out and bought them with my own money), and phones were not transferred, just to name a few.

For the two years I had been involved in the project, the move to the Maria Fareri Children's Hospital was planned for June 20 2004. However, two weeks before this date, the building was not ready. As a result, the move was postponed for a month to the middle of July. In July, the date was moved to mid-August and then to September 10. Even then, a week

before the planned move, because of the many loose ends, the Foundation Center wanted to postpone it again for another week. This did not happen.

When I returned to the hospital on September 8 after having been away for over two months, I expected the MFCH to be fully prepared for the move that was to occur shortly. Instead, I found the place in a pretty chaotic state. Throughout the hospital, things were being fixed, added, or finished. Much still needed to be done. Still, there were not as many people as one would expect to get the hospital ready for occupancy. Nurse managers and physicians walked around in disbelief thinking the move would be postponed again since the hospital was not ready to receive patients. Units, closets, and rooms had not been supplied, PICU had no containers for the sharps (needles), monitors were missing at the crib sites in NICU, and the third floor was still being cleaned and supplied. I knew from talking to nurses for the last year that they had mixed feelings about the new building. When I walked over to the third floor of the WMC, I asked the nurses if they were excited about the move. Being able to adequately staff the units was a big concern among the nurses. A typical answer would be:

We are dreading the new place, it is dangerous! It's too big; we do not have enough people to staff it.

THE MOVE

Saturday, Sept. 11: NICU & Non-Patient Units

The first unit to be moved was the NICU. The cribs were rolled from the second floor of the old building to the second floor of the new building. It took up to seven people to transport a newborn in an incubator. First, the least critically ill babies from the SCU were transported. The first mother looked very happy in her new environment while being

photographed and interviewed. The head of the department said smilingly, after the first babies had been moved:

Everything is going smooth, so far no glitches.

The head of the NICU informed me about the set-up of the unit and how they had decided to organize the babies, explaining that the transition of a baby from the very critical unit to a less critical unit is a very important psychological step for parents, adding:

That's why we placed the babies that will soon go home in the unit (SCU) with the windows, as a symbol of their transition to home.

When I asked him about the transition room for parents and how they intend to use it, he said the room is really for the most anxious parents, to practice being with their child before they are sent home. However, according to him, it is more important that staff is trained to train parents while their child is still on the unit. Nurse aides, who are less expensive than nurses, would be ideal to help out but they are often ignored by the nurses because “they are not trained.”

The move of the babies started at 8:30 AM and by 11:00 AM all 40 infants had been moved. Three rooms in the NICU remained closed because there was not enough staff to cover all of the rooms. Because of the staffing problem, the four bed units were occupied by six to seven babies “for the time being.” According to the director of the hospital, this was unacceptable and had to be changed by Monday (two days later). That did not happen.

Next, the more critically ill babies were moved. They were put in the two six-bed rooms because these babies need more supervision and six in a room reduces the workload on the nurses. Also, these rooms are closer to the delivery rooms in the old hospital allowing for

faster transfers. In each of the two critically ill units, one bed would be left open at all times for a possible new admission from labor and delivery.

The babies in isolation were the last to be moved. In the new building there are four isolation rooms but only two were used. The rest of the day, supplies, equipment, offices, and staff's personal belongings were moved. The old site looked quite eerie at the end of the day.

After a few hours, I went back to the unit to talk to the nurses about the move but when we started talking the nurse spilled milk and dropped a bottle because, as she said, "there's too much going on." I took this as a sign that the nurses needed their full attention to adjust to the new situation and this clearly was not a good time to talk to them. The next day, looking back at the move, the nurse manager told me:

It was a smooth move! All kids are doing well. So far parents are very positive. One couple stayed in the transfer room. We need beds for parents to sleep in. The Ronald Mc Donald House should be a priority for the NICU parents because they can not sleep anywhere.

Monday, Sept. 13: PICU & General Pediatrics

On the day of the move, both PICU and general pediatric units are filled to capacity (68 patients in total). A PICU nurse comments:

On the day of the original move [June] we only had five patients, of course, now we have a full house.

The move of the twelve PICU patients started at 8 AM. The atmosphere was more hectic, chaotic, and confused than during the move of the NICU babies. The patients, one by one, were taken on a long journey from the third floor of the old building to the second floor of

the new building. With NICU now operational, one could no longer cut through the unit, but instead had to walk all the way around the NICU.

I kept walking back and forth to observe and help out wherever I could. When possible, I would walk behind the patients who were being moved and help carry things, help parents by telling them about the new unit, or just listen in on what was being said and how patients and parents responded to the new environment. Parents of the second patient who was moved into a private room sighed when walking into the new unit:

Wow, this is amazing, now we can finally sleep.

Three patients (one teenager, two babies) were medically very unstable which made moving them extremely stressful. In one of the old PICU units, a family was grieving with the pastor because their baby was very sick with 20 people around them in the room gathering things to transport a patient. Even though they understood the situation, it was extremely stressful and disturbing to them not to have any privacy at that difficult time. A nurse later told me:

At least this won't have to happen in the new place anymore.

Similar to the first feedback I heard, parents of an 8-year-old who had been in the hospital since 6:30 AM that morning said when seeing the new room:

Wow, now we can finally sleep.

They immediately went to sleep leaning against each other on the couch in the patient's room.

Two days later, when I came back, a mother had personalized her son's room with t-shirts from his football team, pictures, blankets, etc. I never had seen that before in the old PICU.

General Pediatrics

The 54 patients in general pediatrics on the third floor of the old hospital were scheduled to be moved at 12 Noon that Monday. In the morning, while PICU was being moved, business went on as usual. The units were crowded with physicians and residents. There was absolutely no sign that the move was a few hours away. The doors to the new building at the end of the hallway were, after all those months, finally open. I heard one nurse say:

With the doors open, with all the sun, it's like going to the light.

At 12 Noon, the ribbon cutting ceremony took place. The CEO of the WMC, John and Brenda Fareri, physicians, nurses, other staff, and five patients and their families who had been selected to cut the ribbon were present for the ceremony which took place at the border of the old and new building on the third floor. There was a short speech by John to thank everyone for all their work over the past ten years. Then the patients and Brenda cut the ribbons. Patients and parents, followed by staff, walked into the new building while everyone applauded them.

For the remainder of the day, patients were moved to the new building. Some walked over with family and friends and others were wheeled over in a bed or a wheelchair. It was a happy event and things went very smoothly.

CONCLUSIONS

Following the move was an intense and informative experience. The biggest lesson learned is that the preparation for and process of the move cannot be separated from the success of the new hospital. With such a contrast between an old and a new facility, familiar routines will change. Staff will be most impacted. For instance having private patient rooms will

change the dynamics between families and staff because the patient and his or her family are given more control. Anticipating such culture changes and training staff to adequately deal with these changes is crucial to the success of a new building.

Chapter 9 ■ Data Collected at the New Hospital

INTRODUCTION

This chapter presents an overview of the data collected over a period of one year (September 2004 – September 2005) at the Maria Fareri Children’s Hospital. During that year, I spent approximately 350 hours in the new hospital and my research assistant approximately 100. During the first six months I conducted semi-structured and informal interviews and participant observation. The results of the data gathered for each of the methods described in Chapter 6 are presented here.

The original instruments were adapted to fit the new hospital environment. The behavioral mapping technique had to be adjusted to the new floor and new spaces. Instead of 20 mental pictures, the new pediatric floor was divided into 38 mental pictures. The technique remained the same and so did the coding categories. The questionnaires were reviewed with the nurse managers from all the units. Some wording was changed and questions were added to cover new issues or new areas of the hospital. In early February, we started collecting the behavioral mapping data. In early March, six months after opening, we started administering questionnaires to patients, parents, and staff.

A summary of these data is offered at the end of this chapter. A comparison of these data to the old hospital and a discussion of the data can be found Chapter 10.



Figure 15: Images of the new Maria Fareri Children's Hospital

ABOUT THE MFCH

The Maria Fareri Children's Hospital at Westchester Medical Center is the first hospital in the United States to be named after a child. Maria Fareri died in 1995 of rabies, at the age of 13, at the Westchester Medical Center. Even though Maria's parents, John and Brenda Fareri, were impressed by the care that was given to her at the WMC, they realized that this hospital was built at a time when families were not considered an important part of a patient's care. Because there was little or no room for them to stay with Maria in the PICU, they would sleep outside the door in the corridors.

After Maria died, her parents learned that she had made a special wish as part of a school project "For the Health and Well-Being of All the Children in the World." With Maria's spirit guiding them, her parents took the initiative to create a new children's hospital that would have Family Centered Care as its main focus. John and Brenda donated the initial amount but, more importantly, stayed actively involved in the design process for the 10 years it took to complete the building.

A foundation center was started with the goal of raising \$25 million to meet the budget requirements for the new Maria Fareri Children's Hospital. At the end of the eight year campaign "Reaching for the Stars," the center had raised \$45 million, had found a great number of sponsors for the hospital, and had 20,000 members of the community involved in the new hospital. Donations, such as a fire truck, a locomotive, a dollhouse, an aquarium, a baseball gallery and a doll-collection are very much present throughout the hospital.

Description of the Units and the Facilities MFCH

In contrast to the old pediatric units, the new facility is a free standing hospital designed for children. The new 270,000 square-foot, three-story building, has room for 44 neonates and 74 pediatric patients. The new building, while five times the size of the old pediatric floors, nonetheless increased the number of beds by only thirteen. NICU gained four beds, PICU four beds, and general pediatrics gained five beds. The entrance, lobby, corridors, cafeteria, store, the outdoors, the ER, and all other services were designed with children in mind. The new children's hospital also houses the adult ER and an adult trauma unit. The neonatal and pediatric units are discussed in more detail below. A floor plan of the NICU and the PICU on the second floor and the pediatric units on the third floor will be given in Appendix B-I.

NICU

The new Neonatal Intensive Care Unit (NICU) was joined with the Special Care Unit on the second floor of the new building. The new NICU counts 40 regular incubators and four isolation rooms. The new NICU is no longer adjacent to the labor and delivery rooms which makes efficient transportation of the infants to the NICU unit more difficult. Also, mothers who stay at the maternity unit of the old hospital after delivery now have to come to the new

building to see their newborns by first passing through a long corridor to get to the main entrance of the NICU unit thus making it less convenient for them. The lack of direct adjacency to the Labor and Delivery Unit was often mentioned by staff as a negative change from the old situation.

The NICU consists of ten patient units for four to six incubators, four isolation rooms, a transition room where one family can stay overnight with their infant before they go home, four breast pump rooms for mothers, three family areas and two pantries, a large waiting room right outside the unit, a front desk, a staff lounge, an office for the nurse manager, a large meeting room, and workspaces for staff and residents. Compared to the old building, the patient units are spacious and calm. There are comfortable chairs for parents while visiting but still no place for them to sleep or shower. However, staff will try very hard to put parents up for the night if needed. Empty isolation rooms or patient rooms at either NICU or the maternity unit are used for this purpose. Daylight is still limited in the unit: only two of the ten patient rooms have windows with two skylights in the family areas. The NICU is still certified for 40 beds. However, the unit often is far over capacity, sometimes taking care of 50 or more infants. The unit has a total of 22,500 square feet and an average of 100 square feet per bed. Figure 16 shows pictures of the NICU on the second floor. One depicts the interior of the six-bed room for the highest care and one shows a family waiting area on the unit.



Figure 16: Images of the NICU on the second floor of the MFCH

PICU

The Pediatric Intensive Care Unit (PICU) with eighteen beds is located on the second floor of the MFCH. The PICU consists of eighteen private patient rooms, two family areas with pantry and one shower, a family waiting area right outside the unit, a front desk, a nurses' lounge, two consultation rooms, an office for the nurse manager, two work stations for physicians and residents, and one decentralized work place for nurses between every two rooms. Every room is equipped with a TV, a pull-out sofa for parents, and a window to the lobby or the outside. The PICU covers an area of 18,000 square feet. Figure 17 shows pictures of PICU. One picture shows a private patient room, the second one the family waiting area for the unit.



Figure 17: Images of the PICU on the second floor of the MFCH

General Pediatrics

The general pediatric floor is divided into six smaller pods: Sailing, Heroes, Flight, Theater, Arts, and Literature. Patients are assigned according to age, with the youngest ones in Sailing and the oldest in Literature. The one exception is oncology patients, where all ages are grouped together in the Arts pod. While each pod has its own character they are similar in set-up: six to eight private rooms and one semi-private room grouped around a central nursing station and a family area with a small pantry. All rooms have a window to the outside, a bathroom and shower, a pull-out sofa for parents to spend the night, a closet, a desk, a sink, a phone, and a large TV with DVD player. General pediatrics has 56 beds of which 48 are private rooms and eight semi-private rooms.

All pods have their own character. Sailing has a large play-sitting area representing a sailboat; Heroes has a fire truck that is wheelchair accessible; Theater has an art studio with special daily art programs; Arts has a small play area for the oncology patients; and Literature has a space for teens to sit and watch movies on a screen.

In addition, the third floor has a playroom for infants and toddlers, a playroom for school-aged patients, a computer room for teenagers, two central meeting areas, public bathrooms,

a nurses lounge, offices for nurse managers, two conference rooms, a playroom for school aged children, six rooms for medical supplies, two storage rooms, and a pharmacy. Figure 18 shows pictures of two different pods (heroes and literature) on the third floor. Figure 19 shows examples of the nursing stations the pods and Figure 20 shows the family areas adjacent to the nursing station in the pods where parents and patients can eat or sit and warm their food.



Figure 18: Images of the pods on the third floor of the MFCH



Figure 19: Images of the nursing stations on the third floor of the MFCH



Figure 20: Images of family areas on the third floor of the MFCH

Ronald McDonald House

The MFCH has an in-house Ronald McDonald House to accommodate parents or families who need a place to stay while their child is being hospitalized. The Ronald McDonald House has five rooms for families and includes a dining room, kitchen, living room with fireplace, a laundry, and a gym facility. Each of the five rooms has a private bath and shower. The Ronald McDonald House is sponsored and managed by the Starwood Sheraton Hotel. Together with nurse managers and Child Life of the different units, parents are selected on a daily basis to stay at the Ronald McDonald House. Figure 21 shows a typical bedroom and the kitchen area in the Ronald McDonald house.



Figure 21: Images of the Ronald McDonald House on the third floor of the MFCH

Art Program

From the beginning of the design of the new hospital, art has been an important focus. At the new hospital, the arts, education, nature, and play therapy have been integrated as a part of the healing environment. A special Art Committee has been working to commission site-specific works by leading contemporary artists, assemble a permanent art collection, and launch an art studio for patients and families and a music therapy program.

The Art Studio on the third floor provides a safe place for children within a stressful environment and a place for expression to young patients undergoing serious or life-threatening illnesses or injuries. Figure 22 shows an example of art in one of the corridors of the third floor and a picture of the art studio.



Figure 22: Images of Art and the Art Studio on the third floor of the MFCH

PARTICIPANT OBSERVATION NOTES

Through participant observation, I tried to glean which elements of the new hospital environment helped or hindered people in the things they did or wanted to do. The observations focused on how the new facility was being used, its differences from the old, what changes were made to the building to better accommodate the users, and new patterns of wear and tear. In this section, my observations just after the move will be presented.

My First Impressions of the New Place

As mentioned in Chapter 8, moving into a new building has a significant impact on its occupants. It also impacted me and my presence as a researcher in the hospital. What follows are impressions taken from my notes during the three months after the move. For instance, the occupancy of the building impacted my ability to move around the new facility:

Wednesday, Sept. 15 2004:

Since the beginning of my study in 2002 I have followed the construction of the building closely. I toured around people, showed it to friends and family and as a result got to know the building very well. Before the opening I had access to all areas,

including surgery, NICU, the ER, etc. The opening was very exciting but it now feels strange that spaces that used to be accessible are now occupied and taken over. I have to rethink the routes I'm taking, because some of these doors are now closed.

In many ways my work became more pleasant and easier in the new hospital. It was a friendlier place that seemed to impact its users in a positive way:

October 21, 2004:

Walking around in the new hospital is a completely different experience. People seem happier; it feels so much easier in general to make contact with staff. Compared to the old building there is so much space, which seems to make it easier for people to make (eye)contact. Before it seemed too crowded and too noisy to even say a simple hello. Now there seems to be more eye contact in the corridors, more friendly exchanges, and more smiles! Staff and physicians even approached me today, which was very unlikely to happen before.

And:

I can finally sit while conducting an interview!

Also I observed an interesting and unexpected change:

On the third floor most of the doors and blinds are closed which makes it difficult to tell if someone is in the room and what is happening in the room. I wonder if patients and parents know that they can open the curtains. When I asked a nurse she said she does not know whether they know. She says staff members never open the blinds or tell patients or parents that they can open it. If I ask her if cleaning personnel leaves the curtains open after they clean a room for a new patient she also says she does not know.

Thus doors and blinds were kept closed most of the time indicating that patients and families in the room wanted and took more control over privacy. This has both a positive and a negative side-effect:

The good news is that people knock!! Staff does seem to knock on door before entering, which was less likely to happen in the old place.

The drawback is that because everything is closed, I do not know what is happening in the room: is the child asleep, being examined or are there visitors? As a consequence I feel more of an intruder when I want to enter a room. This is shared by the volunteers I spoke to today like Rob, from Pet Therapy, and Sandy from the Pinwheel Project.

About the PICU I wrote:

PICU seems quiet, many rooms are empty, and some are being used for storage.

November 30, 2004:

I did not always feel comfortable walking around the hospital having to talk to patients and parents. Some days I felt more of an intruder and even harbored doubts about the need for this study. On such days I was very happy to know someone in the hospital with whom I could spend some time to regain confidence and joy in the work I was doing. One of these days is described below:

After ten days not being in the hospital and after Bruce (the director of the Foundation Center) had left I find it difficult to go back to the MFCH because he played such an important role in me feeling at home and comfortable at the hospital. Now going back after ten days I feel sort of uncertain. The first person I bump into today was Sandee from the Pinwheel Project. She came out of the elevator on the 1st floor. I was happy to see her, and so was she. We both have experienced many times how difficult it is to get things done in a hospital environment as a volunteer. We share many of the same frustrations but also a similar passion that keeps us going. I decided to spend some time with her, going around the floors with her cart with coffee, food and small gifts to visit patients, parents and staff. Through her, I felt it was easy to

get in touch with patients and parents again, because they all love her and the pinwheel cart. She does great work for parents and patients, and doctors and nurses really appreciate that.

Through her I not only got to meet patients and their parents but I also got to see a different side of the medical staff.

We first went to the PICU. PICU just went through a very rough weekend with a teenager dying after a soccer game. It had been suggested in the papers that she died as a result of an accident, while the cause of death was unknown. Apparently the family and community support in the hospital was amazing. There was a group of people in the room and in the lounge to support the family and her the whole time. People would bring food to the hospital.

While going around with Sandee, we talked to the staff about what had happened and how sad they were that she had passed away. It is rare to see that side of the doctors and nurses, but over coffee and home-made brownies the emotions were shared.

Sandee knows many of the patients and their special wishes. There was a boy waiting for a kidney transplant who loves pasta with tomato sauce so she brought him a whole tray of pasta in tomato sauce cups so he will eat something and gain some strength.

RESULTS OF THE INTERVIEWS

In the first few months after the opening, I conducted semi-structured and informal interviews with patients, parents, and staff. The interviews with patients and parents focused on how they experienced the new hospital and, had they stayed in the old building, how they would compare the two.

Interviews with staff focused on how their work environment had changed, what things had improved, or did not work well. Interviews were conducted in the patients' rooms on the pediatric floors. Staff members were asked to participate in an interview at a time and place

that was convenient for them. The data gathered from the semi-structured and informal interviews will be used for illustration purposes in the comparison of the data in Chapter 10.

Table 14 gives an overview with the number of semi-structured interviews.

Table 14: Overview of total number of semi-structured interviews conducted at MFCH

Interviews	N	Gender	Age
<i>Patients</i>	8	Male = 3	10 – 18
		Female = 5	12 – 18
<i>Parents</i>	12	Male = 4	n/a
		Female = 8	
<i>Staff</i>	21	Male = 6	n/a
		Female = 15	

RESULTS OF BEHAVIORAL MAPPING

Observations of Privacy

To gain an understanding of how privacy was regulated on the pediatric floor of the new MFCH, we observed whether patient doors and blinds of the doors and windows (to the corridors) were kept open or closed. Over a period of three months, we observed three times a day between 10:00 AM and 7:00 PM for twenty days. Inter-rater reliability among the two observers, after training, was 99%. Figure 23 shows pictures of a typical private patient room with views to the nursing station (left) and the facilities such as a couch for parents and a plasma TV (right).



Figure 23: Images of an inpatient room on the third floor of the MFCH

Doors Open or Closed

A door was counted as open if we could clearly see the patient in the room. In total, there were 56 doors to patient rooms on the third floor. During the time of our observation, not all units were occupied. Because of staffing issues, one unit remained closed. When we first started observing, the Sailing pod was closed due to frozen pipes in the unit. The unit was moved to the Flight neighborhood. Halfway through our observations, the unit moved back to its original place, the Sailing pod. When a pod was not in use, it was excluded from the observations.

Forty-seven doors (56 doors minus nine doors of the closed unit) were observed three times daily over 20 days for a total of 2820 observations. During this period, doors were open 51% of the time and closed 49% of the time. In contrast to the old hospital, as described in Chapter 7, the status of the doors varied throughout the day, indicating that people were able to express their choice and regulate their privacy. See Table 15.

Blinds of the Doors and Windows Open or Closed

In addition to the doors being open or closed, we counted the times the blinds covering the glass in the door was pulled or open and whether the blinds of the windows next to the doors were open or closed. During 2820 observations, the blinds next to the doors were counted as closed 80 % of the time and as open 20 % of the time. And the blinds next to the windows were counted as closed 68 % of the time and as open 32 % of the time.

In addition, we counted whether or not the room was occupied by a patient. The blinds or door did not have to be open to tell whether the room was being used or not because one could see through the blinds just enough to tell. In the 2820 observations, the bed was occupied 90% of the time and unoccupied (not assigned to a patient) 10% of the time.

In contrast to the old hospital, as described in Chapter 7, the status of the blinds of doors and windows varied throughout the day indicating that people did express their choice and were able to regulate their privacy. See Table 15 for an overview of these data.

Table 15: Overview status of doors, blinds doors and windows and occupancy beds at MFCH

Observation	Status	N	%
<i>Doors</i>	Door open	1440	51%
	Door closed	1380	49%
	Total	2820	100%
<i>Curtains doors</i>	Curtain open	554	20%
	Curtain closed	2266	80%
	Total	2820	100%
<i>Curtains windows</i>	Curtain open	915	32%
	Curtain closed	1905	68%
	Total	2820	100%
<i>Occupancy beds</i>	Beds occupied	2529	90%
	Beds empty	291	10%
	Total	2820	100%

Observations of the Use of Corridors and Playrooms

To understand how and by whom the playrooms and the corridors of the pediatric floor were being used, we observed these areas five times a day during 20 days. The inter-rater reliability among the three observers, after training, was 100%.

Based on the database of the hospital the number of boys and girls during the three months of observations was 56% boys and 44% girls, which are exactly the same percentages as during the observations in the old hospital as described in Chapter 7. The age distribution during the months of observations was 33% (0 – 1 years), 22% (2 – 5 years), 23% (6 – 12 years), and 22% (13 – 18 years), which is more or less the same as the age distribution during the observations in the old hospital. See Table 16.

Table 16: Actual number of patients, their gender and age range during observations at MFCH

Patients	Gender and Age	N	%
<i>Gender</i> N = 988	Girls	431	44%
	Boys	557	56%
	Total	988	100%
<i>Age</i> N = 988	0 – 1 years	330	33%
	2 – 5 years	216	22%
	6 – 12 years	224	23%
	13 – 18 years	218	22%
	Total	988	100%

Use of the Corridors

If children were allowed to leave their bed, they were often allowed to walk around the third floor or play in one of the playrooms. To gain a better understanding of the frequency of patients on the floor and their activities while outside of their rooms, we observed who was in the corridors and, if they were patients, what they were doing. To increase the accuracy of the observations and secure inter-rater reliability, 38 areas were defined on the third floor of

which a ‘mental picture’ was taken. Whoever was in the mental picture at that one moment would be counted. See the map of the third floor with the areas the mental pictures were taken marked and the instruments used in Appendix B-III.

Thirty four or thirty five mental pictures, depending on what unit was closed, were taken five times a day over 20 days resulting in a total of 3355 mental pictures taken in the corridors. Of those, in 55% of the times, one or more people were observed and 45% times there was no one in the mental picture. Figure 24 shows a picture of the corridors on the third floor and one of the special features, the fire truck, at the end of one of the corridors.



Figure 24: Images of the corridors of the third floor of the MFCH

A total of 4744 people were observed in the corridors of whom 82% were staff, 12% parents and family, 5% were patients, and 1% siblings or friends. Of the 211 patients observed in the corridors, 47% were boys and 53% girls. This is a relatively high percentage of girls and low percentage of boys compared to the actual number of boys and girls in the hospital at that time (see Table 16). The ages ranged from newborns to eighteen years with 16% being younger than one year, 44% being between two and five years, 25% between six and twelve years, and 15% between the ages of thirteen and eighteen. The postures of the patients were walking or being carried (N = 61), sitting outside the room, near a nursing station or family

pantry area (N = 57), being pushed in wheelchair or stroller (N = 38), standing (N = 33), cycling (N = 16), being pushed on a gurney or bed (N = 4), and walking with a dog (N = 2). The patients were engaged in the following activities: no focused activity (N = 62), engaged in conversation (N = 56), gross motor play (N = 29), drinking or eating (N = 20), play with toys/materials (N = 18), sleeping (N = 11), reading (N = 4), walking the dog (N = 3), and other activities such as watching TV and using a computer (N = 4). Of all the patients observed in the corridors, 22 walked with IV poles, four were in a wheelchair, and twelve patients were wearing a mask. The other 81% did not use masks, IVs, or a wheelchair. See Table 17 for an overview of the data.

Table 17: Overview of observations of the use of corridors at MFCH

Corridors	Observation	N	%
<i>Occupancy</i>	Occupied	1843	55%
	Empty	1521	45%
	Total	3355	100%
<i>Users in Corridor</i>	Parent/visitor	562	12%
	Staff	3911	82%
	Sibling/friends	60	1%
	Patients	211	5%
	Total	4744	100%
<i>Gender Patients</i>	Girls	112	53%
	Boys	99	47%
	Total	211	100%
<i>Age Patients</i>	0 – 1 years	34	16%
	2 – 5 years	92	44%
	6 – 12 years	53	25%
	13 – 18 years	32	15%
	Total	211	100%
<i>Postures Patients</i>	Walking or being carried	61	29%
	Being pushed (stroller)	38	18%
	Sitting	57	27%
	Standing	33	16%
	Cycling	16	8%
	Lying on gurney	4	2%
	Walking dog	2	1%
	Total	211	100%
<i>Activities Patients</i>	No focused activity	62	29%
	Conversation	56	27%
	Gross motor play	29	14%
	Drinking or eating	20	10%
	Play with toys	18	9%
	Sleeping	11	5%
	Games/puzzles	4	2%
	Reading	4	2%
	Walk with dog	3	1%
	Other: TV, computer	4	2%
	Total	211	100%
<i>Special Needs</i>	Masks	12	6%
	IVs	22	10%
	Wheelchair	4	2%
	Other	1	1%
	Total	39	19%
<i>Rounding of figures may cause total percentages to exceed 100%</i>			

Use of the Infant and Toddler Playroom

The Infant and Toddler playroom on the third floor was designed for infants and toddlers (patients) and their parents. It is a pleasant, sunny, and amply-sized room with large windows to an unused courtyard. In the rooms are low tables and chairs for children and toys such as a kitchen for fantasy play and loose materials. Sometimes the room was used for child-life activities such as music events or special visitors such as Elmo. During the 100 times (five times a day over 20 days) we observed the play room, it was empty 61% of the time and occupied 39%. In contrast to the old hospital, this room was now used more often than the other school age playroom. Figure 25 shows pictures of the exterior and the interior of Infant and Toddler Playroom.



Figure 25: Images of the Infant and Toddler playroom on the third floor of the MFCH

A total of 113 people were observed in the playroom, of whom 41% were patients, 41% parents and family, 10% staff, and 8% siblings or friends. Of the nine patients who were in the playroom, 52% were girls and 48% boys. The ages ranged from newborns to eighteen years, with two patients being younger than one year, 38 being between two and five years and six between the ages of six and twelve. The postures of the patients involved sitting (N = 24), walking (N = 11), standing (N = 7), and lying down (N = 4). The patients were

engaged in the following activities: play with toys or materials (N = 37), no focused activity (N = 3), art activities (N = 2), talking (N = 2), playing games (N = 1), and sleeping (N = 1). Of the 46 patients, six patients (13%) were wearing a mask while in the room. The other 87% of the patients did not use masks, IVs, or a wheelchair. See Table 18 for an overview of the data.

Table 18: Observations of the Infant and Toddler playroom third floor MFCH

Playroom Infant & Toddler	Observation	N	%
<i>Occupancy</i>	Occupied	39	39%
	Empty	61	61%
	Total	100	100%
<i>Users room</i>	Parent/visitor	46	41%
	Staff	12	10%
	Sibling/friends	9	8%
	Patients	46	41%
	Total	113	100%
<i>Gender Patients</i>	Girls	24	52%
	Boys	22	48%
	Total	46	100%
<i>Age Patients</i>	0 – 1 years	2	4%
	2 – 5 years	38	83%
	6 – 12 years	6	13%
	13 – 18 years	0	0%
	Total	46	100%
<i>Postures Patients</i>	Sitting	24	52%
	Standing	7	15%
	Walking	11	24%
	Lying down	4	9%
	Total	46	100%
<i>Activities Patients</i>	Play with toys	37	81%
	No focused activity	3	7%
	Conversation	2	4%
	Art activities	2	4%
	Other: games sleeping	2	4%
	Total	46	100%
<i>Special Needs</i>	Masks	6	13%
	IVs	0	0%
	Wheelchair	0	0%
	Total	6	13%
<i>Rounding of figures may cause total percentages to exceed 100%</i>			

Use of the School-Age Playroom

The school-age playroom on the third floor was designed for older patients on the floor and their parents. It also is an amply-sized room with high table and chairs, some games on display but most behind locks. A few times a week, the room was used for child-life activities such as a clown-performance or music events. Of the 100 observations, five times a day for 20 days, the playroom was empty 70% of the time and occupied 30%. In contrast to the old playroom, this room had no TV. Figure 26 shows pictures of the exterior and the interior of the School-Age Playroom.



Figure 26: Images of the School-Age playroom on the third floor of the MFCH

A total of 96 people were observed in the playroom of whom 39% were patients, 32% parents and family, 21% staff, and 8% siblings or friends. Of the 37 patients who were in the playroom, 43% were boys and 57% girls. The ages ranged from newborns to eighteen years with three patients being younger than one year, sixteen being between two and five, fifteen between six and twelve, and three between the ages of thirteen to eighteen. The most frequently occurring postures among patients were sitting ($N = 28$) and standing ($N = 7$). The most common activities in which patients were engaged were playing with toys ($N = 17$), engaged in a conversation ($N = 8$), and attending a special event ($N = 5$). Other

activities were playing a game or puzzle (N = 4), no focused activity (N = 2), and art activity (N = 1). Of all the patients observed in the playroom, eleven came in with IV poles, and four were wearing a mask. The other 49% of the patients did not use masks, IVs or a wheelchair. See Table 19 for an overview of the data.

Table 19: Overview of observations of the School-Age playroom third floor MFCH

Playroom School-Age	Observation	N	%
<i>Occupancy</i>	Occupied	30	30%
	Empty	70	70%
	Total	100	100%
<i>Users Room</i>	Parent/visitor	31	32%
	Staff	20	21%
	Sibling/friends	8	8%
	Patients	37	39%
	Total	96	100%
<i>Gender Patients</i>	Girls	21	57%
	Boys	16	43%
	Total	37	100%
<i>Age Patients</i>	0 – 1 years	3	8%
	2 – 5 years	16	43%
	6 – 12 years	15	41%
	13 – 18 years	3	8%
	Total	37	100%
<i>Postures Patients</i>	Sitting	28	75%
	Standing	7	19%
	Walking	1	3%
	Lying down	1	3%
	Total	37	100%
<i>Activities Patients</i>	Play with toys	17	46%
	Games/puzzles	4	11%
	Special Event	5	13%
	Conversation	8	22%
	No focused activity	2	5%
	Art activity	1	3%
	Total	37	100%
<i>Special Needs</i>	Masks	4	11%
	IVs	11	30%
	Wheelchair	0	0%
	Total	15	41%
<i>Rounding of figures may cause total percentages to exceed 100%</i>			

Use of the Art Room

In addition to the two playrooms, the new hospital has an art studio located in the Theater Pod. The studio is spacious and bright with large windows overlooking the miniature golf course outside. Art projects by patients are on display on the walls. The studio is run by Jessica who is a Child Life specialist and has a master's degree in art. During our observations, the room was closed most of the time. The opening hours varied but often started later in the afternoon after our rounds of observations. Figure 27 shows pictures of the interior of the Art Studio and examples of art made by patients on the wall.



Figure 27: Images of the Art Studio on the third floor of the MFCH

Of the 100 observations, five times a day for 20 days, the art room was empty 83% of the time and occupied 17%. A total of 65 people were observed in the art room of whom 42% were patients, 18% parents and family, 34% staff, and 6% siblings or friends.

Of the 27 patients who were in the art room, 56% were boys and 44% girls. The ages ranged from approximately five to eighteen years with seven patients being between two and five years, thirteen between six and twelve years, and seven between the ages of thirteen eighteen. The most frequently occurring postures among patients were sitting ($N = 21$) and standing ($N = 5$). The most common activity in which patients were engaged was an art activity

(N = 26). Of the patients observed in the art room, eleven came in with IV poles, and five were wearing a mask. The other 41% of the patients did not use masks, IVs or a wheelchair.

See Table 20 for an overview of the data.

Table 20: Overview of observations of the Art Studio third floor MFCH

Art Room	Observation	N	%
<i>Occupancy</i>	Occupied	17	17%
	Empty	83	83%
	Total	100	100%
<i>Users room</i>	Parent/visitor	12	18%
	Staff	22	34%
	Sibling/friends	4	6%
	Patients	27	42%
	Total	65	100%
<i>Gender Patients</i>	Girls	12	44%
	Boys	15	56%
	Total	27	100%
<i>Age Patients</i>	0 – 1 years	0	0%
	2 – 5 years	7	26%
	6 – 12 years	13	48%
	13 – 18 years	7	26%
	Total	27	100%
<i>Postures Patients</i>	Sitting	21	78%
	Standing	5	19%
	Walking	1	3%
	Total	27	100%
<i>Activities Patients</i>	Art activities	26	96%
	No focused activity	1	4%
	Total	27	100%
<i>Special Needs</i>	Masks	5	19%
	IVs	11	41%
	Wheelchair	0	0%
	Total	16	59%

Rounding of figures may cause total percentages to exceed 100%

Use of the CIC room

The Companions in Courage Room (CIC) is a multi media room for teenagers. Here patients can play computer games, go online to check email, or use instant messaging. During the months of our observation, the room was only open a few hours a day (3:30 PM – 5:30 PM) a few days a week. The reason for these limited hours was that Child Life wanted to be

present when children were in the room to make sure the room used properly. Almost always when we did our rounds the room was closed. Only during the last week of our observations the opening hours were expanded to 9:00 AM – 7:00 PM. Only patients of twelve years and older were allowed to use the computer. Figure 28 shows pictures of the interior of the CIC room and the rules of the room.



Figure 28: Images of the CIC Room on the third floor of the MFCH

Of the 100 observations, five times a day for 20 days, the CIC room was empty 94% of the time and occupied 6%. A total of eight people were observed in the CIC room of whom four were patients, one a parent or family, and three staff members.

Of the four patients who were in the CIC room, only boys were observed. One patient was between six and twelve years of age, and three between the ages of thirteen and eighteen. All four patients were sitting using the computer. Of the patients observed in the CIC room, one came in with an IV pole. The other three patients did not use masks, IVs, or a wheelchair. See Table 21 for an overview of the data.

Table 21: Overview of observations of the CIC Room third floor MFCH

CIC Room	Observation	N	%
<i>Occupancy</i>	Occupied	6	6%
	Empty	94	94%
	Total	100	100%
<i>Users room</i>	Parent/visitor	1	12%
	Staff	3	38%
	Patients	4	50%
	Total	8	100%
<i>Gender Patients</i>	Girls	0	0%
	Boys	4	100%
	Total	4	100%
<i>Age Patients</i>	6 – 12 years	1	25%
	13 – 18 years	3	75%
	Total	4	100%
<i>Postures Patients</i>	Sitting	4	100%
<i>Activities Patients</i>	Computer	4	100%
<i>Special Needs</i>	IVs	1	25%

RESULTS OF THE QUESTIONNAIRES MFCH

Questionnaires were administered at the old hospital to the three user groups. The same questionnaire was used in the new hospital. Only minor changes were made to match the new situation such as new names of units and facilities. Questions that were no longer applicable were eliminated and a few new questions were added to address specific aspects of this hospital. In total 32 patients, 135 parents and 126 staff filled out the questionnaires. See Table 22 for an overview of the number of questionnaires.

The same scales that were selected in the old hospital questionnaires (Chapter 7) were selected for analysis in the new hospital questionnaire. A reliability analysis was calculated for these scales. Scales with internal reliabilities smaller than 0.5 were considered low, reliabilities between 0.5 and 0.7 were considered moderate and reliabilities greater than 0.7 were considered high. For the selected scales, the mean scores were calculated and then renamed. An explanation of the scales, the items of which they consist, their reliabilities, and their

relation to the dimensions will be shown and discussed in Chapter 10, where they are compared. The main findings for each user group will be discussed below.

Table 22: Overview of the number of questionnaires at MFCH

WMC	N
<i>Patients</i>	32
<i>Parents</i>	135
<i>Staff</i>	126

Questionnaires Patients MFCH

Thirty-two patients between 7 and 17 years old filled out the questionnaires with an average age of 14 years ($M = 13.6$, $SD = 2.7$). Of the thirty-two patients, 53% were girls ($N = 17$) and 47% boys ($N = 15$). For 75% of the respondents, it was their first time in the WMC or MFCH. Of the 25% who had been to the WMC before, the average number of visits was 0.6 ($M = 0.6$, $SD = 1.3$). All but one patient (from PICU) stayed at the one of the inpatient units on the third floor.

The same twelve scales as the Patient Questionnaire in the old hospital were selected for further analyses. A reliability analysis was calculated for each of these twelve scales. All but one of the 47 items for the twelve scales had a corrected item-total correlation of 0.25 or larger.

Questionnaires Parents MFCH

The Parent Questionnaire was filled out by 135 parents. The majority (79%) of questionnaires were filled out by mothers, 18% were filled out by fathers, and 2% by relatives. Parents who filled out the questionnaires were divided over the different pediatric

units as follows: Inpatient Units third floor (72%), Neonatal Intensive Care Unit (12%), and Pediatric Intensive Care Unit (16%). Of them, 97% was in a private room. Of the parents, 37% had stayed at PICU at some point during their stay at the hospital. The average age of the child being hospitalized was five years old ($M = 5.2$, $SD = 5.5$).

The same ten scales as the Parent Questionnaire in the old hospital were selected for further analyses. A reliability analysis was calculated for each of these ten scales. All but one of the 42 items for the ten scales had a corrected item-total correlation of 0.25 or larger.

Questionnaires Staff MFCH

A total of 126 questionnaires were collected at the MFCH from nurses (55%), attending physicians and fellows (22%), residents (9%), ancillary staff (6%), nursing assistants (5%), and other staff (3%). The average length that staff worked in this hospital was 8.4 years ($M = 8.4$, $SD = 6.7$). The majority of the staff (82.5%) had worked in the old hospital before the move.

Staff members who filled out the questionnaires were divided among the different pediatric units as follows: Inpatient Units third floor (40%), Neonatal Intensive Care Unit (39%), Pediatric Intensive Care Unit (21%).

The same eleven scales as the Staff Questionnaire in the old hospital were selected for further analyses. A reliability analysis was calculated for each of these eleven scales. All of the 67 items for the eleven scales had a corrected item-total correlation of 0.25 or larger.

SUMMARY OF THE NEW HOSPITAL

While the old building was old, dark, gloomy, and cramped, the new building is new, spacious, friendly, colorful, bright, and with attractive attributes to look at for children and adults. Even though rules and procedures have not changed in the new building, the change of environment has impacted the culture of the hospital and the life of patients, parents, and staff.

In contrast to the old NICU, the new NICU is spacious, has ample room for families in and outside the patient rooms, and has facilities for parents such as a pantry, breastfeeding rooms, and a transition room. Even though the new unit is much more pleasant and comfortable to be in, it does put a lot of pressure on the medical staff. The unit is very spread out and, due to lack of staff, it can not be used the way it was designed. Some rooms have twice the number of patients it was designed for making it a lot less comfortable for parents and staff.

The PICU changed from a ward into a calm, spacious, all private room unit. Parents can now comfortably stay with their children; they can shower on the unit; there are two pantries and ample space for waiting families. Because of the space and the facilities, there are more parents staying with their child and more siblings and friends visiting. In the old building that was simply not possible.

The new general pediatric unit was broken down into six smaller pods creating a less institutional atmosphere and providing visual access between the nursing station and all rooms. The comfortable private rooms and bathrooms make it much easier for a parent to spend the night with their child.

Compared to the old building, there are many more reasons for patients to get out of bed. On the floor are things to explore and play with such as a fire truck and a choice of special rooms such as the art room, computer room, and playrooms. As a result, in contrast to the old building, patients and parents seem more active and mobile. A more complete comparison of the old and the new hospital will be given in the next chapter.

Chapter 10 ■ Comparison of the Old and the New Hospital and Discussion

INTRODUCTION

In Chapter 7 and Chapter 9, the data gathered during behavioral mapping in the WMC and MFCH were presented and the main demographics of the respondents to the questionnaires were discussed by the user group. In this section, results from the behavioral mapping and the questionnaire data from the old and the hospital will be compared. The data presented in this chapter form the basis for the discussion and revision of the Seven Dimensions, the Charts, and the model in Section IV.

COMPARISON OF THE RESULTS FROM BEHAVIORAL MAPPING AND QUESTIONNAIRES

Because the Seven Dimensions apply to the needs, concerns, and wellbeing of both patients and parents, the comparisons of the data for these two groups are organized by dimension. The data for staff will be presented separately. For all three user groups, t-tests for independent samples were conducted. These t-values will be presented along with Cohen's effect size d for the standardized difference between the two means. Because of the relatively large number of items and scales per questionnaire, a selection was made of scales that were the most important conceptually and had the highest reliabilities. Since the selection of variables used for the t-test varied among twelve scales for the patient questionnaire, ten

scales for the parent questionnaire, and eleven scales for the staff questionnaire, the Bonferroni corrected alpha was used for all significance levels. Because of the relatively small sample sizes an adjustment of $p = 0.10$ was used. An alpha of smaller or equal to 0.05 was considered significant; an alpha between 0.05 and 0.10 was considered a trend toward a significant difference. Descriptives of some of the scales that were not selected for further analyses will be presented under the dimensions. A summary of all findings will be given in the Chart in the Section IV as well as the conclusions of the findings.

Data from the Patients and Parents by Dimension

The same steps were taken for the comparison of the patient and the parent questionnaires. However, in contrast to the patient questionnaires, the parents approached to fill out the questionnaires covered three distinct units: the PICU, the inpatients on the third floor, and the NICU. Therefore, the data for the parents discussed in the next paragraphs, where applicable, will be broken down by unit to make differences between the old and the new units interpretable.

Basic Physiological Needs Patients and Parents

The first dimension defined in Chapter 5 was Basic Physiological Needs. The items in the questionnaire for Patients and Parents related to this dimension consisted of two scales: sleep and food. The items for these scales were grouped and the internal reliability was calculated for both scales for the old and the new hospital.

Even though the reliabilities of both sleep and food were moderate to high on the patient questionnaire, only the scale for sleep was selected for further analyses because the scale *Food* was not expected to change in the new environment. The three items belonging to the scale

Food were: “The food in the hospital tastes good,” “The food choices in the hospital are good,” and “I can get something to eat or drink when I want it.”

The items for *Food* on the Parent questionnaire did not group well (low reliability) and were not selected for further analyses but will be reviewed in Section IV. The reliabilities for *Sleep* were moderate. Tables 23 and 24 show the items belonging to the scales *Sleep* for Patients and Parents, and the internal reliabilities of the scales for the old and new hospital.

Table 23: Items and reliabilities for variable ‘Sleep’ for Patients

1. SLEEP N = 2	α old hospital	α new hospital
1. I sleep in the hospital just as well as I sleep at home	0.72	0.59
2. At night I have no problems sleeping because of noise or business in my room		

Table 24: Items and reliabilities for variable ‘Sleep’ for Parents

1. SLEEP N = 4	α old hospital	α new hospital
1. I sleep in the hospital just as well as I sleep at home		
2. I get enough sleep in the hospital to feel healthy	0.67	0.64
3. At night I have no problems sleeping because of noise or business in the room		
4. There is enough privacy for me in the room to sleep		

Based on these items, a new variable (Meansleep) was calculated for both Patients and Parents. The mean scores, standard deviations, standard mean errors for the old and the new hospital, and the effect sizes between the two groups were calculated.

The Patients’ data show that the ability to sleep improved in the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 2.82 ($M = 2.82$, $SD = 1.06$) and in the new hospital 3.44 ($M = 3.44$, $SD = 1.05$). The effect size between the two means was high ($d = 0.59$). See Table 25.

The Parents’ data show that the ability to sleep improved for both the PICU and the third floor in the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old

PICU was 2.57 (M = 2.57, SD = 0.81) and in the new PICU 3.46 (M = 3.46, SD = 0.77). The effect size between the two means was high ($d = 1.13$). On a scale of 1 (never) to 5 (always), the mean score for sleep on the old third floor was 2.70 (M = 2.70, SD = 0.88) and on the new third floor was 3.52 (M = 3.52, SD = 0.76). The effect size between the two means was high ($d = 1.00$). Since parents were not allowed to sleep in the old NICU and had limited facilities for sleeping in the new NICU these data are not available. See Table 26.

Table 25: Means, SD and effect size new mean ‘Sleep’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meansleep	Old	30	2.82	1.06	0.19	0.59
	New	32	3.44	1.05	0.18	

Table 26: Means, SD and effect size new mean ‘Sleep’ for PICU and third floor Parents

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meansleep PICU	Old	7	2.57	0.81	0.31	1.13
	New	19	3.46	0.77	0.18	
Third floor	Old	65	2.70	0.88	0.11	1.00
	New	94	3.52	0.76	0.08	

An independent t-test (equal variances not assumed) between the means shows a significant difference between the old and the new hospital for Patients ($t = -2.32$, $p = 0.02$) indicating that patients slept better and were less disturbed by noise in the new hospital.

Because of the small N, the independent t-test between the means for Parents was only calculated for the third floor. The data show a significant difference between the old and the new hospital for Parents ($t = -6.10$, $p < 0.001$) indicating that parents slept better, had more privacy, and were less disturbed by noise in the new hospital. See Tables 27 and 28 for the t-values and significant levels for the Meansleep for Patients and Parents.

Table 27: T-test for equality of means: ‘Meansleep’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meansleep	Equal variances assumed	-2.32	60	0.02	-0.62	0.27
	Equal variances not assumed	-2.32	59.60	0.02	-0.62	0.27

Table 28: T-test for equality of means: ‘Meansleep’ for Parents

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meansleep Third floor	Equal variances assumed	-6.27	157	0.00	-0.82	0.13
	Equal variances not assumed	-6.10	123.72	0.00	-0.82	0.13

Interestingly, even though patients and parents indicated that they slept better in the new hospital, the number of hours of sleep did not change much. Patients and parents were asked how many hours they slept on a normal night in the hospital. The average hours of sleep for patients increased slightly (Old: M = 6.1, SD = 1.73, New: M = 6.6, SD = 2.01). And, for parents, the average hours of sleep almost remained the same (Old: M = 5.0, SD = 1.67; New: M = 5.2, SD = 1.45).

Agency and Control for Patients and Parents

The second dimension defined in Chapter 5 was Agency and Control. The items in the questionnaire for both Patients and Parents related to this dimension consisted of three scales: *Control in the Room*, *Privacy*, and *Being Informed*. The items for these scales were grouped and the internal reliability was calculated for all three scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 29 to 34 show the items belonging to the scales *Control in the Room*, *Privacy* and *Being Informed* for Patients and Parents and the internal reliabilities of the scales for the old and new hospital.

Table 29: Items and reliabilities for variable ‘Control in the Room’ for Patients

1. CONTROL IN THE ROOM N = 5	α old hospital	α new hospital
1. Others will leave my room if I want them to	0.69	0.73
2. I can decide who enters my room		
3. I can decide what things happen in my room		
4. When it gets too noisy in my room I can quiet things down		
5. I have as much privacy as I want when I am in my room		

Table 30: Items and reliabilities for variable ‘Control in the Room’ for Parents

1. CONTROL IN THE ROOM N = 7	α old hospital	α new hospital
1. I can decide when I want to sleep, rest, or eat	0.88	0.83
2. I or my child can decide how many people are in my child's room		
3. Others will leave my child's room when I or my child want them to		
4. I or my child can decide who enters my child's room		
5. I can decide for or with my child what things happen in my child's room		
6. When it gets too noisy in my child's room I can quiet things down		
7. I have as much privacy as I want when I am in my child's room		

Table 31: Items and reliabilities for variable ‘Privacy’ for Patients

2. PRIVACY N = 4	α old hospital	α new hospital
1. I feel comfortable talking to staff while in bed because others can't hear me	0.72	0.64
2. I can have private (telephone) conversations in my room		
3. I can have private conversations elsewhere on the third floor		
4. I can be alone when I want to		

Table 32: Items and reliabilities for variable ‘Privacy’ for Parents

2. PRIVACY N = 5	α old hospital	α new hospital
1. I can find a room other than the bedroom on this floor to talk privately	0.88	0.75
2. I can find a place to talk privately on the phone on this floor		
3. There is enough privacy in the room to talk with staff about my child's illness		
4. Overall, there is enough privacy in the room		
5. I can find a place to be alone here in the hospital if I want to		

Table 33: Items and reliabilities for variable ‘Being Informed’ for Patients

3. KNOWING N = 6	α old hospital	α new hospital
1. The staff explains to me what is going on	0.71	0.74
2. I can get more information about my illness and treatment if I want to		
3. The staff introduce themselves to me		
4. The nurses come quickly when I call them		
5. I can get pain medication when I need it		
6. I help decide about my treatment and medication intake		

Table 34: Items and reliabilities for variable ‘Knowing’ for Parents

3. KNOWING N = 5	α old hospital	α new hospital
1. The staff explains to me what is going on with my child's illness 2. I help decide in the treatment and medication of my child 3. I can get more information about my child's illness or treatment if I want to 4. The staff introduce themselves to me 5. The nurses come to my child's room quickly when I call them	0.75	0.66

Based on the items of the three scales, new variables (Meancontrol, Meanprivacy, and Meanknowing) were calculated. The mean scores, standard deviations, standard mean errors for the old and the new hospital and the effect sizes between the groups were calculated.

The data show that the sense of *Control in the Room* for Patients improved in the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 2.52 (M = 2.52, SD = 0.85 and in the new hospital 3.53 (M = 3.53, SD = 0.93). The effect size between the two means for *Privacy* was high ($d = 1.13$). Also, the sense of *Control in the Room* for Parents improved in the new hospital for all three units. On a scale of 1 (never) to 5 (always), the mean scores for control by unit in the old hospital were: PICU M = 2.52, SD = 0.85; third floor M = 3.17, SD = 1.13; NICU M = 2.49, SD = 1.09 and for the units in the new hospital: PICU M = 4.47, SD = 0.57; third floor M = 4.36, SD = 0.62; NICU M = 3.29, SD = 1.03. The effect sizes between the means for *Control* for all three units were high (PICU $d = 0.82$, third floor $d = 1.31$, NICU $d = 0.75$).

The data indicate that *Privacy* for patients improved in the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.02 (M = 3.02, SD = 1.10) and in the new hospital 4.22 (M = 4.22, SD = 0.72). The effect size between the two means for control was high ($d = 1.30$). Also, the data indicate that *Privacy* for Parents improved for all units in the new hospital. On a scale of 1 (never) to 5 (always), the mean scores for *Privacy*

by unit in the old hospital were: PICU $M = 2.29$, $SD = 0.92$; third floor $M = 2.95$, $SD = 1.16$; NICU $M = 3.16$, $SD = 1.47$ and for the units in the new hospital: PICU $M = 4.47$, $SD = 0.69$; third floor $M = 4.33$, $SD = 0.73$; NICU $M = 4.04$, $SD = 0.95$. The effect sizes between the means for *Privacy* for all three units were high (PICU $d = 2.68$, third floor $d = 1.42$, NICU $d = 0.71$).

The scale *Knowing* or being informed for Patients did not change much between the old and the new hospital. The effect size between the two means for *Knowing* was moderate ($d = 0.44$). On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.85 ($M = 3.85$, $SD = 0.71$) and, in the new hospital, 4.15 ($M = 4.15$, $SD = 0.66$). Neither did *Knowing* or being informed for Parents change much between the old and the new hospital. On a scale of 1 (never) to 5 (always), the mean scores for *Knowing* by unit in the old hospital were: PICU $M = 4.37$, $SD = 0.66$; third floor $M = 4.18$, $SD = 0.72$; NICU $M = 4.43$, $SD = 0.61$ and for the units in the new hospital: PICU $M = 4.35$, $SD = 0.64$; third floor $M = 4.40$, $SD = 0.57$; NICU $M = 4.25$, $SD = 0.74$. The effect sizes between the means for *Knowing* for all three units were low (PICU $d = 0.03$, third floor $d = 0.34$, NICU $d = 0.27$). Tables 35 and 36 show the data for these three scales for Patients and Parents.

Table 35: Means, SD and effect size new means ‘Control’, ‘Privacy’ and ‘Knowing’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meancontrol	Old	30	2.52	0.85	0.16	1.13
	New	32	3.53	0.93	0.16	
Meanprivacy	Old	30	3.02	1.10	0.20	1.30
	New	32	4.22	0.72	0.13	
Meanknowing	Old	30	3.85	0.71	0.13	0.44
	New	32	4.15	0.66	0.12	

Table 36: Means, SD and effect size new means ‘Control’, ‘Privacy’ and ‘Knowing’ for Parents by unit

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meancontrol PICU	Old	7	3.82	0.97	0.37	0.82
	New	21	4.47	0.57	0.12	
Third floor	Old	66	3.17	1.13	0.14	1.31
	New	98	4.36	0.62	0.06	
NICU	Old	9	2.49	1.09	0.36	0.75
	New	16	3.29	1.03	0.26	
Meanprivacy PICU	Old	7	2.29	0.92	0.35	2.68
	New	21	4.47	0.69	0.15	
Third floor	Old	66	2.95	1.16	0.14	1.42
	New	98	4.33	0.73	0.07	
NICU	Old	9	3.16	1.47	0.49	0.71
	New	16	4.04	0.95	0.24	
Meanknowing PICU	Old	7	4.37	0.66	0.25	0.03
	New	21	4.35	0.64	0.14	
Third floor	Old	66	4.18	0.72	0.09	0.34
	New	98	4.40	0.57	0.06	
NICU	Old	9	4.43	0.61	0.20	0.27
	New	16	4.25	0.74	0.18	

An independent t-test (equal variances not assumed) between the means for *Control* for Patients shows a significant difference between the old and the new hospital ($t = -4.45$, $p < 0.001$). Because of the small N, the independent t-test between the means for Parents was only calculated for the third floor. Control for Parents on the third floor also changed significantly ($t = -7.80$, $p < 0.001$). These data indicate that patients’ and parents’ sense of control in the new hospital room was higher than in the old hospital room on the third floors.

The difference between means for *Privacy* was also significant for Patients ($t = -5.06$, $p < 0.001$) and Parents on the third floor ($t = -8.60$, $p < 0.001$) indicating that patients and parents experienced more privacy in the new hospital than in the old hospital. Because of the

small N, the independent t-test between the means for Parents was only calculated for the third floor.

The difference between means for *Knowing* was not significant for Patients ($t = -1.70$, $p = 0.10$), indicating that the access to information and nurses did not change significantly between the old and the new hospital. Because of the small N, the independent t-test between the means for Parents was only calculated for the third floor. The difference between means for *Knowing*, after Bonferroni correction, shows a trend toward a significant difference for Parents on the third floor ($t = -2.04$, $p = 0.04$), indicating that the access to information and nurses did improve slightly in the new hospital. See Tables 37 and 38 for the t-values and significant levels.

Table 37: T-test for equality of means: ‘Meancontrol’, ‘Meanprivacy’, ‘Meanknowing’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meancontrol	Equal variances assumed	-4.44	60	0.00	-1.01	0.23
	Equal variances not assumed	-4.45	59.99	0.00	-1.01	0.23
Meanprivacy	Equal variances assumed	-5.12	60	0.00	-1.20	0.23
	Equal variances not assumed	-5.06	49.57	0.00	-1.20	0.24
Meanknowing	Equal variances assumed	-1.70	60	0.09	-0.29	0.17
	Equal variances not assumed	-1.70	58.83	0.10	-0.29	0.17

Table 38: T-test for equality of means: ‘Meancontrol’, ‘Meanprivacy’, ‘Meanknowing’ for Parents

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meancontrol Third floor	Equal variances assumed	-8.66	162	0.00	-1.19	0.14
	Equal variances not assumed	-7.80	91.95	0.00	-1.19	0.15
Meanprivacy Third floor	Equal variances assumed	-9.36	162	0.00	-1.38	0.15
	Equal variances not assumed	-8.60	99.68	0.00	-1.38	0.16
Meanknowing Third floor	Equal variances assumed	-2.13	162	0.03	-0.22	0.10
	Equal variances not assumed	-2.04	117.90	0.04	-0.22	0.11

Observations of Privacy

In both the old and the new hospital, we observed how privacy was regulated by patients and parents in the general pediatric units. Through systematic observations, we mapped whether patients kept their doors open or closed and whether they had their bedside curtains (in the old building) or window blinds and door blinds (to the corridors) open or closed. In the new building, it was often informally mentioned by staff and volunteers that doors and blinds were kept closed more frequently than in the old units.

In the old hospital, patients often shared a room while most of the rooms in the new hospital were private. As a consequence, the control over the status of the door was shared. In the new hospital, patients and parents kept the doors of the room closed (49% closed) twice as often as in the old hospital (24% closed) indicating that if patients and parents are given more control, they prefer more privacy. See Figure 29.

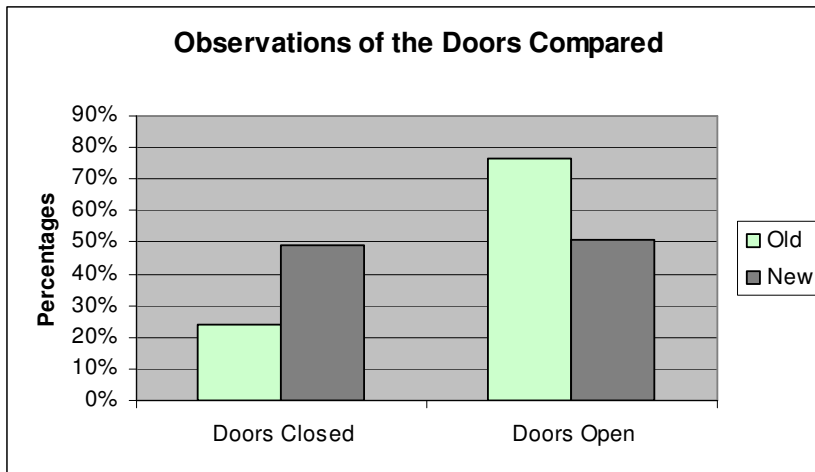


Figure 29: Comparison of observations of the doors reflecting privacy regulation

In the old building, the rooms were located along two long corridors with only two central nursing stations. Some rooms were quite isolated both visually and aurally. In contrast, the

six pods of the new building each consisted of patient rooms around a nursing station. As a consequence, there could always be direct visual and auditory connection between a room and the nursing station implying that, with the nursing station right outside their room, they felt safer and less need to keep the doors or blinds open. The doors were kept closed despite the fact that nurses did not want them closed because that prohibited them from hearing or viewing monitors in the patient rooms. However, requests to leave the door open were often ignored by parents and patients.

If the doors were open in the old hospital, the number of bedside curtains in the rooms that were closed was counted and, in the new hospital, the number of blinds covering the glass in the door and window was counted. In the old building, even though the doors were open more often, the bedside curtains were closed 66% of the time. In the new building, in addition to the doors, the blinds of doors were closed 80% of the time and the blinds of the windows 68% of the time.

Feeling Safe and Secure for Patients and Parents

The third dimension was Feeling Safe and Secure. On the Patient questionnaire only one item (“I feel safe in the hospital”) in the questionnaire was directly related to this dimension. On the Parent questionnaire only two items (“I feel safe in the hospital,” and “I can leave my child alone and feel comfortable”) in the questionnaire were directly related to this dimension. Because of a low reliability, these items were not used for further analysis.

The sense of feeling safe increased in the new hospital. Only 47% of the patients indicated *always* feeling safe in the old hospital versus 72% in the new. Only 50% of the parents indicated *always* feeling safe in the old hospital versus 78% in the new.

Social Support for Patients and Parents

The fourth dimension defined in Chapter 5 was Social Support. The items in the questionnaire for Patients related to this dimension consisted of four scales: *Support in Hospital*, *Connection to the Outside World*, *Support from Parents*, and *Space for Family and Friends*.

The items in the questionnaire for Parents related to this dimension consisted of two scales: *Support in Hospital* and *Connection to the Outside World*. The items for the scales were grouped and the internal reliability was calculated for all scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 39 to 44 show the items belonging to the scales for Patients and Parents and the internal reliabilities of the scales for the old and new hospital.

Table 39: Items and reliabilities for variable ‘Social Support in Hospital’ for Patients

1. SUPPORT IN HOSPITAL N = 6	α old hospital	α new hospital
1. There are places I can go to in the hospital to meet other patients	0.77	0.79
2. I like to meet other patients		
3. I can find kids of my age to play with or talk to		
4. My friends come to visit me as often as I want and as they can		
5. It's easy to stay in touch with my friends and family when I'm in the hospital		
6. I can find someone to talk to here in the hospital about things that worry me		

Table 40: Items and reliabilities for variable ‘Social Support in Hospital’ for Parents

1. SUPPORT IN HOSPITAL N = 4	α old hospital	α new hospital
1. There is enough space for my family members in my child's room	0.68	0.63
2. There are places I can go to in the hospital to meet other parents		
3. I can find someone to talk to here at the hospital about things that worry me		
4. When I feel down there is a special place I can go to		

Table 41: Items and reliabilities for variable ‘Connection to Outside’ for Patients

4. CONNECTION TO OUTSIDE N = 3	α old hospital	α new hospital
1. I know what is going on at school while I'm in the hospital	0.53	0.77
2. I know what is going on at home while I'm in the hospital		
3. I know what is going on with my friends while I'm in the hospital		

Table 42: Items and reliabilities for variable ‘Connection to Outside’ for Parents

2. CONNECTION TO OUTSIDE N = 2	α old hospital	α new hospital
1. It's easy to stay in touch with my partner/family/friends when I'm in the hospital	0.78	0.65
2. It's easy to stay in touch with work when I'm in the hospital		

Table 43: Items and reliabilities for variable ‘Support from Parents’ for Patients

2. SUPPORT PARENTS N = 3	α old hospital	α new hospital
1. It is important for me to have my parents here at night	0.80	0.76
2. It is important for me to have my parents here during the day		
3. A family member stays with me at night		

Table 44: Items and reliabilities for variable ‘Space for Family and Friends’ for Patients

3. SPACE N = 2	α old hospital	α new hospital
1. There is enough space for my parents/brothers/sisters in my room	0.65	0.67
2. There is enough space for my friends in my room		

Based on the items of the four scales for Patients, four new variables (Meansupport, Meanoutside, Meanparents, and Meanspace) were calculated for Patients and two new variables (Meansupport and Meanoutside) for Parents. The mean scores, standard deviations, standard mean errors for the old and the new hospital and the effect sizes between the groups were calculated.

The data show that feeling of *Social Support* while in the hospital improved slightly for Patients. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.14 (M = 3.14, SD = 0.83) and in the new hospital 3.57 (M = 3.57, SD = 0.93). The effect size between the two means for *Support* was moderate ($d = 0.49$). Feelings of *Social Support* while in the hospital improved for Parents in PICU and on the third floor and slightly for NICU. On a scale of 1 (never) to 5 (always), the mean scores for *Support* felt in the hospital by unit in the old hospital were: PICU M = 3.50, SD = 0.99; third floor M = 3.08, SD = 0.95; NICU M = 3.33, SD = 1.13 and for the units in the new hospital: PICU M = 4.27,

SD = 0.71; third floor M = 4.02 SD = 0.78 NICU M = 3.59, SD = 0.90. The effect sizes between the means for *Support* for PICU and the third floor were high (PICU $d = 0.89$, third floor $d = 1.08$) and low for NICU ($d = 0.25$).

The data show that *Connection to the Outside* for Patients while in the hospital did not change much. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.11 (M = 3.11, SD = 0.99) and in the new hospital 3.34 (M = 3.34, SD = 1.13). The effect size between the two means for *Connection to the Outside* was low ($d = 0.21$). In contrast, *Connection to the Outside* for Parents while in the hospital for all three units improved. On a scale of 1 (never) to 5 (always), the mean scores for *Connection to the Outside* by unit in the old hospital were: PICU M = 3.79, SD = 1.35; third floor M = 3.65, SD = 1.15; NICU M = 3.06, SD = 1.78 and for the units in the new hospital: PICU M = 4.40, SD = 0.80; third floor M = 4.44 SD = 0.89 NICU M = 4.00, SD = 0.95. The effect sizes between the means for *Connection to the Outside* for all three units were high (PICU $d = 0.55$, third floor $d = 0.77$, NICU $d = 0.66$).

The change of environment had a moderate effect on the Patient's wish for *Parental Support*. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.86 (M = 3.86, SD = 1.14) and in the new hospital 4.32 (M = 4.32, SD = 0.89). The effect size between the two means for *Parental Support* was moderate ($d = 0.45$). The data show that *Space* available for family and friends improved from the old to the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 3.32 (M = 3.32, SD = 1.13) and in the new hospital 4.44 (M = 4.44, SD = 0.76). The effect size between the two means for *Space* was high ($d = 1.16$). Tables 45 and 46 show the data for the scales for Patients and Parents by unit.

Table 45: Means, SD and effect size new means ‘Support’, ‘Parents’, ‘Space’ and ‘Outside’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meansupport	Old	30	3.14	0.83	0.15	0.49
	New	32	3.57	0.93	0.16	
Meanoutside	Old	30	3.11	0.99	0.18	0.21
	New	32	3.34	1.18	0.21	
Meanparents	Old	30	3.86	1.14	0.21	0.45
	New	32	4.32	0.89	0.16	
Meanspace	Old	30	3.32	1.13	0.21	1.16
	New	32	4.44	0.76	0.13	

Table 46: Means, SD and effect size new means ‘Support’ and ‘Outside’ for Parents by unit

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meansupport PICU	Old	7	3.50	0.99	0.37	0.89
	New	21	4.27	0.71	0.15	
Third floor	Old	66	3.08	0.95	0.12	1.08
	New	98	4.02	0.78	0.08	
NICU	Old	9	3.33	1.13	0.38	0.25
	New	16	3.59	0.90	0.23	
Meanoutside PICU	Old	7	3.79	1.35	0.51	0.55
	New	21	4.40	0.80	0.17	
Third floor	Old	65	3.65	1.15	0.14	0.77
	New	98	4.44	0.89	0.09	
NICU	Old	9	3.06	1.78	0.59	0.66
	New	16	4.00	0.95	0.24	

An independent t-test (equal variances not assumed) between the means for *Support* in the hospital for Patients shows a trend toward a significant difference between the old and the new hospital ($t = -1.94$, $p = 0.06$) indicating that patients’ sense of social support improved in the new hospital.

Because of the small N of Parents for both the PICU and the NICU, the independent t-test between the means for the third floor was calculated. The t-test for social *Support* in the hospital for Parents on the third floor shows a significant difference between the old and the new inpatient floors ($t = -6.66$, $p < 0.001$) indicating that parents felt more social support in the new hospital than in the old hospital.

The data for *Connection to the Outside* for Patients show no significant difference between of the old and the new hospital ($t = -0.84$, $p = 0.40$) indicating that patients' ability to stay in touch with home, school, and friends while in the hospital did not change significantly between the old and the hospital. In contrast, the difference between means for *Connection to the Outside* on the third floor for Parents on the third floor was significant ($t = -4.68$, $p < 0.001$) indicating that parents' ability to stay in touch with home, family, and work was better in the new hospital. Because of the small N of Parents for both the PICU and the NICU, the independent t-test between the means for the third floor was calculated.

The difference between means for *Parental Support* for Patients shows a trend toward a significant difference ($t = -1.79$, $p = 0.08$) indicating that patients' needs for parental support increased in the new hospital. An explanation for this might be that the new hospital, in contrast to the old, had mostly private rooms, providing less company, fewer distractions from other patients, and increasing the dependence on parents, relatives, and friends. The difference between means for the amount of *Space* experienced by Patients did change significantly ($t = -1.79$, $p < 0.001$), indicating that the space available for friends and family in the room improved significantly between the old and the new hospital. See Tables 47 and 48 for the t-values and significant levels.

Table 47: T-test for equality of means: ‘Meansupport’, ‘Meanparents’, ‘Meanspace’, ‘Meanoutside’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meansupport	Equal variances assumed	-1.93	60	0.06	-0.43	0.22
	Equal variances not assumed	-1.94	59.88	0.06	-0.43	0.22
Meanparents	Equal variances assumed	-1.80	60	0.08	-0.47	0.26
	Equal variances not assumed	-1.79	54.76	0.08	-0.47	0.26
Meanspace	Equal variances assumed	-4.62	60	0.00	-1.12	0.24
	Equal variances not assumed	-4.57	50.44	0.00	-1.12	0.25
Meanoutside	Equal variances assumed	-0.84	60	0.41	-0.23	0.28
	Equal variances not assumed	-0.84	59.34	0.40	-0.23	0.28

Table 48: T-test for equality of means: ‘Meansupport’, ‘Meanoutside’ for Parents

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meansupport Third floor	Equal variances assumed	-6.91	162	0.00	-0.94	0.14
	Equal variances not assumed	-6.66	121.15	0.00	-0.94	0.14
Meanoutside Third floor	Equal variances assumed	-4.93	161	0.00	-0.79	0.16
	Equal variances not assumed	-4.68	112.78	0.00	-0.79	0.17

Distraction and Engagement for Patients and Parents

The fifth dimension was Distraction and Engagement. The three items in the Patient questionnaire (“I do schoolwork while in the hospital,” “I like having or would like to have internet access in my room,” and “I leave my room to go to other places in the hospital”) belonging to this scale did not show a high reliability and acted as single items. Therefore, these items were not used for further analysis.

The items in the Parent questionnaire related to this dimension consisted of two scales: *Computer Use* and *Resources for Everyday Activities*. The items for the scales were grouped and the internal reliability was calculated for both scales for the old and the new hospital. The items belonging to the scale for *Computer* had low reliabilities and moderate to high

reliabilities for the scale *Resources for Everyday Activities*. The two scales were not used for further analyses because of the minimal changes in the new hospital regarding these scales.

Everyday Behavior for Patients and Parents

The sixth dimension defined in Chapter 5 was Everyday Behavior. The items in the questionnaire for Patients related to this dimension consisted of two scales: *Mobility* and *Daily Rhythm*. The items for these scales were grouped and the internal reliability was calculated for both scales for the old and the new hospital. The reliabilities for the scale mobility were moderate to high. The items for *Daily Rhythm* (“I can decide at what times I play in my room,” “I can watch television if I want to,” and “I can decide at what times I rest in my room”) did not group well (low reliability) and were not selected for further analysis. Table 49 shows the items belonging to the scale *Mobility* and the internal reliabilities of the scale for the old and new hospital.

The items in the questionnaire for Parents related to this dimension consisted of two scales: *Involvement in Care of Child* and the *Ability to Go Places*. The items for the scales were grouped and the internal reliability was calculated for both scales for the old and the new hospital. Both scales had low reliabilities and were not used for further analysis.

Table 49: Items and reliabilities for variable ‘Mobility’ for Patients

1. MOBILITY N = 2	α old hospital	α new hospital
1. I can leave my room when I want to	0.59	0.82
2. I can get out of bed when I want to		

Based on these two items for Patients a new variable (Meanmobility) was calculated. The mean score, standard deviation, standard mean error for the old and the new hospital and

the effect size between the two groups were calculated. The data show that the control over *Mobility* for Patients did not change in the new hospital. On a scale of 1 (never) to 5 (always), the mean score in the old hospital was 4.00 (M = 4.00, SD = 0.91) and in the new hospital 4.14 (M = 4.14, SD = 1.08). The effect size between the two means was low ($d = 0.14$). See Table 50.

Table 50: Means, SD and effect size new mean ‘Mobility’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meanmobility	Old	28	4.00	0.91	0.17	0.14
	New	29	4.14	1.08	0.20	

An independent t-test (equal variances not assumed) between the means shows no significant difference between the old and the new hospital ($t = -0.52$, $p = 0.61$) indicating that patients’ sense of control over when they leave bed or their room was no different between the old or the new hospital. See Table 51 for the t-values and significant levels.

Table 51: T-test for equality of means: ‘Meanmobility’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanmobility	Equal variances assumed	-0.52	55	0.61	-0.14	0.27
	Equal variances not assumed	-0.52	54.01	0.61	-0.14	0.27

Observations of Use of Corridors

In both the old and the new hospital, observations were made of who was in the corridors and playrooms and, if they were patients, what they were doing. One of the objectives of the hospital in the child’s healing process is to get patients up and out of bed as soon as they can. The new hospital provided much more interesting places to go to than the old building

so the mobility and range of activities in the new hospital was expected to increase. Figure 30 compares the number of people observed in the corridors in the old and the new hospital.

The comparison between the old and the new hospital showed:

- **Increased mobility of patients.** It was often heard in the old building that patients were too sick to get out of bed to play. However, systematic observations showed that the new hospital had three and a half times more patients in the corridors on the third floor.
- **Increased mobility of parents and siblings.** Twice as many parents and three times more siblings were counted in the corridors of the new hospital showing that, compared to the old building, parents and siblings were less confined to the patient rooms.

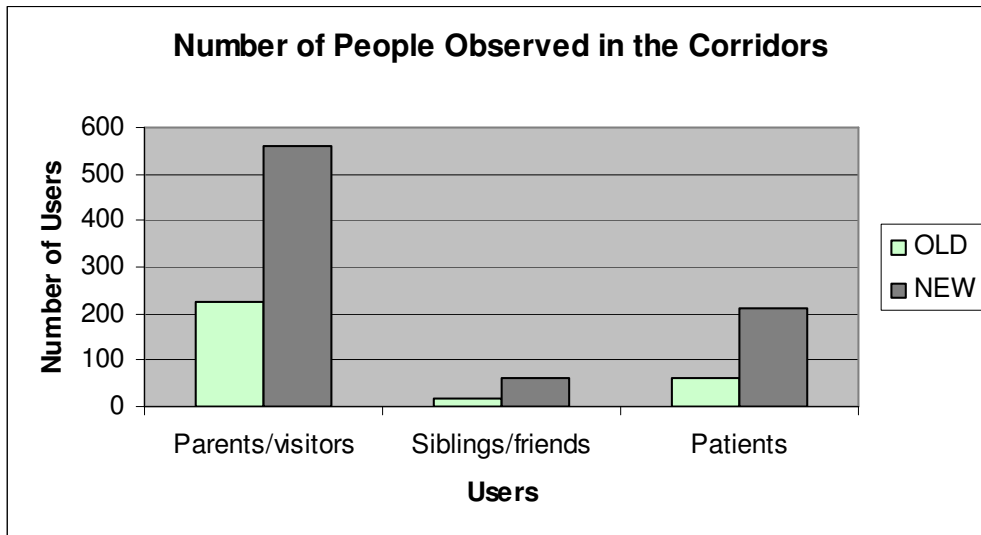


Figure 30: Number of people observed in the old and the new corridors

- **Decreased passive activity.** Of the patients counted in the corridors of the old hospital, the majority (63%) of them were not engaged in a focused activity. A 50%

reduction of patients with no focused activity was seen in the new hospital. Here only 30% of the patients were not engaged in a focused activity.

- **A wider range of active activities.** In addition, three times more diversity in active activities by patients such as running, fantasy play, and cycling was displayed in the new hospital. This diversity is shown in Figure 31. For example, in the old building, gross motor play, such as running and cycling, only occurred 3% of the time while in the new building it occurred 14%. Play with toys, materials, games, and puzzles in the corridors of the old building occurred only 7% of the time while this was seen 11% of the time in the new building. Another activity that did not occur in the old building but was seen in the designated sitting and dining areas of the new pods was eating and drinking by patients (10%).

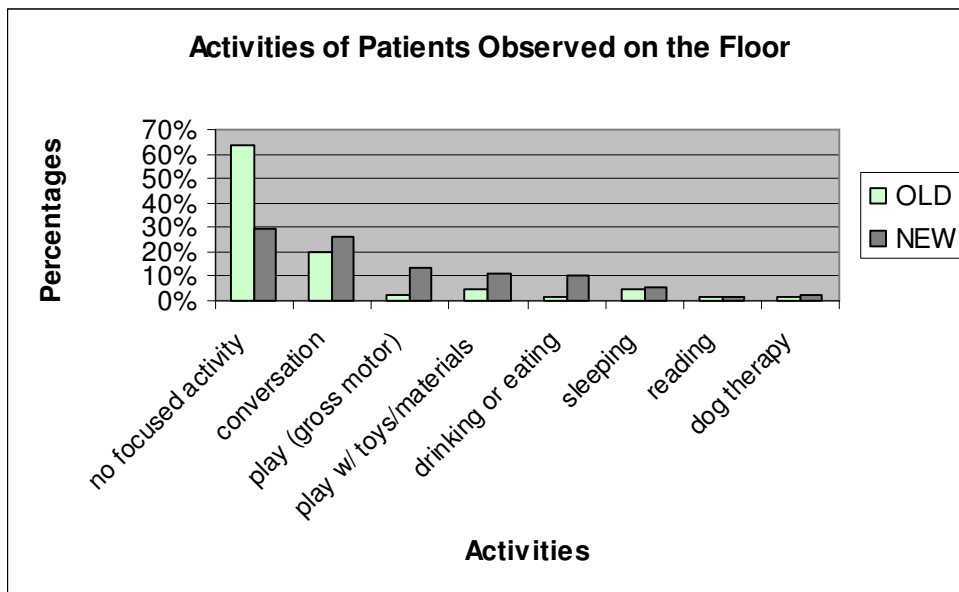


Figure 31: Range of activities by patients observed in the old and the new hospital

Use of the Playrooms

Like the old hospital, the new facility had an infant and toddler playroom and a school-age playroom. However, in addition to these, the new pediatric floor had an art studio and a computer room for teenagers. A comparison between the old and the new hospital showed:

- **Increased use of playrooms.** In the old building, the school-age playroom was used most often (41% occupancy). The infant and toddler playroom was barely used (14% occupancy). In the new building this was the opposite: school aged occupancy was 30% and infant and toddler playroom occupancy was 39%. Patients between five and eighteen years old now also have the art studio and computer room to go to. This explains the drop in occupancy of the school age playroom. The art studio, during our observations, was used 17% of the time and the computer room 6%. The use of the playrooms is shown in Figure 32. Systematic observations showed that, overall, the new hospital had two times more patients in the playrooms, art studio, or computer room. The old playrooms had a total of 61 patients in both the playrooms while in the new hospital the number of patients in the four rooms totaled 114 patients. In addition, the number of parents in the playrooms increased, while the number of siblings counted in the playrooms remained almost the same between the old and the new hospital.

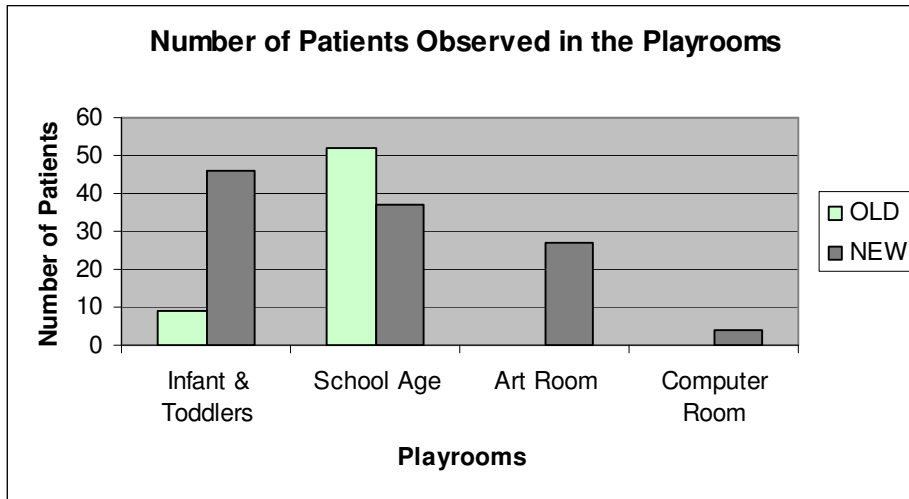


Figure 32: Observed number of patients in the old and the new playrooms

The range of activities seen within the rooms did not change between the old and the new building. Playing with toys and materials in both the infant and toddler playroom and the school-age playroom remained the most frequent activity. However, the number of patients involved in art activities did increase drastically. In the old hospital, the art activity did occur in the school-age playroom (4%) but, with the new art studio and the designated Art-Child-Life specialist, significantly more children were involved in art activities. The data also show a more appropriate use of the playrooms in terms of the age groups. In contrast to the old building, the infant and toddler playroom is now mostly used by two to five year olds (52%), and the art room by six to twelve year old patients (48%). Both in the old and the new hospital, the number of boys and girls in the playrooms was almost equally divided and equaling the actual distribution of gender at the times of observations.

Normalized Environment for Patients and Parents

The seventh dimension defined in Chapter 5 was Normalized Environment. The items in the questionnaire for Patients related to this dimension consisted of four scales: *Aesthetics of*

the Room, Wayfinding, Things to do Compared to Home, and the Room Compared to Home. The items in the questionnaire for Parents related to this dimension consisted of seven scales: *Aesthetics of the Room, the Bathroom, Wayfinding, Things to Do Compared to Home, the Room Compared to Home, Support Compared to Home, and Basic Needs Compared to Home.* The items for all scales were grouped and the internal reliability was calculated for all scales for both the old and the new hospital.

For Patients, the reliabilities for the scales *Aesthetics* (“The bathroom I use is clean and pleasant,” “The room I stay in is clean and pleasant,” “The furniture in my room is comfortable and nice looking”) and *Wayfinding* (“I can find my way around the hospital easily,” “The signs in the hospital help me find my way around”) did not group well (low reliability) and were not selected for further analysis. The reliabilities for the two scales for Patients, *Comparing the Things to Do* and *Comparing the Room to Home* were moderate to high.

For Parents, the reliabilities for the scales *Bathroom, Things to Do Compared to Home, and Support Compared to Home* had low reliabilities and were not used for further analyses. The scale *Wayfinding* had high reliabilities but was not used for further analyses. The reliabilities for the three scales for Parents, *Comparing the Room to Home, Comparing Basic Needs to Home, and Aesthetics,* were moderate to high. Tables 52 to 56 show the items belonging to the scales for Patients and Parents and the internal reliabilities of the scales for the old and new hospital.

Table 52: Items and reliabilities for variable ‘Things to Do Compared to Home’ for Patients

1. COMPARED TO HOME THINGS TO DO N = 4		α old hospital	α new hospital
1.	My ability to play music here	0.72	0.66
2.	The interesting things to do here		
3.	My ability to use the computer here		
4.	My ability to play with other kids		

Table 53: Items and reliabilities for variable ‘Room Compared to Home’ for Patients

2. COMPARED TO HOME ROOM N = 7	α old hospital	α new hospital
1. The smell in the hospital room	0.61	0.82
2. The coziness of this room		
3. The amount of storage in this room for personal belongings		
4. The quietness of this room		
5. My ability to control privacy here		
6. The amount of space in my hospital room		
7. The things to look at		

Table 54: Items and reliabilities for variable ‘Room Compared to Home’ Parents

2. COMPARED TO HOME ROOM N = 6	α old hospital	α new hospital
1. The smell in my child’s room	0.77	0.71
2. The coziness of my child’s room		
3. The amount of storage in my child’s room for personal belongings		
4. The quietness of my child’s room		
5. My ability to control privacy here		
6. The amount of space in my child’s room		

Table 55: Items and reliabilities for variable ‘Basic Needs’ for Parents

3. COMPARED TO HOME BASIC NEEDS N = 3	α old hospital	α new hospital
1. I sleep in the hospital	0.55	0.66
2. I have a daily routine here		
3. The quality of the food I eat in the hospital		

Table 56: Items and reliabilities for variable ‘Aesthetics’ for Parents

1. AESTHETICS N = 3	α old hospital	α new hospital
1. My child’s hospital room is clean and pleasant	0.82	0.64
2. The bathroom I use is clean and pleasant		
3. The furniture in my child’s room is comfortable and nice looking		

Based on the items of the two scales for Patients, two new variables (Meantodo and Meanroom) were calculated. Based on the items of the three scales for Parents, three new variables (Meanroom, Meanbasicneeds and Meanaesthetics) were calculated. The mean scores, standard deviations, standard mean errors for the old and the new hospital, and the effect sizes between the groups were calculated.

The data show that *Things to Do Compared to Home* for patients in the hospital improved in the new hospital. On a scale of 1 (better than home) to 3 (worse than home), the mean score in the old hospital was 2.73 (M = 2.73, SD = 0.36) and in the new hospital 2.35 (M = 2.35, SD = 0.42). The effect size between the two means for *Things to Do* was high ($d = 0.97$).

Compared to home, the hospital room in the new hospital was rated as better than the room in the old building by Patients and Parents. On a scale of 1 (better than home) to 3 (worse than home), the mean score in the old hospital for Patients was 2.66 (M = 2.66, SD = 0.30) and in the new hospital 2.08 (M = 2.08, SD = 0.46). The effect size between the two means for the *Room Compared to Home* was high ($d = 1.49$). The mean scores for Parents by unit in the old hospital were: PICU M = 2.64, SD = 0.35; third floor M = 2.74, SD = 0.32; NICU M = 2.52, SD = 0.40 and for the units in the new hospital: PICU M = 2.20, SD = 0.36; third floor M = 2.13 SD = 0.33 NICU M = 2.27, SD = 0.10. The effect sizes between the means for the *Room Compared to Home* for all three units were high (PICU $d = 1.24$, third floor $d = 1.88$, NICU $d = 0.62$).

Compared to home, *Basic Needs* for Parents were better met in the new hospital than in the old building. On a scale of 1 (better than home) to 3 (worse than home), the mean scores by unit in the old hospital were: PICU M = 2.67, SD = 0.33; third floor M = 2.74, SD = 0.34; NICU M = 2.28, SD = 0.44 and for the units in the new hospital: PICU M = 2.43, SD = 0.38; third floor M = 2.53 SD = 0.41 NICU M = 2.22, SD = 0.60. The effect sizes between the means for *Basic Needs Compared to Home* for PICU and the third floor were high (PICU $d = 0.67$, third floor $d = 0.56$) and low for NICU ($d = 0.11$).

The data show that the *Aesthetics* for Parents of all three units improved. On a scale of 1 (never) to 5 (always), the mean scores for *Aesthetics* by unit in the old hospital were: PICU

M = 3.62, SD = 1.30; third floor M = 3.32, SD = 1.09; NICU M = 3.63, SD = 1.05 and for the units in the new hospital: PICU M = 4.59, SD = 0.56; third floor M = 4.62 SD = 0.54 NICU M = 4.29, SD = 0.77. The effect sizes between the means for *Aesthetics* for all three units were high (PICU $d = 0.97$, third floor $d = 1.51$, NICU $d = 0.72$). See Tables 57 for Patients and 58 for Parents.

Table 57: Means, SD and effect size new means ‘Compared to Home to Do’ and ‘Room’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meantodo	Old	30	2.73	0.36	0.07	0.97
	New	32	2.35	0.42	0.07	
Meanroom	Old	30	2.66	0.30	0.05	1.49
	New	32	2.08	0.46	0.08	

Table 58: Means, SD and effect size new means ‘Aesthetics’, ‘Compared to Home Room’ and ‘Basic Needs’ for Parents

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanaesthetic PICU	Old	7	3.62	1.30	0.49	0.97
	New	21	4.59	0.56	0.12	
Third floor	Old	66	3.32	1.09	0.13	1.51
	New	98	4.62	0.54	0.05	
NICU	Old	9	3.63	1.05	0.35	0.72
	New	16	4.29	0.77	0.19	
Meanroom PICU	Old	7	2.64	0.35	0.13	1.24
	New	21	2.20	0.36	0.08	
Third floor	Old	66	2.74	0.32	0.04	1.88
	New	98	2.13	0.33	0.03	
NICU	Old	9	2.52	0.40	0.13	0.62
	New	16	2.27	0.41	0.10	
Meanbasicneed PICU	Old	7	2.67	0.33	0.13	0.67
	New	21	2.43	0.38	0.08	
Third floor	Old	66	2.74	0.34	0.04	0.56
	New	98	2.53	0.41	0.04	
NICU	Old	9	2.28	0.44	0.15	0.11
	New	16	2.22	0.60	0.15	

An independent t-test (equal variances not assumed) between the means for the scales for Patients comparing *Things to Do* ($t = 3.81$, $p < 0.001$) and the *Room Compared to Home*

($t = 5.96, p < 0.001$) show significant effects between the old and the new hospital for both scales. Patients felt that the new hospital offered more diversions and things to do than the old hospital and that their rooms in the new hospital were no longer rated as worse than home but rather as equal to home.

Because of the small N of Parents for both the PICU and the NICU, the independent t-test between the means for the third floor was calculated for all three means. An independent t-test between the means for the *Room Compared to Home* on the third floor for Parents was also significant ($t = 12.03, p < 0.001$) indicating that the rooms in the new hospital were no longer rated worse than home but rather equal to home by the parents. Also, *Basic Needs Compared to Home* improved significantly for Parents on the third floor ($t = 3.52, p < 0.001$) indicating that parents ability to sleep and feed themselves compared to home was improved. The t-test for *Aesthetics* shows a significant difference between the old and the new inpatient floors ($t = -8.98, p < 0.001$) indicating that parents on the third floor evaluated the environment as more pleasant in the new hospital than in the old hospital. See Table 59 and 60 for the t-values and significant levels.

Table 59: T-test for equality of means: ‘Meantodo’, ‘Meanroom’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meantodo	Equal variances assumed	3.79	60	0.00	0.38	0.10
	Equal variances not assumed	3.81	59.59	0.00	0.38	0.10
Meanroom	Equal variances assumed	5.88	60	0.00	0.58	0.10
	Equal variances not assumed	5.96	53.75	0.00	0.58	0.10

Table 60: T-test for equality of means: ‘Meanaesthetics’, ‘Meanroom’, ‘Meanbasicneeds’ for Parents

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanaesthetics Third floor	Equal variances assumed	-10.14	162	0.00	-1.30	0.13
	Equal variances not assumed	-8.98	86.24	0.00	-1.30	0.14
Meanroom Third floor	Equal variances assumed	11.91	162	0.00	0.62	0.05
	Equal variances not assumed	12.03	144.49	0.00	0.62	0.05
Meanbasicneeds Third floor	Equal variances assumed	3.39	162	0.00	0.21	0.06
	Equal variances not assumed	3.52	154.94	0.00	0.21	0.06

Overall

In addition to the Seven Dimensions, both the Patient and Parent questionnaires ended with three items asking for an *Overall Evaluation* of the hospital. The items for both scales were grouped and the internal reliabilities were calculated for both the old and the new hospital. The reliabilities for the scales *Overall Evaluation* for Patients and Parents were high. Tables 61 and 62 show the items belonging to the scales and the internal reliabilities of the scales for the old and new hospital.

Table 61: Items and reliabilities for variable ‘Overall’ for Patients

1. OVERALL N = 3	α old hospital	α new hospital
1. How would you rate your hospital room?	0.87	0.73
2. How would you rate this hospital as a building for children?		
3. How would you rate the way the hospital looks in general?		

Table 62: Items and reliabilities for variable ‘Overall’ for Parents

1. OVERALL N = 3	α old hospital	α new hospital
1. How would you rate your child’s room?	0.89	0.72
2. How would you rate this hospital as a building for children?		
3. How would you rate the way the hospital looks?		

Based on these three items a new variable (Meanoverall) was calculated for both the Patients and Parents. The mean scores, standard deviations, standard mean errors for the old and the new hospital and the effect sizes between the groups were calculated. The data show that the *Overall Evaluation* of the new hospital was higher for both Patients and Parents. On a scale of 1 (very poor) to 5 (very good), the mean score for Patients in the old hospital was 3.37 (M = 3.37, SD = 0.88) and in the new hospital 4.73 (M = 4.73, SD = 0.38). The effect size between the two means was high ($d = 2.00$).

The mean scores for Parents by unit in the old hospital were: PICU M = 3.29, SD = 1.18; third floor M = 3.23, SD = 0.93; NICU M = 3.89, SD = 1.08 and for the units in the new hospital: PICU M = 4.81, SD = 0.37; third floor M = 4.82 SD = 0.36 NICU M = 4.69, SD = 0.33. The effect sizes between the means for Overall Evaluation for all three units were high (PICU $d = 1.74$, third floor $d = 1.98$, NICU $d = 1.00$). See Tables 63 and 64.

Table 63: Means, SD and effect size new mean ‘Overall Rating’ for Patients

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanoverall	Old	30	3.37	0.88	0.16	2.00
	New	32	4.73	0.38	0.07	

Table 64: Means, SD and effect size new mean ‘Overall Rating’ for Parents

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanoverall PICU	Old	7	3.29	1.18	0.45	1.74
	New	21	4.81	0.37	0.08	
Third floor	Old	66	3.23	0.93	0.11	1.98
	New	98	4.82	0.36	0.04	
NICU	Old	9	3.89	1.08	0.36	1.00
	New	16	4.69	0.33	0.08	

An independent t-test (equal variances not assumed) between the means for *Overall Evaluation* of the hospital shows a significant difference between the old and the new hospital for Patients ($t = -7.81$, $p < 0.001$) and Parents on the third floor ($t = -13.20$, $p < 0.001$)

indicating that Because of the small N of Parents for both the PICU and the NICU, the independent t-test between the means for the third floor was calculated. Patients and Parents rated the room, the hospital as a building for children, and the overall looks higher in the new hospital than in the old hospital. See Tables 65 and 66 for the t-values and significant levels.

Table 65: T-test for equality of means: ‘Meanoverall’ for Patients

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanoverall	Equal variances assumed	-7.98	60	0.00	-1.36	0.17
	Equal variances not assumed	-7.81	39.02	0.00	-1.36	0.17

Table 66: T-test for equality of means: ‘Meanoverall’ for Parents

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanoverall	Equal variances assumed	-15.29	162	0.00	-1.59	0.10
	Equal variances not assumed	-13.20	78.06	0.00	-1.59	0.12

Summary of the Data from Patients

The patient questionnaire covered Seven Dimensions and twenty underlying scales. Of these twenty scales, twelve were selected for comparison between the old and the new hospital.

The data showed that the following aspects improved significantly in the new hospital:

1. Patients slept better and were less disturbed by noise in the new hospital.
2. Patients’ sense of control over who entered the room or what happened in the room increased.
3. Patients experienced more privacy while talking to staff or on the phone and found privacy to be alone if they wanted to.

4. The space available for friends and family in the new hospital room improved.
5. Patients felt that the new hospital offered more diversion and things to do than the old hospital.
6. Patients in the new hospital rated their rooms no longer as worse than home but rather as equal to home.
7. Patients rated the room, the hospital as a building for children, and the overall looks higher in the new hospital.

The data also showed that two aspects did show a trend toward a significant improvement in the new hospital.

1. Patients' sense of social support in the new hospital improved slightly.
2. Patients' need for parental support increased in the new hospital.

The data also showed that three aspects were not significantly affected by the move into the new hospital.

1. Patients' access to information about treatment and medication and access to nurses.
2. Patients' ability to stay in touch with home, school, and friends while in the hospital.
3. Patients' sense of control over when they can leave bed or their room.

It should be noted, however, that the mean scores for two of the three aspects were relatively high, on a five point scale, both in the old and in the new situation with mean scores between 3.85 and 4.44. Patients' ability to stay in touch with home, school, and friends while in the hospital remained the same ($M_{\text{old}} = 3.11$ and $M_{\text{new}} = 3.34$) even though it

was expected to improve in the new place. Conclusions of the findings will be given in Section IV.

Summary of the Data from Parents

The parent questionnaire covered Seven Dimensions and twenty-two underlying scales. Of these twenty-two scales, ten were selected for comparison between the old and the new hospital. The data showed that nine of the ten aspects improved significantly on the inpatient floor of the new hospital:

1. Parents slept better and were less disturbed by noise in the new hospital.
2. Parents' sense of control over who entered the room or what happened in the room increased.
3. Parents experienced more privacy while talking to staff or on the phone and found privacy to be alone if they wanted to.
4. Parents' sense of social support and space available for friends and family in the new hospital increased.
5. Parents' ability to stay in touch with home, work, and friends while in the new hospital increased.
6. Parents felt that the new hospital was more aesthetically pleasing than the old hospital.
7. Parents in the new hospital rated their child's room no longer as worse than home but rather as equal to home.

8. Parents' ability to sleep and feed themselves compared to home improved in the new hospital.
9. Parents rated the room, the hospital as a building for children, and the overall looks higher in the new hospital.

The data showed a trend toward a significant improvement in the new hospital for access to information about the child's treatment and medication and access to nurses. The mean scores on a five point scale, for this aspect, were already relatively high both in the old and in the new situation ($M_{old} = 4.18$ and $M_{new} = 4.40$). Conclusions of the findings will be given in Section IV.

Data from the Staff by Dimension and Unit

The dimensions for staff were based on the literature review and the Chart in Appendix A-IV. The staff's happiness and ability to work efficiently is directly linked to the patients and families wellbeing. Therefore, the staff's wellbeing and its dimensions were added to the model.

Efficiency Unit

The items in the questionnaire related to Efficiency of the Unit consisted of two scales: *Functionality* and *Cooperation*. The items for these scales were grouped and the internal reliability was calculated for both scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 67 and 68 show the items belonging to the scales *Functionality* and *Cooperation* and the internal reliabilities of the scales for the old and new hospital.

Table 67: Items and reliabilities for variable ‘Functionality’ for Staff

1. FUNCTIONALITY N = 15	α old hospital	α new hospital
1. My unit is conveniently located in the hospital	0.87	0.92
2. The design of my unit positively affects my ability to work		
3. The physical appearance of my unit is pleasant		
4. There is sufficient daylight in my unit		
5. The space in my unit is generally very adequate for the work I have to do there		
6. The place(s) for confidential conversations with colleagues in my unit are adequate		
7. The storage areas in my unit meet our needs adequately		
8. It is easy to maintain cleanliness of the surfaces in my unit		
9. The physical conditions such as light and temperature in my unit are good		
10. The lighting in the unit supports the work that needs to get done		
11. It is easy to move beds and equipment around the unit		
12. In terms of walking distance, the supplies and meds are conveniently located on the floor		
13. I know what’s happening in other units on this floor		
14. The ability to keep an eye on patients’ comings and goings is sufficient		
15. The layout of the unit makes it easier for me to supervise & observe the patients in my unit		

Table 68: Items and reliabilities for variable ‘Cooperation’ for Staff

2. COOPERATION N = 2	α old hospital	α new hospital
1. The design of the units supports cooperation between doctors and nurses	0.68	0.82
2. Overall, the design of the space allows for the adequate training/teaching of staff		

Based on the items of the two scales, new variables (Meanfunctionality and Meancooperation) were generated by unit. The mean scores, standard deviations, standard mean errors for the old and the new units and the effect sizes between the groups were calculated.

The data show that *Functionality* of the units improved in the new hospital for all units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Functionality* by unit in the old hospital were: PICU M = 2.96, SD = 0.50; third floor M = 2.62, SD = 0.54; NICU M = 2.07, SD = 0.74 and for the units in the new hospital: PICU M = 3.40, SD = 0.49; third floor M = 3.51, SD = 0.73; NICU M = 2.52, SD = 0.75. The effect sizes between the means

for *Functionality* for all three units were high (PICU $d = 0.89$, third floor $d = 1.39$, NICU $d = 0.60$).

By contrast, *Cooperation* did not improve equally for all three units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Cooperation* by unit in the old hospital were: PICU $M = 2.95$, $SD = 0.86$; third floor $M = 2.80$, $SD = 0.89$; NICU $M = 2.17$, $SD = 1.07$ and for the units in the new hospital: PICU $M = 3.30$, $SD = 0.67$; third floor $M = 3.55$, $SD = 0.96$; NICU $M = 2.39$, $SD = 1.18$. The effect sizes between the means for *Cooperation* for PICU was moderate ($d = 0.45$), for the third floor was high ($d = 0.81$), and low for NICU ($d = 0.20$). Table 69 shows the data for the two scales by unit.

Table 69: Means, SD and effect size new means ‘Functionality’ and ‘Cooperation’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanfunctionality PICU	Old	19	2.96	0.50	0.11	0.89
	New	22	3.40	0.49	0.10	
Third floor	Old	47	2.62	0.54	0.08	1.39
	New	39	3.51	0.73	0.12	
NICU	Old	39	2.07	0.74	0.12	0.60
	New	37	2.52	0.75	0.12	
Meancooperation PICU	Old	19	2.95	0.86	0.20	0.45
	New	22	3.30	0.67	0.14	
Third floor	Old	47	2.80	0.89	0.13	0.81
	New	38	3.55	0.96	0.16	
NICU	Old	39	2.17	1.07	0.17	0.20
	New	37	2.39	1.18	0.19	

An independent t-test (equal variances not assumed) between the means was calculated by unit. The t-test for *Functionality* shows a significant difference between the three old and the three new units: PICU ($t = -2.84$, $p = 0.01$), third floor ($t = -6.28$, $p < 0.001$), and NICU ($t = -2.58$, $p = 0.01$) indicating that staff felt that the *Functionality* of the units was improved in the new hospital. The difference between means for *Cooperation* was only significant for

the third floor ($t = -3.72, p < 0.001$) indicating that staff felt that the new design positively impacted both *Cooperation* between and training of staff. Staff from PICU and NICU, however, said that the *Cooperation* was not significantly improved in the new hospital: PICU ($t = -1.43, p = 0.16$) and NICU ($t = -0.87, p = 0.39$). See Table 70 for the t-values and significant levels.

Table 70: T-test for equality of means: ‘Meanfunctionality’ and ‘Meancooperation’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanfunctionality PICU	Equal variances assumed	-2.84	39	0.01	-0.44	0.15
	Equal variances not assumed	-2.84	38.05	0.01	-0.44	0.15
Third floor	Equal variances assumed	-6.46	84	0.00	-0.89	0.14
	Equal variances not assumed	-6.28	68.76	0.00	-0.89	0.14
NICU	Equal variances assumed	-2.59	74	0.01	-0.44	0.17
	Equal variances not assumed	-2.58	73.71	0.01	-0.44	0.17
Meancooperation PICU	Equal variances assumed	-1.45	39	0.15	-0.35	0.24
	Equal variances not assumed	-1.43	33.63	0.16	-0.35	0.24
Third floor	Equal variances assumed	-3.75	83	0.00	-0.75	0.20
	Equal variances not assumed	-3.72	76.32	0.00	-0.75	0.20
NICU	Equal variances assumed	-0.87	74	0.39	-0.23	0.26
	Equal variances not assumed	-0.87	72.41	0.39	-0.23	0.26

Nursing Station Efficiency

The items in the questionnaire related to Efficiency of the Nursing Station consisted of two scales: *Efficiency* and *Safety Needs*. The items for these scales were grouped and the internal reliability was calculated for both scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 71 and 72 show the items belonging to the scales *Efficiency* and *Safety Needs*, and the internal reliabilities of the scales for the old and new hospital.

Table 71: Items and reliabilities for variable ‘Efficiency Station’ for Staff

1. EFFICIENCY N = 7	α old hospital	α new hospital
1. The nursing station is conveniently located on the floor	0.86	0.88
2. The noise level at the nursing station is usually appropriate		
3. The privacy at the nursing station is appropriate to the needs of staff		
4. The privacy at the nursing station is appropriate to the needs of patients		
5. There is enough space for me at the nursing station to do my work		
6. The facilities, such as computers and telephones, at the station are sufficient and convenient		
7. The nursing station is a pleasant environment to work in		

Table 72: Items and reliabilities for variable ‘Safety Needs’ for Staff

2. SAFETY NEEDS N = 4	α old hospital	α new hospital
7. It is easy to observe patients from the nursing station	0.84	0.83
9. The communication system between staff and patients works well		
10. The layout of the units make it easy to assist a colleague		
11. The layout of the units make it easy to respond to a code		

The data show that *Efficiency* of the nursing station improved in the new hospital for all units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Efficiency* by unit in the old hospital were: PICU M = 2.57, SD = 0.53; third floor M = 2.47, SD = 0.73; NICU M = 2.45, SD = 0.99 and for the units in the new hospital: PICU M = 3.56, SD = 0.69; third floor M = 3.53, SD = 0.80; NICU M = 2.45, SD = 0.99. The effect sizes between the means for *Efficiency* for all three units were high (PICU $d = 1.61$, third floor $d = 1.38$, NICU $d = 0.76$).

By contrast, *Safety Needs*, did not improve for all three units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Safety Needs* were lower in the new PICU (M = 2.92, SD = 0.95) and NICU (M = 1.72, SD = 0.98). The effect sizes between the means for *Safety Needs* for these two floors were high (PICU $d = 0.95$, NICU $d = 1.00$). The *Safety Needs* on third floor did improve slightly in the new hospital (third floor old M = 2.88, SD = 0.78; third floor new M = 3.28, SD = 0.90). The effect size between the means for

Safety Needs on the third floor was $d = 0.48$. Table 73 shows the data for the two scales by unit.

Table 73: Means, SD and effect size new means ‘Efficiency Station’ and ‘Safety Needs’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanefficiency PICU	Old	19	2.57	0.53	0.12	1.61
	New	22	3.56	0.69	0.15	
Third floor	Old	47	2.47	0.73	0.11	1.38
	New	39	3.53	0.80	0.13	
NICU	Old	25	1.74	0.88	0.18	0.76
	New	28	2.45	0.99	0.19	
Meansafety PICU	Old	19	3.68	0.61	0.14	0.95
	New	22	2.92	0.95	0.20	
Third floor	Old	47	2.88	0.78	0.11	0.48
	New	38	3.28	0.90	0.15	
NICU	Old	30	2.90	1.35	0.25	1.00
	New	32	1.72	0.98	0.17	

The t-test for *Efficiency* of the nursing station shows a significant difference between the three old and the three new units: PICU ($t = -5.21, p < 0.001$), third floor ($t = -6.38, p < 0.001$), and NICU ($t = -2.74, p = 0.01$) indicating that staff felt that the *Efficiency* of the nursing stations was improved in the new hospital.

The difference between means for *Safety Needs* was significant for PICU ($t = 3.08, p < 0.001$) and NICU ($t = 3.91, p < 0.001$). However, the effect was opposite from the desired direction because staff of both units felt the *Safety Needs* were worse in the new than in the old hospital. The difference between means for *Safety Needs*, after Bonferroni correction, was marginally significant for the third floor ($t = -2.13, p = 0.01$), indicating that safety improved slightly in the new hospital. See Table 74 for the t-values and significant levels.

Table 74: T-test for equality of means: ‘Meanefficiency’ and ‘Meansafety’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanefficiency PICU	Equal variances assumed	-5.12	39	0.00	-0.99	0.19
	Equal variances not assumed	-5.21	38.54	0.00	-0.99	0.19
Third floor	Equal variances assumed	-6.43	84	0.00	-1.06	0.17
	Equal variances not assumed	-6.38	78	0.00	-1.06	0.17
NICU	Equal variances assumed	-2.73	51	0.01	-0.70	0.26
	Equal variances not assumed	-2.74	51	0.01	-0.70	0.26
Meansafety PICU	Equal variances assumed	2.99	39	0.00	0.76	0.25
	Equal variances not assumed	3.08	36.11	0.00	0.76	0.25
Third floor	Equal variances assumed	-2.16	83	0.03	-0.39	0.18
	Equal variances not assumed	-2.13	73.71	0.04	-0.39	0.18
NICU	Equal variances assumed	3.95	60	0.00	1.18	0.30
	Equal variances not assumed	3.91	52.76	0.00	1.18	0.30

Patient Rooms Functionality

The items in the questionnaire related to the Functionality of the Patient Rooms were grouped and the internal reliability was calculated for both the old and the new hospital. Both reliabilities were high. Table 75 shows the items belonging to the scale *Functionality Patient Room* and the internal reliabilities for the old and new hospital.

Table 75: Items and reliabilities for variable ‘Functionality Patient Room’ for Staff

1. FUNCTIONALITY PATIENT ROOM N = 7	α old hospital	α new hospital
1. The effectiveness of built-in equipment for treating patients near the bedside, such as medical gasses, is convenient	0.86	0.92
2. The space around the bed for easy access to the patient is adequate		
3. The bedside lighting is effective at night		
4. The rooms are comfortable for patients to be in		
5. The rooms are comfortable for parents to be in		
6. The space in the patient’s rooms allows for easy patient movement (in bed, wheelchair)		
7. The space in the patient’s bathrooms allows for easy patient care		

The data show that *Functionality Patient Rooms* improved in the new hospital for all units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Functionality* by unit in the old hospital were: PICU M = 2.29, SD = 0.60; third floor M = 2.14, SD = 0.72; NICU M = 1.75, SD = 0.78 and for the units in the new hospital: PICU M = 4.28, SD = 0.65; third floor M = 4.04, SD = 0.92; NICU M = 3.37, SD = 0.89. The effect sizes between the means for *Functionality Patient Room* for all three units were high (PICU $d = 3.18$, third floor $d = 2.30$, NICU $d = 1.94$). Table 76 shows the data for the two scales by unit.

Table 76: Means, SD and effect size new means ‘Patientroom’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanpatientroom PICU	Old	19	2.29	0.60	0.14	3.18
	New	21	4.28	0.65	0.14	
Third floor	Old	47	2.14	0.72	0.11	2.30
	New	39	4.04	0.92	0.15	
NICU	Old	39	1.75	0.78	0.13	1.94
	New	36	3.37	0.89	0.15	

The t-test for *Functionality Patient Room* shows a significant difference between the three old and the three new units: PICU ($t = -10.06$, $p < 0.001$), third floor ($t = -10.25$, $p < 0.001$), and NICU ($t = -8.41$, $p < 0.001$) indicating that staff felt that the functionality of the patient rooms was improved in the new hospital. See Table 77 for the t-values and significant levels.

Table 77: T-test for equality of means: ‘Meanpatientroom’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanpatientroom PICU	Equal variances assumed	-10.02	38	0.00	-1.99	0.20
	Equal variances not assumed	-10.06	37.99	0.00	-1.99	0.20
Third floor	Equal variances assumed	-10.75	84	0.00	-1.90	0.18
	Equal variances not assumed	-10.52	71.55	0.00	-1.90	0.18
NICU	Equal variances assumed	-8.41	73	0.00	-1.63	0.19
	Equal variances not assumed	-8.37	70.04	0.00	-1.63	0.19

Facilities Staff

The items in the questionnaire related to Facilities for Staff consisted of two scales: *Facilities On the Floor* and *Facilities Off the Floor*. The items for these scales were grouped and the internal reliability was calculated for both scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 78 and 79 show the items belonging to the scales *On Floor* and *Off Floor* and the internal reliabilities of the scales for the old and new hospital.

Table 78: Items and reliabilities for variable ‘Facilities on Floor’ for Staff

1. ON FLOOR N = 9	α old hospital	α new hospital
1. The nurses' lounge is a pleasant place to stay in	0.77	0.90
2. The facilities to keep (fridge) and warm (microwave) my own food are appropriate		
3. There is enough personal storage (e.g. locker rooms) on the floor for me		
4. There are sufficient places in the hospital where I can retreat for private discussions		
5. The bathrooms for staff on the floor are sufficient and convenient		
6. There are sufficient places in the hospital where I can go for tension release		
7. The location of stairways encourages the use of stairs instead of elevators		
8. The art on the floor is interesting for me		
9. When I want a cup of coffee or drink I can get one easily on the floor		

Table 79: Items and reliabilities for variable ‘Facilities off Floor’ for Staff

2. OFF FLOOR N = 5	α old hospital	α new hospital
1. The outdoor space meets the needs of staff	0.62	0.77
2. The staff restaurant is a pleasant place to eat at		
3. The location of the staff restaurant is convenient for staff to take their meals		
4. I can conveniently park my car near the hospital		
5. The chapel is at a convenient distance for staff?		

The data show that satisfaction with the *Facilities On the Floor* improved for all three units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Facilities On the Floor* by unit in the old hospital were: PICU M = 2.23, SD = 0.60; third floor M = 1.88, SD = 0.61; NICU M = 1.77, SD = 0.66 and for the units in the new hospital: PICU

M = 3.71, SD = 0.69; third floor M = 3.34, SD = 0.86; NICU M = 2.19, SD = 0.60. The effect sizes between the means for *Facilities On the Floor* for all three units were high (PICU $d = 2.29$, third floor $d = 1.96$, NICU $d = 0.67$).

Satisfaction with *Facilities Off the Floor* did not improve equally for all three units. On a scale of 1 (strongly disagree) to 5 (strongly agree) the mean scores for *Facilities Off the Floor* by unit in the old hospital were: PICU M = 2.34, SD = 0.57; third floor M = 2.38, SD = 0.77; NICU M = 2.03, SD = 0.77 and for the units in the new hospital: PICU M = 2.94, SD = 0.82; third floor M = 3.06, SD = 1.07; NICU M = 2.18, SD = 0.83. The effect sizes between the means for PICU ($d = 0.85$) and NICU ($d = 0.73$) were high and low for the third floor ($d = 0.19$). Table 80 shows the data for the two scales by unit.

Table 80: Means, SD and effect size new means ‘Onfloor’ and ‘Offfloor’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanonfloor PICU	Old	19	2.23	0.60	0.14	2.29
	New	22	3.71	0.69	0.15	
Third floor	Old	47	1.88	0.61	0.09	1.96
	New	39	3.34	0.86	0.14	
NICU	Old	39	1.77	0.66	0.11	0.67
	New	37	2.19	0.60	0.10	
Meanofffloor PICU	Old	19	2.34	0.57	0.13	0.85
	New	22	2.94	0.82	0.17	
Third floor	Old	47	2.38	0.77	0.11	0.73
	New	38	3.06	1.07	0.17	
NICU	Old	39	2.03	0.77	0.12	0.19
	New	37	2.18	0.83	0.14	

The t-test for *Facilities On the Floor* shows a significant difference between the three old and the three new units: PICU ($t = -7.34$, $p < 0.001$), third floor ($t = -8.92$, $p < 0.001$), and NICU ($t = -2.93$, $p = 0.01$) indicating that staff felt that the *Facilities On the Floor* were better in the new hospital. The difference between means for *Facilities Off the Floor* was significant

for the third floor ($t = -3.28, p < 0.001$) indicating that staff felt that the *Facilities Off the Floor* improved in the new hospital. The difference between means, after Bonferroni correction, for PICU ($t = -2.74, p = 0.01$) was marginally significant, saying that the *Facilities Off the Floor* improved slightly in the new hospital. *Off Floor Facilities* were not significantly improved in the new hospital for NICU ($t = -0.83, p = 0.41$). See Table 81 for the t-values and significant levels.

The systematic observations confirm that the on-floor facilities improved for staff. In the old building, the playrooms and family lounge were often used for staff meetings, staff phone calls, or just for retreat. In the new hospital playrooms, this does not happen. Staff members who were counted in the playrooms in the new hospital were volunteers or Child Life staff playing with patients. In the new hospital, staff members seem to have adequate work space, meeting rooms and lounges so they no longer need the playrooms.

Table 81: T-test for equality of means: ‘Meanonfloor’ and ‘Meanoffloor’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanonfloor PICU	Equal variances assumed	-7.26	39	0.00	-1.48	0.20
	Equal variances not assumed	-7.34	39	0.00	-1.48	0.20
Third floor	Equal variances assumed	-9.20	84	0.00	-1.46	0.16
	Equal variances not assumed	-8.92	67.04	0.00	-1.46	0.16
NICU	Equal variances assumed	-2.93	74	0.00	-0.42	0.14
	Equal variances not assumed	-2.93	73.86	0.00	-0.42	0.14
Meanoffloor PICU	Equal variances assumed	-2.67	39	0.01	-0.60	0.22
	Equal variances not assumed	-2.74	37.53	0.01	-0.60	0.22
Third floor	Equal variances assumed	-3.39	83	0.00	-0.68	0.20
	Equal variances not assumed	-3.28	65.11	0.00	-0.68	0.21
NICU	Equal variances assumed	-0.83	74	0.41	-0.15	0.18
	Equal variances not assumed	-0.83	72.67	0.41	-0.15	0.18

Facilities Residents

Because the hospital is affiliated with the New York Medical College, teaching is an important part of the daily routines. The design of the hospital can facilitate or hinder this directly. Therefore, six items in the questionnaire were specifically included for the residents. The items related to *Facilities for Residents* were grouped and the internal reliabilities were calculated for both the old and the new hospital. Both reliabilities were high. Table 82 shows the items and the internal reliabilities for the old and new hospital.

Table 82: Items and reliabilities for variable ‘Facilities Residents’

1. FACILITIES RESIDENTS N = 6	α old hospital	α new hospital
1. The resident call-room is a pleasant place to stay in	0.91	0.92
2. The resident call-room is conveniently located		
3. The fax, copying and telephone facilities meet the needs of residents		
4. The places for studying and academic work are conveniently located		
5. The space for studying and academic work is adequate		
6. The consultation room for lectures and signing out are adequate		

Because of the small N for residents of the PICU and NICU only the third floor data could be calculated. The data show that the *Facilities for Residents* improved on the third floor in the new hospital. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean score for *Facilities for Residents* in the old hospital was $M = 1.50$, $SD = 0.66$ and for the new hospital $M = 3.40$, $SD = 0.86$. The effect size between the means for *Facilities for Residents* on the third floor was high third floor ($d = 2.49$). Table 83 shows the data for the third floor.

Table 83: Means, SD and effect size new means ‘Residents’

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size <i>d</i>
Meanresidents Third floor	Old	9	1.50	0.66	0.22	2.49
	New	10	3.40	0.86	0.27	

The t-test shows a significant difference between the old and the new inpatient floors ($t = -5.41$, $p < 0.001$) indicating that residents felt that their facilities in the new hospital were better than in the old one. See Table 84 for the t-values and significant levels.

Table 84: T-test for equality of means: ‘Meanresidents’ third floor

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanresidents Third floor	Equal variances assumed	-5.33	17	0.00	-1.90	0.36
	Equal variances not assumed	-5.41	16.61	0.00	-1.90	0.35

Facilities Patients

The items in the questionnaire related to *Facilities for Patients* were grouped and the internal reliability was calculated for both the old and the new hospital. Both reliabilities were high. Table 85 shows the items belonging to the scale *Facilities for Patients* and the internal reliabilities of the scale for the old and new hospital.

Table 85: Items and reliabilities for variable ‘Facilites Patients’ for Staff

1. FACILITIES PATIENTS N = 6	α old hospital	α new hospital
1. The chapel is at a convenient distance for patients and parents	0.80	0.77
2. There are appropriate places to have confidential conversations with parents and families		
3. The outdoor space meets the needs of your patients		
4. There are convenient and interesting places for patients to get to on the floor		
5. The signs for direction on the floor are easily understood by patients and parents		
6. First time visitors to this unit know how to find their way		

The data show that the *Facilities for Patients* improved in the new hospital for all three units. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Patient Facilities* by unit in the old hospital were: PICU $M = 2.19$, $SD = 0.56$; third floor $M = 2.19$,

SD = 0.65; NICU M = 2.04, SD = 0.60 and for the units in the new hospital: PICU M = 2.94, SD = 0.69; third floor M = 3.03, SD = 0.11; NICU M = 2.53, SD = 0.76. The effect sizes between the means for *Facilities for Patients* for all three units were high (PICU $d = 1.19$, third floor $d = 1.24$, NICU $d = 0.72$). Table 86 shows the data by unit.

Table 86: Means, SD and effect size new means ‘Patientfacilities’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meanpatientfacilities PICU	Old	19	2.19	0.56	0.13	1.19
	New	22	2.94	0.69	0.15	
Third floor	Old	45	2.19	0.66	0.10	1.24
	New	38	3.03	0.69	0.11	
NICU	Old	39	2.04	0.60	0.10	0.72
	New	37	2.53	0.76	0.13	

The t-test shows a significant difference between the three old and the three new units: PICU ($t = -3.83$, $p < 0.001$), third floor ($t = -5.62$, $p < 0.001$), and NICU ($t = -3.10$, $p < 0.001$) indicating that staff felt that the facilities for patients improved in the new hospital. See table 87 for the t-values and significant levels.

Table 87: T-test for equality of means: ‘Meanpatients’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meanpatients PICU	Equal variances assumed	-3.77	39	0.00	-0.75	0.20
	Equal variances not assumed	-3.83	38.87	0.00	-0.75	0.19
Third floor	Equal variances assumed	-5.64	81	0.00	-0.83	0.15
	Equal variances not assumed	-5.62	77.56	0.00	-0.83	0.15
NICU	Equal variances assumed	-3.12	74	0.00	-0.49	0.16
	Equal variances not assumed	-3.10	68.46	0.00	-0.49	0.16

Overall Evaluation

The items in the questionnaire related to Overall Evaluation consisted of two scales: *Overall Satisfaction* and *Evaluation*. The items for these scales were grouped and the internal reliability was calculated for both scales for both the old and the new hospital. All reliabilities were moderate to high. Tables 88 and 89 show the items belonging to the scales and the internal reliabilities of the scales for the old and new hospital.

Table 88: Items and reliabilities for variable ‘Overall Satisfaction’ for Staff

1. SATISFACTION N = 3	α old hospital	α new hospital
1. I would recommend my unit to a friend as a good place to work	0.63	0.83
2. I like being in this hospital		
3. The design of this hospital reflects our hospital's overall mission statement or philosophy		

Table 89: Items and reliabilities for variable ‘Overall Evaluation’ for Staff

2. EVALUATION N = 3	α old hospital	α new hospital
1. On a scale of 1 to 10, with 10 being the best, how would you rate the design of your unit?	0.91	0.93
2. On a scale of 1 to 10, with 10 being the best, how would you rate the design of the patient rooms?		
4. On a scale of 1 to 10, with 10 being the best, how child friendly would you rate the design of the pediatric or neonatal floors?		

The data show that the *Overall Satisfaction* improved for PICU and the third floor. On a scale of 1 (strongly disagree) to 5 (strongly agree), the mean scores for *Overall Satisfaction* in the old hospital were: PICU M = 3.12, SD = 0.64; third floor M = 2.81, SD = 0.77; NICU M = 2.63, SD = 0.97 and for the units in the new hospital: PICU M = 3.95, SD = 0.79; third floor M = 3.95, SD = 0.95; NICU M = 2.63, SD = 0.90. The effect sizes between the means for *Overall Satisfaction* were high for PICU ($d = 1.15$) and the third floor ($d = 1.32$) and zero for NICU ($d = 0$).

The *Overall Evaluation* of the hospital did improve for all three units. On a scale of 1 (worst) to 10 (best), the mean scores for *Overall Evaluation* by unit in the old hospital were: PICU M = 3.98, SD = 2.14; third floor M = 3.59, SD = 1.81; NICU M = 2.72, SD = 1.98 and for the units in the new hospital: PICU M = 7.30, SD = 1.19; third floor M = 7.79, SD = 1.84; NICU M = 4.95, SD = 2.24. The effect sizes between the means for *Overall Evaluation* for all three units were high (PICU $d = 1.92$, third floor $d = 2.30$, NICU $d = 0.89$). Table 90 shows the data for the two scales by unit.

Table 90: Means, SD and effect size new means ‘Satisfaction’ and ‘Evaluation’ by unit for Staff

Name New Mean	Hospital	N	Mean	S.D.	Std. Error Mean	Effect size d
Meansatisfaction PICU	Old	19	3.12	0.64	0.15	1.15
	New	22	3.95	0.79	0.17	
Third floor	Old	47	2.81	0.77	0.11	1.32
	New	39	3.95	0.95	0.15	
NICU	Old	39	2.63	0.97	0.16	0.0
	New	37	2.63	0.90	0.15	
Meanevaluation PICU	Old	19	3.98	2.14	0.49	1.92
	New	22	7.30	1.19	0.25	
Third floor	Old	46	3.59	1.81	0.27	2.30
	New	39	7.79	1.84	0.30	
NICU	Old	39	2.72	1.98	0.32	0.89
	New	37	4.59	2.24	0.37	

An independent t-test (equal variances not assumed) between the means was calculated by unit. The t-test for *Overall Satisfaction* shows a significant difference between the old PICU ($t = -3.69$, $p < 0.001$) and the old third floor ($t = -6.08$, $p < 0.001$), indicating that staff enjoyed working in the new facility more than in the old one. Staff of the NICU did not feel that the new hospital was a better work environment ($t = 0.03$, $p = 0.98$).

The difference between means for *Overall Evaluation* was significant for all three units: PICU ($t = -6.02$, $p < 0.001$), third floor ($t = -10.53$, $p < 0.001$), and NICU ($t = -3.84$, $p < 0.001$)

indicating that the design of the new hospital was better evaluated than the old one. See Table 91 for the t-values and significant levels.

Table 91: T-test for equality of means: ‘Meansatisfaction’ and ‘Meanevaluation’ by unit for Staff

Name Mean	t-test for Equality of Means	t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Meansatisfaction PICU	Equal variances assumed	-3.63	39	0.00	-0.82	0.23
	Equal variances not assumed	-3.69	38.87	0.00	-0.82	0.22
Third floor	Equal variances assumed	-6.19	84	0.00	-1.14	0.18
	Equal variances not assumed	-6.08	72.82	0.00	-1.14	0.19
NICU	Equal variances assumed	0.03	74	0.98	0.01	0.21
	Equal variances not assumed	0.03	73.95	0.98	0.01	0.21
Meanevaluation PICU	Equal variances assumed	-6.26	39	0.00	-3.32	0.53
	Equal variances not assumed	-6.02	27.19	0.00	-3.32	0.55
Third floor	Equal variances assumed	-10.55	83	0.00	-4.19	0.40
	Equal variances not assumed	-10.53	80.22	0.00	-4.19	0.40
NICU	Equal variances assumed	-3.85	74	0.00	-1.87	0.48
	Equal variances not assumed	-3.84	71.86	0.00	-1.87	0.49

Summary of the Data from Staff

The staff questionnaire covered Seven Dimensions and thirteen underlying scales. Of these thirteen scales, eleven were selected for comparison between the old and the new hospital. The data showed that the following aspects changed significantly for the different units in the new hospital:

Staff PICU

1. Staff members felt that the functionality of the PICU was improved in the new hospital.
2. Staff members felt that the efficiency of the nursing station was improved in the new hospital.

3. Staff members of PICU felt that the safety needs were *worse* in the new hospital.
4. Staff members felt that the functionality of the patient rooms was improved in the new hospital.
5. Staff members felt that the facilities on the floor, such as the lounge, bathrooms, and locker rooms did improve in the new hospital.
6. Staff members felt that the facilities for patients at PICU improved in the new hospital.
7. Staff members enjoyed working in the new PICU more than in the old one.
8. Overall, the design of the new hospital was evaluated as better than the old one.

Staff Third Floor

1. Staff members felt that the functionality of the third floor units was improved in the new hospital.
2. Staff members felt that the new design positively impacted both cooperation between and training of Staff members on the third floor.
3. Staff members felt that the efficiency of the nursing station was improved on the third floor of the new hospital.
4. Staff members felt that the functionality of the patient rooms was improved on the third floor of the new hospital.
5. Staff members felt that the facilities on the third floor, such as the lounge, bathrooms, and locker rooms did improve in the new hospital.
6. Staff members felt that the facilities off the floor improved in the new hospital.

7. Residents felt that their facilities in the new hospital were better than in the old hospital.
8. Staff members felt that the facilities for patients at the third floor improved in the new hospital.
9. Staff members enjoyed working on the new third floor more than on the old one.
10. Overall, the design of the new hospital was evaluated as better than the old one.

Staff NICU

1. Staff members felt that the functionality of the NICU was improved in the new hospital.
2. Staff members felt that the efficiency of the NICU nursing stations was improved in the new hospital.
3. Staff members of NICU felt that the safety needs were *worse* in the new hospital.
4. Staff members felt that the functionality of the NICU patient rooms was improved in the new hospital.
5. Staff members felt that the facilities on the floor for NICU, such as the lounge, bathrooms and locker rooms did improve in the new hospital
6. Staff members felt that the facilities for patients at NICU, where applicable, improved in the new hospital
7. Overall, the design of the new hospital was evaluated as better than the old one.

The data showed that two aspects for the different units show a trend toward a significant improvement in the new hospital.

Staff PICU

1. Staff members from PICU said that the off floor facilities improved marginally in the new hospital.

Staff Third Floor

1. Staff members felt that the safety needs on the third floor did not improve in the new hospital.

The data showed that certain aspects for the different units were not significantly affected by the move into the new hospital.

Staff PICU

1. Staff members did not feel that the new PICU design had a positive impact on the cooperation between and training of Staff members.

Staff NICU

1. Staff members did not feel that the new NICU design had a positive impact on the cooperation between and training of Staff members.
2. Staff members said that safety did not improve at the new NICU.
3. Staff members from NICU said that the off floor facilities did not improve in the new hospital.
4. Staff members did not think the new NICU was a better work environment than the old one.

COMPARISON OF THE SITES

Because staff, the types of patients, and the location remained the same in both hospitals, the biggest impact of the new building was in the change of environment. The new building was new, spacious, friendly, colorful, bright, and with attractive attributes to look at for children and adults while the old building was old, dark, gloomy, and cramped. Even though rules and procedures had not changed in the new building, the change of environment did impact the culture of the hospital and the life of patients, parents, and staff.

The main focus of the new hospital was to create an environment that was family centered. With private rooms and rooming in facilities for parents, parents were invited to stay with their child, and participate in the care. Even though this was the philosophy in the old building, there were often no (or very limited) facilities to accommodate parents. As a result, in the new building, parents were more often present and more involved in the care of their child significantly impacting the dynamics between staff and parents.

Because parents had limited space in the old hospital, the relationships between staff and parents used to be more authoritarian while in the new hospital, these became more egalitarian. Patients and parents in the new building had much more control over their rooms. Also, the pods on the third floor were designed to lessen the barrier between staff and parents and patients by creating a sitting area and pantry adjacent to the nursing station. Traditionally, a nursing station is somewhat shielded from patients and parents for privacy reasons as staff need to be able to discuss patients without being overheard by other patients or parents. In the open set-up of the nursing station of the new hospital, nurses and physicians became more approachable and visible. This open design, especially on the third floor, had an impact on the parent-staff interaction. When I asked nurse managers how they

dealt with this culture change and whether it was addressed at meetings, I did not get a clear answer.

Nurses on the floor were more outspoken and not always positive about the new hospital. For instance, the nurses felt that the openness of the station made it difficult to have confidential discussions and protect the privacy of patients. In addition, they felt that having staff decentralized in six pods made it very difficult to assist one another and as a result they had lost their most valuable resource, each other's hand. The needs and concerns of staff will be further discussed in Section IV.

Conclusions of the data presented in this chapter and previous chapters will be given in Section IV. All data collected through participant observation, interviews, behavioral mapping, and questionnaires will be used to enrich and modify the Seven Dimensions of healing environments. These dimensions will form the basis for the revised model also presented in Section IV.

SECTION IV ■ REVISED MODEL OF HEALING ENVIRONMENTS AND ITS IMPLICATIONS FOR DESIGN

Chapter 11 ■ Modifying the Dimensions of a Holistic Healing Environment

INTRODUCTION

The Seven Dimensions of the model of holistic healing environments were defined in the Formative Research based on the literature analysis, the interviews, and observations (Section II). The literature and the dimensions were used to develop the instruments to apply this model in a single-case study of a children's hospital (Section III). In this section, the findings from the literature, observations, behavioral mapping, interviews, and questionnaires will be linked back to the Seven Dimensions to conceptualize healing

environments for children more richly, to modify the dimensions, and to work towards a unified model.

A hospital and a home environment can be thought of in terms of the kinds of behavior settings that are available (Barker, 1968 & 1987). A behavior setting is a small-scale social system consisting of people and inanimate objects. Within the temporal and spatial boundaries of the system, the various components interact in an orderly, established fashion to carry out the setting's essential function (Barker, 1968). The hospital setting has a time-ordered sequence of person-environment interactions that tell us about attributes and the standing patterns of human activity of the place. This standard pattern of human activity Barker calls "programs."

For example, in a child's home, the bedroom is an important behavior setting. We can ask to what degree a hospital provides a similar behavior setting to a child's bedroom. In the hospital, most patients are confined to the patient's room for some or even most of their hospital stay. This then functions, in part, as a bedroom. But, unlike their home bedroom, it also has other functions at different times. Sometimes it becomes a medical treatment room and, at other times, it is a playroom or a family dining room.

Once the patient recovers and becomes more mobile, they can move into other behavior settings such as a playroom, dining area, class room, and computer room. Using the language of behavior settings, we can ask how the transitions in and out of a hospital can be made smoother.

The dimensions and the conceptual model of healing presented in this chapter focus on how better to support patients and their families during the transition in and out of the hospital

and how better to support children and parents in approximating everyday life during their stay in the hospital.

THE REVISED CHART AND MODEL

From the beginning of this research, the patient has been the focus. However, a holistic healing environment for a patient is not complete without taking the family and staff into consideration. In Chapter 5, the Patient, Parent, and Staff Charts were presented. Based on the findings from the literature, observations, behavioral mapping, interviews, and questionnaires (Section III), these Charts were enriched, revised, and integrated into one Chart. This integrated Chart is presented below.

Today, most hospitals consider parents as partners in care. Consequently, when a child is hospitalized, a parent is usually to some degree hospitalized also. Patients and parents are then confined to the same behavior settings. Thus, many of the Seven Dimensions also apply to the parents, albeit in a different way. The extent to which the hospital environment helps parents be supportive and effective caretakers, reduces their stress, and allows for a continuation of daily activities impacts the child's wellbeing. In addition, the staff's ability to work efficiently and happily impacts both the patient's and the parent's wellbeing. Therefore, the parent and the staff Charts were added as two extra dimensions (*Supportive and Efficient Parents, Supportive and Efficient Staff*) to the integrated Chart.

Figure 33 below represents the revised model of holistic healing environments. The figure shows how the nine dimensions of the Integrated Patient Chart directly influence patients and help parents to better support their child. Because the aspects impacting staff's ability to be effective and supportive are different from the patient's and parent's dimensions, the

staff's needs and concerns are depicted separately in Figure 33. The dark arrows represent how the Nine Dimensions directly influence the patient's wellbeing. The dotted lines represent how Seven Dimensions influence the Parents wellbeing to help them better support their child and the five aspects that influences staff's ability to be supportive and effective caretakers.

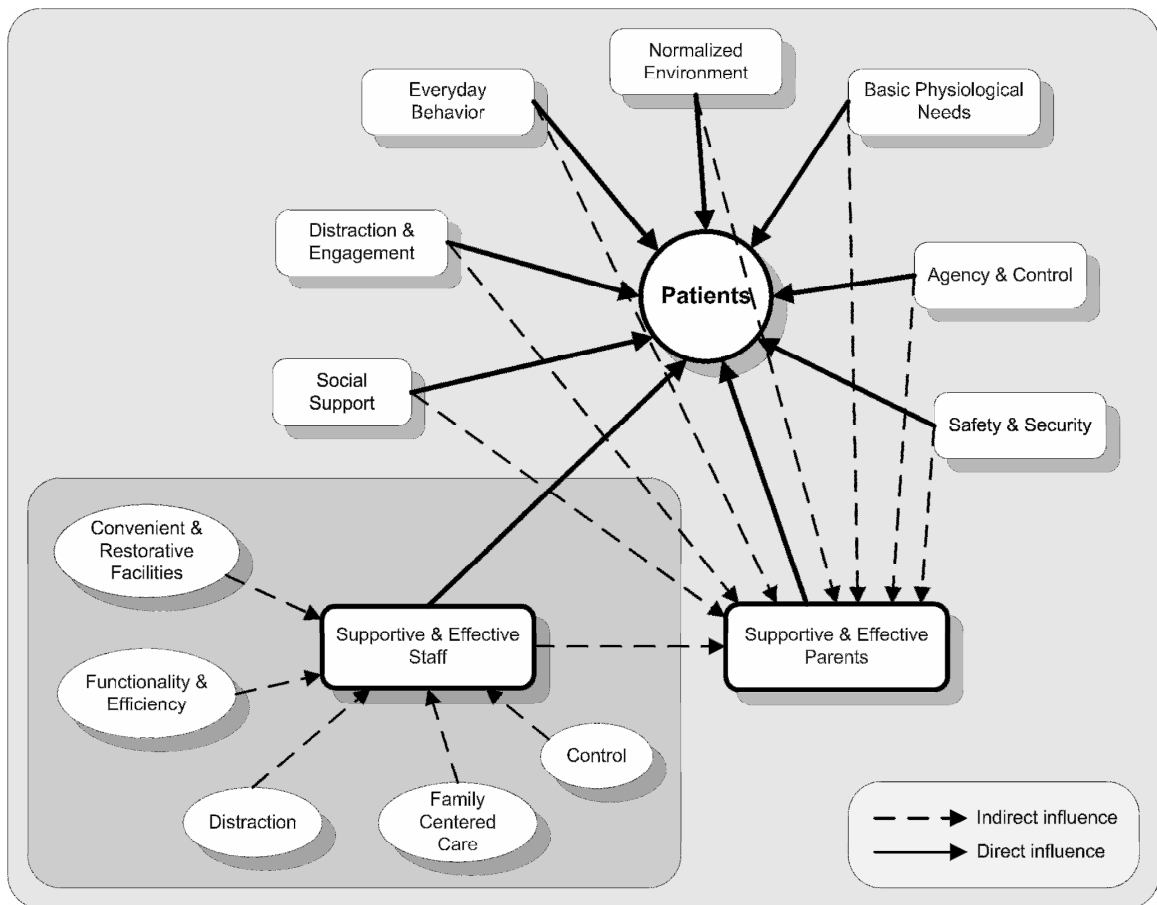


Figure 33: The Revised Model: the Nine Dimensions of the Integrated Patient Chart of Holistic Healing Environments, including the needs and concerns for staff

Based on the Nine Dimensions of healing, an Integrated Patient Chart was developed. The first column of the Integrated Patient Chart presented below contains the Nine overarching Dimensions of healing. The next column contains concepts that are related to the dimension in the first column. The third column gives a description of the design healing relationship,

i.e. what the healing power of a design decision is. This is based on what was found in the literature (Section II) and on the findings of the research presented in Section III. Suggestions for further reading are presented in the final column.

Table 92: The Integrated Patient Chart of Holistic Healing Environments

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
<i>Patients 0 to 18 years</i>			
Basic Physiological Needs	<i>Sleep</i>	Getting adequate sleep and rest. Feeling and being rested. Helps recovery of child. Prerequisite for psychological wellbeing. Create facilities for parents, comfort and quietness, private rooms.	Olds et al., 1987
	<i>Food</i>	Getting adequate food. Meeting appetite. Helps recovery prerequisite for psychological wellbeing. Increase choice of food and ability to make your own in nearby pantry.	F. de Vos, 2004
	<i>Pain</i>	Getting adequate pain relief. Avoid needless suffering. Self-administering of pain medication. Alternatives for pain relief such as place for praying, relaxation, meditation, etc.	F. de Vos, 2004
Feeling Safe & Secure	<i>Safety & Security</i>	Having family support. Having parents stay with child 24/7, need for comfortable facilities for parents in child's room.	Olds et al., 1987; Picker Institute, 1998
		Having (visual) connections to staff. Feeling connected and seen reduces anxiety. Visual connection between bed/room and nursing station.	Picker Institute, 1998; Yeaple et al., 1995
		Knowing the place is being watched. Knowing there is control over entrances & surveillance e.g. controlled access security, cameras, visual openness.	Picker Institute, 1998; Yeaple et al., 1995
		Keeping personal possessions (identity). Bring in things from home to personalize space and make it comfortable for patients (blanket, display books, games, photos, cards, etc.) in patient room and teen lounge.	Shepley, 1998
		Keeping personal valuables. Having a safe place e.g. lockable storage in patient room.	Picker Institute, 1998; Yeaple et al., 1995
		Being cared for. Access to therapeutic help, being able to talk freely to someone (Social worker, volunteer, etc.).	F. de Vos, 2004
		Having access to psychological help. Therapeutic help, being able to talk freely to someone (e.g. social worker, volunteer, psycho-therapist) in a safe environment (e.g. quiet room, playroom counseling room).	F. de Vos, 2004

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
		Reducing transfers. Not being moved around too much, no unnecessary stops and transportations. E.g. change logistics, have acuity adaptable rooms.	Ulrich et al., 2004
		Reducing patient falls. E.g. having the bathroom close to bed	Ulrich et al., 2004
Agency & Control	<i>Perceived & Actual Control</i>	Having control. Perceived control as related to restrictions of institutional environments. Impacts life satisfaction, vigor, depression. Impacts rules, routines and available choices.	Rivlin & Wolfe, 1979; Rivlin, 1981; Schutte et al., 1992;
		Having control. Reduce psychological social uncertainties such as medical equipment and unfamiliar elements in rooms and corridors, etc.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich 1991b; Winkel & Holahan, 1985
		Having visual connections to staff from bed(side). Knowing you can call someone and that they will hear you and come, increases sense of security and lowers anxiety.	Picker Institute, 1998; Yeaple et al., 1995
		Having control over daily rhythm. Control over when to rest, sleep, play, get out of bed, etc. (e.g. light, curtain, TV, playroom, food). Flexibility of rules and availability of facilities are important.	Kari, 1999; Proshansky et al., 1976
		Being able to feel competent. Different levels (age) of stimulation and accomplishment. Having a choice of doing things yourself if possible (e.g. wash, bathroom, heat food, get drinks)	Olds et al., 1987; Winkel & Holahan, 1985; Yeaple et al., 1995
		Having control over noise. Being able to create comfortable sound levels. Use materials that absorb noise, efficient use of alarms and bells in room and corridors and have quiet areas.	Ulrich et al., 2004; F. de Vos, 2004
		Having control over who enters & leaves the room, etc. Knock before entering a room. Door visible to patients.	F. de Vos, 2004
		Having control over lights and temperature in the room.	Olds et al., 1987
		Having control over eating. Being able to eat what and when you want. Increase control over when and what to eat. Being able to get or make own food. E.g. pantry with refrigerator, stove and microwave.	Olsen, 1984; Shepley, 1998
Agency & Control	<i>Perceived & Actual Control</i>	Making it easy to move around when impaired. Considerate of impairments to increase independence e.g. thresholds, obstacles, buttons, signs, and maneuver space.	Picker Institute, 1998; Scher, 1997; Yeaple et al., 1995
		Making it easy to orient and find one's way. Reduce uncertainty and confusion, provide coherence in hospital, use clear cues such as visible entrance, views to the outside, etc.	Carpman et. al, 1985; Evans & McCoy, 1998

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Agency & Control		Making it easy to orient and find one's way. Space cognition and orientation (e.g. human scale, size of building, spatial design, visible signs), avoid institutional aspects in hospital.	Horsburgh, 1995; Nagasawa, 2000; Scher, 1997; Williams, 1988
	Privacy	Having control over privacy. Control over privacy while in room, by having ways to regulate privacy with e.g. curtains, doors, space, etc.	Kari, 1999; Olds et al., 1987; Wolfe, 1978
		Having control over privacy & confidentiality. Exchange of information while being protected from others (visual, acoustic, etc.) by having e.g. consulting rooms or private rooms.	Picker Institute, 1998; Scher, 1997; Winkel & Holahan, 1985
		Providing privacy while being transported. Not being exposed to visitors when wheeled through hospital and have personal identifiers not exposed (e.g. separate elevators & corridors).	Horsburgh, 1995; Yeaple et al., 1995
		Having privacy when using toilet or pan in bed. Embarrassment to be seen or heard (<i>adolescents</i>), create privacy and toilet in or near bedroom.	Hutton, 2002; Kari, 1999; Wolfe, 1978
		Having privacy when showering or being washed. Embarrassment to be seen naked (<i>adolescents</i>). Create privacy in bathroom and have shower curtain as extra boundary.	Hutton, 2002; Kari, 1999; Wolfe, 1978
		Having privacy for grooming. Appearance of hair, clothes, etc. (<i>adolescents</i>). Having laundry and hairdresser.	Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978
		Having privacy while using telephone. Not being heard by others while on the phone (<i>adolescents</i>). Having a private room with phone or private place to call.	Hutton, 2002; Olds et al., 1987
		Having the ability to be alone. Place to unwind (<i>adolescents</i>). Being able to find a private room or place.	Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978
		Having a place to pray or have private conversations. E.g. Chapel, family room, consult room, etc.	Olds et al., 1987; Yeaple et al. 1995
		Having control over social isolation vs. interaction. Dayroom: sociepetal seating better than sociefugal patterns for dayrooms/lounges.	Gross et al. 1998; Holahan, 1978 Sommer & Ross, 1958, Volker, 2002
	Creating places for social interaction. Bedroom size impacts privacy, more social interaction in smaller rooms.	Ittelson et al., 1970	
	<i>Knowing what is going on</i>	Having choices & independence. Having and given choices and knowing why things happen. Create access to sources, empower patients by explaining what is happening.	Kari, 1999; Olds, 1981/ 1987; Scher, 1997; Winkel & Holahan, 1986
		Having access to information. Knowing what is going on. Having access to different resources e.g. library, support groups, internet.	Bearison, 1994; Olds et al., 1987, Scher, 1997

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Agency & Control	<i>Knowing what is going on</i>	Having access to windows from room. Perceptual and cognitive links to external environment. Contact with outside world, orientation, and feeling connected and knowing what is going on (e.g. day, time, weather).	Horsburgh, 1995; Verderber et al., 1987; Yeaple et al., 1995
		Being informed. Understanding who is who in the health team, proper introductions and ways to keep track of who is who.	F. de Vos, 2004
		Learning from other patients. Support from peers in hospital or outside, need for informal meeting places on floor or unit.	Bearison, 1994, F. de Vos, 2005
Social Support	<i>From Inside</i>	Having Family support. Impact on psychological and physiological (stress) and behavioral (social withdrawal) wellbeing e.g. rooming-in for and facilities for parents, being able to see siblings. Facilities for relatives such as Ronald McDonald house.	Olds et al., 1987 ; Picker Institute, 1998; Scher, 1997; Eiser, 1990; Shepley, 1998; Winterberg, 2003
		Having contact with other patients and support groups. Meeting other patients and parents for support, to talk or play with. Create places for informal meeting, age appropriate (play) rooms, lounge, etc. on the floor.	Bearison 1994; Eiser, 1990; Hutton, 2002; Kari, 1999; Shepley, 1998; Winterberg, 2003, Houtzager et al., 2001
		Creating community support. Feeling supported and cared for by community such as special events, donations, food, etc. organized by hospital and volunteers.	F. de Vos, 2004
		Having someone to talk to. Personal attention and comfort for patient and parent such as nurse, volunteer, Child Life, chaplain, etc.	Horsburgh, 1995; Scher, 1997,
	<i>From Outside</i>	Staying in touch with friends/school/ peer network. Support network of friends in hospital or from distance. Provide facilities for friends in the room and a lounge, internet (email & web cam), phone, etc.	Eiser, 1990; Kari, 1999; Picker Institute, 1998; Ulrich, 1991; Winterberg, 2003
Everyday Behavior	<i>Activities</i>	Allowing for a range of activities. Diversion, availability and range of facilities in hospital e.g. games, toys, books, places, videos, computers, arts for <i>all</i> ages. Brought to the bed and outside the rooms.	Krol et al., 2003; Olds et al., 1987
		Optimizing physical activity. Need for movement to stimulate systolic process. Provide destinations for children to go to, and explore the environment	F. de Vos, 2004
		Optimizing need for purposeful activity and movement. Being active, distracted, and avoid boredom, motivate patients to be engaged. Provide interaction around bed and on floor.	Krol et al. 2003; Olds, 1981/ 1987
		Creating a meaningful environment for teenagers. Space designed for and by teenagers, with pantry, computer, couch, etc. on floor.	F. de Vos, 2004

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Everyday Behavior	<i>Activities</i>	Maximizing a continuation of daily activities. Maintain daily routines one has at home with friends and family such as celebrate birthdays, provide space for family gatherings.	F. de Vos, 2004
		Staying in touch with school (education). Schoolwork and electronic learning opportunities in bedroom or in classroom.	Eiser, 1990; Kari, 1999; Krol et al. 2003; Langeveld et al., 2003; Shepley, 1998
		Being able to get fresh air and go outside. Physical access to nature for patient to help recovery e.g. garden, balcony, open window, courtyard. Also accessible for beds and wheelchairs.	Olds, 1987; Scher, 1997
		Staying in touch with outside world. Being able to receive support of family, friends, peers, and community e.g. phone, email, TV, radio, family lounge, meeting places, chairs.	Hutton, 2002; Olds et al., 1987; Winterberg, 2003; F. de Vos, 2004
	<i>Emotions</i>	Feeling free to express oneself. Having positive emotions: laugh, smile. Engage in, events & positive distractions (e.g. movies, clowns, music, celebrate birthday).	Winterberg, 2003 F. de Vos, 2004
		Feeling free to express oneself. Having negative emotions: being angry, sad. Provide ways and place to release tension.	F. de Vos, 2004
		Feeling free to express oneself. Being able to make noise & be loud, to run and express oneself.	F. de Vos, 2004
		Feeling the freedom to express ones culture and religion. Honor cultural differences and life-style e.g. eating, drinking, religious habits, places to pray, meditate, a chaplain, etc.	Olds et al., 1987; Winterberg, 2003
		Stimulating the five senses. Provide appropriate stimulation for five senses, such as music, art, olfactory, touch though hospital.	Malkin, 1993
		Having access to nature. Visual access to nature: plants, pictures of nature, and windows in rooms and corridors	Horsburgh, 1995; Malkin, 1993; Picker Institute, 1998; Ulrich, 1991b
Provide Distractions	<i>Distraction</i>	Providing positive distractions and engagement in daily activities. Psychological, physiological & behavioral wellbeing, reduce anxiety and distress, provide age appropriate stimulation.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich, 1991a+b; Yeaple, 1998
		Having access to restorative places and art. Place to unwind and release stress such as garden, playground, playroom, and private space.	Arneill & Devlin, 2002; Evans & McCoy, 1998; Korpela et al., 2002; Olds et al., 1987; Scher, 1997

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
		Providing adequate interaction for distraction. Limit passive distractions, create things that children can touch, manipulate, interact with, etc.	F. de Vos, 2004
Normalized Environment	<i>Deinstitutionalize</i>	Creating symbolic meaning. A child friendly environment. Qualities to improve healing, use scale and world that represents child Make it less institutional, all levels of stimulation.	Evans & McCoy, 1998; Horsburgh, 1995; Winkel & Holahan, 1985;
		Creating symbolic meaning. Impression environment makes influences perceived quality (e.g. better mood & satisfaction waiting room appraisal).	Arneill & Devlin, 2002; Leather et al. 2003
		Creating comfort and beauty. Pleasing colors and lighting. Make it less institutional: child friendly materials and finishes, comfortable furniture, readable and understandable signs.	Arneill & Devlin, 2002; Evans & McCoy, 1998; Olds, 1981/ 1987; Picker Institute, 1998; Williams, 1988
		Avoiding negative distraction. Minimize noise with materials and less noisy machines Make it less institutional: child friendly materials and finishes everywhere.	Olds, 1981/ 1987; Picker Institute, 1998; Ulrich, 1991a+b; Williams, 1988
		Reducing environmental, physical psychological and social stressors. Minimize medical smell and sound and visual elements. Age 7-17: Unfamiliar elements PICU; pain and discomfort; illness, knowledge, privacy; disruption in relationships.	Tichy et al., 1988
		Maintaining the environment. Show respect, prevent vandalism and destruction.	Gross et al., 1998
		Making it easy to orient and find one's way. Reduce uncertainty and confusion, provide coherence, and use clear cues such as a visible entrance.	Carpman et. al, 1985; Evans & McCoy, 1998
		Making it comparable to home. Create an environment that affords everyday behavior by comparing behavior settings to the home environment	F. de Vos, 2004
		Using of non-toxic products (no PVC)	Olson, 2002
	<i>Diversity</i>	Providing diversity of rooms Kitchen, activity rooms, etc. for more mobility and continuation of daily activities	Olsen, 1984; Voelker, 1994; Williams, 1988
		Creating age appropriate spaces. for Infant & Toddlers, preschool, adolescents. Being with kids same age / gender, for peer support, and sense of belonging.	Olds et al., 1987; Shepley, 1998

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Normalized Environment		Providing comfortable and convenient facilities for parents and friends such as chairs, ability to get drinks, place to gather, etc.	Olds et al., 1987; Picker Institute, 1998; Shepley, 1988
		Creating access to windows. Windows reduce anxiety, depression, and delirium in ICU (from bed).	Keep et al. 1980
		Having windows. Recovery after surgery, view of nature vs. brick wall from window results in less medication, less negative comments, and faster recovery.	Ulrich, 1984
Supportive and Effective Parents	<i>Basic needs</i>	Getting adequate sleep and rest. Feeling and being rested. Helps parent to stay fit to support child. Prerequisite for psychological wellbeing. Create comfortable facilities for parents, comfort and quietness, private rooms.	Olds et al., 1987
		Getting adequate and healthy food. Prerequisite for psychological wellbeing. Increase availability of food and ability to make your own in pantry.	F. de Vos, 2004
		Providing showers for parents. Being able to wash, groom, and use bathroom to feel clean and fresh to better support child.	Olds et al., 1987
Supportive and Effective Parents	<i>Feeling Safe & Secure</i>	Staying with child. Having the ability to stay with child 24/7, need for facilities for parents in patient room.	Olds et al., 1987; Picker Institute, 1998
		Having (visual) connections to staff. Feeling connected and seen reduces anxiety while in room.	Picker Institute, 1998; Yeaple et al., 1995
		Knowing the place is being watched. Knowing there is control over entrances & surveillance e.g. controlled access security, cameras, visual openness.	Picker Institute, 1998; Yeaple et al., 1995
		Knowing someone is with your child. Comfort to leave room for a while or when unable to be with child.	Olds et al., 1987
		Keeping personal possessions (identity). Bring in things from home to personalize space and be comfortable for parent (display books, games, photos, cards, etc.) in bedroom.	Shepley, 1998
		Keeping personal valuables. Having a safe place e.g. lockable storage in room.	Picker Institute, 1998; Yeaple et al., 1995
		Being cared for. Access to therapeutic help, being able to talk freely to someone (Social worker/volunteer, etc.) Also: getting food, drinks, blankets, towels, pillows, etc.	F. de Vos, 2004
Having access to psychological help. Therapeutic help, being able to talk freely to someone (e.g. social worker, volunteer, psychotherapist) in a safe environment (e.g. quiet room, playroom counseling room).	F. de Vos, 2004		

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive and Effective Parents	<i>Perceived & Actual Control</i>	Having control. Perceived control as related to restrictions of institutional environments. Impacts life satisfaction, vigor, depression. . Impacts rules, routines and available choices.	Rivlin & Wolfe, 1979; Rivlin, 1981; Schutte et al. 1992;
		Having control. Reduce psychological social uncertainties such as medical equipment and unfamiliar elements in rooms and corridors, etc.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich 1991b; Winkel & Holahan, 1985
		Having visual connections to staff from bedside. Knowing you can call someone and that they will hear you and come, increases sense of security and lowers anxiety.	Picker Institute, 1998; Yeaple et al., 1995
		Having control over daily rhythm. Control over when to rest, sleep, play, get out of bed, etc. (e.g. light, curtain, TV, playroom, food).	Proshansky et al. 1976
		Being able to feel competent. Having a choice of doing things yourself if possible (e.g. wash, feed child and learn medical procedures).	Olds et al., 1987; Winkel & Holahan, 1985; Yeaple et al., 1995
		Having control over noise. Being able to create comfortable sound levels. Use materials that absorb noise, efficient use of alarms and bells in room and have quiet areas.	F. de Vos, 2004
		Having control over who enters & leaves the room, etc. Knock before entering a room.	F. de Vos, 2004
		Having control over lights and temperature in the room.	Olds et al., 1987
		Having control over eating. Increase control over when and what you eat. Being able to get or make own food. E.g. pantry with refrigerator and stove and microwave	Olsen, 1984; Shepley, 1998
		Being able to take care of self and child while staying on floor. Parents will not leave a critically ill child alone. All crucial facilities should be on floor or unit	F. de Vos, 2004
	<i>Perceived & Actual Control</i>	Making it easy to move around when impaired. Considerate of impairments of visitors e.g. thresholds, obstacles, buttons, signs, maneuver space.	Picker Institute, 1998; Scher, 1997; Yeaple et al., 1995
		Making it easy to orient and find one's way. Reduce uncertainty and confusion, provide coherence, use clear cues such as a visible entrance, views to the outside, etc.	Carpman et. al, 1985; Evans & McCoy, 1998
		Making it easy to orient and find one's way. Space cognition and orientation (human scale, spatial design, visible signs), avoid institutional aspects.	Horsburgh, 1995; Nagasawa, 2000; Scher, 1997; Williams, 1988
		Creating convenient and accessible parking, entrance, elevators, floor, etc. for all (dis)abilities	Picker Institute, 1988

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive and Effective Parents	<i>Privacy</i>	Having control over privacy. Control over privacy while in room, by having ways to regulate privacy with e.g. curtains, doors, space, etc.	Olds et al., 1987; Wolfe, 1978
		Having control over privacy & confidentiality. Exchange of information about child while being protected from others (visual, acoustic etc) by having e.g. consulting rooms or private rooms.	Scher, 1997; Winkel & Holahan, 1985
		Having privacy when using toilet. Embarrassment to be seen or heard by strangers. Create privacy in and around toilet for parents.	F. de Vos, 2004
		Having privacy when showering. Create privacy in and around shower for parents.	F. de Vos, 2004
		Having privacy while using telephone. Not being heard by others while on the phone. Having a private room with phone or private place to call.	Olds et al., 1987
		Having the ability to be alone. Unwinding and being able to find a private room or place.	Olds et al., 1987; Wolfe, 1978
		Having a place to mourn, pray and have private conversations. E.g. Chapel, family room, consult room, etc.	Olds et al., 1987; Yeaple et al. 1995
		Having control over social isolation vs. interaction. Dayroom: sociopetal seating better than sociofugal patterns for dayrooms/lounges.	Gross et al. 1998; Holahan, 1978 Sommer & Ross, 1958, Volker, 2002
	Creating places for social interaction. Bedroom size impacts privacy, more social interaction in smaller rooms.	Ittelson et al., 1970	
	<i>Knowing what is going on</i>	Having choices & independence. Having and given choices and knowing why things happen. Create access to sources, empower parents by explaining what is happening.	Olds, 1981/ 1987; Scher, 1997; Winkel & Holahan, 1986
		Having access to information. Knowing what is going on. Having access to different resources e.g. library, support groups, internet.	Bearison, 1994; Olds et al., 1987, Scher, 1997
		Having access to windows. Perceptual and cognitive links to external environment. Contact with outside world, orientation, and feeling connected and knowing what is going on (e.g. day, time, weather).	Horsburgh, 1995; Verderber et al., 1987; Yeaple et al., 1995
		Being informed. Understanding who is who in the health team, proper introductions and ways to keep track of who is who.	F. de Vos, 2004
		Learning from other patients and parents. Support from peers in hospital or outside, need for informal meeting places.	Bearison, 1994, F. de Vos, 2005
		Having Family support. Being able to see partner and other children while staying in hospital. Facilities for relatives such as Ronald McDonald house.	Olds et al., 1987 ; Shepley, 1998;

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive and Effective Parents	<i>Social Support</i>	Having contact with other patients, parents and support groups. Meeting other patients and parents for support, to talk or play with. Create places for informal meeting, age appropriate (play) room, lounge for parents, etc.	Bearison 1994; Eiser, 1990; Hutton, 2002; Kari, 1999; Shepley, 1998; Winterberg, 2003, Houtzager et al., 2001
		Creating community support. Feeling supported and cared for by community such as special events, donations, food, etc.	F. de Vos, 2004
		Having someone to talk to. Personal attention and comfort for patient and parent such as nurse, volunteer, Child Life, chaplain, etc.	Horsburgh, 1995; Scher, 1997,
		Staying in touch with home front, relatives and work. Support network of relatives, work, home front in hospital or from distance. Provide facilities for parents: lounge, internet (email & web cam), phone, etc.	F. de Vos, 2004
Supportive and Effective Parents	<i>Everyday Behavior</i>	Allowing for a range of activities. Diversion, availability and range of facilities in hospital e.g. games, books, places, videos, and computers.	Krol et al., 2003; Olds et al., 1987
		Optimizing need for purposeful activity and movement. Being active, distracted, and avoid boredom.	Krol et al. 2003; Olds, 1981/ 1987
		Optimizing continuation of everyday activities. Maintain daily routines one has at home, work, with friends and family such as celebrate birthdays.	F. de Vos, 2004
		Optimizing continuation of everyday activities. Wash clothes, laundry facilities.	Olds et al., 1987
		Optimizing continuation of daily activities. Make meals for self and child to stay healthy and active: cooking facilities.	Olds et al., 1987
		Optimizing continuation of daily activities Being able to work in room with child: desk, chair, computer, and internet.	F. de Vos, 2004
		Staying fit and healthy. Stay fit and sane to support child, getting exercise e.g. Fitness facilities for parents.	Olds et al., 1987 F. de Vos, 2004
		Being able to get fresh air and go outside. Physical access to nature for parent e.g. garden, balcony, open window, courtyard.	Olds, 1987; Scher, 1997
		Staying in touch with outside world. Being able to receive support of family and friends, community, peer friends, phone/ email/TV /radio, family lounge, refrigerator for food, chairs.	Hutton, 2002; Olds et al., 1987; Winterberg, 2003; F. de Vos, 2004
Feeling free to express oneself. Having positive emotions: laugh, smile. Engage in, events & positive distractions (e.g. movies, clowns, music, celebrate birthday).	Winterberg, 2003 F. de Vos, 2004		

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive and Effective Parents	<i>Everyday Behavior</i>	Feeling free to express oneself. Having negative emotions: being angry, sad. Provide ways and place to release tension.	F. de Vos, 2004
		Feeling the freedom to express ones culture and religion. Honor cultural differences and life-style e.g. eating, drinking, religious habits, places to pray, meditate, a chaplain, etc.	Olds et al., 1987; Winterberg, 2003
		Stimulating the five senses: Provide appropriate stimulation for five senses, such as music, art, olfactory, touch.	Malkin, 1993
		Having access to nature Visual access to nature: plants, pictures of nature, windows.	Horsburgh, 1995; Malkin, 1993; Picker Institute, 1998; Ulrich, 1991b
	<i>Provide Distraction</i>	Providing positive distractions /engagement in daily activities. Psychological, physiological & behavioral wellbeing, reduce anxiety and distress, provide appropriate stimulation.	Evans & McCoy, 1998; Picker Institute, 1998; Ulrich, 1991a+b; Yeaple, 1998
		Having access to restorative places and art. Place to unwind and release stress such as garden, playground, playroom, and private space.	Arneill & Devlin, 2002; Evans & McCoy, 1998; Korpela et al., 2002; Olds et al., 1987; Scher, 1997
	<i>Normalized Environment</i>	Creating symbolic meaning. Impression environment makes influences perceived quality (e.g. better mood & satisfaction; waiting room appraisal).	Arneill & Devlin, 2002; Leather et al. 2003
		Creating comfort and beauty. Pleasing colors and lighting. Make it less institutional: child friendly materials and finishes, comfortable.	Arneill & Devlin, 2002; Evans & McCoy, 1998; Olds, 1981/ 1987; Picker Institute, 1998; Williams, 1988
		Avoiding negative distraction. Minimize noise with materials and less noisy machines Make it less institutional: child friendly materials and finishes	Olds, 1981/ 1987; Picker Institute, 1998; Ulrich, 1991a+b; Williams, 1988
		Maintaining the environment. Show respect, prevent vandalism/destruction	Gross et al., 1998
		Making it easy to orient and find one's way. Reduce uncertainty and confusion, provide coherence, and use clear cues such as a visible entrance.	Carpman et. al, 1985; Evans & McCoy, 1998
		Making it comparable to home. Create an environment that affords everyday behavior by comparing behavior settings to the home environment	F. de Vos, 2004

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
	<i>Normalized Environment</i>	Providing diversity of rooms. E.g. kitchen, activity room for more mobility and continuation of daily activities.	Olsen, 1984; Voelker, 1994; Williams, 1988
		Providing comfortable and convenient facilities for parents and friends such as chairs, ability to get drinks, etc.	Olds et al., 1987; Picker Institute, 1998; Shepley, 1988
		Creating access to windows. Connection to the outside, distraction, etc.	F. de Vos, 2004
Supportive & Effective Staff	<i>Control</i>	Increasing effectiveness of care. Not too much task oriented, use spatial organization. Reduce work overload stress and mistakes.	Gadbois, 1992; Starfield, 2004;
		Reducing work overload stress such as frequent interruptions during work, standing, activity of doctors and administrative work.	Gadbois, 1992
		Being able to plan to make a schedule e.g. a clock in a visible place. Information & Planning	Shepley, 1998
		Being able to know what's going on in the hospital, floor e.g. blackboards where notes can be posted. Information & Planning	Shepley, 1998
		Being able to know what is going on at a certain day e.g. use of blackboards with notes which change every day. Information & Planning	Shepley, 1998
		Reducing stress & uncertainty Knowledge of rules and procedures. Reduce stress and uncertainty by having written rules and procedures.	Shepley, 1998
		Reducing organizational stress such as adequate staffing and relations with hierarchy.	Gadbois, 1992
		Providing a backstage. Deal with emotional overload. Relations with patients and coping with suffering.	Gadbois, 1992
		Creating privacy & prevent noise from outside. Working without interruptions and, privacy while treating the patient, writing charts, computer, etc.	Shepley, 1998
			<i>Functional and Efficient layout</i>
	Creating efficient adjacencies. Improving efficiency, less time-consuming. Create convenient, separate elevators, corridors for patient transfers	Evans & Mc Coy, 1998; Horsburgh, 1995 Shepley, 1998	
	Reducing walking distances. Reduce number of trips with efficient and self supporting units	Gadbois, 1992; Yeaple et al., 1995	
	Creating easy access to equipment. Place for staff's equipment in each patient room, pods need to be self-supporting, convenient med rooms and supply rooms.	Shepley, 1998	

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive & Effective Staff	<i>Functional and Efficient layout</i>	Reducing traffic time and wayfinding. Quicker transport for patients. Separate entrance and transport paths for critically ill patients.	Shepley, 1998
		Reducing errors. Being able to prevent mistakes and do job well. Enough lighting & space for staff in the patients rooms.	Shepley, 1998; Ulrich, et al., 2004.
		Making hospital accessible. Optimize traveling time for staff, good connections to public transportation.	Olds et al., 1987
		Optimizing access to building. Increase convenience for staff. Separate park area for staff with enough space to park the car	Olds et al., 1987
		Optimizing collaboration. Foster collaboration, create adequate workspace, meeting areas, teaching facilities, etc.	Shepley, 1998
		Convenient and efficient facilities. Reduce travel time, e.g. lounge, stairs, toilet, supplies, med rooms, storage, routing, etc.	Shepley, 1998
		Optimizing layout Well placed nursing stations reduce stress and save time. Nursing stations that oversee the patient rooms.	Olds et al., 1987
	<i>Convenient and restorative facilities for staff</i>	Providing eating and drinking supplies. Coffee machine, pantry, vending machine, etc. on floor.	Olds et al., 1987
		Creating restorative places. When staff has to work more hours/days than usual, comfortable lounge, beds for doctors and residents.	Olds et al., 1987
		Creating restorative places. Place to rest and not work, to refill the battery Nursing lounge away, /not accessible from public and patients.	Evans & Mc Coy; 1998 ; Olds et al., 1987
		Creating convenient and comfortable place to eat, drink and talk and not be on the floor. Staff restaurant with good food and nice views of the outside.	Olds et al., 1987
		Having access to a pantry. Being able to have something to eat A kitchenette on the floor to quickly warm, cook food during the nightshift when restaurant is closed.	Olds et al., 1987
		Getting emotional relief. Coping with the suffering and losses Having a colleague or therapist to talk to, in order to deal with the things that happen on the floor.	Olds et al., 1987
		Providing private space, backstage. Being able to be out of sight.	Goffman, 1969
		Staying connected. Having contact with outside world. Windows with access to the outside, nature views. Knowing what time and weather it is.	Shepley, 1998

Table 92: The Integrated Patient Chart of Holistic Healing Environments (cont'd)

Nine Dimensions of a Holistic Healing Environment	<i>Related Concepts</i>	Design Healing Relationships F. de Vos, 2005	Further Reading
Supportive & Effective Staff	<i>Distraction & contact with outside world</i>	Being able to go outside. Get fresh air. Outside (staff) garden with exercise facilities	Olds et al., 1987
		Reducing stress. Create a more pleasurable work environment with distractions such as art in the units	Shepley, 1998
		Reducing stress. Music for a more pleasurable work environment Stereo (radio) at the nursing lounge (if not too loud: at the nursing station)	Shepley, 1998
	<i>Family Centered Care</i>	Involving parents in care of the child. Parents get responsibility, child gets care from his parents, and it helps staff saving time. Provide information /teaching on how to help with the medical care for the child.	Olds et al., 1987
		Knowing parents are comfortable Knowing that they can eat, sleep, wash themselves and have something to do Reduces stress on staff.	F. de Vos, 2004

THE DIMENSIONS OF THE MODEL REVISED

The Nine Dimensions presented in the Integrated Chart above will be discussed in more detail in this section. One of the goals of this research was to define the dimensions of healing in a holistic context and from a perspective that minimizes disruptions to children's everyday life. Therefore, reaching beyond the boundaries of the hospital building, the dimensions are discussed within the parameters of daily life. To work towards smoother and less abrupt transitions between the home and the hospital environment, the hospital environment ideally should foster the range of activities patients and parents engage in in daily life. There should also be an attempt to arrange spaces in familiar ways.

Often patients are admitted through the ER, making an admission to the hospital unexpected. This can become more complicated if a hospital is located a great distance away

form home. For example, in the MFCH, most patients lived more than an hour away and some as far as three or four hours away. Once at the hospital then, parents often could not return home to arrange things there or fetch belongings such as clothes, toiletries, or work to make their stay in the hospital a little easier. Also, most parents did not want to leave their child alone and stayed with their child the whole time. Sometimes parents would take turns but very rarely would they leave their child unattended. The main reason was, depending on the age of the child, that their absence would upset the child too much or that they did not want miss any procedure done to the child. As a result, they would not eat, drink, shower, or go outside for fresh air unless someone they trusted watched their child or brought them food.

These factors, an unexpected stay at the hospital, living far away, and not wanting to leave their child alone, play a significant role in how parents and patients experienced their stay at the hospital and should be kept in mind when defining their needs and concerns.

The Nine Dimensions are discussed in more detail below. Because the needs and concerns for patients and parents are so closely linked, they will be discussed simultaneously under each dimension. The needs and concerns for staff will be addressed separately.

Minimizing Disruptions to Basic Physiological Needs

The first dimension is Basic Physiological Needs. Basic Physiological Needs are considered to be prerequisites for psychological wellbeing and include getting adequate sleep and food (Olds et al., 1987), being able to wash and groom and, in the case of patients, adequate pain relief. How can hospitals deal with these needs and concerns adequately and with the least disruption?

Sleeping

A child normally sleeps in a familiar environment surrounded by familiar things and knowing that a parent or loved one is nearby. The hospital room is unfamiliar, with strange sounds and activities happening at night, and often without a loved one nearby. For patients, having a parent or guardian with them might be the single most important thing, depending on the age of the child and the seriousness of the illness. Rooming-in facilities in NICU, PICU, and General Pediatrics allow parents to stay with their child and make them feel more comfortable at night. As we saw in Chapter 9, the simple solution of a pull-out sleeping chair can bring parents and patients together more frequently. Without an adequate sleeping facility, parents can even become sick themselves. For example, in the old building I would often hear complaints from parents similar to this one from a mother:

I was so exhausted that I got sick myself [fever]. Just because I was too tired and ate bad or no food.

Noise is another factor influencing sleep compared to home. Constant noise from machines, alarms, telephones ringing, people talking, and staff taking care of other patients makes it difficult to sleep (Ulrich et al., 2004). This can be affected greatly by design changes; private rooms, for instance, solve many of the issues related to noise and privacy. As we saw in Chapter 10, patients and parents said they slept significantly better in the new hospital where they have private rooms.

In general, when thinking of the patient's room as a bedroom, we want to create a calm, soothing environment where lights can be adjusted, curtains can be pulled, and with comfortable sleeping facilities for parents. Familiar objects such as a blanket or comforter, music, dolls, pictures, drawings help to make both the parent and patient more at ease.

Separate nurse, patient, and parent zones in a room maximize the ability of, for example, staff to take care of the child without waking the parents up and for parents to read or work at night without disturbing the child.

Eating

In order to get better, patients need to eat adequate meals. Also, parents who stay with their child in the hospital need to be able to eat in order to stay fit to take care of their child. As my study showed, this is usually not easy in a hospital. Food was one of the most predominant complaints in my study. Patients were confronted with limited choices, food that was served at strange hours, or simply with things they did not like. Nurses on the pediatric unit told me:

There are no good choices for kids. They have the same choices as the rest of the hospital. There should be more appropriate choices, even if they are not healthy ones because it is so difficult to get some kids to eat.

In daily life, parents prepare food for their children and have dinner together with them. Mothers would often tell me that they would prepare food in the hospital for their child if that were possible, just to make their child eat. Not eating well and/or having to leave your child to get food are unnecessary stress factors in a hospital. A nurse reported:

There is nothing for parents in the current situation. We have nothing to offer them (crackers, soup) if they can't afford to buy. Why can't a parent meal be added to the child's bill? It would really increase the satisfaction if parents could have meals with their children. In real life, you have family dinners. Here you can't even eat together.

A mother typically complained:

Food should be provided for parents as well as the children, so that we as parents don't have to leave our child's bedside to eat.

A particular concern is mothers still breastfeeding their babies in the hospital. Many nurses told me that they see it as the hospital's responsibility to feed these mothers because it is crucial for the child's healing process that mothers stay healthy themselves.

Whether food is provided to parents by the hospital or not, facilities such as a refrigerator should be available were patients and parents can keep food brought from home or given to them by others, facilities where they can prepare simple meals, and a place on the units for families to have a meal together. A physician summarized it nicely:

Don't punish them with hospital food, get the food they like!

Wash and Groom

It is important for parents to feel clean and fresh in order to better support their hospitalized child. They need to be able to wash, groom, and use a bathroom nearby their child. If the bathroom is too far away, they are less likely to use it, because, as this study consistently confirms, they do not want to leave their child unattended.

Providing visual and acoustic privacy to all users of the bathroom, especially adolescents and parents, is another important concern. Not having privacy may cause considerable stress for parents and adolescents. A mother reported:

Even taking a shower was hard. I had to go to another unit, to shower in a room with four patients and parents in it. Do you know how embarrassing and uncomfortable that is to step into a room with patients and parents?!

Another said:

I always felt embarrassed because I thought I would be in the shower too long.

Since a hospital stay is often unexpected, parents and patients rarely bring clean clothes or toiletries to the hospital to make their stay more comfortable. Therefore, as we saw in Chapter 10, a place to wash clothes and buy some toiletries in the hospital can greatly improve the parents wellbeing and, in addition, lower the burden on staff who are otherwise likely to take care of the parent by finding ways to provide toiletries and get new or clean clothes.

Pain Relief

Providing adequate pain relief to avoid needless suffering in children may not be directly linked to the environment. However, besides allowing children to self-administer pain medication to give them some sense of control, through design one can create alternatives for pain relief such as places for praying, relaxation, and meditation. Teenagers, especially, often mentioned that they would like to have a place for teenagers to pray and meditate (F. de Vos, 2004).

Maximizing Sense of Safety and Security

The second dimension is Feeling Safe and Secure, as we tend to be at home or in a familiar environment. In a strange environment, especially when feeling sick or when in pain, we feel vulnerable, less safe, and anxious. How can we reduce these feelings of anxiety and maximize the sense of security in a hospital?

For young patients, having a parent or loved one stay with them 24/7 is likely the most effective way to enhance their sense of safety and security (Olds et al., 1987; Picker Institute, 1998). This study showed, as seen in Chapter 10, that the more comfortable and supporting the facilities for parents, the more likely parents will stay with their child and the better they

support their children. When I asked parents what they would change in the old hospital if they could change one thing, a mother wrote:

A more comfortable environment for parents who are there to support and take care of their sick child. A parent who is happy and comfortable is a much better provider for the child.

Another very important way to increase the sense of security for patients and parents is having (visual) connections to staff from the room even while in bed. This enhances the feeling of being connected to and being seen by staff which reduces feelings of anxiety and alienation (Picker Institute, 1998; Yeaple et al., 1995). As the data showed in Chapter 10, patients and parents felt more secure in the new hospital where, in contrast to the old building, they did have visual connection to staff from the room.

Another way to enhance a sense of security is by surrounding patients and parents with familiar objects such as their blanket, pictures, drawings, books, cards, and religious objects. Bringing things from home to personalize the room helps patients and parents be more comfortable and to reinforce their identity (Shepley, 1998). Questionnaires and observations in the old and the new hospital showed that patients and parents were more likely to personalize the private rooms in the new hospital than when sharing a room in the old hospital. When bringing in personal belongings, patients and parents also indicated that they had no place to keep personal valuables in a safe place, e.g. lockable storage. Parents would sometimes use their car as storage if they had to leave the room for a procedure with child. Having a lockable storage increases mobility and a sense of safety (Picker Institute, 1998; Yeaple et al., 1995).

As hospitals become more spacious and more open, more areas are left unsupervised. Due to fire regulations which require a certain number of exits per square foot and within certain distances, the number of entrances and exits also increases. This creates a conflict between openness, which is welcoming, and safety. In line with other studies (Picker Institute, 1998; Yeaple et al., 1995), my study showed that patients and parents want to know the place is being watched, that there is control over entrances, surveillance of units and corridors, and controlled access to the units. With the number of entrances and exits increasing and relatively less staff to supervise or welcome people, this is not always the case and leads to a threatened sense of safety and security.

This threatened sense of security relates to a concern for parents who can not stay with their child. Even though the new hospital had more security guards walking around, parents often did not feel safe. The unsupervised space and entrances clearly detracted from a feeling of comfort. My study confirms what Olds et al (1987) pointed out: parents need to know someone is with their child or watching her so they feel comfortable leaving. This addresses an interesting dichotomy in today's hospitals. On the one hand we want to foster openness in hospitals and ease the boundaries but on the other hand there seems to be a growing need for supervision and security.

My study showed that being cared for by staff or volunteers can also greatly contribute to a patient's or parent's sense of security. An unexpected gesture, such as a nurse or volunteer offering a blanket or pillow, a cup coffee, or a telephone card can make all the difference. For instance, an eight year old girl, when asked what made her smile in the hospital, wrote:

The candy cart lady makes me smile.

The candy cart lady was a volunteer at the MFCH who would go around the patient rooms three to five times a week with a cart full of things to brighten a person's day: a cup of coffee, home made brownies, soup, crayons, and nail polish or coloring books. Such personal touches and the feeling that someone cares and thinks of you positively impacted many patients and parents. Also, access to an interpreter if needed and being able to talk to someone (e.g. social worker, volunteer, and psychotherapist) makes patients and parents feel more secure.

Another kind of safety is limiting the risks of being in a hospital. According to recent research, a visit to a U.S. hospital is dangerous and stressful. Medical errors and hospital-acquired infections are among the leading causes of death in the United States (Ulrich, R. & Zimring, C., 2004). New studies now focus on how to increase patient safety by reducing medical errors, patient falls, increasing infection control, and reducing transfers. Patient safety was also a concern for parents in my study:

My child was very sick in the old PICU, so I was always nervous about other infections. Sharing the room with other patients was scary. Here, even the pediatric intensive care has private rooms.

Maximizing Agency and Control

The third dimension is Agency and Control. As a patient in a hospital, one usually loses control over aspects we tend to take for granted in daily life such as when to get up, what to wear, where to go, what to do, to be alone, or be with someone, etc. Institutions tend to limit our control and thus negatively impact our sense of agency. How can hospitals optimize and increase patients' and parents' control over and access to aspects such as knowledge, privacy, decisions, independence, and freedom of movement?

Perceived and Actual Control

In a hospital, perceived control by patients and parents is likely to be lessened by the restrictions that come with an institutional environment (Rivlin & Wolfe, 1979). As Schutte et al. (1992) pointed out, an individual's perceived control over the environment can influence aspects such as health, self-esteem, anxiety, depression, activity, and satisfaction. Consequently, perceived control over the hospital environment plays an important role in the sense of agency one feels. For instance, restrictions related to the child's illness such as not being allowed out of bed for medical reasons are very different from implicit or explicit rules limiting a child's mobility or a non-supportive environment that limits the freedom of movement. The data presented in Chapter 10 clearly show that a more inviting and challenging environment and flexible rules can significantly enhance a patient's mobility and range of activities. In the old hospital, people preferred staying in their rooms. The new hospital, in contrast, as mentioned by a Child-Life specialist:

...promotes independence for patients and parents. Parents and patients seem more comfortable and explore the environment. Before, we would have to tell parents where the playroom was or the cafeteria; now they often have found it themselves.

The data of my study also showed that perceived control over who enters and leaves your room and what happens in the room is significantly improved when given a private room. In the old hospital I would often get comments from parents and patients such as:

When sharing a room you have no control over anything.

As we saw in Chapter 10, patients and parents not only had more actual control over whether the door was open or closed and what happened in the room but it also changed the dynamics between staff and patients and parents because the room now belonged to

them more than to the staff. As a result, knocking by staff members, a normal courtesy when wanting to enter a room, had returned in the new hospital and was often mentioned as big improvement in the new hospital both by patients and parents. A 14-year-old boy wrote as his favorite thing in the new hospital:

I like that everyone knocks before coming in.

Another form of control is actual control over the environment (Olds et al., 1987). At home, we can regulate the temperature, open windows, dim lights, control noise, etc. In a hospital, this is often not the case. The data in Chapter 9 show that satisfaction and wellbeing increases if patients and parents do have control over lights, temperature, windows, and noise in the room. Interviews with staff pointed out that when parents do not have control over these aspects this results in complaints with nurses which increases the stress and frustration for staff because often they can not do anything to solve it. A father with a lot of experience in both hospitals said:

The rooms here are much more pleasant and beautiful with the three colors on the wall and the wood. And you can control the lights, which gives you some control over something! Also finally a phone! There was none at the old PICU. Now I can work from here.

Maximizing the patients' and parents' ability to eat and drink what and when they want by being able to get or make their own food also increases the sense of control (Olsen, 1984; Shepley, 1998). As we saw in Chapter 9, observations showed that the facilities in the new hospital such as a pantry with refrigerator and a microwave were used by older patients and parents. However, it was often mentioned by parents that they would prefer their own refrigerator in the room and more facilities on the floor to cook a meal for their child. Also,

many parents suggested providing them with takeout menus to order food from outside the hospital and have it delivered to the main lobby.

As pointed out before, proximity of facilities for parents such as a shower, vending machines, or a pantry significantly increases their control to take care of themselves and their child while not leaving their child alone for too long. Therefore, all crucial facilities should be on the floor, possibly even in the unit.

Our sense of control can also be undermined by a new, unfamiliar, and inaccessible environment. The less unfamiliar equipment, sounds, and smells we are exposed to in corridors, rooms, and waiting areas and the more readable and comforting the hospital is, the more psychological uncertainties and stress can be reduced (Evans & McCoy, 1998). The old hospital's hallways had shiny floors and gloomy lights and the corridors were cluttered with medical equipment, machines, and beds making it a sometimes eerie place. In contrast, the new hospital's corridors were carpeted, had indirect warm lighting, and equipment was less exposed making you sometimes forget you were in a hospital. Avoiding institutional aspects is an important aspect of creating a healing environment and reducing uncertainty and confusion.

In a new and strange environment, it can be difficult to find one's way. Despite the fact that so much research has been done on wayfinding, it still seems to be one of the most difficult things to solve in hospitals. A dad, when comparing the old to the new hospital, told me:

The signage in the old place was very intimidating, telling you all the things you can't do. Here it is more friendly, but signage is not very informative. I'm a boy scout, but I got lost here.

Aspects mentioned in the literature to improve wayfinding are: providing coherence, and using clear cues (Carpman et. al, 1985), human scale, spatial design, and visible signs, (Horsburgh, 1995; Nagasawa, 2000; Scher, 1997; Williams, 1988). Not only the building itself but also the surroundings and parking facilities have to be accessible and easy to find. The less readable, understandable, or considerate of age and impairments, the more dependent and stressed patients and visitors will be upon entering the facility (Picker Institute, 1988; Scher, 1997; Yeaple et al., 1995).

Privacy

Another important issue is privacy (Horsburgh, 1995; Olds et al., 1987; Picker Institute, 1998; Sher, 1997; Winkel & Holahan, 1985). In daily life, we generally control with whom we spend time and when, what information we share with others, who can see us undressed and who not, and our ability to be alone. In a hospital, this is quite the opposite; it is determined for us with whom we will share a room, when and how many friends can come visit, when information is shared, and by whom. We are wheeled down corridors with personal identifiers exposed, nurses and doctors talk about us without us being present, we share bathrooms and showers with strangers, and very personal information is overheard by roommates and their visitors. As shown in Chapter 7, these kinds of invasions of privacy can cause stress, embarrassment, and anxiety.

One's perception of privacy is defined by an environmental dimension that is composed of three elements (Wolfe, 1978). First, the environmental dimension has a cultural element set by the mores of a community. Second, it has a socio-physical element defined by the ecological and physical properties of a setting that define human behavior. Third, it has a life-cycle element: privacy experiences will apply differently to individual at various stages of

the life cycle. The different stages and concepts of privacy should be taken into account when designing a children's hospital. My study confirmed that the environment needs to allow for privacy and independence for different age-groups with differing needs. For instance, teenagers made it clear in interviews that they have very specific privacy demands that were often not met in the old hospital. Adolescents mentioned feeling embarrassed to be seen or heard when going to or using the bathroom or a bedpan or the possibility of being seen naked when showering or while being washed. Bathrooms in the room with additional curtains around the shower and curtains around the bed help to assure the level of privacy adolescents need (Hutton, 2002; Kari, 1999). Also, appearance of hair and clothes can be a reason for embarrassment and uncertainty for adolescents defining the need to groom in privacy and to have a laundry facility and hairdresser (Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978). A 16-year-old girl wrote about the new hospital:

Privacy is very important in the room and bathroom. I like that everyone knocks before they come in.

Sometimes it is argued that double rooms are needed for patients who do not have parents who stay over to give them company. However, when asked, almost all patients and parents in this study professed to prefer a private room over a shared room. Being exposed to other sick children or sharing the room with another family was experienced as very stressful.

An interview with a father, who spent many years in the old and the new hospital with his two children, told me:

The new PICU is great. Private rooms, space, quiet. So much better. In the old place, when my child was very sick, I was sure my son was going to die, with all these alarms and nurses not responding (they know what it means, but we don't). It was crowded, there was no privacy, and you were exposed to other patients. There

was one child with cancer, and one very deformed patient. You could see and hear everything, which was very disturbing and stressful. You just don't want to deal with that, because you can't. Here there is no visual invasion, and you do not hear doctors or nurses talk about patients.

And as a child cries somewhere in the PICU he says:

... this is the first time I hear a child screaming, what a difference from before!

Both adolescents and parents need to be able to talk privately on the phone where they can not be heard by others (Hutton, 2002; Olds et al., 1987). Again, private rooms can provide this kind of privacy. In addition, patients and parents need to be able find a place to be alone and to unwind, have a place to mourn, pray, and have private conversations (Hutton, 2002; Kari, 1999; Olds et al., 1987; Wolfe, 1978). The old hospital barely supported any of these needs as was often pointed out by parents. The new place however, adequately supports these needs. As a father in the new PICU told me:

Now there is a place for grieving, in the room, in the kitchen, or in the consultation room. Before, if a child died, parents were grieving in the hallway. The old family lounge was like a bus stop, it was always crowded. The drawback is that you are isolated from other parents. I've been here for five weeks, but do not know who is here. There are times it is useful for parents to talk to one another.

His comment illustrates another interesting aspect I would often hear in the new hospital — the need for having places for social interaction. Because most patients now have private rooms, parents especially mentioned the need for a meeting place in the new hospital in the evenings when the child was sleeping. This will be further addressed under the dimension Social Support.

A more general but very important need for privacy is confidentiality around exchange of information (HIPPA or federal privacy regulations). My study showed that parents and patients experience it as very stressful if they feel others can overhear what is being said. A mother described the difference between the old and the new facility as follows:

Here, unlike the other place, are things to distract you and take your mind of the situation for a while. Here it is definitely more serene. There is more privacy, and you can finally have a one on one conversation with the doctors.

Being Informed

In daily life, we are confronted with choices all day long: what to wear, whether to eat another sandwich or not, do our homework now or later, play with a friend or alone, etc. In the hospital setting, we lose control over many of these choices and thus some of our independence. As mentioned above, institutional settings typically constrain our behavior and limit our freedom of choice (Rivlin & Wolfe, 1979). Therefore, changing the physical elements of an institution is not enough to truly change its institutional character (Rivlin et al., 1981). Thus, one also has to change the culture, rules, and policies of a hospital to truly create a holistic healing environment. For instance, as shown in Chapter 10, patients' and parents' access to information about treatment and medication did not change much in the new hospital. Clearly, this aspect was impacted more by the policies of the hospital and its rules than by its design and compromised patients and parents need to know why things happen, what is going on, and be given a choice (Kari, 1999; Olds, 1981 & 1987; Scher, 1997; Winkel & Holahan, 1986).

However, design also plays a role, as became clear when comparing the old and the new NICU. In the new NICU, as was shown in the data comparison in Chapter 10, parents felt

they had less access to information and were less informed in the new hospital. According to staff, this has to do with the new unit being so spread out in comparison to the old one, that parents no longer have the almost unlimited access to nurses and attending physicians they had before when they were all cramped into four small rooms. Parent and patients indicated that they wanted to know who is who in the health team and to have access to information and different resources such as a library, support groups, and the internet. The fact that the new hospital did not have internet access in the rooms was often mentioned as an omission by teenagers and parents.

In daily life we learn from the people around us such as our peers, friends, and family. Sharing experiences, learning from other patients and parents, and supporting each other appear to be just as important in the hospital environment (Bearison, 1994). Therefore, as mentioned before, it is very important to create formal and informal meeting places for parents and patients especially if the hospital has private rooms.

Another aspect of staying informed is having contact with the outside world. In my study, patients and parents indicated that being able to look out of a window was highly valued. Having access to a window provides perceptual and cognitive links to the external environment. Contact with the outside world is important for orientation and feelings of connectedness such as knowing what time it is, what the weather is like, and whether it is day or night (Horsburgh, 1995; Verderber et al., 1987; Yeaple et al., 1995).

Facilitating for Social Support

The fourth dimension is Social Support. Having family support while in the hospital impacts psychological, physiological (stress), and behavioral (social withdrawal) wellbeing of patients

and parents (Olds et al., 1987; Picker Institute, 1998; Scher, 1997; Eiser, 1990; Shepley, 1998). As shown in this study, the most important form of support is parental support for children. Therefore, rooming-in facilities should be provided so parents can stay with their child. As shown in Chapter 10, the need for parental support even increased in the new hospital when patients were mostly staying in private rooms.

Social support can be experienced in many different ways. Support can be found in the hospital, through contact with other patients, parents, or support groups. Bearison (1994) pointed out that cancer patients often learn most about their illness through other patients and also find a great deal of support by sharing their thoughts. Therefore, a hospital should have places for informal or casual meeting, age-appropriate rooms for play, dedicated space for teenagers, and a lounge for parents (Eiser, 1990; Hutton, 2002; Kari, 1999; Shepley, 1998; Houtzager et al., 2001).

Interviews from my research presented in Section III pointed out that meeting other patients and having a place to go to with them or with friends was often mentioned. Teenagers especially felt that there was no appropriate place for them to go in the new hospital. In describing the place they would feel comfortable in, a lounge with couches (“like in [the TV-series] ‘Friends’”), a place to pray, play music, read books, and use computers, and video games were often mentioned. Also, personal attention for patients and parents from a nurse, volunteer, Child Life, chaplain, and especially from the candy cart lady significantly contributed to the feeling of being supported.

An important aspect in the maintenance of everyday life for patients and to assure a smoother transition in and out of the hospital is the ability to stay in touch with the outside world by seeing friends, school, and peers (Eiser, 1990; Kari, 1999; Picker Institute, 1998;

Ulrich, 1991; Winterberg, 2003). For instance, the interviews at the WMC pointed out that children wanted to stay in touch with school and their friends and siblings. If this was not possible, it was experienced as upsetting and stressful. Visits from friends and family, having a parent stay over, and having access to a phone and email were cited as important ways to stay in touch with everyday life.

Also, interviews in my study pointed out that, for parents, staying in touch with home, relatives, and work while in the hospital reduced feelings of isolation, anxiety, and stress. A mother who stayed in the hospital with a sick child often implied that siblings were taken care of by the father or by other family members. Staying in the hospital full-time was extremely stressful for the parents for many reasons. Thus, contact with home and family (other adults) is an important outlet for the one who remains in the hospital. Therefore, access to a phone and email is considered crucial in order to stay in touch with home, work and friends, and also to find more information online about a child's illness or treatment. Also, additional services such as an in-house Ronald McDonald house, can bring families together. A mother in the new PICU told me:

Having the in-house Ronald McDonald house is great. Her dad could come more often and spend the night, instead of driving seven hours in one day. It's hard if you live that far away; you're more isolated from family and friends.

A father, who spent many years in the hospital with his two children, told me when comparing the old and the new PICU:

It is a good thing that siblings can come and visit, in the old place that was impossible.

An attractive, soothing, comfortable environment with space and facilities for families and friends is more likely to bring social support to the hospital. A mother in the new hospital told me:

Her sister loves coming here. She is the best medicine for her. It makes my daughter feel better to have her sister around, she wanted to get up and play. She even walked when she saw her.

Especially with frequent hospitalizations, normal family routines and traditions are seriously disrupted. Therefore, it is important that a family can spend time together, eat together, pray together, celebrate a birthday together, etc. The more the environment adequately meets and supports these concerns, the more a continuation of these normal patterns can take place.

As one of the mothers wrote when comparing the old to the new hospital:

My family wanted to come and visit me but there was no place for them to sit or even come into the room. Here we can be in this room or go to a lounge. Now my eight-year-old can come, while that was very difficult before.

When the hospital is a great distance from home, school, or work, facilities such as computers with internet access, email and webcams, and accessible phones (in the room) are ways for patients and families to stay in touch. As mentioned before, social support can also come from the community through special events organized in the hospital such as dogs visiting, concerts, clowns, magicians, dinner parties, food donations, donations of clothes, baby blankets, beanie babies, balloons, and so forth.

Facilitating Everyday Behavior

The fifth dimension is Everyday Behavior which focuses on important aspects of daily life related to wellbeing and development such as freedom of choice and mobility, routines, rhythms, all a continuation of daily activities.

This becomes particularly important when children are hospitalized for a long time or frequently because they suffer from a chronic disease. It is important to minimize the ways that the hospital environment disturbs children's social and emotional life and their schoolwork (Winterberg, 2003; Olds & Daniels, 1987). How can we create a nurturing environment where development is supported and stimulated to allow for normal development even during hospitalization?

Daily Activities

Usually when we are sick and especially when we are hospitalized, daily routines and activities are suddenly disrupted. As pointed out by Tichy et al., (1988) and confirmed by the data from my study, the disruption of contact with peers, school, family, activities, and work is experienced as stressful by children and parents. The moment patients are well enough, they want to be active and engaged in purposeful activities and movement. As was shown in Chapter 10, an environment that is inviting can motivate patients to get out of bed, go places, and to be engaged in activities. The environment needs to provide destinations, interactions, diversion of activities, and an availability and range of facilities for *all* ages such as games, toys, books, places, videos, computers, and arts (Krol et al., 2003; Olds et al., 1987). The comparison of data in Chapter 10 confirmed that a more appealing environment with clear destinations and places to go for patients and parents significantly increased (3.5

times) the mobility of both patients and parents. In addition, in the new hospital, a wider range of activities that patients were engaged in was seen showing that with a more interesting and diverse environment one can actually motivate patients, even those who are very sick, to come out of bed and become engaged in some kind of activity.

A group of patients often neglected are teenagers. Studies conducted by Hutton (2002) and Kari (1999) show the specific needs and concerns of this age group. Hospitals often provide specific spaces for infants, toddlers, and school-age patients but not an area specifically designed for and by teenagers. This age group, however, is most likely to be affected by the disruption of daily routines, contact with friends, and school. My study indicated that there is a great need for spaces designed for and by teenagers to provide a meaningful environment that allows for independence and privacy and has a range of facilities such as a pantry, computers with internet access, couches, music, and a TV.

A continuation of routine activities includes staying in touch with school. Opportunities for schoolwork, teaching, electronic learning, and taking exams while in the hospital should be provided in the bedroom or in a classroom (Eiser, 1990; Kari, 1999; Krol et al. 2003; Langeveld et al., 2003; Shepley, 1998). When I asked a teacher in the MFCH why she thought it was important to continue school in the hospital, she said:

Teaching gives hope to the child, because it is about the future. That outlook is important for a child to get better; you have to think positive, never negative, even if the child may not make it.

When I asked her if she thought teaching in the room was better than teaching in a classroom, she said:

School should be outside of a child's room so they get motivated to get out and feel less sick. A classroom would be great, then kids can talk to other children, share experiences about the hospital and about their illness.

Usually an important part of our daily routines also includes social events: meeting friends, going out, having dinners, or celebrating a birthday (Hutton, 2002; Olds et al., 1987; Winterberg, 2003). As pointed out before, being able to stay in touch with the friends by phone, mail, and email, to have friends and family come over, to celebrate a birthday with loved ones, or to have family dinners are important aspects of approximating everyday life. In my study, the candy cart lady became an important new reliable and friendly routine for the patients and parents in the hospital.

Daily routines for parents include being able to wash clothes, being able to make meals for oneself and one's child, staying healthy and active by getting exercise to better support child. A place to participate in daily routines such as washing their clothes, exercising, cooking, or having a meal together was often mentioned by parents. Said one mother:

I would definitely use the gym here once it opens, I used to walk up and down the stairs in the old building, just to get some exercise to keep me sane.

To minimize long term disruptions for working parents and to maximize their ability to be with their child and provide support, parents need to be able to work in the room with their child. Parents in this study often indicated that facilities such as a desk, chair, and a computer would have made their lives a lot easier and less stressful.

Expressing Emotions

In daily life children usually get to express themselves. They run, play, scream, laugh, and cry. In hospitals too, it is important that children feel able to do these things (Winterberg, 2003).

For instance, in the new hospital, positive emotions such as laughing and smiling were often expressed when playing together or during happy events such as watching a clown, listening to music, and celebrating a birthday. For the expression of negative emotions, means and locations to release tension need to be provided, for instance being able to make noise and be loud, to run, and be wild.

Providing True Distraction and Engagement

The sixth dimension is Distraction and Engagement and relates to the need for children to engage in activities so that they can take their mind off being sick. Providing positive distractions and possibilities for engagement increases psychological, physiological, and behavioral wellbeing, reduces anxiety and distress, and provides appropriate stimulation (Evans & McCoy, 1998; Picker Institute, 1998; Ulrich, 1991a&b; Yeaple et al., 1998).

In contrast to Everyday Behavior, which is mainly about maximizing the ability for patients and parents to do things they do at home, the dimension Distraction and Engagement is about special attractions, events, and services. The purposes of these events, attractions, and services are to make the hospital less institutional, more interesting and beautiful, to attract visitors, involve the community, and to make the lives of patients and families less stressful while in the hospital. The old hospital did not have many such distractions while the new hospital does, such as a huge fish tank in the lobby, a large doll house, a sports arcade, and a doll collection in the corridors. A mother at the new PICU who spent three years with her 11-year-old daughter in the old building told me:

Here, unlike the other place, are things to distract you and take your mind of the situation for a while.

Children prefer things they can play with, touch, manipulate, and interact with (Olds et al., 1987). In this study, it was clear that attractions or places that were interactive such as a fire truck, the art room, and the computer room were used significantly more than non-interactive attractions such as the doll collection or doll house that are both behind glass. Also, many of these attractions were too distant from the patient's room and inaccessible for bedridden children. Furthermore, the use of distraction should be secondary to the holistic emphasis of my model where the goal is for a child to find opportunities for engagement in a rich and accessible environment at all times, not just on special occasions. Thus, when designing a children's hospital, distractions and engagements should be aimed at children of different ages and all levels of mobility and should provide appropriate amounts of interaction so children can be distracted.

Patients who are too sick to get out of bed and those that are in isolation should have visible distractions by having windows to activities and the outdoors. Opportunities for distraction and engagement should also be designed to serve patients in bed or in a wheelchair and should be interesting to all ages. In addition, as shown in the data in Chapter 10, a pleasant and attractive environment is more likely to attract visitors, siblings, and friends and thus enhances social support and community involvement.

Moving Towards a Normalized Environment

The seventh dimension, A Normalized Environment, encompasses those aspects that de-institutionalize the hospital environment. How can we make the hospital a less stressful and fearful place and enhance comfort and beauty for children and families?

As pointed out in the literature, we can improve healing and reduce stress by creating a child-friendly environment that has symbolic meaning, uses a scale and world that represents children, and focuses on all levels of stimulation (Evans & McCoy, 1998; Horsburgh, 1995; Winkel & Holahan, 1985). Comfort and beauty can also be created by using pleasing colors, lighting, child friendly materials and finishes, and by avoiding negative distraction (stressors) such as noise and unfamiliar objects (Evans & McCoy, 1998; Olds, 1981/1987; Picker Institute, 1998; Ulrich, 1991; Williams, 1988). Many of these elements were employed in the new children's hospital. The findings of my study confirm that patients and parents valued the new hospital as more aesthetically pleasing than the old hospital. They also rated the patients' rooms, the hospital as a building for children, and the overall looks higher in the new hospital than in the old hospital. A mother said about the new hospital:

The lobby and hallways are more like a hotel now, before they were very institutional. The lobby is underused though, but it is nice that it is there, it makes it a nicer place.

Another way to conceptualize a normalized environment is to compare the hospital to the home environment. When asked in the questionnaires in my study, patients and parents indicated that, in the new hospital, they no longer valued their rooms as worse than home but as equal to home.

A father with years of experience in both hospitals described what effect the new hospital has on him:

A much lower blood pressure, because it is quieter and there is more privacy. I'm much more relaxed here, in the old place I had to stand most of the time next to my child. Here it is much more peaceful.

Research has shown that a pleasant environment can also influence how people perceive the quality of care positively. It can improve mood, alter physiological state, and improve overall satisfaction (Arneill & Devlin, 2002; Leather et al. 2003). In the old building, parents, patients, and staff often complained about the poor maintenance of the hospital. Damaged chairs, chipped walls and paint, and broken lights, TVs, and telephones were felt as neglect, to wit, a lack of respect. Some people even made inferences about the medical care hoping it would not be as poor as the building. Maintaining the environment is therefore an important aspect of comfort, beauty, and satisfaction. Keeping the building clean and fixing and replacing broken things shows respect to its users and prevents vandalism and destruction (Gross et al., 1998).

Even high-stress environments benefit greatly from a continuation of everyday routines. The PICU in the old building was highly institutional. The four categories of stressors for patients and parents in the PICU as defined by Tichy et al. (1988) all applied to the old hospital. There were environmental stressors (e.g. unfamiliar elements, medical smells, noise, other patients), physical stressors (e.g. factors producing pain, disruption of sleep and eating), psychological stressors (e.g. lack of privacy, inadequate knowledge), and social stressors (e.g. disruptions of relationships with family, friends, and school). In the new hospital, however, many of these changed for the better. For instance, private rooms took care of noise, other patients, disruption of sleep, and lack of privacy. Social stressors were greatly diminished because family and friends were now allowed to visit and even had their own family areas with a pantry, TV, shower, etc. This not only benefited the patient but also helped parents and visitors to better support their child or friend.

As mentioned before, in order to reduce uncertainty, confusion, and stress and to make it easy to orient and find one's way, the hospital should be easy to read and coherent and use clear cues and readable signs (Carpman et. al, 1985; Evans & McCoy, 1998).

Normalizing the environment in my model also entails creating a diversity of rooms and facilities for patients and parents. Different environments such as a kitchen, an activity room, a laundry, and a cafeteria stimulate mobility and continuation of normal activities (Olds et al., 1987; Olsen, 1984; Shepley, 1988; Voelker, 1994; Williams, 1988). The new hospital did provide much more diversity for both patients and parents than the old hospital which resulted in greater mobility of patients and parents as was shown in Chapter 10. Providing age-appropriate spaces for infants, toddlers, preschoolers, and adolescents allowed children to be with children their own age and find peer support. It promoted a general sense of belonging.

In order to optimize holistic healing environments when designing hospitals, we must take qualities of normal settings for children and apply them to hospital environments to make them less institutional and provide age-appropriate play environments and restorative places (Bagot, 2004; Kytta, 2002; Korpela et al., 2003). Especially in hospitals, it is important to create restorative places. Patients, parents, and staff all need places to unwind and release stress such as a garden, playground, playroom, or place to meditate (Arneill & Devlin, 2002; Evans & McCoy, 1998; Korpela et al., 2002; Olds et al., 1987; Scher, 1997).

In hospital design, it is important to incorporate appropriate stimulation for the five senses such as music, art, nice smells, and fresh air (Malkin, 1993). There are a number of studies showing the importance and healing power of music and art (Caine, 1991; Moss, 1988). My study, for instance, shows the popularity of the art room in the new hospital for both boys

and girls. When it was open, patients were in it and, unlike in other playrooms, they would always be engaged in some art project. This level of engagement was not reached in other playrooms.

While much research shows the importance of nature in stress reduction and the healing process (Horsburgh, 1995; Malkin, 1993; Picker Institute, 1998; Ulrich, 1991b), access to nature in hospitals is often limited. The new hospital offered excellent opportunities for creating accessible outdoors spaces such as a courtyard and balconies. Unfortunately, these remained unused. The spaces were not designed so the doors remained locked. Patients often mentioned in the interviews and on the questionnaires that they would love to go outside. Creating accessible courtyards and gardens for all patients, including those in bed or in a wheelchair, should be included in all future hospitals as a way of creating true healing environment.

Having visual access to nature through plants, pictures of nature, windows, and being able to get fresh air and go outside to a garden, balcony, or courtyard helps in recovery (Olds, 1987; Scher, 1997). Research showed that when patients after surgery are exposed to a window with a view of nature instead of a brick wall, they require less medication, make fewer negative comments, and experience faster recovery (Ulrich, 1984). Windows are very important for all patients as they reduce anxiety and depression (Keep et al. 1980).

In our multi-cultural society, we must be aware of and honor cultural differences and lifestyles. This also applies in a hospital. As became clear during my observations and interviews, patients and parents need to feel and have the freedom to express their culture and religion in their eating and drinking habits and religious practices by having a place to pray or meditate with access to a chaplain. Private rooms can solve part of this problem but

there is a clear need for multi-cultural, designated places for praying, meditation, and other religious practices.

Supportive and Effective Staff

The Seven Dimensions discussed so far are components that directly influence patients' and parents' wellbeing. One dimension yet to be addressed is Supportive and Effective Staff. Caring for sick people is physically and emotionally tiring and can result in e.g. burnout, errors, and illness. My model stresses the importance of taking care of the needs and concerns of staff because the better caretakers themselves are cared for, the happier they are and the better they can take care of their patients. Therefore, we also need to ask: how can we reduce stress caused by a misfit between staff and the environment?

Even though it is often said that hospitals are designed with doctors and staff in mind rather than the patient, my findings showed the opposite to be true. In the new MFCH, the nurses were dissatisfied. They felt the building was mainly designed for patients and parents leaving them in an environment that does not meet their needs and concerns. For instance, a nurse from the new PICU said:

While the goals of a family centered children's hospital have been realized, I can't stop feeling that some of the reasons and needs of caring for children who need to be here have been overlooked as well as what the staff needs to adequately care for them. In an effort to make a pleasant environment too many strong needs – e.g. central monitors that can actually be seen by PICU staff – had been shoved aside.

Many of the concepts discussed above that help relieve patients' and parents' stress also help relieve caregivers' stress. However, there are design decisions that benefit patients' and

parents' wellbeing but may drastically change staff's routines. Since patients' wellbeing can not be separated from the staff's wellbeing, this ninth dimension was added to the model.

Efficiency and Functionality of Unit and Nursing Station

Many design decisions that are beneficial to patients and parents such as private rooms, decentralized nursing, and openness of the nursing station can significantly increase stress for staff. As we saw in the previous section, private rooms, for instance, provide many benefits for the patient and parent such as increased control, privacy, quietness but also change the dynamics among staff. My observations and interviews in the new hospital showed that with the doors closed, staff loses supervision over patients, both visual and auditory; with parents in the room, staff members often feel like intruders; and while in a room taking care of a patient, a nurse can not see what is happening in the other rooms.

Some of these changes are part of a culture change an organization faces when moving into a new building such as changed dynamics between staff and patients and families. A nurse in one of the pods on the third floor told me:

They close blinds and door on you, even if you ask them to leave it open. I should be able to hear them. And then parents blame us for not coming fast enough when alarm goes of, we just can't hear it.

Families take over rooms sometimes: sinks with forks and knives, workspace covered with food, mom brought toaster in room, parents making out on sofa.

Therefore, it is important that these culture changes are identified and addressed before the move. Other issues may be solved with technology, such as central monitoring, to make sure staff knows what is going on when doors are closed or when taking care of a patient in another room.

Decentralized nursing reduces feelings of alienation and anxiety for patients and parents because of the (visual) proximity of staff. For staff, however, this is a major adjustment from centralized nursing. As a nurse in one of the pods in the new hospital told me:

The hotel look is pretty but not functional. They have taken away our biggest resource – each other – by putting pods in. For instance, with only two nurses in a pod, if one nurse is outside of the pod, you can not leave to help in a code.

Staffing is a big concern when units are broken down into pods. Nurses miss each other's support and the flexibility they had when working in a centralized unit. In addition, if there is not a clerk for each pod, they now have to do administrative tasks such as answering the phone or following up on orders that they didn't have to do before. As Gadbois (1992) and Starfield (2004) pointed out, in order to reduce work overload stress, increase effectiveness of care, and reduce mistakes, things such as frequent interruptions during work, standing, and activities of doctors and administrative work need to be limited.

Another concern raised in the new NICU was that, as a result of decentralized nursing, nurses do not learn as much from each other anymore:

We don't learn as much as we used to. Before we all shared a small space, now we are so spread out, you can see the learning curve go down. You would see procedures and treatments, or just walk over to see how someone handled a case, now we are so spread out, it is hard to interact, hard to track someone down.

To increase the sense of control, the staff wants to know what is happening in other units and to reduce emotional strain they want to follow up on patients they cared for. With decentralized nursing this is often a challenge (Shepley, 1998; Gadbois, 1992). In the old building, PICU was on the same floor as general pediatrics; in the new building they are on

different floors. A nurse in PICU told me how this impacted their sense of closure with patients:

With PICU and General Peds separated, staff does not get closure. Before, kids used to remain on the same floor and would walk around on the unit and stop by to knock on our door. Now kids move up to the third and we hardly ever see them again. I miss that. Now you only get to see the very sick. You never see the good part of your work anymore. We only deliver acute care, but do not get to see the results. We do not have time to go up to the floor. It is a loss for both patients and staff.

With limited staff in a pod, the efficiency of the layout of the unit and proximity to supplies becomes crucial. Shadowing and interviews in my study pointed out that staff members do not want to leave the pod in order to get medication or supplies or even go to the bathroom. The moment they leave the pod, they feel as though they are abandoning their patients because they can no longer hear or see them. Consequently, pods should be completely self-sufficient so that staff members do not have to leave them which not only reduces walking distances but, even more importantly, saves time and increases flexibility.

To ease the boundaries between staff and patients and parents, nursing stations generally have become more open. Even though this is valued by patients and parents, it often creates a confidentiality conflict for staff. They feel they do not have enough privacy in the nursing station to talk about patients without being overheard by others.

Decentralization means more space and often more exits and entrances. Like parents, caretakers are concerned with safety and supervision of the spaces and entrances. Controlled access and registration of visitors to the hospital and units becomes an important aspect to ensure staff's safety and sense of security.

Functionality of Patient Rooms

Patient rooms need to be pleasant and comfortable for patients and parents but they also need to be efficient for staff. To maximize the staff's ability to do their jobs, patients' rooms should have a staff zone separate from the family space. Their work space, including the sink, all switches, and medical equipment needed should be in the staff zone. This way staff can operate without having to bother the families. Also, a standardized location of supplies, equipment and room layout can reduce medical errors (Ulrich & Zimring, 2004).

Enough work space in the patient room, ample room around the bed, wide enough doors and corridors so beds can be easily maneuvered in and out and adequate lighting are factors that make staff's work more efficient (Olds et al., 1987; Shepley, 1998). The implications of more space in the NICU can be significant. The nurse manager from NICU told me:

We've done a lot more bedside surgery since we moved here, which is much better for the baby, because the OR is cold and causes much more stress. There is just a lot more space here that makes that possible.

Of great concern to staff is respecting HIPPA rules. The study showed that private rooms positively impact the staff's ability to speak confidentially without worrying that other parents and children can hear them talk about patients. In the old hospital, when patients were sharing rooms, this would sometimes inhibit staff's freedom to talk. Another aspect was, a nurse told me:

We don't have to worry as much about parents asking what the other child's diagnosis is.

Facilities for Staff

Nurses can not be expected to remain smiling and friendly for a twelve-hour shift if they do not have a comfortable lounge to which they can retreat, let off steam, and recharge their batteries. Staff members need a backstage area that is private and out of sight of patients and parents (Goffman, 1969, Olds et al., 1987). As became clear during my observation and shadowing, nurses often do not have time to leave the unit or floor so they need a convenient place to eat and drink and some simple cooking facilities to quickly warm or cook food during the nightshift when the restaurant is closed. This becomes even more important when the hospital is located in a rural environment where there are no, or a limited number, of stores.

Less stress and a more pleasurable work environment can be enhanced by providing distraction in the units such as art, music, access to drinks and snacks, and by reducing noise (Shepley, 1998). Facilities for staff, such as a lounge, cafeteria, meeting rooms, lockers, bathrooms, the location of stairways, and parking need to be adequate and conveniently located to reduce walking and save time (Olds et al., 1987; Shepley, 1998). The facilities for staff need to be in balance with the rest of the hospital. Having a beautiful new building while having to share one locker with four colleagues does not convey the right message to staff members. Also, windows with access to the outside, views of nature, access to a garden, and exercise facilities help staff to reduce stress and regain energy (Evans & Mc Coy, 1998; Olds et al., 1987; Shepley, 1998). Facilities such as a chapel or place for meditation, a day-care center, a gym, a store, mail services, and access to the internet help to reduce work-stress and enhance overall satisfaction.

Facilities for attending physicians and residents include a pleasant and conveniently located call-room with adequate facilities including fax, copying, computers and telephones, and places for teaching, lectures, studying, and academic work.

Family Centered Care

True family-centered care is not easy to implement and often requires a culture change for staff and changes in policies and rules in the hospital. The staff needs to involve parents, provide information, and teach them how to help with their child's medical care. It is important to involve parents in the care of the child and give them responsibility because it can make the child more comfortable and it helps staff save time (Olds et al., 1987).

A nurse told me about the new hospital before it opened:

The private rooms will be an improvement, parents' company has a huge influence on the child's wellbeing. The kids use less pain medication if the parent is around, so the more the better.

My study showed that staff also needs to know that patients and parents are comfortable. If they know that parents can eat, sleep, wash themselves, and have meaningful things to do, it reduces their workload and worry and consequently their stress. Nurses in the new hospital told me:

Staff seems to like the environment, despite the walking distances. They don't have to apologize to the parents anymore for the lack of space, and the miserable rooms.

A doctor at PICU said:

The day we moved here, it changed my medical practice. It is so much better to work here and it is much better for the patients and families.

The impact the new environment has on staff also has a noticeable effect on parents:

I know they are some of the same nurses but they seem friendlier now. Nurses and doctors don't seem to be as stressed as they used to be. They have space now. I feel more treated as a real person now, not like a number. Doctors can finally sit down while they talk to you.

Also the environment has a noticeable effect on patients. One nurse in PICU described how she saw how a patient changed only by being moved from the PICU to general pediatrics on the third floor. The even nicer environment and the symbolic step of improvement had a major impact:

One patient with head surgery would not move or get out of bed. We cured him by sending him up to the third floor.

In an era of staff shortages, retention of nurses is critical. Creating a work environment that is efficient, functional, pleasant, and focused on reducing stress for staff and increasing their wellbeing not only helps to recruit and retain staff but also results in higher staff satisfaction, less turnover, reduced sick days, and fewer errors (Ulrich, et al. 2004).

CONCLUSIONS AND CONCEPTUALIZATION OF A HOLISTIC HEALING ENVIRONMENT

This study integrates contributions from various fields about the impact of the healthcare environment on our physiological, social, and psychological wellbeing and behavior. Seven Dimensions of healing and a preliminary model have been developed based on the findings in a Formative Study and on the literature review. The dimensions and the model were applied to a case study comparing an old and a new children's hospital. Based on the findings of this study the Seven Dimensions were refined, enriched, and expanded to Nine Dimensions.

As discussed in Chapter 1, the most frequently recurring elements to reduce stress for patients and families in the literature on healing environments are connection to nature, providing options and choice, social support, pleasant diversions, and elimination of environmental stressors (e.g. Ulrich, 1991; Berry et al., 2004). The dimensions presented in this study overlap partially with these elements but conceptualize a more holistic approach to healing. First, the Nine Dimensions presented in this section are based on *all* aspects found in the literature including the most frequently recurring ones presented above. Second, the Nine Dimensions address a wider range of issues related to stress reduction and wellbeing for patients and family including the needs and concerns for staff. Third, instead of taking the hospital as a starting point, the Nine Dimensions of this study focus on how to approximate everyday life while in the hospital, with daily life as the point of reference. Thus far, only a handful of studies have utilized this perspective. Finally, the dimensions form the basis for a conceptual model of a holistic healing environment that minimizes disruptions to children's everyday life that will be presented below.

The starting point for the development of the conceptual model was to define a healing environment from a holistic perspective and from a perspective of everyday life. To reach beyond the boundaries of a more traditional hospital building, the dimensions were discussed within the parameters of daily life in order to achieve smoother transitions between the home and the hospital environment and a continuation of the scope of activities patients and parents routinely engage in.

To show how a child's and parents' lives change while hospitalized, I took an ecological approach. The model not only takes into consideration the hospital but also all the other behavior settings that influence the hospital setting from a child's perspective. These range

from the child's home, school and peer setting, to the parents' work situation, and the care of siblings. As we saw in the beginning of this chapter, there is a great discrepancy between the behavior settings we have in daily life and those we encounter in the hospital environment. To illustrate this, Figure 34 conceptualizes what a typical child's everyday behavior settings can be like in North America and Europe. The figure depicts the behavior settings that we typically find within the child's home and the behavior settings that are available outside of the home.

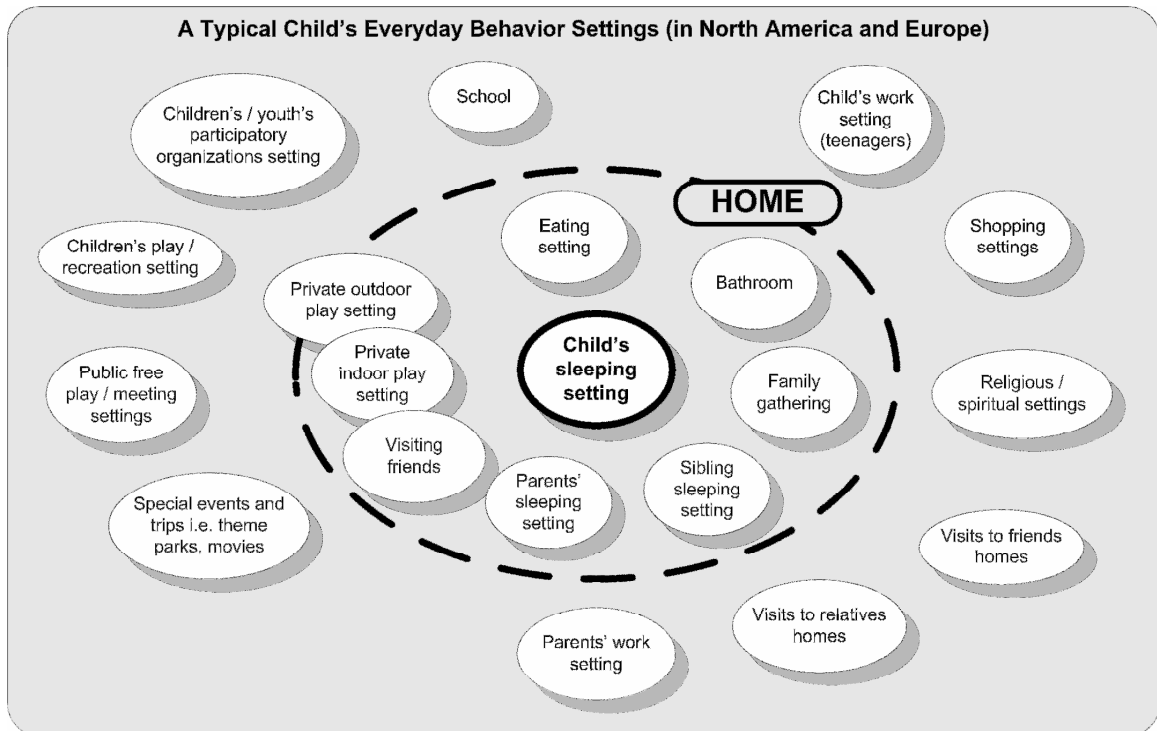


Figure 34: A typical child's everyday behavior settings (in North America and Europe)

Figure 34 serves to show how drastically the behavior settings change when a child is confined to bed or to the patient's room for some or even most of their hospital stay. In a child's home, the bedroom is an important behavior setting. To what degree does a hospital provide a similar behavior? As shown in Figure 35 the hospital room for bedridden patients functions in part as a bedroom but, unlike their home bedroom, it also has many other

functions at different times. Many of the behavior settings we find at home such as eating, family gathering, and play setting now also take place in the patient room. In addition, the room serves as a setting for new and unfamiliar behaviors such as receiving medical treatments and having distraction from clowns, etc. The settings that move into the patient room are marked with an arrow and a darker circle. The two rectangles in Figure 35 show the new settings that are added.

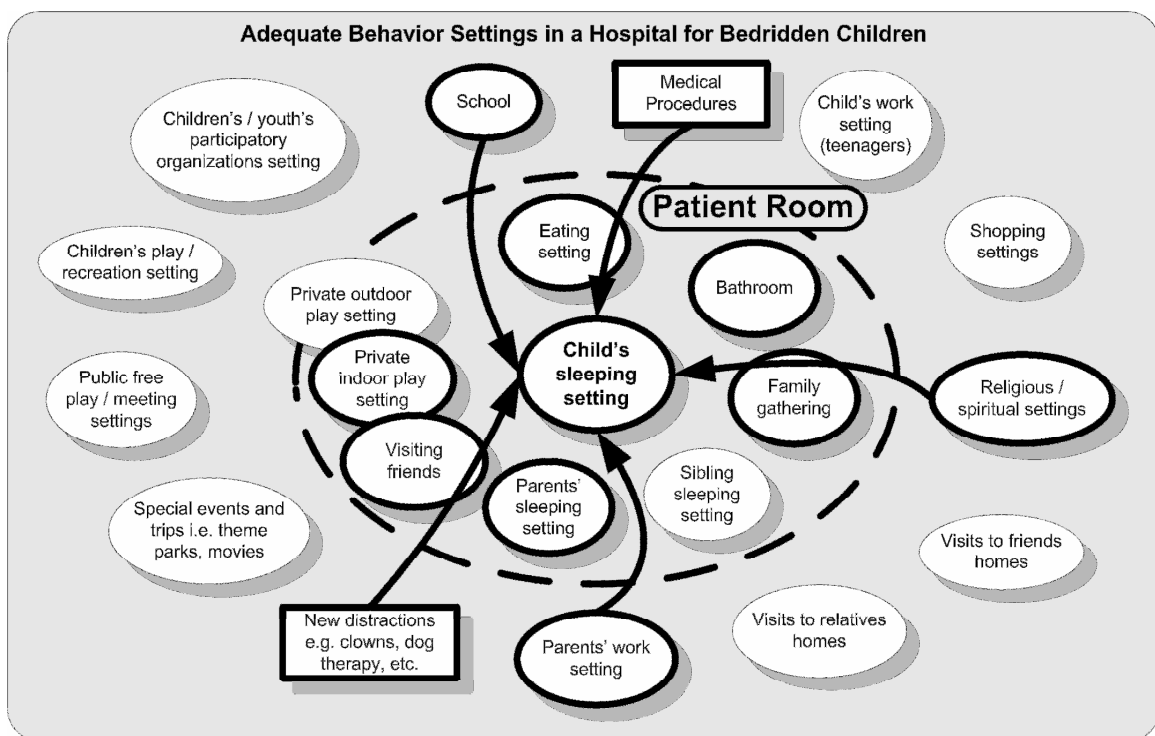


Figure 35: Adequate behavior settings in a children’s hospital for bedridden children

Once the patient recovers and becomes more mobile, the behavior settings change again. Now, a child has the option to move into other behavior settings. For instance, the child can decide to eat in his room or go to the dining area, to play in the patient room or go to the playroom, art room, or computer room. This choice and the expansion of behavior settings is shown in Figure 36. The dark circles again represent the available settings and the dotted lines symbolize the choice of setting for the child.

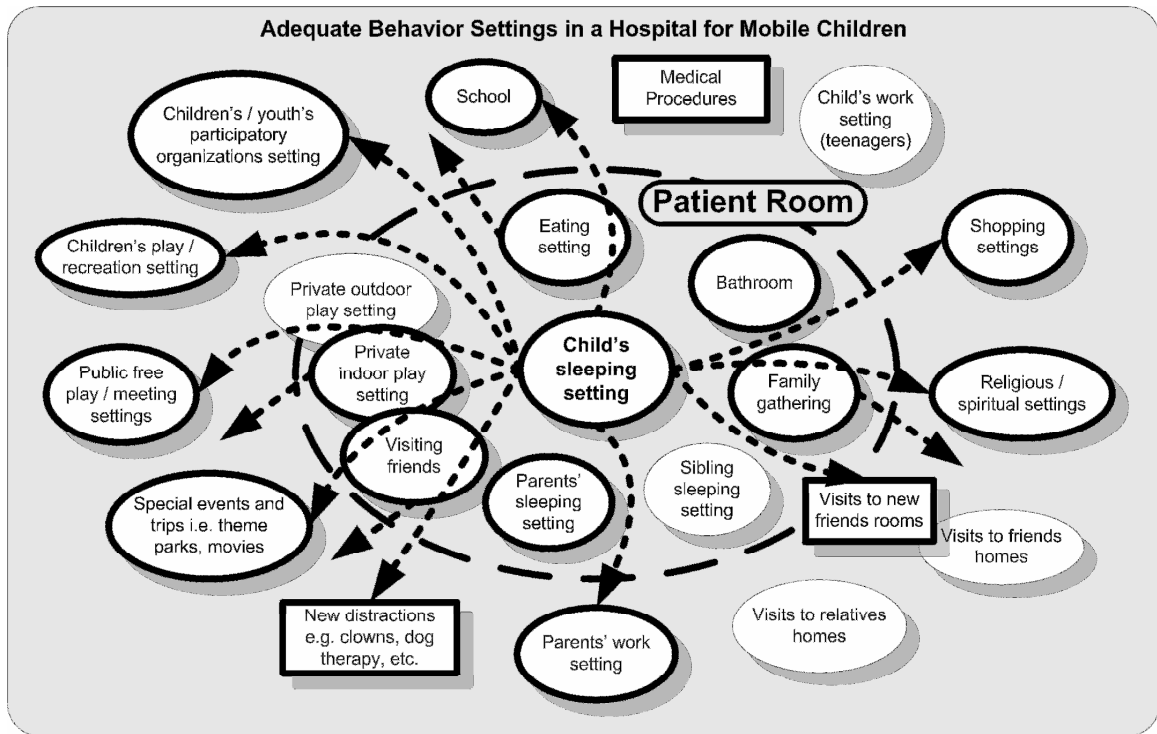


Figure 36: Adequate behavior settings in a children’s hospital for mobile children

Mobility, however, is not the only way for a child to have access to a wide variety of behavior settings and to ensure continuation of routine activities. Today, technology can play a crucial role in the child’s ability to stay in touch with home, friends, relatives, school, and other activities in the hospital. The internet, webcams, instant messenger, and email can all bring the different settings to the child in bed or bridge distances when, for instance, family and friends are too far from the hospital. Ways of achieving additional behavior settings through electronic means are depicted in Figure 37.

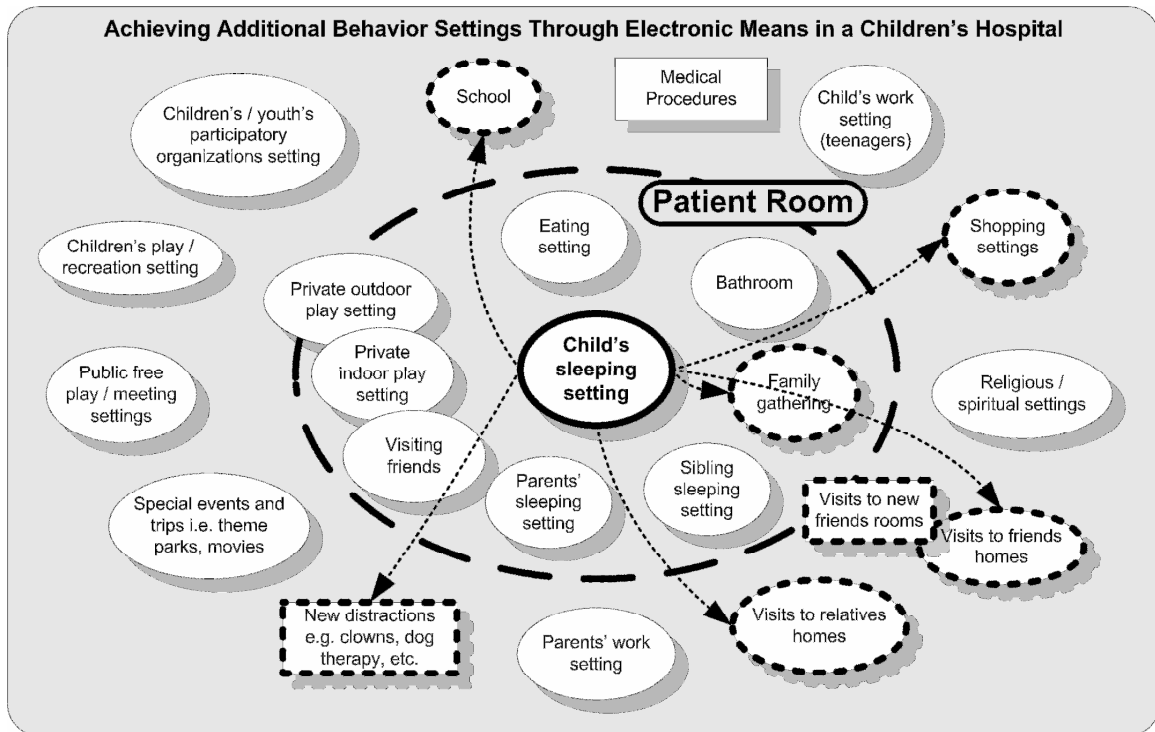


Figure 37: Achieving additional behavior settings through electronic means in a children's hospital

Figures 35, 36, and 37 conceptualize a holistic healing environment and illustrate how conceptual ideas of approaching everyday life in a hospital environment can play out in real life situations. By creating adequate behavior settings in hospitals, patients and parents, when appropriate and desired, will be able to continue many of their daily activities and routines which ultimately will ease their transitions in and out of the hospital.

The Nine Dimensions discussed in this chapter can be used to understand the dynamics of the different behavior settings and the different behaviors the settings need to afford and support patients, families, and staff. Even though each dimension has been discussed separately, it should be clear that the dimensions are not mutually exclusive; they overlap and interact. For instance, we saw that a holistic healing environment facilitates unencumbered behavior and influences social support: creating an eating setting outside of the room creates

a reason for the child to get out of bed, allows families to have a meal together, allows a child to get something to eat or drink when he wants, increases their choice of what they eat, and provides an informal meeting place for patients and parents to hang out together. As this study pointed out, to approximate everyday life and ease of transition, hospitals should provide adequate behavior settings geared to foster a continuation of daily activities. Therefore, qualities of everyday settings for children should be applied to hospital environments to make them less institutional by providing age appropriate play environments and restorative places.

The Importance of Incorporating Staff into the Model

It is interesting how I started this study focusing on patients and parents and their needs in a healing environment. Throughout the process of gathering data and spending my days in the hospital, I came to realize that a healing environment for patients and parents is directly linked to a healing environment for staff. The goal of the new MFCH was family-centered care. They clearly achieved that in excellent fashion. However, staff were less satisfied and often felt not listened to, not understood, and not taken care of in a way they should have been. Many opportunities for creating a supportive and soothing environment for staff seem to have become lost in the process. When decisions needed to be made about space allocation, decisions were often made in favor of patients and parents and at the cost of staff without fully understanding what the long-term consequences were. Some changes and problems could have been managed by having more staff involved in the design process, by training staff to be prepared for the new environment, by providing the appropriate technology, or by simply explaining why things were designed the way they were. Managing

the process from a more holistic perspective is therefore crucial to the success of the building. The process can not be separated from the product.

Implications for Hospital Management

With growing awareness of the role the environment plays in people's wellbeing, the responsibilities of the healthcare system clearly have changed. Today, more and more hospitals are reaching beyond providing medical care. The person as a whole with their social, psychological, and physical needs increasingly becomes the focus in an attempt to optimize the match between the hospital and its users.

The model and dimensions of this study were concerned mainly with how to achieve a holistic healing environment. However, a holistic approach to healing, to enhance everyday life in hospitals, not only implies physical (design) changes but also organizational changes that will minimize the institutional characteristics. This has important implications for hospital management.

It is critical that the design of new hospital building ultimately matches the strategic objectives and goals set at the beginning of the design process. When confronted with, for instance, conflicting needs of patients and staff, one should revisit these objectives (e.g. family-centered care, patient safety) and make decisions in line with the objectives and goals. I stress also that a true holistic healing environment can not be had without a change of culture when moving into a new building no matter how healing the environment is meant to be. This requires staff training and management of culture change.

There is no such thing as the perfect hospital but today we can not afford to design these important facilities without investigating, understanding, and managing the following factors:

the consequences of design decisions; conflicting needs and concerns; strategic objectives and the organization's mission statement; changed dynamics; staff involvement, feedback and subsequent retraining; and, finally changed, i.e. de-institutionalized, rules and procedures.

SECTION V ■ REFLECTIONS: METHODOLOGICAL CRITIQUE AND SUGGESTIONS FOR FUTURE RESEARCH

Chapter 12 ■ Methodological Critique

THE CHALLENGE OF DEFINING ONE'S ROLE AS A HOSPITAL RESEARCHER

Working in a children's hospital certainly has its challenges. I had the advantage of being asked to conduct this study by Bruce Komiske, the former director of the Children's Foundation. Consequently, I had backup when needed while finding my way through the maze of the hospital and seeking out the right people for information. Almost everything I tried to accomplish took a lot of patience and always much more time than I expected. In addition, due to the financial difficulties of the WMC, many employees at the management level had been laid off, leaving little continuity in the people with whom I tried to establish a

relationship to help me gather the information needed for the archival portion of my research.

As a researcher (or even volunteer) in this hospital, it takes a long time before one feels accepted. There was not a hostile environment but people generally did not seem to care much about the study. For three years, I followed my own path but, as a researcher, really did not belong anywhere. Often, I did not have a place to put my coat or to keep my research materials without feeling like an intruder.

As in any organization, what with the turmoil around the layoffs and the new hospital being built, there was often a lot of tension on the floor. Early on, I chose to be neutral, avoiding the hospital's politics, and personal tensions among staff. I chose not to voice my opinion about anything unless directly related to my research. Staying independent, I felt, would be the best way to get people to trust me or, at the very least, not view me as any sort of threat.

The biggest challenge, however, was getting used to the feeling of helplessness when exposed to sick and dying children. Maneuvering between my role as researcher and my normal human instincts, I often wanted to help out by giving a pacifier to a crying baby, help a child who asked to be pushed in a wheelchair or in a cart, play with a patient in the playroom, or watch a patient so mom could go to the bathroom. However, as a volunteer/researcher I was not entitled to do so. In an early stage of my research (March, 2004) I wrote the following in my notes:

Today, while I was sitting in the school-age playroom, one child was really active and tried to involve me in his fantasy game. I did not know what to do. Talk to him? Play with him? Tell the boy I'm busy? I'm confused about what I can do and can't do!

I considered taking the required training to become a cuddler at NICU or a volunteer with more space to maneuver on the inpatient floors. Ultimately, I decided against this because I was afraid that I would be spending more time with the children, taking away my focus on the purpose of my presence there. Even though I was unable to help the children directly in this hospital, I do hope that, through this study, the lives of patients and families in future hospitals will be less stressful and more comfortable.

LIMITATIONS OF STUDY

The opening of the new children's hospital created a unique opportunity to do a pre-post evaluation. By looking closely at the old and the new hospital, I learned what aspects from either hospital contributed to a healing environment and what issues needed improvement. In addition, a move is a big change in the life of an organization and is likely to bring things to the surface that otherwise stay unnoticed. However, focusing on just one case has its limitations. Every hospital has its unique 'culture' formed by elements such as the people, the location, the institutional organization, and its background. But I believe that the value of this in-depth study of one hospital outweighs its limitations. To my knowledge, there are very few published case studies that researched *and* quantified the elements of a healing environment in a systematic way. In addition, studying the literature, building on my experience of a previous evaluation of a children's hospital and years of consulting, I learned that many of the issues that matter to patients, families, and staff are not unique to this particular location. The hospital's behavior settings have many generic issues. To learn what issues were specific to this organization and which were generic, the data were linked to existing literature and to feedback from specialists in the field.

METHODOLOGICAL CRITIQUE

Concessions: Revisions from Original Proposal

Planning research and actually conducting it are two different things especially when doing such a large scale project in an institutional environment such as a hospital. Since the first few months when I started the study at the WMC, there have been a number of revisions to the original research proposal. These are described below.

Participatory Approach

The biggest revision was regarding participation of users in this study. This research was set up to adopt a participatory approach in its overall research design by working collaboratively with the users of the hospital (such as patients, parents, staff, administration) to discuss the themes of this study, review the methods, and provide an avenue for the sharing and analysis of the findings and methods used.

The most difficult groups to involve were the patients and parents. For instance, I originally intended to ask patients and parents to keep a logbook of their hospital stay, describing, and drawing their experiences (e.g. how they experienced the hospital, the things they did during the day, the things they missed the most, how the environment could be improved to better suit their needs). However, patients were often too sick to participate or even be approached and also I could not keep track of the patients because all participation had to be anonymous due to HIPPA regulations.

I had also intended to ask patients after the interview for a short walkthrough of the pediatric floor to get them to show me the places and things they liked and disliked in the hospital and to explain why. I wanted to give them a camera to take pictures or a video of

the places they visited. Taking pictures or video did not pass the IRB because the risk of taking footage of another patient without their consent was too big. The walkthroughs unfortunately did not happen either because most patients were too weak to do so or it was unclear if they were allowed to or parents were not available to sign the consent for patients under 18 years old.

One of the goals of this study was to develop instruments to monitor the hospital environment from the user perspective that ultimately would be ‘owned’ and used on a regular basis by the hospital. Defining how to assess the quality of healing in this hospital and what instruments were suitable and convenient would therefore be done with the help of the participants. I intended to obtain feedback on the data found by presenting them to the participants in focus group sessions to verify the validity of the data and my interpretations.

However, it was very difficult to engage staff members on a regular basis or organize them into groups. Nurses and attending physicians were simply too busy and I was not in the position to make it happen. For instance, I had intended to set up an advisory committee made up of nurses, attending physicians, Child Life, and administrative staff that was formed through consultation with the heads of departments and the Children’s Hospital Foundation. The purpose of the advisory committee would have been to help secure the study’s foundation, scope, and ongoing smooth running by meeting monthly. Again, this did not happen, the main reasons being the financial crisis of the WMC and the many layoffs which led to a lack of continuity of staff in the beginning phase of this research.

Despite the many constraints imposed upon ongoing research in a hospital environment, I still found ways to share my data and interpretations, albeit in a more informal way with nurse managers, nurses, and sometimes parents.

Comments on Methodology

Not Having an Agenda

Looking back on this study, there are a few more lessons learned that I would like to discuss. Probably the most unexpected and valuable lesson came while waiting for IRB approvals of the Medical College, the Hospital, and the University (CUNY). Because I was not allowed to start my data collection, I spent time shadowing staff members. While observing and talking to medical staff, I learned about their activities and routines and the routines of patients on the floor. Usually when doing research one has an agenda or script to follow for finding patients, getting consent, administering a questionnaire, or doing an interview. This can limit our ability to absorb because we are focused on something else. That is why I would recommend to anyone about to start a similar study to spend some time in the building with the users *without* an agenda. My presence without an agenda (no interviews, no observation protocol) turned out to be some of my most valuable time spent on the floors.

Choosing and Developing Instruments

Choosing methods and developing instruments would be far more effective if we could do it with the knowledge we have after completion of the study. This is especially true in the field of environmental psychology where methods and instruments are rarely published. Consequently, there are very few instruments available that have been used in other settings

and have been tested for reliability and validity. In addition, every setting is unique, so instruments often need to be adapted to suit their environment.

Developing questionnaires is a difficult and tedious job and often underestimated. Especially when doing analyses, one realizes the importance of *how* you ask questions as well as the information each question is designed to elicit. In a next study, I would spend even more time on questionnaire development and testing and think more thoroughly about the analyses beforehand.

In a hospital setting, one has little control over the response of participants. In this study parents were often happy to participate in an interview or to fill out a questionnaire. It gave them something to do as they do not get a lot of opportunities to voice their opinion. Medical staff is usually too busy but with the help of the nurse managers we ended up with quite a good response. Patients, however, were more difficult. In each hospital, we found only 30 patients who could participate over a period of three months. Patients were either too sick or too young, mentally disturbed, or could not read or write. Consequently the N for patients is very small. Are questionnaires the best way to collect information from young patients (ages eight to eighteen) or are there better ways? I think there is a need to develop more playful and interactive tools to gain feedback from sick children about hospital environments.

Scope of Project

This study originated with Bruce Komiske, from the Foundation Center, suggesting a need to do a comparative study. I was drawn by the unique opportunity and the ample possibilities. Even though I was warned many times not to make the scope of this project too big, I also felt a responsibility to the Foundation Center and the hospital to do a

thorough job. Especially in a real-life situation, such as this hospital, I felt it was difficult to isolate a specific unit or user group because I neither wanted to exclude anyone nor ignore the fact that units are related and so are the needs and concerns of staff, patients, and parents. As a result, the scope did in fact grow bigger and bigger. I often felt torn between my commitment to the hospital and my dedication to the development of a model. For instance, instead of studying all of the units in the hospital, it might have been enriching to follow patients and parents longitudinally to better understand the long-term effects of hospitalization and the transitions in and out of to the hospital. On the other hand, it *was* a unique situation. The advantage of following one hospital over a three-year period to gain an in depth understanding of the place, of recording changes after the move while staff, parents, and patients were comparable, of having access to all units and areas, and of learning how the hospital works as a whole. I would not have wanted to miss that.

Chapter 13 ■ Directions for Future Research

MEDICAL AND ECONOMIC BENEFITS

It might seem simple enough to state that better environments will improve health and wellbeing. Yet, until now, most research has been concerned with the economics of improving healthcare. Some argue that because the potential economic benefits in creating healing environments are less obvious than the social and psychological benefits, a structural effort to create a true healing environment would not be fruitful to undertake (Ulrich, 1992; Komiske, 2003). In order to bridge the gap between environmental social science and the administration of hospitals, environmental social science needs to find ways to illustrate the economic benefits of health outcomes of different design solutions (Komiske, 2003).

That is why, originally, one of my objectives for this dissertation was to gain information on the medical and economic benefits of implementing a healing environment. In addition to gathering the qualitative data, I traced possible measures of success of implementing a healing environment by comparing data from the WMC and the new MFCH. The questions I focused on were: Are there any medical outcomes resulting from using a more holistic or broader healing perspective in designing a hospital setting? What are the measurable therapeutic outcomes, such as reduced length of stay, of creating a healing children's hospital compared to a traditional functional clinical children's hospital?

In a workshop with hospital staff members held in January 2002 at the WCH, we established a list of possible measures of success: the expected medical and economic benefits. The list

consists of the following measures: patient and family satisfaction, staff satisfaction, increased market share, ability to attract new staff, reduced length of stay, increased philanthropic support, increased reimbursement per party payments, increased volunteer involvement, improved corporate relationships and support, and instilling pride in the community.

Studying these medical and economic benefits is a long term commitment and not directly related to the development of my model of holistic healing environments. Therefore it was decided to exclude the discussion of these medical and economic data from the dissertation. The results of the medical and economic outcomes of implementing a healing environment will be published in a future article.

OTHER DIRECTIONS

Directions for future research that grow out of what I have done so far may include:

- *Investigating how the dimensions of the model interact.* Further research is needed to understand how the Nine Dimensions of the Model presented in Section IV interact and influence each other. There may be a hierarchy related to Maslow's hierarchy of needs (Maslow, 1970) in the importance of dimensions for patients and parents but further research is needed to investigate this.
- *Enriching the model with ecological and developmental research.* Further research is needed to enhance our understanding of how best to arrange the relationships of different behavior settings in children's hospitals. My conceptual model, shown in Section IV, offers a broad overview of the everyday ecology but specific questions remain such as how to design and where to locate play spaces for all ages.

- *Relate the design healing relationships to design applications.* To maximize the applicability of this research to the design profession, the dimensions of healing in the Integrated Chart of Healing Environments for patients might be translated into directions for design by working collaboratively with architects for other buildings and spaces or users.
- *Investigating the wellbeing of (sick) children longitudinally.* To enrich our conceptualization of the impact hospitalization has on children and parents, it would be extremely useful to follow patients and parents longitudinally. By working with the same patients and families more in depth and over a longer period of time, insight can be gained in the long-term effects of hospitalization and the transitions in and adaptation to the hospital environment over time (Bearison, 1991; Matza, Swensen, Flood, Secnik & Leidy, 2004).
- *Investigating the generalizability of the Dimensions of Healing Environments to other settings and user groups.* To increase the applicability and accessibility of the Dimensions of Healing Environments, research is needed to investigate whether the dimensions are flexible enough to be adapted and applied to other kinds of children's health facilities such as emergency and trauma units, long term facilities, and even to adult hospitals or senior healthcare facilities.
- *Developing methods for more participatory research with young patients.* Active involvement of the users (especially children) in hospital evaluation and design may be difficult but is not impossible. The development of more engaging methods and instruments that help us understand how 'everyday life' for patients of different ages can be better supported while in a hospital environment would be valuable.

- *Focusing on how to balance needs and concerns.* One of the conclusions of this study was the importance of balancing the needs and concerns of patients and families on the one hand and staff on the other. A more in-depth understanding of how design decisions and, more specifically, which design solutions benefit one group but negatively impact the other is crucial to our ability to balance the needs of all users.

APPENDIX A ■ FORMATIVE RESEARCH: INTERVIEWS & STAFF CHART

A-I ■ Interview Parents

Introduction and consent forms (give copy to parent)

Date _____

Unit 3North 3South 3PICU 3INF/Tod 3SCU 2NICU

Relationship to child _____

I General information

1. Is this your first time in this hospital? Yes No
if no: how many times here _____
How many times other hospital? Where?
2. How did you get here/hear about this hospital?
 - via emergency room
 - referred by pediatrician – specialist – other hospital
 - other....

3. How far do you live from the hospital? _____minutes drive. Name county

II Transition

I'm interested in how your child in the hospital affects the rest of your life e.g. how your stay in the hospital affects staying in touch with home/friends/family/work:

4. How long has your child been in the hospital?
5. Have you stayed with your child the whole time?
6. Do you have other children you're taking care of? If yes:
6a who is taking care of them while you are here?
6b have they been to visit?
if no: why not?
if yes: how did they respond to the hospital
7. Were/are you working full-time previous to your child's hospitalization?
8. Do you have parental leave to take care of your child? How otherwise arranged?
9. How do you stay in touch with home?
 hospital phone cell phone email go back and forth other _____
10. While your child is in the hospital, do you ever leave the building?
- Where do you go? How do you get to these places? Are these places convenient to get to or easily accessible?
 - What do you think about parking at the hospital/places near the hospital you go to? Do you use public transportation to get to the hospital or places near it?
 - Do you think this could be improved? If yes how?
11. Aside from your child's illness, what is stressful about being the hospital that would not be present when you are at home?

III Being in the hospital

12. Do you feel you understand what's going on, that you are informed?
(Who is whom in the hospital, what is happening with your child...)
13. Do you think this could be improved? If yes how?
14. What places do you go to in the hospital? Where have you been (lobby, cafeteria, shop, library, chapel, garden, outside, playroom...)
15. How do you feel about/ and how could it be improved (for you and child?)
 the room

A-I ■ Interview Parents

- sharing the room
- the nursing unit
- the floor
- the hospital overall
- the food
- room and facilities (chairs/places to go to) for families
- shops/services (post office) food library

16. Being that you're in the hospital, what is missing for **you** and your **child** to get through the day?

IV Feelings of wellbeing

17. What do you consider the most stressful while being **in** the hospital?

- other sick children
- not knowing what's going on
- taking care of yourself
- other _____

18. What in the hospital brings you comfort during your stay?

19. How could the hospital building improve/contribute to your wellbeing and that of you child? And why?

A-II ■ Interview Patients

Introduction and consent forms (give copy to patient)

Date _____

Unit 3North 3South 3PICU 3SCU

I General information

- 1) Is this your first time in this hospital? Yes No
if no: how many times here _____
How many times other hospital? Where?
- 2) How did you get here/hear about this hospital?
 - via emergency room
 - referred by pediatrician – specialist – other hospital
 - other....
- 3) How far do you live from the hospital? _____minutes drive
Name county _____

II Transition

I'm interested in how your life in the hospital affects the rest of your life e.g. how your stay in the hospital affects staying in touch with home/friends/family/work:

- 4) How long have you been in the hospital?
- 5) Were/are you in school/working full-time previous to your hospitalization?
- 6) How do you stay in touch with home?
 - hospital phone cell phone email go back and forth other _____
- 7) Do you ever leave the building?

Where do you go? How do you get to these places? Are these places convenient to get to or easily accessible?

What do you think about parking at the hospital/places near the hospital you go to?
Do you use public transportation to get to the hospital or places near it?

Do you think it could be improved? If yes how?

- 8) Aside from your illness, what is stressful about being in the hospital that would not be present when you are at home?

III Being in the hospital

- 9) Do you feel you understand what's going on, that you are informed?

(Who is whom in the hospital, what is happening with you...)

- 10) Do you think this could be improved? If yes how?

- 11) What places do you go to in the hospital? Where have you been (lobby, cafeteria, shop, library, chapel, garden, outside, playroom...)

- 12) How do you feel about/ and how could it be improved (for you?)

the room / sharing the room / the nursing unit / the floor / the hospital overall /

the food / room and facilities (chairs/places to go to) for families / shops services (post office) food library

- 13) Being that you're in the hospital, what is missing for **you** to get through the day?

IV Feelings of wellbeing

- 14) What do you consider the most stressful while being **in** the hospital?

- other sick children
- not knowing what's going on
- taking care of yourself
- other _____

- 15) What in the hospital brings you comfort during your stay?

- 16) How could the hospital building improve/contribute to your wellbeing? and why?

A-III ■ Interview Staff

Date: _____

Unit: 3 North 3 South PICU NICU Infants/Toddlers

Job Title/Function: _____

- 1) How long have you been working at this hospital?
- 2) Have you always worked on your current unit? YES NO
- 3) If no, what other units/floors have you worked on?
- 4) How far do you have to travel to come to work every day?
- 5) Have you worked in other hospitals?
- 6) Have you heard about the new Children's Hospital?
 - a) Have you seen it?
 - b) What do you think about it/What have you been told about it?
 - c) Do you think/hope it will be better than this existing space?
- 7) What do you think are the three worst things about this hospital?
- 8) What are the three best things in this hospital for patients/families and staff?
- 9) How could the environment be improved to make your work easier?
- 10) What difference do you think the private rooms will make for:
 - a) You and the other staff / Family / Patients?
- 11) Do you have to pay for parking at the hospital?
- 12) How do you feel about following:
 - a) Confidentiality Issues/ Noise on the floor / Space for meetings/ Lounges/Space for personal items:
- 13) How well do you think this environment supports patient and Family Centered Care?

A-IV ■ The Staff Chart: Summary of the Literature Review and Data from Formative Research

Dimensions of healing	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Medical Staff					
Control	Work overload stress	Effectiveness of care Reduce mistakes Not too much task oriented	Reducing work-stress & spatial organization	Gadbois, 1992; Starfield, 2004	Too noisy, too cramped
		Frequent interruptions during work		Gadbois, 1992	Crowded space, many interruptions
		Standing		Gadbois, 1992	Not enough seats
		Activity of doctors		Gadbois, 1992	Too little space
		Administrative work		Gadbois, 1992	Inadequate space
Control	Information & Planning	Being able to plan / to make a schedule	A clock in a visible place	Shepley (1998)	3 clocks: 2 at 3 North, 1 clock at 3 South
		Being able to know what's going on in the hospital / floor	Blackboards where notes can be posted	Shepley (1998)	Notes are posted on the walls of the nursing station
		Being able to know what's going on at a certain day	Blackboards with notes which change every day	Shepley (1998)	Notes are posted on the walls of the nursing station
	Reducing Stress/uncertainty	Knowledge of rules and procedures	Reduce stress and uncertainty by having written rules and procedures	Shepley (1998)	To be learned via the binder
	Organizational stress	Adequate staffing		Gadbois, 1992	Understaffed
		Relations with hierarchy		Gadbois, 1992	Ok
	Emotional overload	Relations with patients		Gadbois, 1992	Good
Coping with suffering			Gadbois, 1992	No restorative spaces	

Dimensions of healing	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Medical Staff					
	Privacy & prevent noise from outside	Working without interruptions and privacy while treating the patient	Sliding partitions instead of a 2 patients next to each other in 1 room	Shepley (1998)	Curtains in double rooms
Efficiency	Functional Efficiency layout	Improving efficiency, less time-consuming	Separate elevators	Shepley (1998)	3 elevators for staff and 3 public elevators
		More time and convenience	Writing surface in bedroom for nurses	Shepley (1998)	Writing surface in nursing station but not in bedroom
		Efficient adjacencies		Evans & Mc Coy, 1998; Horsburgh, 1995	Adjacencies are fine
		Trips (walking distance)		Gadbois, 1992; Yeaple et al., 1995	Pretty efficient
		Easy access to equipment	Closet for staff with equipment in each patients room	Shepley (1998)	Cabinets for materials next to patients room
		More time, convenience and privacy	Toilets just for staff	Shepley (1998)	In and near staff lounges
		Effectiveness reduce traffic time and wayfinding	Location class and conference room near entrance	Shepley (1998)	Very limited facilities on floor
		Quicker transport for critically ill patients	Separate entrance and transport paths for critically ill patients	Shepley (1998)	No separate quick circulation, via public corridors where visitors and staff are walking. Helicopter patients go to the ER via the same corridors.
		Being able to prevent mistakes and do job well	Enough lighting & space for staff in the patients rooms	Shepley (1998)	No adequate lighting, too noisy
		Functional	Easy Access	Less traveling time for staff, attractive to staff	Good connections to public transport
Less walking time for staff	Separate park area for staff with enough space to park the car			Olds et al. (1987)	No separate park area, they pay for parking

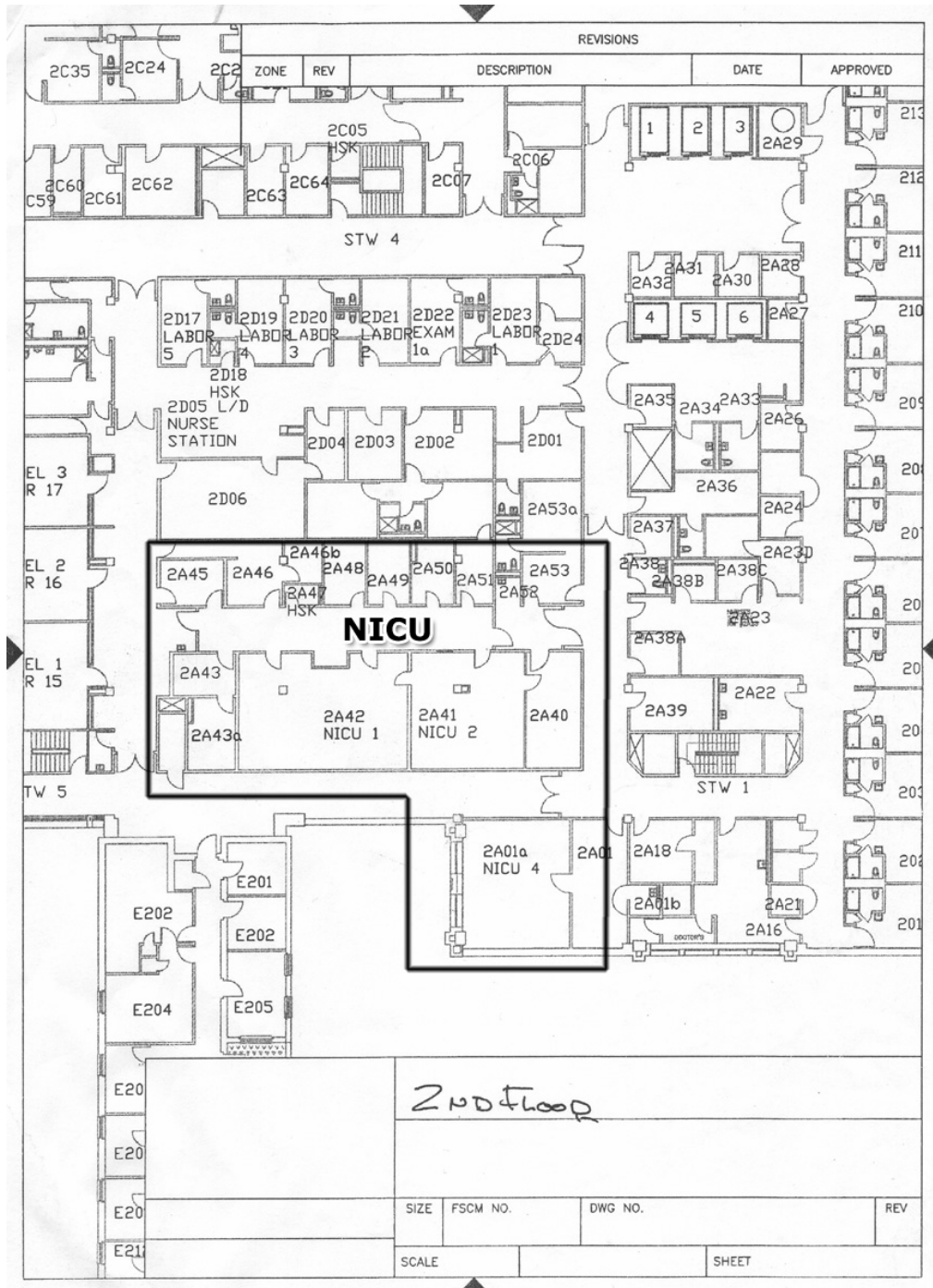
Dimensions of healing	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)	
Medical Staff						
	Functional Efficiency facilities	Foster collaboration	Design or organizational	Shepley (1998)	Design on third floor fosters collaboration	
		Lesser time and effort for maintenance	Easy to clean toys and furniture	Shepley (1998)	Furniture in patient rooms, equipment and toys need to be cleaned	
		Well placed nursing stations reduce stress and save time	Nursing stations that oversee the patient rooms	Olds et al. (1987)	Some rooms are hard to see from the nursing station	
Restorative Environment	Restorative	Drink supplies	Coffee machine in the conference / on floor	Olds et al. (1987)	Very limited	
		Restorative when staff has to work more hours/days than usual	Beds for doctors and residents	Olds et al. (1987)	Happens regularly	
		Place to rest and not work, to refill the battery	Nursing lounge away/not accessible from public and patients	Evans & McCoy; (1998) Olds et al. (1987)	There are 5 lounges, all unattractive and small	
		Place to eat, drink and talk and not be on the floor. Refill the battery	Staff restaurant with good food and nice views of the outside	Olds et al. (1987)	Staff restaurant in basement, and public one on the main floor	
		Cooking, preparing for eating, being able to have something to eat	A kitchenette on the floor to quickly warm/cook food during the nightshift when restaurant is closed	Olds et al., (1987)	There's a pantry for patients with a microwave. No kitchenette though	
		Getting emotional relief/coping with the suffering/losses	Having a colleagues or therapist to talk to, in order to deal with the things that happen on the floor	Olds et al. (1987)	Cramped and uncomfortable spaces	
		Need for private space/backstage	Being able to be out of sight		Goffman, 1969	Very poor staff lounges
		Distraction & contact with outside world	Less stress & more energy. Feeling/contact with outside world	Windows with access to the outside, nature views	Shepley (1998)	No windows on the floor, only in patients room

Dimensions of healing	Relevant Behaviors in a Children's Hospital	Design Healing Relationships	Topic/theme as described in the literature	References	Findings from Formative study at WMC (F. de Vos, 2004)
Medical Staff					
		Restorative, distraction and contact with outside world.	Outside (staff) garden with exercise facilities	Olds et al. (1987)	One nice garden, no exercise facilities
		Less stress & more pleasurable work environment & distraction	Art (changeable posters) in the units	Shepley (1998)	No changeable posters, wall paintings
		Less stress, music for a more pleasurable work environment	Stereo (radio) at the nursing lounge (if not too loud: at the nursing station)	Shepley (1998)	There's 1 radio at 3 North that is sometimes on
Centered Care	Involve parents in care	Involve parents in care of the child. <i>parents get responsibility, child gets care from his parents, and it helps staff saving time</i>	<i>Provide information /teaching on how to help with the medical care for the child.</i>	Olds et al. (1987)	Information folder for parents??
	Family	Knowing parents are comfortable	Knowing that they can eat, sleep, wash themselves and have something to do	Reduces stress on staff	F. de Vos (2004)

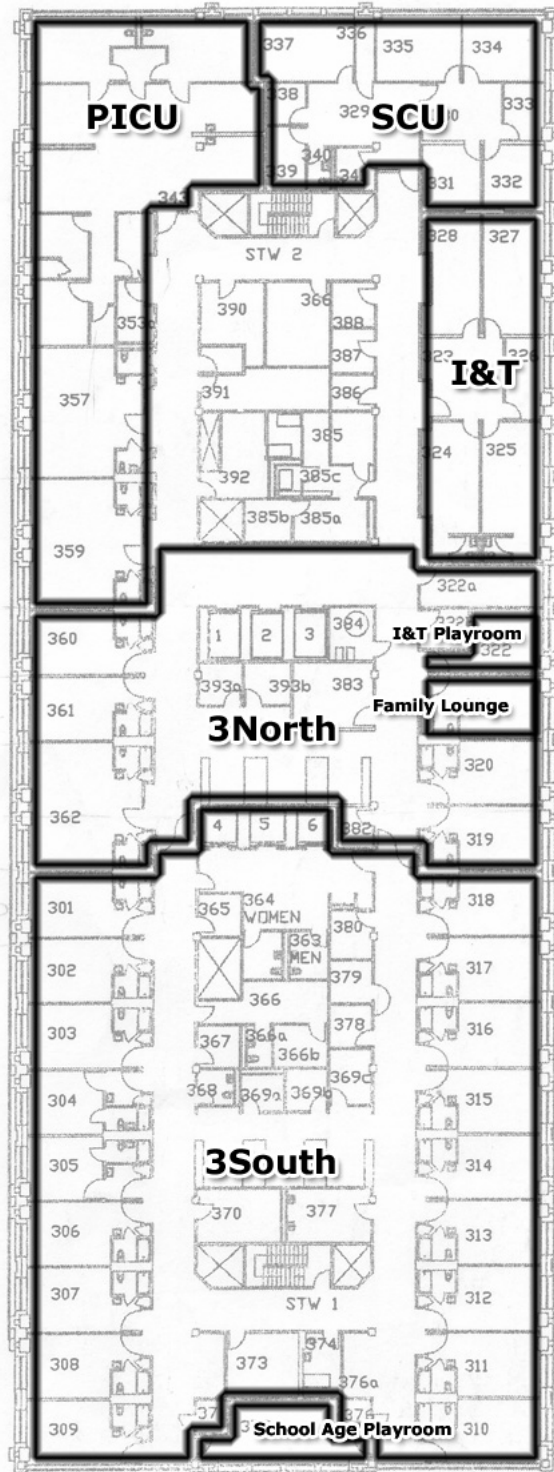
APPENDIX B ■ INSTRUMENTS STUDY

B-I ■ Floor Plans NICU and Pediatric Units WMC and MFCH

NICU WMC SECOND FLOOR

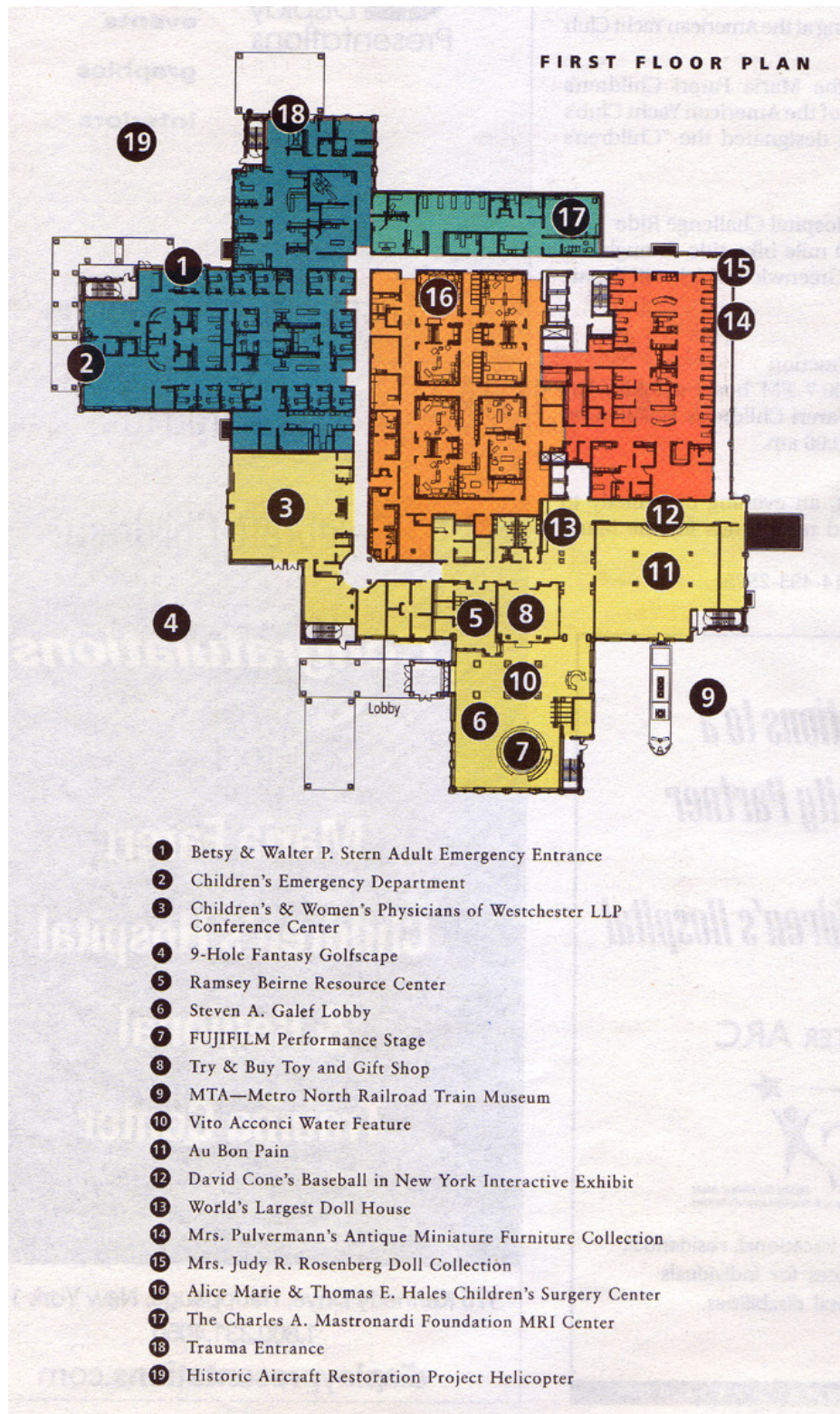


PEDIATRIC UNITS WMC THIRD FLOOR

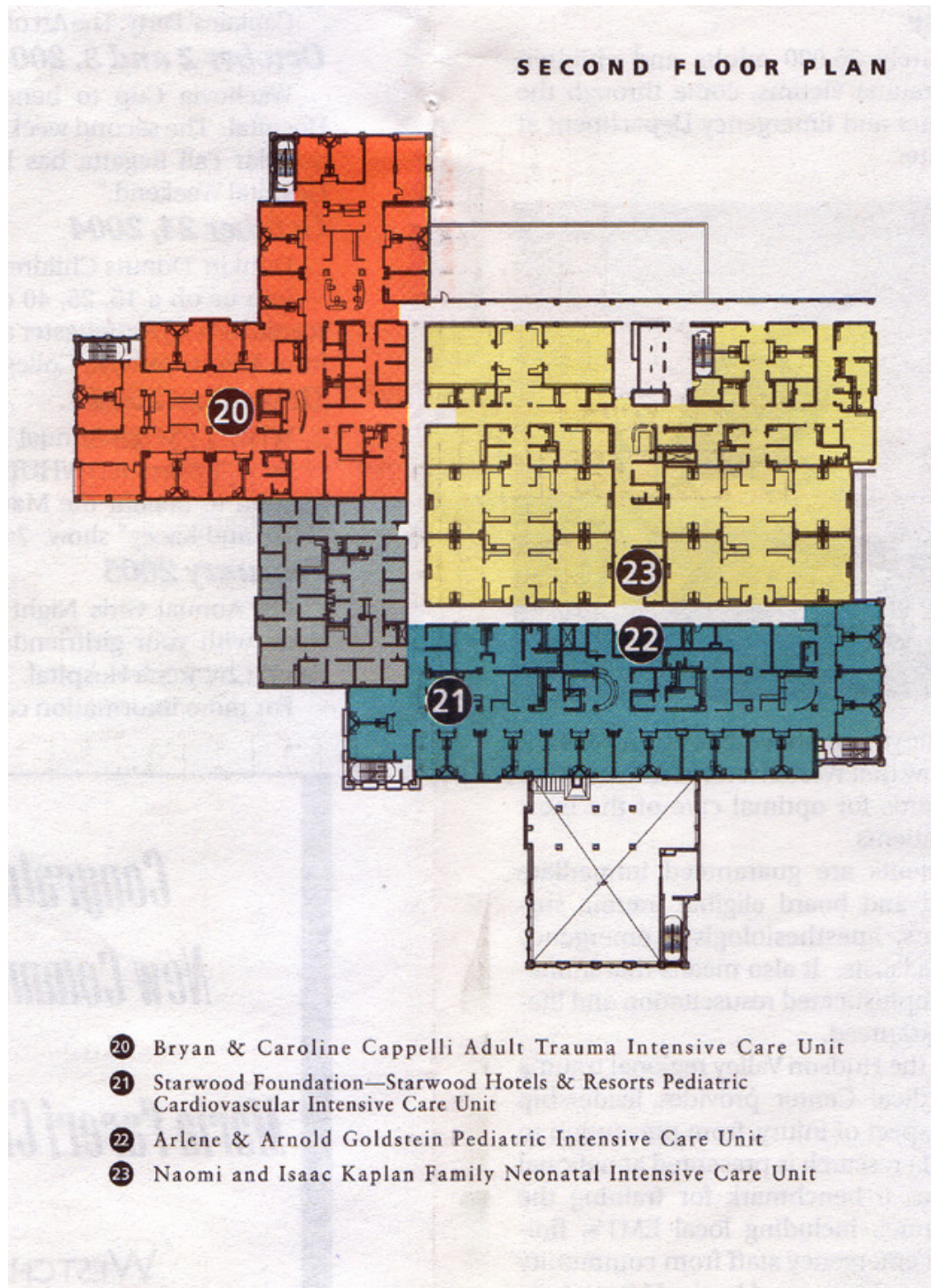


- PICU = Pediatric Intensive Care Unit**
- SCU = Special Care Unit**
- I&T = Infant and Toddlers**
- 3 North = General Pediatrics**
- 3 South = General Pediatrics**

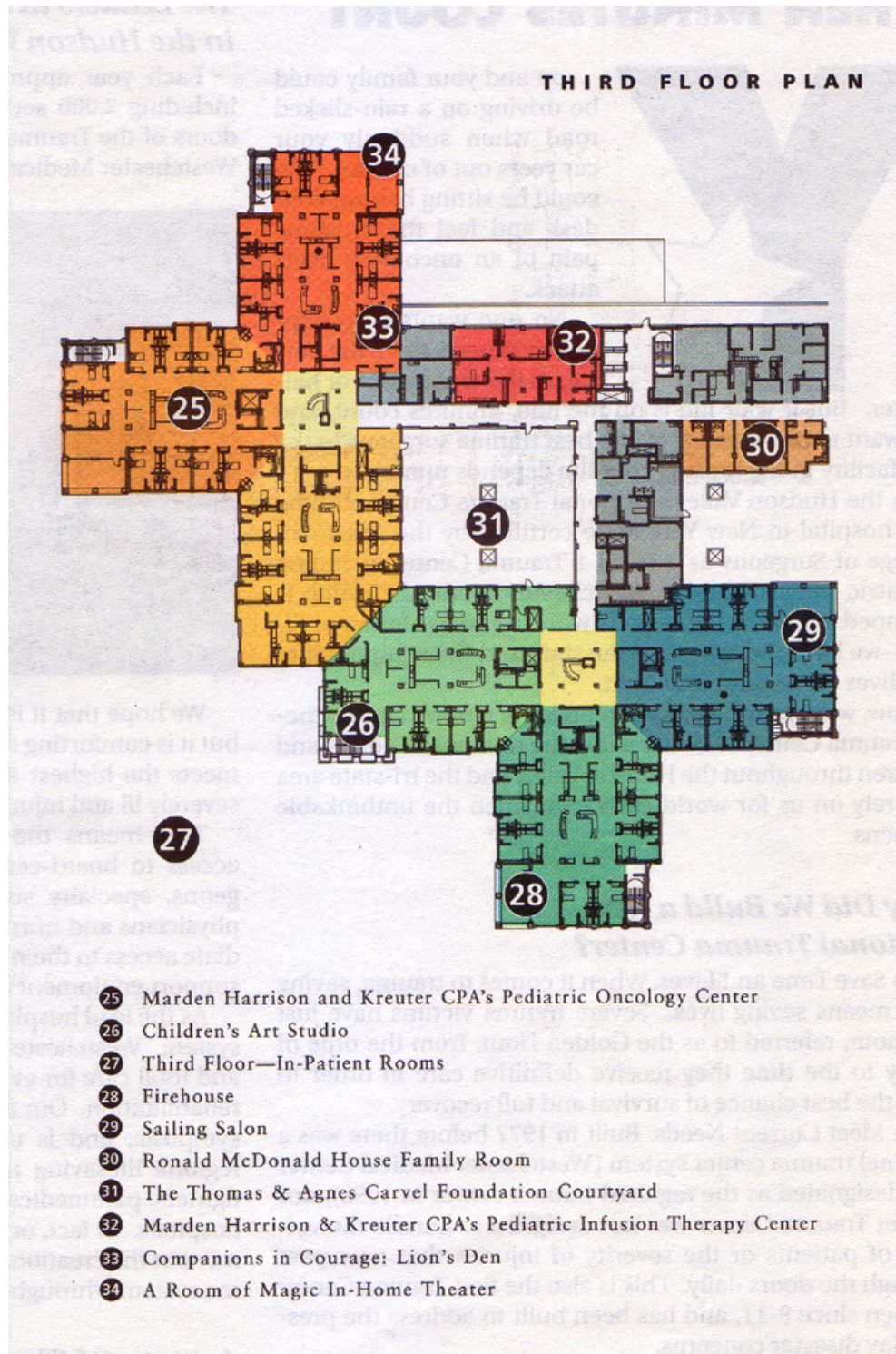
MFCH FIRST FLOOR



NICU AND PICU MFCH SECOND FLOOR



PEDIATRIC UNITS MFCH THIRD FLOOR



B-II ■ Interviews Rules and Routines at the Hospital

WHAT ARE THE RULES?

- What is the mission with regards to patient care?
 - What is the philosophy behind the care for patients?
 - Are these written down anywhere?
 - If so, where could we find them?
 - Are these things all staff knows of?
- Are there any differences with regards to age/sex/kind of illness?
 - Are there averages used which these rules/guidelines are based on?
- Is it possible to deviate from the rules?
- How easy is it to deviate from the rules?

Ask for each question: whether it is an explicit/written or unwritten rule/culture?

- Are there any written or explicit rules regarding patients freedom of independence/movement?
 - When do they have to stay in bed?
 - When can they get out of bed?
 - Does a doctor need to give approval for that?
 - Where can they go?
 - When can they use the playroom?
 - When can they go downstairs?
 - When can they go outside?
 - When can they sit at the nursing station?
 - At what age can they move freely/move where they want?
 - Till what age have they got to be accompanied by an adult?
 - Can that be an older sibling too?
 - And from what age on?

- Are there different rules for adolescents?
- What are the rules regarding siblings?
 - When can siblings visit?
 - Are all ages welcome?
 - E.g. can an infant be with the mother all day?
 - Can they ever stay over?
 - If no why not?
 - Are there ever exceptions to this rule?
- What are the rules regarding parents?
 - One parent can stay with the patient 24/7
 - When can both parents stay?
 - When can both parents and a sibling stay?
- What are the rules concerning other visitors?
 - How many can be at the bedside at once?
 - Is there a difference in a one or two person bedroom?
 - Are there any exceptions (e.g. birthdays, dying children, etc.)?

Are there any explicit rules with concern to staff-patient interaction?

About nurses/ doctors/ child life/ volunteers/ teachers

- Do they have to knock before entering the room?
- Do they always introduce themselves?
- Do they tell the patient when they'll be back/when they'll be examined?
- Do they tell the patient when they'll approximately be discharged?

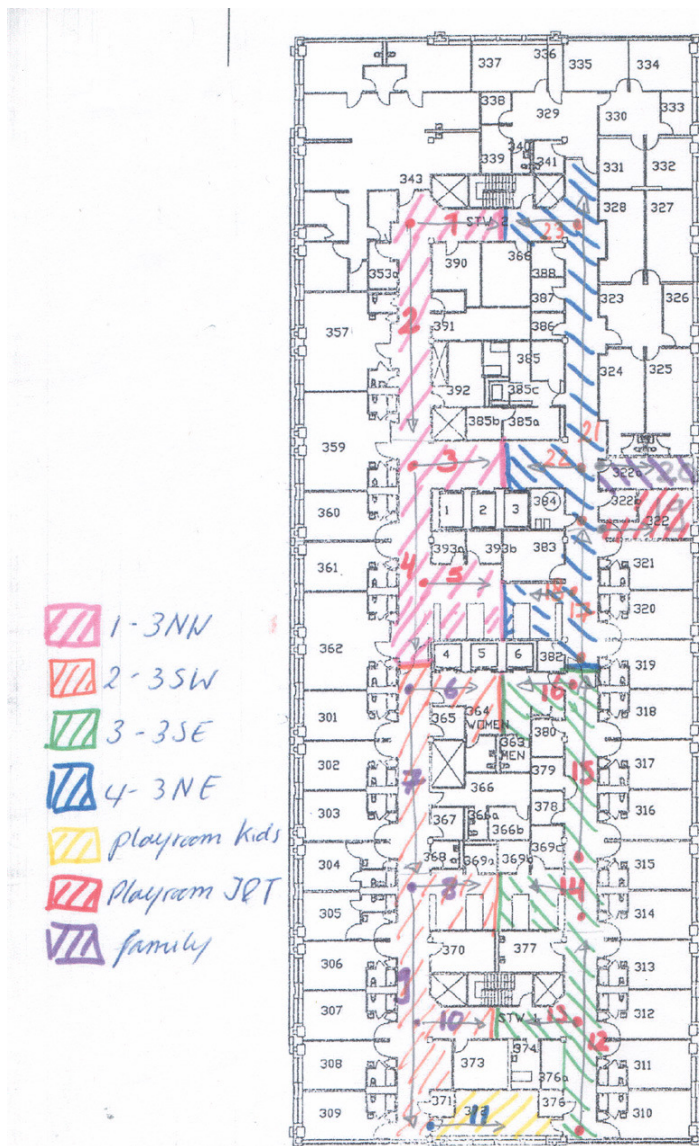
THE DAILY ROUTINES OF THE HOSPITAL

1. What are the times that the nurses switch shifts (nightshift to dayshift/ dayshift to nightshift)
2. At what time do the nurses start making their rounds on the floor? How many rounds a day?
3. From when to when is Child Life in the office?
4. At what time does Child Life start visiting the children?
5. At what time do the doctors come in to visit the children?
 - Do they visit a patient every day?

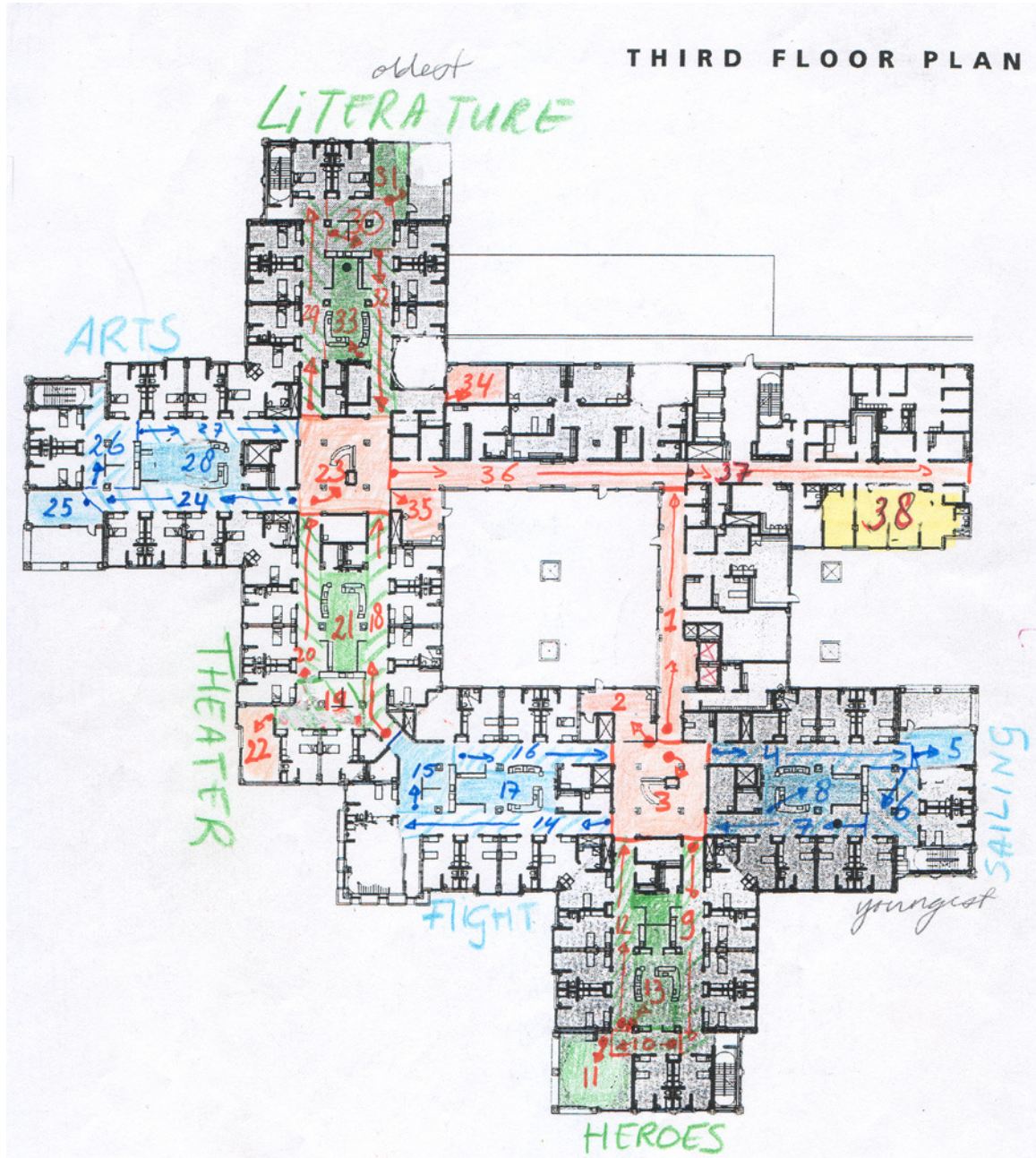
6. At what time and till what time are the teachers on the floor?
7. At what time and till what time are the volunteers on the floor?
8. During which times is it the busiest (**staff**) on the floor? Why?
9. At what time is breakfast being served?
10. Can the children choose to have breakfast later in the morning?
11. Is there a set time that children get showered?
12. Is there a set time that babies get a new diaper?
13. At what times are **visitors** (not parents) allowed on the floor?
14. When do most **parents and or visitors** visit their children? Why then?
15. At what time do children get their lunch?
16. Can they choose to have lunch at a later time? Why?
17. At what time can the children get out of bed to play?
18. Is there a time that most children are out of bed? Why then?
19. From when to when can the children watch television?
20. At what time do children get dinner?
21. Can they choose to have dinner later?
22. At what time do the children have to go to bed?
 - Does that mean they have to sleep?
23. How often and when do meetings take place between nurses?
24. How often and when do most Child Life meetings take place?
25. How often and when do most meetings between Child Life and nurses take place?
26. How often and when do most meetings between doctors and nurses take place?
27. How often and when do most meetings between doctors and Child Life take place?
28. How often and when do most meetings between doctor/residents on the floor take place?

B-III • Behavioral Mapping Tools

OVERVIEW MENTAL PICTURES TAKEN FOR OBSERVATIONS ON THE THIRD FLOOR OF WMC



OVERVIEW MENTAL PICTURES TAKEN FOR OBSERVATIONS ON THE THIRD FLOOR OF MFCH



INSTRUCTIONS OBSERVATIONS

Purpose

1. Get an indication of how people deal with privacy and control of privacy. Do they leave doors open? Do they leave curtains open?
2. Get an idea of what kids are doing and where they are if they are not in bed (mobility and activity)
3. Get an idea of how, when and by whom the playrooms, etc. are being used

Step 1: Patients

Every time you do the observations (5 times a day) write down the number of patients per unit

Step 2: Obstacles (WMC only)

how many times? Twice a day (in the morning and in the afternoon before you leave)

what? Obstacles are the objects that are in the corridors that may obstruct you in your way down the hall. This excludes bins, the medicine car at the nursing station, but includes the slippery signs, closet on wheels, cleaning equipment not in use at the moment you walk by, trash, beds, linen cars or cribs

Step 3: Doors & Curtains

1. how many times? 3 times a day (preferably in the morning, around Noon, and afternoon: 10, 13, 16) **always write day, date and time on sheet!**
2. room numbers the first column are the room numbers
3. are the doors open or closed? count door as closed if closed or less than 5 cm open
0 = open, 1 = closed
4. curtain door open or closed? curtain is counted as closed if less than 1/2 open
0 = open, 1 = closed
5. curtain window open or closed? curtain is counted as closed if less than 1/2 open
0 = open, 1 = closed
6. how many beds are occupied in the room? write down if the bed is occupied or not – the patient does not have to be in the room – check on the board at the nursing station if in of doubt (0 = 0 patient, 1 = 1patient etc.)
write down any remarks about the rooms if necessary

Step 4: Activities Floor

1. how many times? 5 times a day, every hour-hour and a half
2. special activity? write down what activity is.
3. 1st 3 rows: the first 3 rows (empty/TV/clean) cannot be scored for the floor, only for the playrooms

Make a ' mental picture' of the part of the floor you're looking at, as shown on the floor map

Count:

- | | |
|--------------------|--|
| Staff | Count the number of staff per picture, this includes cleaning staff and other people with a hospital ID badge, volunteers are also scored as staff |
| Parents | If there are people on the floor without a hospital ID tag, count them as parent or visitor |
| Siblings | When there are kids on the floor that are not patients, count them as siblings/friends |
| Patients | Write down the number of patients alone, with other patients or patients with others

Write down for patients only the number of boys and girls, and their ages.
A child is scored in the 0-1 row if they're not able to walk |
| Posture & activity | Only patients get scored on their posture and activity, write down main posture and main activity

patients on the floor are scored only once in the posture section (e.g. walking, standing, etc.) and once in the activities section

stroller: if a kid is in a stroller/cart at the nursing station, it's scored as sitting, not as being pushed in a stroller or cart |
| IVs, etc. | note if patient have special needs such as IV pole, masks, wheelchair etc |
| comments | write down special activities or events on floor, if a unit is closed or any other special situation that may influence observations |

BEHAVIORAL MAPPING CODING SHEET

MFCH Observations Floor: how many kids are on the floor and what are they doing?

Date: Day: Observer: **PAGE 1**

TIME: _____ Special activity: clown dog per. pinwheel other

Round	1	2	3	4	5	G1	P1	M1	Sailing				Heroes			Flight		
Picture	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
empty yes (0) / no (1)																		
TV on yes (0) / no (1)																		
# staff																		
# parents/visitors																		
# siblings/friends																		
# pat. alone																		
# pat. w/ patients																		
# pat. w/ others																		
# boys (patients)																		
# girls (patients)																		
age 0-1 (patients)																		
age 2-5 (patients)																		
age 6-12 (patients)																		
age 13-18 (patients)																		
postures	walking/pulled by dog																	
	being push. w/cart/str.																	
	walking / running																	
	standing																	
	sitting																	
	laying down																	
	cycling																	
other:																		
activities	cleaning																	
	working																	
	conversation:talk/listen																	
	watch TV / video games																	
	sleeping																	
	no focused activity																	
	reading																	
	telephone																	
	drinking or eating																	
	formal teaching																	
	games/puzzles																	
	play with toys/materials																	
	play (gross motor)																	
	computer																	
	art activities																	
other:																		
IV's / oxygen																		
masks																		
wheelchair																		
other:																		
comments:																		

B-IV ■ Questionnaires

GENERAL INTRODUCTION

Hello! My name is Fiona de Vos. I would like to learn about how children experience the Maria Fareri Children's Hospital and all of the places in it. If you want, you can help me by telling me what you think about this new hospital. For instance, you can tell me what you like and do not like about your room, what other places you go to on the floor, what you like about them and what you do not like about them. Your ideas can help to improve this hospital and create better hospitals in the future.

Instructions: Please rate the following questions about **your** experiences on the second or third floor of the Maria Fareri Children's Hospital. Circle the number that best represents **your** feelings. There are no 'right' or 'wrong' answers. The best answer is usually the first answer that comes up when you read the question.

Let me give you an example:

	Never	Rarely	Sometimes	Often	Always
I like to have my door open	1	2	3	4	5

For instance: If you have your door open rarely, you circle the number '2'.

Space is provided for you to comment on good and bad things about the hospital environment. When you have completed the survey, please put it in the box at the nurse's station or give it back to me.

Thank you!

All information will remain strictly confidential

QUESTIONNAIRE PATIENT

ABOUT ME (Please fill in)

How old are you? _____

Are you a boy or girl? ___Boy ___Girl

How many members of your family do you live with? _____

How long have you been in this hospital? _____Days

What unit are you in? **2nd**: PICU **3rd**: Sailing Heroes Flight Theater Arts Literature

Is this your first time in this new hospital? ___Yes ___No

If no, how many times have stayed in this new hospital? _____times

How many times have you stayed at the old hospital (next doors)? _____ times

How many times have you stayed at other hospitals? _____ times

During this stay, have you spent time in the PICU? ___Yes ___No

SLEEP

Never Rarely Somet. Often Always

- | | | | | | |
|---|---|---|---|---|---|
| 1. I sleep in the hospital just as well as I sleep at home | 1 | 2 | 3 | 4 | 5 |
| 2. At night I have problems sleeping because it is noisy or busy in my room | 1 | 2 | 3 | 4 | 5 |
| 3. In the hospital I usually sleep _____hours a night | | | | | |

Other comments about sleep:

FOOD

Never Always

- | | | | | | |
|---|--------------|---|---|---|---|
| 1. The food in the hospital tastes good | 1 | 2 | 3 | 4 | 5 |
| 2. The food choices in the hospital are good | 1 | 2 | 3 | 4 | 5 |
| 3. I can get something to eat or drink when I want it | 1 | 2 | 3 | 4 | 5 |
| 4. At this moment I'm on a (special) diet and can only eat food given by the hospital | ___Yes ___No | | | | |
| 5. I eat food brought from home or from a take-out restaurant while here | 1 | 2 | 3 | 4 | 5 |

Other comments about food:

ABOUT MY HOSPITAL ROOM

Never Always

- | | | | | | |
|---|---|---|---|---|---|
| 1. Others will leave my room if I want them to | 1 | 2 | 3 | 4 | 5 |
| 2. I can decide who enters my room | 1 | 2 | 3 | 4 | 5 |
| 3. When it gets too noisy in my room I can quiet things down | 1 | 2 | 3 | 4 | 5 |
| 4. I have as much privacy as I want when I am in my room | 1 | 2 | 3 | 4 | 5 |
| 5. I like to have the door of my room open | 1 | 2 | 3 | 4 | 5 |
| 6. I like to have the door and window blinds of my room open | 1 | 2 | 3 | 4 | 5 |
| 7. The room I stay in is clean and pleasant | 1 | 2 | 3 | 4 | 5 |
| 8. I have as much privacy as I want when I am in the bathroom | 1 | 2 | 3 | 4 | 5 |
| 9. The bathroom I use is clean and pleasant | 1 | 2 | 3 | 4 | 5 |
| 10. If I want to I can put up any decorations I like in my room | 1 | 2 | 3 | 4 | 5 |

	Never			Always	
11. I can make as much noise as I want in my room	1	2	3	4	5
12. I have a safe place where I can store my personal belongings	1	2	3	4	5
13. I can control the lighting in my room	1	2	3	4	5
14. I can control the temperature in my room	1	2	3	4	5
15. I can decide what things happen in my room	1	2	3	4	5
16. I can watch television if I want to	1	2	3	4	5
17. I can decide at what times I rest in my room	1	2	3	4	5
18. I like to be able to look outside through a window while in my bed	1	2	3	4	5
19. The furniture in my room is comfortable and nice looking	1	2	3	4	5
20. Are you allowed to get out of bed? __Yes __No					

If you are allowed to get out of bed, please answer the following:

	Never			Always	
21. I can leave my room when I want to	1	2	3	4	5
22. I can get out of bed when I want to	1	2	3	4	5
23. I can decide at what times I play in my room	1	2	3	4	5

Other comments about my room:

PRIVACY IN MY HOSPITAL ROOM

Do you have a private room now? __Yes __No

	Never			Always	
24. I prefer a private room over sharing a room with another patient	1	2	3	4	5
25. I feel comfortable talking to staff while in bed because others can't hear me	1	2	3	4	5
26. I can have private (telephone) conversations in my room	1	2	3	4	5
27. I can have private conversations elsewhere on the 3 rd floor	1	2	3	4	5
28. I can be alone when I want to	1	2	3	4	5

Other comments about privacy:

KNOWING WHAT'S GOING ON

	Never			Always	
1. The staff explains to me what is going on	1	2	3	4	5
2. I help decide about my treatment and medication intake	1	2	3	4	5
3. I can get more information about my illness and treatment if I want to	1	2	3	4	5
4. I can get pain medication when I need it	1	2	3	4	5
5. The staff introduce themselves to me	1	2	3	4	5
6. I can find someone to talk to here in the hospital about things that worry me	1	2	3	4	5
7. Who are the people you feel most comfortable to talk to about your concerns here in the hospital other than your parents? (Check all that apply) <input type="checkbox"/> nurse <input type="checkbox"/> doctor <input type="checkbox"/> child life <input type="checkbox"/> volunteer <input type="checkbox"/> cleaning person <input type="checkbox"/> other_____					

Other comments:

GETTING HELP WHEN I NEED IT

	Never			Always	
1. The nurses come quickly when I call them	1	2	3	4	5
2. It is important for me to have my parents here at night	1	2	3	4	5
3. It is important for me to have my parents here during the day	1	2	3	4	5
4. I brought things from home to personalize my room	1	2	3	4	5
5. I feel safe in the hospital	1	2	3	4	5
6. During my stay I switched rooms ____ times					

Other comments:

FAMILY AND FRIENDS

	Never			Always	
1. A family member stays with me at night	1	2	3	4	5
2. It's easy to stay in touch with my friends and family when I'm in the hospital	1	2	3	4	5
3. There is enough space for my parents/brothers/sisters in my room to visit	1	2	3	4	5
4. I know what is going on with my friends while I'm in the hospital	1	2	3	4	5
5. My friends come to visit me as often as I want and as they can	1	2	3	4	5
6. There is enough space for my friends in my room	1	2	3	4	5
7. I like to meet other patients	1	2	3	4	5
8. I can find kids of my age to play with or talk to	1	2	3	4	5
9. I know what is going on at school while I'm in the hospital	1	2	3	4	5
10. There are places I can go to in the hospital to meet other patients	1	2	3	4	5
11. I know what is going on at home while I'm in the hospital	1	2	3	4	5
12. On a normal day I have ____ friends and family members visiting me					

Other comments about family and friends:

ACTIVITIES

	Never			Always	
1. I feel there is enough to do during the day so that I am not bored	1	2	3	4	5
2. I use a computer while in the hospital	1	2	3	4	5
3. I (would) like to have internet access in my room	1	2	3	4	5
4. If I use the computer, I use <input type="checkbox"/> my own laptop <input type="checkbox"/> computer in the hospital <input type="checkbox"/> other _____					
5. If I use the computer, I use it for <input type="checkbox"/> games <input type="checkbox"/> schoolwork <input type="checkbox"/> e-mail <input type="checkbox"/> browse the web <input type="checkbox"/> other____					
6. I do schoolwork while in the hospital	1	2	3	4	5
7. If yes, I prefer to do schoolwork <input type="checkbox"/> in my bed <input type="checkbox"/> in my room <input type="checkbox"/> in the playroom <input type="checkbox"/> other_____					
8. Are you allowed to leave your room? ____Yes __No					
9. If yes, I leave my room to go to other places in the hospital	1	2	3	4	5
10. If yes, check all the places that you go to: <input type="checkbox"/> playroom(s) <input type="checkbox"/> art room <input type="checkbox"/> other units <input type="checkbox"/> other patient rooms <input type="checkbox"/> Computer room (Lion's Den) <input type="checkbox"/> family area/pantry <input type="checkbox"/> corridors <input type="checkbox"/> lobby <input type="checkbox"/> cafeteria <input type="checkbox"/> Family Resource Center <input type="checkbox"/> chapel <input type="checkbox"/> outside <input type="checkbox"/> garden <input type="checkbox"/> other_____					

	Never			Always	
11. I (would) like to go outdoors if possible	1	2	3	4	5
12. I prefer being alone than talking to other people	1	2	3	4	5
13. When I feel down there is a special place I can go to Where is this place? _____	1	2	3	4	5
14. I can find my way around the hospital easily	1	2	3	4	5
15. The signs in the hospital help me find my way around	1	2	3	4	5
16. I can freely practice my cultural/religious activities in the hospital	1	2	3	4	5
17. What makes you smile in the hospital? _____					
18. What makes you angry in the hospital? _____					

Other comments about activities:

COMPARED TO HOME (Check one)

	Better than home	Equal to home	Worse than home
1. My ability to play music here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My ability to use the computer here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The smell in the hospital room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The coziness of this room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The amount of storage in this room for personal belongings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The quietness of this room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The interesting things to do here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. My ability to control privacy here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. The quality of the food I eat in the hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The amount of space in my hospital room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I sleep in the hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. My ability to play with other kids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. The things to look at	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other comments:

	Very Poor			Very Good	
	1	2	Fair 3	Good 4	5
❖ How would you rate your hospital room?	1	2	3	4	5
❖ How would you rate this hospital as a building for children?	1	2	3	4	5
❖ How would you rate the way the hospital looks in general?	1	2	3	4	5
❖ If I could change one thing of the hospital environment, what would you change?					

Is there is anything not covered in this questionnaire you would like to mention?

This questionnaire was filled out by ___Patient ___ Parent

Thank you!!

QUESTIONNAIRE PARENTS

ABOUT ME (Please fill in)

How old is your child? _____years

Are you the Mother Father Grandparent Other _____

How many live with you in your household? _____

How long has your child been in this hospital? _____Days

What floor is your child on? ___2nd ___ 3rd

What unit is your child in? 2nd: PICU 3rd: Sailing Heroes Flight Theater Arts Literature

How many nights have you or one of your family members been with your child? _____

Is this your child's first time in the new hospital? ___Yes ___No

If no, how many times has your child stayed in the new hospital? _____times

How many times has your child stayed at the old hospital? _____ times

How many times has your child stayed at other hospitals? _____ times

During this hospital stay, has your child spent time in the PICU? ___Yes ___No

How do you get to this hospital? (Check all that apply) car bus friend's car train taxi other_____

Are you employed by anyone? ___Yes ___No

SLEEP

Never Rarely Somet. Often Always

- | | | | | | |
|--|---|---|---|---|---|
| 1. I stay with my child at night in the hospital | 1 | 2 | 3 | 4 | 5 |
| 2. <i>If you spend the night in the hospital, please answer the following:</i> | | | | | |
| 3. I sleep in the hospital just as well as I sleep at home | 1 | 2 | 3 | 4 | 5 |
| 4. At night I have problems sleeping because it is noisy or busy in the room | 1 | 2 | 3 | 4 | 5 |
| 5. I get enough sleep in the hospital to feel healthy | 1 | 2 | 3 | 4 | 5 |
| 6. The hospital supplies linens, blankets and towels for me to use | 1 | 2 | 3 | 4 | 5 |
| 7. On a normal night in the hospital I sleep _____hours | | | | | |

Other comments about sleep:

FOOD

Never

Always

- | | | | | | |
|---|---|---|---|---|---|
| 1. I buy food in the hospital for myself | 1 | 2 | 3 | 4 | 5 |
| 2. I eat just as well in the hospital as I eat at home | 1 | 2 | 3 | 4 | 5 |
| 3. I bring my own food from home or from a take-out restaurant | 1 | 2 | 3 | 4 | 5 |
| 4. If you do bring your own food, where do you keep the food? _____ | | | | | |
| 5. The variety/choice of food I can buy in the hospital is good | 1 | 2 | 3 | 4 | 5 |
| 6. I (would) make my own food in the hospital if possible | 1 | 2 | 3 | 4 | 5 |
| 7. I (would) cook for my child in the hospital if it were possible | 1 | 2 | 3 | 4 | 5 |

Other comments about food:

ABOUT MY CHILD'S HOSPITAL ROOM

	Never					Always				
1. I or my child can decide how many people are in my child's room	1	2	3	4	5					
2. Others will leave my child's room when I or my child want them to	1	2	3	4	5					
3. I or my child can decide who enters my child's room	1	2	3	4	5					
4. When it gets too noisy in my child's room I can quiet things down	1	2	3	4	5					
5. I have as much privacy as I want when I am in my child's room	1	2	3	4	5					
6. My child's hospital room is clean and pleasant	1	2	3	4	5					
7. I have as much privacy as I want when I am in the bathroom	1	2	3	4	5					
8. The bathroom I use is clean and pleasant	1	2	3	4	5					
9. I or my child can control the temperature in my child's room	1	2	3	4	5					
10. I or my child can make my child's room more pleasant looking if we want to	1	2	3	4	5					
11. I or my child can control the lighting in my child's room	1	2	3	4	5					
12. I can decide for or with my child what things happen in my child's room	1	2	3	4	5					
13. I have a safe place where I can store my personal belongings	1	2	3	4	5					
14. I can decide when I want to sleep, rest, or eat	1	2	3	4	5					
15. I use the bathroom to wash, shower and groom	1	2	3	4	5					
16. I like to be able to look outside through a window while in the room with my child	1	2	3	4	5					
17. The furniture in my child's room is comfortable and nice looking	1	2	3	4	5					

Other comments about my child's room:

PRIVACY IN MY CHILD'S HOSPITAL ROOM

	Never					Always				
Does your child have a private room? __Yes __No										
1. I prefer a private room over sharing a room with another patient/family	1	2	3	4	5					
2. I can find a room other than the bedroom on this floor to talk privately	1	2	3	4	5					
3. I can find a place to talk privately on the phone on this floor	1	2	3	4	5					
4. There is enough privacy in the room to talk with staff about my child's illness	1	2	3	4	5					
5. I like to have the door of my child's room open	1	2	3	4	5					
6. I like to have the door and window blinds of my child's room open	1	2	3	4	5					
7. Overall, there is enough privacy in the room	1	2	3	4	5					

If you spend the night in the hospital, please answer the following:

8. There is enough privacy for me in the room to sleep	1	2	3	4	5					
--	---	---	---	---	---	--	--	--	--	--

Other comments about privacy:

KNOWING WHAT IS GOING ON

	Never					Always				
1. The staff explains to me what is going on with my child's illness	1	2	3	4	5					
2. I help decide in the treatment and medication of my child	1	2	3	4	5					
3. I can get more information about my child's illness or treatment if I want to	1	2	3	4	5					
4. The staff introduce themselves to me	1	2	3	4	5					
5. I can find someone to talk to here at the hospital about things that worry me	1	2	3	4	5					
6. Who are the people you feel most comfortable to talk to about your concerns here in the hospital other than your family? (<i>Check all that apply</i>) <input type="checkbox"/> nurse <input type="checkbox"/> doctor <input type="checkbox"/> child life <input type="checkbox"/> volunteer <input type="checkbox"/> cleaning person <input type="checkbox"/> other (s)_____										

Other comments:

GETTING HELP WHEN I NEED IT

	Never					Always				
7. The nurses come to my child's room quickly when I call them	1	2	3	4	5					
8. It's important for me to be with my child	1	2	3	4	5					
9. I can leave my child alone and feel comfortable	1	2	3	4	5					
10. I can find a place to be alone here in the hospital if I want to	1	2	3	4	5					
11. I brought things from home to personalize my child's room	1	2	3	4	5					
12. I feel safe in the hospital	1	2	3	4	5					
13. I like to help in the care of my child while he/she is here	1	2	3	4	5					
14. During my stay my child switched rooms ____ times										

Other comments:

FAMILY AND FRIENDS

	Never					Always				
1. It's easy to stay in touch with my partner/family/friends when I'm in the hospital	1	2	3	4	5					
2. There is enough space for my family members in my child's room to visit	1	2	3	4	5					
3. There are places I can go to in the hospital to meet other parents	1	2	3	4	5					
4. On a normal day my child has ____ friends/family members visiting him/her										
5. It's easy to stay in touch with work when I'm in the hospital	1	2	3	4	5					
6. On the floor I miss the following (<i>Please mark all that apply</i>): <input type="checkbox"/> music <input type="checkbox"/> flowers <input type="checkbox"/> books <input type="checkbox"/> information about illnesses <input type="checkbox"/> games <input type="checkbox"/> magazines <input type="checkbox"/> snacks <input type="checkbox"/> drinks <input type="checkbox"/> support groups <input type="checkbox"/> other_____										
7. Have you used the family area/pantry in your unit? __yes __no										
8. If yes, the family area is a pleasant place to be in	1	2	3	4	5					
9. Have you used the Ronald Mc Donald House here in this hospital? __yes __no										

Other comments about family and friends:

ACTIVITIES

	Never				Always
1. I feel there is enough to do for me during the day so that I'm not bored	1	2	3	4	5
2. I use a computer while in the hospital	1	2	3	4	5
3. I (would) like to have internet access in my child's room	1	2	3	4	5
4. If I use the computer, I use <input type="checkbox"/> my own laptop <input type="checkbox"/> computer in the hospital <input type="checkbox"/> other _____					
5. If I use the computer, I use it for <input type="checkbox"/> work <input type="checkbox"/> games <input type="checkbox"/> e-mail <input type="checkbox"/> browse the web <input type="checkbox"/> other _____					
6. Do you ever work while in the hospital?	1	2	3	4	5
7. If I do work I like to <input type="checkbox"/> stay in my child's room <input type="checkbox"/> go to the family area <input type="checkbox"/> go to the cafeteria <input type="checkbox"/> other _____					
8. I leave my child's room to go to other places in the hospital	1	2	3	4	5
9. If yes, how often do you leave the room during the day? _____					
10. If yes, check all the places that you go to: <input type="checkbox"/> playroom(s) <input type="checkbox"/> art room <input type="checkbox"/> family area/pantry <input type="checkbox"/> Computer room (Lion's Den) <input type="checkbox"/> other units <input type="checkbox"/> corridors <input type="checkbox"/> lobby <input type="checkbox"/> cafeteria <input type="checkbox"/> Family Resource Center <input type="checkbox"/> chapel <input type="checkbox"/> outside <input type="checkbox"/> garden <input type="checkbox"/> other _____					

	Never				Always
11. The bathroom is close enough to use when I want	1	2	3	4	5
12. Food and drinks are close enough to use whenever I want	1	2	3	4	5
13. I (would) like to go outdoors with my child if possible	1	2	3	4	5
14. I like to talk to and meet other parents	1	2	3	4	5
15. When I feel down there is a special place I can go to Where is this place or places? _____	1	2	3	4	5
16. I can easily find my way in the hospital	1	2	3	4	5
17. The signs in the hospital help me find my way around	1	2	3	4	5
18. I can easily find a place to park my car	1	2	3	4	5
19. I can freely practice my cultural/religious activities in the hospital	1	2	3	4	5
20. If there was a fitness facility I would use it	1	2	3	4	5
21. If there was a laundry facility in the hospital I would use it	1	2	3	4	5

Other comments about activities:

COMPARED TO HOME (Check one)

	Better than home	Equal to home	Worse than home
1. My ability to play music here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My ability to use the computer here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The smell in my child's room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The coziness of my child's room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The amount of storage in my child's room for personal belongings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The quietness of my child's room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The interesting things to do here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. My ability to control privacy here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMPARED TO HOME (Check one)

	Better than home	Equal to home	Worse than home
9. The quality of the food I eat in the hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The amount of space in my child's room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I sleep in the hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. My ability to meet with other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I have a daily routine here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The different spaces I can use here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Support from other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other comments:

	Very Poor	Poor	Fair	Good	Very Good
❖ How would you rate your child's hospital room?	1	2	3	4	5
❖ How would you rate this hospital as a building for children?	1	2	3	4	5
❖ How would you rate the way the hospital looks?	1	2	3	4	5
❖ How well does the design of this hospital support you in taking care of your child?	1	2	3	4	5
❖ If you could change one thing in the hospital environment, what would you change?					

Is there is anything not covered in this questionnaire you would like to mention?

Thank you!!

QUESTIONNAIRE STAFF

GENERAL (Please rate all the questions for the unit you most often work at)

Which unit do you most often work at? 3rd: Sailing Heroes Flight Theater Arts Literature

2nd: PICU NICU

How long have been working at the WMC and / or MFCH on the pediatric or neonatal floor? ____ years

What shift do you usually work? ____ Day ____ Night ____ Swing

Have you worked on the old pediatric or neonatal floor? ____ Yes ____ No

What is your function? RN NA RT Other _____

ABOUT MY UNIT

	<i>Strongly Disagree</i>			<i>Strongly Agree</i>		
	1	2	3	4	5	N/A
1. My unit is conveniently located in the hospital	1	2	3	4	5	N/A
2. The storage areas in my unit meet our needs adequately	1	2	3	4	5	N/A
3. The physical appearance of my unit is pleasant	1	2	3	4	5	N/A
4. The place(s) for confidential conversations with colleagues in my unit are adequate	1	2	3	4	5	N/A
5. The physical conditions such as light and temperature in my unit are good	1	2	3	4	5	N/A
6. In terms of walking distance, the supplies and meds are conveniently located on the floor	1	2	3	4	5	N/A
7. The layout of the unit makes it easier for me to supervise & observe the patients in my unit	1	2	3	4	5	N/A
8. It is easy to maintain cleanliness of the surfaces in my unit	1	2	3	4	5	N/A
9. The policies and procedures in this unit are clear to staff	1	2	3	4	5	N/A
10. The policies and procedures in this unit are clear to patients	1	2	3	4	5	N/A
11. There is sufficient <i>daylight</i> in my unit	1	2	3	4	5	N/A
12. I feel comfortable with the emergency-call system and fire alarm system	1	2	3	4	5	N/A
13. The lighting in the unit supports the work that needs to get done	1	2	3	4	5	N/A
14. I know what's happening in other units on this floor	1	2	3	4	5	N/A
15. The ability to keep an eye on patients' comings and goings is sufficient	1	2	3	4	5	N/A
16. The space in my unit is generally very adequate for the work I have to do there	1	2	3	4	5	N/A
17. The design of the units supports cooperation between doctors and nurses	1	2	3	4	5	N/A
18. It's easy to move beds and equipment around the unit	1	2	3	4	5	N/A
19. The design of my unit positively affects my ability to work	1	2	3	4	5	N/A

Comments about the unit:

ABOUT THE NURSING STATION

1. The nursing station is conveniently located on the floor	1	2	3	4	5	N/A
2. There is enough space for me at the nursing station to do my work	1	2	3	4	5	N/A
3. The noise level at the nursing station is usually appropriate	1	2	3	4	5	N/A

4. The privacy at the nursing station is appropriate to the needs of staff	1	2	3	4	5	N/A
5. The privacy at the nursing station is appropriate to the needs of patients	1	2	3	4	5	N/A
6. The nursing station is a pleasant environment to work in	1	2	3	4	5	N/A
7. It is easy to observe patients from the nursing station	1	2	3	4	5	N/A
8. The facilities, such as computers and telephones, at the station are sufficient & convenient	1	2	3	4	5	N/A
9. The communication system between staff and patients works well	1	2	3	4	5	N/A
10. The layout of the units make it easy to assist a colleague	1	2	3	4	5	N/A
11. The layout of the units make it easy to respond to a code	1	2	3	4	5	N/A

Comments about the nursing station:

ABOUT THE PATIENT'S ROOMS (NICU staff, please fill out based on **one** patient per bed space)

1. The effectiveness of built-in equipment for treating patients near the bedside, such as medical gasses, is convenient	1	2	3	4	5	N/A
2. The space around the bed for easy access to the patient is adequate	1	2	3	4	5	N/A
3. The bedside lighting is effective at night	1	2	3	4	5	N/A
4. The rooms are comfortable for patients to be in	1	2	3	4	5	N/A
5. The rooms are comfortable for parents to be in	1	2	3	4	5	N/A
6. The space in the patient's rooms allows for easy patient movement (in bed, wheelchair)	1	2	3	4	5	N/A
7. The space in the patient's bathrooms allows for easy patient care	1	2	3	4	5	N/A

Comments about the patient's rooms:

ABOUT THE FACILITIES

1. The nurse lounge is a pleasant place to stay in	1	2	3	4	5	N/A
2. There are sufficient places in the hospital where I can retreat for private discussions	1	2	3	4	5	N/A
3. There are sufficient places in the hospital where I can go for tension release	1	2	3	4	5	N/A
4. I can conveniently park my car near the hospital	1	2	3	4	5	N/A
5. The staff restaurant is a pleasant place to eat at	1	2	3	4	5	N/A
6. The location of the staff restaurant is convenient for staff to take their meals	1	2	3	4	5	N/A
7. The facilities to keep (fridge) and warm (microwave) my own food are appropriate	1	2	3	4	5	N/A
8. There is enough personal storage (e.g. locker rooms) on the floor for me	1	2	3	4	5	N/A
9. The outdoor space meets the needs of staff	1	2	3	4	5	N/A
10. The bathrooms for staff on the floor are sufficient and convenient	1	2	3	4	5	N/A
11. Overall, the design of the space allows for the adequate training/teaching of staff	1	2	3	4	5	N/A
12. The location of stairways encourages the use of stairs instead of elevators	1	2	3	4	5	N/A
13. The art on the floor is interesting to the patients and families	1	2	3	4	5	N/A
14. The art on the floor is interesting for me	1	2	3	4	5	N/A
15. When I want a cup of coffee or drink I can get one easily on the floor	1	2	3	4	5	N/A

16. The chapel is at a convenient distance for staff 1 2 3 4 5 N/A
 17. What kind of facilities on the floor/in the hospital are missing? _____

Other comments:

REGARDING PATIENTS

	Strongly Disagree					Strongly Agree	
1. The outdoor space meets the needs of your patients	1	2	3	4	5		N/A
2. The signs for direction on the floor are easily understood by patients and parents	1	2	3	4	5		N/A
3. First time visitors to this unit know how to find their way	1	2	3	4	5		N/A
4. There are appropriate places to have confidential conversations with parents and families	1	2	3	4	5		N/A
5. It is good if parents participate in the care of the patient in this unit	1	2	3	4	5		N/A
6. There are convenient and interesting places for patients to get to on the floor	1	2	3	4	5		N/A
7. It is important that patients get out of bed and be active as soon as they can	1	2	3	4	5		N/A
8. The chapel is at a convenient distance for patients and parents	1	2	3	4	5		N/A
9. A Parent should be able to sleep in the room with his/her child at any time	1	2	3	4	5		N/A
10. Other facilities should be provided (e.g. Ronald McDonald) for parents to sleep	1	2	3	4	5		N/A
11. I feel comfortable with parent(s) rooming in	1	2	3	4	5		N/A

Other comments:

OVERALL SATISFACTION

- | | | | | | | | |
|--|---|---|---|---|---|--|-----|
| 1. Compared to the old building this hospital is an improvement | 1 | 2 | 3 | 4 | 5 | | N/A |
| 2. I would recommend my unit to a friend as a good place to work | 1 | 2 | 3 | 4 | 5 | | N/A |
| 3. I like being in this new hospital building | 1 | 2 | 3 | 4 | 5 | | N/A |
| 4. I have been involved in or consulted about the planning of this new children's hospital | 1 | 2 | 3 | 4 | 5 | | N/A |
| 5. The design of this hospital reflects our hospital's overall mission statement or philosophy | 1 | 2 | 3 | 4 | 5 | | N/A |
| 6. On a scale of 1 to 10, with 10 being the best, how would you rate the design of your unit? _____ | | | | | | | |
| 7. On a scale of 1 to 10, with 10 being the best, how would you rate the design of the patient rooms? _____ | | | | | | | |
| 8. On a scale of 1 to 10, with 10 being the best, how child friendly would you rate the design of the pediatric or neonatal floors? _____ | | | | | | | |
| 9. Is there anything about the design of the Maria Fareri Children's Hospital not covered in this questionnaire that you would like to comment on? | | | | | | | |

Thank you!!!

BIBLIOGRAPHY

- Damage control-not. *The Journal News*, May 8, 2005.
- Westchester Hospital says it must have government money to survive. *The New York Times*, March 8, 2005.
- Arneill, A.B. & Devlin, A.S. (2002). Perceived Quality of Care: the Influence of the Waiting Room Environment. *Journal of Environmental Psychology*, 22, 345-360.
- Bagot, K.L. (2004). Perceived Restorative Components: a Scale for Children. *Children, Youth and Environments* 14(1), 107-129.
- Bakos, M. Bozic, R. Chapin, D. & Neuman, S. (1980). Effects of Environmental Changes on Elderly Resident's Behavior. *Hospital & Community Psychiatry*, Vol. 31, No. 10, 677-682.
- Bakos, M. Bozic, R. & Chapin, D. (1987). Children's Spaces. Designing Configurations of Possibilities. In C.S. Weinstein, & T.G. David (Eds.), *Spaces for Children* (pp. 269-288). New York: Plenum Press.
- Barker, R. (1968). *Ecological Psychology*. Stanford California: Stanford University Press.
- Barker, R. (1987). Prospecting in Environmental Psychology: Oskaloosa Revisited. In D. Stokols & I. Altman (Eds). *Handbook of environmental psychology*. pp. 1413-1432. New York: Wiley.
- Bearison, D.J. (1991). *"They Never Want to Tell You" Children Talk about Cancer*. Cambridge: Harvard University Press.

- Bearison, D.J. (1994). Pediatric Psychology and Children's Medical Problems. In W. Damon (Ed.), *Handbook of Child Psychology, Vol. 4* (pp. 635-711). New York: John Wiley & Sons, Inc.
- Berry, L.L., Parker, D., Coile, C., Hamilton, D.K., O'Neill, D.D., & Sadler, B.L. (2004). The Business Case for Better Buildings. *Frontiers of Health Services Management, 21:1*, 1-22
- Bronfenbrenner, U. (1977). Toward an Experimental Ecology of Human Development. *American Psychologist, Vol. 32*, 513-531.
- Brown, P. & Taquino, L.T. (2001). Designing and Delivering Neonatal Care in Single Rooms. *Journal of Perinatal and Neonatal Nursing, June*, 68-83.
- Caine, J. (1991). The effects of music on the selected stress behaviors, weight, caloric and formula intake, and length of hospital stay of premature and low birth weight neonates in a newborn intensive care unit. *Journal of Music Therapy, XVIII(4): 180-182*.
- Carpman, J.R. (1990). Toward Consumer-Responsive Health Care Facility Design. In *Government Seminar sponsored by Centre Scientific et Technique du Batiment. Paris, France* (pp. 1-45).
- Carpman, J.R., Grant, M.A., Simmons, D.A. (1985). Hospital and Wayfinding. A Video Simulation Study. *Environment and Behavior, Vol. 17, No. 3, May*, 296-314.
- Carpman, J.R. & Grant, M.A. (1993). *Design that Cares: Planning Health Facilities for Patients and Visitors*. American Hospital Publishing, Inc, American Hospital Association Company.
- Chawla, L. & Heft, H. (2004). Children's Competence and the Ecology of Communities: A Functional Approach to the Evaluation of Participation. *Journal of Environmental Psychology, special issue*.
- Chen, T.S. & Sanoff, H. (1988). The patients' view of their domain. *Design Studies, Vol. 9 (1)*, 146-161.
- De Vos, F. (2004). *Developing a Model of Healing Environments in a Children's Hospital*. Unpublished Masters Thesis.
- Devlin, A.S. & Arneill, A.B. (2003). Health Care Environments and Patient Outcomes. A Review of the Literature. *Environment and Behavior, Vol. 35 No. 5, Sept*, 665-694.
- Dilani, A. (Ed). (2001). *Design & Health: the Therapeutic Benefits of Design*. Stockholm: AB Svensk Byggtjänst.
- Eiser, C. (1990). Psychological Effect of Chronic Disease. *Journal of Child Psychiatry, Vol. 31, No. 1*, 85-98.
- Erikson, E. (1956). *Childhood and Society*, (pp. 209-274). New York: Norton & Company.
- Evans, G.W. & McCoy, J.M. (1998). When Buildings Don't Work: the Role of Architecture in Human Health. *Journal of Environmental Psychology, 18*, 85-94.
- Gadbois, C., Bourgeois, P., Guillaume, J. & Urbain, M.A. (1992). Hospital Design and the Temporal and Spatial Organization of Nursing Activity. *Work & Stress, Vol. 6, No. 3*, 277-291.

- Goffman, E. (1969). *The Presentation of Self in Everyday Life* (Introduction & chapter I). New York: Doubleday.
- Gross, R. Sasson, Y. Zarhy, M. Zohar, J. (1998). Healing environment in psychiatric hospital design. *General Hospital Psychiatry, Vol. 20(2), Mar*, 108-114.
- Hamilton, D.K. (2003). The Four Levels of Evidence-Based Practice. *Healthcare Design, 3, Nov*, 18-26
- Hamilton, D.K. (2004). Hypothesis and Measurement: Essential Steps Defining Evidence-Based Design. *Healthcare Design, 4, Mar*, 43-60
- Holahan, C.J. (1978). Social Isolation and Seating Patterns in an Experimental Hospital Dayroom. In *Environment and Behavior; a dynamic perspective* (pp. 81-96). New York: Plenum Press.
- Horsburgh, C.R. (1995). Healing by design. *The New England Journal of Medicine, Vol. 333 (11), Sept*, 735-740.
- Houtzager, B.A., Grootenhuis, M.A. & Last, B.F. (2001). Supportive Groups for Siblings of Pediatric Oncology Patients: an Evaluation. *Psycho-Oncology, Vol. 10*, 315-324.
- Hutton, A. (2002). The Private Adolescent: Privacy Needs of Adolescents in Hospitals. *Journal of Pediatric Nursing, Vol. 17, No. 1*, 67-72.
- Ittelson, W.H., Proshansky, H.M. & Rivlin, L.G. (1970). Bedroom Size and Social Interaction of the Psychiatric Ward. *Environment and Behavior, Dec*, 255-270.
- Ittelon, W., Rivlin, L. & Proshansky, H. (1970). The Use of Behavioral Maps in Environmental Psychology. In H. Proshansky, W. Ittelson & L. Rivlin (Eds.). *Environmental Psychology: Man and his Physical Setting*. New York: Holt, Rinehart, Winton Inc.
- Kari, J.A., Donovan, C., Li, J. & Taylor, B. (1999). Teenagers in Hospitals: what do they want? *Nursing Standard, Vol. 13, No. 23*, 49-51.
- Keep, P., James, J. & Inman, M. (1980). Windows in the Intensive Therapy Unit. *Anaesthesia, Vol. 35*, 257-262.
- Komiske, B. (2003a). *Design as a Strategic Investment*. (unpublished paper)
- Komiske, B. (2003b). Ten Principles for Creating a World-Class Children's Hospital. *Healthcare Design, Vol. 3, No. 2, May*, 39-42.
- Korpela, K. Kytta, M. & Hartig, T. (2003). Restorative Experience, Self-regulation, and Children's Place Preferences. *Journal of Environmental Psychology, 22*, 387-398.
- Krol, Y., Grootenhuis M.A., Destrée-Vonk, A., Lubbers, L.J., Koopman, H.M. & Last, B.F. (2003). Health Related Quality of Life in Children with Congenital Heart Disease. *Psychology and Health, Vol. 18*, 251-260.
- Kytta, M. (2002). Affordances of Children's Environments in the Context of Cities, Small Towns, Suburbs and Rural Villages in Finland and Belarus. *Journal of Environmental Psychology, 22*, 109-123.

- Langeveld, N.E., Stam, H., Grootenhuis, M.A. & Last, B.F. (2002). Quality of Life in Young Adult Survivors of Childhood Cancer. *Supportive Care in Cancer*, Nov, Vol. 10(8), 579-600.
- Langeveld, N.E., Ubbink, M.C., Last, B.F., Grootenhuis, M.A., Voute, P.A. & De Haan, R.J. (2003). Educational Achievement, Employment and Living Situation in Long-term Young Adult Survivors of Childhood Cancer in the Netherlands. *Psycho-Oncology*, Apr-May, Vol. 12(3), 213-225.
- Leather, P., Beale, D., Santos, A., Watts, J. & Lee, L. (2003). Outcomes of Environmental Appraisal of Different Hospital Waiting Areas. *Environment and Behavior*, Vol. 35 No. 6, Nov, 842-869.
- Lindheim, R. (1979). How Modern Hospitals Got That Way. *The Co Evolution Quarterly*, Winter, 462-473.
- Malkin, J. (1993). Beyond Interior Design. *Health Facilities Management*, Nov.
- Malkin, J. (1999). What is a Healing Environment? *Aesclepius*, Vol. 1, No. 3, Nov.
- Maslow, A. H. (1970). *Motivation and Personality*, 2nd. ed., New York, Harper & Row.
- Matza, L.S., Swensen, A.R., Flood, E.M., Secnik, K. & Leidy, N.K. (2004). Assessment of Health-Related Quality of Life in Children: A Review of Conceptual, Methodological, and Regulatory Issues. *Value in Health*, Vol. 7, No. 1, 79 -92.
- Moss, VA. (1988). Music and the surgical patient. The effect of music on anxiety. *AORN Journal*, 48(1), 64-69.
- Nagasawa, Y. (2000). The Geography of Hospitals: A Developing Approach to the Architectural Planning of Hospitals. In S. Wapner, J. Demick, et al (Eds.). *Theoretical Perspectives in Environment-Behavior Research: Underlying Assumptions, Research Problems, and Methodologies* (pp. 217-227). Dordrecht, Netherlands: Kluwer Academic Publishers.
- Olds, A.R. (1981). Humanizing the Pediatric Hospital Environment. *Hospital Administration Currents*, Vol. 25 (1), Jan-March, 1-6.
- Olds, A.R. & Daniel, P.A. (1987). *Child Health Care Facilities: Design Guidelines and Literature Outline*. Bethesda: Association for the Care of Children's Health.
- Olsen, R. V. (1984). The Effect of the Hospital Environment; Patient Reactions to Traditional versus Progressive Care Settings. *Journal of Architecture Planning Research*, 1, 121-136.
- Olson, K. (2002). The greening of health care. *Utne*, Nov-Dec, 85-88.
- Picker Institute (1998). *Improving Design Quality and Consumer Satisfaction by Assessing the Built Environment*. The Centre for Health Design, Inc.
- Preiser, W.F.E., Rabinowitz H.Z. & White E.T. (1988). *Post-Occupancy Evaluation*. New York: Van Nostrand Reinhold.
- Proshansky, H.M. Ittelson, W.H. & Rivlin, L. (1970). Freedom of Choice in Behavior in a Physical Setting. In H.M. Proshansky, W.H. Ittelson, & L. Rivlin (Eds.), *Environmental*

- Psychology: Man and his physical setting*, (pp. 170-179). New York: Holt, Rinehart & Winston.
- Rivlin, L., Bogert, V. & Cirillo, R. (1981). Uncoupling Institutional Indicators. *Paper Presented to EDRA, Ames, Iowa*.
- Rivlin, L. G. & Wolfe, M. (1979). Understanding and Evaluating Therapeutic Environments for Children. In D. Canter & S. Canter (Eds.). *Designing for Therapeutic Environment: A Review of Research*, (pp. 29-61). Chichester, England: John Wiley & Sons.
- Rivlin, L. G. & Wolfe, M. (1985). Settings for deviant learning: a present-day example of the evolution of an institution. In: *Institutional Settings in Children's Lives*, (Chapter 1 & 4). New York: John Wiley & Sons.
- Rogers, C.A. (2001). Healing with Design and Communications: an Educational approach. *Graphic Design, June*, www.icograda.org
- Rubin, H.R., Owens, A.J. & Golden, G. (1998). *Status Report (1998): An investigation to determine whether the built environment affects patients' medical outcome*. The Center for Health Design, Inc / Wayne Ruga, AIA, FIIDA
- Scher, P. (1997). Patient focused design. Issues, Criteria & Detail Design. *Human Centered Design for Health Care Buildings, HCHD, Aug*, 156-160.
- Schutte, N., Malouff, J., Lawrence, E., Glazer, K. & Cabrales, E. (1992). Creation and Validation of a Scale Measuring Perceived Control over the Institutional Environment. *Environment and Behavior, Vol. 24, No. 3, May*, 366-380.
- Shepley, M.M (1998). *Healthcare Environments for Children and their Families*. Dubuque: Association for the Care of Children's Health.
- Shumaker, S.A. & Pequegnat, W. (1989). Hospital Design, Health Providers, and the Delivery of Effective Health Care. In E.H. Zube & G.T. Moore (Eds.). *Advances in Environment, Behavior, and Design Volume 2*, (pp. 161-199). New York: Plenum.
- Sommer, R. & Ross, H. (1958). Social Interaction on a Geriatrics Ward. *International Journal of Social Psychiatry, 4*, 128-133.
- Stam, H., Grootenhuis, M.A., & Last, B.F. (2001). Social and emotional adjustment in young survivors of childhood cancer. Review. *Supportive Care in Cancer, Vol. 9*, 489-513.
- Starfield, B. (2000). Doctors are the Third Leading Cause of Death in the US, Causing 250,000 Deaths Every Year. *Journal of American Medical Association, July 26, 284(4)*, 483-485.
- Tétreault, M. & Passini, R. (2003) *Architects' Use of Information in Designing Therapeutic Environments*. Chicago, IL: Locke Science Publishing Company, Inc.
- Tichy, A.M., Braam, C.M., Meyer, T.A. & Rattan, N.S. (1988). Stressors in Pediatric Intensive Care Units. *Pediatric Nursing, Vol. 14, No. 1, Jan-Feb*, 40-42.
- Ulrich, R.S. (1984). View Through a Window May Influence Recovery from Surgery. *Science, 224, April*, 420-421.

- Ulrich, R. S. (1991a). Effects of Health Facility Interior Design on Wellness: Theory and Recent Scientific Research. *Journal of Health Care Design*, 3, 97-109.
- Ulrich, R.S. (1991b). Wellness by Design: 'Psychologically Supportive' Patient Surroundings. *Group Practice Journal*, July/Aug, 10-19.
- Ulrich, R.S. (1992). How Design Impacts Wellness. *Healthcare Forum Journal*, 20, 20-25.
- Ulrich, R.S., Simons, R.F. & Miles, M.A. (2003). Effects of Environmental Simulations and Television on Blood Donor Stress. *Journal of Architectural Planning Research*, 20; 1, 38-47.
- Ulrich, R. & Zimring, C. (2004). The role of the Physical Environment in the Hospital of the 21st Century: A Once-in-a-Lifetime Opportunity. *The Center for Health Design for Designing the 21st Century Hospital Project*.
- Verderber, S. & Reuman, D. (1987). Windows, Views, and Health Status in Hospital Therapeutic Environments. *The Journal of Architectural and Planning Research*, Vol. 4 (2), 120-133.
- Vickery, C.G. (2003). Discovery Design ProcessTM: Getting Patients into the Act Healthcare Design from the Patient Perspective. *Healthcare Design*, Vol. 3, No. 2, May, 28-29.
- Voelker, R. (1994). New Trends Aimed at Healing by Design. *JAMA*, Vol. 272, No. 24, Dec, 1885-1886.
- Volker, L. (2002). *Patiëntgerichte ziekenhuisomgevingen; het reguleren van sociale interactie voor klinische patiënten*. Eindhoven: Technische Universiteit Eindhoven.
- Weber, D.O. (1996). Life-Enhancing Design. *Healthcare Forum Journal*, 39, 3-11.
- Williams, M.A. (1988). The Physical Environment and Patient Care. *Annual Review of Nursing Research*, Vol. 6, 61-85.
- Winkel, G. & Holahan, C.J. (1985). The Environmental Psychology of the Hospital: Is the Cure Worse Than the Illness? *Prevention in Human Services*, 11-33.
- Winterberg, D.H. (2003). Zieke Tiensers. *Medisch Contact*, Vol. 58, nr. 45.
- Wolfe, M. (1978). Childhood and Privacy. In I. Altman & J.F. Wohlwill (Eds.). *Children and the Environment. Human Behavior and Environment. Advances in Theory and Research*, Volume 3, (pp. 175-222). New York: Plenum.
- Yeaple, W. (1998). *Children's Thoughts and Feelings Regarding Their Treatment Environment*. Ann Arbor: UMI Dissertation Services.
- Yeaple, W., Iltus, S., De Vos, F. & Sabo, K. (1995). *Hasbro Children's Hospital: A Post-Occupancy Evaluation*. Unpublished report.
- Zeisel, J., Hyde, J. & Levkoff, S. (1994). Best practices: An Environmental-Behavior (E-B) model for Alzheimer special care units. *American Journal of Alzheimer's Disease*, Vol. 9(2), Mar/Apr, 4-21.
- Zeisel, J., Silverstein, N.M., Hyde, J., Levkoff, S., Powell, L. & Holmes, W. (2003). Environmental Correlates to Behavioral Health Outcomes in Alzheimer's Special Care Units. *The Gerontologist*, Vol. 43, No. 5, 697-711.