Safe patient care – safety culture and risk management in otorhinolaryngology

Abstract

Safety culture is positioned at the heart of an organization's vulnerability to error because of its role in framing organizational awareness to risk and in providing and sustaining effective strategies of risk management. Safety related attitudes of leadership and management play a crucial role in the development of a mature safety culture ("top-down process"). A type marker for organizational culture and thus a predictor for an organization's maturity in respect to safety is information flow and in particular an organization's general way of coping with information that suggests anomaly. As all values and beliefs, relationships, learning, and other aspects of organizational safety culture are about sharing and processing information, safety culture has been termed "informed culture". An informed culture is free of blame and open for information provided by incidents. "Incident reporting systems" are the backbone of a reporting culture, where good information flow is likely to support and encourage other kinds of cooperative behavior, such as problem solving, innovation, and inter-departmental bridging. Another facet of an informed culture is the free flow of information during perioperative patient care. The World Health Organization's safe surgery checklist" is the most prevalent example of a standardized information exchange aimed at preventing patient harm due to information deficit. In routine tasks mandatory standard operating procedures have gained widespread acceptance in guaranteeing the highest possible process quality. Technical and non-technical skills of healthcare professionals are the decisive human resource for an efficient and safe delivery of patient care and the avoidance of errors. The systematic enhancement of staff qualification by providing training opportunities can be a major investment in patient safety. In recent years several otorhinolaryngology departments have started to incorporate stimulation based team trainings into their curriculum.

Keywords: safety culture, risk management, incident reporting, standard operating procedures, team training

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1 Organizational culture and safety culture

Every private practice, department, or hospital is characterized by a certain manner of how people act and react and how the balance between patient care and economic interests, innovation, efficacy, and human attention is found. This distinctive property, "the way how we do it, how we think about certain things and how we feel" is summarized in the literature as organizational culture. Organizational culture includes all characteristics that make an organization (and this means already a private practice with a few people working there) unique as a stable social system and that makes it different from other organization. The attitudes and values of this culture can be described by means of "artifacts" (e.g. explicit rules, dress codes, designing of the practice or the wards etc.) but also by observed behavioral patterns [1]. Asking an organization about its aims regarding safety, is equivalent to asking it about its safety culture. Thus safety culture is one aspect of the organizational culture and can be defined as pattern of common attitudes regarding safety. It must be considered on three levels:

The most obvious level, i.e. the outer layer, is the *observed behavior* of people working in the organization. Their actions protect or jeopardize patient safety. The second level includes the conscious and thus also communicable *attitudes of the colleagues* regarding the value of safety in their organization. They may be congruent or discordant with the official statements of the hospital or the practice. The deepest level of those general attitudes regards the *basic conviction and values* that reflect the "spirit of the house" and that represent the aims of the stake holder or the practice organization. If those aims are focused on economic aspects, also the basic attitudes

have an impact on patient safety. Generally the people are not conscious of those attitudes that are thus not communicable, but they influence the other two levels in a significant way. In this sense the conception of safety culture includes observable indicators as well as psychological aspects [2].

2 Safety culture: the DNA of safety

Safety culture and risk management can be compared to the genotype and phenotype of an organization: the safety culture as DNA of patient safety determines in the decisive way how high the priority of safe patient care can be "expressed" in the individual co-worker and which measures of risk management are taken to make the organization as a whole safer. In contrast to the definition, according to the Duden dictionary that defines "safety" as the "condition of being safe", the term of safety in the context of patient care is not a static final state. Moreover, safety should be understood as a "dynamic non-event" [3]. "Non-event" means that safety cannot be defined as a permanent property but as a non-occurrence of undesired events. "Dynamic" in this context means that this state can never be lasting but it has to be achieved again every day. In this daily process of achieving safety, the staff members play a very important role.

The term of "safety culture" as a specific aspect of organizational culture was first used in 1986 by the International Atomic Energy Agency (IAEA) in a public report about the GSA (greatest supposed accident) of Chernobyl [4]. In this context the IAEA defined safety culture globally as properties and attitudes of an organization determining that safety as highest priority is paid special attention to. Beside this term of safety culture, also the concept of "safety climate" can be found in organizational literature. Both conceptions belong together, but they have different meanings [5].

- *Safety climate* describes a changeable, because individual, perception of the organizational staff. If staff members are asked, their reply will always be a snapshot of the current attitudes, convictions, and perceptions on safety and risk shared at a certain time. The safety climate of a practice or department can thus be measured and is generally inquired by means of questionnaires.
- Safety culture is more complex and describes properties that are present for a longer time and that cannot be changed easily. Assessing the actual safety culture of the individual ENT department or practice directly is nearly impossible and requires a deep analysis of the organization including also how staff members and management interact in order to find common perceptions of safety.

3 Characteristics of safety culture

Although safety culture cannot be directly measured, there are often properties of this culture that can be associated. Those are among others [1]:

- Self-conception (has the practice/department an explicit and written statement?)
- Values, norms, and general principles of action
- Traditional patterns of behavior ("We treat our patients in this certain way.")
- The way of interprofessional and interdisciplinary behavior (staff members, nurses, physicians in hospitals, surgical team)
- The way of learning within the organization (in particular learning from mistakes and incidents)

This means that safety culture implies that all structures and processes within an organization, all workplaces and devices, the qualification of the staff and their relationships are designed in that way that safe action and interaction is possible at any time and at any workplace [6]. So it becomes obvious that an efficient safety culture is not delegated to single responsible staff members (e.g. safety or quality representatives) but rather that all staff members want to live the safety culture in their daily routine.

The better the safety culture is in a practice or a hospital, the less undesired events occur [7], [8], [9] and the more staff members contribute actively to the assessment of errors or undesired events [10], [11]. Safety culture cannot be changed "quite simply" and a strong safety culture does not come over night into a hospital. Changes of values need time and motivation, therefore safety culture develops based on an adaptation to economic (e.g. "Can we afford this kind of safety?") and social (e.g. "Do we want to achieve a serious assessment of errors?") conditions and as a reaction on success and failure (e.g. "What can we learn from a severe incident that happened last week?"). Regarding the development of a safety culture, the safety-related attitudes of the hospital management and practice owners play a decisive role ("top-down process"). Safety culture is a task to be fulfilled by the management. Efforts undertaken for changes that are only supported by particularly motivated staff members and that have to be enforced against the existing culture are generally not successful.

Looking for positive characteristics that promote a safety culture, especially the following factors are important [6]:

- **Handling of safety-critical information:** In the literature, "safety culture" is often used as synonym of "informed culture" [12] so that one major characteristic for a mature safety culture and a decisive approach for changes is the handling of safety-relevant information. If an incident or accident with patient damage occurs, important safety-related information comes up unsolicited. Traditional attitudes and procedures of a department or practice are probably questioned. Further, this information can also be collected systematically and

assessed which is the sense of reporting and learning systems ("incident reporting systems") and morbidity & mortality boards. Based on a series of key aspects regarding the handling of safety-related information, different degrees of maturity of the safety-culture can be described. They will be further explained in the following.

- **Systemic thinking:** It is no longer the staff member at the "sharp end" [13] having been the last one to treat the patient who is in the focus of the interest. Instead, attention is paid to the interaction of different factors concerning the people, the general conditions under which the incident has happened, and other influencing factors that might have been introduced probably several years before and that suddenly become relevant for the development of the incident. Seen from the systemic perspective, it is rarely a false action that leads to the undesired event. Moreover the basic conditions and actions on all levels of an organization make a system "vulnerable" that one single safety-endangering action is sufficient that an incident occurs. In a "vulnerable system", similar circumstances cause similar errors, independent from the people being involved in the actions. The systemic perspective does not reduce the assessment of damages to the alternative "people or system" but postulates the complementary "people in the system" [14].

- **Justice ("Just culture")** [14], [15], [16]: The systemic approach determines that the assessment of a severe incident does not focus on assignment of guilt to a person but on the analysis of systemic factors. Just culture in this context, however, does not mean that staff members are not personally liable, as it could be understood from the frequently used term of "no blame culture". A culture where everything is allowed and everything is forgiven would be beyond belief and risky in the eyes of the staff and so a (just) safety culture does not accept a general amnesty for failures. Because the personal responsibility of the individual is not denied, all staff members know that certain patterns of behavior endanger the safety and are thus inacceptable.

- **The human factor as risk and resource:** Human factors render the action of the staff in the health sector unsafe and contribute mainly to the jeopardisation of patients. At the same time, however, the human factor is the decisive resource helping to realize patient hazard and to successfully avert the risk. Every time when an attentive person recognizes a critical situation or an error, finds a correct diagnosis and introduces corrections, human factors play a role. A strong safety culture knows that the human factor must never be equated only with a "risk factor", and so it promotes the human factor competences of the staff ("non-technical skills", e.g. finding decisions, communication, teamwork, stress management).

- **Orienting based on the theory of high reliability organizations (HRO)** [17]: Big organizations of other economic sectors with comparably complex structures as

hospitals can work without incidents and thus reliably and safe [3]. Supposing that an attentive organizational design and management can generally achieve safety and reliability of the processes, HRO exist according to certain principles:

- *Assessment of failures:* Generally there is skepticism towards persisting and quiet phases of success because success bears the risk of an attitude of self-satisfaction and carelessness. HRO staff always expects the unexpected – they "hope the best and expect the worse". That is why the staff focuses very much on failures and incidents. Since little deviations may indicate problems in the system, they are considered as cost-free opportunities to learn.

- *Caution against simplifying suppositions:* Skepticism is shown towards simplifying suppositions and interpretations of events. In order to understand the complexity of the system environment differentiated and complex models and conceptions about internal and external events are preferred.

- *Sensitivity for operational processes:* Operational processes and normal routine are analyzed carefully with regard to their weaknesses and their potential for errors.

- *Respect of expertise:* Decisions are made case-by-case at the point where the highest professional expertise for the problem is located. This high respect of professional expertise generally allows separating functional decisions from the formal hierarchy.

- *Aspiration for flexibility and resilience:* Staff members of reliable organizations know that undesired surprises may always occur. That is why the strive for flexibility on one hand in order to discover errors early and on the other hand in order to make the system more resistant by flexible adaptation in case of the occurrence of failures.

- *Intensive communication about deviations:* In reliability organizations the staff members are explicitly invited to discuss actual states, deviations, individual intended actions, minimal events, and failures. Frequent reflection of decisions avoids that staff members start to accept deviating behavior, and little violation of rules as "normal" actions.

The properties described here for high reliability organizations can be understood as encouragement for the development in otorhinolaryngology. A simple transfer of this "model for success" to health care is nearly impossible because of the difference of the systems so that certain skepticism towards an easy requirement to transfer the model without adapting it is appropriate [18].

4 Levels and development of safety culture

Culture develops and changes, and so at a certain time within an organization there may be attitudes regarding

safety of different intensity and changes may occur during time. This circumstance is taken in account by Diane Parker who described the model of maturity degrees of safety culture (Figure 1). This model shows the dynamism and multidimensionality of safety culture and its possibilities of development over five levels [19]. The increasing maturity of the safety culture leads to the fact that self-protecting and suppressing views become less important and that attitudes and actions focus on safety:

- Pathologic ("Who cares as long as no one sees us?")
- Reactive ("We work on safety: each time when an incident occurred.")
- Calculative ("We have created systems which allow us to control the risk.")
- Proactive ("We work on problems we notice.")
- Generative ("Safety? Everything we do focuses on safety!")
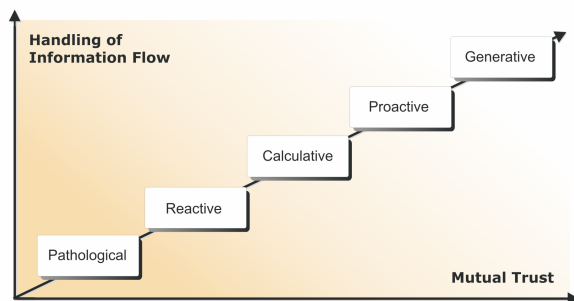
Figure 1: Framework model for the development of safety culture (based on [11], with kind approval of Springer Publishing). The increasingly open management of critical information and the growing confidence within an organization leads to a higher degree of maturity of an organization.

Based on the phases and corresponding aspects described in Table 1 the degree of maturity of the safety culture in the individual practice or department can be assessed and stimulation for future development can be retrieved.

5 Risk management

Beside the influence of the safety culture, patient safety can be impaired by a series of other factors that lie in the severity of the disease, the risk potential of the therapy, and in the different interfaces of patients' care. The objectives of risk management in medical services with regard to the patients should aim at

- avoiding each endangering of the treatment purpose as well as
- achieving the highest possible patient satisfaction and in relation to the staff members and the hospital
- ensuring the highest possible security of the processes,
- low costs and financial stability as well as
- preserving a good reputation.

So risk management in medical services focuses on all factors resulting from the control process and the perform-

ance processes of patients' treatment. "Risk management" describes a dynamic process that includes all measures for systematic identification, analysis, assessment, surveillance, and control of risks. An effective risk management should not start only after the evaluation of an incident but it should start at a time when failure can still be avoided and damage can be prevented. In the context of risk management, an iterative process (e.g. PDCA cycle) identifies and eliminates safety-endangering conditions and processes so that the process of patients' care becomes safer – independently from the treating staff members. Since in many manuals all aspects of risk management in medical services are described exhaustively, the following paragraphs will only describe some important measures as examples that are relevant for a future improvement of the safety culture in otorhinolaryngology. As the organizational safety correlates with its management of information, in particular

- learning and reporting systems ("incident reporting"),
- checklists for perioperative interfaces: safe-surgery checklist of WHO, and
- standardized patients' care (SOPs)

allow an improvement of patients' safety. A second and very important pillar of a strong safety culture that will have to be implemented in otorhinolaryngology is the significance of good teamwork for a higher patient safety. ENT departments often focus on

- formal team training and
- simulation trainings

for strengthening communication and team competences. First published results in this context seem to be promising.

6 Reporting and learning systems ("Incident Reporting Systems"; IRS)

6.1 Aims of an incident reporting system

Safety culture is "informed culture" and its degree of maturity is reflected in the management of safety-relevant information. This information based on observed or experienced incidents, failures, or process deviations can be collected by staff members and transferred to the organization. Synonymous terms to describe this kind of reporting system are error reporting system, (critical) incident reporting system, or reporting and learning system. Every incident should be reported that leads to a risk for patients, independently from the aspect if the incident could have been avoided or not and if it was based on misbehavior of the medical staff or not. Because of this functional description the term of error reporting system (– not all safety-related incidents are caused by human errors –) and the term of critical incident reporting system (CIRS) (– not all reported incidents are potentially critical for the patients –) are not really appropriate. Based on a

Table 1: Different phases and corresponding aspects of safety culture (according to [19]).

	Pathologic	Reactive	Calculative	Proactive	Generative
Assumptions about the causes of the incident	Individuals are considered as being to blame; incidents are part of daily work.	Trying to cast off staff members who are prone to errors, system-related causes are considered but without resulting actions.	The management has a rather excluding than integrating attitude, there is rather an individual-related than system-related perspective.	The management considers the whole system (all processes).	The aim is to never blame individuals; staff members show broad understanding with regard to the interaction of systems and individuals.
Reports about risks and insecure actions	There are no reports.	Reports are simple and focus on the question who or what caused the incident.	Reports are written according to a determined form in order to receive as many reports as possible.	Reports focus on origins not only on events, immediate reporting is encouraged.	Information from reports is used actively on all levels in daily routine.
How are incidents reported and analyzed?	Only severe incidents are assessed.	Examinations exclusively concentrate on the direct causes; the focus is placed on the identification of the guilty person.	The reasons are mostly expected on the level of staff.	Information and "lessons learned" are shared with the whole organization; there is only few creative imagination about how underlying factors can influence processes.	Examination and analysis focus on the broad understanding how incidents occur.
What happens after an incident?	The priority is to minimize the damage and to restart production.	The management reacts angrily on every new report about an incident; reports are possibly not submitted to superiors.	The staff members report about their own incidents, the management cares for the consequences for the annual business report.	Examination focuses on deeply underlying reasons; results are reported to the management.	The management shows its interest in all involved people and in the examination process.
Techniques for safety at work	There is no technique; "take care for yourself that nothing happens".	After an incident, a risk management strategy is introduced, after its introduction it is not systematically used.	Technologies available on the market are introduced even without incidents having occurred, however, only few consequences are visible.	Analysis of the safety at work is accepted by the staff as being in their own interest.	The safety at work is regularly checked based on a defined process; the staff members are not afraid of indicating dangers to each other.
Training in order to increase competence	Training is considered as necessary evil; only attendance of obligatory trainings.	Training is individual-related: "If we succeed to change your attitude, everything will turn out fine."	There is much training for standard situations and partly the transfer to the work place is successful.	The management unlimitedly recognized the competences and skills of the staff acquired at work.	Topics such as "attitudes" are considered to be as important as "knowledge" or "practical skills"; the need of training is assessed and learning methods are suggested by the staff members.
Rewards for high performance in the field of safety	It is not expected nor given; failure is punished.	There is only punishment for safety-endangering behavior.	Lip service is given regarding safety-conscious behavior.	There is rewarding for good performance in the field of safety; the evaluation is rather process- than results-oriented.	Safety-conscious working is already motivation enough.

historical background, however, the term of CIRS has been coined so that it will further be used.

An analysis of the information contained in the reports can be used to detect potential sources of errors and up to that time unidentified systemic weaknesses.

Those error-enhancing conditions (formerly also called latent errors) can then be defused so that they do not become relevant at another time in combination with other factors. A second significant function of information can be an organization learning process [20]. If the report is made available beyond the individual practice or department to the public (e.g. via CIRSmedical.de; see below), learning processes in other departments or in the special medical associations can be initiated.

6.2 Properties of an incident reporting system (IRS)

With inception of the law of patients' rights the implementation of an incident reporting system becomes a legal obligation that is also mandatory for otorhinolaryngology. With an isolated process change ("we will implement IRS starting next month") however neither the intention of the legislator nor the sense of IRS is fulfilled. Moreover, IRS can only be introduced successfully when the basic presuppositions are present:

- IRS are *exclusively* meant to avoid future incidents, their purpose it not to clarify questions of guilt or liability. A report is not analyzed under the aspect of "who is guilty?" but with regard to identifiable factors and processes. The property of IRS is to be proactive and solution-oriented.
- IRS reports represent a *subjective summary* of an individual person and they do not give an extensive overview of "what had happened". In order to assess all aspects of the incident other instruments (e.g. the London protocol [21]) have to be applied.
- IRS are *participation programs* that can only exist due to the readiness of the staff members to contribute with their knowledge about sources of errors and improvement possibilities in the processes of the hospital.
- IRS for itself is useless. In order to be effective, they have to be *part of* an (probably only department-related) system of *risk and quality management*.

Authors of the international literature mostly agree on the organization of incident reporting systems [22], [23], [24], [25]. The most important properties of an IRS are:

- *Voluntariness:* No staff member is obliged to submit reports.
- *Anonymous and confidential reporting:* The staff members must be able to rely on absolute confidentiality and anonymity of their reports. Anonymisation or disidentification of the reports must be performed before the public is informed so that only directly concerned people can suppose that the report describes the original incidence.

- *Freedom from sanction:* A report must not lead to legal consequences for the staff members. The explicit written confirmation of the medical and nursing direction can be helpful in this context. The possibly applicable criminal responsibility or civil liability, however, is not abrogated by this confirmation.
- *No legally relevant cases:* Even if an anonymisation and disidentification of the reports before publication does not allow subsequent reconstruction of the incidents, a reporting of legally relevant cases is not recommended. Since severe incidents are analyzed by other means the information that results from those investigations is at the disposition of the organization.
- *Independent from, but supported by the management:* IRS must be introduced and supported by the management. At the same time, the structure of the CIRS team should be independent from the hospital management.
- *System oriented analysis by experts:* If the systemic analysis of reports is meant to be systematic and successful, high expertise is required. This expertise can be present on site or imported in form of external analysis.
- *Rapid response about the consequences:* The reporting staff members must be able to see the benefit of their reports. If a short-term change is not possible because of the complexity of the problem, a regular report about the current state of realization is helpful.
- *Teaching of the staff members regarding the use of IRS:* The staff members must be informed about the philosophy and the operation of an IRS and undergo continuous updating. Some hospitals have made good experience with a kick-off event for introduction of the system.

With respect of the pragmatic organization of an IRS, the following aspects are applied:

- The questionnaire must contain *free-text fields*. Since the relevant information is based on a possibly detailed description of the incident and the accompanying circumstances, the focus of the questionnaire should be the possibility of inserting free texts.
- Since a *successful management* of the incidents leads to safety-relevant information, also successful strategies for problem solution should be assessed [26].
- The *reporting threshold must be low* because not only dramatic incidents are opportunities for improvement but also unimportant deviations from standards and routine procedures.
- The *workload to submit a report must be low* so that it can be integrated in the clinical routine that is characterized by time pressure. The most appropriate systems are user-friendly.
- Reporting systems can be paper-based ("letter box") or electronic whereas from a practical point of view electronic reporting questionnaires prevail (e.g. local databases, web-based systems).

Which system finally is introduced in a practice or hospitals is not relevant as long as the assessment and

Figure 2: Double function of an incident reporting system. Staff members submit safety-relevant incidents in an anonymised way. The information contained in the report is analyzed and from the multitude of possible reactions a locally feasible solution is chosen. Taken measures or current status of the assessment are communicated to the staff. At the same time care is taken that the knowledge is durably noted in the organization (organizational learning).

analysis of the reports corresponds to the mentioned criteria. Often this decision is anticipated by the hospital owner or the hospital group. Since many systems do not allow an insight for external people, the organizational learning potential is not used by others. In this context the "Netzwerk CIRSmedical.de" (network CIRSmedical.de, http://www.cirsmedical.de/) offered by the Ärztliches Zentrum für Qualität in der Medizin (ÄZQ, medical center for quality in medical services) on behalf of the BÄK (Bundesärztekammer, German Medical Council), KVB, Deutscher Pflegerat (German Nursing Council), deutsche Krankenhausgesellschaft (German Hospital Association) represents a recommended alternative: practices, departments, and hospitals can use the IRS as an internal reporting system and at the same time make their cases available on a national scale in order to provide experience for other ENT colleagues. Some medical associations (e.g. the German Society for Anesthesiology and Intensive Care; DGAI, Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin) use and recommend CIRSmedical.de as a specific reporting and learning system.

6.3 Working of an incident reporting system

Reports that are introduced in an incident reporting system initiate a cyclical process consisting of report, analysis, measures, response. Beside changes, the report also launches learning processes within an organization (organizational learning). The knowledge about the origin and the remedial action are supposed to remain and be effective in the organization even if the staff members involved in the incident are no longer present (Figure 2).

6.4 Introduction of an incident reporting system

The German Coalition for Patient Safety (Aktionsbündnis Patientensicherheit, APS) has formulated recommendations for actions that describe the planning and implementation of an IRS in seven steps [22] and that can be adapted to the local circumstances. Those steps are:

- Decision phase
- Planning phase
- Introduction of CIRS
- Realization of evaluation and analysis
- Organization of improvement measures in the risk management
- Assessment of feedback
- Evaluation of experiences with the IRS

With the submission of a report by a staff member, the real work starts and so the decisive factor for acceptance and long-term implementation of IRS is based on the action resulting from reports. If IRS reports do not lead to visible changes the system will soon peter out. Since some reports touch very basic problems, their analysis and correction requires probably a long time and therefore regular communication about the current status of the management of those problems is important. Staff members want to know that their reports are being read, taken seriously, and serve as inducement for changes.

7 Safe surgery checklist

An informed culture knows about the safety relevance of an information loss at the perioperative interfaces: insuf-

ficient communication and unsatisfactory team work result in the largest part of safety-relevant incidents and complications in the perioperative medical services. This is mainly due to the loss of important information associated with the communication deficit [27]. A standardized information transmission in form of structured briefings is most common in high risk sectors and has also the potential in perioperative medical services to improve teamwork and the quality of results [28], [29]. In order to make the quality of the processes and the results independent from the individual user, the introduction of checklists turned out to be useful. With the purpose to systematically address the aspects that are prone to errors of diagnosis or treatment, serial checklists were suggested for the different areas in perioperative medical services [30].

The most common and safety-relevant perioperative checklist seems to be the "Surgical Safety Checklist" conceived by the World Health Organization (WHO). In an innovating study, the effect of this WHO checklist for avoiding errors in the process of surgical interventions was evaluated and a significant reduction of the operatively caused lethality (by 47%) and severe complications (by 36%) was observed [31]. The WHO divided the Surgical Safety Checklist into three parts: the part before anesthesia ("sign in"), before skin incision ("time out"), and immediately after the end of the surgery ("sign out"). This segmentation is meant to prove that at exactly defined times the treating team assesses the significant safety-relevant information about the patient and in cases of "time out" communicates this information to everybody in a clearly audible way. A direct transfer and unchanged acceptance of the original checklist is neither desired nor useful. Moreover, it should be adapted to the local circumstances according to certain rules [32] in order to guarantee the patient safety at the interfaces of the perioperative phases mostly extensively. Independently from the aspect which modifications are performed, it is important to guarantee the objective of a structured communication about the most important contents within the team. A German journal entitled Deutsches Ärzteblatt recently published a review article [33] in which the authors describe extensively the current literature with regard to the effect of the surgical safety checklist of the WHO on the complication rate and the interdisciplinary communication, focusing especially on the changes of the safety culture in the surgery phase resulting from the application of the checklist. Because the description in the mentioned publication is very extensive, the authors only want to indicate this publication instead of discussing it at this point.

8 Implementation of standard operating procedures (SOP)

If there is an accepted best procedure for a repeatedly occurring task, this procedure should be applied by all staff members. The desired high similarity of the processes is achieved by standardization. Standardization (e.g. standards for surgeries, conservative treatments, diagnostic pathways) can be performed within a hospital or crossing departmental boundaries (e.g. guidelines of the German ENT Society). A type of standards that is very specific for practices or departments is the local definition of standard procedures (standard operating procedures, SOP). An SOP is the detailed written description of a desired procedure that is meant to standardize the accomplishment of certain tasks. The advantage of those standard procedures for the individual is that they stipulate successful treatment concepts for many situations and thus the basic process quality allows a high quality of the results. In the context of the team of the operating room, SOPs offer the advantage that all people involved know about the necessary treatment steps and their sequence and in this way the creation of common mental models is facilitated. First results indicate that the treatment results can be improved by an introduction of standardized treatment processes. Standardization causes for example that the hospital stays could be shortened which led to a reduction of the costs [34], [35]. The general acceptance of standard procedures contrasts with the fact that medical challenges or problems can be dealt with by means of several secure treatment alternatives and in the particular situation where a decision must be found, the preservation of the user's medical (and thus personal) therapeutic freedom may have a high priority for him or her. While the non-compliance of SOPs represents a punishable default in certain high-risk technologies (e.g. aviation) the non-compliance cannot be considered as negligence or carelessness in medical services. Moreover it reflects the medical self-conception of a free profession and of the medical "culture". However, if the medicine wants to find a way to an "ultra-safe system", the question of a cultural re-orientation must be asked [36] only systems where the professional autonomy is given up for obligatory standards have a realistic chance to significantly increase their operative safety. This is why the operative medicine had to answer the question whether it might be ready to replace a tradition based on "creative craftsmen" [36] by a system of qualitatively equivalent (and exchangeable) team players ["equivalent actors" [36]] in order to increase the reliability.

9 Team work and patient safety

Qualified staff members are a decisive resource for safety-conscious working and for avoiding failures. However, the focus of this qualification should not only be placed on the acquaintance of medico-technical knowledge and technical skills but also on learning non-technical skills [37], [38], [39]. Communication, teamwork, and decision-making competence should be associated with medico-technical contents as part of medical and nursing competences. Especially in the medical field expert knowledge, clinical algorithms, and practical skills had been

Table 2: Patterns of behavior allowing the surgeon to strengthen the teamwork. The properties mentioned in the behavioral marker system NOTSS (NOnTechnical Skills for Surgeons) can be taught specifically in the context of team trainings (according to [38]).

Category	Elements
Situation awareness	Information seeking
	Information understanding
	Anticipation and projection
Decision making	Considering options
	Taking decision for an option and communicating
Communication and teamwork	Exchanging information
	Establishing common understanding
	Coordinating team activities
Leadership behavior	Setting standards and maintaining them
	Supporting others
	Coping with pressure

trained up to now without considering the fact that the treatment of patients is generally performed in the context of a team. In the clinical routine it is taken for granted that communication and cooperation within a team go smoothly without any problem [40].

Beside the mentioned educational deficit, the open dialogue within a treatment team is often difficult because of rigid hierarchical structures. Sometimes the significance of a hint or a warning does not depend on the logical nature of the argument but on the professional group, the professional status, or the position within the hospital hierarchy. In extreme cases an atmosphere comes up where a whole professional group (e.g. the nursing staff) or hierarchic levels (e.g. residents) is denied the competence and the authorization to express their concerns regarding safety or risks [41]. In a recently published simulation study only 28% of the staff members dared to contact their senior physician regarding their concerns about the safety of a planned measure while the other staff members remained silent hoping for a spontaneous solution of the conflict. In nearly 90% of the cases the silence led to the situation that a possibly lethal dose of a drug was given [42].

Meanwhile it can be considered as a fact that poor up to non-existent teamwork is one of the key factors for insufficient patient care and for the occurrence of incidents [43], [44]. However, upon reversion it could be shown that effective communication and good teamwork allow improvement of the quality of the patient care regarding conservative as well as operative medicine and that the frequency of failures and incidents can be reduced [43], [45], [46], [47].

10 Team training in otolaryngology

The systematic teaching of non-technical skills and the team training play an important role in the context of patient safety and mature safety culture. Training measures may include frontal teaching with interactive elements such as role playing games, case studies, and discussions

[48] and also units with patient simulators ("full-scale simulators"). All social and interpersonal skills that are necessary for teamwork can be systematically achieved through those training programs. Since the non-technical skills that are significant in one field cannot be transferred from one environment to another (for example from civil aviation to the ENT operating room), behavioral marker systems were developed and validated for the surgical disciplines (NOn Technical Skills for Surgeons; NOTSS [38] or for teams of an operating room (Observational Teamwork Assessment for Surgical teams, OTAS [49]). Those behavioral markers describe which behavior patterns may strengthen the teamwork during surgical interventions and thus should be specifically trained. Table 2 and Table 3 give an overview of the categories and elements of behavioral marker systems.

After the majority of simulation-based team trainings had been performed for a long time in the classical acute care disciplines (e.g. anesthesiology, intensive care, emergency care), in pediatrics and obstetrics (overview see [50]), the simulation training is more and more often found in otorhinolaryngology. In particular the dynamic environment of the ENT-specific outpatient clinic where the staff members are confronted with high-risk emergency cases such as obstruction of the airways, bleedings, and allergic reactions is appropriate for teaching basic skills of teamwork [51], [52], [53].

Notes

Competing interests

The author declares that he has no competing interests.

Table 3: Patterns of behavior allowing the single staff members to strengthen the teamwork. The properties mentioned in the behavioral marker system OTAS (observational teamwork assessment for surgical teams) can be taught specifically in the context of team trainings (according to [38]).

Category (and definition)	Examples
Communication Quality and quantity of the information exchange between team members	– Asks the team if everything is ready for surgery. – Questions and instructions are communicated clearly and effectively. – The whole team is informed about the current progress. – The surgeon informs the team about technical difficulties and/or changes of the planned course.
Coordination Management and timing of the activities and tasks	– Informs the team early about requirements so that tasks (e.g. new instruments) can be provided in time. – The surgeons coordinate the use of the equipment (e.g. camera work in the context of minimally invasive surgery). – Contributes to smooth instrumentation.
Cooperation and support Mutual assistance by team members; support and mutual correction of errors	– Reacts on requests and inquiries of nurses. – Reacts on requests and inquiries of anesthesia. – Supports assistants and compensates their lack of experience.
Leadership abilities Direction, assertiveness and mutual support within the team	– Assistants receive instructions and support. – Asks team of anesthesiologists and theater nurses to get help . – Supervision of team members who lack of experience in certain tasks or with instruments Assertiveness to minimize noise or distraction in the operating theater
Monitoring/situational awareness Observations by the team and awareness of occurring processes	– The surgeon asks the anesthesiologist about the patient's condition. – Asks the theater nurse if the sets of swabs, needles, and instruments is complete.

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