Doctoral Thesis

Organization of hospital services: A comparative analysis of pre operative patient preparation

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Organization of Hospital Services: 
A Comparative Analysis of Pre Operative Patient Preparation

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presented by
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Abstract

As health care systems around the world continue to shift from seller's markets to buyer's markets the more hospitals will be forced to provide quality healthcare services with greater efficiency and effectiveness. In doing so, the organization of work and the systematic processes used to progress patients along the patient care pathway will require optimization. Consequently, operating room (OR) efficiency has become a high priority of many institutions.

The current study aims to compare and contrast pre surgical patient preparation routines between four teaching hospitals to decipher best practice measures to improve overall pre surgical patient preparation efficiency. Particularly, the study strives to give insight to the following:

1. How does organizational design and complexity of pre operative patient preparation routines compare between hospitals, and what organization provides for the most effective throughput?
2. What surgery ward layout provides for the most efficient and effective patient flow?
3. How does OR team composition and task responsibility compare between hospitals, and what effect does this have on efficiency?

Using a six-step methodology (Systemic Structure & Complexity Analysis Network – SCAN), designed specifically for the study at hand, data was gathered and analyzed at four teaching hospitals in Switzerland and Canada. The following method was used:

1. Walk through observation of the patient preparation process and simultaneous interview with senior anesthetist consultant
2. Focus groups with OR staff members to describe and to illustrate the pre-surgical patient preparation process
3. Composition of process flow charts and complexity assessment for each subprocess of the preparation procedure; identification of process strengths and weaknesses
4. A series of 10-15 online patient preparation observations whereby task events and preparation milestones were recorded to a handheld device and later analyzed for time
5. Compare and contrast architectural layout between hospitals to decipher design constraints thought to influence organization and efficiency of preparation processes

6. Development of an optimized preparation process

The study revealed that the organization of pre surgical patient preparation routines needs to be carefully considered. The arrangement of work, the number of people involved, and the delegation of work activities among personnel were all factors found to have an impact on the efficiency and effectiveness of pre surgical patient preparation processes.

Post intubation preparation routines were found to progress more rapidly the fewer personnel involved in preparation activities. By minimizing the number of personnel cooperating in post intubation preparation events precluding the first surgical incision, compensated by enlarging task responsibilities of those involved, surgery times will commence sooner.

The arrival of the surgeon to the OT and involvement in post intubation preparation activities was found to directly influence the timeliness of preparation completion. The greater a surgeon’s association with post intubation preparation activities the sooner did the surgeon arrive, and the quicker did overall preparation times elapse. To establish the most efficient and effective organization of post intubation preparation processes, surgeons should take direct responsibility for the conduct of activities leading up to the first incision.

The time required to induce patients in an induction theatre was found to take longer than when performed in the operating theatre, and the overall duration the patient was induced for leading up to the first surgical incision was greater. To improve upon efficiency, and to minimize patient risks, drug costs, and post surgical recovery times, patients should be induced in the operating theatre rather than the induction theatre. Instead, induction theatres should be utilized as staging areas for the patient, where all pre intubation preparatory activities arise, excluding the intubation process itself.

The findings indicate that sterile preparations arising in the operating theatre act to negatively influence overall preparation efficiency by creating an access barrier to patient entry. Sterile preparations occurring in an outlying sterile corridor negates
this access barrier and allows patient preparation routines to proceed uninhibited. To facilitate unrestrained patient preparation workflow pre surgical sterile equipment preparations should arise in an outlying sterile corridor, rather than inside the OT.

The numbers of preparatory events which take place while the patient occupied holding area space were found to be minimal in comparison to overall waiting time. Hospitals should strive to utilize holding area space more effectively. By maximizing the number of preparatory events which arise while the patient awaits transfer to a procedure room, the time and complexity of subsequent processes leading up to the first surgical incision will be kept to a minimum.

The complexity of ordering and delivering patients to the surgery ward is minimized by avoiding the use of retrieval personnel (i.e. porter). When patient delivery was in the hands of ward nurses, process complexity decreased. As a result, delivery lead times and the cost effectiveness of order and delivery processes benefit from reduced manpower. To streamline order and delivery processes hospitals should bypass the middle man and exploit ward nurses, rather than utilizing patient retrieval personnel (i.e. porters).

The study also revealed that careful consideration must be given to design aspects of OR facilities to ensure that the organization of processes and task events have been well thought out before definitive architectural solutions are implemented. The following findings should be considered when designing OR facilities of the future:

1. The findings advocate the use of a multiple-procedure-room scheme to facilitate patient surgery flow. Operating theatres that were adjoined by both induction theatres and extubation theatres were found to positively influence surgery flow by permitting anesthesia related activities to transpire in parallel to processes in the operating theatre (OT).

2. Sterile equipment and utensil preparations arising in the OT were found to create access barriers to patients awaiting transfer. To ensure that pre surgical patient preparation activities evolve uninhibited, future hospital design schemes should include a segregated sterile corridor for sterile preparations.
3. The findings advocate the use of OR holding areas. Such quarters were found to influence OR efficiency by providing refuge for patients awaiting transfer to procedure rooms. Such vicinities not only ensure the patient’s presence in the OR before the time of surgery, but also provide the occasion for pre surgical preparatory activities to commence.