PLANIFIER POUR LA SALLE D'OPÉRATION NUMÉRIQUE EN PLEIN ESSOR

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RÉSUMÉ

Les infirmières et infirmiers travaillant dans les salles d'opération d'aujourd'hui font face à de nouvelles technologies qui sont ajoutées suivant la tendance vers la réalisation de la salle d'opération numérique. Plusieurs hôpitaux à travers le pays entreprennent actuellement des rénovations afin d'inclure de nouveaux équipements. Cela exige que les infirmières et infirmiers s'adaptent aux nouveaux systèmes, se familiarisent avec les forces motrices poussant cette tendance et comprennent l'impact de celle-ci sur leur pratique quotidienne. Dans le présent article l'auteur explore les raisons pour lesquelles les salles d'opération numériques deviennent la norme et ce que les infirmières et infirmiers doivent comprendre afin de travailler efficacement dans ce nouvel environnement.

PLANNING FOR THE RAPIDLY EMERGING DIGITAL OR

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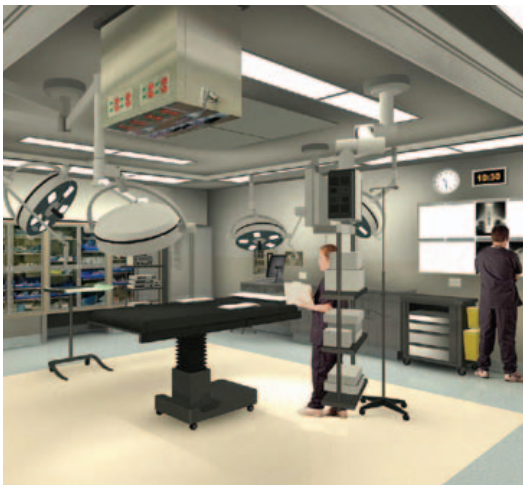

Courtesy Cobos Evamy

Double articulated boom systems in Digital OR Suite, University of Alberta Hospital.

ABSTRACT

Nurses working in today's operating room environments are faced with new technologies being added as the trend toward the digitalization of ORs becomes a reality. Many hospitals across the country are currently undergoing renovations to include updated equipment. This means nurses must adapt to new systems and become familiar with the driving forces behind the trend and how it will affect their daily work. Here, the author explores why digital ORs are increasingly becoming the norm and what today's nurses need to understand in order to be effective in this emerging environment.

Patients in today's hospitals are receiving care using the latest technology and medical techniques, but they are usually unaware of the tremendous amount of work involved in producing that high level of care.

Modern hospital operating rooms are changing dramatically with the advent of minimally invasive surgical (MIS) techniques and digital technology. Healthcare

Digital OR (cont.)

professionals are finding themselves faced with many new challenges as they work with engineers and planners to redevelop many of the aging healthcare facilities in existence today.

The consultation process that is involved when a hospital embarks on the redevelopment of its surgical suites involves close contact with all of the stakeholders who use these facilities – this includes patients, operating room nursing staff, surgeons, administrators, manufacturers, and other healthcare workers. It is increasingly important for these users to understand the complexities of the technology so that planners, architects, and engineers can ensure that all digital changes accommodate both the technological requirements and the needs of the people using the technology. The need for digitalization is clear and it is occurring rapidly in healthcare facilities across North America. A survey of new projects in Canada and the United States, and discussions with hospital surgical teams and equipment vendors, revealed the digital revolution is a top priority for many healthcare facility planners.

Cardiac Catheterization reports, Magnetic Resonance Imaging (MRI) scans, Computed Tomography (CT) scans, film imaging or ultrasound, patient medical history and vital signs are all becoming increasingly computerized and available in digital format.

Despite the convenience that results from the ease of access to digital information, moving into this environment does pose challenges for the nursing staff. The goal is to seamlessly integrate this new dimension of the hospital OR into the daily routine. That process begins by understanding exactly how, and why, the new digital OR is becoming predominant and what factors need to be considered in order to effectively digitalize the OR components.

In addition to updating the OR, cutting-edge technology can also be used to help provide user groups with a clearer understanding of the redevelopment process. 3D and interactive computer modeling programs can be used, in addition to traditional plan and elevation drawings, to illustrate how new equipment will be placed in the room and how it can be moved around.

CHANGES IN THE DIGITAL OR

The technology and equipment supporting MIS may be more portable, but it also requires more space in the OR than was needed in the past to support more invasive procedures. A typical OR was approximately 44 square metres. A new digital OR requires 60 square metres. The additional space is the result of several factors, including: the space required for flat-screen digital monitors, the equipment connected to them, and the service booms that house them (as well as medical gases and a range of other equipment). New double-articulated boom systems, which can swing freely about the entire OR, act as the central piece of equipment for accessing most surgical devices.

These double-articulated boom systems are central to the digitalization of the OR because they can house what used to be located on two or three freestanding carts – carts that often caused overcrowding of medical staff during surgeries and procedures. Traditional display methods resulted in the need for monitors and equipment to be centrally located for ease of viewing by the surgeon and nursing staff – this involved the dedicated use of a lot of room in the OR. In the digital OR equipment such as scope equipment, bair huggers, cautery devices, and flat-screen monitors, can be moved around the surgical suite more easily and efficiently on the double-articulated boom systems.

The University of Alberta Hospital in Edmonton (UAH) is a prime example of the trend toward digital ORs. Between 2004 and 2007 they will expand existing facilities from the current 14 ORs to 19 ORs in total, plus two procedure rooms. The Level Three surgical suite renovations include provisions to replace the existing Central Sterile Room (CSR) with a cutting-edge Central Service – Supply Product Distribution (CS-SPD) that

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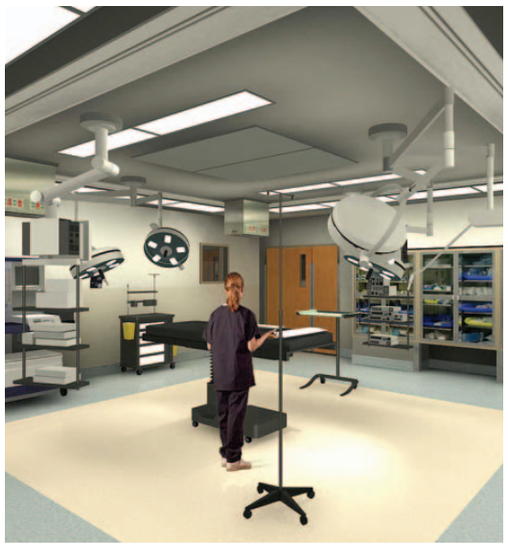
also incorporates a new Case Cart system. New MIS techniques, particularly endoscopic and laparoscopic procedures, benefit greatly from the new boom systems because it allows the equipment to be separated from the display monitors. This provides a clearer image to everybody who is part of the surgery or procedure, not just those located near the equipment. Data can now be recorded in real time and made available to remote locations or central monitoring desks in the OR itself. The potential now exists to have that information sent digitally to off-site teaching facilities for use in classroom settings.

Further efficiencies are being gained through overall layout and design changes. The UAH plan included moving cardiac surgery to the new Alberta Heart Institute and developing a paediatric surgical suite with six operating rooms. It has created efficiencies by making use of shared surgical support facilities. Changes were also made to the pre-operative and post-operative layout to allow for sharing of those two areas in accordance with patient demand. This change, coupled with the extension of digital technology into the rooms, has created a more efficient working environment.



Courtesy Cobos Evamy

Double articulated boom systems in Digital OR Suite, University of Alberta Hospital.

Deb Maerz, Director of Projects and Planning for the UAH, has worked closely with all stakeholders to ensure user groups are consulted and their input was included in the overall redevelopment project. She was able to comment about the digitalization of the hospital ORs and reported significant efficiencies. Her experience, based on feedback from surgeons and nurses, was that there is no longer a need to have so many electrical cords running around the inside of the ORs or the need to retrieve physical data from records departments in other areas of the hospital.

"So much of our data is available digitally now. We used to have the old x-ray view box (in the OR), but now x-rays can be sent through digitally to the monitors, as well as a Cardiac Cath or a CT scan or an MRI. You can call it all up digitally so the surgeon can see it on the screen at the same time they're actually doing the surgery," says Maerz.

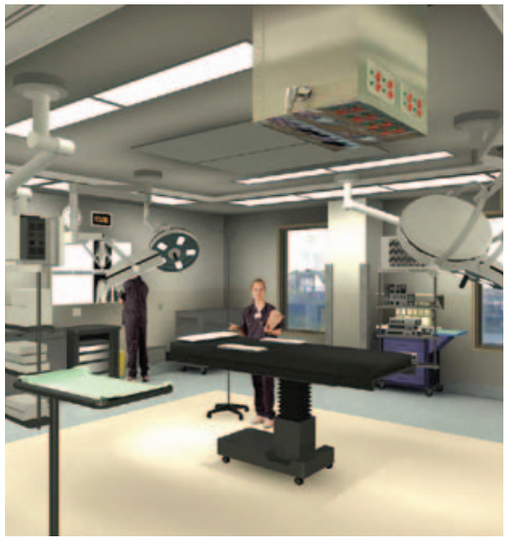
MECHANICAL AND ELECTRICAL ENGINEERING CONSIDERATIONS

Since many facilities that are undergoing renovations have not been upgraded for quite some time – the UAH facility, for example, was built in 1982 and has received only minor upgrades since 1982 – planners and stakeholders must address a wide range of issues involving other services that will be affected by the upgrades. They include medical gas systems, ventilation systems, specialty exhaust systems, and domestic water systems. It may also include mechanical systems serving other areas of the facility not specific to the ORs. The increased use of cauterization devices is one such application where proper smoke ventilation, through specialty exhaust systems, is required due to the toxic gases that are produced.

The existing air supply system currently utilized in the ORs may not be effective due to changing ventilation needs caused by the new IT equipment in the digital OR. Newer digital technology produces more heat and therefore requires better ventilation. Other systems must be explored in order to ensure that ventilation rates, temperature control and pressure control capabilities are not compromised.

On the electrical side, older systems need to be upgraded to allow for current equipment and future equipment additions. In the world of the digital OR, sophisticated electronic switching systems are needed to handle the Web-based information systems, proprietary image signals from scopes and diagnostic imaging, and other signals that may arise as newer technologies are added. At the UAH, two industry-standard 19-inch stainless steel cabinet racks were implemented to house the electronic switching systems within each OR. Every unit needs to be accessible from the front and back to facilitate power and data distribution. They are linked directly to the air exhaust system and allow for cooling and negative pressure relative to the OR.

When all is said and done, the new digital OR must accomplish several things in order to be effective, efficient, and operationally sound. The layout and design must meet the medical staff's clinical needs, be compatible with building systems, and adhere to facility management standards and procedures. In the not-too-distant future, robotics and voice recognition technologies will likely become commonplace as the technology is perfected and updated. As with most work environments in the 21st century, digital technology is the norm and should be considered during all planning stages.



Courtesy Cobos Evamy

Double articulated boom systems in Digital OR Suite, University of Alberta Hospital.

ISSUES TO CONSIDER WHEN PLANNING FOR THE NEW DIGITAL OR

1. Determine the types of procedures supported (general surgery, plastics, neurological, orthopaedics, ENT, etc). The apparatus, monitoring devices, and complexity of the surgeries will begin to form the foundation of the layout and the placement of devices.

2. Locate the operating table and determine its movement during the surgery. In some procedures, such as urology, the table moves very little during the surgery. In other procedures, such as plastics, ENT, and neurosurgery, the table can be rotated 90° or 180° to provide easier access to the surgical site.

3. Locate the anaesthetic gas services and determine the type of column required: fixed, retractable or an articulated service arm. Anaesthetic gas columns are typically placed near the head of the patient on the right side. Articulated service arms are appropriate where procedures require the table to be moved during the procedure. Fixed columns can be used where little or no table movement is anticipated.

4. Establish the number of OR lights that are required. The number will depend on the type of procedures accommodated in the room and, to a lesser extent, the surgeons' use of headlights. A single hub, doubled-headed light is adequate for most procedures. Plastics, orthopaedics and Cardiac Surgery typically require two sets of lights.

Digital OR (cont.)

5. Determine how the patient enters and exits the room. This will affect the design, since equipment must be able to accommodate a range of circumstances.

6. Catalogue the equipment used in each type of surgical procedure. Is the equipment dedicated to a particular OR, or will it be necessary to move it between a number of ORs? It may be appropriate to place dedicated, frequently used equipment on an equipment boom. Equipment stacked vertically on a boom reduces overall space required, reduces OR set-up and cleaning time, and reduces the clutter that can compromise the sterile field. An articulated service column, providing services to tethered equipment carts, may, however, be more appropriate for equipment which needs to be moved between a number of operating rooms.

7. Locate cameras and microphones for telecommunications to other sites. In the past, cameras have been mounted in surgical lights. However, there is a growing consensus that independent boom-mounted cameras provide the best visualization of the surgical site.

8. Establish the number of flat screen monitors required. This is dependant on the type of procedure performed and the number of surgeons and residents present during the procedure. Typically, two or three flat screen monitors are required to display information, but the following may also need to be viewed on monitors:

   a. Video images from scopes

   b. Digital diagnostic images

   c. Medical records information

   d. Patient physiological signs

9. Determine the types and quantity of cabinets required. These can include warming cabinets, supply cabinets and table parts cabinets. Digitally equipped ORs also require equipment cabinets to accommodate electronic equipment such as routers, amplifiers, recording and playback equipment, video processors and the like. For maximum flexibility, these can also be accessible from both front and back, and be mechanically cooled to offset equipment heat loads.

10. Select the best location for the documentation centre. This is a small computer workstation from which communications, information retrieval, and charting can occur. The documentation station should be located away from the sterile field. It should have a clear view of the OR table in order to facilitate charting. The documentation station might also need to be located in close proximity to the equipment cabinets as it is often necessary for the circulating nurse or other staff member to access the documentation equipment during a procedure.

11. Consider ceiling heights in relation to the height of articulated service arms (also known as equipment booms). The number of electrical hubs available, plus the space constraints of the ceiling height, will affect how many OR lights and equipment booms can be provided and where they should be located.

12. Co-ordinate the ceiling plan. This includes mechanical services, lighting equipment mounts, and how the electrical/ communications services are linked to the building infrastructure.

13. Accommodate the needs of other elements in the room. This includes x-ray view boxes (which will be phased out entirely over the next five to ten years) and clocks or other devices.

14. Consider if the OR will need to accommodate infectious cases? If yes, new CSA standards require that the OR be equipped with a positively pressurized vestibule at all entrances.

SARS

LE SYNDROME RESPIRATOIRE AIGU SÉVÈRE ET SES EFFETS SUR LES SOINS DE SANTÉ

Comment le Canada a fait face à cette crise

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Résumé

- L'épidémie mondiale du syndrome respiratoire aigu sévère (SRAS) a eu un effet indirect sur tous les établissements sanitaires des pays touchés tout en mettant les pays non touchés en état d'alerte.
- Les professionnels de la santé ont le devoir d'être au courant des mesures de prévention des infections afin de prévenir la propagation du SRAS.
- Cet article examine cette nouvelle maladie et la façon dont elle a influencé la prestation des soins médicaux au Canada.

Les salles d'opération du monde entier adoptent quotidiennement les nouvelles technologies et les nouvelles techniques chirurgicales. Le personnel infirmier, cependant, peut souvent oublier l'impacte que la découverte d'une nouvelle maladie peut avoir sur l'exercice de sa profession. Il est important de minimiser les risques d'une telle découverte autant pour le personnel infirmier que pour les patients, les membres de leurs familles et amis, pour ne pas oublier la population mondiale en général.

Courtesy L. Socha

Mask being worn correctly

SEVERE ACUTE RESPIRATORY SYNDROME AND ITS EFFECTS ON HEALTH CARE

How Canada Has Dealt With This Ordeal

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In Brief

- The global epidemic of severe acute respiratory syndrome (SARS) indirectly has affected all health care facilities in affected nations and has unaffected nations on alert.
- Health care practitioners need to be aware of infection control measures to prevent the spread of SARS.
- This article looks at this new disease and how it has affected the delivery of health care in Canada.

Surgical suites worldwide embrace progress in technology and new surgical techniques daily. Nurses, however, often forget about the impact that discovery of a new disease could have on nursing practice. It is important to minimize the risks of such a discovery for health care providers as well as patients, family members, friends, and the world population in general.

BIRTH OF A NEW DISEASE

November 2002 is the estimated birth date of severe acute respiratory syndrome (SARS), although global knowledge of the disease was not achieved until February 2003.[1,2] It is believed to have originated in the Guangdong Province of China.[3] A Chinese nephrologist carried the disease to Hong Kong where 12 hotel guests contracted the virus in February 2003. Most affected hotel guests occupied the same floor as the physician. The disease then spread to Singapore, Toronto, and Hanoi, Vietnam – the race was on.[4]