

Observational Teamwork Assessment for Surgery (OTAS)

USER Training Manual (draft)

February 2011

OBSERVATIONAL TEAMWORK ASSESSMENT FOR SURGERY (OTAS):

INTRODUCTION AND USER GUIDE

WHAT ARE NON-TECHNICAL SKILLS?

Non-technical skills reflect the interpersonal (e.g. communication, teamwork, and leadership) and cognitive skills (i.e. decision-making and situational awareness), that complement clinicians' technical skills. In the operating room (OR), non-technical aspects of performance are effectively captured by the way a team works together to deliver care safely.

WHY IS TEAMWORKING/NON-TECHNICAL PERFORMANCE IN OPERATING ROOMS IMPORTANT?

Failures in teamwork and non-technical skills in the OR have been frequently implicated in adverse events to surgical patients. In contrast, empirical evidence has found that superior teamwork is associated with fewer errors in the OR.

WHAT IS THE OBSERVATIONAL TEAMWORK ASSESSMENT FOR SURGERY (OTAS) AND HOW DOES IT WORK?

OTAS is a psychometrically robust (i.e. reliable and valid) tool that captures comprehensively the quality of teamworking and team interactions in the OR.

OTAS consists of five behaviours that team-members in the OR exhibit to a higher or lower degree during surgery. Taken together, these behaviours provide an index of the quality of inter-professional teamwork in the OR. The five behavioural dimensions of teamwork of interest are:

- **COMMUNICATION:** quality and quantity of information exchanged among members of the team.
- **COORDINATION:** management and timing of activities and tasks.
- **COOPERATION AND BACK UP BEHAVIOUR:** assistance provided among members of the team, supporting others and correcting errors.

- **LEADERSHIP:** provision of directions, assertiveness and support among members of the team.
- **TEAM MONITORING AND SITUATIONAL AWARENESS:** team observation and awareness of ongoing processes.

These behaviours are assessed via real-time observation in the OR (or relevant video recording wherever available). Each behaviour is scored on a seven-point scale (0-6). On this scale:

- The highest score (6) indicates significant enhancement to teamwork via exhibition of the behaviour of interest
- The scale midpoint (3) indicates average performance of a behaviour, which neither enhances nor hinders teamwork
- The lowest score (0) indicates severe hindrance to teamwork via lack of the behaviour of interest

In more detail:

RATING ANCHORS	BRIEF ANCHOR DEFINITION
6	Exemplary behaviour; very highly effective in enhancing team function
5	Behaviour enhances highly team function
4	Behaviour enhances moderately team function
3	Team function neither hindered nor enhanced by behaviour
2	Slight detriment to team function through lack of/inadequate behaviour
1	Team function compromised through lack of/inadequate behaviour
0	Problematic behaviour; team function severely hindered

All surgical procedures are managed by a multidisciplinary team. OTAS takes into account the fact that a range of OR professionals must work together to provide safe surgical care – namely, surgeons, anaesthetists/anaesthetic nurses/Operating Department Practitioners (ODPs), and nurses (scrub nurses and circulating nurses/“runners”). Therefore, the observer provides separate behavioural scores for each of the three subteams; the surgical subteam (surgeon and

assistant/s), the anaesthetic subteam (anaesthetist and anaesthetic nurse/ODP), and the nursing subteam (scrub nurse/practitioner and circulating nurses).

In addition, surgical procedures evolve over time, and whereas teamworking may be reasonable to start with, it may deteriorate during a case – or, in contrast, the team may not function well in the beginning of a case, but may fare better once the case is underway. OTAS distinguishes between the key phases of a surgical procedure: pre-, intra-, and postoperative. The definitions of when a phase begins/ends are provided in Table 1. Typically, to ensure feasibility in observation, assessors tend to start at the Pre-operative Phase: Stage 2 or 3 (depending on the case) and finish at the Post-operative Phase: Stage 1 or 2.

Table 1: OPERATIVE PHASES AND STAGES OF OTAS

PHASE	STAGE 1	STAGE 2	STAGE 3
1. PRE-OP	pre-op planning and preparation	patient sent for to anaesthesia given	patient set-up to op-readiness
2. INTRA-OP	opening/access to contact of target organ	op-specific procedure	from prepare to close to complete closure
3. POST-OP	anaesthetic reversal to exit from theatre	transfer to recovery/recovery to ward	feedback and self-assessment

In summary, therefore, the OTAS assessor provides separate behaviour scores for each of the five behaviours, across each of the three subteams and also across the three key operative phases.

In total, OTAS generates 45 behavioural ratings per observed procedure: 5 behaviours x 3 subteams x 3 operative phases.

: To facilitate the assessor’s task in rating the teamwork behaviours, a list of “exemplar behaviours” for each subteam and phase of surgery is available. These behaviours allow the assessor to anticipate behaviours that are expected within a phase/by a subteam. . Consistent

presence and successful completion of the exemplar behaviours allows an assessor to rate the quality of teamwork highly. In contrast, if these behaviours are not observed, or are carried out in an inconsistent manner the quality of teamwork is likely to be lower. It is important to mention, however, that the final behavioural ratings should be determined by the assessor's overall assessment of team performance, rather than purely being driven by the presence/absence of exemplar behaviours – these behaviours are aimed to guide the ratings rather than function as a 'checklist'.

WHY DOES IT REQUIRE TRAINING TO USE OTAS?

As is evident from the preceding sections, OTAS is a complex tool, which requires good knowledge and skill in application by the assessor. The tool was not designed to be complex, but rather because human behaviour is not simple to observe objectively, all observational assessments will have their complexities.

A key scientific requirement for an observational assessment tool like OTAS is that different assessors observing the same case will arrive at similar assessments of the overall quality of team performance. Technically, this is termed 'inter-observer reliability' and is assessed quantitatively via a range of correlation coefficients applied to OTAS scores derived from at least two different assessors blinded to each other's ratings. The more similar the assessors' scores, the higher the correlation coefficients and the better the inter-observer reliability. This aspect of OTAS scoring is important, as not only does it ensure scientifically robust assessment, but it also renders the assessment process transparent and fair on all team-members who take part.

It is, therefore essential that all assessors receive training to use the tool in a similar manner – otherwise observers' understanding of what the behaviours entail is likely to be idiosyncratic. As a result, it is likely that observations will differ across sites, inter-observer reliability will be low, and the data analyses will be flawed, with significant negative impact on the perceived relevance, transparency and fairness of the assessment process.

Perfect reliability is almost impossible when observing human behaviour, but provision of training can ensure that all observers achieve a minimum acceptable standard of reliability.

WHAT DOES THE TRAINING CONSIST OF?

There are three phases to the observers' training:

PHASE 1: Familiarisation with the tool and the relevant evidence base

This first phase consists of a one-to-one session with an Imperial College researcher, who introduces OTAS to a prospective assessor and explains how to use the tool. . This can be achieved by observing real cases, or using a set of pre-recorded video clips (provided by the OTAS team) recorded in a simulated OR. In this phase, assessors are also required to read selected articles on the development and validation of OTAS, and consider the practical/ethical issues around its usage (see references below).

Learning Outcomes: familiarisation with OTAS and OTAS literature; introduction to OTAS usage in ORs.

PHASE 2: Observation training and assessor calibration with expert

This phase consists of supervision/guidance provided by OTAS team researcher in assessing teamwork in the OR using the tool. This typically involves joint assessment in real time of team performance in real cases in the OR between expert OTAS assessor and trainee OTAS assessor. Upon completion of each observed case, the two assessors compare their scores and the expert assessor provides detailed feedback to the trainee assessor regarding the scoring of OTAS behaviours. This is the assessment calibration process. A key part of this process is to troubleshoot problematic aspects of OTAS observations as experienced by the trainee assessor.

Trainee OTAS user calibration via remote feedback and guidance provided by an expert OTAS assessor is currently being piloted, to facilitate training in OTAS over distance.

Learning Outcomes: improved understanding of OTAS use, behaviour definitions/exemplars and scoring anchors; clarification of observation queries and difficulties; successful calibration of scoring with expert OTAS assessor. At the end of this Phase, trained OTAS assessors can use the tool unsupervised in their own hospitals/ORs.

PHASE 3: Refresher training for consolidation of learning (as required)

In this Phase, an OTAS expert carries out team performance assessments using the tool in the newly trained assessor's own institution. The process is similar to that employed in Phase 2. The aim of this Phase is to consolidate the observation skills that have been acquired in Phase 2; in addition, because there are likely differences in team culture and practices across different institutions, this Phase allows recalibration of scoring on the basis of the local behavioural norms. This Phase may only be required in some cases – particularly when accuracy in the assessment is a key requirement and continuous quality assurance of the assessment process is needed.

Learning Outcomes: continuous proficient use of OTAS to independently assess team performance.

WHAT CAN OTAS BE USED FOR?

OTAS can be used in different ways;

1. OR teams can use the OTAS exemplars as indices of their teamworking effectiveness without numerical scoring.
2. OR teams can use the OTAS exemplars as well as some numerical scoring to self-evaluate how well they think they are performing and identify areas for improvement.
3. OTAS can be used in formal prospective research to quantify team processes and correlate them with clinical processes and ultimately patient outcomes.
4. OTAS can be used in team training environments for skills assessment and provision of structured, objective feedback on non-technical performance.

INTERESTED IN KNOWING MORE? GET IN TOUCH.....

For further information about OTAS, and the training that we provide please contact: Dr Nick Sevdalis @ n.sevdalis@imperial.ac.uk

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