



SSM HEALTH OUTPATIENT CENTER REDESIGN: FROM TRADITIONAL TO INTEGRATED CARE

06.14.2021

Research Team

HGA Architects & Engineers

Kara Freihoefer, PH.D., NCIDQ, EDAC, LEED AP

Tanya Chadha, Associate AIA, EDAC

Lou Bunker-Hellmich, EDAC

Anoosha Baladi, EDAC

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HGA Architects & Engineers

Project Team

Architect & Engineer
HGA Architects & Engineers

Engineer
Affiliated Engineers, Inc.

Engineer
Affiliated Engineers, Inc.

Engineer
Kimley-Horn Associates, Inc.

Landscape Architect
Ken Saiki Design, Inc.







CONTEXT & BACKGROUND

The healthcare design industry is experiencing a paradigm shift towards integrated, team-based care that removes physical barriers between staff and patient care areas. However, there is little evidence to support this shift in thinking. While being progressive about designing for a team-based patient care delivery model, the industry is struggling to evaluate the true impact of an open, collaborative clinic layout on patient and staff outcomes. The SSM Dean Health Fish Hatchery Outpatient Center Redesign project aims to contribute to the knowledge base on this topic.

SSM Dean Health's Fish Hatchery outpatient building had reached the end of its useful life and needed to be replaced. The existing clinic served as a central hub for the SSM system in Madison and provided much needed services to an underserved patient population. However, clinic conditions were compromised in both operational processes and spatial configuration preventing optimization of real estate and creating inconsistencies in user experience.

With these shortcomings in mind, the vision for the new clinic was to establish a flagship replacement building to drive the standard of future SSM Dean Medical Group facilities while improving the delivery of patient care. To do so, the project aimed to transform its current traditional and episodic outpatient care model to a team-based integrated model while enhancing its operational bottom-line. The health system intended to use this opportunity to optimize and redistribute services throughout their Madison network and strategically determine co-location of services within the new facility based on market demand, desired service line offerings, and improved synergies.



RESEARCH DESIGN

To support these goals, it was crucial to understand the current state of existing clinic spaces. To this end, a pre-occupancy evaluation of two clinics (one primary care and one specialty) was undertaken. Both clinics were being relocated to the new facility. The specialty orthopedic clinic included an on-stage layout and the primary care internal medicine clinic was traditional in its layout.

The objective of this phase of the study was to gather baseline data to inform design decision-making in real-time. The project team sought to understand how the existing clinic layouts impacted work and patient flows, user satisfaction, and operational performance.

Research questions for this investigation included:

How satisfied are users with clinic, exam room, and workstation design?

- How does this influence overall perception of care?
- How does this influence perceived productivity?

What are the staff workflows within the clinic modules?

- Where do they spend their time?
- Where do they communicate?
- How much do they travel?

What are patient flows and throughput within the clinic?

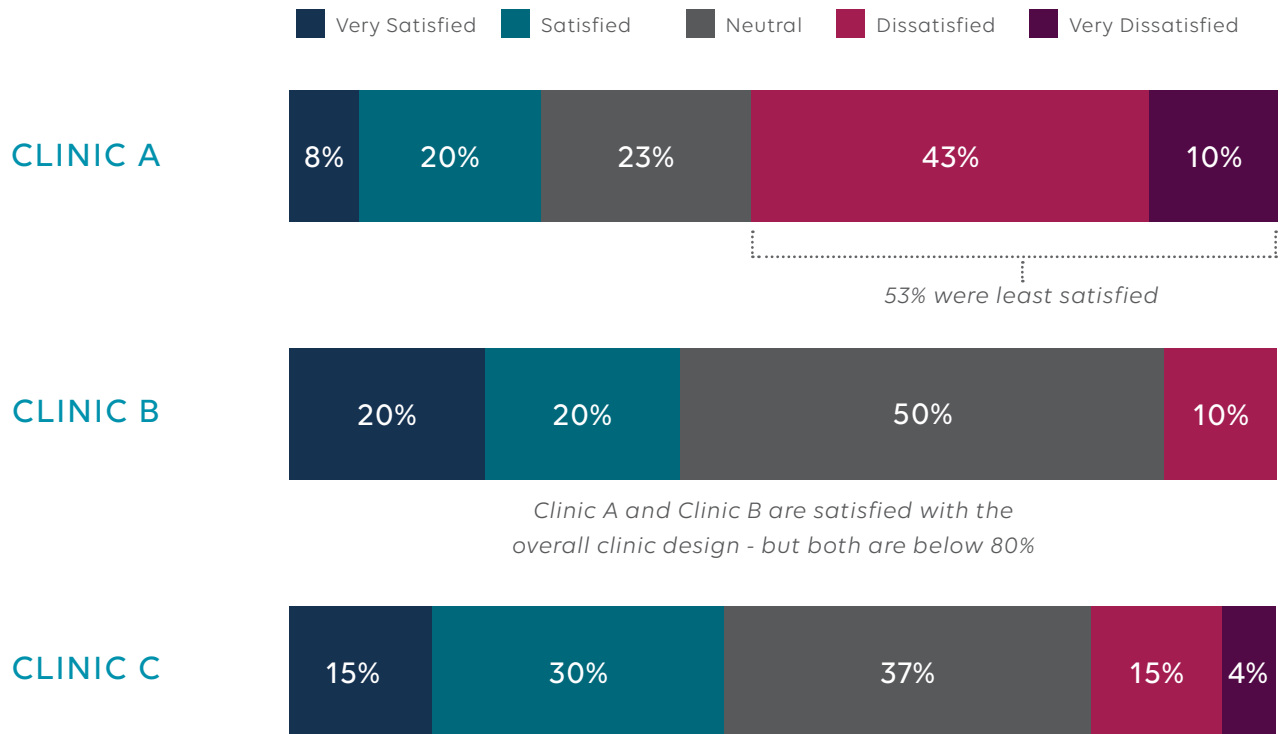
- Where and how long do patients wait?
- How long do patients consult with care providers?

How is the current environment operating and performing?

RESEARCH METHODS

A combination of evidence-based design and lean process improvement tools were used to inform a holistic design solution. Lean exercises such as Gemba walks, value stream mapping, and adjacency diagramming were conducted with the core interdisciplinary team to map the current, future, and ideal state of the clinics.

What is your satisfaction with the overall clinic design?



A mixed-methods approach was adopted for the pre-occupancy evaluation study to allow for triangulation of the findings from quantitative and qualitative data sources via surveys, unobtrusive observations and secondary data collection. The same methods had been used during past HGA studies and were pilot-tested for reliability. In general, a mixed-method approach yields triangulation of findings and helps inform conclusions.

Online questionnaires were distributed to clinic staff to understand perceived experience and satisfaction in terms of staff communication and collaboration, spatial configuration of exam rooms, workspaces, and various attributes that can hinder or enhance overall experience. A total of 106 survey responses (40% response rate) were collected from clinic staff.

During observations, staff were unobtrusively observed to understand overall workflow, time spent in different areas, travel time, and communication details. Patients

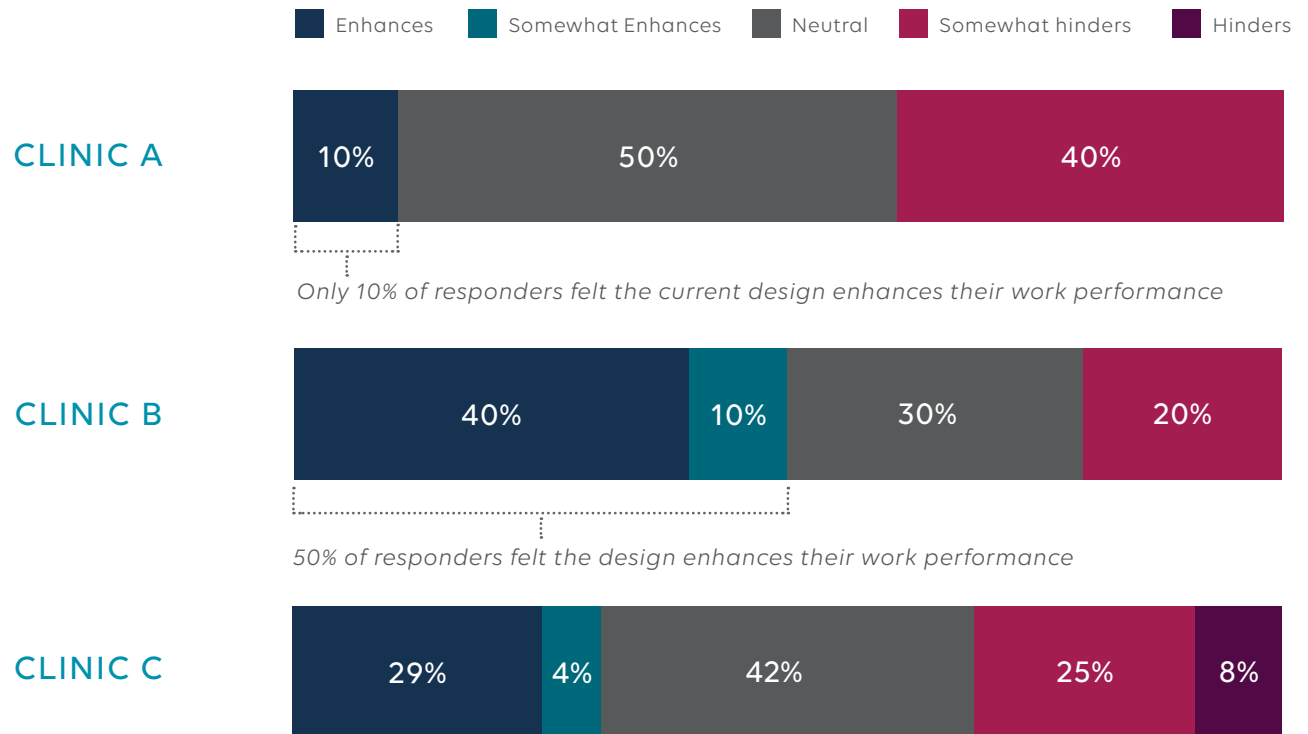
were observed to track overall throughput time, wait and consultation times, and activities while waiting. In all, 960 minutes of shadowing data were collected in the orthopedic clinic on two days in March 2020. Unfortunately, the internal medicine clinic observation data could not be captured due to the COVID-19 pandemic. This data will be gathered at a later date.

Additionally, secondary data for each service line was collected and analyzed to understand operations, growth, and throughput in these services. Time stamped, annualized patient volume data was gathered from the health system to assess volume, cycle time, throughput, and utilization of the existing clinics.

DATA ANALYSIS

Data were analyzed using descriptive statistics, some averaged per 8-hour shift. Additionally, the data gathered from these methods and tools was used to

Does the design of overall clinic design affect work performance?



develop a prioritized list of critical-to-quality (CtQ) criteria both at the clinic module and exam room level. CtQ is a Lean concept in which critical operational, design, or human experience attributes, necessary to produce a measurable quality outcome, are identified. The CtQs were used as evaluation criteria for all design work completed throughout the project.

FINDINGS

Overall findings revealed that the existing clinics were compromised in both operational processes as well as spatial configuration. In terms of overall clinic design, survey results indicated that only 31% of orthopedics staff and 10% of internal medicine staff felt that the current layout enhanced their work performance. Clinic layout and noise levels were the biggest dissatisfiers for the orthopedic group, while natural light was an important satisfier.

For exam room design, 33% of orthopedics and 26% of internal medicine staff felt that the current exam room

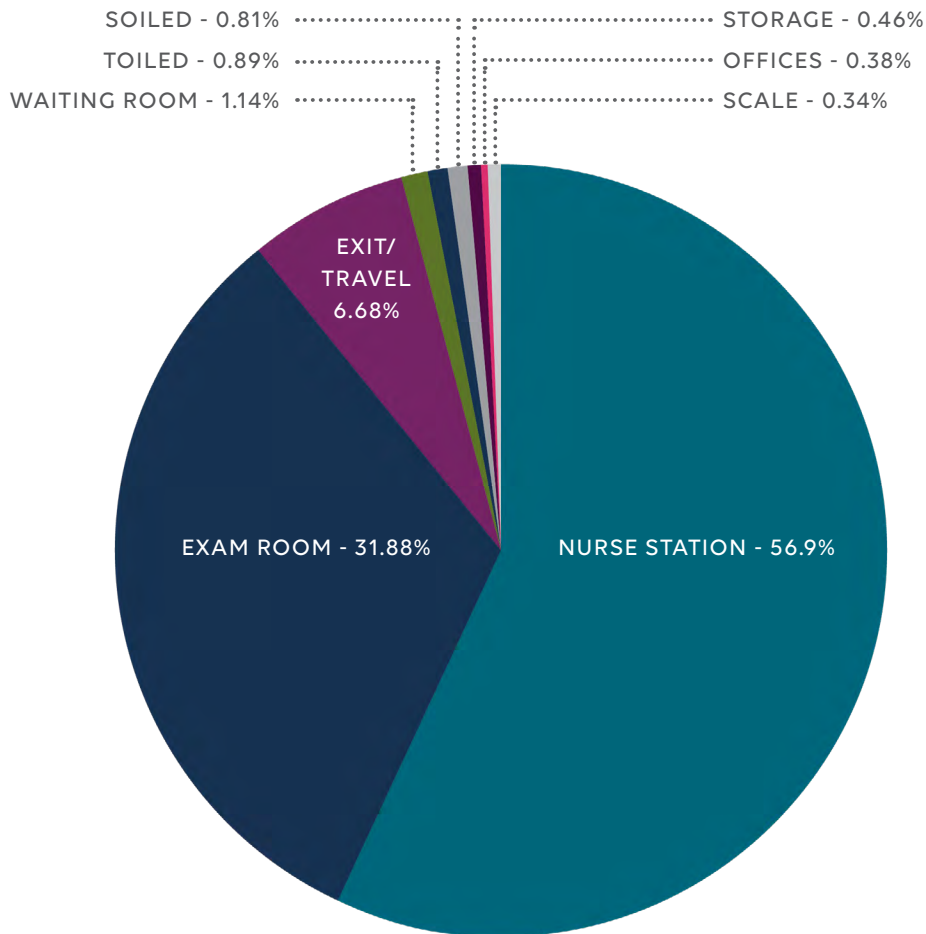
design enhanced their work performance. Charting functionality was the biggest dissatisfier for the two service lines.

Staff shadowing data for the orthopedics clinic showed that staff spent more than one-half of the day (57%) at nurse stations. While in this area, 29% of the time was spent charting. Staff spent 32% of the time in exam rooms. Overall, staff spent 7% of their day traveling between locations in the clinic.

On average, staff spent a total of 106.34 minutes communicating outside of the exam room throughout the day. Most of this communication was observed at the nurse stations (95.45 minutes) in face-to-face interaction with other staff (57.20 minutes). Phone communication accounted for 37.26 minutes of the communication time.

Patient observations at the orthopedic clinic showed that the check-in process was on average 10.46 minutes long, with waiting accounting for 8.77 minutes of that time. While waiting, patients mostly sat and watched

STAFF TIME SPENT



others, looked at their phone, did paperwork, or read. Once called back to a room, a typical appointment was roughly 38,57 minutes long, of that, 10.82 minutes was MR/RN consultation, 11.38 minutes was spent waiting for the physician, and 11.96 minutes was spent in consultation with the physician.

Secondary data analyses of health system records showed that uneven physician schedules, dedicated exam rooms, and duplication of clinical service lines in multiple locations resulted in low utilization rates with internal medicine being 35.50% utilized, whereas orthopedics, which was duplicated at 3 locations, was even lower at 22% utilized.

APPLICATION TO PRACTICE

Results of the pre-occupancy study informed the design decision-making process and resulted in hypothesizing a design solution that was thought to support a team-based care delivery model. Thus, an

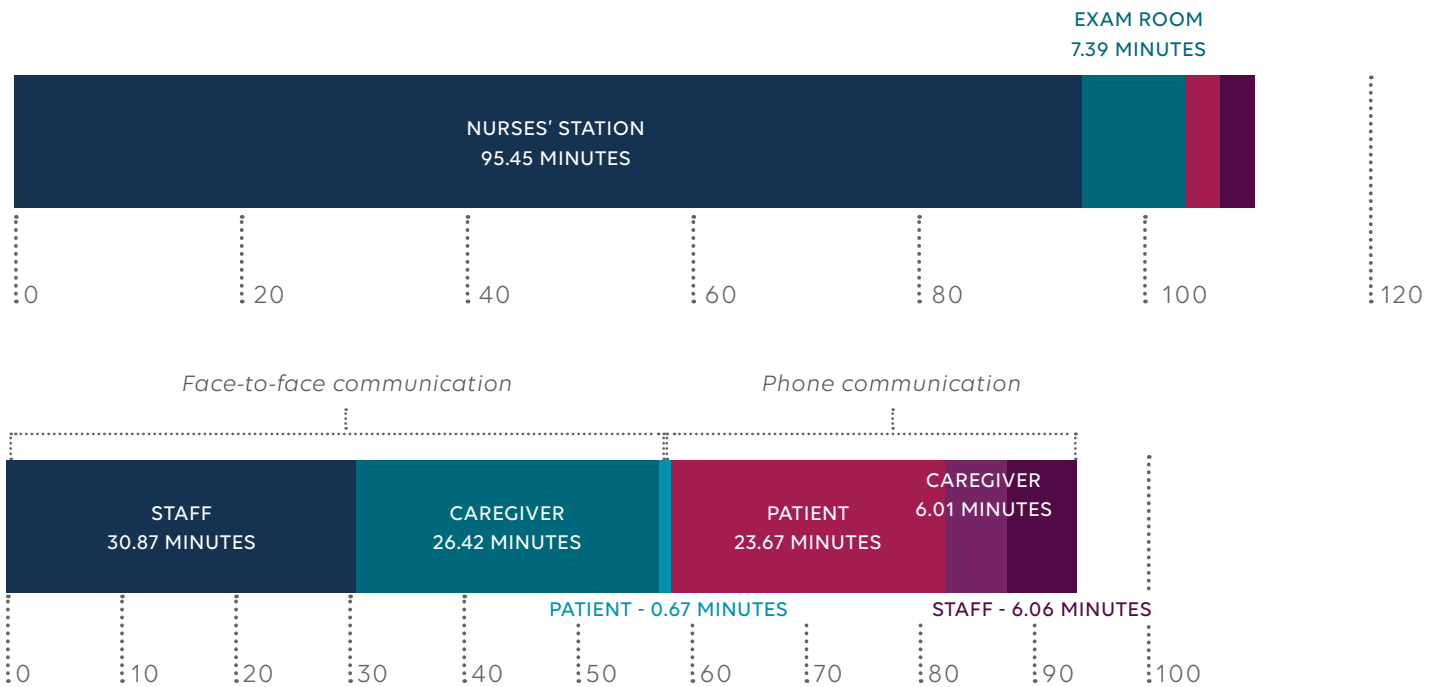
"on-stage, on-stage" clinic module was developed to remove physical barriers and blur the lines between patient and staff zone.

Design interventions hypothesized and applied to address each research finding are as follows:

Staff collaboration and travel distance - Service lines are co-located based on synergies, which aid in cross-collaboration and eliminate silos. This supports staff workflow between service lines and provides a continuum of care for patients. Within the clinic module, staff, and patient zones are co-located, so less time is spent traveling.

Staff productivity and workflow - A combination of open and enclosed workstations are included in the design. Workstations are unassigned and rotate daily, thus maximizing team integration potential. The staff zone is strategically designed to ensure daylight floods the space and improves staff wellbeing.

STAFF TIME SPENT COMMUNICATING IN VARIOUS LOCOATIONS AND BY VARIOUS TYPES OF PEOPLE - AVERAGED BY 8-HOUR SHIFT



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Staff communication - Workstations are designed to ensure care teams sit together. An informal collaborative zone is provided in each module for staff huddles and aims to improve caregiver interactions.

Patient wait times - Utilization of rooms is optimized with a universal, unassigned exam room model, reducing patient wait times. Flexible consultation rooms are provided to support visit overflow and improve throughput. The registration process was streamlined by targeting a 70% pre-registration goal using various alternative modes of registration.

Patient experience - Visibility and access to caregivers is greatly improved with the on-stage presence of exam rooms next to caregivers. Within exam rooms, the sink is the only fixed element, supporting flexibility and family integration.

Equitable design - Community insights played a key role in defining the site and ensured development of a grocery store and public transit stop with direct access from the bus stop to the clinics.



NEW DESIGN: ON-STAGE / ON-STAGE

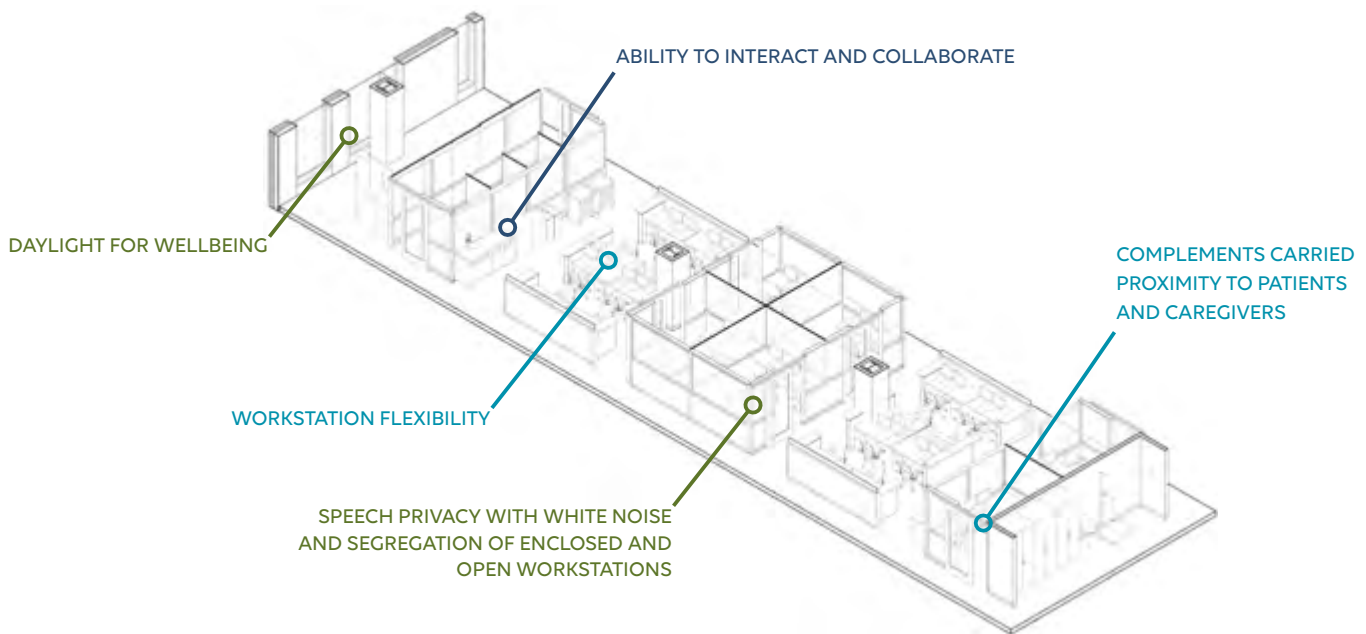
IMPACT ON STAKEHOLDERS

Measuring the existing state of the clinics had a direct impact on design ideation and the design decision-making process for the project. Survey and shadowing results captured the voice of the occupants and represented their satisfaction with the existing settings.

For example, study results revealed a strong correlation between work performance of caregivers and overall clinic design, which led to changes in the project ideation process. Full-scale cardboard mockups of workstations, along with simulated care scenarios were created by the design team so that the staff could experience potential solutions in real-time before the design was finalized. Furthermore, overall occupant satisfaction with clinic designs was less than 40%, prompting administrators and stakeholders to build full-scale mockups of the entire clinic module to test each phase of the design.

A high correlation between satisfaction and natural light was found in one of the orthopedic clinics. This led the design team to reinvent the wheel and create a solution that provided daylight in the entire staff zone verses in just a few spaces. Traditionally, daylighting is offered as a positive distraction in patient areas and staff spaces are often ignored.

In terms of workstations, a high correlation was found between overall satisfaction with workstations and proximity to caregivers, patients, and the ability to interact with other caregivers. This finding informed the decision to provide an open-team design concept supporting proximity and cross-collaboration. Findings also showed high noise levels contributed to increased dissatisfaction. Hence, the open-team plan was designed to be a combination of open and enclosed workstations that enabled cross-collaboration. The plan creates small neighborhood groupings that reduce noise across the space. As a result of additional acoustic studies done during ideation, white noise was added in the space to increase speech privacy.



PROPOSED WORKSTATION DESIGN

Study findings revealed that the configuration of the exam room, charting ability, and aesthetics contributed to high dissatisfaction with exam rooms. This resulted in redefining the exam room with the sink being the only fixed element yielding a flexible configuration. Mobile charting stations give providers maximum mobility to interact with the patient.

Operational findings showcased unevenness in physician schedules resulting in low utilization of real estate and low throughput. This prompted stakeholders to set target utilization for the new clinic at 60% and redefine operations to achieve higher throughput and yield.

IMPACT ON DESIGN INDUSTRY

Using a similar methodology and tools from past studies to evaluate the pre-occupancy state of the specialty clinics, this study built upon previous research completed at HGA. The previous study compared two clinics layouts; one clinic was designed with an on-stage, off-stage module and the other contained a linear module. The present study adds a third module type to help build an outpatient clinic benchmarking database at the firm.

A benchmarking database with multiple clinic module configurations will provide insight on key design interventions and their impact on patient and staff outcomes. It will elevate the knowledge base of the industry at large and provide much needed

evidence comparing the impact of clinic layouts on overall outcomes.

In addition, establishing a pre-occupancy baseline for this study will enable an effective pre- and post-occupancy comparison in the future. Once the facility is built in March 2022, and occupied for six months, the same research methodology will be implemented to determine if the design met a certain level of success (i.e., if outcomes associated with the CtQs were achieved).

FINAL THOUGHTS

There has been a strong push in healthcare design to create integrated spaces and change processes from a siloed approach to one that supports collaboration. Findings from this research advance industry knowledge and showcase the direct impact of design interventions on patient and staff flow, collaboration, communication, and satisfaction with the designed environment. Design innovations from the project, informed by the study, have the potential to transform user experience and health system outcomes. The research summarizes key metrics that support the role of the built environment in enhancing outcomes especially around collaboration and communication, improving productivity, and workflow. The insights garnered from this study could also be applied to workplace strategies for public, corporate, and science and technology projects as well.



HGA

420 North 5th St, Ste 100
Minneapolis, MN 55401

T 612.758.4000
F 612.758.4199

