



HGA

ST. ELIZABETH YUNG FAMILY CANCER CENTER | INFUSION CENTER

DESIGN RESEARCH RESULTS



Pioneering Research Informs the Design of a Cancer Infusion Center.

Cancer continues to be one of the most challenging health conditions today, affecting millions of individuals and their families. For designers it means providing accessible, supportive care spaces. However, the impact of the design of cancer centers, specifically infusion centers, on patients, families, and staff remains one of the most under-researched topics in healthcare environments.

To help understand the impact these spaces, HGA's Design Insight Group (DIG) led a pre- and post-occupancy evaluation (POE) at the new St. Elizabeth Cancer Infusion Center in Edgewood, Kentucky. The goal was to understand how the design of the cancer infusion space impacts staff efficiency, as well as staff and patient satisfaction. The new infusion center takes advantage of the view to the campus and adjacent golf course. The 72 Infusion stations are divided into 6 pods of 12 to maximize staffing efficiency. Each pod has two private rooms, 10 semi-private bays and a lounge with a view outside.

The study compared pre-occupancy data (2018) with post-occupancy data (2022), using staff shadowing, patient and staff surveys to understand the impact of the design decisions in the new space, including:

- **SMALLER, COMMUNITY-FOCUSED PODS:** Six pods with semi-private infusion bays to enhance patient comfort.
- **ON-SITE PHARMACY:** Centrally located for efficiency, replacing an off-site model.
- **NATURAL LIGHT:** Light is brought in or borrowed in as many spaces as possible.

Results reveal the new design improves patient and staff experience and operational efficiency, as well as answered questions about:

- Workflow and room visits.
- Patient privacy.
- Communication and collaboration.
- Satisfaction with design (infusion center, infusion bays, workstation).
- Delivery of medication.

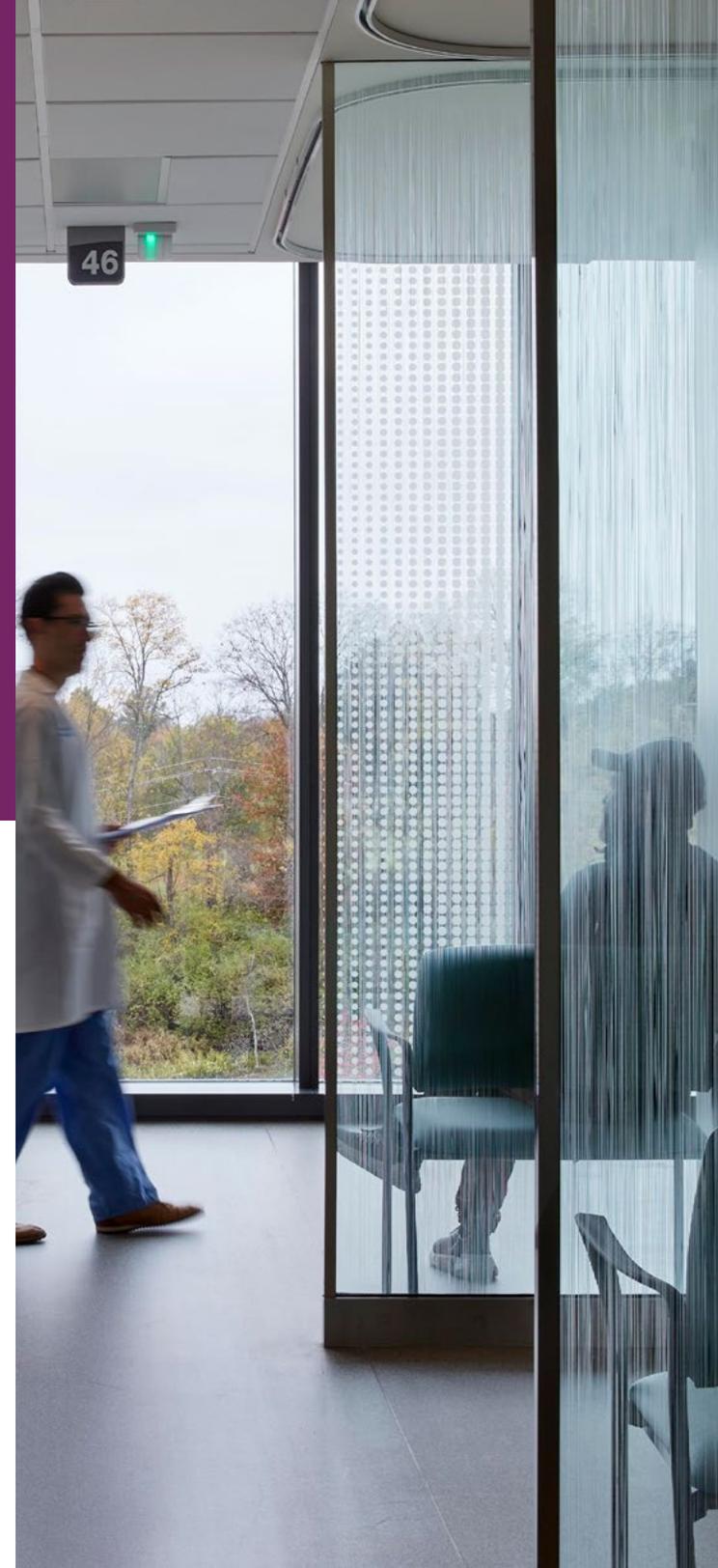
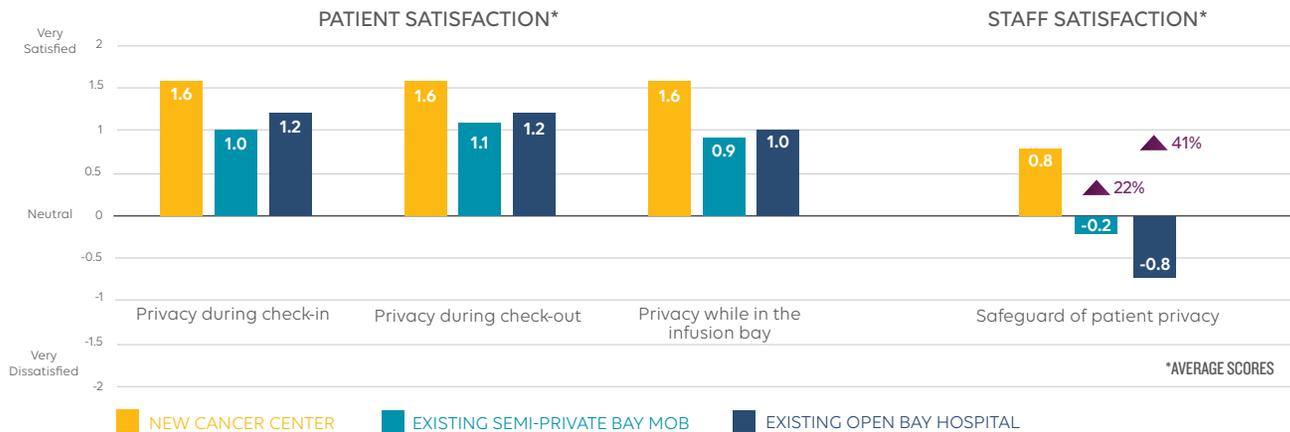
IMPROVED PRIVACY LEADS TO HIGHER SATISFACTION

The new infusion center design significantly improved satisfaction with privacy for both patients and staff from the previous infusion center environments:

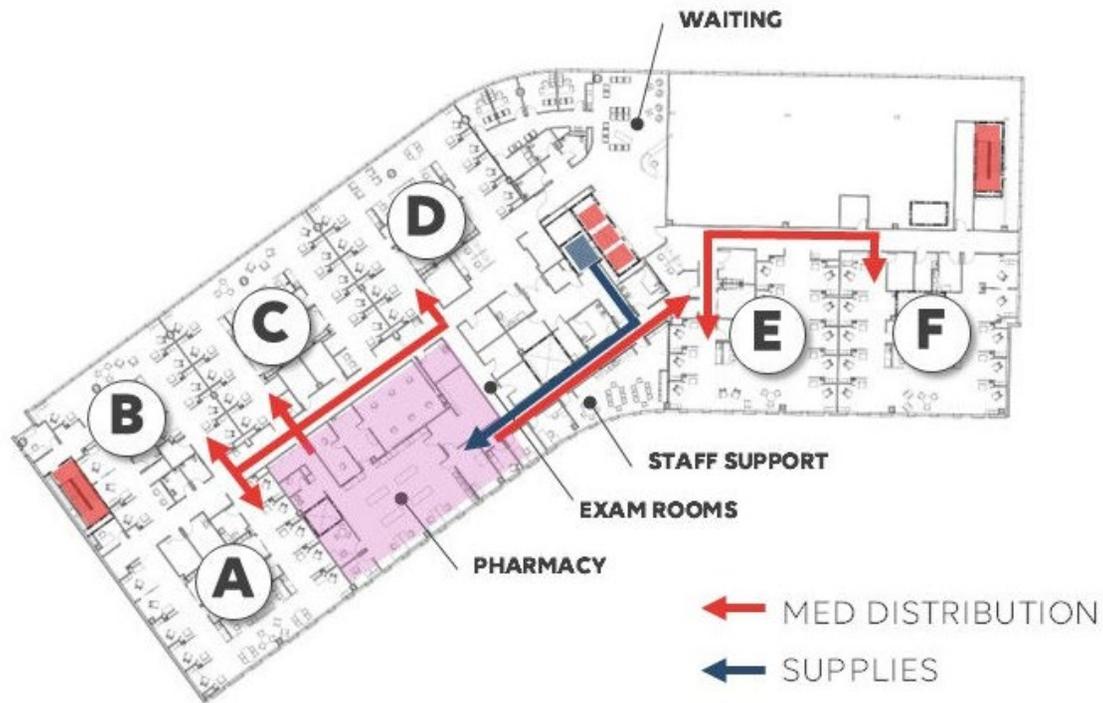
- **PATIENTS FELT MORE SECURE:** Patient satisfaction with privacy **increased by 8%** compared to the previous semi-private bay design at the MOB and **by 15%** compared to the former open bay design in the hospital.
- **STAFF REPORTED EVEN GREATER IMPROVEMENT:** Staff satisfaction with patient privacy experienced an even higher increase by **22%** over the semi-private bay and **41%** over the open bay design.

Key design features driving this improvement to patient and staff sense of privacy:

- Semi-private bays with solid walls on three sides for better privacy.
- Pod layout of infusion bays with fewer bays per pod created a quieter, more private environment.
- Frosted glass between patient bays.
- Staff computer workstation in each bay for charting.



STREAMLINED MEDICATION DELIVERY BOOSTS EFFICIENCY & SATISFACTION



In the new infusion center there is an embedded pharmacy space in addition to dedicated pharmacy workstations in each pod (letters A-F on the plan to the left indicate location of the infusion pods) to facilitate staff collaboration and create a safe and efficient space for medication preparation and delivery. This design is supported by:

- Pharmacy has access to natural light.
- Pharmacy technicians deliver medications directly to the point of care.
- Each infusion bay has a locked medication drawer and special lighting to support its distribution.
- Access to back of house corridor for supplies.



The post-occupancy evaluation found the new infusion center supported:

- **FASTER MEDICATION ACCESS:** Pharmacy technicians now deliver medications directly to patient bays, placing them in locked drawers for nurses.
- **REDUCED NURSE TRAVEL TIME:** Previously, nurses had to retrieve medication from a pharmacy or medication room, adding delays.
- **HIGHER NURSE SATISFACTION:** Satisfaction with medication storage improved by **13%** over the semi-private bay design and **20%** over the open bay design.
- **ENHANCED PATIENT CONNECTION:** Pharmacy technicians are now more involved in patient care, fostering better relationships.



AVERAGE TIME SPENT WALKING BETWEEN CARE AREAS DURING AN 8-HOUR SHIFT

7% NEW CANCER CENTER

9% EXISTING SEMI-PRIVATE BAY MOB

10% EXISTING OPEN BAY HOSPITAL

REDUCING NURSE TRAVEL THROUGH EFFICIENT DESIGN

With nursing shortages and increasing workloads, reducing fatigue is critical. The design of the new infusion center took this into account to reduce nurse travel distances with smaller infusion pods that have supplies and equipment in closer proximity to patients, and the new medication delivery process to eliminate steps to and from the medication room and pharmacy.

The new infusion center's design significantly improved efficiency by:

- **MINIMIZING TRAVEL DISTANCE:** Nurses spent less time walking, allowing more time for patient care.
- **ENHANCING ACCESS TO SUPPLIES/EQUIPMENT:** Smaller pods with medication rooms and storage spaces kept essential care items within reach for nurses.
- **REDUCING UNNECESSARY TRIPS:** Nurses made fewer entries and exits from patient bays while maintaining the same amount of time inside, suggesting reduced disruptions without compromising hands-on care time

Overall, data showed that nurses had fewer disruption when caring for patients, and therefore had an overall more efficient workflow.



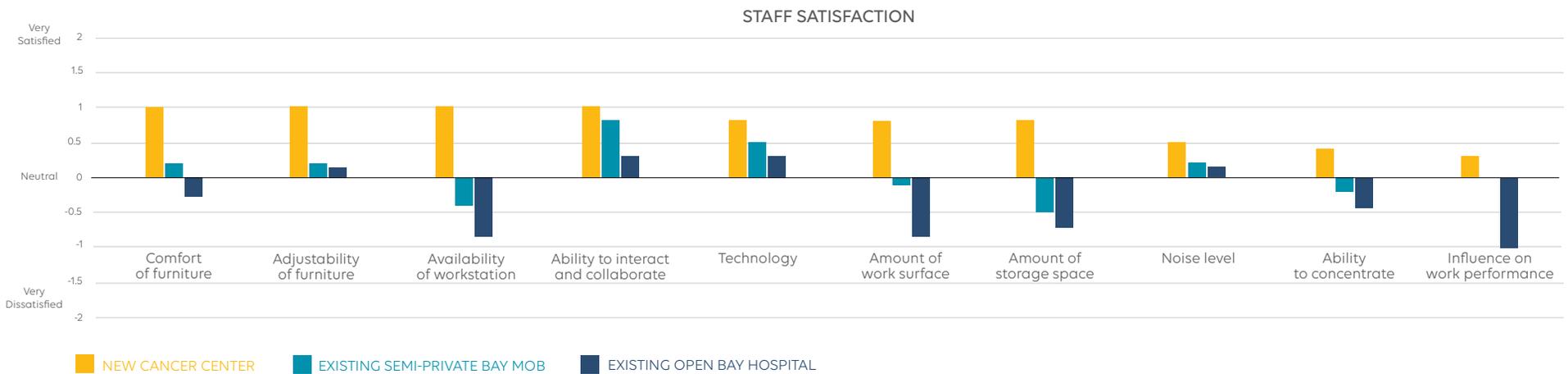
ENHANCED NURSE STATIONS IMPROVE SATISFACTION & FOCUS

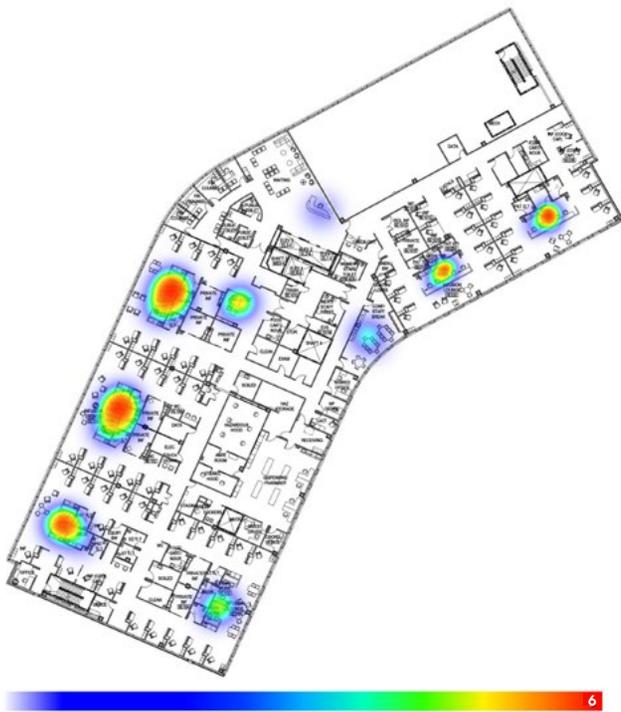
The new infusion center addressed key nurse concerns by improving workstation design, size, and location to improve upon the two previous sites:

- Nurse station is located near the expansive floor-to-ceiling windows for daylight.
- Glass dividers for auditory privacy.
- Medication room directly behind work area.
- Every work area includes a dual monitor workstation for pharmacy.
- Collaboration area for nursing and pharmacy consults.

The research reveals these design features support a more comfortable and efficient work environment for nurses. There is:

- **MORE SPACE PER NURSE:** Workstations increased to 41 SF per nurse, up from 31 SF (semi-private design) and 26 SF (Hospital open bay design).
- **GREATER WORKSTATION SATISFACTION:** Nurses reported improvements in availability, workspace size, and ability to focus without distractions.
- **BETTER WORK ENVIRONMENT:** Access to natural light and outdoor views boosted nurse satisfaction with the space.

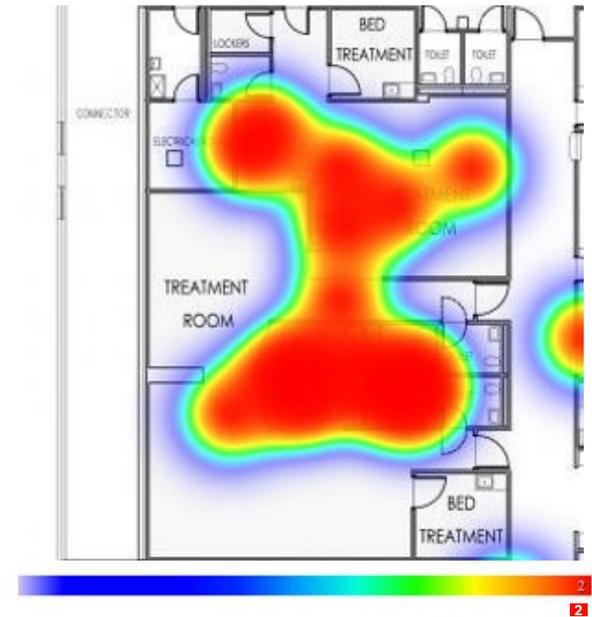




NEW CANCER CENTER



EXISTING SEMI-PRIVATE BAY MOB



EXISTING OPEN BAY HOSPITAL

The above heat maps of staff collaboration spaces show that in the New Cancer Center nurse communication happening at more isolated areas compared to the semi-private design and existing hospital, and communication is happening mainly at the nursing stations, also at check out/scheduling and the conference room.

BALANCING COLLABORATION & EFFICIENCY IN THE POD DESIGN

The new pod layout provided:

- **LARGER PATIENT BAYS:** Expanded to 84 SF, up from 77 SF and 35 SF in previous designs.
- **IMPROVED WORKSTATIONS:** More space for nurses, but reduced visibility between adjacent pods.

While this improved patient privacy, workstation size, and staff efficiency, it also introduced challenges in nurse collaboration:

- **LOWER COLLABORATION SATISFACTION:** Nurses found it harder to connect with colleagues in other pods and stay updated on center-wide activities.

Despite these challenges, nurses remained committed to teamwork and assisting colleagues across pods. Finding ways to enhance communication without compromising the benefits of the pod design will be key moving forward.



CHANGE MANAGEMENT: THE KEY TO A SUCCESSFUL TRANSITION

The post-occupancy evaluation of the new infusion center revealed that nurses who had worked in the previous infusion centers reported lower satisfaction than those who had only worked in the new infusion center. This underscores the importance of change management to help staff adapt to new layouts and workflows.

- **FAMILIARIZATION IS ESSENTIAL:** Nurses needed time to adjust to differences in operations and layout.
- **PROVIDING RATIONALE IMPROVES BUY-IN:** Sharing evidence-backed benefits (e.g., reduced travel time) helps staff embrace changes.
- **OVERALL IMPACT:** Despite collaboration challenges, the new design enhanced efficiency, privacy, and satisfaction for both staff and patients.

Although the new pod design presented some challenges in facilitating collaboration across pods, it ultimately created a more efficient work environment, leading to increased satisfaction among both staff and patients.

RESEARCH IMPACT

This study is among the first to explore the impact of design decisions within cancer infusion centers, and is only a starting point to understand the built environment's impact on patients and staff in those spaces.

The complete findings from the pre- and post-occupancy research have been published in the peer-reviewed *Health Environments Research & Design Journal* and can be accessed [here](#).



ABOUT THE PROJECT

St. Elizabeth Healthcare Cancer Center delivers innovative care to a region historically underserved with comprehensive cancer care options in northern Kentucky. Located at St. Elizabeth Healthcare's Edgewood Hospital campus, the six-story, 236,000 SF Cancer Center consolidates all cancer services under one roof.

The program includes the Center for Integrative Oncology with whole-person care and wellness amenities on the first floor, such as a yoga studio, meditation, art and music therapy, and demonstration kitchen. Additional programming includes Women's and Breast Health, multi-disciplinary clinics, infusion, administration, retail pharmacy, outdoor healing garden, and 650-car parking garage.

Architecturally, the Cancer Center fulfills St. Elizabeth's vision for an iconic building that promotes a calm and compassionate environment with a distinct presence. It is a place for wellness, supports collaboration amongst medical staff, and inspires confidence in patients, staff, and the community.



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