

Planning and designing highly

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functional nurses' stations

The nurses' station is the fulcrum of activity on the inpatient hospital floor. At some point, virtually every hospital function intersects at this critical junction, often simultaneously, via impromptu meetings among a wide cross-section of hospital staff. This intensive and varied use presents a set of complex and challenging issues for hospitals and the people that help them effectively plan for new or renovated facilities.

Over the past three years, members of our current Nurture by Steelcase team have conducted detailed ethnographic research at leading health facilities to evaluate a wide variety of nurses' station interactions—especially how caregivers perform their duties and how patients receive their care.

Nurture's research and design approach is built around the user experience. We undertake five steps to provide specific solutions to our healthcare clients: Understand, Observe, Synthesize, Realize, and Pilot/Test.

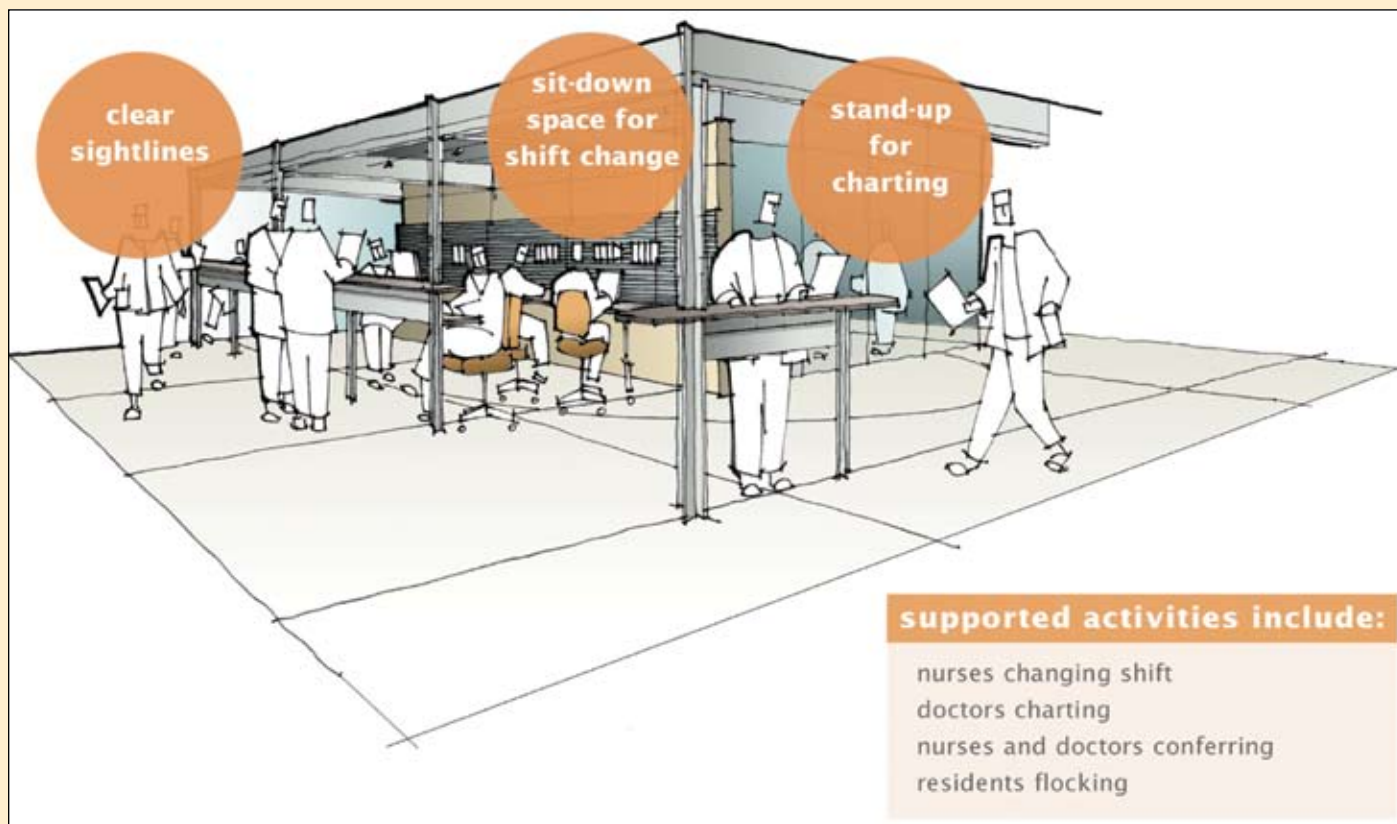


Figure 1. An example of a centralized nurses' station.

After analyzing the issue—through business concerns, technology trends, and what's new and how it affects the organization—Nurture's research team goes on-site to build a first-hand understanding of the user's day-to-day worklife. The Nurture design research team—consisting of researchers, designers, and product specialists—then synthesizes these findings into design principles, criteria, and concepts that feed into the product development process. Finally, Nurture shares all of this information with architects, designers, and clients.

Building on existing research on nurses' stations, our research process has allowed Nurture to more fully understand the nurses' station and to come up with what we believe to be better design concepts.

Controlled Chaos

Many kinds of work happen in the nurses' station, but traditional designs try to force-fit them into a single, rigid configuration—typically with a fortress-like counter and an enclosed room behind it. This assumes that work happens in neat, defined silos. In reality, there's chaos and crowding, with many different behaviors colliding in the space.

First and foremost, nurses' stations need to be considered in the context of providing patient care and as a functional work space. Sharp aesthetics are nice, but this space, maybe more than any other in the hospital environment, needs to be highly functional.

Through our observations, we have seen examples of different types of nursing station organizational models: centralized, decentralized, and various combinations of the two. Each has its own set of benefits and trade-offs relative to patient care and work.

Centralized. In this model (figure 1), the nurses' station is a central hub on the unit—all workstations are located here, as are the unit assistant and most office machines.

- **Pros:** Nurses and clinical staff work together in a central location; quick access to peers paves the way for learning, mentoring, and efficient communication; resources can be consolidated.
- **Cons:** Less proximity to patients; increased congestion and noise.

Decentralized. There is no central hub in this model (figure 2). Nursing stations are located throughout the unit outside each patient room, and the unit assistant is typically located near the entrance to the unit.

- **Pros:** Nurses are closer to patients; possibly fewer distractions; each nurse has his or her own work space.
- **Cons:** Fewer opportunities for informal learning with peers; sense of isolation; less proximity to control center for the unit assistant.

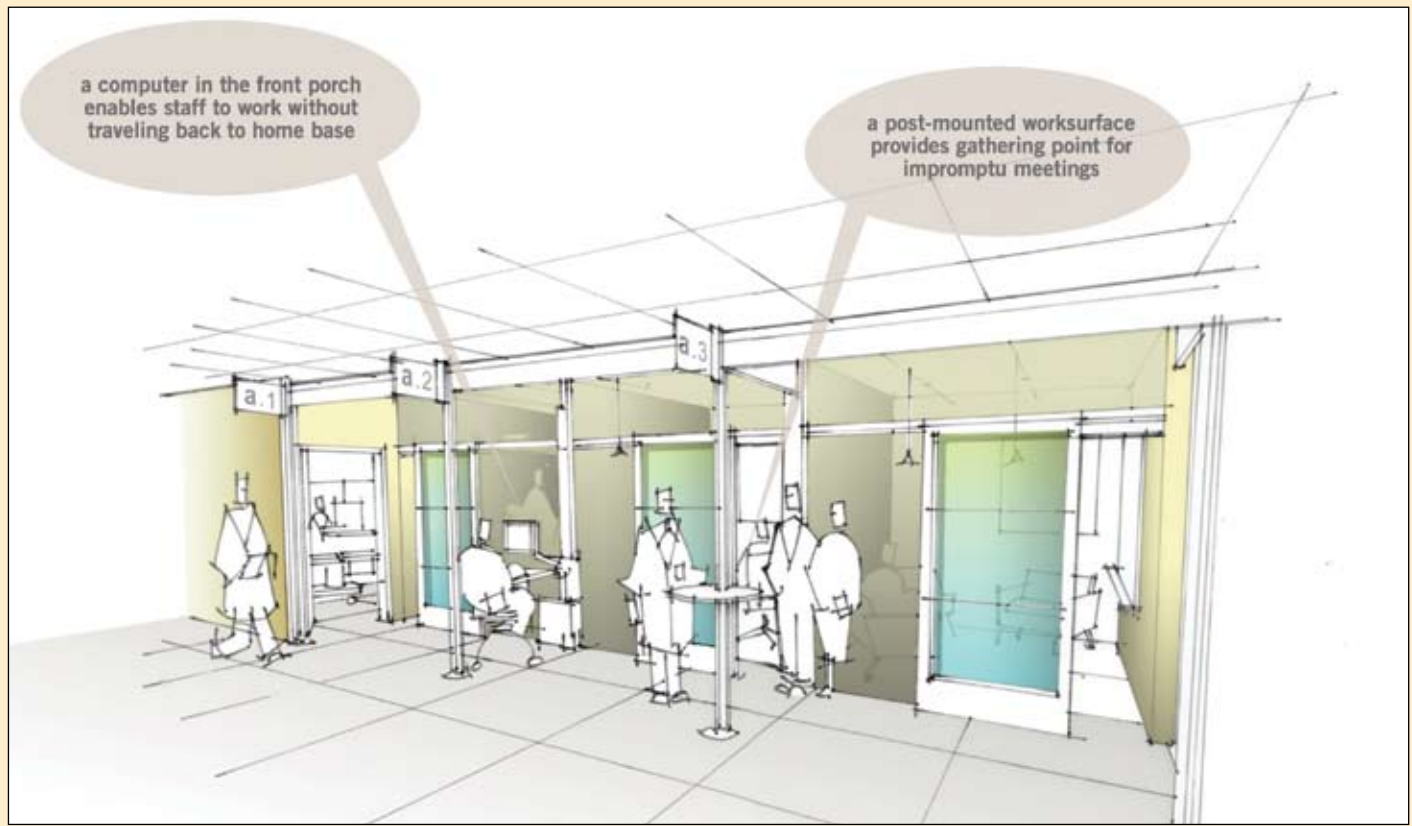


Figure 2. An example of a decentralized nurses' station.

Key Design Principles

Regardless of which organizational type one chooses, our research team has identified five key principles to consider when designing a nurses' station or series of stations.

1. Allow for Control and Flexibility. The ability for staff and patients to control their environment is crucial. The environment needs to support:

- changes in care delivery, such as bedside charting and physician order entry;
- changes in technology, such as increased access to computers (e.g. mobile carts, bedside terminals) and the integration of clinical technology with patient records; and
- the ability to adapt spaces as needs change.

2. Support the Social Ecology. Social interaction is key to learning. The environment needs to support the many ways people interact for learning. The space should:

- accommodate generational mentoring and apprenticeship;
- allow for different group sizes (e.g., one-to-one and one-to-many);
- allow for informal versus formal instruction; and
- allow for on-the-go versus stationary instruction.

3. Understand Work Processes. The environment needs to consider and support the users and activities. The space should accommodate:

- different types of hospital units;
- different roles (e.g., physicians, nurses, radiologists); and
- different types of work (e.g., charting, group rounds, medication preparation and delivery, and shift changes).

4. Reduce Cognitive Load. Information overload leads to confusion and disorganization. The environment needs to support the display of:

- information that needs to be visible for a long time;
- information that changes frequently; and
- ways to call attention to important information (e.g., allergy alerts on a chart).

5. Maximize Spatial Relationships. Space plays an important role in security, staff and patient safety, communication, and physical demands on caregivers. Designers should strive to:

- understand the relationships between different activity zones to prioritize adjacencies;
- consider patient monitoring and staff communication when creating sight lines between zones; and
- consider travel distances when designing (e.g., supply rooms, med rooms, patient rooms, and staff respite areas).



Figure 3. An example of a centralized nurses' station showing the three work zones: *curbside* (1), *step-in* (2), and *immersive* (3).

Principles in Practice

In the centralized model, the length of time and level of concentration required to complete a task led to the development of three distinct zones within the central nursing hub: *curbside*, *step-in*, and *immersive* space (figure 3).

Curbside is where impromptu meetings take place—quick consultations, chart reviews, etc. This doesn't require a desk or meeting room and is best served by a standing-height work surface that two or more can gather around easily. This type of space is even more important when groups work and roam the floor, such as during physician rounds.

Step-in is for more involved work such as charting, dictation, or going over a treatment plan. Seated-height tools are beneficial here, possibly with some medium-height panels to provide some visual or acoustic privacy.

Immersive space allows for concentration and privacy for planned meetings or work where participants not only need to fully immerse themselves in the work, but also have access to tools like computers, whiteboards, or other information displays.

The incorporation of and careful colocation of these zones allow work to flow more smoothly, supporting all five design principles.

To maximize spatial relationships, support control and flexibility, and enhance the work process, the removal of barrier walls in the nurses' station helps create an open environment that enhances staff communication and improves traffic flow.

The incorporation of and careful colocation of these zones allow work to flow more smoothly, supporting all five design principles.

To support the social ecology and work processes while allowing for maximum control and flexibility, it is important to incorporate different types of workstations in support of different work activities, (i.e., sitting versus standing, groups versus individual, private versus shared).

In the decentralized model, locating nurses' stations just outside the patient rooms allows nurses a clear view into the room, enabling them to closely monitor patient activity. This maximizes spatial re-

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Figure 4. Providing easy access to computing hardware via an adjustable, wall-mounted computing kiosk helps supports a number of key design principles in developing decentralized nurses' stations.

relationships, reduces cognitive load, and supports work processes.

Because nurses frequently work together, decentralized stations need to be large enough for more than one nurse to work at a time. This supports both social ecology and work processes.

Technology can enable real-time updating of information at satellite nurses' stations, reducing cognitive load and enhancing work processes (figure 4). It is also important to plan space for parking and charging mobile computing devices.

Best of Both Worlds

A combination of both organizational models provides a variety of options and may give users the best of both worlds. For example, nurses' stations could be distributed around a central core, which contains the supply and storage areas and meeting rooms.

Better nurses' station planning and design can help reduce staff stress and fatigue, increase effectiveness in delivering care, improve patient safety, reduce patient and family stress, and ultimately improve outcomes and overall healthcare quality. **HD**

Joyce Bromberg is the Director of Research for Steelcase. She has 27 years of industry experience, the past 12 of which have concentrated on Advanced Concepts and User-Centered Research. Questions regarding the insights discussed in this story or about Nurture research in general can be directed to JBROMBER@steelcase.com. To send comments to the author and editors, e-mail bromberg1106@hcdmagazine.com.