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Nontechnical skills and decision making in operative vaginal delivery

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A B S T R A C T

Nontechnical skills are defined as social, cognitive and personal resource skills that are necessary to conduct any technical skill safely. Whilst the skills are categorised into three domains: social, cognitive and personal resources, these are dependent on each other and the development and effectiveness of one relies on the other two. Effective nontechnical skills are essential in the safe care of patients in any setting, and their importance can be clearly demonstrated in the safe development of skills in many areas of medicine and surgery. Increasingly the importance of these skills is being recognised in outcomes for patients and staff, and training courses and assessment tools are being developed and used in obstetrics. Understanding of the role of nontechnical skills in labour and especially in operative vaginal births should be embedded across the specialty. Further research is needed in validation of assessment tools for these skills when used in obstetrics.

Introduction

Nontechnical skills underpin any task undertaken by clinicians in the care of their patients, and nowhere else in obstetrics is this seen so clearly as within the setting of an operative vaginal delivery

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(OVD). Nontechnical skills are defined as social, cognitive and personal resource skills that are imperative to perform any technical skill safely [1]. The social domain includes communication, professional behaviour, leadership and team work, while the cognitive domain covers situational awareness, decision making, task management and reflection [2,3]. The personal resource skill includes coping with stress and fatigue.

Technical skills not supported by the non-technical skills or human factors of a task have a greater risk of poor outcome. Inadequacy in non-technical skills has been shown to lead to a large proportion of adverse events in health care. Subjective incident reports were gathered through interviews of surgeons in three teaching hospitals in USA. These reports identified communication failure as contributory factor in 43% of cases of adverse events [4]. A study in Obstetrics attributed 70% of the errors to communication [5]. Similar findings have been noted in more recent maternity reports. The Kirkup report, focusing on organisational failures in a maternity unit, sited lack of teamwork and poor interpersonal relationships as a contributory factor [6]. Each Baby Counts is a UK wide quality improvement program run by Royal College of Obstetricians and Gynaecologists reviewing the care provision in all cases of intrapartum stillbirths, neonatal deaths or severe brain injury within seven days of birth. The report on 1136 cases from 2015 showed human factors were contributory in 30% of cases with lack of situational awareness, stress and fatigue as the most frequent individual factors [7]. An in-depth analysis of 50 cases of compensation claims for cerebral palsy highlighted the value of timely decision making [8].

Developing the non-technical skills in obstetrics is vital for doctors as, at the same time as developing their technical skills, they are faced with an awake client, an audience of birth partners and midwives and often concerns about fetal wellbeing. Increasingly however, nontechnical skills are being recognised as important in training and assessment in medical education [9]. In medicine, human error can never be eliminated, but developing and training in nontechnical skills offers a resource to reduce this risk [1]. Obstetrics, more than any part of medicine, offers a challenge for clinicians that is unique. Women do not arrive on a labour ward eagerly anticipating their vacuum extraction or forceps delivery, and yet, in the United Kingdom, 12.7% of all women and a quarter of first-time mothers have an operative vaginal delivery [10]. This likelihood of operative vaginal delivery combined with patient expectations can have far-reaching effect on the women. Studies have shown that 3–4% of women suffer from post-traumatic stress disorder (PTSD) following birth, and that this number can be as high as 20% in high risk groups. Interaction with medical staff and operative deliveries are well-recognised as risk factors for the development of PTSD [11–13]. Some of the features of an OVD which can feel particularly traumatic to women are the loss of control, the fear for her baby and the loss of dignity in such a setting.

Whilst the origins of non-technical skills lie in the need to enhance safety in aviation and healthcare, these skills can also be beneficial to the health professionals. A study investigating prevalence of emotional distress and post-traumatic stress disorder among obstetricians found that the triggers for these emotions included doubts about decision making, criticism following a complex case, and complications arising during an operative delivery [14]. In this study, some of the obstetricians left the profession due to these emotional stressors. Training in non-technical skills may help obstetricians to deal with these high emotional impact situations. By having effective nontechnical skills, these features can be addressed to improve outcomes for women and doctors.

Domains of nontechnical skills for operative vaginal delivery

Non-technical skills are task specific and whilst generally classified into social skills, cognitive skills and personal skills, in this review we focus on the skills specific for operative vaginal delivery. The skills are classified into seven main categories and each category is subdivided into individual elements or subtasks. This model of classification has been informed by the non-technical skills taxonomies described in anaesthesia and surgery [15,16]. The nontechnical skills for operative vaginal delivery are shown in Table 1 below. In practice however the skills are inter-related and a lack of one of the skills will have an impact on the other skills and therefore a detrimental effect on the task. Personal resource skills of coping with stress and fatigue influence how the social and cognitive skills are executed.

Table 1
Nontechnical skills for operative vaginal delivery.

Category	Elements
Social Skills	
Professional relationship with the woman	Communicate procedure with the mother
	Maintain dignity of the mother
	Partner participation
Maintaining professional behaviour	Calm
	Confident/Assertive
	Able
Team work and communication	Clear exchange of information
	Identifying resources
	Aware of team capabilities
	Respect for members of team
Cognitive skills	
Situational awareness	Information gathering
	Understand and analyse information
	Anticipation
Decision making	Consider all options available
	Implement one option
	Evaluate/reassess the option chosen
Personal resources skills	
Dealing with stress and fatigue	Reflection
	Resilience training
	Support from colleagues and friends

Social skills

Professional relationship with the mother and the birthing partner

The element of developing professional relationships with the mother and the birthing partner is specific to obstetrics where the mother and the partner are aware of and anticipate being part of the decisions being made in the delivery room. Interpersonal relationships with the care givers in labour are vital to maternal satisfaction with birth experience. Breakdown in these relationships can lead women to find birth traumatic and violent [17]. Mother's cooperation and trust in the obstetrician are vital for the operative vaginal delivery to be a positive experience for the mother and the team caring for her. Without effective communication with the woman and her birth partner, trust cannot be established. Obstetricians again have a unique challenge, as they often have to establish this trust extremely quickly for fetal and maternal safety. Eye contact, introductions, tailoring conversation to the situation and empathy are all important to build rapport. An anticipated technically low risk lift-out delivery can lead to distress if there is no relationship built beforehand. Positive and negative birth experience is related more to the feeling and exertion of control and choice and less the mode of delivery [18]. The professional relationship with the mother allows the obstetrician to be able to take her birth preferences into consideration and thereby giving mother a sense of control. An ongoing dialogue with the mother (and the team) to keep mother informed of the progress can help alleviate some of the fears mother may be experiencing and providing some emotional and existential safety [19].

Maintaining professional behaviour

All behavioural marker taxonomies for non-technical skills include a category of Leadership. However, in case of OVD, the accoucheur may not always be the leader of the clinical setting. For example, a junior obstetrician doing an OVD is more likely to focus on the procedural details of the delivery and a senior midwife may become a more likely leader who could direct and coordinate the work of others in the delivery room. Therefore, the focus of this element is for the obstetrician to be calm and assertive.

Maintaining professional behaviour in an OVD can be challenging. This requires the obstetrician to remain calm in the face of a high-pressure situation, as well as coping with distractions and

interruptions [3]. Assertiveness is necessary, as often in an OVD setting there are many voices in the room, and the skill involves a delicate balance between commanding respect in the room, without being overbearing and working beyond one's ability.

Team work and communication

Communication and teamwork are the most well recognised non-technical skill across all medical domains. In the context of OVD, this involves communication with the team and working together towards the common goal of a safe OVD. Communication can be defined as 'a two-way process of reaching mutual understanding, in which participants not only exchange information but also create and share meaning' [20] The communication should be unambiguous, clear and adequate. Tools such as SBAR and are recognised as good standards of communication. Modelling the communication in a standardised framework such as SBAR (situation, background, assessment and recommendation) can reduce errors and gaps in communication. Introduction of SBAR communication in the anaesthetic clinics in Sweden lead to an improvement in communication and safety climate and led to a reduction in communication related incidents [21]. SBAR communication should be used between the midwife caring for the mother and the obstetrician. When a decision is made to perform an OVD, the obstetrician needs to detail the instrument use intended, the urgency and the venue.

Many studies have shown that team work improves patient outcomes, and that effective teamwork has a positive feedback on members of the team [22–24]. The MBRRACE report published in 2016 highlighted the importance of authentic multidisciplinary team working in critically ill women, and this easily carries through to OVD [25]. The smallest team during an OVD comprises of an obstetrician, midwife, neonatologist, the woman and her birth partner. If the delivery is conducted in the operating theatre the team extends to the anaesthetist and the theatre staff. All team members have specific skills and the obstetrician should be aware and respectful of the team's abilities. Good team leadership has been shown to empower team members to report adverse events, as they feel safe to do so, therefore improving patient outcomes [26]. Teams that are open and respect their members have greater psychological safety, where the team members feel empowered to ask questions, speak up when mistakes are made and make suggestions without fear of negative consequences to self. Similarly a good team allows for cross monitoring of performance during an OVD and supporting the team appropriately [27].

Cognitive skills

Situational awareness

Situational awareness is the assessment of the environment and the detection of any changes within it. It forms three parts: perception, comprehension and projection [28]. Perception involves assessment of the clinical situation when asked to review a mother with view to performing an OVD. This is gained by thorough history taking (antenatal and intrapartum), abdominal and vaginal examination and an assessment of maternal and fetal wellbeing. The next step is comprehension, where the obstetrician uses the information gathered to analyse if an OVD can be avoided and if not, assess the safest method. Projection involves thinking ahead to the variables that could occur in the situation. This is important for overall labour ward management, and within an OVD setting may include anticipating potential complications. An example is to plan that should a vaginal delivery be unsuccessful is there an operating theatre free, anaesthetist and theatre staff available to proceed to caesarean section. It also includes assessing who the accoucheur should be in this case: it may not be appropriate for the most senior obstetrician to be doing the low cavity non rotational delivery if elsewhere on delivery suite a high-risk woman is likely to require intervention imminently elsewhere. When performing an OVD, situational awareness involves evaluating the clinical situation continuously and adjusting the actions accordingly as shown in Fig. 1 [29].

Situational awareness however can be easily lost, through cognitive overload and distractions. The Each Baby Counts report from 2015 found situational awareness to have been a contributory factor in 44% of babies with poor outcomes and recommended that all clinical staff need to understand the key principles of maintaining situational awareness to ensure the safe management of complex situations [7].

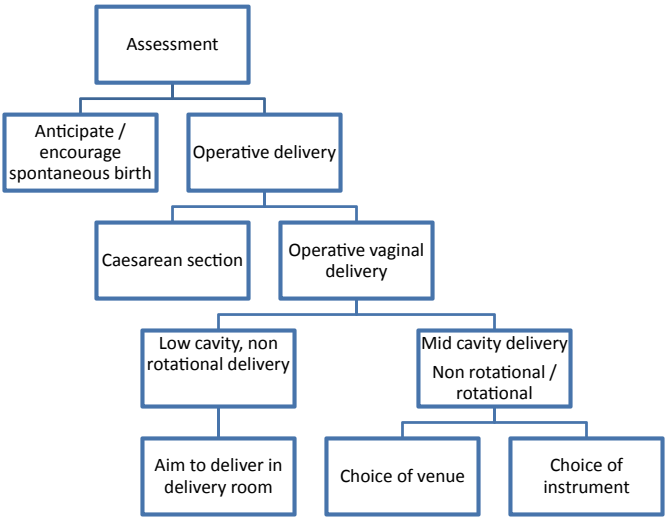

Fig. 1. Decision steps when considering an operative vaginal delivery.

Decision making in OVD

While decision making is part of the cognitive domain of nontechnical skills, without drawing on both cognitive and social domains, a good decision cannot be made. The first decision is often the hardest to make: is an operative vaginal delivery necessary? The principle of first do no harm should be at the forefront of any decision to carry out a delivery.

In all cases where there are no immediate concerns to maternal and/or fetal wellbeing, promotion of normal delivery should be considered. Are there any strategies that can be used to improve the likelihood of a normal delivery? Strategies to promote likelihood of spontaneous birth include optimising the 3 P's – passenger, powers and passage. These include, checking for and correcting malposition where possible, ensure good uterine activity specially in nulliparous women, change of position to facilitate well directed maternal effort and encourage correction of malposition and emptying the urinary bladder to optimise the passage.

Once the decision to perform an operative delivery has been made, the next step is to decide the safest route of delivery: vaginal or caesarean. This decision is made following a review of the maternal and fetal history and examination and with consideration to the mother's, birthing partner and midwife's opinions. If the fetal head is below the spines, and less than 45° from the occipito-anterior (OA) position, and good descent is noted with maternal effort, then a vaginal delivery is likely to be successful. If not, the obstetrician should be aware of the increased potential for a failed instrumental delivery. Table 2 shows the process of decision making and situational awareness in operative deliveries. Of note, although multiple studies have been published on tools to predict the need for OVD or caesarean section, a Cochrane review in 2012 found no studies meeting the inclusion criteria for trial of instrumental delivery in theatre versus immediate caesarean section for anticipated difficult assisted births [30]. The morbidity is greater in this situation and cohort studies report conflicting results regarding increased morbidity with complex OVD or caesarean sections at full dilatation or use of multiple instruments, thereby highlighting need for selection of most appropriate mode of delivery in the first instance [31–33].

If the operator has decided that an OVD is appropriate, and where to carry this out, this should be communicated to the team. It is important again to reflect that the woman may be disappointed with this, and to communicate and use language well. The term “prolonged second stage” should be used and “failure to progress” avoided, as women may perceive the situation to be a personal failure.

The choice of instrument should be discussed with and explained to the mother and her birth partners. Table 3 gives an overview of instruments and the decision-making process. If there is a

Table 2
Decision making regarding optimum mode of operative delivery.

Assessment	OVD in the delivery room	OVD in theatre	Consider caesarean section
Position	<45° rotation from OA position	>45° rotation from OA position	
Station	At spines or +1 station if all other examination findings are favourable	At spines or +1	Above the spines Consider CS in midcavity station if other findings are unfavourable
Moulding	Nil/+	+/++	+++
Caput	Nil/+	+/++	+++
Descent with contractions and maternal effort	Good	Some/minimal	None
Ease of rotation of fetal head with pushing or vaginal examination	Easy rotation	Some rotation/partial/slips back	No rotation
Birth canal/Pelvic dimensions	Subjective perception of adequate pelvic dimensions		Subjective perception that the pelvic dimensions may not be adequate
Suspected fetal compromise	The selection depends on the operator expertise aiming for a delivery option that is quickest and safest for mother and baby.		

disagreement over instrument choice, then ideally another obstetrician's opinion should be sought. It is important to convey risks and benefits to patients as well as possible, and obtain consent, usually verbal if in the delivery room, and written if going to the operating theatre [34].

By the end of this decision-making process, the woman should understand the procedure and have given consent, the team should be aware of the decision and agree, and the obstetrician should feel confident that they have made the correct choices. It is vital however that the decision making is considered a dynamic process that is re-evaluated at each step and decisions adjusted to changing clinical situation (Fig. 2) [35].

Personal resources skills

Dealing with stress and fatigue

Work related events have been reported to lead to stress among obstetricians [36]. There is greater recognition of stress following an adverse event and the term 'second victim' has been used to address the impact on healthcare professionals involved in an unanticipated adverse event [37].

Table 3
Choice of instrument based on extent of rotation of Vertex.

Non-rotational low cavity delivery	Midcavity/rotational delivery
Favour vacuum if:	Select manual rotation or vacuum extraction (rigid cup) if:
Absence of a working epidural	Presence of good analgesia
Presence of good expulsive efforts	Descent of fetal head with maternal effort
Presence of good contractions	On vaginal assessment a degree of rotational movement is possible
Absence of marked caput and moulding	The birth canal is adequate and absence of signs of true cephalopelvic disproportion
Favour forceps if:	Select Kiellands if:
Presence of a dense epidural block	Presence of a dense regional block
Absence of good expulsive efforts	Descent of fetal head with maternal effort
Absence of good contractions	The birth canal is adequate and absence of signs of true cephalopelvic disproportion
Marked caput and moulding	
A method should only be used if the operator is adequately trained.	
Where possible, mother's preferences should be taken in account when selecting an instrument.	
Vacuum delivery is contraindicated for gestational age less than 34 weeks and face presentation.	

Underlining is to highlight the subsection.

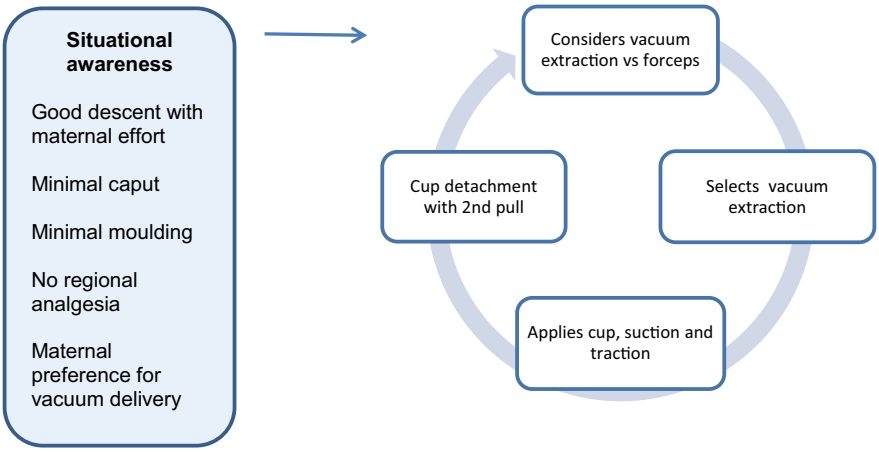

Fig. 2. Dynamic decision making in Operative vaginal delivery.

Recognised adverse events form a small part of day to day challenges faced by doctors. There is often an element of self-doubt. A study into self-perceived medical errors among residents in a teaching hospital in USA showed an association with personal distress, disassociation from the situation and reduced empathy. Moreover, the self-perceived errors were greater when the residents were fatigued and distressed [38,39]. Fatigue and stress have been associated with an increase in medical errors [40,41]. It is therefore important for obstetricians to develop the skills to deal with stress and fatigue. Reflecting on one's stress and fatigue levels is the first step to recognising and mitigating the likelihood of error. It can be immediate reflection before undertaking task, or afterwards, analyse the process and the outcome of the task with view to improving the performance. Increasing fatigue can impair cognitive function, can lead to the detriment of other nontechnical skills. Reflection may allow for the obstetrician to recognise that they are not the right person at that time to do that task. Evidence however shows that coping with stressful events with effective feedback can have a benefit on performance [42]. This balance involves developed self-awareness, as well as effective situational awareness. Resilience training can also be helpful in dealing with stress and breaking the vicious circle of self-perceived medical errors and resultant poor self-esteem, emotional distress and burnout.

Training and assessment

As with any skills taught throughout training, it is important to have reliable methods of training and assessment. However, in obstetrics a training program for developing and assessing the individual nontechnical skills is not as well established as those for a technical skill, such as closing the abdomen or suturing skills. Training in teams is well established in the UK and many other areas of the world. The PROMPT (PRactical Obstetric Multi-Professional Training) Foundation has well-developed training packages that aim to teach both technical and nontechnical skills to teams within the setting of their own units, and evidence has shown that these can be effective both in the simulation and real-life settings [22,23,43,44]. Indeed, these findings can be replicated with other training packages, such as Team STEPPS where team training program helped reduce perinatal mortality [45]. The ROBuST (RCOG Operative Birth Simulation Training) course aims to address technical and nontechnical skills and delivers structured training in these. It is now mandatory for all Obstetric trainees in the UK to attend this course in the first two years of their training especially before starting to work under indirect supervision on the labour ward rota. There is currently no

evidence to suggest that this course has increased the technical or non-technical skills of the obstetricians.

As much as many studies focus on delivering this training, at the pre-consultant grade, it is important to recognise the importance of continuing education in nontechnical skills throughout our careers. A study looking to develop a maternal satisfaction measurement tool in 2009 used a cross-sectional survey in women who had had an operative birth in the preceding 24 h. Interestingly this found that junior obstetricians (those at ST2 level) scored significantly higher in respect than their consultants. It also showed that almost all juniors scored higher than consultants in areas of safety and communication [46]. Allowing for numbers and potential difficulty of cases encountered, this sheds an interesting light on patients' perception of non-technical skills. It is often assumed that the most senior member of the team have the best developed nontechnical skills, however the women in this study did not concur with this hypothesis.

Throughout the speciality training programme in UK, a mixture of work-based assessments aim to address these skills, but no compulsory assessments reliably cover them. Table 4 details the nontechnical skills assessment that is embedded within the RCOG program. There is no evidence to show that these assessments are used correctly to assess these skills. This is of concern as assessment of nontechnical skills is much more important since we have lost the apprenticeship model where a trainee spent a significant proportion of their working hours under supervision of one consultant and his/her team.

Formal assessment of nontechnical skills in obstetrics is not mandatory in the UK. Throughout the speciality training programme, a mixture of work-based assessments aim to address these skills, but no compulsory assessments reliably cover them, and there is no evidence to show that these assessments are used correctly to assess these skills. Many specialities are now using formal assessments to assess nontechnical skills in their staff, including anaesthetics and emergency medicine. The Royal College of Surgeons of Edinburgh and University of Aberdeen developed the assessment non-technical skills for surgeons (NOTSS) as a behavioural marker system with the aim to formally assess these skills on an individual basis, rather than as part of a wider team assessment. The NOTSS aims to assess five skills – situation awareness, decision making, task management, communication and teamwork and leadership [47]. The skills assessed are very similar to the nontechnical skills expected of an Obstetrician and Gynaecologist. Therefore, this assessment has been attractive to obstetrics and gynaecology, and evidence has shown that it has the potential to be a useful adjunct in the speciality [48]. The RCOG has adapted the NOTSS for trainees in a labour ward and in a gynaecology theatre setting (Table 5). The intention is that the tool be used as a debrief tool to give feedback in a structured manner after a labour ward shift, and the RCOG pilot suggested that the debrief may take as little as five minutes to complete [49].

Table 4
RCOG workplace-based assessments.

Assessment	Nontechnical skills suggested to assess
OSAT	Communication with patients/relatives
	Peri-operative planning
	Use of assistants
	Communication with theatre staff/anaesthetist
	Selection and checking of instruments/equipment
	Forward planning
	Dealing with problems/difficulties
Case-based discussion	Professionalism: Respectful, logical approach to problem-solving, diligent and self-directed approach to patient and learning needs
Mini-CEX	Communication skills: Patient-friendly, questioning style, empathy, clear explanation
	Professionalism: Respectful, courteous, confident, use of team members
TO1	Empathy and respect
	Team working
	Verbal communication skills
	Accessibility and conscientiousness
	Organisation and thoroughness
	Insight

Table 5
RCOG NOTSS tool for Labour Ward.

Category	Element	Feedback on performance and debriefing notes
Situation Awareness	Gathering information	
	Understanding information	
	Projecting and anticipating future state	
Decision Making	Considering options	
	Selecting and communicating option	
	Implementing and reviewing decisions as appropriate	
Communication and Teamwork	Exchanging pre, intra and post-operative information with team (and patient if awake)	
	Establishing a shared understanding	
	Co-ordinating team activities	
	Role clarity	
Leadership	Setting and maintaining standards	
	Supporting others	
	Coping with pressure	

The pilot study for its use in obstetrics was promising, with overall high satisfaction scores in trainees and trainers, who also found it straightforward to use, but the authors recognised that it may be difficult to engage trainees in yet another assessment, and training must be given to recognise the behaviours being assessed [49]. This correlates with another study, showing that novices at the assessment tended to give lower scores than those who were experienced [50]. Criticism can also be levied at NOTSS for not including patient feedback, particularly if to be used in a labour ward setting, where nontechnical skills underpin so much of the role, however tools are being developed in conjunction with NOTSS to allow for patient-centred evaluation [51].

Another limitation of NOTSS is that no formal training has been provided to assess the skills. The depth of feedback given depends on the enthusiasm and experience of the assessor and the time set aside for feedback. We suggest that the assessment tool should be supported by a key of behaviours. This will make it easier for an assessor to give the trainee more detailed feedback of his or her skill level allowing a more structured feedback and a focussed reflection. Table 6 shows an example of good and poor behaviours for the category we consider unique to obstetrics; maintaining professional behaviour. While NOTSS appears to be a valid tool in the assessment of nontechnical skills within surgical training [52], it is not yet compulsory for training in obstetrics and gynaecology, and assessment in nontechnical skills within the specialty continues to be delivered in a mostly informal fashion as additional comments on OSATS forms. Effective feedback relies upon good educational supervision, and frank discussion among teams about how they feel nontechnical skills are developing. There is also reconsideration to be given to how nontechnical skills are assessed in the consultant grade of obstetricians. Revalidation and appraisal incorporate

Table 6
An illustration of good and poor behaviours for the category of 'maintaining professional behaviour'.

Element	Good behaviour	Poor behaviour
Calm	Stays calm in an emergency situation	Panics in an emergency situation
	Does not appear stressed	Appear anxious and rushed in a stressful situation
Confident/assertive	Create a confident atmosphere	Does not appear confident
	Clear firm instructions	Instructions not firm
	Takes the lead	
Able	Knows his/her limitations	Does not know his/her limitation
	Open and honest about his/her ability and reflects on the experience	Not reflective of his/her practice after an adverse event
	Gentle and shows empathy	Rough and lacks empathy

non-technical skills indirectly through outcome data and feedback from patients and colleagues, as no formal tools have been developed, and yet development of skills does not stop at completion of training.

Summary

Nontechnical skills are appropriately recognised as key to being an effective obstetrician, and this is easily demonstrated in the setting of operative vaginal delivery. Without these skills, there is breakdown in the relationship with the woman, her birth partners and the labour ward team, and adverse events can all too easily occur. Training exists in the form of in-house emergency training, and courses and feedback for trainee obstetricians, but formal feedback tools still need to be better developed and there has to be a way of introducing this at all grades, not just those in training. In developing these skills through effective training and feedback, labour ward teams will become more cohesive and women and their babies will receive better care.

Practice points

- Effective nontechnical skills are essential in the role of any practicing obstetrician
- Nontechnical skills are divided into three domains: social, cognitive and personal resources skills, however these domains interweave, and one can influence the outcomes of others
- Without good nontechnical skills, there is a greater likelihood of adverse events, and this can be seen in the setting of an operative vaginal delivery
- Formal methods of training and assessment remain to be further developed at all stages of obstetric careers

Research agenda

- The effectiveness of nontechnical skills training in improving patient outcomes
- Validation of assessment tools for non-technical skills in pregnancy and labour

Conflict of interest

None.

Abbreviations key

SBAR Situation Background Assessment Recommendations
PROMPT Practical Obstetric Multi Professional Training
ROBuST RCOG Operative Birth Simulation and Training
MBBRACE-UKTeamSTEPPS Team Strategies and Tools to Enhance Performance and Patient Safety
NOTSS Non Technical Skills for Surgeons
Mini-CEX Mini clinical evaluation exercise

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bpobgyn.2019.02.001.

References

[1] Flin R, O'Connor P, Crichton M. Safety at the sharp end: a guide to non-technical skills. Ashgate; 2008.
[2] Bahl R, Murphy DJ, Strachan B. Non-technical skills for obstetricians conducting forceps and vacuum deliveries: qualitative analysis by interviews and video recordings. Eur J Obstet Gynecol Reprod Biol 2010;150(2):147–51.
[3] Jackson KS, Hayes K, Hinshaw K. The relevance of non-technical skills in obstetrics and gynaecology. Obstet Gynaecol 2013;15(4):269–74.
[4] Wilson J. A practical guide to risk management in surgery; developing and planning. In: Healthcare risk resources international-royal College of surgeons symposium; 1999.
[5] Guise JM, Segel S. Teamwork in obstetric critical care. Best Pract Res Clin Obstet Gynaecol 2008 Oct;22(5):937–51.
[6] Kirkup DB. The report of the morecambe bay investigation. 2015.
[7] RCOG. Each baby Counts: 2015 full report. London. 2017.
[8] Magro M. Five years of cerebral palsy claims: a thematic review of NHS Resolution data. 2017.
[9] Non-Technical Skills for Surgeons (NOTSS) - RCOG. https://www.rcog.org.uk/globalassets/documents/careers-and-training/assessment-and-progression-through-training/notss-labour-ward-guidance.pdf.
[10] Digital N. NHS Maternity Statistics, England 2016-17 2017 [Available from: https://files.digital.nhs.uk/pdf/l/1/hosp-epis-stat-mat-repo-2016-17.pdf.
[11] Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med 2016;46(6):1121–34.
[12] Grekin R, O'Hara MW. Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. Clin Psychol Rev 2014;34(5):389–401.
[13] Yildiz PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: a systematic review and meta-analysis. J Affect Disord 2017;208:634–45.
[14] Baas MAM, Scheepstra KWF, Stramrood CAI, Evers R, Dijksma, n LM, van Pampus MG. Work-related adverse events leaving their mark: a cross-sectional study among Dutch gynecologists. BMC Psychiatry 2018 Mar 22;18(1):73.
[15] Fletcher G, Flin R, McGeorge P, Glavin R, Maran N, Patey R. Rating non-technical skills: developing a behavioural marker system for use in anaesthesia. Cognit Technol Work 2004;6:165–71.
[16] Yule S, Flin R, Paterson-Brown S, Maran N, Rowley D. Development of a rating system for surgeons' non-technical skills. Med Educ 2006;40:1098–104.
[17] Thomson M, Downe S. Changing the future to change the past: women's experiences of a positive birth following a traumatic birth experience. J Reprod Infant Psychol 2010;28(1):102–12.
[18] Cook K, Loomis C. The impact of choice and control on women's childbirth experiences. J Perinat Educ 2012 Summer; 21(3):158–68.
[19] Nilsson C. The delivery room: is it a safe place? A hermeneutic analysis of women's negative birth experiences. Sex Reprod Healthc 2014 Dec;5(4):199–204.
[20] ACT academy. SBAR communication tool. https://improvement.nhs.uk/documents/2162/sbar-communication-tool.pdf.
[21] Randmaa M, Mårtensson G, Leo Swenne C, Engström M. SBAR improves communication and safety climate and decreases incident reports due to communication errors in an anaesthetic clinic: a prospective intervention study. BMJ Open 2014; 4(1).
[22] Siassakos D, Fox R, Hunt L, Farey J, Laxton C, Winter C, et al. Attitudes toward safety and teamwork in a maternity unit with embedded team training. Am J Med Qual 2011 Mar-Apr;26(2):132–7.
[23] Siassakos D, Bristowe K, Draycott TJ, Angouri J, Hambly H, Winter C, et al. Clinical efficiency in a simulated emergency and relationship to team behaviours: a multisite cross-sectional study. BJOG An Int J Obstet Gynaecol 2011;118(5):596–607.
[24] Mazzocco K, Petitti DB, Fong KT, Bonacum D, Brookey J, Graham S, et al. Surgical team behaviors and patient outcomes. Am J Surg 2009;197(5):678–85.
[25] Knight M, et al. Saving lives, improving mothers' care - surveillance of maternal deaths in the UK 2012-14 and lessons learned to inform maternity care from the UK and Ireland confidential enquiries into maternal deaths and morbidity 2009-14. Oxford: National Perinatal Epidemiology Unit, University of Oxford; 2016.
[26] Appelbaum Nital P, Dow A, Mazmanian Paul E, Jundt Dustin K, Appelbaum Eric N. The effects of power, leadership and psychological safety on resident event reporting. Med Educ 2016;50(3):343–50.
[27] Edmondson A. Psychological safety and learning behavior in work teams. Adm Sci Q 1999;44(2):350–83.
[28] Endsley MR. Toward a theory of situation awareness in dynamic systems. Hum Factors 1995;37(1):32–64.
[29] Bahl R, Murphy DJ. Strachan B Decision-making in operative vaginal delivery: when to intervene, where to deliver and which instrument to use? Qualitative analysis of expert clinical practice. Eur J Obstet Gynecol Reprod Biol 2013 Oct;170: 333–40.
[30] Majoko F, Gardener G. Trial of instrumental delivery in theatre versus immediate caesarean section for anticipated difficult assisted births. Cochrane Database Syst Rev 2012;10.
[31] Murphy DJ, Liebling RE, Patel R, Verity L, Swingler R. Cohort study of operative delivery in the second stage of labour and standard of obstetric care. BJOG 2003 Jun;110:610–5.
[32] Murphy DJ, Macleod M, Bahl R, Strachan B. A cohort study of maternal and neonatal morbidity in relation to use of sequential instruments at operative vaginal delivery. Eur J Obstet Gynecol Reprod Biol 2011;156:41–5.
[33] Demissie K, Rhoads GG, Smulian JC, Balasubramanian BA, Gandhi K, Joseph KS, et al. Operative vaginal delivery and neonatal and infant adverse outcomes: population based retrospective analysis. BMJ 2004 Jul 3;329:24–9.
[34] Bahl R, Strachan B, Murphy DJ. Operative vaginal delivery. Green top guidelines. London: RCOG Press; 2011.
[35] Attilakos G, editor. ROBuST RCOG operative BirthSimulation training course manual. Cambridge Medical Press; 2014. p. 30–41.
[36] Wahlberg A, Andreen Sachs M, Johannesson K, Hallberg G, Jonsson M, Skoog Svanberg A, et al. Post-traumatic stress symptoms in Swedish obstetricians and midwives after severe obstetric events: a cross-sectional retrospective survey. BJOG 2017 Jul;124(8):1264–71.

[37] Wu AW. Medical error: the second victim. The doctor who makes the mistake needs help too. BMJ 2000 Mar 18; 320(7237):726–7.
[38] West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. J Am Med Assoc 2006 Sep 6;296(9):1071–8.
[39] West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD. Association of resident fatigue and distress with perceived medical errors. J Am Med Assoc 2009 Sep 23;302(12):1294–300.
[40] Welp A, Meier LL, Manser T. Emotional exhaustion and workload predict clinician-rated and objective patient safety. Front Psychol 2015 Jan 22;5:1573.
[41] Welp A, Meier LL, Manser T. The interplay between teamwork, clinicians' emotional exhaustion, and clinician-rated patient safety: a longitudinal study. Crit Care 2016 Apr 19;20(1):110.
[42] Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. PLoS One 2016;11(7).
[43] Hull L, Arora S, Aggarwal R, Darzi A, Vincent C, Sevdalis N. The impact of nontechnical skills on technical performance in surgery: a systematic review. J Am Coll Surg 2012;214(2):214–30.
[44] Draycott TJ, Crofts JF, Ash JP, Wilson LV, Yard E, Sibanda T, et al. Improving neonatal outcome through practical shoulder dystocia training. Obstet Gynecol 2008 Jul;112(1):14–20.
[45] Riley W, Davis S, Miller K, Hansen H, Sainfort F, Sweet R. Didactic and simulation nontechnical skills team training to improve perinatal patient outcomes in a community hospital. Joint Comm J Qual Patient Saf 2011 Aug;37(8):357–64.
[46] Siassakos D, Clark J, Sibanda T, Attilakos G, Jefferys A, Cullen L, et al. A simple tool to measure patient perceptions of operative birth. BJOG An Int J Obstet Gynaecol 2009;116(13):1755–61.
[47] Yule S, Flin R, Maran N, Rowley D, Youngson G, Paterson-Brown S. Surgeons' non-technical skills in the operating room: reliability testing of the NOTSS behavior rating system. World J Surg 2008 Apr;32(4):548–56.
[48] Beard JD, Marriott J, Purdie H, Crossley J. Assessing the surgical skills of trainees in the operating theatre: a prospective observational study of the methodology. Health Technol Assess 2011 Jan;15(1):1–162. i-xxi.
[49] Jackson S, Brackley K, Landau A, Hayes K. Assessing non-technical skills on the delivery suite: a pilot study. Clin Teach 2014;11(5):375–80.
[50] Yule S, Rowley D, Flin R, Maran N, Youngson G, Duncan J, et al. Experience matters: comparing novice and expert ratings of non-technical skills using the NOTSS system. ANZ J Surg 2009;79(3):154–60.
[51] Yule J, Hill K, Yule S. Development and evaluation of a patient-centred measurement tool for surgeons' non-technical skills. Br J Surg 2018;105(7):876–84.
[52] Wood TC, Raison N, Haldar S, Brunckhorst O, McIlhenny C, Dasgupta P, et al. Training tools for nontechnical skills for surgeons—a systematic review. J Surg Educ 2017;74(4):548–78.