Chapter-II

Review of Literature

This chapter describes the existing knowledge about the quality management in hospitals as a system and Operation Theatre Complex as one of the micro system of the hospital. This section also elaborates the significance of factors responsible for the implementation of the quality management system in the operation theatre complex.

Patient safety is the cornerstone of a high quality healthcare organisation. In the modern world of advancing technology, providing health care effectively involves a set of interrelated diagnostic, clinical and administrative process inputs and outputs, all of which must be complimentary to each other to ensure the delivery of quality patient care, which is any organisation's ultimate goal. (Crago, 2000)

Meyer et al (2004) have developed four factors that help in achieving high-quality care and successful Quality Improvement programs in hospitals. These are right culture, right people, right processes and right tools. Kanapathy (2008)carried out a literature review of critical factors of quality management used in research questionnaires. He highlighted that a total of 27 different critical factors of quality management were developed and utilized by 7 groups of established researchers who conducted research in different parts of the world. He reported that Saraph & Benson (1989) were the pioneers in developing a quality management instrument which identified 8 critical factors of quality management: top management support, quality reporting (which includes quality information availability and quality information usage), employee training, employee involvement ,product design, supplier quality, process management and role of quality department. Kanapathy

(2008) citesSilaand Ebrahimpour (2003) who highlighted that the same critical factors were later used byMotwani, et al. (1994),Badri& Davis (1995) and Quazi, Jemangin, Kit andKian (1998). These researchers had reported the instrument used by Saraph*et al.* as validand reliable (Sila&Ebrahimpour, 2003 cited in Kanapathy (2008). Flynn *et al.* (1994, cited in Kanapathy, 2008, p.22) developed 7 critical factors of quality management while Ahire*et al*.(1996, cited in Kanapathy ,2008, p. 22) developed 12 critical factors. Additionally, Black and Porter (1996, cited in Kanapathy ,2008, p. 22) developed 8 critical factors of quality management, Zeitz*et al*. (1997, cited in Kanapathy ,2008, p. 22) developed 7, whereas Joseph *et al.*(1999, cited in Kanapathy ,2008, p.22) developed 10. Rao *et al.* (1999, cited in Kanapathy ,2008, p. 22) developed and validated a measurement instrument for international quality management research which consisted of 13 critical factors of quality management, thereby making a significant contribution. Based on the existing literature researchers has identified 7 important factors for our current study.

These are:

1. Top management commitment
2. Human resource development
3. Strategic Quality management Planning
4. Infrastructure and Technological support
5. Process management
6. Healthcare Professionals willingness to participate in Quality improvement
7. External forces

2.1. Quality Management System and Role of Top management commitment:

According to the business dictionary, the highest ranking executives can be termed as top management with varied titles such as chairman, managing director, chief executive officer, president etc. They have the responsibility of the whole organisation. The board of directors frame the policies for the organisation. The top management has the mammoth task of converting the policies into short

term and long term goals and objectives. It conceptualises strategies and outlines the blueprint for the organisation. It makes important decisions which affect all the people in the organisation. The top management is held entirely responsible for the success or failure of the organisation. It has the last word on contentious issues. It spends more time on planning and making strategies rather than on day to day operations.

The role of the top management can be summarized as follows -

a) Top management formulates the short term and long term objectives and broad outline of policies of the organisation.

b) It issues necessary instructions for preparation of department budgets, procedures, schedules etc.

c) It prepares strategic plans and policies for the enterprise.

d) It appoints the executive for middle level i.e. departmental managers.

e) It controls and coordinates the activities of all the departments.

f) It is also responsible for maintaining a contact with the outside world.

g) It provides guidance and direction.

h) The top management is also responsible towards the shareholders for the performance of the organisation (MSGExperts, 2008).

In the context of a government teaching hospital, top management would include the Health Department of the Government, Medical Director,

In the context of a privately run teaching hospital, top management would include the promoters, trustees and board of directors.

According to Juran (1989), top management commitment is a measure of the extent to which top management sets up Quality Management objectives and strategies, provides and allocates necessary resources for the same, emphasizes on quality improvement efforts, and evaluates Quality Management implementation and performance (Juran, 1989). Many quality gurus such as Deming; Crosby; Oakland; Kanji and Baker and Feigenbaum have pointed out the crucial role of top management commitment and leadership in QMS

implementation. To initiate the work on any QMS in an enterprise the commitment of top management is the foremost step. (Juran, 1989). It is not possible to adopt QM and improve performance without strong top management support. Top management carries the primary responsibility for commitment to quality and the support efforts necessary to successful TQM implementation can only come from there. Hence, the most critical factor contributing to successful QMS program is top management (Kralovec, 1990).

One of the most important factor in the effective implementation of a quality management system is leadership from the top. Only the firm resolve of senior leadership can lay stress on quality as a top priority, create a corporate culture for quality and arrange for the finances and man power required to support organisational learning. The importance of leadership at higher-level may be especially critical in cultivating clinical involvement in implementation of a quality management system.Such a leadership practices what it preaches; is willing to invest in high-quality staff, processes, and supportive tools; and provide institution-wide commitment to get to the root of quality problems and to strive ceaselessly to look for solutions (Meyer, et al., 2004).

Meyer et al. point out that, top-performing hospitals have a striking degree of motivation and commitment to ensuring high-quality care and fulfilling the QMS mission. They are not just going through the motions or conducting QI activities because they are under outside pressure to do so.This commitment is reflected in and nurtured by: active leadership and personal involvement on the part of the CEO, other top managers, and the Board of Trustees; a clear-cut quality-related mission and aggressive quality-related targets; standing and ad-hoc quality committees; regular reporting of performance indicators with accountability for improved results; and the promotion of a safe environment for reporting errors.(Meyer, et al., 2004)Since an healthcare team’s task is complex and dynamic, the role of leadership is all the more important. Leaders need to

maintain a strategic focus to support the organisation's vision, facilitate goal setting, educate, and evaluate achievements. When leaders assign responsibility to the appropriate people, team members become more confident and independent in their work. Traditionally, doctors have assumed leadership of healthcare teams, regardless of their competence. However, with changing times, new roles for healthcare leaders are evolving that include team development, in order to maintain clinical productivity and patient satisfaction (Mickan & Rodger, 2000). Further, the authors cite Kane (1975) who suggested that leadership be allocated to the team member with the most expertise, rather than being linked to professional groups. Healthcare organisations primarily differ from other industrial organisations in terms of leadership structure. They do not have a clear hierarchy due to the presence of an organized body of professionals who are not employees- the physicians. Physicians possess a unique body of knowledge which gives them the privilege of ascertain amount of autonomy in clinical decision making. They are reluctant to participate in implementation of quality management systems due to distrust of hospital's motives, lack of time and fear that reducing variation in clinical processes will compromise their ability to vary care to meet individual patients' needs (Lee, et al., 2002).

Though it is widely believed that the systematic application of industrial quality improvement (QI) methods can result in significant improvement in clinical processes and medical care outcomes, reports suggest that hospital management intentionally narrow the focus of QMS efforts to business or service processes to avoid the appearance of management encroachment on physician autonomy in clinical decision making (Deming, 1986). A diffuse leadership structure in a healthcare setting does not lessen the importance of top management leadership. It opens up avenues for leadership from other sources, including boards of directors and physician leaders (Lee, et al., 2002).

Leadership from the top may be vital for removing the departmental and professional barriers that come in the way of cross-functional teams to tackle the

issues of clinical cost and quality (Lee, et al., 2002). Weiner et al (1997) concur on the view expressed by Kralovec (1990) that Quality Improvement projects directed at physician practice patterns and utilization should be run by and for physicians. Top management will have to devise strategies to increase clinical involvement in QMS if they wish to realize the full benefits of this approach of QMS (Juran, 1989).

Several organisations such as air traffic control systems, nuclear power plants and naval aircraft carriers constantly function under difficult conditions. In spite of that, they are able to work in a manner that is almost entirely “failure-free”. They have very few adverse events. Hence they are called High Reliability Organisations. The health care services sector can learn from the principles of the HROs and similarly achieve consistently safe and effective performance despite high levels of complexity and unpredictability in the work environment. The basic tenets of the HRO theory are:

- Maintain a powerful and uniform culture of safety
- Use optimal structures and procedures
- Provide intensive and continuing training of individuals and teams
- Conduct thorough organizational learning and safety management.

All the above can be achieved only with the strong commitment from the top management (WHO, 2012).

Lee et al. (2002) cite Shortell et al. and Boerstler et al. who opine that authoritative and hierarchical cultures and top- down management approaches with limited employee empowerment are barriers to the facilitation of Continuous Quality Improvement. They used the concept of CQI pyramid suggested by O’brien et al. (as cited by Lee, et al.,2002) to assess the factors associated with CQI implementation, one of them being organisational culture. Organisation

culture refers to the underlying beliefs, values, norms and behaviours of the organisation that either support or act as a barrier to organisation-wide

improvement. The underlying culture has a strong influence on the productivity and efficiency of an organisation. As cited byLee et al. (2002), Quinn and Kimberley have classified the ethos of a hospital into four cultural types: group, developmental, rational or hierarchical. Group culture refers to working in a group. It stresses the development of employees, affiliations, employee empowerment, teamwork and consensus building. Developmental culture is one that encourages changes and growth, and one which values innovative ideas and prospective strategies as important assets. In organisations with rational cultures, the emphasis is on planning, productivity and efficiency as such organisations are highly performance oriented. An hierarchical structure is characterised by bureaucracy and stability where importance is given to following organisational directives, enforced roles, rules and regulations. In the study carried out by Lee et al., hospitals having a stronger disposition of group/ developmental culture showed a higher degree of CQI implementation. The type of culture adopted by a health care setup depends on the value system of the top management.

It has been widely recognized that hospitals arenot as safe as they should be. This can be improved by having a culture that promotes safety within the organization in order to remove any inefficiency in patient safety (Tutuncu, 2012)To create such a culture is the onus of the top management. Human errors in complex systems are inevitable. Errors due to human factors are the main cause of accidents not only in machine system operations but also in health care settings. A strong safety culture can help minimizing medical errors. In order to assure patient safety, healthcare leaders or top management have been encouraged to take responsibility for reducing medical errors and adverse events in a strong safety culture (Tutuncu, 2012).EKAWithin the healthcare industry, clinical seniority alone is not a sufficient criterion for leadership. The tasks and

responsibilities of a leader suggest that some clinical leaders should be actively engaged with the entire healthcare organization (i.e. the hospital and its management) in order to promote the work of the team that they lead. Understanding of management structures and knowledge of organizational targets (often decided by central policymaking bodies) are prerequisites for the effective clinical leader (Sevdalis & Hull, 2012).

Resource allocation, be it human resources or financial resources, is a prime requirement for the implementation and sustainability of any quality management system. Since the top management has control over it, their total commitment in person and spirit is of utmost importance for a sustainable quality management system.

Organisations need to provide teams with adequate financial resources, administrative and technical support and professional education. A safe physical environment where team members work in close proximity to each other can promote communication and cohesion. The real costs of setting up and maintaining teamwork need to be formally recognised and sufficiently resourced. In healthcare environments, there may be conflict between clinical responsibilities and training needs, and over issues of patient risk and privacy. In times of financial paucity, clinical care is given priority over professional education. Healthcare professionals do not give priority to training that is not directly related to their clinical setting, despite knowing that training is essential for becoming skilled in teamwork (Mickan & Rodger, 2000).

The hospital Board plays an important role in creating a corporate culture for quality. The Board is the organizational entity legally held accountable for quality of care. It is ultimately responsible for developing and overseeing quality improvement. The Board has an important role for planning, implementing, and institutionalizing the hospital's CQI/TQM effort. The board is often the only structural interface through which elements of hospital (and community)

leadership can jointly establish, communicate and evaluate a quality vision. This favourable position offers the board considerable leverage to build clinical involvement in CQI/TQM. For example, the board can enhance the credibility of the CQI/TQM effort by linking it to the organization's mission and strategic objectives, allocating financial resources for CQI/TQM, revising executive compensation and performance evaluation criteria, and playing an active role in quality control.

The Board can also play a key role in promoting clinical involvement in CQI/TQM by maintaining "continuity of purpose" in situations of executive turnover. A unique feature of the hospital Board is its stability. CQI/TQM takes several years to yield significant cost savings and measurable quality improvement. Active Board involvement in CQI/TQM increases the chance that the hospital's quality focus will remain constant even in the absence of stability in executive positions. Steady, visible Board leadership creates a climate of trust and assures staff and physicians of the hospital's unwavering commitment to CQI/TQM(Weiner, et al., 1997).

Hospital top management can encourage ephysician participation in CQI/TQM by identifying different segments of physicians (e.g., salaried hospital-based or group practice-based physicians, physicians with special interests in QI, or high-admitting physicians of high-cost, high volume conditions) and targeting each with a specific strategy to increase the probability of involvement. Physician leaders can be especially helpful in implementing this approach. Finally, hospital leaders can encourage cross-functional teamwork among health professionals by assigning budgets on clinical service lines rather than traditional departmental lines(Weiner, et al., 1997).

2.2 Human Resource Development

Healthcare is like a team sport where an entire team is in-charge of patients(Sevdalis & Hull, 2012). High-quality physicians, nurses, administrators, and ancillary staff are critical to producing high-quality outcomes and effective quality improvement (ASQ, American Society for Quality, 2016). Meyer et al.(2004) reported that top-performing hospitals stressed the need for hiring the right people, credentialing, and re-credentialing. Nursing staff plays a vital role in health care. Their successful recruitment and more importantly, retention is possible if they are given due respect, empowered and provided with opportunities for advancement. All are expected to be good team players, able to participate in multi-disciplinary teams for both QI and patient care management (Meyer, et al., 2004). Dealing with individuals who have variety of dispositions and a range of professional and non-professional experiences is a crucial element of teamwork (Mickan & Rodger, 2000). Healthcare teams work in a setting characterized by severe tension, burdensome workload, often high stakes decision making and very consequential errors. Individuals have limited capabilities. In his classic review of how human factors impact on adverse events, the psychologist Reason has suggested that human failures present more threats to complex and potentially hazardous systems like healthcare, rather than technical failures.

Human shortcomings along with organizational and environmental complexity result in ‘production pressures’ and the naturally occurring stress of managing very sick patients. In such situations, humans are more prone to committing mistakes (Sevdalis & Hull, 2012). According to the literature review carried out by Kanapthy (2008)on critical factors of Quality Management used in Research Questionnaires,4 out of the 7 studies had included employee training as one of the critical factors of quality management. He cites George & Jones (2005) who express that training is an efficient way to increase workers’ ability to perform better than the lowest level required.

An organization which fully utilizes the skills of its workers' ability achieves organizational effectiveness. Training employees in the notions and tools of quality enhances the effectiveness of quality improvement activities. In other words, training contributes to successful implementation of quality management systems in a firm. Along with employee training, employee involvement is also a pre-requisite for a successful QMS. Employee involvement is defined as 'to empower employees, to provide them information, to upgrade their knowledge and to provide remuneration for quality performance' (Oliver, 1988, as cited in Kanapathy 2008). Employee involvement can be achieved only if there is employee empowerment. Kanapathy (2008) cites Stoner, Freeman and Gilbert (1995, p.277) who define empowerment as 'the act of providing authority, knowledge and resources to individuals so that they can achieve work objectives'.

The improvement of patient safety requires a conscious effort to change our current systems and attitudes, such that safety interventions become rooted within healthcare organizations and are used more effectively by expert teams that have clear understanding of their tasks and roles. Along with improvements associated with biomedical advances, improvements in the human factors and team working aspects of healthcare are necessary to bring about any significant improvement in patient outcomes (Sevdalis & Hull, 2012).

The entire health care team should be trained in communication, teamwork,and situational awareness. For example, anaesthetists providing care to patients must be prepared to deal with unexpected events and emergencies—including anaphylaxis, myocardial infarction, unexpected profound blood loss, embolism, and numerous other intra operative crises that arise without warning(Sevdalis & Hull, 2012).

Human factors

Human factors issues are major contributors to adverse events in health care. Human factors is a discipline that spans engineering, cognitive psychology, and ergonomics and emerged specifically in response to the safety concerns of high-risk industries. Although it involves a lot of theory, it has a practical importance, always aiming to bridge the gap between theory and application(Vincent, et al., 2004). OT-sysytem approach Vincent charlesIt seeks to optimize the relationship between technology and humans, applying information about human behaviour, abilities, limitations, and other characteristics to the design of tools, machines, systems, tasks, jobs and environments for effective, productive, safe and comfortable human use.

In the context of health care, human factors can have serious and sometimes fatal consequences. It is important to recognise the places or instances where errors are likely to occur and devise systems and approaches in order to avoid them or to minimize their occurrence and effects.Human beings differ from machines. Compared to machines, humans are unpredictable and unreliable, with a limited ability to process information. But, they have their own thought process, they are innovative, resourceful, self-aware and flexible in their thinking. The human brain is very efficient at discerning between important and unimportant information and making sense of things. This makes it easier for them to handle some of the complicated and unclear design of some aspects of the workplace like the physical layout, equipment placement etc.At the same time, human brain is also distractible, which is both a strength and a weakness. It is due to distractibility that humans notice when something unusual is happening. Hence they can recognize and react to circumstances quickly and adapt to new situations and new information. Distractibility predisposes humans to error. The loss concentration while performing an important task leads to the incidence of errors. Another human factor which predisposes to error is limited memory

capacity which is further reduced by tiredness, tension, hunger, illness, language or cultural factor.

Encountering situations like newness of the assigned task (without supervision), inexperience of the job at hand, shortage of time, inadequate checking , poorly designed procedures and poor human-equipment interface increase the chances of error (WHO, 2012). According to the WHO bulletin on Patient Safety (WHO, 2012), the acronym IM SAFE (illness, medication, stress, alcohol, fatigue, emotion) that was developed in the aviation industry is useful as a self-assessment tool to determine whether a health-care professional is fit for work. The bulletin suggests putting knowledge on human factors into practice such as applying human factors thinking to the work environment, avoiding reliance on memory, making things visible, reviewing and simplifying processes, standardising common processes and procedures, routinely using checklists and decreasing reliance on vigilance (WHO, 2012).

As mentioned earlier, preventable errors are often not related to failure of technical skill, training, or knowledge but represent cognitive, system, or teamwork failures. Nontechnical skills such as communication, cooperation, coordination, and leadership are critical components of teamwork. The lack of these interpersonal skills often lead to adverse events and errors. In a review of litigated surgical outcomes, communication failures accounted for 87% of the system failures that led to an indemnity payment. The communication failures occurred primarily between caregivers, rather than between caregiver and patient. Failures in teamwork that lead to the disruption of surgical flows have been noted at a rate of 17.4 per hour in one cardiac surgery study and at11 per case in another by Wahr et al. (2013). Such disruptions add up, leading to technical errors and adverse patient outcomes.(Wahr, et al., 2013)

Surgical team members vary in their awareness of their own and their colleagues' teamwork skills. In multiple studies, there is a large variation between self-

assessment of communication and teamwork skills by surgeons and anaesthesiologists and their associated nursing and perfusion staff. Surgeons rated the teamwork of other surgeons as high/very high 85% of the time, but nurses rated their collaboration with surgeons as high/very high only 48% of the time. Objective assessment of teamwork skill highlights differences between skill level of team members and can indicate an area where education and training is required (Wahr, et al., 2013).

Assessing non technical skills such as teamwork is difficult and requires observational and often seemingly subjective assessment by experts. Five measurement tools, each with its own strengths and weaknesses, have been designed for surgical team and sub team skills: the Observational Teamwork Assessment for Surgery (OTAS), the Oxford Non-technical Skills (NOTECHS), the Non-Technical Skills in Surgery (NOTSS), the Anaesthesia Non-Technical Skills (ANTS), and the Scrub Practitioners' Non-technical Skills (SPLINTS). Of these 5, NOTSS, ANTS, and SPLINT are designed to assess the individual nontechnical skills of surgeons, anaesthesiologists, and scrub practitioners respectively, whereas OTAS and NOTECHS are specifically designed to assess team behaviors and skills. The OTAS includes a task checklist and a team behaviours assessment. It has good construct validity (ie, it actually measures what it appears to measure) and strong reliability between expert observers but weak reliability between expert and novice observers, which indicates that training of observers is required.

The surgical NOTECHS was directly adapted from an aviation NOTECHS scale and measures skills in 4 domains (cooperation/teamwork, leadership/management, situational awareness, and problem solving/decision making) some research teams have added communication/team skills. The NOTECHS has good reliability between expert and novice observers, has been

used to show improvement in non-technical skills after training, and has been used to show significant inverse correlation between technical errors and Nontechnical score. There is good correlation between then TECHS and OTAS scores when used in parallel; both the OTAS and the modified NOTECHS have been found to be construct valid(Wahr, et al., 2013).

Operating Room Management Attitudes Questionnaire (ORMAQ) is an extensively used attitudes questionnaire with surgical teams to examine surgeons' non-technical skills. This is adapted from an instrument measuring safety attitudes in aviation and is used to determine the attitudes of operation theatre personnel towards behaviour related to teamwork and safety (Flin, et al., 2006).

The American Health Association's scientific statement on Human factors and teamwork in a cardiac operating room describes the role of 6 C's in communication among teams. These C's are: communication, co-operation, coordination, cognition, conflict and coaching (Wahr, et al., 2013).

Communication

Communication is "the exchange of information between a sender and a receiver." In the Operating Room, several individuals interact with each other at the same time. Breakdown or delays in communication amongst the involved persons puts the safety of patient at risk. Amongst the 5 aspects of teamwork behaviour in the Operating Room, Wahr et al (2013) reported communication skill to be the worst. Miscommunication can occur in several ways. For example, when the source d livers a message imprecisely (eg, by using ambiguous or incomplete language),when the receiver decodes the delivered message in an incorrect way, or when the data is given at the incorrect time to the wrong individual. Improper communication is the main cause of error and adverse outcomes in both general and cardiac surgery. Many a times, teams

unacquainted with each other work collectively on a case. In such instances the communication gap is worse. Communication gap in the operating room may be assigned in equal measure to timing, content (erroneous or missing data), purpose, and audience (delivered to or received by the wrong person).A supportive and safe climate of the organisation encourages effective interaction which is open, adaptable, accurate, and concise. When open communication occurs, the activities are performed in a well- coordinated manner. Adaptable communication shows that team members understand each other and adapt to one others' workloads, and accurate communication promotes efficiency .It has been shown that there is a strong positive correlation between effective communication and improved team performance/outcome in high risk areas such as cockpit crews, navy teams, and surgical teams.

Effective communication is the mainstay of fundamental team processes, such as coordination, cooperation, cognition, coaching, and conflict resolution(Wahr, et al., 2013).Joyce A Wahr-Halverson et al., (2011) reported that communication failures related most frequently to equipment updates and keeping team members informed on the progress of an operation. These failures could lead to procedural delay and inefficiencies. They suggested that a training program that teaches teamwork and communication skills is one strategy that could improve communication among members of the operating room team. A place like operation theatre where in a highly sterile environment multidisciplinary team works on patients. In such an environment a proper flow of information is essential. WHO surgical safety checklist enhances the team participation and communication during the procedure.

Cooperation

Cooperation is the essence of teamwork and includes the feelings, mind-sets, and views that have a bearing on our conduct. Wahr et al. (1997) reported that the most widely studied attitudes include collective efficacy(a collective sense of proficiency), team orientation(a preference for and belief in teamwork), cohesion

(an allegiance to the team, its job, or both), mutual trust (a shared belief that all will contribute to and protect the team), adaptive performance, psychological safety and team empowerment (the feeling that team members have the authority to control their work and environment). Team members work hard and are prepared to take more risks when there is collective efficacy in the team. By doing so, the members get a feeling of satisfaction. At the same time it leads to better performance/ outcomes. High level of trust within a team results in a lesser need to monitor each other and a high level of commitment to performance as well as the organisation. (Wahr, et al., 2013).

Coordination

In the operating room, coordination of inputs from multi-disciplinary participants is of prime importance. Cooperation between departments or disciplines is enabled by avoiding hierarchical or formal power structures, acknowledging that all disciplines as equally important to a case, recognising collective responsibility as a team and working towards achievement of group goals. (Plasters, et al., 2003).Coordination requires a good rapport among team members and is essential for successful team performance. It is, essentially, “orchestrating the sequence and timing of interdependent actions.” (Wahr, et al., 2013). For proper coordination among team members, it is essential that all team members have a clear understanding of the job at hand, the environment, and individual roles and responsibilities within the team. When there is proper coordination among team members, the members can foresee each other’s actions and needs without explicit communication, which in turn increases efficiency. Mutual team understanding allows team members to provide help, information, and feedback, which allows the team to modify structures and processes without hampering performance. The ability to visualise a situation beforehand is essential for effective teamwork and performance, especially in the operating room where stressful situations are a routine. Coordinated behaviour results in actions and tasks being performed in synchrony and does not result in a wasted effort. Means

of improving coordinating behaviours include team training in coordination and adaptation, providing information updates, and delegating responsibilities appropriately. Improving the understanding shared among team members enhances coordination and performance (Wahr, et al., 2013).

Cognition

Cognition refers to the team's collective knowledge about the roles, responsibilities, and capabilities of each member. The more the team members work and interact with each other, the more the understanding improves. When a team member begins to foresee what the other team member will need next, the team coordination improves. With dynamic situations cropping up in the operating room every instant, it is important for team members to have a common understanding of the surroundings, in order to resolve the problems. Teams lacking in shared understanding have reduced coordination, which leads to poor performance. Several intermediations have been suggested to enhance team cognition, which include reflexivity training (ie, guided reflection of strategies used by the team), cross-training (i.e, training all team members on the tasks and duties of other members as well),and simulation-based team training.(Wahr, et al., 2013).

Conflict

Conflicts are disagreements among individuals. They are normal as any two individuals cannot be expected to agree on everything at all times. They can be related to assigned tasks, relationships, or processes. Since Operating room conflicts are inevitable, learning to deal with them in a healthy way is crucial. Successful conflict resolution requires mutual respect among surgeons and anaesthesiologists and other nursing staff, careful listening, adherence to issues,

recognition of differences and acknowledgment of the emotional aspects of the disagreement. (Attri, et al., 2015)

Communication among team members is the mainstay of conflict resolution. Conflict can have constructive as well as destructive repercussions. Task or process-related disagreements results in constructive discussions which help to improve group performance in resolving non-routine problems and in group decision making. At the same time, relationship based disagreements can lead to ego clashes between subordinates or coordinates. This can have a profound negative effect on both group performance and individual satisfaction and the member may no longer be comfortable being a part of the group. Whenever there is conflict in the operating theatre, the leader needs to take charge and address it through coordination and reconciliation rather than trying to avoid it. When the conflicting parties are unequal in status, whereby one member has greater power or seniority, such as physicians with nurses or an attending physician with residents it is difficult to resolve the argument amicably.

Wahr et al. (2013) reported that 73% of operating theatre personnel opined that disagreements in the operating theatre are resolved appropriately, but 29%stated they would have trouble speaking up if they felt a problem with patient care, and 41% felt unable to express disagreement. Certain tasks or functions may be seen as crucial to achieve task goals by physicians. The same may be viewed as unnecessary and belittling by subordinates. It is human nature for every individual to finds one's own behaviour as appropriate and fail to see others' point of view. When videos of conflict scenarios were shown to teams in training sessions, surgeons, anaesthesiologists, and nurses accorded a similar rating to the tension levels portrayed in the videos but rated their own profession as having relatively less responsibility for creating or resolving the tension. The 7-step model, principle-based conflict resolution, and advocacy/inquiry are some of the methods of conflict resolution reported in the literature. It is possible to teach effective conflict management techniques for amicable conflict resolution. Such techniques constitute an important component of most team-training methods

(Wahr, et al., 2013). OT Steps suggested by Attri et al. (2015) required to be taken to resolve a conflict include: anticipating conflict and being prepared with clearly articulated policies and procedures for technical matters, identifying the source of conflict, remaining non-judgemental while resolving a conflict, maintaining communication and avoiding conflict in public.

Coaching

Team coaching is defined as "direct interaction with a team intended to help members make coordinated and task-appropriate use of their collective resources in accomplishing the team's work,"(Wahr, et al., 2013),p.1144). It helps underachievers to upgrade their skill set. Average performers can enhance their skills so that they can be star performers in future. Armour et al. (2011)provided the Team STEPPS program, a team training program designed and tested for health care applications, to the OR staff. The training occurred over 2 months to all members of the OR team, including scrub technicians, nurses, certified registered nurse anaesthetists, anaesthesiologists, surgeons, and all anaesthesiology and surgical resident staff. The data generated confirmed that team training improved OR performance and reduced mortality but continued team training was required to provide sustained improved OR culture. (Armour, et al., 2011). A similar result was obtained in a detailed analysis of 4863 cases by Wolf et al. (2010) to study the efficacy of medical team training where training produced sustained improvement in OR team function, including decreased delays and improved case scores. (Wolf, et al., 2010)Gillespie,et al.(2010) has conducted a systematic literature review of 12 studies to critically assess the results of team training interventions used in the operating room and found before-and-after implementation improvements in team practices and complication rates.

Coaching involves getting to the root of problems and resolving them through discussions among team members. As a result of coaching, relationships among team members tend to improve; there is improved individual satisfaction, emotional security and safety. Leadership coaches can teach ideal behaviours to leaders, provide constructive inputs to improve the performance of the group, and encourage communication among team members without any inhibitions. Intra team coaching involves such behaviours as providing advice, suggestions, guidance and instructions, calling attention to potential error, and confronting members who break norms. However, these coaching behaviours are of use only when members of the group are sporting and willing to listen to suggestions and constructive criticisms for their betterment(Wahr, et al., 2013).

Rydenfalt (2014) observed that operating team in a operating room is not always unified as may be apparent. Team members from different disciplines may have contrasting views which can create stressful situations in the team. She suggests a complementary alternative to the popular team training approach to improve teamwork in *Organizing for teamwork*. The three organizational principles of team stability, occasions for communication and an adaptive approach to leadership are identified as important in order to organize for teamwork. As teamwork is associated with patient safety, this can potentially have implications for patient safety as well. (Rydenfalt, 2014)

Self-knowledge

Micken (2000) cited Belchert et al (1987) that individuals need to be independent and self-aware before they can be satisfied, productive and respectful of others. According to Horwitz (1970), each individual contributes four images to a team in a healthcare setting, which are : a personal and professional self-image, professional expectations, an understanding of colleagues' skills and responsibilities, and a perception of colleagues' images of the individual. Of these four images, Maple (1987) suggested that the professional's self-image was the

most influential in team members understanding and interacting with each other. (Mickan & Rodger, 2000)

Trust

The ability to trust originates from self-knowledge and expertise and experience. Individual team members differ in their technical expertise levels, beliefs and priorities. Working together for a considerable time helps to develop faith in each other's functional capabilities and dependability. Once trust is established, individuals are open to sharing their expert knowledge and skills as they do not fear being diminished or exploited. Teams in which members trust each other show reverence for one another's skills and know-how. When healthcare professionals discuss their professional values and standards with an open mind, they can cultivate mutual respect. When team members acknowledge and praise the unique skills and contributions of each other to coordinated patient care, the trust among them strengthens. (Mickan & Rodger, Charateristics of effective teams: a literature review, 2000)

Commitment

Commitment rests on self-knowledge and an ability to trust others. Self-knowledge understands of one's own capabilities, personality, feelings or inspirations. Commitment to common team goals and values provides direction and motivation for individual members. Committed members show an increased feeling of responsibility for and participate in the team's work. Mickan & Rodger (2000) cited Goleman's (1998) emphasis that committed individuals were willing to make short term personal sacrifices, believing that they could generate a greater good. High levels of commitment enabled individual team members to perform well in spite of challenges and pressures that may otherwise be perceived as stressful. Healthcare teams have a common goal of patient care and they all agree that team work is the only way to provide this comprehensive and coordinated care. Committed individuals are more willing to invest personally

in the team, contribute to the decision making and respect the balance of interdependence and collaboration (Mickan & Rodger, 2000).

Flexibility

Flexibility is the ability to maintain an open attitude, accommodate different personal values, be receptive to the ideas of others and adjust to different situations. Flexibility requires honesty, self-knowledge, reflection and regulation. In healthcare teams, individuals need to understand and accept role overlap and be supportive in assisting teammates to meet patients' needs. Many a times, in the operating room environment, professional values, identity and frames of reference often require flexibility in response to policy and resource changes (Mickan & Rodger, 2000). Effective team characteristics

2.3 Strategic Quality Management Planning & Process Management

The implementation of QMS requires strategic planning. Various guidelines are proposed by the different accreditation organization for developing a system of quality management.The guidelines proposed by NABH about operation theatre and surgical procedure (NABH COP13,14,15 Chapter) hospital should have documented policies and procedures that guide the care of patients undergoing surgical procedures. These include preoperative assessment and a provisional diagnosis documented prior to surgery, preoperative consent by operating surgeon, use of surgical checklist, proper qualification of operating surgeon and staff, operation notes with name and sign of operating surgeon and post operative care plan. The quality assurance programme includes surveillance of the operation theatre environment including the daily monitoring of humidity and temperature; at least monthly monitoring of pressure differential, at least six monthly monitoring of the integrity of HEPA filter and monitoring the efficacy of OT cleaning and disinfection processes.

In 1931 Shewart came up with the concept of laying emphasis on processes rather than products. Since the early 1980sprocess management as an explicit concept has been in limelight. Hammer &Champy (1993) introduced the idea of Business Process Re-engineering, which they defined as “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed” (p. 32), which once again gave process management a boost in popularity. Although scholars are divided on the appropriateness of such a radical approach as Business Process Re-engineering, they concede that process management holds promise for organizations. (Palmberg, 2010 as cited by Rehder, 2012).

Palmberg (2009 as cited by Rehder, 2012) discovered that there is no common definition of either a process or process management. From an extensive literature review she defines a process as “a horizontal sequence of activities that transforms an input (need) to an output (result) to meet the needs of a customer or stakeholder” (Palmberg, 2009 as cited by Rehder 2012,p. 207).

Classification of processes can be done in several ways. According to one classification, processes are of two types: core processes and support processes. Core processes are related with the strategic objectives and competitive advantages of an organization and are targeted towards external customers. Supporting processes on the other hand are targeted towards internal customers and enable the core processes to be executed as planned (Rehder, 2012).

In case of the healthcare sector, processes can also be classified as standard, routine and non-routine processes. Standard processes are repeated in exactly the same way over and over again. They can be clearly defined and demand compliance with the specifications. Routine processes are a little less static, as they are also repeated often but with small differences in the execution. Usually one option to proceed can be chosen from several different ones depending on the

situation. Clinical guidelines containing these options and the decision factors can be used here.

Non-routine processes are processes that occur only once (or very few times) and that demand an approach based on interpretation of symptoms and the experience and intuition of the employee(s) dealing with the task (Rehder, 2012).In an OT complex where perioperative care means care of patient in preoperative phase, Intra operative phase and post operative phase are routine process. OT related healthcare professionals should be trained about theses care process and related quality management protocols. Due to the involvement of multi disciplinary staff there may chances of variation in the process. In such situation protocols, SOPs play an important role and minimize the variations in the outcome.

Process management is important because the processes in the organisation lay the foundation for the organizational structure. In other words, the main features of the organizational design are business processes that encompass different functions. Along with functional and product orientation, processes make up the organizational structure. (Rehder, 2012).process management -hospital

In order to focus on processes, the organization needs to be divided into organizational units, each of which handles a singular process as completely as possible and which have minimal interaction between one another, reducing the coordination costs. Within the units, interdisciplinary teams make sure that the tasks are fulfilled autonomously without management involvement. Compared to a functional organization, the employees have a higher level of autonomy and handle more diverse tasks (Rehder, 2012).Decentralisation is a very important aspect of process management. It means that the decisions are taken by the same people who are affected by it. This achieves a dual purpose of quick decisions as well as higher employee satisfaction and motivation. This can be done by making each organisational unit as a profit centre and associating remuneration to certain performance indicators, either individually or in a group.

The different units are then responsible for their own profit but also have the power to make decisions influencing it. Employees can feel challenged and empowered and usually enjoy their work more than when someone just tells them what to do all the time (Rehder, 2012).

Another vital aspect of process management is the focus on customers. Customer expectation is the starting point to develop holistic structure for fulfilling those expectations. Only those tasks that actually add value to the final product may be considered, because focusing on what the customer wants brings considerable quality improvement to the organization (Rehder, 2012).

- Palmberg (2009 as cited by Rehder,2012) has identified several reasons for implementing process management which are reproduced here:
- Controlling and improving the processes of the organization
- Improving the quality of products and services
- Removing barriers between functional groups and bonding the organization together
- Identifying opportunities for outsourcing and the use of technology support for business
- Improving the quality of collective learning within the organization and between the organization and its environment
- Aligning the business processes with strategic objectives and customer needs
- Improving organizational effectiveness and improving business performance
- Understanding core processes in order to continue to operate effectively and gain competitive advantage
- Gaining back market shares and increasing employee satisfaction (Rehder, 2012)
- Similarly, the results obtained from implementing process management are stated as follows:

- Genuine understanding of what quality is for the customer and how each employee contributes to it
- Improved customer satisfaction and increase in customer base
- Common language and standardization of tasks within the organization and a more holistic view of the organization
- Higher efficiency
- Decreased costs (in various areas of the organization)
- Higher quality of work
- Shorter throughput times and higher delivery accuracy
- Better learning process in the organization
- Better financial performance as a result of many of the other outcomes.

Rydenfalt (2014) points out that the WHO Surgical Safety Checklist to improve patient safety, is not actually used in reality in the manner in which it should be. She fears that this could lead to new risks if its correct usage is taken for granted and other behaviours are adapted accordingly. The perceived importance of different Checklist items and the conception of risk among its users should be considered in future efforts to improve Checklist usage as a part of process management. (Rydenfalt, 2014)

Process management is a very broad concept that can be used for different objectives and has high potential in several areas. However, in order to reach its full potential, process management has to be implemented correctly and maintained adequately in the organization (Rehder, 2012).

2.4 Infra-structure and Technical support

The Oxford Dictionary defines infrastructure as the basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise. In the Operating Room, the environment comprises the physical space, the equipment, and the people (staff and patients). Ergonomics, is defined as “an appliedscience concerned with

designing and arranging things people use so that the people and things interact most efficiently and safely" (Wahr, et al., 2013).cardiac OT-human factors Improper ergonomics of room and equipment is primarily responsible for flow disruptions that may lead to technical errors as well as surgical-site infections(Wahr, et al., 2013).

Both the size and layout of the OR can influence safety. If the operating room is very small, equipment occupies most of the space and very less space is left for staff to move around to do their task. Equipment that is not properly arranged with wires hanging loosely come in the way of hospital staff from approaching the patient quickly and safely. Conversely, if the operating room is excessively large the staffs has to cross longer distances resulting in loss of time which is very crucial in operations.

An ideal layout of an operating theatre should have beds for pre-op holding, separate changing rooms for both sexes, scrubbing area, fully equipped operating rooms, waiting zone for patient's relatives, storage area, collection area for medical waste and used linen and patient recovery room. Along with the equipment used for anaesthesia and surgery, other equipment which may be required in case of an emergency should be readily accessible in the operating room. According to universal guidelines and guidelines proposed by NABH an operation theatre complex should have zoning so unidirectional flow will be maintained.

The top hospitals provide support to their physicians, nurses and other staff by providing computerised data systems and appointing qualified staff to abstract medical records of the patients analyze data, and help in the process of quality improvement. Information and data tools play a critical role. They also provide access to the latest guidelines and protocols. Sessions on continuing medical education, conferences and peer networking are promoted to keep the hospital staff aware of the latest developments. Meyer at al. (2004) reported that the best performing hospitals commonly employed IT strategies with four main commitments: a desire to invest in IT; to design a customised information system

in consultation with the users i.e the physicians and staff which will fulfil their specific needs and fit in the culture of the organisation; encouraging the purchase of new software and systems; and conceiving IT systems that provide real-time feedback to providers (including access to patient history, test results, computerized reminders,etc.) as they are caring for patients.

The kinds of quality-related IT investments that some hospitals have made or are in the process of making include:

- Changing to a paperless system that provides real-time data of all the departments(e.g., electronic medical records, e-hospital notes with input at bedside);
- Converting to bar-coded medications and automatic dispensing;
- Matching patient admissions with bed capacity, immediate tracking of filled beds and daily changes in nursing needs;
- Using electronic dashboards linked to patient records that alert staff to test results and unresolved issues;
- Enabling physicians to view imaging results and other test results on a PC in hospitals and in their offices;
- Investing in Computerized Physician Order Entry (CPOE) and other types of decision support software to remind physicians about procedures or tests that are indicated and to reduce medication errors (e.g., through alerts about potential dosage errors and drug interactions);
- Providing clinicians with computer access to up-to-date scientific and medical literature summaries on specific diseases, procedures, etc.;
- Developing management tools for monitoring and comparing performance of physicians, units, procedures, etc. (Meyer, et al., 2004)
- Efficient in-house processes are developed in some hospitals which accumulate data on outcomes and cost and provide statistics on surgeries, tests, and other procedures to identify gaps in the process where there is scope for improvement. The staffs of Quality Improvement departments are trained to identify problems and resolve them with the

help from physicians. The shortcomings or problems are not overlooked, but are subjected to scrutiny to come up with solutions and accountability. Implementation of corrective action leads to improved efficiencies and reduced errors related to standardization of supplies and procedures. (Meyer, et al., 2004) QMS-Success ingredients

2.5 Healthcare professionals' willingness to participate in Quality Improvement

It is a difficult task for hospital leaders to create clinical involvement in quality improvement programmes. Hospital staff consider QI activities a burden, without proper prior introduction of QI concepts. Physicians are not very keen on being a part of QI projects due several reasons. Firstly, if the top leadership is not open, then their motives are looked at with a certain amount of mistrust. Secondly, any quality improvement programme involves filling forms and recording observations which is time consuming and monetarily non-rewarding. Thirdly, physicians fear that introduction of standard procedures will take away from them the liberty to vary clinical care as per individual patient's requirement. Clinical personnel play a central role in resource allocation decisions. Hospital leadership needs to think of tactics to enhance the participation of physicians in QI in order to fully harness the benefits of quality improvement programmes. (Weiner, et al., 1997).

Clinical involvement in QI means the physician activity, clinical department activity as well as the use of quality of care data for quality improvement. When physicians attend formal QI training or are a part of QI project team, they are assumed to be involved in quality improvement programme. Conducting QI training programmes reflects the organisation's resolve to move towards enhancing the quality of service being provided.(Weiner, et al., 1997).

In a hospital setting, when an adverse event or error occurs, accusations are made on the health-care professionals looking after the patient at the time.In a fit of rage it is natural to point fingers, but doing so does not improve the situation, only worsens it. No health-care professional would deliberately harm a patient. Deliberate action would be a violation. If any healthcare professional becomes associated with an adverse event, then his or her career is jeopardised. As a result, health-care professionals try to cover up adverse incidents/errors. When a blame culture exists in a health-care organization, it will not learn from the mistakes made, resulting in repetition of the same errors in future also. Adopting a systems approach and getting to the root cause of an error or adverse event will enhance the involvement of healthcare professionals in the QI programmes (WHO, 2012).

Although physicians may be economically and organizationally independent of the hospital, they are sensitive to the messages that are conveyed by hospital management. Physicians may respond more positively to CQI/TQM when senior managers demonstrate through words and deeds that the hospital is committed to providing high-quality medical care. By leading through example, senior managers build credibility and trust with clinical staff, which in turn, may spur greater clinical involvement in CQI/TQM. Further, by creating a corporate culture for quality, senior managers may encourage clinical staff to initiate or participate in quality improvement projects. Physician leadership is a key factor influencing clinical acceptance and involvement in CQI/TQM. Hospital leaders can extract dedication from physicians in the CQI/TQM effort by training them early and involving them from the beginning. Physicians may demonstrate leadership for quality by providing inputs in strategic planning, policymaking, and related governance activities. By participating in governance, physician leader scan model the hospital's vision of quality and directly participate in discussions on cost-quality trade-offs. The active participation of physicians in governance may enhance interaction among physicians, managers, and boards, and also

build trust by assuring clinical staff that their professional values and goals are represented in policy decisions. Hence, involvement of physician leaders in governance may increase the acceptability and participation of clinical staff in hospital CQI/TQM efforts (Weiner, et al., 1997).

2.6 Quality Management System and External force

With increasing consumer rights awareness among laymen, hospitals are under pressure for accountability, transparency and providing equitable healthcare to all strata of society.(Wagner, et al., 2006).

In recent years, the attitude toward quality management in healthcare has undergone a dramatic transition. Quality measurement and improvement have now risen to a much higher stature, and, in the case of some health care provider systems, have assumed a position at center stage in strategic planning. In other situations where quality measurement has not been fully embraced, its potential for impact has gained a healthy respect from providers. This new acceptance of quality management has been the result of improved science in outcomes measurement and demand by payers to make health care providers accountable for outcomes. There is a market driven demand for health care quality (Shulkin, 1997).Patient satisfaction has gained importance. Although most patients are not medical experts, Wagner et al. (2006) point out that they have enough good sense to precisely narrate their experiences with the health care system (or lack of it) ; they cite the example of one study which established that consumers correctly reported 80-94% of history and physical elements that were performed during a health examination. Collecting patient satisfaction information also provides a fair insight of the design and management of the health care system. Also, in the healthcare industry, patient experiences are very important because the trust and interpersonal relationship between a physician and patient is the foundation of a successful hospital. Patients who do not have pleasant interaction with the physicians tend to change them and their health plans frequently, resulting in a disruption of their care, delay in getting the required

care and poorer health outcomes. For all these reasons, patient satisfaction measures are valuable, and sub-optimal ratings are cause for concern. (Teleki & Damberg, 2003). All these factors compounded together have resulted in the development of several accreditations, specific to the hospitals.

Accreditation is a type of self-assessment and peer review with the intention of improving the quality of service (Wagner, et al., 2006). Accreditation is beneficial to all the stakeholders. It stimulates continuous improvement in a hospital. It enables a hospital to demonstrate commitment to quality care. It increases the trust of the people in the services offered by the hospital. It also provides opportunity to the healthcare unit to benchmark with best. The staffs in an accredited hospital is a satisfied lot as it provides for continuous learning, a good working environment, leadership and above all ownership of the clinical processes. Finally, accreditation provides an objective system of empanelment of a hospital by insurance companies and other third parties e.g corporate for the medical care of their employees. The data regarding the infrastructure, facilities offered by the hospital and the level of care is freely available to the general public for making a choice, for the hospitals which are accredited.

Competition from other hospitals is also a major factor driving quality in hospitals.Economists is of the opinion that competition helps to streamline management and improves productivity.(Bloom, et al., 2010)

Quality is a strategic differentiator tool for sustaining competitive advantage (Mosadeghrad, 2014).Bloom et al. (2010) examined the causal impact of competition on management quality in public hospitals of UK. They found that management quality is strongly correlated with financial and clinical outcomes such as survival rates from emergency heart attack admissions. More importantly, they found that higher competition (as indicated by a

greater number of neighbouring hospitals) results in increased management quality.(Bloom, et al., 2010)