

CHILDREN'S HOSPITAL OF PITTSBURGH

RESEARCH HIGHLIGHTS



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### ABOUT ASTORINO

Founded in 1972, Astorino is an award-winning, full-service company providing architectural, engineering, interior design, and design-build services. With offices in Pittsburgh, PA, Palm Beach Gardens, FL, and Naples, FL, Astorino has built a reputation for quality design, innovative solutions and strong project management.

Ranked among the top healthcare designers in the country, Astorino offers an award-winning portfolio consisting of more than 1000 design projects internationally, which total over \$2.4 billion in volume.

### ABOUT FATHOM

It was our commitment to enhancing the healing process that led us to the development of our subsidiary company, **fathom**, whose creativity-driven

process brings research, design and conceptual thinking together. **fathom** uses the power of emotion to communicate, stimulate and inspire. When the average person can express only 5% of his or her thoughts consciously, how can you truly determine your user's needs — and, more importantly, design to meet those needs? Through the use of metaphors, visual imagery and an Insight Journal, the **fathom** process delivers a unique and revolutionary way to dig into your user's conscious and subconscious to uncover his or her deepest thoughts and feelings so you can connect with them on a more profound emotional, intellectual and experiential level.

Early in the design phases of the project, **fathom** will use a variety of techniques based in psychology, neuroscience, anthropology and architecture, combined with our patented Deep Design Filter, to uncover and prioritize



design concepts. In the past four years we have used these research techniques on a variety of projects, including such healthcare projects as the VA Pittsburgh, Riley Hospital for Children and Butler Community Hospital.

### fathom the ability to

- Identify users' subconscious needs and translate them into design guidelines
- Clearly establish design priorities and save time during the design process
- Build consensus among a diverse group and facilitate decision making
- Facilitate informed decision-making during the value engineering process
- Ensure a design that responds to users' needs while sustaining functionality and user satisfaction long into the future

### **RESEARCH TECHNIQUES**

BACKGROUND RESEARCH

ONE-ON-ONE INTERVIEWS WITH COLLAGE DEVELOPMENT ETHNOGRAPHY, INCLUDING PHOTO DOCUMENTATION SENSORY ANALYSIS AND COLOR ANALYSIS

### **ANALYSIS**

Research results are collected, dissected, evaluated and examined and compiled into usable information.

### **DISCOVERY SESSIONS**

Interactive group brainstorming sessions are conducted to further explore concepts identified through the analysis and to brainstorm possible solutions.

### INTERPRETATION

Results accrued from the process to date are recorded, distilled, organized and prioritized. Design principles and guidelines are established and prioritized and design objectives refined into the most fundamental ideas, based on the relevant issues.

### INSIGHT JOURNAL

The Insight Journal is a collection of customized design principles and guidelines brought to the surface through the **fathom** process. Combined with imagery, quotations and interview excerpts, it is a resource and inspiration for stimulating creativity and bringing designs to life.

research analysis Discovery Sessions interpretation Insight Journal

Children's Hospital of Pittsburgh of UPMC (CHP) approached Astorino for a solution to its overcrowded and outdated campus. Since then, Astorino has worked very closely with fathom and with this hospital, one of the top pediatrics institutions in the country, as strategic partners to help clearly define their facility's needs and build anew.

Because designing a children's hospital was such an awesome responsibility, Astorino realized that using intuition alone to create the right concept may not be enough. They wanted to create a design that could potentially heal patients, provide parents with hope, and keep the staff energized day to day. HOW DO YOU BEGIN DESIGNING A HOSPITAL THAT CAN ENHANCE THE HEALING PROCESS? We wanted answers from patients, parents and staff about what they truly wanted in a new hospital. In turn, we would create a healing environment for them with this new hospital.

In order to gain these deeper insights into the needs and wants of the various user groups, Astorino turned to fathom and its innovative pre-design research process, to help inform and inspire a more meaningful design for CHP. Through thirty interviews and multiple brainstorming sessions with patients, parents and staff, observation and photodocumentation, a new perspective on how a children's hospital should look and, more importantly, feel, was uncovered.

By uncovering users' thoughts and feelings about the ideal Children's Hospital of Pittsburgh experience, the team was able to create a design that addresses the rational and emotional needs of the diverse user groups.

This 9.8 acre, 1.4 million-square-foot campus encompass the full range of inpatient services and ambulatory care facilities. Designed with the hospital's goal of LEED® (Leadership in Energy and Environmental Design) certification in mind, the design is sensitive to the environment and will reduce operation costs dramatically.



"Architecture stands on the threshold of a new era. [Using neuroscience and research in design,] the real beneficiaries are future generations who will have their environments more carefully tuned to their needs and desires."

-John Eberhard, FAIA
Executive Director, The Academy of Neuroscience for Architecture
Latrobe Fellow of the College of Fellows of the AIA
Director of Research Planning for the AIA

The hospital's Clinical Services Building was designed as a distinctive city landmark, prominently visible from various citywide vantage points. The building's façade exudes vibrant colors through the use of natural materials, incorporating unique curved sail-like shapes.

The resulting design for the new Replacement Facility embodies the Hospital's desire to provide a quality facility that will reinforce the strong reputation of Children's Hospital of Pittsburgh. The end product will provide an environment designed to promote healing and where the dedicated staff will have the requisite tools to deliver state-of-the-art medical care to patients and their families for generations to come.

We believe that the methods and techniques that were used with CHP can be applied on a national (or broader) level with the potential of achieving the same results. fathom the ability to

Identify users' subconscious needs and translate them into design guidelines

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OUR PROCESS IS FOUNDED IN THE BELIEF THAT A PROJECT'S SUCCESS DEPENDS ON TRULY UNDERSTANDING THE USERS - THE CHALLENGES THEY FACE, THE GOALS AND DREAMS THEY HOLD CLOSE AND THE TYPE OF ENVIRONMENT THAT WILL HELP THEM SUCCEED.

Throughout this project we engaged patients, family members and staff. In order to provide un-biased and well-rounded insights, a mix of hospital experiences were sought within each of these segments. We talked to a 9-year-old girl, a 20-year nursing veteran and many in between. We talked to those that were experiencing the healing process first hand, and to those that provided their care.

We enabled the users to speak for themselves, to share their own experiences. Through the use of imagery and collage building, users were able to communicate feelings and ideas that are sometimes difficult to describe. We listened more than we talked. By listening to the needs, wants, values, hopes and fears the project team establishes a personal relationship with the users and eagerly takes on the responsibility of creating the best possible environment for these people—one that meets their unique needs.

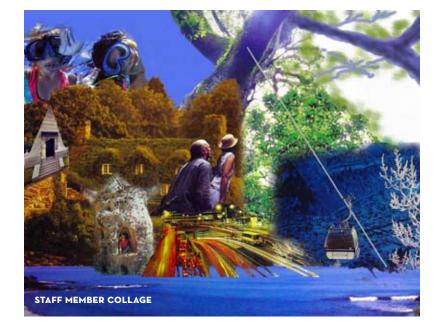
WHO WE TALKED TO:

PATIENTS
PARENTS
STAFF

### ONE-ON-ONE INTERVIEWS WITH COLLAGE DEVELOPMENT (ZMET) CONDUCTED BY OLSON ZALTMAN ASSOCIATES

The ZMET approach recognizes that people think and communicate in complex ways that traditional methods do not capture. This technique uses various means to elicit information from research participants, with an emphasis on visual images, metaphors and emotions. Patients, staff, and family members were asked to select images that represent their feelings towards the hospital and their experience in it. In conjunction with images, the interviewer asks open-ended questions. The final result is a collage that tells a unique and honest story about the individual's feelings and wishes for the facility.

Some example collages follow on this and the next page.

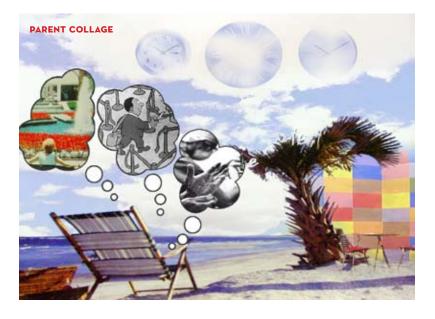


"A monster-type tree with things sprouting out...what this place feels like when you can't get your drugs, you can't get to dinner, you can't get to the bathroom, you can't get your supplies."

"The isolated ski lift [conveys] **loneliness and no support**. I think some of our families arrive in that state. But the hopeful thing about this is that the rope tow is moving upward, which is **hope and future**."

"Home is a comfort zone. When people come here, we should aspire to make them feel comfortable and secure."

"The children relay a sense of **honesty and adventure and fun**. And that is what kids are and I don't think we can ever lose sight of that when they come here."



"The clocks show that, while you are here, to a certain degree, **time stands still**. You don't want time to stand still most of the time because, as time clicks on, you have more answers even if they are not the answers you want."

"A bright, cheerful area. They need something that's cheerful and happy, especially for the little kids. And then a place to gather for any group, whether it's visitors, family or physicians."

"I think the current hospital is a **maze**. You don't know what floor to go on, which elevator to go on."

"The ocean waves are soothing and healing and that's what the hospital does."



"I put the colors in the background because color **is very important**. It kind of sets the atmosphere for a place."

"I made the dog blue because he's **sad** and that's the way I feel when I'm in the ICU or just can't get out of my room."

"The playroom is a nice place that I like being in and enjoy going in there and getting away from doctors and stuff. It's probably the most important place for me."

"I put the books together with the computer because I kind of do both of those things in the library and I enjoy doing them. they **get my mind off** of whatever may be going on."

### **DISCOVERY SESSIONS**

Interactive group brainstorming sessions were conducted with patients, staff, healthcare professionals, designers, and architects. The goal of these sessions was to solicit pertinent information, in an indirect and creative manner. This unconventional approach resulted in creative thoughts and feelings that a designer can more freely interpret with his or her own creativity and intuition.

### ETHNOGRAPHY INCLUDING PHOTO DOCUMENTATION

Through weeks of observation and photo documentation we were able to document the daily routines and happenings of the hospital, providing us an opportunity to see and experience the life of CHP. Photo documentation provides those involved in the project to have a first-hand glimpse into the current conditions the facility.







### **SENSORY ANALYSIS**

Design is about the total experience and embracing all five senses gives a more holistic approach to a healing environment. By prompting users to express their perceptions of CHP in an unconventional way that incorporated all five senses, the designers were able to include another layer of information in to their design that is otherwise not available.

Though color is something that should ultimately be chosen by the designers, our color expert gives them a place to start. These selections are made based on the analysis of interviews, in conjunction with the functional needs of the project and years of color research experience.



sensory analysis: color the ideal Children's Hospital Experience

NOT the ideal Children's **Hospital Experience** 



# METAPHORS

TRANSFORMATION. AT A FUNDAMENTAL LEVEL, THE HOSPITAL EXPERIENCE IS ABOUT TRANSFORMATION FROM AN UNBALANCED TO A BALANCED STATE. THE PHYSICAL ENVIRONMENT, NOT JUST THE QUALITY OF CARE, AFFECTS TRANSFORMATION; THIS MAKES ARCHITECTURE ESSENTIAL TO RESTORING BALANCE.

CONTROL. PATIENTS NEED TO FEEL THEY HAVE CONTROL OVER THEIR ILLNESS AND ENVIRONMENT AND STAFF NEED TO FEEL EMPOWERED TO GIVE THE BEST CARE POSSIBLE. PATIENTS NEED TO MAINTAIN THEIR IDENTITIES AND SOME MEASURE OF FREEDOM/CHOICES. PRIVACY IS A KEY CONCEPT.

CONNECTION. THERE IS AN INNATE NEED FOR PATIENTS TO CONNECT WITH THE OUTSIDE WORLD, THEMSELVES, OTHERS AND EVEN THE BUILDING ITSELF. THE HOSPITAL EXPERIENCE IS FILLED WITH CONNECTIONS.

ENERGY. THERE IS AN INHERENT NEED FOR CERTAIN TYPES OF ENERGY AND ENERGY SOURCES TO GET THROUGH THE HOSPITAL JOURNEY. CONTROL AND CONNECTION AFFECT ENERGY. ARCHITECTURE SHOULD MAXIMIZE ENERGY.

1: HIGHER PRIORITY

2: MEDIUM PRIORITY

**3: LOWER PRIORITY** 

### THE DEEP METAPHORS

Out of our initial research, and with the aid of the ZMET collaging exercise, 1 deep metaphor and 3 supporting metaphors surfaced. The deep metaphor of **TRANSFORMATION** is supported by those of **CONTROL**, **CONNECTION**, and **ENERGY**. The more metaphors that are satisfied by a design or human objective, the more important a priority it is.

### Design & Human Objectives

| Desigi              | 1 & HI                                | umar          | Objectives   |   |                  | Danier Objectives  | Inspirational Images   |
|---------------------|---------------------------------------|---------------|--|---|------------------|--|--|
| Priority            | Metapho                               | rs User       | Issue  | Related Wants & Needs                         | Human Objectives | Design Objectives  | торналогия   |
| CONTI<br>1. Child-F | ROL<br>riendly / Fo<br>Ct<br>Cl<br>En | ocus<br>P,F,S | People desire a more child-friendly hospital. They hope that the new hospital will be more inviting and interactive for children.              |   |                  | Interactive art for kids. "Little People" furniture Appropriate scale Wall texture at lower level of wall surface Party room for families/ friends of patient Low windows for children   |  |
| 1                   | Ct                                    | P,F,S         | Open spaces give the hospital a feeling of being <b>child-friendly</b> .   | Let kids actually be themselves - be kids.    |                  | Play areas in hospital / atrium<br>Play space outside<br>Open area in patient rooms<br>Larger atrium   | kid sized furniture  |
| 2                   | Ct<br>Cl                              | P,F,S         | Feel like a kid's room   | People should know it is a pediatric hospital |                  | Furniture scale Ability for personalization Family comfort Shelves for games and other personal objects Place for drop-down table to eat together  |  |
|                     |                                       |               | 6/19/03 Staff Brainstorming 6/27/03 Family Brainstorming 11/17/03 Patient Brainstorming White- Astorino In-House Brainstorming (various dates) |   |                  | Flexible seating for when there are more visitors Lighting control Colorful rooms / walls Furniture arrangement in patient bedroom to be flexible, allow for multiple seating arrangements Control music system from bedside Computer / video games  | Cool room! Liked all the compartments, Place for everything. |
| 1                   | Ct<br>Cl<br>En                        | Р             | Appeal to kids   | To feel less frightened                       |                  | Fit family in room Colorful nurse uniforms Hide medical equipment Technology / entertainment Interactive activities, Internet Minimize sounds from medical equipment Adjustable lighting (brightness) Pictures on wall Bulletin board Bed alcove Look outside from the bed Comfortable blankets / linen Colorful gowns / pajamas Child-friendly food | Liked the alcove - gives privacy.                            |
|                     |                                       |               |  |   |                  | Feel like a "big toy store"  |  |

### Design & Human Objectives

### CONNECTION 1. To One-self People need to be able to focus on themselves to maintain mental balance. Atrium / garden Internet Meet some new kids their own age. The patients are isolated from Playroom / lounge 2 In-hospital e-mail Come into this room and maybe forget their friends, school, their outside FRC Patient directory about being in the hospital. Group activities room Family spa / exercise area In-room computer cameras Meet / interact with other patients Opportunities to meet other people lessen the feelings of being alone 2. To Family / Friends Playroom / lounge To have them be Family is a wonderful thing I know it helped him. I know in my heart Family zone in patient room there with us all the it helps. Family waiting areas time that they want. Ability for family to accompany patient to medical procedures Usually in the library I'll get on Internet Talk to them and tell me what is going on Feel like I can keep contact with the internet. 2 Telephones and what they have been doing Video / web camera Public phones friends and family. Cell phone accessibility Isolated room Maintain a family atmosphere Family members need to be able to Informal gathering spaces communicate comfortably with one Technology can help to connect another. family and friends Family private zone - using Waiting room, confidential area to booth seating to provide Connect with family members have a conversation on the phone. Primarily in ED, CCU, and surgical areas visual / acoustic privacy Like a second home but need work / life The sense of family is strengthened. balance - see other staff more than husband / wife. Consult rooms 3. To Staff Knowing that you Sometimes that is what helps you get Some doctors are there to show you Color-code rooms to nurse have friends and Ct out of here. that if you ever need anything they station for assistance family and nurses Record question for Dr to will be there. and doctors that are get later. standing behind you. Greeter at front door To see a friendly face It helps to have staff help us with Someone to give directions things we need Volunteer

Child-life Babysitter

Someone to play with

Alone time - no family available

RESEARCH RESULT EXCERPTS: SENSORY ANALYSIS: COLOR





### rainbow Mix them all together. A lot of fun colors. A roller coaster ride.

### blue

Light blue, sky blue, blue-green

Soothing. Calm. Healing. Spacious and happy.
Pretty, relaxing.
(For boys' rooms.)



The exact opposite of black, and if black is bad, white is probably good.

**purples**Soothing.

**pink**For girls' rooms.

**[sky blue]** "I never have bad feelings about working here or getting up in the morning to come here. I feel happy here. I feel at home here."

**green**All-time favorite color. The hospital is not a place you are

completely dreading.

**red**An exciting color.
Happiness.

**orange** Sunny, cheerful, optimistic.

the ideal Children's Hospital Experience



TAG CLOUD: CURRENT HOSPITAL SITUATION RESEARCH RESULT EXCERPTS:

boredom hopelessness institutional

impatience

lack of personality

trapped prison/jail/ca anxiety

loss of control

complicated frustration

confusion

disjointed

time moves slowly/stops

for patients & their families

time moves too fast (for staff)

loneliness

isolation

lose touch

no windows

The more often a word came up in an interview, the larger it appears.

### **DEPLETES ENERGY**

### **PROVIDES ENERGY**

RESEARCH RESULT EXCERPTS: THE MANY DIFFERENT ENERGY SOURCES

Almost everything
in Control and
Connection has some
effect on energy



## TRANSLATION INTO DESIGN

### METAPHORS: TRANSFORMATION, CONTROL, CONNECTION, ENERGY

By incorporating the design principles identified through the **fathom** process, the architects created a meaningful design that truly meets the needs of the users on both a physical and emotional level.

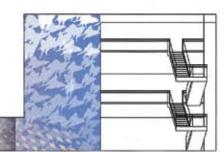
Fundamentally, the hospital is about TRANSFORMATION—movement from an unbalanced state to a balanced state. The idea of transformation is shown throughout the hospital in various ways. For example, the main corridor connecting the parking garage to the main lobby literally transforms as you travel through. The lighting, texture, floor and wall patterns change and support the underlying motif of a cocoon turning into a butterfly.

The supporting metaphors are those of **CONTROL**, **CONNECTION** and **ENERGY**. **CONTROL** is incorporated into the design of the individual patient rooms, where the children are given as much control in their rooms as possible. They are child-friendly places that are intimate and private, providing a distraction from illness and allowing an escape from the hospital environment. **CONNECTION** 

is used as an element in the building's façade where it changes from a very utilitarian looking building with mostly gray tones to a rich and colorful façade with which the children could emotionally identify. **ENERGY** is demonstrated throughout the hospital as well. One specific example is the design for an outdoor healing garden in which the users of the hospital can be energized while being immersed in nature and the outside world.

As a core element, this facility is designed as a model for family-centered care. Patient rooms are individual and provide a variety of accommodations for family members. The family zone is intended for overnight stay, with a sleeping surface, curtained privacy, and other amenities. Each patient unit holds a cluster of rooms centered on a common area where children and families can meet and play. Other features throughout the facility, including a variety of lounges, kitchenette, laundry facilities, chapel, school and business center, provide family members with the resources necessary to continue normal life activities while providing a level of privacy not common in hospitals.

**BELOW: RENDERING OF TRANSFORMATION CORRIDOR** 







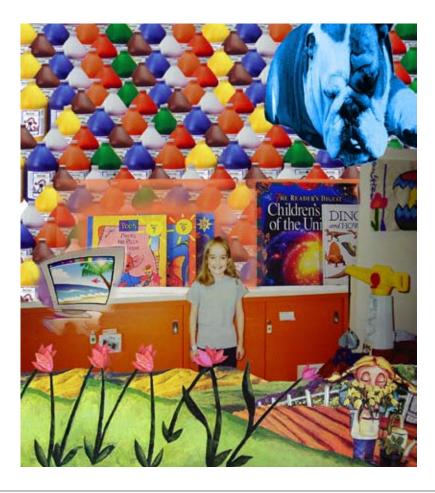


### AT TOP: ELEVATION BEFORE FATHOM

While contextual with the surrounding Lawrenceville neighborhood, and sized to be a significant landmark, the original renderings show a building clad in traditional materials, used in a traditional way. The building is handsome, but like its Oakland counterpart, there is little indication that this is a place for children.

### ABOVE, LEFT AND RIGHT: AFTER FATHOM

Informed by the user research, the new facade comes to life with dynamic and organic shapes, a rich and welcoming color palette, and the use of traditional Pittsburgh materials in a much less traditional way. The CHP journey begins when a child leaves home, and this building tells him or her, from miles away, that it is a place for kids.





### ABOVE: PATIENT COLLAGE AND COLOR PALETTE

The collage building exercise was key to eliciting hard-to-convey ideas and feelings. Additionally, the images themselves inspired the Astorino designers when thinking about the interior and exterior color palette. In the interviews, respondents had stated their desire for a more colorful, upbeat, and exciting atmosphere in the new hospital, and their collages reaffirm this. In the end, it was the users, and even the color names, that determined the resulting palette.





Sherwin Williams

SW6892 Carnival





### ABOVE: MATERIALS PALETTE

Again, taking inspiration from the user collages and interviews, the design team assembled a materials palette that translates the need for upbeat, family-friendly colors and textures.

TRANSLATION INTO DESIGN: COLOR & MATERIALS











CLOCKWISE, FROM TOP LEFT: A LONG CORRIDOR BECOMES LESS MONOTONOUS

THROUGH COLOR AND PATTERN; A NURSES' STATION AND WAYFINDING; A PLAYROOM
IN PROGRESS; BUTTERFLY MOTIF CARRIED INTO CURVED, TRANSLUCENT PANELS.







CONT'D

DESIGN,

TRANSLATION INTO



AT TOP: THE 4,000 SF HEALING GARDEN, WHERE USERS CAN BE ENERGIZED BY IMMERSING THEMSELVES IN NATURE, COMES TO LIFE. PATIENTS, THEIR FAMILIES, AND HOSPITAL STAFF CAN REACH THE GARDEN THROUGH A 4-STORY ATRIUM AND ITS SCREENED-IN PORCH, WITH LARGE ROCKING CHAIRS AND CALMING CEILING FANS. THE QUIET SPOTS AND MOVABLE CUSTOM-MADE FURNISHINGS—PICNIC TABLES, ADIRONDACK CHAIRS AND SWINGING BENCHES—WILL MAKE IT CONDUCIVE FOR PATIENTS AND FAMILIES TO ENJOY THE FRESH AIR TOGETHER, AND FOR STAFF TO REJUVENATE IN THE SERENE SETTING.

AT BOTTOM: THE "TRANSFORMATION CORRIDOR," THE MAIN CORRIDOR CONNECTING THE PARKING GARAGE TO THE MAIN LOBBY. THE LIGHTING, TEXTURE, FLOOR AND WALL PATTERNS EXPRESS THE EVOLUTION OF HEALING, USING DESIGN ELEMENTS THAT SUPPORT THE MOTIF OF A COCOON DEVELOPING INTO A BUTTERFLY AND A MOTIF OF CHANGING SEASONS ON THE TERRAZZO FLOOR.









AT TOP: PATIENT ROOMS ARE CHILD-FRIENDLY AND THE CHILD HAS CONTROL OVER THINGS LIKE LIGHTING AND DISPLAY OF PERSONAL ITEMS.

AT BOTTOM: STAFF HAVE CONTROL OVER PATIENT CARE BY BEING ABLE TO SEE EASILY INTO THESE ROOMS WITHOUT COMPROMISING A FAMILY'S PRIVACY.







ABOVE: THE ATRIUM, OR FAMILY TOWN SQUARE, COMES TO LIFE. A CENTRAL GATHERING AREA, IT ALLOWS FOR EDUCATIONAL AND ENTERTAINMENT PROGRAMS, AIDED BY THE INCORPORATION OF A HUGE MOVIE SCREEN THAT DESCENDS OVER THE WINDOWS (ALSO AT RIGHT). DOORS LEAD TO THE HEALING GARDEN, AND THOSE THAT CANNOT GO OUTSIDE CAN STILL CONNECT WITH NATURE. A LABYRINTH IN THE FLOOR ALLOWS FOR CONTEMPLATION AND DISTRACTION DURING QUIETER TIMES.



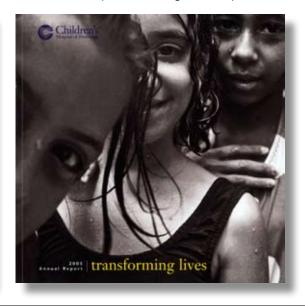
The deep metaphor of Transformation and the corresponding butterfly motif have legs beyond their incorporation into the design and interiors of the facility.

Discovering
Discovering

Highlights from the 2005 3rd World Congress of the International

Pediatric Transplant Association

Check out some of these printed pieces, by both the in-house marketing team at Children's Hospital, and the agencies they have hired.







Children's Hospital of Pittsburgh Transplant Center

### CONCLUDING THOUGHTS

Childhood is a time of transformation, of energy and color. And for a sick child, those things are even more important. **fathom**'s team of research professionals are moms, dad, aunts, uncles, sisters and brothers too. We want to make healthcare facilities that make kids better. And we can take the passion and experience garnered from projects like CHP and put that to work on your next effort.

We believe that the methods and techniques that were used with Children's Hospital of Pittsburgh of UPMC can be applied on a national (or broader) level with the potential of achieving the same results.

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