Improving the
Patient Experience:
Best Practices for
Safety-Net Clinic Redesign

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About the Authors

The **Center for Health Design** is a research and advocacy organization of forward-thinking health care and design professionals who are leading the quest to improve the quality of healthcare through building architecture and design. The Center's mission is to transform health care environments for a healthier, safer world through design research, education, and advocacy. More information is available at www.healthdesign.org.

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About the Foundation

The **California HealthCare Foundation** is an independent philanthropy committed to improving the way health care is delivered and financed in California. By promoting innovations in care and broader access to information, our goal is to ensure that all Californians can get the care they need, when they need it, at a price they can afford. For more information, visit www.chcf.org.

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I. Introduction

Evidence-based design links the design of the physical environment with an organization's patient safety and quality improvement agenda. Evidence-based design has been defined as the process of basing decisions about the built environment on credible research to achieve the best possible outcomes.

A GROWING BODY OF RESEARCH SHOWS CONCLUSIVELY that the physical environment of health care facilities affects patients, staff, and families by impacting patient safety and quality of care. More than 1,200 studies conducted in acute care settings show that different aspects of the physical environment including noise, light, unit layout, air quality, and surface finishes impact outcomes such as stress, falls, medical errors, and nosocomial infections.

Recent meta-analyses of the physical features of health care facilities have primarily focused on acute care settings. Long-term care settings were examined in a literature review conducted in 2006 by The Center for Health Design (CHD) funded by a grant from the California HealthCare Foundation (CHCF), which concluded that the physical environment plays an important role in improving clinical outcomes and quality of life for residents. There is some evidence that the physical environment plays an important role in outpatient settings as well. However, empirical information linking the design of outpatient settings — especially safety-net clinics (SNCs) — with patient outcomes has not been synthesized and analyzed, making it inaccessible to those making key decisions regarding SNC design and operation. Very few resources exist to support safety-net clinic design.

Safety-net clinics encompass several different types of facilities, including county hospitals, outpatient clinics within public hospitals, and state, county, or private community health centers, among others. Defined largely by their mission to provide health care services to individuals and their families regardless of their ability to pay, SNCs continue to fill a very critical need in our health care delivery system by providing essential primary care and specialty care services to millions of uninsured patients. Many SNCs provide care in buildings that were built for other purposes (such as offices or residences) and later retrofitted as SNCs. These outdated buildings can impede care-giving processes, impact patient safety and quality of care, and contribute to dissatisfaction among patients and staff. Improved facility design can be a critical element in bringing about change in

the way health care is provided and experienced in safety-net clinics and other outpatient settings.

This report summarizes the results of a research project examining how health care facility designs and various physical aspects of ambulatory care environments can positively or negatively impact patient experiences. The project included a review of literature examining evidence-based design in ambulatory care clinics (ACCs), and best practice case studies of community health center designs. This report is intended as a resource guide to help decision-makers involved in designing new SNCs or retrofitting existing SNCs create safer, less stressful, and more patient-centered care environments.

The focus of this project was to understand the key issues involved in designing safety-net clinics, which comprise a subset of ambulatory care clinics (ACCs). While both ambulatory care and safety-net clinics provide a wide range of outpatient primary, medical, and surgical care services, including preventive (e.g., health check-ups) and curative (e.g., treatment for chronic diseases) treatments, SNCs are distinguished by their mission to provide services regardless of patients' ability to pay. However, recognizing that research on ACCs is sparse and that research focusing on safety-net clinics is even more limited, the literature review looked at studies conducted within any type of ACC. Best practice case studies (conducted as on-site visits and phone interviews) were conducted at community health centers (one type of SNC) to supplement and strengthen the information obtained from the literature review. The case study findings along with the literature review provide a snapshot of the current state of ambulatory care design and provide a foundation for offering initial design recommendations and considerations for those involved in designing safety-net clinics.

II. Background

RECENT TRENDS IN THE DELIVERY OF HEALTH care services have seen a progression toward patient-centered and family-centered initiatives, an increase in the use of medical technology, and new models of providing underserved populations with access to quality health services. As health care shifts from inpatient to outpatient services, and from treating episodic illnesses to a more longitudinal orientation, primary care facilities are serving increasing numbers of patients.[1] The "medical home" model with its effective focus on a regular source of care in a familiar, comprehensive and coordinated system is increasingly influencing primary/ambulatory care.[2] Ambulatory care (referring to outpatient primary, medical, and surgical care services) is wide-ranging and addresses both preventive care (e.g., health check-ups) and curative treatments (e.g., treatment for chronic diseases).

Ambulatory care occurs in a range of traditional and emerging settings including private physicians' offices, urgent care centers, community health centers, outpatient and emergency departments of hospitals, county clinics, and retail clinics, among others. Ambulatory care clinics (ACCs) vary in the types and menu of services offered, populations served, funding sources, and models of care. Accordingly, there is a great variance in required square footage, physical space needs, design, re-design, and management of ACC spaces. The physical design of ACCs reflects the overall approach to care, can support or inhibit important functions that occur within ACCs, and influence the experienced quality of care.

A variety of for-profit and non-profit ACCs across the United States serve a range of populations. The variety of sources and consistency of funding—especially for those clinics serving underserved populations—influence these clinics' accessibility, types of enabling services (e.g., interpretation services), and clinic policies.[3, 4] In addition to funding, community needs and licensing regulations influence the types of services offered at such safety-net clinics, often spanning a wide range of preventive, primary care, and other services.[5]

A new paradigm of ambulatory care is being developed to shift from an older one-size-fits-all, reactive, and hierarchical approach focused on sickness, to a more recent integrated, iterative patient-centered approach. (Recent efforts in this regard include those at the Stoeckle Center for Primary Care Innovation, and SPARC at Mayo Clinic.) There is a corresponding shift in the construction and management of health care facilities; trends show a shift towards ambulatory care facilities. A 2008 report by the Healthcare Financial Management Association includes recent statistics from Reed Construction Data on construction trends in the health care industry that project a growth in new health care facilities by 14 percent in 2008 with a steady increase in the coming years.[6] In addition, aging facilities are in need of updating and renovation to correspond with newer technologies and operational styles. Overall construction costs for health care facilities run close to $35 billion annually; these high costs prevail even as the health care design industry addresses the need for optimizing costs with flexible spaces and cost-effective evidence-based design approaches.

Research has begun to address the role of the built environment in the overall ambulatory care

experience and as a component of the quality of care, by focusing on patients' accounts of their experiences in ACCs.[7] Correspondingly, recent patient-centered and family-centered initiatives in participating practices are gathering information to see how best to improve patient and staff outcomes.

For example, the TransforMED home initiative has whole-person care as a central goal, addressing it through a culturally sensitive, community-oriented approach (www.transforMED.com). Key features include providing patients with an easily accessed "medical home" that becomes the starting point for a continuous system of care, emphasizes quality and safety, and uses advanced data-based information systems. In a similar approach, the Advanced Medical Home model is set forth by the American College of Physicians as "patient-centered, physician-guided, cost-efficient, longitudinal care that encompasses and values both the art and science of medicine."[8] In this model, physicians are viewed as coordinators and facilitators of a patient's journey through the health care system, providing care in a variety of settings based on patient need and physician skills.

At the core of such initiatives, among other features, is an increased emphasis on timely access to information and primary care access points, improved channels of communication between clinicians and patients, and continuity of care services, all of which imply a restructuring of the system, right from the ways in which ACCs are funded to the ways in which their physical spaces are designed and linked.

Efforts that address a patient-centered approach have begun to explore the benefits of health information technology such as clinical electronic medical records[9] or the portability of personal medical care information using USB technology. Part of this integrated approach also includes an examination of the physical environmental context

of ACCs, envisioning new spaces responsive to the new paradigm: flexible, multi-purpose, technology-enabled spaces that meet the needs of visitors and staff.

But while the impact of physical clinic design on health outcomes has been established in other long-term and acute care settings,[10] it has not yet been documented in the ACC context. Examining the relationship between physical design features and clinic outcomes is especially needed at this time when the ACC market is redefining itself, and when ACCs utilizing newer models of care (e.g., care-team based) must sometimes operate in buildings designed for traditional models of care (e.g., physician-based).

Even as a burgeoning Internet creates immediate and speedy access to health-related information pertinent to ACC users, the information that demonstrates how the physical environment impacts patient and staff outcomes in ACCs — particularly safety-net clinics — has not been consolidated meaningfully. The following review of literature and best practice case studies aims to fill this gap.

III. Findings: Literature Review

Similar to past efforts in long-term and acute care settings, this review of empirical literature on ACC settings aims to provide evidence-based guidance for future design and design research in ACCs. Addressing a gap in the health care field, this review asks the following main question: Which physical features of ACC settings have been associated with favorable patient, staff and operational outcomes?

Patient Outcomes

Patient outcomes summarized in this section include patient satisfaction with the ACC experience, and other physiological and psychological outcomes such as pain, anxiety, or stress during the ACC experience. Patient outcomes in primary care facilities are influenced by the type of clinic (who is served, and what type of services are offered), its physical attributes (location, configuration, and spatial characteristics of the clinic), and experiential aspects of the patient's clinic experience (duration of wait times, attractiveness and cheerfulness of the waiting rooms, cleanliness, lighting, navigation and wayfinding, type of physician and physician-patient communication, personalization of services, anxiety and stress to availability of audio, visual and other distractions in the clinic environment).

A patient's clinic experience is a complex assembly of multiple factors, starting from access to the clinic, continuing through the exam room, and concluding with closure and exit procedures. The patient's experience in a clinic can be broadly categorized into five phases: 1) access, 2) waiting/registration, 3) examination, 4) procedures, and 5) discharge/exit. In each phase, a combination of physical (built)

environmental factors, organizational factors, and interpersonal factors interactively contribute to the patient's overall experience as represented in the conceptual framework in Figure 1. Because of the diversity of ACC types and functions, and because the effort in this review is to find common features, the core of Figure 1 includes common experiential features of ACCs as experienced by ACC patients.
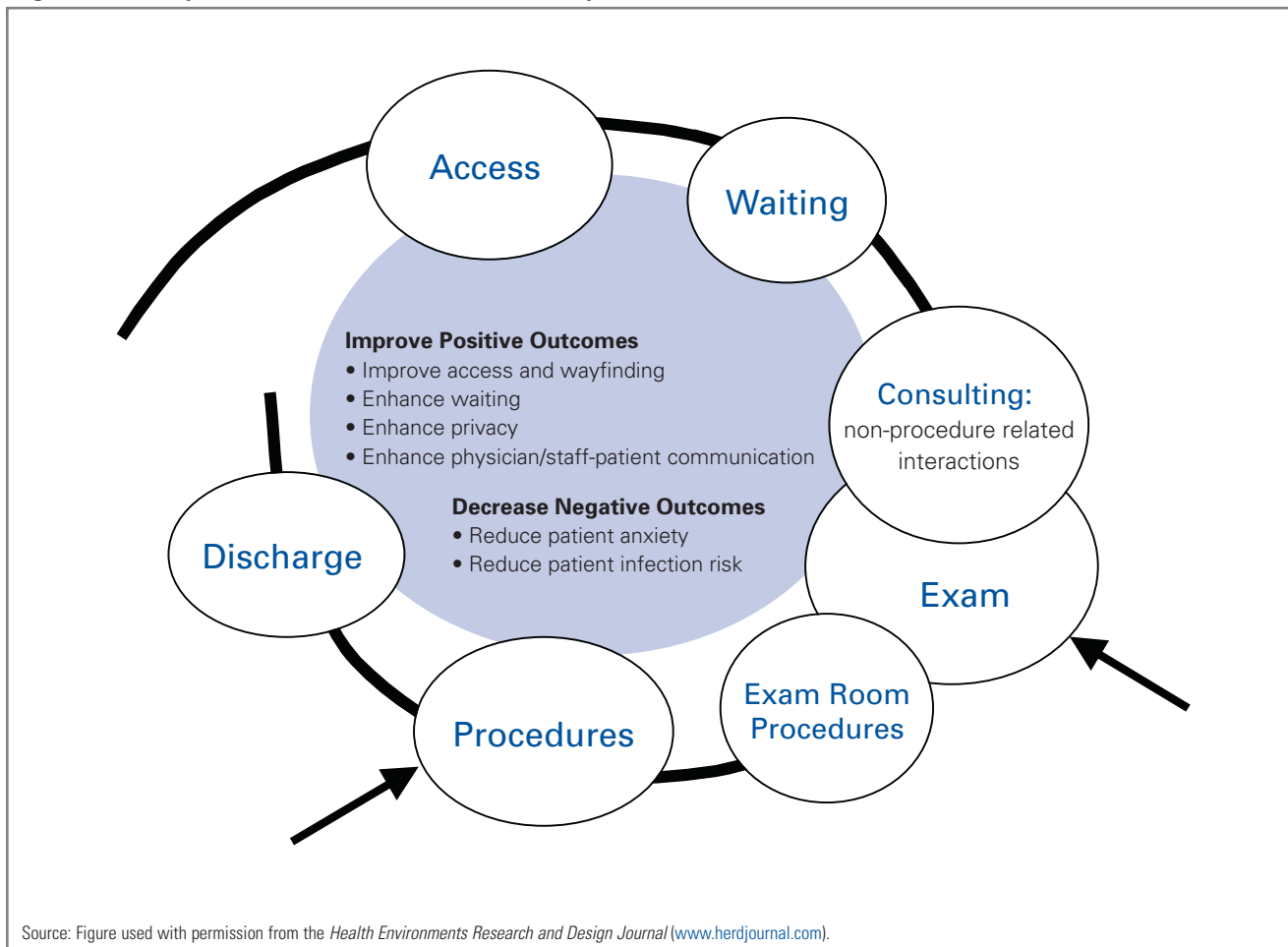
Access

Access issues address aspects such as a clinic's geographic proximity to patients[11] and internal factors within each facility such as the configuration of parking areas[12] and ease of navigation within the clinic.[13] When these elements were successfully addressed, positive patient outcomes resulted. In contrast, inaccessibility, non-availability of parking[14] and wayfinding problems due to symmetry of the facility[15] impacted patient experience negatively. Streamlined approaches such as providing access to multiple services in one-stop clinics were associated with reduced short-term patient anxiety.[16]

Waiting

The most significant aspect of patient experience and satisfaction in waiting areas was the time spent waiting. Reducing wait times operationally and implementing self-service kiosks to speed up the registration process were associated with higher patient satisfaction. Other aspects of the waiting phase also impacted patient experience. Some effective features included spatial boundaries that distinguished waiting areas clearly from any adjacent circulation paths[17] or that clustered exam rooms in a pod-like configuration.[18] Within the waiting areas,

Figure 1. Conceptualization of Phases of Patient Experience

Source: Figure used with permission from the *Health Environments Research and Design Journal* (www.herdjournal.com).

physical and ambient properties also influenced patient experience: Cleanliness was associated with higher patient satisfaction[19] and areas rated with higher physical attractiveness were associated with reduced anxiety, higher perceptions of quality of care, and shorter perceived wait times.[20] Similarly, a waiting area with a nouveau (non-traditional) style was associated with lower self-reported stress and higher patient satisfaction than a traditional style.[21] Presence of noise was negatively associated with patient satisfaction[22] and a calm and quiet waiting area was preferred.[23]

The presence of waiting room distractions such as televisions, Internet or other diversions such as childrens' play areas were found to help reduce patient anxiety. However, this effect also depended on the nature and content of the distraction—for example, factors such as the usefulness of educational posters displayed in waiting rooms,[24] age-appropriateness of reading materials and activities,[25] and the choice of hard toys (easier to clean and disinfect) versus soft toys in play areas.[26]

Some research has examined the experiences of individuals who accompany a patient to the clinic. Parents accompanying children to an outpatient bone marrow transplant clinic had mixed feedback to open waiting room in which staff members could assess children. Though parents strongly appreciated the

informal social interaction with other parents and patients and preferred this setting to more traditional settings, they had concerns about privacy and the comparison of their child with others.[27] Informal social contact in waiting areas also resulted in therapeutic and learning outcomes.[28]

Examination and Consultation

In the examination phase of an outpatient visit, clinician-patient communication is increasingly mediated by the presence of technology. The spatial organization of the room and orientation of the computer screen with respect to the patient and clinician affected communication (e.g., allowing patient to see information on screen) and the sense of connection (e.g. reduced eye contact) experienced by the patient.[29] Because this phase is characterized by more waiting,[30] the content of the distractions such as posters[31] or age-appropriate reading material[32] was a significant part of the experience.

Procedures

In the procedures phase, some research explored the need to consider visual and auditory privacy of the patient.[33] However, most research has focused on the sedative and analgesic use of different audio-visual distractions.[34–37]

Discharge

Although the discharge phase is a critical component of the patient experience and establishes an opportunity for continuity of care, no research was found pertinent to this phase.

Staff Outcomes

Space and layout issues can affect staff by facilitating or hindering their tasks. The literature showed that staff performance cannot reach full potential without a supportive physical and social environment.

Efforts to solve physical space issues in ambulatory care clinics have had mixed results. More positive outcomes were associated with collaborative efforts in which all or most staff members were involved in planning and implementing a reconfiguration of the physical environment and related systems. Reorganizations that are imposed upon staff members with little or no input from the staff are associated with less successful outcomes.

Of the existing research examining the effects of layout and ambient conditions on performance of staff, most has focused on accuracy and errors in filling prescriptions in pharmacies. While electronic records are replacing handwritten records and cutting down on staff tasks such as record pulling time, new types of errors have emerged (e.g., a patient receiving a prescription meant for another patient) requiring new vigilant skills among staff. Although rates of errors between handwritten and computerized were not significantly different, computerized prescribing with an advanced decision support system was recommended for checking dosage and frequency to help reduce medication-related errors.

Another occupational factor of concern to the well-being of staff, especially therapists, is isolation experienced due to the nature of the occupation. In a study of 31 therapists in outpatient clinics in Israel, there was an inverse statistical correlation between work satisfaction and feelings of loneliness.[38]

Operational Outcomes

Multiple factors mentioned in the earlier categories of patient and staff outcomes are closely intertwined with clinic-related operational outcomes. Examples of preferred outcomes include a confluence of factors such as staff productivity, efficiency of operations, higher productivity (more patients seen per hour), and reduced cycle time (length of a patient's experience).

Efforts to redesign clinic operations implemented at various sites are yielding post-redesign evaluation data. Operational outcomes included the benefits of decentralized nurse stations that helped reduce wait times[39] and using electronic medical records (EMRs).[40] Implementing an electronic medical record (EMR) system in ambulatory primary care settings is associated with non-financial benefits including quality of care, fewer medical errors, and better access to information.[41] EMRs also offer space savings because storage of paper records is eliminated, potentially reducing leasing costs.[42] An underlying concern with EMRs is adherence to HIPAA regulations.

Table 1. Summary of Main Findings and Implications for the Physical Design of ACCs Based on Phase of Patient Experience

Improved Positive Patient Outcomes

ACCESS

- Geographic proximity and ease of accessibility associated with greater patient satisfaction.[43]

- Women-only clinic associated with higher satisfaction versus traditional clinics.[44]

- Clear signage and good connections between parking structure and levels of the facility associated with greater patient satisfaction.[45] *Cardiac catheterization, electrophysiology, pulmonary, vascular, ECG, cardiac stress testing, nuclear medicine, nuclear cardiology facilities.*

- One-stop clinic reduced short-term anxiety.[46] *Breast cancer clinic.*

- Wayfinding clarity easier and less confusing in facility with asymmetrical plan with views to the outside serving as cues for orientation.[47]

WAITING/REGISTRATION

- Clear physical boundaries for waiting area, distinguished from adjacent circulation paths, associated with clarity in wayfinding.[48] *General practice clinic, pharmacy, X-ray facilities.*

- Self-service electronic kiosks tested at SPARC reduced time spent in lines.[49]

- Cleanliness associated with higher patient satisfaction.[50] *Internal medicine, surgery, ophthalmology, obstetrics/gynecology, pediatrics, Chinese medicine, otolaryngology, orthopedics, family medicine, and dermatology facilities.*

- Calm and quiet areas associated with higher satisfaction.[51] *Cardiac catheterization, electrophysiology, pulmonary, vascular, ECG, cardiac stress testing, nuclear medicine, nuclear cardiology facilities.*

- Educational posters depicting prescription-filling process associated with higher levels of satisfaction.[52] *Outpatient pharmacy.*

- Patient escorts individually greet and escort patients to and from procedure areas to mediate patient experience.[53]

- Distractions reduce anxiety.[54]

- Nouveau environment reduced anxiety more than a traditional environment.[55] *Neurology clinic.*

- Physical attractiveness associated with reduced anxiety.[56] *Gynecology, dermatology, gastroenterology clinics.*

- Open waiting enables informal social support.[57] *Pediatric bone marrow transplant clinic.*

- Reduced noise associated with greater patient satisfaction.[58] *Internal medicine, surgery, ophthalmology, obstetrics/gynecology, pediatrics, Chinese medicine, otolaryngology, orthopedics, family medicine and dermatology facilities.*

- Hard toys in waiting rooms/areas were associated with decreased infection risk when compared with soft toys.[59] *General practice clinic.*

EXAMINATION/CONSULTING

- Clusters of exam rooms, work rooms, and support areas in a pod system associated with greater patient satisfaction.[60] *Surgical, respiratory and EMT clinics in a pod.*

- Availability of age-appropriate media/reading material associated with greater patient satisfaction.[61] *Pediatric clinic.*

- Educational posters are noticed but effectiveness of education through posters needs further research.[62]

Table 1. Summary of Main Findings and Implications for the Physical Design of ACCs Based on Phase of Patient Experience, *continued*

Improved Positive Patient Outcomes, *continued*

PROCEDURES

- Clear signage and good connections between levels of the facility associated with greater patient satisfaction.[63]
  Cardiac catheterization, electrophysiology, pulmonary, vascular, ECG, cardiac stress testing, nuclear medicine, nuclear cardiology facilities.

- Audiovisual distractions associated with greater patient satisfaction.[64] *Colonoscopy.*

- Music induced sleep without sedatives.[65] *ECG, CT scan.*

- Music induced sleep faster and without sedatives.[66]

- Virtual reality distraction effective in reducing pain.[67] *Pediatric oncology treatment.*

- Virtual reality intervention effective in reducing symptom distress and fatigue.[68] *Breast cancer chemotherapy.*

- Views and sounds of nature effective in pain reduction.[69] *Bronchoscopy.*

Decreased Positive Patient Outcomes

ACCESS

- Unavailability of parking associated with decreased patient satisfaction.[70] *Diabetes clinic.*

WAITING/REGISTRATION

- Same waiting area for different age groups was not favored.[71] *Pediatric clinic.*

- Open waiting compromises privacy.[72] *Pediatric bone marrow transplant clinic.*

- Soft toys in waiting rooms/areas were associated with increased infection risk when compared with hard toys.[73]
  General practice clinic.

EXAMINATION/CONSULTING

- Thin walls and flimsy curtains compromise auditory and visual privacy.[74]

- Visual access to therapy areas compromises visual and auditory privacy of patient.[75]

- Computers in the room associated with perception of reduced eye contact.[76]

- Physical placement of exam room computers influenced sense of connection experienced by patient.[77]
  Internal medicine/family practice.

Improved Positive Staff Outcomes

ACCESS

- Non-linear (circular) layout for pharmacy enables quicker efficient dispensing because of reduced distance traveled and time for filling prescriptions.[78]

EXAMINATION/CONSULTING

- Dedicated space for community health worker at site enabled successful intervention.[79] *Mental health clinic.*

PROCEDURES

- Color-coded clusters/modules based on complexity of surgical procedure, surgeon scheduling, and surgery turn-around time was easier for staff.[80] *Outpatient surgery care unit.*

- Standardized dress code and educational posters for procedures helped staff training and acclimatizing to new workflow.[81]
  Outpatient surgery care unit.

Table 1. Summary of Main Findings and Implications for the Physical Design of ACCs Based on Phase of Patient Experience, *continued*

Decreased Positive Staff Outcomes

EXAMINATION/CONSULTING

• No clearly demarcated space for community health worker at site compromised intervention and patient privacy.[82]
  Mental health clinic.

PROCEDURES

• Signage dividing unit into pre- and post-operative areas to improve workflow created an imbalance in staff workloads.[83]
  Outpatient surgery care unit.

Improved Positive Operational Outcomes

WAITING/REGISTRATION

• Decentralized nurse stations helped reduce visit time.[84] *Pediatric clinic.*

• Electronic medical records (EMRs) enabled quicker access to patient files.[85]

• Identifying where patient waits in the waiting area on an electronic seating chart improved overall efficiency and protected patient privacy.[86] *Cardiac catheterization, electrophysiology, pulmonary, vascular, ECG, cardiac stress testing, nuclear medicine, nuclear cardiology facilities.*

• EMR use associated with positive financial return on investment.[87]

Decreased Positive Operational Outcomes

ACCESS

• One-stop clinic not cost-effective.[88] *Breast cancer clinic.*

Physical Design Implications for Each Phase

ACCESS

• Consider parking adequacy or alternate forms of transport; locate beside public transport routes.

• Provide clear wayfinding cues.

• Provide clear signage.

• Avoid symmetry; distinguish areas by using color or materials for easier navigation and wayfinding.

WAITING/REGISTRATION

• Consider logical clusters of rooms if physical design permits.

• Establish clear spatial boundaries for waiting areas undisturbed by circulation paths.

• Physical attractiveness: use warm colors, easy-to-clean materials and finishes.

• Provide distractions such as television, computers that can engage patients while they wait.

• Demarcate different waiting areas based on age-appropriate waiting activities.

• Minimize noise from scheduling or other visitor activities.

EXAMINATION/CONSULTING

• Organize exam room functions within flexible layout as much as possible to enable patient-clinician communication.

• Consider appropriateness of posters on walls or reading material provided.

PROCEDURES

• Maintain auditory and visual privacy.

• Enable audio-visual distractions as needed.

Note: If relevant in more than one phase, finding is repeated.

Need for Future Research

A summary of the literature review presented above illustrates that some findings do relate physical environmental features to ACC outcomes. However, the findings at this time do not yet cluster into clear robust patterns that could immediately inform design and management of ACCs in general and community health centers in particular. While all efforts were made to expand the scope of the search and cast as wide a net as possible, it is clear from the current assembly of literature that the following gaps exist:

- Although the research on waiting areas and wait times is aimed at the patient experience, the studies are conceived under an older medical model of episodic illness in which care ends with the experience in the exam room of the ACC. Therefore, there is an absence of research on discharge functions, which would typically create closure for the visit and establish continuity of care beyond the current episode.

- The studies reviewed for this report do not address the staff perceptions of the patient areas or the patient-staff interface. For example, staff perceptions of the waiting areas or wait times and perceived or actual impact on their daily functions have not been explored.

- Because there is a wide variance in the types of ACCs — compare for example a hospital outpatient department with a community health center — the research collected in this report seems fragmented, making it difficult to transfer the evidence directly to design. The first task at hand would be to create a comprehensive typology of ACCs along with unique attributes of each. This would identify gaps much more effectively and provide focused ways in which applied design research could be carried out.

Literature Review Summary and Conclusions

Overall, the physical environment of ACCs has been associated empirically in the following ways with patient and staff experiences and outcomes, and with operational outcomes in ambulatory care facilities:

- **Spatial relationships** (e.g., spatial configuration: symmetry or absence of it; adjacencies of spaces, clearly defined boundaries of spaces; interface with circulation axes within the clinic; and need to reconfigure the function and type of storage spaces),

- **Visual and acoustic privacy** (e.g., visual access to computer screens given the progression towards electronic recordkeeping; levels of visual accessibility of screens; HIPAA needs; adequacy of acoustical rating of walls),

- **Physical attractiveness** (e.g., appearance and arrangement; lighting),

- **Ambient experience** (e.g., noise, music and its positive effects; natural and visual distractions; audiovisual distractions; cleanliness; comfort; and sensory characteristics) and,

- **Information** (e.g., signage; educational and informative posters).

Despite these findings, the settings of the articles used in this review and their findings together present a fragmented picture, revealing multiple opportunities for future inquiry. A systems approach is recommended that reflects a conceptual framework emphasizing ACCs' flexibility and adaptability, use of technology, and connectedness — three concepts that are closely aligned with sustainable design principles.

Operational outcomes have not been studied clearly and comprehensively as they relate to ACC design. There are many links that could be

studied — infection risk, for example, could be
explored with perspectives of the janitorial staff and
how the clinic design serves their needs, etc. Infection
risk in buildings designed with sustainable materials
(those that require little or no maintenance, e.g.,
concrete, brick) can be compared with others. Effects
of daylighting, another sustainable design feature,
could be explored with respect to physician and staff
productivity, patient satisfaction and energy savings.

Overall, while this review identified several gaps,
it also shows avenues for many linkages with existing
efforts in ACC design and the health care industry.
In conclusion, this review can be used a stepping
stone for more concrete investigations.

IV. Findings: Best Practice Case Studies

To supplement the literature review examining evidence-based ACC design, case studies were conducted at community health centers to compile best practices in SNC design. The physical environment features and community attributes of community health center facilities throughout the United States were examined through either on-site visits and/or telephone interviews with the clinics' CEOs, clinic managers, facility managers, and board members. The facilities studied varied in size, services offered, and the type of setting (rural, suburban, and urban).

From the on-site visits and telephone interviews, common issues and attributes emerged. They included: the importance of clinic access, the value of waiting spaces, features in the exam/procedure room, providing an ambient experience, security, information and privacy, recognizing spatial relationships and staff features, ensuring a community connection, and understanding the building process.

Access

Providing access to the community health center was the number one concern from all of the sites interviewed and visited. The location of the building needed to be within the neighborhood of the residents served to reinforce access to care. Providing enough parking for patients and visitors can enhance access to care. Many of the sites visited and interviewed, due to an urban setting, did not have nearly enough parking for their visitors. At many of the sites, improving access to care also meant either providing alternative transportation for patients or being located on/near the bus route and train station.

Designing for the pedestrian not only included locating the site near alternative transportation but also creating pedestrian friendly walkways, stroller parks, and locating bike racks at the entries.

Improving access also meant improving wayfinding. Many of the facilities utilized color and symbol signage to strengthen wayfinding throughout the facility. Not only was color used within the public spaces of the clinic/center (waiting areas, entries, community rooms) it was used within the exam rooms and clinic space to distinguish service lines (e.g. women's health, pediatrics). Informational kiosks are also included to improve wayfinding; these kiosks, primarily located upon entry, provide patients and visitors with information on the building features and services offered.

Waiting

Overwhelmingly, the importance of multiple waiting spaces was evident among the safety-net clinics visited and interviewed. Among these facilities, multiple spaces such as consult rooms, community conference rooms and outdoor areas provided additional spaces for waiting and eased the pressure on the typically overcrowded waiting area. Positive distractions found throughout the waiting spaces and lobby/reception areas included audiovisual material on a variety of devices (handheld devices, kiosks and televisions), artwork, educational materials, views to the outdoors, and TV programming as well as electronic monitors to inform patients about waiting time. The waiting areas, lobbies and reception areas tended to be open and bring plenty of daylight into the spaces; many of the facilities have high-end

finishes, bright colors, and natural wood accents to bolster community pride.

Exam Room/Procedure Space

Bringing services to the patient is becoming the new model of care throughout many of the facilities. At Southcentral Foundation's Native Primary Care Clinic, for example, integrating the physician, nurse case manager, behaviorist, and nutritionist's care within the exam room creates an opportunity to change the layout of the space; a chair, furnishings, and a medical supply cabinet but no exam table are used to lower the power differential and continue the process of building a relationship with the patient. Additionally, at a few sites, furniture modifications within the exam rooms have been made to strengthen communication between the patient and provider. Because of the variety of services provided, the exam rooms need to be multi-purposed and age-specific. Many of the clinics have standardized the provision of certain equipment and supplies in their exam rooms, but have not standardized the specific layout or size of that equipment.

Ambient Experience, Information, and Technology

Color palettes featured within the various clinics were dependent on the cultures of the communities served. The colors ranged from earth tones to bright colors. Many of the recently designed facilities (within the past two years) featured wood finishes. Providing access to nature whether it was through window views, a roof-top garden, or an adjacent city park was deemed a priority. At Bolinas Community Health Center, the building is sited in such a way that every space within the facility has a view to nature. Play areas within the lobby setting, waiting areas, and exam rooms added to the ambience;

many facilities did not designate a play area but incorporated elements of play throughout.

Health information is communicated to patients not only through the provider-patient relationship but through multiple venues such as resource centers and Internet connections. Many facilities are transitioning to electronic medical records (EMRs) to communicate health information between providers. With advances in technology, providing care through telemedicine will become more apparent.

Security and Privacy

The location of some clinics makes security of staff and patients an issue. Designing a space to be secure but accessible and welcoming is a challenge. At many of the clinic locations, a security guard is on-site to provide a physical presence; other locations use cameras, monitoring systems, or keycard-access doors to facilitate the necessary separation of medical spaces from public spaces.

Maintaining patient privacy is an issue within waiting and lobby areas. Facilities have addressed privacy issues in a variety of ways such as architectural designs, furniture placement, the use of acoustic-sensitive materials and fabric, and creating separate areas for discussion (e.g. designated quiet areas and consult rooms).

Spatial Relationship

When considering adjacencies of services, the current staff and patient flow should be documented. In several of the clinic spaces, the exam rooms, medical assistant stations, and provider offices were organized along concentric circles with the provider offices on the perimeter of the space and the exam rooms within the interior. Designing for change through multi-purpose spaces is a common theme; many of the facilities are utilizing one space for differing functions (e.g. the mental health treatment room can

function as a consult space or an overflow waiting area).

Staff Features

Throughout the facilities interviewed and visited, there was no shortage of unique staff features. Dedicated staff lounges, restrooms, kitchens, locker rooms, and conference rooms were abundant in both the new designs for future facilities as well as in the existing spaces. Many of the conference rooms were geared towards multi-purpose functioning not only as a training space for staff but as a place for media events and educational discussions. Several facilities have designed a work station for every provider and staff member to be equipped with a computer.

Connection to Community

Social responsibility is customary for community clinics/health centers as they provide services and programs and deliver care to all those in need. Many of the clinics interviewed and visited offered care not only within their clinics but in homes, schools, and traveling vans. Being located within the neighborhood of the residents served, the community clinic is an anchor for medical care and jobs. A common theme within all of the sites was the relationship developed with other entities or organizations to strengthen the programs offered.

Building Process

Many of the facilities interviewed and visited are currently planning a new or renovated space or have recently completed a significant project. Several facilities involved key stakeholders including patients in the community, board members, and other community leaders in the planning process. Educating the entire team about the building process through attending related conferences and visiting other community clinics and health centers

added value to the design process as well as created an opportunity to step outside of what is typically designed or thought.

Many of the individuals involved with the design process stated that hiring an architect with credible experience in community clinic/health center design was very important. While the trend is to pursue LEED certification, many of the facilities are utilizing architects familiar with sustainable choices, which allow the planning and design team to choose environmentally-friendly materials, flooring, and furniture if LEED certification is not feasible. Several facilities have utilized the building project and process to educate the community, solicit support, and cater events around the services provided.

V. Design Recommendations.

WHILE THERE IS A GROWING BODY OF research on the impact of the design of ambulatory care environments on outcomes, there are very few studies that specifically address issues around safety-net clinic design. This table pulls together the design recommendations for safety-net clinics based on the findings from the literature review as well as best practice case studies. These recommendations are not meant as prescriptive guidelines; rather, it is recommended they be used as guiding considerations during the design process.

The "When to incorporate" column indicates the types of situations (new construction, renovation, or existing facility) in which the design strategy can be cost-effectively incorporated into the physical environment. The "Cost" column reflects costs of incorporating this strategy relative to other strategies. A wide range of costs reflects the scale of changes and whether the strategy is to be incorporated in a new facility or in a renovation. The "Source" column indicates the source for the design recommendation: whether it came from the literature review or from the best practice case studies.

Table 2. Design Recommendations

	WHEN TO INCORPORATE			COST			SOURCE	
	NEW CONSTRUCTION	RENOVATION	EXISTING	LOW	MODERATE	HIGH	LITERATURE REVIEW	CASE STUDY
Access								
Ensure convenient physical access	x					x	x	x
Make accessible along public transportation routes	x					x	x	x
Locate clinic presence within neighborhood of residents served	x					x		x
Utilize clear signage and wayfinding	x	x	x		x		x	x
Mail hand-held maps for easier wayfinding	x	x	x	x				x
Avoid highly symmetric facilities that influence wayfinding negatively	x						x	
Provide bike racks and walking paths around and near clinic facilities	x	x	x	x	x			x
Reinforce community commitment through the selection of interior aesthetics	x	x		x	x			x
Utilize color coding and symbol signage to aid in wayfinding within the clinic	x	x		x	x			x
Provide well-lit and secure entryways	x	x			x			x

Table 2. Design Recommendations, *continued*

	WHEN TO INCORPORATE			COST			SOURCE	
	NEW CONSTRUCTION	RENOVATION	EXISTING	LOW	MODERATE	HIGH	LITERATURE REVIEW	CASE STUDY
Waiting/Registration Areas								
Identify clear spatial boundaries for waiting areas	x	x			x		x	
Lighter finishes and wall-mounted lighting preferred	x	x		x				x
Design physically attractive waiting areas	x	x			x			x
Provide an environment that is clean, calm, and quiet	x	x	x		x		x	x
Utilize electronic sign-in kiosks to speed up registration	x	x				x		x
Provide children with safer hard toys within play areas (easier to disinfect)	x	x	x	x			x	
Use televisions as positive distractions	x	x	x	x			x	x
Provide computers connected to Internet for browsing	x	x	x		x			x
Provide age-appropriate positive distractions or waiting room entertainment/activities (e.g., pediatric clinic serves various age groups)	x	x	x		x		x	x
Use posters, displays, newsletters—sometimes effective	x	x	x	x			x	x
Design an open setting which can aid social interaction in some cases	x	x				x	x	x
Ensure multiple areas for waiting (outside, inside, overflow)	x	x			x	x		x
Provide information kiosks within lobby space	x	x				x		x
Consider acoustic properties of materials found within waiting areas to aid in minimizing noise	x	x		x	x			x
Provide a variety of lighting options (controlled, natural, skylights)	x	x			x	x		x
Exam/Consulting								
Consider adjustable features for technological equipment to enable changing models of care (e.g., sharing on-screen information with patient)	x	x	x			x	x	x
Use posters to effectively communicate information	x	x	x	x			x	
Utilize non-educational reading or electronic media for pediatric clinics	x	x	x	x	x		x	x
Enable patient-clinician communication through flexible layout of exam space	x	x			x		x	
Consider the furnishing in exam rooms to lower the power differential between provider and patient	x	x	x	x	x			x
Maximize unused space within exam rooms (e.g. chamfered corners)	x	x			x	x		x
Provide ample space for family within exam and procedure rooms	x	x			x	x		x
Design exam rooms/procedure space to include multiple caregivers as a part of the caregiving process	x	x			x	x		x
Standardize placement of equipment and supplies within treatment and exam room	x	x		x				x

Table 2. Design Recommendations, *continued*

	WHEN TO INCORPORATE			COST			SOURCE	
	NEW CONSTRUCTION	RENOVATION	EXISTING	LOW	MODERATE	HIGH	LITERATURE REVIEW	CASE STUDY
Procedures								
Enable audio-visual distractions — enabling technology needed for this	x	x				x	x	
Ensure access to daylight	x	x			x	x		x
Ensure access to window views of nature	x	x			x	x		x
Provide strong acoustic ratings of dividing walls for informational/conversational privacy	x	x			x		x	x
Consider sight angles into and out of rooms for visual privacy	x	x			x		x	
Consider sight angles to computer screens from exterior of room for patient privacy	x	x			x			x
Provide ample space for family within exam and procedure rooms	x	x			x	x		x
Design exam rooms/procedure space to include multiple caregivers as a part of the care-giving process	x	x			x	x		x
Standardize placement of equipment and supplies within treatment and exam room	x	x		x				x
Discharge								
Consider separate entry/exit for mental health patients	x	x			x			x
Staff Areas								
Include staff experiences and participation in programming process, especially as design responses to desired workflow patterns are planned	x	x			x		x	x
Consider appropriate rates of illumination for tasks to be conducted accurately	x	x		x				x
Consider layout and ergonomics that can make work patterns more efficient — for example, circular layout for pharmacy for dispensing medicines quickly and efficiently	x	x				x	x	x
Consider adequacy of spaces for affiliated non-traditional staff	x	x			x		x	
Design furniture and fixed cabinetry for correct ergonomic solutions	x	x		x	x			x
Provide a designated computer workstation for all staff	x	x	x		x			x
Provide secure access for staff-only areas	x	x	x		x			x
Operational Issues								
Consider impact of moving to electronic medical records on technology needs and space needs (may need less square footage with EMRs — but may need more tech support)	x				x		x	
Accommodate new staff (e.g., counselors) in addition to traditional staff as models of care change	x	x	x		x		x	x

VI. Conclusion

THIS REPORT SUMMARIZES THE FINDINGS from a research project that included a review of literature examining evidence-based design in ambulatory care clinics (ACCs), and best practice case studies of community health center designs. This document provides a comprehensive set of practice and design considerations for designing new safety-net clinics and retrofitting existing facilities. Some of these design strategies such as providing space for families within examination rooms are easier to incorporate within new construction or during a significant renovation. However, there are several design modifications that can be done easily in an existing facility at relatively low cost. Examples include improving the ambience of waiting areas through furniture placement or a new paint palette, or furnishing exam rooms to improve patient-physician interaction. These and other design strategies, including cost estimates, are outlined in the Design Recommendations section above, including guidance on when they are best incorporated within the building design.

In addition to generating specific design recommendations, the literature review and case studies provide insight into a wide range of issues involved in the design of safety-net clinics. Decision makers should consider the following key strategies and practices while designing new safety-net clinics or retrofitting old ones:

- Involve staff in the design process. Their input is valuable and their involvement in the process will result in greater buy-in and success in achieving intended outcomes.

- Consider improvements to the physical environment in conjunction with process redesign and operational changes in order for the design changes to be effective.

- With new construction, pay attention to the location of the facility within the community or communities served to promote ease of access for community members.

- Create attractive, comfortable waiting areas that cater to the needs of the population(s) being served. Provide different types of age-appropriate distractions in waiting areas including views to nature, computer terminals, safe toys, and posters.

- Consider how the design balances patient privacy with needs for security and for staff and patient safety.

- Pay careful attention to the design of the examination/procedure room. The design should support interaction and communication between patient and physician as well as accommodate family as participants in care. Rooms should also be sized to accommodate multiple caregivers as part of the caregiving team.

With the increasing focus on providing patient-centered care in outpatient environments, it is becoming more essential to create physical environments that truly support such a model of care. Best practices in terms of safety-net clinic design are evolving as the role and focus of safety-net clinics themselves evolve.

Appendix: Case Studies

Sites Visited

Bolinas Community Health Center
  Bolinas, Marin County, California

La Clinica de la Raza
  Fruitvale Village, Alameda County, California

La Maestra Community Health Clinic
  San Diego (City Heights), California

Lifelong Medical Care Over 60 Health Center
  Berkeley, California

Sites Interviewed

Parkland Health
  Irving Health Center
  Irving, Texas

Thundermist Health Center
  Woonsocket, Rhode Island

Clinica Sierra Vista
  The Central Bakersfield Community Health Center
  Bakersfield, California

Golden Valley Health Centers
  Merced (Merced Suites), California

Southcentral Foundation's Anchorage Native
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  Anchorage, Alaska

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