Universal Symbols in Health Care

Innovator Facilities Post Audit Report

Table of Contents

Executive Summary

This report details findings, implications and lessons learned from Phase II of Signs That Work an initiative of Hablamos Juntos, a national program funded by the Robert Wood Johnson Foundation (RWJF) to develop easy-to-understand universal graphic symbols for health care facilities, working in partnership with the Society for Environmental Graphic Design (SEGD).

The UHCS system was developed primarily with limited English proficiency (LEP) populations in mind, but is also effective for those who are challenged by literacy issues, visual impairment, brain injury, etc.

Phase II of the project aimed to help four innovator health facilities develop prototype signage and wayfinding* programs using graphic symbols, with the help of a team of leading national experts in symbols and wayfinding. The project also served to advance understanding of how symbols can be effectively used in healthcare wayfinding.

In parallel, the project established a consortium of design schools, initially to develop and test 22 new symbols to meet the symbol needs of the demonstration sites, and long term to promote on-going development and testing of symbols for wayfinding in healthcare facilities.

The main focus of this report is the experience of the innovator site implementation experience.

Note: For these purposes, 'wayfinding' is the method for providing consistent information in overt and obvious ways to guide a person to their destination. In practical application, this information can include maps and signs; overt clues in the architecture and interior design of a facility; use of color, pattern and texture; or other systems of information that patients, visitors and staff use to navigate to and among destinations.

The methods used to conduct this work are detailed in the **Project Overview** section of this report. In brief, however, the approach used is as follows:

- Four innovator facilities were chosen to serve as demonstration sites for testing and implementating symbols based wayfinding

- Both in-house and locally contracted designers selected by the four innovator facilities participated in general training that covered the development of effective wayfinding systems. They then developed prototype systems

- Corbin Design, experts in measuring the user experience, documented the before-and-after signage program in the innovator facilities* and participated in development and testing of symbols based prototype wayfinding systems

- A research team led by Philip Garvey of the Pennsylvania State University developed and implemented testing methodologies to evaluate certain key questions related to symbols based wayfinding

*Note: Results of incremental research into documented changes in the user experiences of patients, visitors and staff is being appended to this document as **Appendix 1 – User Satisfaction Research Results – Baseline and Post Implementation**, scheduled for completion by September 30, 2010.*

The following high level findings are detailed in the **Key Lessons Learned, Overview of Designed Solutions**, and **Case Examples from Innovator Facilities:**

- At the highest possible level, it appears that symbols based wayfinding systems can be powerful and effective at addressing the needs of LEP patients and visitors and indeed all users of healthcare facilities

- Symbols can be effectively incorporated into the wayfinding systems of a variety of healthcare institutions

- Employing a disciplined 360 assessment process to develop and test prototype and final wayfinding programs helped innovator facilities develop successful systems

- A careful approach to symbol and referent assignment, that assigns a single symbol to each primary destination within the facility, produces systems which are more easily accessed and used

- Symbols may be employed in many types of signage, provided attention is paid to size, legibility and unobstructed visibility

- Testing and evaluating sample prototype systems with typical end users helps produce more effective solutions

- Print materials, websites, staff training materials and other supporting tools can help users to recognize symbols in wayfinding and to associate a symbol with a destination

These findings are important because they showcase the success of symbols in healthcare wayfinding and they show a path forward for other decision makers who seek to develop systems for their facilities. Each finding is explained in the following sections.

Through the experiences of the four innovator facilities who participated in this project, the reader of this report will gain a deep understanding of how symbols can be implemented in healthcare wayfinding systems, the processes by which symbols based wayfinding systems can be developed and implemented, and the impacts that use of symbols in wayfinding can have on the patient/visitor experience of LEP populations and others.

Project Overview

Four innovator facilities were selected to implement symbols in new wayfinding systems and to share practical implementation experiences and results. These healthcare facilities represent diverse areas of the country as well as diverse facility functions and demographic makeup. A description of the facilities, along with detail on the choices they made and the outcomes, appears in the section "Case Examples from Innovator Facilities."

Facilities selected designers, either in-house employees or contracted outside consultants, to develop designed wayfinding solutions. These designers participated in a six part web-based training, designed and facilitated by the SEGD, which walked them through the steps of a wayfinding program design process.*

Experience design experts from Corbin Design were selected to work with a technical expert panel to provide assistance to the innovator facilities and to document pre-audit and post-audit conditions with respect to wayfinding systems and LEP populations.

A Technical Expert Panel of design experts was selected to provide advice based on best practices in the development and use of graphic symbols in healthcare environments.

Project Objectives

1. Support implementation of symbols based wayfinding systems using evidence-based practices in the four innovator facilities.
2. Document the implementation experience and results, with special attention to limited English proficiency users.
3. Identify best practices for healthcare facilities.
4. Promote awareness of how symbols based wayfinding can be a solution for multilingual environments.

Note: This training is the focus of the project report "Universal Symbols in Healthcare Workbook: Developing a Symbols Based Wayfinding Program"

Symbol and Referent Library

Symbols developed and tested by the broader Signs That Work Initiative are available at: www.hablamosjuntos.org.

To learn about relevant symbol development and testing activities, go to: www.hablamosjuntos.org.

Site Visit Teams

Corbin Design

Mark VanderKlipp, President, Principal-In-Charge

Sherwood Smith, Research Manager

Hablamos Juntos

Yolanda Partida, Director

Society for Environmental Graphic Design

Craig Berger, Education Director

Penn State University

Philip Garvey, Adjunct Scholar

Participating Facilities and Primary Contacts

Grady Health System, Atlanta, GA

   George C. Smith, Architectural Project Manager

   Sandra Sanchez, Director, Department of Multicultural Affairs

   Stephanie Dietrich, Environmental Graphic Designer,
      Innerface Architectural Signage, Inc.

Children's Mercy Hospital, Kansas City, MO

   Lonnie Breaux, Vice President of Facilities

   Susan Cain, Director of Facilities Planning and Design

   Donald "Scribe" Ross, Paint Specialist

   Dr. John Cowden

Women & Infants Hospital, Providence, RI

   Tatyana Shabalina, Media Center

   Andrew Shinn, Signage and Wayfinding Consultant

   Raymond Texeira, Texeira Design, Signage and Wayfinding Consultant

International Community Health Services, Seattle, WA

   Vajra Allen, Planning, Development & Evaluation Manager

   Andrew Goulding, Signage and Wayfinding Consultant

Project Phases

The following phases of work and research have been completed. A photo gallery of existing signage in the innovator facilities and post implementation signage solutions are reported separately.

1. Pre-Audit Evaluation
   The project team conducted two-day site visits at each of the four innovator facilities consisting of:
   • Review of web and electronic materials directed to patients and visitors
   • Focus groups with healthcare staff, including facilities managers, community affairs representatives, administration, clinical care managers, translators, security guards, volunteers, patient advocates, and others with the ability to comment on current systems in place to address the needs of LEP populations
   • Photographic documentation of existing signage and related wayfinding systems
   • Physical documentation of printed handouts and other materials designed to assist with wayfinding

   In two of four cases the local facility designers responsible for developing prototype systems participated in focus groups with healthcare staff (see above) to gain an understanding of user needs and how symbols development can integrate with a visitor-oriented wayfinding approach. Hearing this feedback firsthand informed the designers' design process and outcomes.

   The pre-audit evaluation established the baseline state of each facility and helped create a framework for recommendations and technical assistance on prototype design development.

2. User Baseline Research

    The Corbin team worked with volunteers and staff from the facilities to:

    • Conduct on-site interviews with patients and visitors with limited
      English proficiency

    • Launch a web-based survey directed at facility staff

    Across the four innovator sites, data was collected from 90 patients and 300
    staff. This information was used to document existing patterns of use and
    highlight general wayfinding challenges and opportunities. These data were
    also used to set a baseline against which post-installation research can be
    compared to determine whether or not there has been measurable improvement
    in the LEP patient/visitor experience and/or in operating efficiencies and
    profitability associated with fewer patients becoming lost.

    ** Note: Results of incremental research into documented changes in the user experiences
    of patients, visitors and staff is being appended to this document as **Appendix 1 – User
    Satisfaction Research Results – Baseline and Post Implementation,** scheduled for
    completion by September 30, 2010.*

3. Prototype Design Development

    Designers employed by each facility (either in-house or contracted externally),
    by the design steps recommended in the SEGD web-based training, developed
    schematic designs based on their understanding of specific conditions at
    each facility.

    The project team provided design review and consultation to innovator facility
    designers in the following areas:

    • Symbol selection: when one symbol could have been used for a variety of
      service lines, clarification was provided

    • Signage design standards: relative to the proposed design at each facility,
      facility designers and the project team discussed symbol location relative to
      arrows, text, color fields and other graphic elements such as building zone or
      level indicators

• Sign type selection: based on the design standards, the team helped determine which type of sign would be appropriate for a given informational use

• Sign type location: based on the pre-audit evaluation, the project team reviewed and recommended optimal locations for certain sign types given size, sight lines, etc.

Temporary signage was produced on foam core or paper.

• Graphic elements: the team helped select signage elements for optimal legibility based on type size, viewing distance, sign location, contrast and other physical factors

Using this input, designers finalized designs and created prototype sets of signs. Prototypes were produced on temporary materials and installed.

4. Post-Audit Evaluation

The site visit team then returned to the innovator facilities to document, evaluate, and test the effectiveness of the installed prototype systems. The team was able to assess the extent to which prototype signage was effectively executed, consistent with design recommendations and developed plans.

Research participants (30-40 per facility) were generally first-time visitors to the facility in which they completed several specific tests. Two tests which are of particular importance to this report:

• Pen and paper test in which participants were asked to find two given symbols within a larger field of symbols under three test conditions: 8 symbols, 16 symbols, and 20 symbols

• Timed wayfinding test in which participants were asked to find their way from a starting point to a sequence of three primary destinations within the facility using temporary signage under three test conditions:
  - symbol only

- symbol with English referent
- symbol with English and a secondary language (Spanish or Chinese, depending on facility populations).

Note: Each participant was shown a printed version of the relevant symbol before setting out to find a given destination.

Participants recruited to test prototype systems included primary speakers of English, Spanish, Chinese (Mandarin), Vietnamese, Khmer, and Somali. While completing the wayfinding task, participants provided qualitative feedback about ease of the wayfinding task, their comprehension of the signs, and sign placement.

Research participants completed pen and paper tests as well as accompanied wayfinding tests.

The post audit studies and evaluation showed the overall effectiveness of the systems in place. The project team was able to observe the extent to which users from a variety of backgrounds were able to use different elements of the systems. The project team was also able to note any shortcomings manifested by areas where visitors were consistently confused or delayed (See *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage* for details of this testing process and results).

4. Post-Implementation User Satisfaction Research
   Once each facility has completed final installation of final wayfinding systems (anticipated for August, 2010), the project team will collect data similar to that collected in User Baseline Research. By comparing overall ratings of the effectiveness and efficiency of the new wayfinding systems relative to the pre-audit conditions, the project teams will be able to measure institutional impacts of effective symbols based wayfinding.

   As noted, results of incremental research into observed changes in the user experiences of patients, visitors and staff is being appended to this document as "**Appendix 1 – User Satisfaction Research Results – Baseline and Post Implementation**."

Key Lessons Learned

Overall findings from the Phase II prototype installations; these findings arise from the case examples detailed below.

General Results

- **Universal health care symbols were used in wayfinding systems designed by the innovator facilities. These systems appear to be effective overall.** According to the results of the wayfinding research conducted during post-audit site visits, 92 per cent of all subjects agreed that they could "easily" find their destination using the symbols based wayfinding systems.

- **Within the four innovator facilities, LEP populations from a variety of cultural backgrounds were able to effectively use the symbols.** Participants in the post-audit research consisted of primary speakers of English, Spanish, Khmer, Vietnamese, Chinese (Mandarin), Somali, and Korean. Overall, all populations were able to navigate health care facilities using symbols. This is important because it confirms that symbols can cross cultural and linguistic boundaries.

- **Low literacy populations were able to use symbols for navigation.** At one of the innovator facilities in particular, a large number of research participants were unable to read either English or their primary spoken language. They were, however, able to find their way to destinations within the facility using symbols.

- **Although the focus of the symbol development initiative was LEP populations, all users, including those with strong English proficiency, were able to navigate using symbols.** These results are presented in the *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage,* a project report written by Philip Garvey. This result suggests that implementation of symbols in healthcare wayfinding may cause overall improvement in patient and visitor wayfinding, across subgroups of the patient and visitor population.

- **Symbols were effectively used in diverse, health care environments, from a large public hospital to a medical clinic building.** The innovator facilities that participated in this study are diverse and each developed an effective symbols based wayfinding solution. Although these data are not such that we can say that symbols will be effective in all health care environments, they do imply that symbols can be useful if implemented in many different kinds of health care settings.

Appendix 1 – User Satisfaction Research Results – Baseline and Post Implementation, (scheduled for completion by September 30, 2010) includes additional research findings and implications regarding the relative impact the four symbols based wayfinding systems are having on wayfinding and on the patient experience within these facilities. These findings examine the extent to which the new systems are "making a difference," from the perspective of both users and facility staff.

Formulating a Symbols Wayfinding Strategy

The four innovator facilities followed a disciplined 360 view to assessment in developing their prototype and final wayfinding programs. It is the judgment of the project team that the processes encapsulated in this assessment helped produce better designed solutions than would otherwise have been created. These processes uncovered how key constituent groups (end users, front line staff, decision makers, etc) perceived the strengths and weaknesses of the existing system, informed design criteria, and pointed to ancillary changes to facilities and policy that would be needed to maximize success. Key elements of the assessment are detailed below.

- **Detailed facility reviews identified shortcomings of existing systems.** By walking through facilities with engaged designers, the project team was able to identify several challenges with existing systems that ultimately shaped the design process. A critical onsite review, coupled with photographic documentation and evaluation, helped create successful design criteria.

- **Involving front line employees and patient advocates in the planning phase appears to be an important step to ensure that designed solutions fit the needs of multiple users.** Although most facilities have pathways by which patients and visitors are intended to receive information and guidance, many patients and visitors receive wayfinding direction from front line staff such as security guards, custodial staff, and retail employees with no official responsibility (or training or tools) for wayfinding. Involving some of these employees showed the need for supporting systems such as tear sheets, brochures, posters, etc. which would allow these individuals to help patients and visitors engage with the symbols based wayfinding system.

- **Determining responsibility for ongoing maintenance of wayfinding systems is an important decision to be addressed in the planning phase.** Although not a primary focus of this study, the project team did observe that when facilities had clear lines of accountability for development and maintenance of wayfinding systems, they were more likely to arrive quickly at effective symbols based wayfinding systems.

- **A rollout and communications plan can help speed effectiveness of the wayfinding system and should be anticipated during the planning phase.** Some facilities developed very specific approaches to introducing symbols based wayfinding to staff. These facilities were generally able to generate a great deal of positive enthusiasm for the system by doing this, and were able to successfully position the launch of the new system as an "event."

Destination Criteria and Assignment

A critical step in the design process is determining which destinations will be represented by symbols, which symbols will be used to represent which destinations, and at which decision points or touch points symbols will be used. Key lessons learned from the design process of the four innovator facilities:

• **Symbols may be most effective when a single symbol is used to represent a single primary destination.** Early in the conceptual design process, some innovator facilities questioned whether or not one symbol could be used to modify or qualify another, e.g. using the Pediatrics or the Outpatient symbols to modify a second symbol. Anecdotally, participants appeared to understand a given system well when it was explained that a single symbol indicated one specific destination.

• **Increasing the number of symbols at any given decision point may start to increase the amount of time that a given user needs to spend in order to find and use symbols in navigation.** On average across all sites and groups, it took participants 15 per cent longer to find two symbols within a group of 16 symbols than within a group of 8, and 55 per cent longer to find two symbols within a group of 20. Though it may be obvious that more symbols means more complexity, it is a first order concern for system design. It is important that symbols be used to represent primary destinations only and that systems not be burdened with extra symbols which are not primary.

• **When there is not a perfect match between a primary destination and a symbol available in the current Universal Health Care Symbol library, facilities should follow a disciplined approach if they wish to supplement with other symbols.** It is clear, based on the experience of some of the innovator facilities in this initiative, that some health care

institutions will have primary destinations for which there is no perfect match from the established symbol set. Hablamos Juntos intends to provide tools for development, testing and validation of new symbols, which will be available www.hablamosjuntos.org.

- **Symbols may be an efficient and effective alternative to bilingual translations in signage.** In three of four facilities, LEP users were able to navigate to destinations faster when wayfinding was presented with only a symbol and English referent for the destination than when a translation into a second language (primary for the participants) was also provided. Although preliminary, these results indicate that when symbols are successfully implemented in wayfinding systems and are understood by users, bilingual translation into a secondary language for wayfinding may not be necessary.

Even when symbols were presented without any English or bilingual referent, symbols in signage could be used for wayfinding.

* Note: This does not in any way diminish the importance of effective translated information for clinical information, policies and procedures, key services, etc.

Design and Development Using Symbols

Although signage is not the only component of wayfinding which is important (see section below on Symbol Support and Education), it is a central element in the systems designed by the four innovator facilities. The project team recognizes that individual facilities have unique constraints and considerations that may inform a variety of successful designed solutions. This was certainly true for the four innovator facilities. However, though a variety of designed solutions may be effective, some overall lessons learned follow:

- **Symbols may be most effective when they are developed as part of a system, with symbols treated consistently throughout.** Since each of the four facilities developed systems in which symbols were presented with consistent color, size and placement relative to other information within any given sign type or wayfinding element, it appears that consistency plays an important role in symbols based wayfinding, with size, shape and contrast being key to symbol effectiveness.

- **Specific applications which have been shown to be effective within the four facilities, and for which there are examples provided, are:**
  - Entry Directory
  - Overhead
  - Guide Sign
  - Elevator Directory
  - Flag/Plate Identification Sign

The Children's Mercy prototype system ensured that symbols were of sufficient size to be legible.

- **These applications were effective when applied to provide for maximum legibility in the environment for symbol based information.** Symbols should be of a sufficient size and contrast/resolution to be visible from the decision point for which they are designed, bearing in mind that some users will be visually impaired. Anecdotally, some participants in the study had difficulty finding relevant symbols in wayfinding elements when these symbols were of insufficient size, contrast or resolution. Although offering specific guidelines for sizes was beyond the scope of this project, ADA requirements for letter height may provide useful benchmarks. Also based on observation, wayfinding elements using symbols should be at eye level and should be unobstructed.

- **Removing nonessential information, clutter, and non-wayfinding uses of symbols from the physical environment appears to enhance the effectiveness of symbols based wayfinding systems.** The pre-audit phase of the project showed that in some facilities, wayfinding information was impacted by a clutter of other types of information. In addition, some facilities were using Universal Health Care Symbols in posted policy statements, which detracted from their utility in wayfinding. Eliminating these types of uses appeared to make the symbols based wayfinding systems more accessible to users.

Design Testing and Analysis

The process used in this project involved a prototype phase, in which temporary signage and materials could be tested with prototypical users, both LEP and non-LEP. In all cases, this process led to refinements in the designs used for final implementation. Therefore, it seems to be an important step to take for other facilities contemplating use of symbols in wayfinding.

- **Designing and implementing a prototype system made of lightweight, low cost materials can be a useful way to test the efficacy of a system before beginning full production.** Each of the four facilities in this study took this approach, posting paper or foam core temporary signage. This allowed them to test the system without making substantial financial investments in permanent signage.

- **Testing with typical end-users may increase the effectiveness of systems.** In this study, when systems were tested by a variety of participants who were unfamiliar with the facilities, including multiple groups of LEP participants, potential shortcomings and problem areas were revealed. This can be a powerful step in ensuring the efficacy of the overall system, provided potential problems are recognized and addressed.

Symbol Support and Education

The efficacy of prototype systems reported throughout this report ultimately depends on end-users first <u>learning</u> which symbol relates to the destination they are seeking and then <u>finding</u> the symbol in the wayfinding elements they encounter on their journeys. The process of learning which symbol to look for can be supported by a variety of communication tools, many of which are being implemented by the innovator facilities.

- **Success of a symbols based wayfinding system may be assisted by implementation of one or all of the following.**
  - A point of reference, such as a static directory or interactive touch screen, positioned close to primary points of entry
  - Print collateral such as brochures and posters, which can allow users and staff to both become accustomed conceptually to symbols in healthcare wayfinding and find specific destinations
  - Integration with scheduling and patient communication activities (e.g. appointment letters) so that patients and visitors are made aware of the symbol and destination they are seeking before they arrive on site at a facility
  - Integration with electronic media designed to assist with wayfinding
  - A thoughtful rollout to staff, patients and the community which announces the introduction of symbols, explains the rationale, and provides some tools for learning (see section on Overall Planning and Strategy Development)

These findings are based on both observation of prototype systems and staff input offered during the pre-audit and post-audit phases of the project.
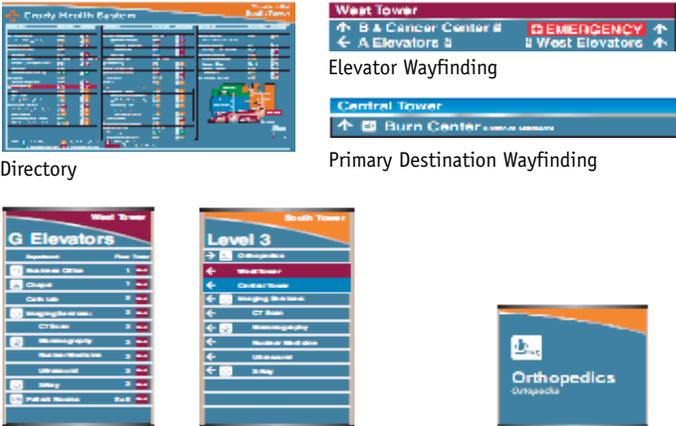
Data and observations to support all findings are provided in the remaining sections of the report.

Overview of Designed Solutions

Detailed case examples documenting the facility design and implementation
experience appear in the following section.

The grid on the following pages is intended to summarize the facility experience:

Woman & Infants Hospital	International Community Health Services
Facility Description: A facility for neonatal and pediatric care, Woman and Infants Hospital is a building that is part of a larger healthcare campus. The facility is undergoing an extensive renovation with a large new addition expanding facilities and public space.	**Facility Description:** With two clinics serving over 16,000 patients yearly, ICHS offers services including medical, dental, and behavioral health; Chinese medicine; and pharmacy. The vast majority of patients are LEP, with the most common languages being Cantonese and Vietnamese.
Stakeholders: An extensive team led by a wayfinding consultant working with the medical system coordinating the work of marketing staff and the facilities department.	**Stakeholders:** A small staff with one planner and one facilities manager handles all sign planning issues.
Mission Statement: • To improve wayfinding for our limited English proficiency patients, as well as our illiterate patients. • To improve on an existing symbols based system installed a year earlier and be a model for future expansion into the health system.	**Mission Statement:** • Establish a cohesive, systematic signage program consistent with the ICHS brand that can be adapted to future clinic sites. • Implement signage consistent with established plan. • Patients find their way to the right place on their first attempt.
Destination Hierarchy: • Building identification • Three main wings of the facility • Primary healthcare destinations • Secondary destinations • Room numbers	**Destination Hierarchy:** • Building identification • Primary healthcare destinations
Designer Strategy: An owners representative working with a designer who is also updating guidelines for other facilities in the health system.	**Designer Strategy:** Facilities planner working with a sign consultant, managing a set of simple sign guidelines.
Pre-Design Recommendations: • Improve locations of existing symbols based sign system. • Improve color contrast of sign system for enhanced legibility. • Provide large format directional signs near main help desk as an initial point of contact.	**Pre-Design Recommendations:** • Create a system that is simple and easy to design and install. • Provide prominent directory signs at main entrances. • Design signs to stand out in the midst of extensive posted information. • Remove UCHS symbols from non-wayfinding policy postings.
Symbol Strategy: Build healthcare and support symbols around the three main sections of the hospital. System built around the central help desk.	**Symbol Strategy:** Small palette of symbols used multiple times to define and identify the sections of the clinics.
Design Concept: Large directory/wayfinding signs oriented around the three main section identities and followed up with symbol oriented directional and identification signs in each section.	**Design Concept:** One standard size wall mounted sign module for all interior wayfinding elements. Multiple identification sign types integrated into the interior spaces. Similar in form, color, location, format, typography.

Design Component Parts:
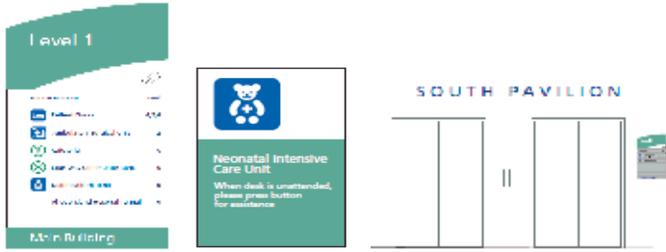
Directory   Identification   Pavilion Identity

Wayfinding

Design Component Parts:

Wayfinding

Wall Directory/Wayfinding
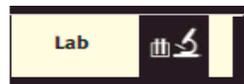
Identification

Prototype Review and Recommendations:
• A successful wayfinding program based on simple concepts, limited color palette and a primary focus on legibility rather than decoration.
• Successful differentiation between Hablamos Juntos symbols (blue squares) and other building amenities (green circles).
• Introduce a directory or similar point of reference close to the main information desk.
• Augment directories with print handouts, web support, or maps at the help desk.
• Maintain the strategy of a limited number of symbols.

Prototype Review and Recommendations:
• Immersive identification sign approach was very successful.
• Standard module size worked well in the simple clinic environment.
• Consistent mounting heights and locations created a recognizable pattern.
• Institute extensive education effort from staff as well as explanatory print materials.
• Increase size of directory with definitions in multiple languages.

Children's Mercy Hospital	Grady Memorial Hospital
Facility Description: This large medical campus, anchoring a system that includes 21 clinics, offers diverse pediatric services including in-patient care, outpatient care, diagnostic testing, and research. 7-10% of all patients are Spanish-speaking; other LEP populations are diverse and on the rise.	**Facility Description:** One of the ten largest hospitals in the country, most of this facility is located in one 22-story, 1.8-million-square-foot building. 12% of all visitors are LEP. Over 90% of these are Spanish-speaking. Because Grady has been operating for nearly 100 years, there are many legacy wayfinding systems.
Stakeholders: Led by Facilities with the Department of Pediatrics providing input.	**Stakeholders:** A leadership team led by Facilities and the Department of Multicultural Affairs reporting to a senior executive group.
Mission Statement: • To expand our current commitment to LEP wayfinding beyond the small pilots we have attempted over the last year (security checkpoint universal symbol charts, few symbols added to existing signs). • To improve the evidence base for symbol choice and placement. • To create generalizable UHCS processes for our on-going 15-year expansion, for Hablamos Juntos, and for the larger wayfinding effort.	**Mission Statement:** • To ensure efficient signage is available to allow people from different cultural and linguistic backgrounds to locate their desired destinations with the fewest number of decision points. • To create coherent, consistent and easily maintained signage system-wide that can be expanded to the rest of health system facilities throughout our service area.
Destination Hierarchy: • Building identification • Zones • Primary healthcare destinations and support destinations • Room numbers	**Destination Hierarchy:** • Building identification • Four main building sections • Elevator cores • Primary healthcare destinations and support destinations • Room numbers
Designer Strategy: In-house designer working in the Facilities department, tasked with redeveloping overall wayfinding standards while incorporating symbols.	**Designer Strategy:** A modular design, fabrication and installation firm hired to implement and adapt existing sign guidelines around healthcare symbols.
Pre-Design Recommendations: • Make references to zones within the hospital more overt. • Design wayfinding elements to stand out from visually active backgrounds rather than blend in. • Be careful not to introduce large numbers of symbols beyond primary destinations. • Increase the size and improve the legibility of symbols.	**Pre-Design Recommendations:** • Remove existing and legacy signage elements. • Increase the size and visibility of wayfinding elements (text and symbols) on new signage. • Provide tools to staff to support wayfinding logic. • Develop a system that can be easily maintained by the facilities staff and the outside modular sign firm.
Symbol Strategy: Large palette of symbols for each hospital zone. All symbols treated equally and consistently on signs.	**Symbol Strategy:** Color coded system built around four zones and elevator cores with symbols used primarily on directory signs at the entrance, elevators and floors.
Design Concept: One main directory/wayfinding sign and one ceiling wayfinding sign used at all major decision points and serving all destinations equally. Multiple identification signs used at destinations.	**Design Concept:** Entrance map directories oriented to the four zones direct to elevators. Symbol oriented directional signs at the elevators and on each floor landing.

Design Component Parts: (Children's Mercy Hospital)

Wayfinding

Wall Directory/Wayfinding

Design Component Parts: (Grady Memorial Hospital)

Directory

Elevator Wayfinding

Primary Destination Wayfinding

Elevator Directory

Elevator Landing Wayfinding

Identification

Children's Mercy Hospital	Grady Memorial Hospital
Prototype Review and Recommendations: • Consistent large symbol sizes were effective. • A larger orientation directory or handouts needed at the major entrance points of each zone. • A limit of eight informational slots on directional signs was imposed; consider adding more information as needed.	**Prototype Review and Recommendations:** • Directory map too hard to spot and symbols too small. • Too many symbol size variations. • Too many existing wayfinding systems in place that confuse the visitor. • Staff training and support materials are needed to enhance the effectiveness of the system and ensure consistent wayfinding direction for patients and visitors.

Case Examples from Innovator Facilities

Each health care facility is unique, with unique patient populations, physical plant, resources, services provided, etc. For this reason, there cannot be a "one size fits all" approach to symbols based wayfinding. The four innovator facilities that participated in this study provide four practical (and different) examples of the many permutations of successful wayfinding systems which might be possible. These case examples are provided for reference only. They are not meant to imply any prescriptive set of constraints or requirements on any other facility which embarks on an effort to incorporate symbols into wayfinding.

Children's Mercy Hospital, Kansas City, Missouri

Grady Memorial Hospital, Atlanta, Georgia

International Community Health Services, Seattle, Washington

Women & Infants Hospital, Providence, Rhode Island

Children's Mercy Hospital, Kansas City, Missouri

This large medical campus, anchoring a system that includes 21 clinics, offers diverse pediatric services including in-patient care, outpatient care, diagnostic testing, and research. The campus also includes numerous medical offices. 7-10% of all patients are Spanish-speaking, with some departments having much higher percentages of Spanish-speaking patient populations. Other LEP populations comprise a growing portion of Children's Mercy's patient population.

Children's Mercy has a highly capable in-house design staff, as well as equipment and technology capable of significant production of signage and materials. This in-house staff was responsible for wayfinding system design and execution.

At the time of a major Emergency Department expansion, Children's Mercy Hospital set out to accomplish the following goals with respect to symbols based wayfinding:

- To expand our current commitment to LEP wayfinding beyond the small pilots we have attempted over the last year (at security checkpoint, a universal symbol chart, a few symbols added to existing signs).

- To improve the evidence base for symbol choice and placement.

- To create generalizable UHCS processes for our ongoing 15-year expansion, for Hablamos Juntos, and for the larger way-finding effort.

1. Baseline

Children's Mercy has a primary point of entry that adjoins the main parking structure. Several other entrances receive limited traffic.

At the time of the pre-audit assessment, Children's Mercy was using a set of four distinct zones within the facility as a key component of its wayfinding logic. These zones were defined by kid-friendly themes (Sky and Space, Myths and Legends, Deep Sea, and Wild Kingdom) which were indicated by characters and color schemes.

In an effort to make the hospital setting more engaging and less clinical for children, Children's Mercy has a visually stimulating environment which includes murals, illustrated characters, colorful finishes, stories, games and other visual imagery. In some cases wayfinding elements were incorporated into these background elements.

For reasons that are largely cultural, there is a strong internal push toward comprehensiveness and equality in signage and wayfinding, i.e. all clinical destinations should be treated equally – if symbols are to be used for some destinations, there should be a symbol for each clinical destination.

Existing treatments which employed symbols showed that when amenity and clinical symbols are very small and/or the number of destinations is very great, symbols tend to be less legible.

Although an information desk staffed by volunteers was positioned near the point of entry, uniformed security guards were often the first point of contact for patients and visitors. These guards were often tasked with providing directions. However, these individuals were provided with relatively few tools and relatively little training to be able to provide this information to LEP populations.

A department ID sign showing the color and theme of Children's Mercy's 'Wild Kingdom' zone.

In some cases, wayfinding elements at Children's Mercy Hospital were incorporated into background or decorative elements.

When amenity and clinical symbols are very small, symbols tend to be less legible.

2. Post Audit Designs

    Components of the wayfinding system include:

    • Wall-mounted directional signs

    • Wall-mounted elevator directories

    • Overhead hanging directional signs

    • Overhead hanging department ID signs

    Each of these components contains universal health care symbols, presented as white symbols on a black background with a colored border to correspond with the zone referenced by the symbol.

    Children's Mercy did not develop lobby directory signage within the prototype set.

    Based on pre-audit recommendations, designers made the decision to simplify the zones to basic color descriptions (Blue, Pink, Purple, Green).

    Designers also made the decision to design wayfinding information to be more visually distinct within this complex environment.

    Children's Mercy followed a self-defined "highway and exit" approach to wayfinding within the prototype system in which they first direct users to zones and then, within zones, direct them to specific destinations. For this reason, a user would generally not see a symbol or related referent name until he or she is in the appropriate zone (Emergency is the exception and is on all directional signs within the system).

    For consistency and brevity, Children's Mercy Facilities Management determined that no more than eight (8) unique "slots" of information would appear on given wall signs.

    As of writing this report, there continues to be a strong internal push for a symbol to match each clinical destination. In the prototype signage, a

symbol was chosen for a very non-typical referent because it was the "best fit" from the existing symbol library. Other destinations in the prototype signage were accommodated using acronyms, placed on the same sign location and treated with the same graphical treatment as approved Universal Health Care Symbols.

3. Assessment and Research Findings

* *Note: Original wayfinding systems were obscured during the post-audit assessment.*

The use of the "Genetics" symbol for the Diagnostic & Treatment Center is a non-traditional use for this symbol, but represented the 'best fit' of available options.

Overall, the Children's Mercy prototype design system was consistent with recommendations made during the pre-audit phase.

The prototype system appeared to be effective overall at guiding potential users within the facility. 95.2 per cent of research participants and 91.7 per cent of LEP research participants agreed that the signs were easy to understand across all test conditions.

Anecdotally, participants appeared to navigate the system with confidence. They made use of each of the elements of the system, including wall-mounted directional signs, wall-mounted elevator directories, overhead hanging directional signs, and overhead hanging department ID signs.

The symbols appeared to the site visit team to be very legible within all of the prototype signage elements. The symbols were of sufficient size to be successfully viewed at a distance by research participants.

The symbols used in Children's Mercy prototype signage were of sufficient size to be successfully viewed at a distance; Note: As part of the post-audit testing, some elements of the signage were intentionally obscured or replaced with bi-lingual translations.

In general, participants found their way to destinations almost as quickly when using "symbols only" signs as they did using signs with English and Spanish referents. Participants with Spanish as

their primary language navigated to their destinations more quickly when symbols with English referents were used than with symbols, English and Spanish. Remember, though, that participants were shown the symbol for the destination they were seeking before they began their journey. The implication may be that if a given LEP patient or visitor is aware of the symbol they are seeking, then they may not require bi-lingual translation into Spanish or any other language to find a destination. However, establishing this awareness for the patient/visitor will be a critical consideration.

In the symbol matching test, participants overall took 12.2 seconds to complete the exercise with 8 symbols and 12.7 seconds to complete the exercise with 16 symbols, a relatively negligible difference. Participants overall took 19.7 seconds to complete the exercise with 20 symbols. These data suggest that increasing the number of symbols that a given user must evaluate at any one time may reach a threshold level beyond which complexity and time required may increase dramatically.

Results of the Referent Assignment Test appear in the report *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage* associated with this phase of work. These data should be useful in assigning specific symbols to referents and vice versa.

All wayfinding tests were completed within the Purple Zone, so the project team is not able to directly comment on the efficacy of the new zone system.

4. Lessons Learned
    Based on the results of the wayfinding test, the project team posits that effective use of symbols may obviate the need for bilingual translation into Spanish in wayfinding. Note: this does not in any way diminish the importance of effective spoken or translated information for clinical information, policies and procedures, key services, etc.

In order for users to seamlessly find their way to a given destination using this symbols based wayfinding system, they must, using the "highway and exit" concept, know both the symbol that represents their destination and the zone in which this destination is located. There may be multiple ways in which this information could be acquired. A typical solution would be a building directory at the entrance, although other solutions, including printed tear sheets, interactive touch screen kiosks, a patient/visitor badging system using these symbols, web-based solutions, etc. may also be effective.

The project team believes that the system will be more effective if users can have a physical piece of information "in hand" which communicates both the destination they are seeking as well as the symbol representing it. In this case, the information users have in hand will allow Children's Mercy staff to help users find their destinations quickly, while teaching staff how to use the system.

The project team is not certain that the constraint to use no more than eight (8) unique "slots" of information on given wall signs is appropriate. While this does bring consistency to the system, it does appear that this may put pressure in some locations to remove some primary destinations or combine destinations. In some cases this may be detrimental to effective pedestrian wayfinding.

The constraint to allow no more than eight unique slots of information caused some destinations to be combined on directional signs.

Regarding the strong internal push for a symbol to match each clinical destination, the project team considers this to be an issue that should be handled with care. While the research findings around number of symbols were rather narrow in focus, it seems likely that introducing large numbers of non-standard symbols into the system may reduce the usability of the system, both for users and for the staff who attempt to assist them with wayfinding. Furthermore, the

symbols within the universal health care symbols set have all been validated through careful research and documented data. While they may be excellent, we cannot speak to the efficacy of self-generated or derived symbols. It should be reiterated that symbols should be used within the facility for primary destinations only.

The project team believes that the overall effectiveness of wayfinding at Children's Mercy Hospital will be improved if all staff who have official or unofficial responsibilities for providing directions and assistance to patients and visitors both receive training on the new symbols based wayfinding system and, if possible, practical tools (such as printed materials) to enable them to help users engage with the system. Cultural training for front line staff would also be recommended.

Grady Memorial Hospital, Atlanta, Georgia

One of the ten largest hospitals in the country, most of this facility is located in one 22-story, 1.8-million-square-foot building. 12% of all visitors are LEP. Over 90% of these are Spanish-speaking.

Grady has an experienced Architectural Project Manager who provided overall design leadership. Wayfinding system design and prototype fabrication were provided by a signage and wayfinding consultant.

Grady's goals for implementing symbols based wayfinding were as follows:

• Ensure efficient signage is available to allow people from different cultural and linguistic backgrounds to locate their desired destinations with the fewest number of decision points.

• Create coherent, consistent and easily maintained signage system-wide that can be expanded to the rest of the health system facilities throughout our service area.

1. Baseline

Grady has four entrances which receive a significant amount of public traffic, though two of these, the Main Lobby and the Clinic Lobby, are more primary.

Grady is complex because of its size and diversity. There are a great many destinations within the facility. In addition, the facility has eight distinct groups of elevators, designated by letter. Unique wings and sub-areas of the hospital are also designated by letters. These do not correspond to the elevator letters.

To a greater extent than any of the other innovator facilities Grady has specific destinations, both amenities and service lines, which exist in multiple locations. For example, mammography is performed both at a primary Imaging Services center as well as within an outpatient clinic in a different part of the hospital.
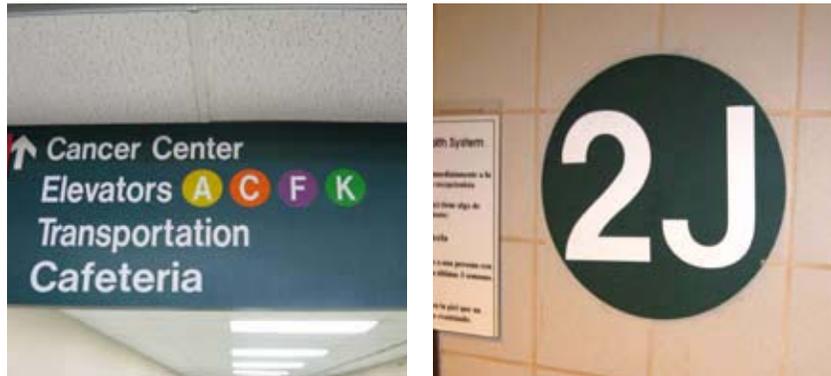
Grady Memorial uses letters to designate elevators as well as wings/sub-areas.

At the time of the pre-audit assessment, Grady was planning to implement a system of zones similar to a cardinal system (Central, South, East and West) to provide an initial frame of reference for wayfinding. It was anticipated that elevator banks would be re-named to fit within this system and serve as the foundational physical features of the wayfinding system.

Because of its long history of more than 100 years of service, Grady has at least 5 legacy wayfinding systems, some of which provide redundant and non-current information.

Some existing systems and individual signs have typography which is too small to be legible from a distance, which reduces its efficacy in wayfinding.

Some of Grady Memorial's legacy wayfinding systems.

Grady is challenged by limited resources. The facility has also had significant turnover in leadership in the past ten years.

The Main Lobby and Clinic Lobby are both serviced by help/information desks which are manned during principal hours of operation. Directions are generally provided using turn-by-turn verbal directions only.

More than any of the other innovator facilities in this study, the staff at Grady use considerable time providing directions to lost patients and visitors. This includes many staff positions without primary responsibility for guiding patients (e.g. clinical staff vs. information desk staff). Again, these directions are generally turn-by-turn verbal instructions or physical escorting.

2. Post Audit Designs
    Components of the wayfinding system include:
    • A directory to be placed in the Clinic Lobby
    • Wall-mounted directional signs
    • Wall-mounted elevator directories
    • Overhead soffit mounted directional signs
    • Wall-mounted department ID signs

Each of these components contained universal health care symbols presented as reversed out blue symbols on a white background.

The prototype set contains references to Central Tower, South Tower, West Tower, and East Tower. These towers have associated colors.

The prototype set references new elevator designations: East Lobby Elevators, South Lobby Elevators, West Lobby Elevators, A Wing Elevators, B Wing Elevators, F Wing Elevators and G Wing Elevators.

Directories indicate the tower in which they are placed with a header marked, e.g. "South Tower". Individual destinations are listed with universal

health care symbol, referent name, floor number and tower reference with the relevant color treatment, e.g. "S" for "South".

3. Assessment and Research Findings

* Note: Legacy wayfinding systems were partially obscured during the post-audit assessment. Some legacy systems were still visible.

An example of a prototype directory developed by Grady Memorial with symbols, elevator references, tower references, floor numbers, and symbols.
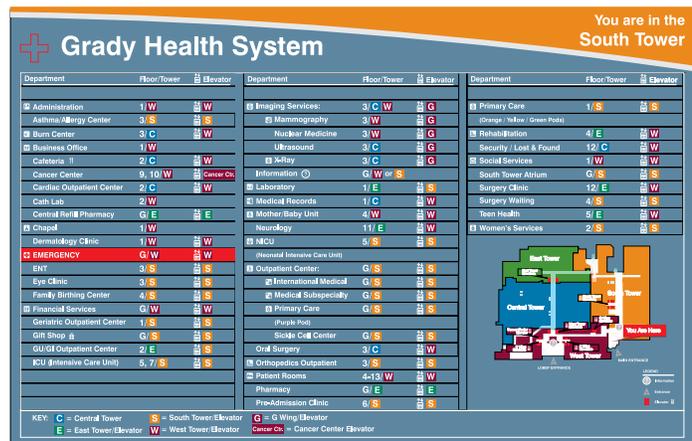
Overall, the Grady prototype design system was consistent with recommendations made during the pre-audit phase.

The prototype system appeared to be effective overall at guiding potential users within the facility. 90.7 per cent of research participants and 88.6 per cent of LEP research participants agreed that the signs were easy to understand across all test conditions.

Anecdotally, participants appeared to navigate the system with some confidence. They made use of each of the elements of the system, including the lobby directory, wall-mounted directional signs, wall-mounted elevator directories, overhead soffit mounted directional signs, and wall-mounted department ID signs.

The symbols appeared to the project team to be legible within many of the prototype signage elements. On overhead directional signs and department ID signs, the symbols were of sufficient size to be viewed from distance by research participants.

Anecdotally, some participants appeared to struggle finding the symbol

Symbols were of sufficient size to be viewed from a distance on overhead directional signs and department ID signs.

Cardiac Outpatient Center	2/ C		W
Cath Lab	2/W		
Central Refill Pharmacy	G/ E		E
Chapel	1/W		
Dermatology Clinic	1/W		W
EMERGENCY	G/W		W
ENT	3/ S		S
Eye Clinic	3/ S		S
Family Birthing Center	3/ S		S
Financial Services	G/W		W
Geriatric Outpatient Center	1/ S		S
Gift Shop	G/ S		S
GU/GI Outpatient Center	2/ E		S
ICU (Intensive Care Unit)	5, 7/ S		S

Size of symbols and/or number of destinations made the lobby directory difficult to use for some users.

Participants generally needed to get within a few feet of wall mounted and elevator directories to find the symbols they were seeking.

for their destination within the lobby directory. This may relate either to the large number of destinations presented here or to the relatively small size of the symbols on the directory.

Anecdotally, participants generally needed to get within a few feet of wall mounted and elevator directories to find the symbols they were seeking. From a short distance, the symbols were easily recognized.

Anecdotally, some participants failed to understand the tower references or the elevator references indicated on the entry directory.

In general, participants found their way to destinations almost as quickly when using "symbols only" signs as they did using signs with English and Spanish referents. Participants with Spanish as their primary language navigated to their destinations more quickly when symbols with English referents were used than with symbols, English and Spanish. Remember, though, that participants were shown the symbol for the destination they were seeking before they began their journey.

In the symbol matching test, participants overall took 9.1 seconds to complete the exercise with 8 symbols, 11.4 seconds to complete the exercise with 16 symbols, and 14.4 seconds to complete the exercise with 20 symbols. These data suggest that as the number of symbols that a given user must evaluate at any one time increases, complexity and time required will increase as well.

Results of the Referent Assignment Test appear in the report *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage* associated with this phase of work. These data should be useful in assigning specific symbols to referents and vice versa.

4.   Lessons Learned

Based on the results of the wayfinding test, the project team posits that effective use of symbols may obviate the need for bilingual translation into Spanish in wayfinding. Note: this does in any way diminish the importance of effective translated or spoken information for clinical direction, policies and procedures, key services, etc.

The lobby directory was an effective component of the Grady wayfinding system. However, a large number of destinations were presented on this directory. While the project team observed that it appeared easier for LEP populations to find symbols on this directory than it would have been for them to find words, the number of primary destinations should be carefully considered. If possible, the number of destinations would be reduced and the symbols would be larger and more legible.

Overall, symbols on surface-mounted signage elements must be of sufficient size to be viewed from a distance, bearing in mind that some LEP users are also visually challenged.

Regarding multiple clinical destinations of the same type, it seems possible that presenting multiple service line symbols at a point of entry or orientation (such as a lobby directory) risks sending users to the wrong part of the hospital. For example, if a user has been given an appointment letter directing them to receive a mammography within Imaging Services, it would be counter-productive for them to see a symbol associated with mammography located within an outpatient clinic in a different part of the hospital. Under these circumstances, it would seem to be appropriate to use the mammography symbol only on wall mounted directional signage and department ID signage within a given clinic. In this case, it would be best to identify the building sector first (e.g. "4 North Imaging Services")

Multiple wayfinding systems can be confusing. It appears to the project

team that a new symbols based wayfinding system will be most effective if legacy systems are removed or obscured.

The project team believes that the overall effectiveness of wayfinding at Grady will be improved if all staff who have official or unofficial responsibilities for providing directions and assistance to patients and visitors both receive training on the new symbols based wayfinding system and, if possible, receive practical tools (such as printed materials) to enable them to help users engage with the system.

International Community Health Services, Seattle, Washington

With two clinics serving over 16,000 patients yearly, ICHS offers services including medical, dental, behavioral health, Chinese medicine, acupuncture, health education, laboratory, WIC, and pharmacy. The vast majority of patients are LEP, with the most common languages being Cantonese and Vietnamese. Otherwise, the patient population is diverse and speaks more than 50 languages.

Wayfinding at ICHS is overseen by a Planning, Development and Evaluation Manager with multiple other responsibilities. Wayfinding system design and prototype fabrication were provided by a signage and wayfinding consultant, and fabrication was provided by the Society for Environmental Graphic Design.

ICHS set out to accomplish the following goals with symbols based wayfinding:
- Establish a cohesive, systematic signage program consistent with the ICHS brand that can be adapted to future clinic sites
- Implement signage consistent with established plan.
- Patients find their way to the right place on their first attempt.

1. Baseline
   ICHS maintains two separate clinic buildings, one in Seattle's International District and the other in the Holly Park neighborhood. In the International District location, clinical destinations are primarily on the ground floor; in the Holly Park location, clinical destinations are on the ground and first floors. Each facility has a single primary entrance.

   The number of primary destinations at each of the ICHS locations is relatively few, but these locations are generally in distinctly separate areas

within facilities. A primary challenge for the facility was to provide appropriate guidance to patients and visitors at the main points of entry.

Within each of the clinical areas of ICHS, there are multiple secondary destinations. Some patients and visitors become lost finding their way to, among, and back from these destinations. Since staff work stations, conference rooms and offices adjoin many of the corridors linking secondary destinations to public waiting rooms, staff are regularly asked to provide directions.

An ICHS clinic corridor – though an overhead sign is intended to guide patients back to Intake, most often patients stop and ask staff people.

At the time of the pre-audit visit, ICHS had already implemented many Hablamos Juntos symbols within its facilities. However, in some cases these symbols were being used to convey policy messages or for other purposes other than wayfinding.

ICHS was generally using flush, wall-mounted department ID signs for primary and secondary destinations.

Public areas within ICHS contain a great deal of information on policies, programs, etc. This amount of information made some wayfinding information difficult to discern.

ICHS is challenged by limited resources.

In some cases, Universal Health Care Symbols were being used to convey policy messages.

2. Post Audit Designs

Components of the wayfinding system include:

- Vinyl ID signs applied to entrance doors
- Lobby directory
- Wall-mounted directional signs
- Wall-mounted and flag-mounted department
  ID signs

Prototype signage was produced on paper, presented as white symbols on a black background.

Each of these components contained universal health care symbols presented as white symbols on a black background.

All signs were built off the same 11x17″ models for efficiency of design and production.

ICHS replaced some wall-mounted ID signs with flag-mounted ID signs.

ICHS removed informational postings and other non-wayfinding treatments of Hablamos Juntos symbols.

3. Assessment and Research Findings
* Note: legacy wayfinding systems were obscured during the post-audit assessment.

Overall, the ICHS prototype design system was consistent with recommendations made during the pre-audit phase.

The prototype system appeared to be effective (though somewhat less effective overall than other prototype systems) at guiding potential users

within the facility. 80.2 per cent of research participants and 69.2 per cent of LEP research participants agreed that the signs were easy to understand across all test conditions.

Anecdotally, participants appeared to navigate the system with some confidence. They made use of each of the internal elements of the system, including the lobby directory, wall-mounted directional signs, and department ID signs.

A prototype lobby directory used by ICHS.

The symbols appeared to the project team to be legible within all of the prototype signage elements.

In general, participants found their way to destinations almost as quickly when using "symbols only" signs than they did using signs with both English and Chinese characters. Participants with Chinese (Mandarin) as their primary language navigated to their destinations more quickly when symbols with English referents and Chinese characters were used, than when only symbols and English were used. This is the only one of the four innovator facilities where providing bilingual translation appeared to have a strong positive effect for a particular language group.

ICHS was the only innovator facility in which bilingual translation (in this case Chinese characters) was associated with faster navigation times for LEP (Mandarin) participants.

In the symbol matching test, participants overall took 9.0 seconds to complete the exercise with 8 symbols, 10.4 seconds to complete the exercise with 16 symbols, and

12.7 seconds to complete the exercise with 20 symbols. These data suggest that as the number of symbols that a given user must evaluate at any one time increases, complexity and time required will increase as well.

Results of the Referent Assignment Test appear in the report *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage* associated with this phase of work. These data should be useful in assigning specific symbols to referents and vice versa.

4. Lessons Learned

Based on the results of the wayfinding test, the project team posits that though translation into Chinese characters may help Chinese-literate users with navigation, effective use of symbols may obviate the need for bilingual translation into the many languages understood by ICHS patients. Note: this does not in any way diminish the importance of effective translated or spoken information for clinical direction, policies and procedures, key services, etc.

The research team believes that the effectiveness of symbols in wayfinding is improved when symbols are not used in posted policy statements or other posted information. That is, since a given symbol is meant to communicate a destination, seeing this symbol in a posted policy statement may make a user believe that they have arrived at this destination.

Women & Infants Hospital, Providence, Rhode Island

This healthcare system consists of one central hospital and 23 off-site clinics and offices. The original hospital is a six-story, 137-bed facility that serves a diverse population including Spanish and Chinese speakers. A new five-story, 140,000-square-foot addition including 60 NICU rooms, public spaces, conference rooms, and auditoriums was completed during the pre-audit phase of the project. Women & Infants delivers 70% of Rhode Island's babies annually. Diversity is on the rise in this state. 50% of the city of Providence is Spanish-speaking. Other LEP populations are also growing.

Wayfinding at Women & Infants was provided by a team of signage and wayfinding consultants working in cooperation with Facilities staff.

At the time of the new five story building expansion, Women & Infants set out to accomplish the following overall goal with symbols based wayfinding: to improve wayfinding for our limited English proficiency patients, as well as our illiterate patients.

1. Baseline
    The existing Women & Infants building consisted of a single tower with multiple clinical destinations on each floor. A primary wayfinding challenge was to direct patients and visitors to the correct floor and then to the correct destination.

    The creation of the new addition introduced a new level of complexity

within the wayfinding hierarchy, with the additional task of directing patients and visitors first to the correct building/tower, then to the correct floor, etc. This building addition also created a new main entrance to the hospital.

Existing signage, some of which employed universal healthcare symbols, used light gray metallic vinyl on a gray background. In many viewing situations, contrast was insufficient. Also, some signs were partially obscured by exit signs and other elements in the physical environment.

Although Women & Infants was using some symbols, contrast was insufficient and some signs were partially obscured.

Security guards at Women & Infants are stationed outside of clinical areas. However, an initial point of contact is typically a staff member or volunteer tasked with providing assistance at the new entrance.

Women & Infants is co-located on a larger healthcare campus containing a number of Women & Infants clinic buildings and other health care institutions. There is some foot traffic which travels between the Women & Infants building and nearby Rhode Island Hospital in a below-ground tunnel.

2. Post Audit Designs
   Components of the wayfinding system include:
   • Wall-mounted and column-mounted (on flexible material to wrap around columns) directional signs
   • Wall-mounted elevator directories
   • Overhead soffit-mounted directional signs
   • Wall-mounted department ID signs

Each of these components contained universal health care symbols presented as white symbols on a blue background.

Women & Infants did not develop lobby directory signage within the prototype set.

Signs were generally visible and unobstructed.

The Women & Infants design team was unable to match each primary destination to a Universal Health Care symbol. As a result, they intend to develop two other symbols to incorporate within the final installed system.

3. Assessment and Research Findings

* *Note: Legacy wayfinding systems were obscured during the post-audit assessment.*

Overall, the Women & Infants prototype design system was consistent with recommendations made during the pre-audit phase.

The prototype system appeared to be effective overall at guiding potential users within the facility. 95.6 per cent of research participants and 98.4 per cent of LEP research participants agreed that the signs were easy to understand across all test conditions.

Anecdotally, participants appeared to navigate the system with confidence. They made use of each of the elements of the system, including the wall-mounted and column-mounted directional signs, wall-mounted elevator directories, overhead soffit mounted directional signs, and wall-mounted department ID signs.

The symbols appeared to the project team to be legible within almost all of the prototype signage elements. Contrast, resolution and size of symbols appeared appropriate.

From the main entrance of the new lobby, directional signage leading to the original building was obscured, and the project team judges that legibility was relatively lower.

Anecdotally, some participants did hesitate within the new main lobby, which may speak to the need for a static directory, interactive touch screen kiosk, or other point of reference which allows users to engage with the wayfinding system prior to navigating a hallway.

In general, participants found their way to destinations almost as quickly when using "symbol only" signs, with no English or Spanish referent, than they did when text was provided. Participants with Spanish as their primary language navigated to their destinations more quickly when symbols appeared with English referents only compared to when symbols appeared with both English and Spanish. Remember, though, that participants were shown the symbol for the destination they were seeking before they began their journey.

Contrast, resolution and size of symbols appeared appropriate in all signage elements.

In the symbol matching test, participants overall took 9.3 seconds to complete the exercise with 8 symbols, 11.1 seconds to complete the exercise with 16 symbols, and 13.3 seconds to complete the exercise with 20 symbols. These data suggest that as the number of symbols that a given user must evaluate at any one time increases, complexity and time required will increase as well.

Results of the Referent Assignment Test appear in the report *Testing Universal Symbols to Support Implementation in Healthcare Facilities Signage* associated with this phase of work. These data should be useful in assigning specific symbols to referents and vice versa.

4. Lessons Learned

Based on the results of the wayfinding test, the project team posits that effective use of symbols may obviate the need for bilingual translation into Spanish in wayfinding. Note: this does in any way diminish the importance of effective translated or spoken information for clinical direction, policies and procedures, key services, etc.

The project team observes that the Women & Infants solution appears to have been the most successful of the four innovator facilities. Admittedly, the facility is not nearly so large or complex as some of the other facilities. However, there are some solid examples here.

Women & Infants based their wayfinding system strictly on primary destinations. The number of elements in any given sign was therefore relatively small and the symbols were relatively large and legible from a distance.

Designs were clean and uncomplicated.

Designs were clean and uncomplicated. The design team created a visible difference between Hablamos Juntos-related symbology and that of general amenities, such as Cafeteria and ATMs, which we feel aided in comprehension and differentiation.

Directional signage was generally placed to be visible and unobscured.

Because some users had confusion within the lobby area, the project team surmises that some starting point of reference would improve the efficacy of the overall system. A typical solution would be a building directory within the main lobby, although other solutions, including tear sheets, touch screens, web-based solutions, etc. may also be effective.

Appendix 1 – User Satisfaction Research Results – Baseline and Post Implementation

* Note: results of incremental research into documented changes in the user experiences of patients, visitors and staff is being appended to this document as Appendix 1 - User Satisfaction Research Results - Baseline and Post Implementation, scheduled for completion by September 30, 2010.