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THE FIVE STAR OR

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With the integration of these five elements, the design and construction of the most complex perioperative projects will attain stellar results. What is it that qualifies as a “star” element in planning, designing and building an exemplary operating room? Let’s consider the process for existing hospitals in planning renovation or expansion of a perioperative area. This includes pre-op, holding, surgery and post-operative areas. First and foremost, it is crucial to consider the safety of the surrounding patient-occupied space. Whenever there is construction in or near patient care areas, the utmost caution must be exercised.



1 SAFETY considerations include supply chain accountability which is often overlooked when planning workflow processes, distribution and patient flow during planning, designing and construction. It is imperative to consider what is going to be transported through the areas and further, what unwanted pathogens might exist in or on the material. Decisions can impact patient safety especially when materials, supplies, and persons will be transferred in and around this area.

When planning a safe layout for an OR area, careful contemplation must include patient loading (feet first/head first) both in the permanent space and the temporary entrances and egress. Cramped space and obtrusive collisions have caused undue injury and inefficient use of time trying to realign and place patients, equipment, clinical personnel and supplies. Regulations, codes, and guidelines are imperative for planning the most efficient use of space.

Constant negative air flow for induction rooms cannot be compromised. Various sources estimate that between 2 million to 4 million nosocomial infections occur annually, resulting in 20,000 to 80,000 fatalities. The cost of nosocomial infections in the United

States is estimated to be about \$4Billion to \$5Billion annually. Many of these airborne infections are transmitted in or around the surgical procedures due to the immunocompromised conditions of the patients. The process to monitor air quality requires due diligence. Technology has developed many tools available and proper training on practice and documentation is crucial.

Observations have been made regarding the placement of specialty equipment necessary to support the perioperative area. For instance, when central sterile supply is located beneath the operating suites, the transfer of case carts may be exposed to unnecessary airborne pathogens during transfer. Consider air flow and exposure along the entire route. If transmission by contact predominates, as many experts suggest, then surface disinfection technologies should have a major impact in reducing infection rates. With more than one third of all nosocomial infections possibly involving airborne transmission a combination of surface and air disinfection should produce optimum results.

Another consideration regarding placement of specialty equipment relates to the behavioral science and performance of a department. When a supporting department is located on the floor beneath where



procedures are performed, there can be a stigma that dominates attitudes of lesser importance. Managers must be aware of the power and influence of supporting groups and how they perceive their contribution. In every way possible, efforts must be realized in order for supportive camaraderie and pride in collaborative successes. Since it is common for central sterile supply to be in the lower level of hospitals, the ideal design and space should consider locating them on the same floor as the operating suites or above them.



LEAN PROCESSES for design and construction are defined in value according to healthcare terms. It allows us to identify and remove barriers to efficiency. Lean also decentralizes decisions and drives responsibility to the level of those performing the function. Another aspect of lean is that it clearly improves communication which leads to savings all the way around.

There is a business case for lean in the OR. It is a quality process that delivers predictable results. What industry could be any more important than that of healthcare to deliver predictable results? If you visit your doctor and are diagnosed with a disease requiring surgery, don't you want to know what can be predicted? Is it curable? What is the treatment, length of recovery and finally, what is the prognosis? Physicians, especially surgeons, just like architects, engineers and builders must have a quality process to follow that will deliver predictable results.

Reliable promises can be attained through lean processes. It identifies potential interruptions, bottlenecks and trends so that early planning can be applied. Traditional construction processes are driven by schedule and budget. With lean, we begin with the end in mind and work backward. It is a pull process instead of a push. Decisions and performance milestones are established by those actually performing the work as opposed to demands by others. It sets a foundation to maximize value and reduce waste.



TEAMWORK in planning and designing the OR is another star point. There are five team dimensions that have been proven in military aviation to decrease errors and save lives. These fundamental principles have been adopted and validated in clinical arenas and combat casualty.

The first team dimension requires maintaining team structure and climate. The core team must be defined within the department context. This must be communicated to the early planners through a very diplomatic process. All ego must be abated and a consensus reached as an initial step in this process. A team leader is selected and the roles of each member are examined closely. Actions are observed and those that cultivate team climate are promoted and recognized. Another key decision relating to an effective team requires a method for handling disagreements.

The second team dimension is to plan and problem solve. This addresses the team's ability to engage in planning and decision making actions. It examines the concept of error, introduces peer monitoring and is a safeguard against errors. A mature team accepts this as an interdependent responsibility of all members of the team. Some members never get to this point, but it is worth striving for.

The third team dimension is communication with the team. It examines the quality of information exchange within the team. It defines the degree of reciprocity among team members in giving and receiving information. Clear, precise communication explains the importance of situation awareness. It also addresses the need to communicate decisions and actions with the team.

A fourth dimension of teamwork is how the workload is managed. It tackles workload management as a means of reducing stress and avoiding errors. This element introduces several workload strategies including task assistance, prioritization and situational awareness. When a fine balance is reached with workload management, proper involvement with the design team is a privilege and most see it as a welcome honor.



Improving team skills is the fifth dimension which works in concert with their ability to monitor and review its general performance and involvement with the planning stage. A strongly skilled team will help to improve the work processes through improved design.



4 QUALITY design in an OR will promote accelerated start times. Through careful consideration of adjacencies, throughput, caseloads and staff ratios, a quality star in the OR will include processes that enhance efficient throughput. It will decrease the length of stay (LOS) and minimize waste through streamlining processes.

The perioperative area of a hospital is by far the most complex and compact of systems integration. The OR integration and the delivery of advanced communications PACS, multi-video displays, data and electronic medical records to the surgical field require astute attention to detail. Therefore, it is crucial to have quality at the forefront when planning, designing and constructing operating suites.

With the pace of technological advances, it is essential to provide optimal flexibility. Careful consideration regarding location, size, number and future demographics must be considered. Having a qualified research source provides the baseline of information necessary to stay abreast of trends and findings that validate decisions in planning the perioperative area.



5 STAFF RETENTION must be considered from the aspect of what will attract the best and brightest talent in clinicians and staff and keep them happy in their professional settings. Making progress in both patient safety and recruitment and retention may depend on redesign of environments to support care providers in work situations.

Disjointed supply sources and missing equipment or supplies places undue stress on clinical staff and physicians. Repetitive travel and waiting for systems or processes will also create waste. These must be avoided in the design of the new space. Another strain to be avoided in design and construction is difficulty in accessing resources to continue or complete care. Multiple interruptions produce a chaotic environment and again, can lead to errors and stress on staff.

Studies show that less than 30% of a nurses' time is actually spent caring for the patient. They typically spend much of their time hunting and gathering supplies or information.

The desired supply and support locations will consider placing central sterile supply in a co-located area close to both endoscopy and surgery, for instance. Careful evaluation should be given to centralized versus decentralized design. The use of pods and case carts might be worth evaluating and presenting to the team for consideration.

There are tools available that will import a workflow database on top of a CAD drawing. This calculates distance in feet that the healthcare workers walk. It can then recalculate with the new proposed design and examine the impact on the workload. Numerous experiments can be run simultaneously.

Summary: We have examined five crucial elements in planning, designing and constructing a five star OR. Exploration of data related to safety and new ways to contribute to a safe environment leads to satisfaction and a quality perioperative environment. Apply proven techniques for eliminating waste and delivering predictable results through lean principles. You can now understand the importance of collaboration and teamwork in the OR. Try to apply principles to enhance staff satisfaction and retention when making your choices for your new OR and take steps to streamline perioperative processes. This provides you with the five essential elements for the Five Star OR.



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