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Teamwork in a Surgical Department

Nikolai Ramadanov

Abstract

Teamwork is essential in surgery. A surgeon alone cannot fulfill his daily tasks. Surgical departments are divided into surgical teams: the surgical team in the operating theater, the surgical ward team, and the surgical emergency team. The common task of those teams is adequate patient care. The characteristics of team members describe necessary abilities such as: open communication, effective coordination skills, collaboration willingness, interdependency, mutual performance monitoring, backup behavior, adaptability, team orientation, and personality type. Team processes are recurring and ongoing short-term courses that occur in the team. The team developmental model separates the development of a team in four stages over a longer period of time. In the last stage, the team reaches the highest level of teamwork performance. Each team must be assessed for their nontechnical skills with team measurement tools. Surgical teams are insufficiently measured. There are possible disadvantages in teamwork, which must be considered and discussed versus the obvious benefits. Leadership is a process where the leading team member sets the direction for the others. There are different styles of leadership, whereby the dominant role of the leader is more or less pronounced. Leadership and teamwork are not contradicting characteristics of teams in the surgical department.

Keywords: teamwork, surgical department, leadership, surgical ward, operating theater

1. Introduction

Surgery is a major medical specialty that uses manual techniques to treat a pathological condition in patients. The classic surgical department of a hospital requires operating theaters with a professional surgical team to perform operations. A surgical team is made up of a surgeon, a surgeon's assistant, an anesthetist, a nurse anesthetist, a circulating nurse, and a surgical technologist. The surgical ward is occupied by those patients who have already undergone surgery, as well as those who are about to or might undergo surgery. These patients are cared for by the surgical ward team. A surgical ward team is composed of at least one surgeon and one surgical ward nurse. Furthermore, the classic surgical department often provides physicians for the treatment of emergency patients in the emergency room or supports emergency physicians with consultations in surgical emergency cases. Teams are obviously essential in all areas of the surgical department, since a single surgeon without additional personal support cannot work effectively.

2. Collaborative effort of a team to achieve a common goal

The collective effort of a group of people, a team, to achieve a common goal is called teamwork [1, 2]. Teamwork is used in any aspect of life where a group of people are working together for a common goal [1, 2]. Teamwork is commonly applied in sports, in industrial organizations, in school, in political parties and healthcare system. A team consists at least of two members. The team size is fixed, or it can vary depending upon the phase and complexity of the common goal. Still, every member must have a defined role within the team in order to be productive and to have a clear purpose within the team [3, 4]. The level of teamwork varies from low to high depending on the aspect of life it is applied. For example, soccer requires a high level of teamwork, whereas tennis requires significantly less teamwork. Good teamwork is linked to improved patient outcomes, better medical staff satisfaction and a reduced incidence of burnouts [5–7]. On the other hand, worse teamwork is linked to poorer patient outcomes due to adverse events, lack of coordination and higher costs [8–10]. Improvement of teamwork ability in operating theaters leads to reduced technical errors [11] and lower perioperative mortality [12]. However, most medical workers lack adequate training in teamwork in healthcare [13]. Some authors call for an emphasis on teamwork training in medical education [14]. In contrast to teamwork in acute cases, teamwork in nonacute patient cases is rarely trained. As chronic diseases place an increasing burden on health systems [15–17], the lack of team training needs to be adapted for long-term treatments [18].

Over the past decade, the efforts to perform better surgical performance increased [19]. Expectations for more transparency from operation results [20], better patient satisfaction and error reduction are rising [19]. In the context of our ongoing strive and expectations to improve health care, the facts paint a troubling picture. Operating theaters are a challenging area in the surgical department where human error can cause a great iatrogenic harm in a hospital [21, 22]. These unintentional adverse events have been reported to be up to 11% in British hospitals [23]. In 1999 the US Institute of Medicine estimated that 44,000 to 98,000 deaths occur in US hospitals annually, at least partially due to avoidable adverse events [24]. Up to two thirds of these events are due to surgical care [25, 26]. Communication errors have been identified as one of the main causes of these adverse events [24, 27]. Furthermore, e.g. it was reported that medication errors in emergency medicine of up to 31.1% were caused by surgeons and internists [28]. Communication problems in the emergency teams are discussed as a possible cause of incorrect drug administration. There have already been successes. E.g. promoting safety checklists has enhanced patient outcomes and reduced errors by improving teamwork [29]. In surgery in particular, the World Health Organization (WHO) has drawn up a safety checklist to enhance teamwork [30]. The improvement of teamwork, that is, nontechnical skills, might be one possible approach to achieving these goals.

The following pages are intended to give the reader an overview of teamwork in the surgical department. This chapter will clearly define the functions of the team members as well as different team constellations. It will describe the main characteristics of the team members. It will explain the team processes and the team development model. It will propose measurement tools for evaluating teamwork. It will discuss the benefits and drawbacks of teamwork and the necessity of strict leadership in the surgical department. It will propose approaches for a better patient outcome by improving teamwork.

3. Teams in the surgical department

Teamwork is essential in surgery. A surgeon alone cannot adequately fulfill his daily tasks, neither in the operating theater nor on the surgical ward. Classic surgical departments consist of several different types of surgical teams with different tasks in everyday hospital life. The common task of those teams is the adequate care for their patients. In general, we can distinguish between three important teams. There is the surgical team in the operating theater, the surgical ward team and the emergency surgical team.

3.1 The surgical team in operating theater

The operating team in the operating room consists of a surgeon, an anesthetist, a surgeon's assistant, a nurse anesthetist, a circulating nurse, and a surgical technologist. There is a clearly structured hierarchy in the team in the order of the members just mentioned. The tasks of each member are clearly defined. The level of leadership is particularly pronounced in the surgical team in operating theater [31]. The work of the surgical team has a direct impact on patient outcome. The privilege and burden of decision-making is primarily focused on the surgeon. The overall environment in the operating theater, the performance and the collaboration between the individual team members largely depend on the behavior, knowledge and interpersonal skills of the surgeon. The level of stress in the operating room is much higher compared to teams in other areas of life. It is therefore of the utmost importance that every member, apart from the self-evident technical competence and preparation, has a high level of teamwork and reliability. The surgical team in the operating theater is a very well-coordinated and professional team. Beginners are subjected to a comprehensive and strictly controlled training until they reach the stage of being able to master their part of the task with confidence. Frequent changes to the members of the core team must be avoided. They negatively affect surgical performance [32]. Frequent changes of core team members must be avoided. They have a negative influence on surgical performance [32].

3.1.1 Surgeon

The surgeon is a physician with completed residency in surgery, who possesses all certifications required for practicing general or specialized surgery. He often is specialized in a particular area of surgery such as abdominal surgery, trauma surgery, pediatric surgery, vascular surgery, thoracic surgery, plastic surgery and cardiac surgery. The task of the surgeon is primarily to lead the operation and the surgical team. Furthermore, the surgeon needs to have full knowledge of the operational procedure and the instruments required. Especially the surgeon bears the responsibility for the successful outcome of the operation. Therefore, his leadership role in such an important team brings him advantages and a great burden at the same time.

3.1.2 Anesthetist

The anesthetist is a physician with completed residency in anesthesiology, who possesses all certifications required for performing narcosis and local anesthesia. The professional interest and responsibility of the anesthetist extends to the patient's overall health before, during and after surgery. In addition to ensuring a

painless operation, the most important task of the anesthetist is to monitor and maintain the vital functions of the patient during the operation. Constant collegial communication and feedback in both directions is absolutely necessary between anesthetist and surgeon. Criticism of communication difficulties comes from both sides.

3.1.3 Surgical assistant

The role of the surgical assistant is held by different members of the team. On the one hand, resident physicians assist in operations as part of their surgical training, on the other hand, this role can be assumed by registered nurse first assistants. The surgical assistant receives clear and unambiguous instructions from the surgeon. The participation of the surgical assistant must not be limited to a mere passive presence at the operating table. It is an active responsible assignment with constant communication with the surgeon leading the operation.

3.1.4 Nurse anesthetist

The nurse anesthetist is an advanced practice registered nurse. She supports the anesthetist before, during and after surgery. The nurse anesthetist receives clear and unambiguous instructions from the anesthetist. Constant communication and feedback with the anesthetist is absolutely necessary.

3.1.5 Surgical technologist

Surgical technologists are trained in numerous types of operations. They are able to assume the next steps in the operational procedure in order to provide the surgeon with the necessary instruments without delay. This helps the surgeon to focus adequately on surgery. The surgical technologists are registered nurses or other medical staff with an appropriate education. They receive clear and unambiguous instructions from the surgeon. Constant communication and feedback with the surgeon is absolutely necessary.

3.1.6 Circulating nurse

Circulating nurses take care of the procurement of instruments and surgical accessories. The circulating nurse receives from the surgical technologist or from the surgeon directly. Constant communication and feedback with the surgical technologist is absolutely necessary.

3.2 The surgical ward team

The surgical ward team consists of at least one surgeon and one nurse. The team is led by a surgical consultant or a surgical registrar [33]. The surgical registrar must have the guaranteed possibility to consult the chief surgeon for pending questions. This team conducts the daily ward round of the patients in the surgical ward and takes care of the resulting ward work. The surgical ward round is a complex process [33]. Sometimes it lasts several hours until all parameters in every patient case are assessed completely [33]. It is advantageous if the individual members of the surgical ward team do not change too often, e.g. for at least a week, as this will interrupt the continuity of the individual patient cases. Wound care, dressing changes and wraps must always be made by both the surgeon and the nurse. Otherwise mandatory hygienic rules and sterility cannot be adhered to. Once again,

constant collegial communication and feedback in both directions between surgeon and nurse is absolutely necessary for the team.

3.3 The emergency surgical team

During normal course of action in the emergency room, the emergency surgical team consists of a physician, who is a surgeon or an emergency physician with a background surgical consultant, and a registered emergency nurse. When treating polytraumatized patients, the general or trauma surgeon is the trauma leader. The shock room supply follows ATLS guidelines [34]. Since the polytraumatized patient is in life-threatening condition, the surgeon's leadership role becomes even more important than in surgical team constellations in other areas. Having the decision-making power, the surgeon bears the greatest responsibility for the patient's outcome. The surgeon depends on a competent and reliable team to achieve the common goal. However, teamwork is a key component to the success of the emergency surgery team.

4. Characteristics of team members

The characteristics of the team members describe necessary abilities, which are a prerequisite for the proper functioning of the team. A sufficient level of professional and technical competence and preparation is a matter of course. However, nontechnical skills are just as important for teamwork.

Open communication and effective coordination skills are required to avoid conflicts, confusion and overstepping boundaries or to resolve existing conflicts healthy [35]. Collaboration willingness is required to complete tasks on time and to share the workload fairly. Furthermore, a high level of interdependency is required to maintain trust, reliability and risk taking. Mutual performance monitoring describes the ability to understand the intentions, roles, and responsibilities of other team members [36]. In this way members can closely monitor performance of others for the purpose of common goal [37]. Backup behavior describes the ability to look after the needs of other team members and to ensure balance during times of increased workload [36]. Adaptability describes the ability of team members to adapt their work to feedback from other team members in order to achieve the common goal [38]. This characteristic requires flexibility. Every team member must be able to adequately response to changing conditions [36]. Team orientation describes the ability to prioritize team goals over individual goals and to respect different opinions [37, 39, 40].

The motivation of the team members has to be present and preserved. Clear and attainable goals must be set. Satisfactory education and career opportunities must be promoted for residents and other team members. Further requirements are the willingness to balanced member contributions, mutual support, effort, and cohesion [41]. The personality type of the team members is a characteristic that cannot be trained. It can only be adjusted to a certain extent. During the hiring of the team member, care must be taken to ensure that they complement and enrich the team and that their specific personality type suits the team. Unsuitable personality type constellation in the team has to be corrected by cancelation or rotations of team members. Here, a proven method of measuring teamwork in people wanting to join a team can help out. The knowledge, skills, and abilities teamwork test (KSA) was introduced in 1994 by Stevens [42]. In a 35-point test it assesses 14 individual KSA requirements for teamwork. The KSA focuses on team-oriented situations, which makes it suitable for evaluating teamwork and team-specific behavior, determining the level of teamwork and finding ways to improve communication.

5. Team processes in the surgical department

Team processes are recurring and ongoing short-term courses that occur in the team. The following specific teamwork processes are grouped into three categories: transition processes, action processes and interpersonal processes [43, 44]. Consciously going through these processes by the team leads to a general improvement in performance by improving collaboration, coordination, and communication of the team members [45]. Action processes occur when the team takes tangible steps to achieve their goals. The progress toward the goals is monitored by responsible team members. Transition processes take place between periods of action. During the transition process, the team assesses its overall performance. The team members give feedback to each other and try to improve the upcoming action process. The interpersonal process is an ongoing process in which team members have to communicate all their positive and/or negative opinions about other team members or about the team's performance.

6. Team developmental model

The team developmental model proposes to separate the development of a team in four stages over a longer period of time: forming, storming, norming, and performing [46]. There are different levels of teamwork in each stage. The forming stage is characterized by mistrust, lack of risk-taking, approach and avoidance attempts of the new team members. There is an internal conflict between members who seek their place among themselves. This stage has a low level of teamwork performance. The storming stage is the stage of deeper conflicts. There is competition for power and authority between team members. This stage has a varying level of teamwork performance, which is predictive for the future of the team. The norming stage is characterized by rising levels of interdependence, team spirit and reliability. This stage has a high level of teamwork performance. The performing stage is the last stage of team development. It is characterized by a satisfactory environment in which the team is able to accomplish its tasks most effectively and successfully. This stage has the highest level of teamwork performance.

7. Measuring and training of teamwork

Each team must be regularly assessed for their nontechnical skills. The causes of good and bad team results must be identified in the characteristics of the team members. Feedback must be given to all team members. The identified weaknesses or strengths in the characteristics of the team members can thus be corrected or promoted. To implement this task, tools had to be developed that allow nontechnical skills of a team to be measured. Numerous such measurement tools have so far been developed for teams in general and have been improved over time. With the increasing awareness that teamwork is fundamental to the outcome of surgical patients [47], progress has also been made in measurement of nontechnical surgical team skills over the past decade. However, experience shows that in practice surgical teams are insufficiently and inconsistently measured [47]. The possibility of training teamwork with serious improvement of the team performance is questionable. While some authors recommend regular team training [14, 48], a systematic review of literature from 2011 with 1036 identified relevant abstracts and 14 articles (four randomized studies and 10 nonrandomized studies) analyzed in detail came to the conclusion that evidence for the technical or clinical benefits of teamwork training in medicine is

insufficient [49]. Another systematic review of literature from 2018 stated that there is insufficient evidence to support the hypothesis that teamwork training interventions improve patient outcomes [19]. One could conclude from this that the personality type of the team members plays a very important role, as this is the main characteristic that can hardly be changed or trained. Candidates wishing to join the team must therefore be carefully screened for their suitability with the rest of the team.

7.1 Measuring tools for the surgical team

Current literature shows that teamwork disruptions, communication errors, cultural and hierarchical barriers lead to safety deficiencies in the operating rooms [50–53]. Furthermore, a systematic review of the literature from 2012 with 28 included studies showed a strong correlation between teamwork failure and technical errors during surgery [54]. A control instrument was required. Several tools have been developed to evaluate teamwork in operating theaters based on direct observation or video analysis [50, 55–63]. In a current systematic review of 2121 searched references and 14 studies included, two assessment tools were identified to measure effectively the nontechnical skills of the surgical team in the operating theater: The Observational Teamwork Assessment for Surgery (OTAS) and Operating Theater Team Non-Technical Skills Assessment Tool (NOTECHS) [47]. The criticism of both tools is that they rely on the questionable assumption that the team performance equals the sum of performances of the team members [47]. The Observational Teamwork Assessment for Surgery was introduced in 2009 by Sevdalis [55] and validated in 2010 by Hull [56]. OTAS consists of 15 items with a 7-point scale and assesses teamwork-related task checklists and teamwork-related behaviors [55]. The validity and reliability of the NOTECHS tool was demonstrated in live operating theater environments in 2009 by Mishra [57]. The tool was restructured and improved in 2014 by Robertson [57]. The new NOTECHS II tool offers a higher level of precision and a higher measuring sensitivity [58]. Another systematic review of iterature from 2015 with 25 studies included concluded that the Nontechnical Skills for Surgeons (NOTSS) assessment was the tool with the highest level of validity, reliability, and acceptability [64]. The NOTSS assesses situation awareness, decision-making, communication, teamwork, and leadership in a 4-point numeric scale system [65, 66]. A systematic review of literature from 2013 indicated that safety checklists are beneficial for teamwork and communication in the operating theater [67]. This may be one mechanism through which patient outcomes are improved [67]. The results of another systematic review and meta-analysis from 2014 with 19 included studies found that surgical safety checklists improve teamwork and communication, reduce morbidity and mortality [68].

7.2 Measuring tools for the surgical ward team

Teamwork in the surgical ward is as important as in the operating theater. In an assessment of patient risks associated with poor communication in surgical care the following problems were detected: communication during the surgical ward round is often limited between patient and physician, with nurses making little contribution [69]. Nurses sometimes have important additional information about patients. Unlike physicians, they monitor patients' daily activities. Therefore, only surgical ward rounds with an integrated assessment by different professional groups, including nurses, allow a complete collection of the important and necessary patient information [69]. Up to two thirds of the deadly events in hospitals are due to surgical care [25, 26]. Communication errors have been identified as the main cause of these adverse events [24, 27]. A study on surgical treatment errors due to

communication breakdown showed that their occurrence is equally distributed across the continuum of care, before, during and after surgery [51]. Despite this knowledge about the distribution of adverse events, there is sparse literature on the measurement of teamwork quality in the surgical ward. Filling this large gap in science will show at which points in the surgical ward improvements in teamwork are necessary. In 2019, Krishnamohan introduced a surgical ward round checklist to monitor documentation [33]. It is claimed to improve communication between team members in the surgical ward team [33]. In 2014, Hull introduced a combined assessment toolkit for technical and nontechnical team skills in surgical ward care [70]. It consists of a novel clinical checklist for ward care (Clinical Skills Assessment for Ward Care); a novel team assessment scale for ward rounds (Teamwork Skills Assessment for Ward Care); and a revised version of a physician-patient interaction scale (Physician-Patient Interaction Global Rating Scale) [70]. It provides a systematic assessment of the quality and safety of surgical care and can be used to check and train residents' skills and performance.

7.3 Measuring tools for the emergency surgical team

The surgical team in the emergency room is often exposed to critical situations. Managing patients in a life-threatening condition is probably the greatest responsibility of medical staff. These teams often consist of interdisciplinary medical staff which is exposed to the challenge to work simultaneously on the treatment of critically ill patients [71]. Wrong decisions quickly lead to fatal consequences. For this reason, in addition to necessary knowledge and experience, strict leadership of the team is required. Only then can clear and quick decisions be made and unambiguous instructions given to the team. Leadership skills are highlighted in advanced life support training and have shown beneficial results in simulated and clinical resuscitation scenarios [72]. A study of 106 adult resuscitation team events with three or more team members over a 10-month period found a need for leadership training [73]. Emergency teams must develop their leadership skills through training and reflective debriefing [73]. Nevertheless, teamwork is indispensable again. A promising way to improve quality in emergency teams is to use nontechnical skills that aim to address human factors by improving leadership, communication, and decision-making [72]. Assessments to evaluate the nontechnical skills of the team are essential to reduce medical errors and improve team performance [71]. In a systematic review of literature from 2016 10 assessment tools for nontechnical skills of hospital action teams were identified [71]. Unfortunately, the validity of these assessment tools to measure the nontechnical performance is limited [71]. A feasible, valid, and reliable measuring tool is the Team Emergency Assessment Measure (TEAM) [73].

8. Benefits and disadvantages of teamwork

Despite the numerous studies that have found advantages in the use of nontechnical skills in surgery, possible disadvantages are still being discussed [74, 75]. Over-focusing on teamwork can prevent teams from peaking. On the one hand, this can affect the whole team or, more often, individual team members who, like the faster animals in a moving herd, wait for the slower ones. In this way more competitive and talented team members can be disadvantaged in favor of the team and their development can be slowed down. One can certainly imagine that the desire and pursuit of professional self-actualization and even showing off is more strongly expressed among surgeons than among other groups of physicians. Forced

commitment to teamwork might reduce the autonomy and individualism of some team members. In other cases, the workload is unevenly distributed, with some team members doing more work and others less. Therefore, the aim of the team leader and of all team members must be to avoid such unfair events. All of these events are possible reasons for conflict in the team. The resulting conflicts prevent the team from achieving the common goal. These potential problems in the team should be considered. A team needs to create conditions for healthy team competition. This can help keep team members motivated, outperform the team average and not suppress individual talents. Again, taking into account the professional development of individual team members must not impair the team cooperation, as it is known that team cooperation is more often associated with very successful and effective teams [76, 77].

Still, the distinct advantages in teamwork in the surgical department must be emphasized. A combined problem-solving effort of the team has surely more potential than an individual [78]. Another advantage of teamwork is building relationships. The pursuit of a common goal leads to greater cohesion, which improves the team's performance [43, 78]. Distinct individual qualities of a team member can also be advantageous in case that the knowledge and skills are offered to improve other team members.

9. Leadership and teamwork

Team leadership describes the ability to coordinate team activities, to distribute tasks fairly, to evaluate performance, to provide feedback and in this way to enhance the team performance [37, 39]. Leadership is a process where the leading team member sets the direction for one or more team members and helps them improve their performance [79]. Positive leadership skills lead to better satisfaction of the medical staff, higher motivation of team members, increased staff retention, and improved performance [80–83]. Beneficial team leadership leads to increased patient satisfaction and reduced adverse events [84–86].

There are different styles of leadership [87], whereby the dominant role of the leader is more or less pronounced. The style of leadership indicates the level of authority of the team leader. Under strict leadership there is less freedom and leeway for subordinate team members. Strict leadership is based on a pronounced hierarchy in the team, led by an authoritarian leader with subordinate followers. On the other hand, servant leadership is a style in leadership where leaders serve their followers [88–90]. Servant leaders try to build a stable organization, bring out the best performance and serve the team [91]. A detailed comparison of lean and servant leadership is given in a systematic review of literature of 29 articles [92]. A systematic review of literature with 18 articles included found that leadership styles were strongly correlated with quality in care, both for the patients and medical staff [93]. Finally, leadership and teamwork must not be seen as contradicting characteristics of teams in the surgical department. Strict leadership does not automatically exclude the need for a functioning team. Every style of leadership and even strict leadership depends on the team members and on their differently led team.

10. Conclusion

Teamwork is essential in surgery. A surgeon alone cannot adequately fulfill his daily tasks, neither in the operating theater nor in the surgical ward nor in the emergency department (**Table 1**). The teamwork, that is, nontechnical skills,

Key points	Remarks/explanations
Types of surgical teams	
Surgical team in operating theater	Consists of a surgeon, an anesthetist, a surgeon's assistant, a nurse anesthetist, a circulating nurse, and a surgical technologist
Surgical ward team	Consists of at least one surgeon and one nurse
Emergency surgical team	The general or trauma surgeon is the trauma leader, when treating polytraumatized patients
Characteristics of team members	
Communication and coordination	Required to avoid conflicts, confusion, and overstepping boundaries
Collaboration	Required to complete tasks on time and to share the workload fairly
Interdependency	Required to maintain trust, reliability, and risk taking
Mutual performance monitoring	Ability to understand the intentions, roles, and responsibilities of other team members
Backup behavior	Ability to look after the needs of other team members
Adaptability	Ability to adapt the work to feedback from other team members
Team orientation	Ability to prioritize team goals and to respect different opinions
Personality type	Cannot be trained; it can only be adjusted to a certain extent
Team processes	
Action process	When the team takes tangible steps to achieve their goals
Transition process	Between two action processes
Interpersonal process	Ongoing communication about positive and/or negative opinions or about the team's performance
Team developmental model	
Forming	Internal conflict between team members; low level of teamwork performance
Storming	Deeper conflicts due to competition for power and authority between team members; varying level of teamwork performance
Norming	Rising levels of interdependence, team spirit and reliability; high level of teamwork performance
Performing	Team is able to accomplish its tasks most successfully; highest level of teamwork performance
Measuring tools	
OTAS	Teamwork assessment tool in operating theater
NOTECHS	Teamwork assessment tool in operating theater
NOTSS	Teamwork assessment tool in operating theater
Tool for technical and nontechnical skills in surgical ward care	Combined assessment toolkit for technical and nontechnical team skills in surgical ward care
TEAM	Measuring tool for teamwork in emergency
KSA	Knowledge, skills, and abilities test measuring teamwork in people wanting to join a team

Table 1.
Summary table of important information.

of teams in the surgical department has an obvious impact on patient outcome. The privilege and burden of decision-making is primarily focused on the surgeon. The performance of the team members depends on the behavior, knowledge, and interpersonal and leadership skills of the surgeon as a team leader. Every team leader depends on his team members. Leadership and teamwork must not be seen as contradicting characteristics of the teams in the surgical department. Both are necessary for the surgical department to function. Each team must be regularly assessed for their nontechnical skills. The causes of good and bad team results must be identified in the characteristics of the team members. Feedback must be given to all team members. The identified weaknesses or strengths in the characteristics of the team members can thus be corrected or promoted. To implement this task, tools had to be developed that allow nontechnical skills of a team to be measured. Two assessment tools are recommended to measure the nontechnical skills of the surgical team in the operating theater: The Observational Teamwork Assessment for Surgery (OTAS) and Operating Theater Team Non-Technical Skills Assessment Tool (NOTECHS). There is a reliable combined assessment tool to measure technical and nontechnical team skills in the surgical ward team. It consists of a novel clinical checklist for ward care (Clinical Skills Assessment for Ward Care); a novel team assessment scale for wards rounds (Teamwork Skills Assessment for Ward Care); and a revised version of a physician-patient interaction scale (Physician-Patient Interaction Global Rating Scale). The Team Emergency Assessment Measure (TEAM) can be used as a measuring tool for emergency surgical teams. Current literature shows that teamwork training interventions do not improve patient outcomes significantly. The personality type of the team members seems to play a very important role, as this is the main characteristic that can hardly be changed or trained. Candidates wishing to join the team must therefore be carefully screened for their suitability with the rest of the team. This is where the Teamwork Test (KSA) of knowledge, skills, and abilities can be helpful as a proven method of measuring teamwork in people who want to join a team. Frequent changes to the members of the core surgical team should be avoided, since the surgical team is a very well-coordinated and professional team. Despite the numerous studies that have found advantages in the use of nontechnical skills in surgery, possible disadvantages are still being discussed. Over-focusing on teamwork can prevent team members from peaking. More competitive and talented team members might be disadvantaged in favor of the team and their development can be slowed down. Forced commitment to teamwork might reduce the autonomy and individualism of some team members. A team needs to create conditions for healthy team competition. This can help keep team members motivated, outperform the team average and not suppress individual talents. Still, the distinct advantages in teamwork in the surgical department must be emphasized. A combined problem-solving effort of the team has surely more potential than an individual. The pursuit of a common goal leads to greater cohesion, which improves the team's performance. Distinct individual qualities of a team member can also be advantageous in case that the knowledge and skills are offered to improve other team members. Once again, teamwork is essential in surgery.

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