EDITORIAL VIEW

The Operating Rooms of Pakistan

With every passing day, the modern operating room (OR) has become a highly complex and technology-rich environment. Today, we find ourselves amidst a sudden and rapid increase in the sophistication of workflow and procedures, such as minimally invasive surgery, lasers, endoscopy procedures and organ transplantations. The benefits to the patient and care provider of such advances are clear and include reduced in-patient time, more effective post-operative pain management and increased efficiency within the hospital. However, as procedures and the devices used have become more complex, the need for a greater range of supporting equipment, such as monitors, cameras, scopes, insufflators, pumps, printers, video recording facilities and video conferencing etc. has arisen.

Besides causing an occupation of the area around the surgical field, this additional equipment also increases the burden on sterilisation. The need for improved equipment management and staff training has become imperative, and traditional methods for the use and maintenance of resources have become inadequate. As a result of these issues, means of minimizing clutter, such as ceiling-mounted boom arms to suspend equipment off the floor and wireless communications technology, to eliminate cabling, have proliferated. The result is that the standard OR, used with very little change throughout the 20th Century, has become outdated and is now stretched beyond its capabilities. In response, leading surgical equipment manufacturers are reviewing fundamental room design and workflow to optimize performance for today's needs. The goals are to simultaneously increase surgical capability, patient comfort and, of course, reduce treatment cost. These pressures have resulted in the emergence of the 'Digital OR' in which digital technology has helped fuel the explosive growth of a wide range of new systems and products. Today, surgeons demand equipment that interacts more naturally with the way that they work - equipment that talks, listens, obeys, captures and displays information according to their needs. Much effort is currently being placed into the development of the user interface of these systems. Voice-activation also has obvious benefits to the surgeon, as they do not need to relinquish their surgical tools but can instead use simple voice commands, with high reliability, to drive devices such as camera systems, operating lights, diathermy, arthroscopic equipment and even the operating table itself. Further audible and visual feedback is also available via speakers and/or video monitors, providing key information as the procedure progresses.

In addition, there is a real drive towards reducing the number of input and output devices such as keyboards and monitors, by integrating these separate pieces of equipment into a central device. To ensure that each system is optimised to a particular surgeon, many digital ORs will allow personalisation, thereby minimizing time taken for changeovers. This presents the opportunity for systems to 'learn' the behaviour of the surgeon, further optimizing the interface between man and machine.

For many of these applications, suitable technology already exists today. A perceived exception to this view exists however in the realms of wireless video transmission.

Applications are already starting to emerge, both within the OR, such as endoscopy or 'swallowable diagnostic pills', as well as outside the room, such as remote viewing by a relevant expert. This need for high visual quality limits the ability to use common compression techniques, which can introduce unwanted artifacts that are prevalent in other commercial applications. The need for high picture quality is obviously paramount. The implementation of an intelligent compression scheme that exploits the low- cost signal processing technology emerging today, as well as a high throughput wireless technology such as ultra-wide band (UWB), is a realisable goal. So, already the OR has begun the transition to a highly automated and advanced environment of precision, efficiency and cost-effectiveness.

The change has already been felt in the Asian countries. The evolution of the concept of medical

treatment as an industry has resulted in springing up of elegant class of hospital suites in most of the countries of the region. The need of sophistication in design and planning has pushed the science of architecture to limits, so that ordinary architects are at loss to fulfill the requirements of modern operating teams which have to cope with a very busy OR schedule. The new breed of hospital architects work with harmony to the end users; the anaesthetists, the surgeons as well as paramedical staff. The design concept emphasizes the need of being patient friendly as well as being staff friendly, coupled with maximizing economy of space and resources.

Not every OR in the region conforms to the new standards, and renovations and new constructions become necessary to meet the enhanced needs and increased work load. The architects, deputed for this purpose must be well familiar with the new concepts and guidelines.

The anaesthetists have a very special role in every step of the process, whether it is new construction, a renovation or an additional construction. Based on their experience they can be the best advisors an architect can have.

We, at Anaesthesia, Pain & Intensive Care have planned to present salient features of prominent operating room complexes (ORC's) of Pakistan to our readers. The aim of this new series of articles is to present and highlight basic principles of operating room planning, redesigning to make the complexes more patient and staff friendly as well as to discuss strong and weaker aspects of a particular ORC turn by turn. Readers are encouraged to submit profiles of their ORC's along with colour photographs and blue prints on the following lines;

1. Introduction; A brief introduction of your institution, department and operating team.
2. Siting (Within the Hospital Building): Whether Situated in the hospital building, or in a separate building, floor on which situated, adjacent departments. The neighboring premises. Reasons Thereof.
3. Layout plan: Supply a labeled, (reproducible by scanning or a soft copy) lay-out plan, especially highlighting sterilized areas, semi-sterilized areas and non sterilized areas; the routes of the patients, the staff, the instrument trolleys, the linen.
4. Main areas;
   a. Patients waiting area
   b. Pre-anaesthesia room
   c. Induction room (if any)
   d. Main operating rooms (1,2,3,…..)
   e. Minor operating room
   f. Recovery area
5. Staff area;
   a. Entry
   b. Changing rooms
   c. Sitting and rest area
6. Equipment;
   a. Monitoring available
   b. Operating lights
   c. Anaesthesia machines
   d. Gas supply system
   e. Baby resuscitation facilities
   f. Any other special equipment
7. Air-conditioning system, whether HEPA filters installed, whether it is HVAC type, or cooling and heating devices installed, means of controlling circulation of the air and humidity
8. Disinfection & sterilization system: Central sterilization supply system or inhouse autoclaves/hot water sterilizers available; the siting of these.
9. Cleaning, Scavenging and waste disposal system
10. Workload
11. Staffing
12. List management
13. Special notable features
14. Weak points

The selected profiles will undergo thorough scrutiny. Critical analysis will be carried out and recommendations formulated by a panel of experts, comprising of senior anaesthetists and civil / environmental engineers. The final version will be published from the next issues of the journal. Comments and suggestions are welcome.

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Editor