

Potential errors and their prevention in operating teamwork

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Human beings in all lines of work make errors. Errors can be prevented by designing systems in such a way that it is difficult for people to do the wrong thing and easy to do the right thing [1]. This is illustrated by looking at the evolution of the Sorin heart-lung machine. In the SIII line the control panel has a uniform grey colour, alarms have the same tone irrespective of their importance and the software design is not uniform for every module. It is quite evident that such a design is prone for errors. The successor of the SIII, the S5 has coloured displays, more intuitive software and clear distinction between the different alarm levels.

A study looking at human factor analysis of cardiopulmonary bypass confirmed the impact of optimal control panel design in error control [2]. It is clear that error detection is a first step in error handling as a great number of minor events, as reported in a study investigating the impact of human errors during cardiac surgery in 243 arterial switch operations, is caused by undetected errors. The authors conclude that error tolerance, error detection, and error recovery are as important as error prevention but even more important is error recovery, a strategy to remedy the situation. Error recovery should be applied before the negative consequences of the made error accrue [3].

However, not only equipment design and protocols are important for error control. Also the work environment and the communication between team members have an impact on the number of errors that occur during a given procedure. Environmental factors include the general operating theatre layout as well as ambient factors such as noise, lighting, motion/vibration and temperature [4].

Reduction of noise in the OR by limiting the number of observers and restricting use of radios, pagers and mobile phones, is desirable and can improve error management and surgical outcome [4].

Bad communication between staff members has been linked to poor outcome [3,5] while ineffective teamwork accounts for approximately 45% of the variance in the errors committed by surgeons during cardiac surgery [4]. Another important aspect is team familiarity and stability. Teams that adopted new surgical techniques had significant shorter operating times when original teams were kept intact. This has not only to do with a higher cumulative experience but also with the fact that members of stable team develop more trust amongst team members that finally leads to more psychological safety.

Conclusion

Surgical performance will be affected by OR environment, teamwork, communication, technology and equipment. In order to further improve the quality of cardiac surgery procedures, interventions need to be developed to decrease the negative impact of these variables.

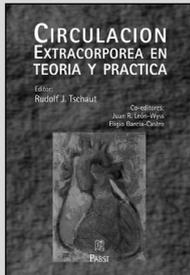
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