ASSESSING COMPETENCE IN TECHNICAL SKILLS OF THEATRE NURSES IN INDIA AND SWEDEN
Evaluation of an observational tool

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ABSTRACT

Surgical processes are a complex function of a number of inter-related factors that include individual skills, team working and operating theatre environment. Individual skills can be divided to technical and non-technical skills. This distinction between technical and non-technical skills is rather recent in the healthcare literature. There are studies made about assessing non-technical skills performed in the operating theatre but studies made to assess theatre nurses’ technical skills have been lacking until recently. The aim of this study is to evaluate clinical applicability of a newly developed observation tool in different contexts and through observing describe similarities or differences between theatre nursing. The observations in the present study are structured with a newly developed observational tool that is developed to assess technical skills of a theatre nurse. The two authors of this study performed the data collection simultaneously at different operation departments. The present study makes evident that the technical skills required of a theatre nurse are considerably different in two different countries. Therefore, it is difficult to use an observational tool without modifying it according to local routines.

Keywords: professional competence, psychomotor performance, operating room nursing
SAMMANFATTNING


Nyckelord: Professionell kompetens, psykomotorisk funktion, sjuksköterskearbete vid operation.
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1 BACKGROUND

1.1 Competence

Competence has become an important concept in human resource development and education during recent decades (Mulder, 2007). The concept of competence is defined and interpreted in multiple ways, both among different scientific fields and even within a single one and there is still a lack of a thorough conceptual framework including an operationalisation (Delamare De Leist & Winterton, 2005; Esteves, 2009; Fletcher, McGeorge, Flin, Glavin & Maran 2002).

Bhatti and Cummings (2007) define competence as an ability to successfully apply professional knowledge, skills and attitudes to new situations as well as familiar ones. Eraut (2008) explains that competence usually refers to a person’s underlying characteristics or overall capacity that is causally related to job performance. According to Taatila (2004) another related term that is close to the term competence is performance. Kak, Burkhalter & Cooper (2001) make a clear distinction between these two terms by explaining competence as someone’s capacity to perform, and performance as the resulting behavior. Stobinski (2008) notes, that competence is one determinant of performance and that the relationship is not direct. Other factors—such as the work setting, time, and motivation—also have a major role in determining performance.

In health care education, the role of competence has grown dramatically as health care employers and educators have identified the gap between education and practice (Scott Tilley, 2008). The assessment of professional competence is essential, as employers, consumers, and other health care stakeholders have heightened expectations for nursing practice (Stobinski, 2008). The globalization, rapid technological development and increasing scientific innovations and demands of cost-effectiveness have created an interest of understanding competence and finding ways of measuring it from educational, individual and managerial point of view (Bauman & Blythe, 2008; Delamare De Leist & Winterton, 2005; Kak, Burkhalter & Cooper, 2001; Stobinski, 2008).
1.2 Competence in clinical nursing

In the context of clinical nursing, researchers have made efforts to clarify the concept since early eighties but still, there is a lack of what competence means in the context of clinical nursing practice (Scott Tilley, 2008; Stobinski, 2008). A lot of work is to be done to achieve a conceptual definition of nursing competence, and establish measurable operational definitions (Rager Zuzelo, 2009).

Parsons and Capka (1997) define competence as a demonstrated ability of an individual to perform and identified cohort of skills in clinical practice. They point that competence is not a measure of individual’s overall expertise. According to Parsons and Capka (1997), competence assessment models should limit their applications to the assessment of core skills and behaviors. Clinton, Murrells and Robinson (2005) claim that this reductionist and conservative approach – in which only work tasks and roles are considered – is consistently recommended to be avoided on nursing competence study in several reviews. Competence seen only as performing different tasks is considered to have a narrow applicability and use in practice, competence then envisioned as a product.

Instead of this concept of competence equated with performance, a holistic conceptualization has been introduced in nursing research (Cowan, Norman & Coopamah, 2005). The focus is not on the performance but on the person who is performing, competence being associated as a quality or state of being of an individual (Locsin, 1998). Cowan, Norman and Coopamah (2005) state that a holistic definition of competence needs to be agreed upon and operationalized in nursing practice. According to them this would also underpin the development of competence standards and the tools required for the assessment.

In Ramritu and Barnard’s (2001) study graduate nurses were asked to describe their understanding of competence. Competence was understood as an evolving process. Competences as performance, knowledge, clinical skills, and safe and ethical practice, management of time and workload, utilization of resources, as limited independence, were found as conceptions of competence of the graduate nurses. Lindberg (2006) presents in her study how intensive care staff understands term competence. The staff described five different ways of understanding competence in intensive care: ability to
cooperate, being able to perceive the situation correctly, being aware of abilities and limitations, being able to act, and being able to disregard the technology, when that is the most correct way of caring for a patient.

Competence is developed through pre-service education, in-service training, hands-on experience, and the assistance of mentors and preceptors (Kak, Burkhalter & Cooper, 2001). A presumption of competence is made with completion of a nursing education program followed by passage of the licensure examination; this presumption of nursing competence lasts throughout a career (Stobinski, 2008), and no mechanism exists for most health care facilities to ensure that practitioners remain up-to-date with current best practices (Scott Tilley, 2008).

1.3 Assessment of competence in clinical nursing

Competence can be assessed using observation, written tests, computerized tests, simulations with anatomic models, job simulations, portfolios and self assessment (Cowan, Norman & Coopamah, 2005; Kak, Burkhalter & Cooper, 2001). The dominant method to assess a health care professional’s continued competence is traditional didactic continuing education (formal conferences, lectures, and dissemination of educational materials) (Scott Tilley, 2008). There is a lack of consensus regarding the most effective method to perform nursing competence assessment (Stobinski, 2008). Each approach has strengths and weaknesses, and the approach adopted to assess competence has implications upon how the outcomes of the assessments should be considered (Cowan, Norman & Coopamah, 2005).

In the last 20 years, the objective structured clinical examination (OSCE) has emerged as a simulation method for assessing competence in nursing education, and nursing. It measures clinical skills using a uniform, structured format of rotating stations simulating a clinical reality (Kak, Burkhalter & Cooper, 2001; Walsh, Hill, Bailey & Koren, 2009). According to Walsh, Hill, Bailey and Koren (2009) there is a concern of the traditional OSCE not reflecting to the nature of nursing practice. Adaptation of OSCE is said to be needed to reflect the holistic approach of clinical nursing, instead of having the perspective of task-oriented competence.
1.4 Theatre nursing competence

The nurse, working at the operating theatre can be called as theatre nurse, operating room nurse (Sevdalis et al., 2009) or perioperative nurse (Fairchild, 1993). The term perioperative nurse was adopted by The Association of periOperative Registered Nurses (AORN) 1982 in United States. "Perioperative" is a more descriptive and accurate term compared to "operating room" because the term focuses on all facets of the patient’s surgical experience: the preoperative, intraoperative and postoperative phases of nursing care (Fairchild, 1993). The term ”perioperative nurse” also includes the anesthetic nursing in United States, as it does in Sweden, where Lindwall and von Post (2008) have adopted the term in their framework for perioperative practice. In this study we have thoroughly used the term”theatre nurse” describing the nurse working in the operating theatre.

Internationally, theatre nurses can have two major roles, either a scrub nurse (also called instrument nurse) role or a circulating nurse role. The traditional responsibilities of a scrub nurse include performing surgical hand scrub and sterile gowning and gloving. A scrub nurse prepares the instruments, trolleys and sterile supplies needed for the surgery, maintains sterile environment, and provides skilled assistance to the surgeon during the operation (Mitchell & Flin, 2008; Spry, 2009). In Sweden, the theatre nurse almost always has the role of a scrub nurse, while the circulating role is mostly carried out by an assistant nurse. The responsibilities of scrub nurse in Sweden include also skin disinfection and draping of the patient’s surgical area prior to the surgery (Public Employment Services, 2010).

The circulating nurse (also terms scout nurse, or circulator nurse are used) is responsible for managing the nursing care of the patient within the operating theatre and coordinating the needs of the surgical team with other care providers necessary for completion of surgery. The circulating nurse observes the surgery and the surgical team from a broad perspective and assists the team to create and maintain a safe and comfortable environment for the patient (Spry, 2009).

In this study, we consider with the term”theatre nurse”, only the nurse who works in the role of scrub nurse (instrument nurse), in the operating theatre.
According to Rothrock (2007) scrubbing and circulating may become obsolete terms; they define only a part of theatre nurses’ sphere of responsibility. The role of theatre nurse subsumes elements of the behaviours and technical practices that characterize professional nursing in general. Theatre nursing is a blend of the technical and behavioral; it is critical thinking, which requires knowledge, skills, and experience as well as doing and caring for patients. Perioperative nurse fulfils a critical function in surgical patient care: she coordinates interventions, ensures patient safety and comfort, prioritizes and plans care, and manages multiple aspects of the patient’s and team’s needs in each surgical intervention (Rothrock, 2007).

Theatre nurses must work within narrow time constraints and must be able to combine the highly developed technical skills and extensive specialist knowledge with caring aspects of their role, give reassurance as well as obtain important clinical and psychosocial information of the patient (Bull & Fitzgerald, 2004; Gillespie, Chaboyer, Wallis, Chang & Werder, 2009). The goal of theatre nursing is in broad terms to maintain an optimal level of wellness in response to the physiological, psychological and sociocultural needs of patients undergoing surgical procedures. The role of a theatre nurse has evolved from task-oriented specialist to a patient-centered professional (Gillette, 1996; Silén-Lipponen, Tossavainen, Turunen & Burdett, 2004).

Three themes were identified as being central in Gillespie, Chaboyer, Wallis, Chang & Werder’s (2009) study on operating theatre nurses’ perceptions of competence. These three themes were knowledge (coalescence of theoretical, practical, situational and aesthetic knowledge), teamwork and communication (highly developed communication skills among teams of divergent personalities and situations), and the ability to coordinate and manage time schedule.

Gillespie and Hamlin (2009) state that theatre nurse competence is an eclectic concept, difficult to define and even more difficult to measure and express, that theatre nursing competence needs to be more precisely articulated, because competence is necessary for safe surgical patient outcomes.
1.5 Technical and non-technical skills

In nursing education, the acceptable competence of technical skills is a major focus of education (Emerson, 2007). Practical nursing skills ensure patients’ safe treatment (Bjork & Romyn, 1999) and are a central part of a healthcare professional’s role. The successful clinical outcome for patients often depends on the competent performance of a technical procedure (Alteren & Bjork, 2006). Knowing how to do a practical skill can be termed “know-how” type of knowledge, practical expertise and skill that is acquired through constant exposure (Baillie, 2001). To collect information about technical skills, psychomotor skills can be used as a search term (Aggarwal, Moorthy, & Darzi, 2004).

Surgical processes are a complex function of a number of inter-related factors that include individual skills, team working and operating theatre environment. Individual skills can be divided to technical and non-technical skills. This distinction between technical and non-technical skills is rather recent in the healthcare literature (personal note, N. Sevdalis, 24th March 2010). Aseptic technique and instrument handover are examples of a scrub nurse’s technical skills (Sevdalis et al., 2009).

The non-technical skills are defined as the critical cognitive and social skills that complement the technical skills to achieve safe and efficient practice in safety-critical occupations (Mitchell & Flin, 2008; Yule, et al., 2009). The non-technical skill is new area of research for healthcare based on a well developed approach from the world of aviation. These skills are sometimes referred to under the general heading of ‘human factors’, but more specifically, as they do not relate directly to clinical knowledge and technical skills, they can be described as non-technical skills. Non-technical skills can be divided into two subgroups: cognitive or mental skills (e.g. decision making, planning, situation awareness) and social or interpersonal skills (e.g. team-working, communication, leadership). Both groups of skills are necessary for safe and effective performance in the operating theatre environment (Fletcher, McGeorge, Flin, Glavin & Maran 2002).

Mitchell and Flinn (2008) made a literature review on operating theatre nurse’s non-technical skills. Non-technical skills as communication, teamwork and situation awareness were discussed in the papers, but no skills that could be classified as
leadership or decision-making were found, although the authors indicate that these may be skills that theatre nurses also require.

Psychomotor skills are studied as special topics in the experimental psychology of learning and performance. Despite theoretical and empirical progress, much remains to be understood about the acquisition of psychomotor skills and their interrelationship with human-factor variables (Evans & Dirks, 2001). The learning, performance, or significance of nursing practical skills is seldom a theme in theoretical and philosophical debate or the topic of research within nursing. The long-standing behaviouristic tradition in nursing could be reason: practical skills viewed in a simplistic way, only as correctly sequenced motor movement (Bjork & Romyn, 1999).

There are studies made about assessing non-technical skills performed in the operating theatre (Marriott, Purdie, Crossley & Beard, 2009; Undre, Sevdalis & Vincent, 2009), but studies made to assess theatre nurses’ technical skills has been lacking until recently (Sevdalis et al., 2009).

1.6 Graduate Diploma in Specialist Nursing

Internationally, the qualifications and courses necessary before becoming a theatre nurse vary (Mitchell & Flin, 2008). In Sweden a Bachelor of Science in Nursing, 180 credit points, is required for Graduate Diploma in Specialist Nursing. Specialist nurse degree is achieved in Sweden when the student completes course requirements of 60 credit points. The student shall demonstrate knowledge and skills required to work independently as a specialist nurse. Furthermore, the student shall demonstrate knowledge of the scientific ground of the specialist area. The student must have insight in the current research and development in the profession. The student must also have knowledge about the relationship between science and evidence based practice and understand the signification of it for the profession. The student shall have a deeper knowledge of planning, coordinating and leading the care and health management (Higher Education Ordinance, 2006:1053).

In addition, in order to obtain a Graduate Diploma in Emergency Care Specialist Nursing with the emphasis on operating theatre nursing, the student shall have acquired the knowledge and skills required to work as a specialist nurse in the operating theatre,
the ability to be responsible for asepsis, instrumentation, assistance and measures to prevent infection in connection with operations, treatment and examinations of patients of all ages as well as the ability to handle biological preparations, the ability to use his/her specialist knowledge in connection with major accidents and disasters in peace and war (Higher Education Ordinance, 2006:1053).

In India, the Indian Nursing Council is an autonomous body under the Government of India. Ministry of Health & Family Welfare was constituted by the Central Government of the Indian Nursing Council Act, year 1947 in order to establish a uniform standard of training for nurses, Midwives and health visitors (Indian Nursing Council, 2010).

The Indian Nursing Council is the regulatory body for profession of nursing. A person practising nursing must be registered with the nursing council. For a person to be registered, he or she has to undergo and pass the prescribed course stipulated by the council. Education is provided by Nursing Colleges in local hospitals and community settings. There are programs of various levels for nursing education in India: General Nursing and Midwifery (GNM), Basic (B.Sc.) and Post Basic (P.B.B.Sc.) (Indian Nursing Council, 2010).

In order to obtain Post Basic Diploma in operating theatre nursing, the student shall have acquired knowledge to provide quality care to patients in operating theatre, manage and supervise patient care in the operating theatre, teach nurses, allied health professionals and family members in areas related to theatre nursing and conduct research in areas of nursing (Indian Nursing Council, 2010).

1.7 Theatre nursing and patient safety

The operating theatre has been described as a dynamic, high-pressured and potentially high-risk environment that is vulnerable to multiple error (Bull & Fitzgerald, 2004; Gillespie, Chaboyer, Wallis, Chang & Werder, 2009; Silén-Lipponen, Tossavainen, Turunen & Smith, 2005; Undre, Koutantji, Sevdalis, Gautama, Selvapatt, Williams et al., 2007). Modern surgery requires a group of suitably skilled people to work together in a team. This team should be able to deal with the demands of their complex work environments and effectively deliver safe surgical patient care (Fletcher, McGeorge, Flin, Glavin & Maran, 2002; Mitchell & Flin, 2008).
Safety is not a state to be achieved, but an emergent process within health care organizations and their subunits, e.g. operating theatres. The safety agenda is associated with awareness and anticipation of more or less latent flaws in the processes (Sheps, 2006). Securing patient safety can be described as the key element in theatre nursing (Alfredsdottir & Bjornsdottir, 2007; McGarvey, Chambers, Boore, 1999). Patient safety is established by creating a safety culture, standardizing equipment, simplifying processes, using checklists, improving incident and hazard reporting, handling information better at patient discharge or transfer, improving team communications, actively managing provider fatigue and shifts and using surgical-site identification protocols (Warburton, 2009). Speed of work and imbalance in staffing are by theatre nurses identified as the main threats to patient safety (Alfredsdottir & Bjornsdottir, 2007; Riley & Manias, 2006).

1.8 Infection prevention and aseptic technique

Patients undergoing surgery are particularly susceptible to infection; therefore, high standards of infection control must be implemented at all times to break the chain of infection (Barrow, 2009). To create a sterile area and to care for the maintenance of it during the operation is a theatre nursing expertise. One of the aims is to guarantee an area in which microorganisms should be as few as possible to prevent contamination of an open surgical wound and reduce post-operative wound infection risk (Nicolette, 2007).

Creating a sterile area begins when the theatre nurse does the surgical hand scrub and dresses up sterile gown and gloves, takes the sterile instruments and equipments in a sterile manner and organizes them on the table for the surgery. He/she will continue to create a sterile area bounded by the surgical site with sterile disposable drapings after patient skin disinfection (Nicolette, 2007).

1.9 No touch technique

In order to prevent injuries to the patient and surgical team members, Association of Surgical Technologists have developed a standard of practice related to sharps safety and use of the neutral zone in the operating theatre. To prevent two individuals from simultaneously handling a contaminated sharp, scalpel blades, suture needles,
hypodermic needles, and sharp surgical instruments a neutral zone should be utilized during all surgical procedures. The sharps should be pointed away from the personnel in the work area Mayo stand or back table. To remove or attach blades, needles or other sharps use of mechanical safety devices requires. For all surgical procedures a double gloving by all surgical sterile team members is recommended (Council on Surgical and Perioperative Safety, 2010).

1.10 Swab, sharp and instrument counts

In order to increase patient safety practices in the perioperative setting it is recommended that sponge, needle and instrument counts should be performed on all procedures with the possibility that a foreign object could be retained. Incorrect count increases with risk factors such as emergency surgical procedures, unexpected change in the scope of the surgical procedure, procedures involving more than one surgical team, extended procedural length of time, unexpected transfusions, and morbidly obese patients. Sponge, sharp and instrument should be accounted for at the end of the surgical procedure and counts should be documented by the surgical team (Council on Surgical and Perioperative Safety, 2010).

1.11 Gown and gloves

The migration of microbes from the skin and scrub attire of the sterile team member to the sterile field is prevented by using sterile gowns and gloves. Sterile gowns and gloves also prevent blood and body fluids from contaminating the team member. Gown and gloves choice should be selected according to the surgical procedure. Prior to entering the sterile field to aid in preventing surgical site infection all sterile surgical team members are required to don a sterile surgical gown and gloving. For all surgical procedures recommends double gloving of surgical members (Council on Surgical and Perioperative Safety, 2010).

2 AIM OF THE STUDY

The aim of the study is to evaluate clinical applicability of a newly developed observation tool in different contexts and through observing describe similarities or differences between theatre nursing in India and Sweden.
2.1 Research question

How does the newly developed observation tool apply when used in assessing theatre nurses in real operating theatres and in different contexts?

3 METHOD

3.1 Design

This study is a quantitative study using structured, non-participant observation as a data collection method. Observation is a suitable method to capture technical skills which are demonstrated behaviorally (Polit & Beck, 2004). In non-participant observations the researcher assumes the role of complete observer and endeavors no influence on the phenomenon under observation. In quantitative research, a validated structured schedule is used for data collection (Watson & Whyte, 2006). The observations in the present study are structured with a newly developed observational tool that is developed to assess technical skills of a theatre nurse. The two authors of this study performed the data collection simultaneously at different operation departments.

3.2 The observational tool

The Imperial College Assessment of Technical Skills for Nurses (ICATS-N©), is a newly developed observational tool for assessing theatre nurses’ technical skills. It is tested in the context of surgical crisis simulations and defined by the constructor as reliable and valid, and feasible to use (Sevdalis et al., 2009; Appendix A).

In the observational tool, the theatre nurses’ technical skills are conceptualized as consisting of two components, one pertaining to knowledge, one pertaining to application. That is, for example, to have knowledge of why asepsis is important during the surgical procedure, and having that knowledge, to be able to maintain sterility using aseptic technique throughout the surgical procedure. The skills included are generic technical skills (core skills) of a theatre nurse, and relevant to any surgical procedure, and are not meant to be procedure-specific (Sevdalis & al., 2009).
The technical skills of the observational tool include gowing and glowing, setting up instrumentation, draping and maintaining sterile field. These four technical skills in the tool are divided in fifteen different observable items. Each observable item is rated on a six-point scale, 6 being achieved when the technical skill is performed so well that it could be used to train others and 1 being achieved when the technical skill is not performed at all (Sevdalis et al., 2009).

A great difficulty was experienced to perform observations and assess the technical skills with a tool lacking information of the standard performance and descriptions of the points 2-5 on the rating scale. Therefore, the constructor of the observational tool was contacted by email, but according to Dr. Sevdalis, there were no detailed instructions of the rating of observable items of ICATS-N©. Since the lack of detailed instructions, the authors begun to define each point on the six-point scale of the tool by examining the literature Nicolette (2007), Rothrock (2007) and Spry (2009) to ensure that equal criterions would be used by the authors during the simultaneous observations.

Measures of inter-observer reliability are considered to be needed when two or more observers participate in data collection (Carthey, 2003; Watson & Whyte, 2006). Before the collection of data for the present study was started, the authors performed pilot observations using the observation tool together with a senior theatre nurse.

The pilot observations took place at three total hip replacement operations in a Swedish hospital during December 2009. Two of the observations were performed during one day, the third observation was performed a week later. The observational tool was used by the senior nurse and both of the authors separately during the observations. An appropriate number in the scale was marked in accordance with the observed performance of the theatre nurse by each observer. Annotations were made by all of the three observers. The authors and the senior nurse compared and discussed the results of the observations after every performed observation.

During the first pilot study observations, the rigorous ratings proved to be impossible to use. It was then agreed, by the authors, that the highest point (6) would be regarded as a standard performance and setting the points 2-5 would be compared to this definition. If
there would be any difficulties in assessing, the authors decided that they would discuss with each other to reach consensus in rating.

After the pilot studies were performed with the senior theatre nurse, a frequency distribution of observable item points was calculated. It was found, that the most frequent point was 6 (62.2%), followed by 5 (20%) and 1 (8.9%).

3.3 The modification of the observational tool

The authors added gloving using open method to the first observable item of the technical skill, “Gowning and gloving using closed method”.

The authors excluded the role of circulating nurse from the fifth item of the technical skills, “Individually count and name instrument with circulating nurse”, and modified the observable item to include using the instrument list.

The content of the eighth item in technical skill “Prepare swabs for cleaning” was interpreted in different ways by the authors, and further instructions were asked of Dr. Sevdalis by e-mail, but the question was not answered by him. The item was then interpreted as performing the skin disinfection of the patient’s surgical area prior to the operation (Appendix B).

3.4 Participants

Inclusion criteria in this study were that each participant is a registered nurse, and works as a theatre nurse. The sample included 10 theatre nurses at each operation department (n=20). A sampling which includes the most conveniently available people as study participants is called as convenience sampling (Polit & Beck, 2004). In the present study, the sample method was convenience sampling: participants were selected by the nurse responsible for staffing in the operation departments, both in India and Sweden.

3.5 Procedure

The observations were performed in two different hospitals, one in southern India, one in eastern Sweden. The hospital in southern India is a multi specialty hospital with capacity of approximately 500 beds. The hospital has 14 operating theatres, in which
general surgery, cardiac surgery, key and pinhole surgery, orthopedic surgery and transplantation surgery is performed. On yearly basis, there are approximately 500 total hip replacement operations 800 spinal operations, 200 neurosurgery operations and approximately 500 total knee replacement operations performed in the hospital.

The hospital in the eastern Sweden is a multi specialty hospital with capacity of approximately 300 beds. The hospital has 13 operation theatres where plastic surgery, breast surgery, upper and lower gastrointestinal surgery and orthopedic surgery is performed. During 2009, there were approximately 400 total hip replacement operations and approximately 300 total knee replacement operations performed in the hospital.

To collect as comparable data as possible, the observations of theatre nurses in both of the operating departments were planned to be performed during total hip replacement operations. However, due to lack of such participants in the Indian hospital, also observations of theatre nurses during 3 spinal surgery operations, 3 neurosurgery operations, and during 1 total knee replacement operation were included in the study in India, beyond the 3 observations during total hip replacement operations, that were possible to perform. The duration of the observations in India varied from one hour to four hours. In Sweden, totally 6 observations during total hip replacement operations and 4 observations during total knee replacement operations were performed. The duration of observations in Sweden was approximately two hours.

Implantable devices are highly susceptible to infection and therefore a major risk in surgery (Darouiche, 2004). The most common reason for reoperation is a deep infection (Swedish Arthoplasty Register, 2008). Infections associated with surgical implants are generally more difficult to manage because they require a longer period of antibiotic therapy and repeated surgical procedures (Darouiche, 2004). Therefore, a primary concern in implant surgery is the prevention of infection. Theatre nurses’ competence in technical skills is important for preparation of the surgical site (Bowen, 2007).

The observations in Sweden and India were performed during two weeks, in January and February 2010. The observational tool was used during the observations, and
appropriate number in the scale was marked according to the observed performance of the theatre nurse. Also annotations were made during the observations to give explanation for the assessment. The authors discussed continuously with each others by e-mail and telephone of the observations and the assessments that were performed in India and Sweden.

All theatre nurses in Sweden were asked to participate the study a day prior the observation and all of the theatre nurses responded that they want to participate. All theatre nurses in India were asked to participate in the study just prior to the observation. All theatre nurses responded that they wanted to participate.

Background data of the theatre nurses who participated in the study included the gender, age, education (type and length) and years of theatre nursing experience. Background data was collected prior to the surgery by asking the participants. Each theatre nurse that participated in the study was observed only once. The observation was initiated when the theatre nurse entered the operating theatre after the surgical hand scrub, and was concluded after the theatre nurse had placed the dressing on the surgical wound.

3.6 Data analysis

All data analysis was carried out by descriptive statistics presented in text and tables. The statistical analysis was performed with Microsoft Excel 2003.

The ordinal scale in the observational tool gives a relative ranking of the points 1-6. The central tendency of an ordinal measurement can be represented by its mode or its median, but the mean cannot be defined (Dahmström, 2005).

Median and mode are used to present all the observable items in data from Sweden. The authors could not use median and mode to present all data from India, due to not applicable observable items.
4 ETHICAL CONSIDERATIONS

The constructor of the observation tool used in this study - Dr. Nick Sevdalis - was contacted by email at an early stage to give permission for using the tool. The permission was obtained.

The theatre nurses working in the operation department were informed of the study purpose but not the specific elements that were observed, to avoid influencing the theatre nurses’ behavior and increase validity of the findings in the study (Polit & Beck, 2004; Watson & Whyte, 2006). The information was given with a written information sheet (Appendix C; Appendix D), and verbally.

To be observed when performing usual working tasks may get the theatre nurse feel uncomfortable. The authors tried to diminish this by being open, respectful and by giving information concerning the study. During the observation, the authors were as unobtrusive as possible.

The participation in this study was voluntary for all theatre nurses, and he/she could withdraw from the observation at any time. If the participation would have discontinued during the observation, the collected data would have been destroyed, and not used in the study.

The collected data in this study is confidential - no individual or organization identities are linked to the information provided. An un-indentifying process of individuals was implemented by giving a code number to every observation session of a theatre nurse. The collected data was handled with the code number. Only the researchers had access to the collected data. The findings of the study will be reported to the involved operation departments.
5 RESULTS

Table 1

Background data of participants

<table>
<thead>
<tr>
<th></th>
<th>Theatre nurses in Sweden (n=10)</th>
<th>Theatre nurses in India (n=10)</th>
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<tr>
<td></td>
<td>n</td>
<td>Mean</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Theatre nursing experience (years)</td>
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<td>11,2</td>
</tr>
<tr>
<td>Undergraduate education 2 years and theatre nursing 1 year</td>
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<tr>
<td>Modified undergraduate education - theatre nursing 2 years and clinical nursing 1 year</td>
<td>3</td>
<td></td>
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<tr>
<td>Undergraduate education 3 years and graduate education 1 year</td>
<td>2</td>
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<tr>
<td>Undergraduate education – theatre and anesthetic nursing 3 years and 6 months</td>
<td>1</td>
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<tr>
<td>General Nursing and Midwifery /The Diploma Course, undergraduate education 3 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baccalaureate in Nursing/ The Degree Course, undergraduate education 4 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2  
Assessing competence in technical skill “Gowning and gloving”

<table>
<thead>
<tr>
<th></th>
<th>Theatre nurses in Sweden (n=10)</th>
<th>Theatre nurses in India (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Mode</td>
</tr>
<tr>
<td>*A1. Gowning and gloving using closed method</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>A2. Placement of gloved hand: clasped mid-chest</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>A3. Back of gown closed using tag</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

* A1 was modified by the authors

During the evaluation of the modified observational tool in Sweden, the observable item, “Gowning and gloving using closed method”, was performed very well by 3/10 of the theatre nurses. 7/10 made mistakes as: not unfolding the gown gently (shaking it), pulling the sleeves of the gown up with the cuff of the gown, and when gloving the right hand, leaving the cuff of the gown visible. The observable items “Gowning and gloving using closed method” and “Back of gown using tag” were not applicable in India.

Table 3  
Assessing competence in technical skill “Setting up instrumentation”

<table>
<thead>
<tr>
<th></th>
<th>Theatre nurses in Sweden (n=10)</th>
<th>Theatre nurses in India (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Mode</td>
</tr>
<tr>
<td>B1. Established working area</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>*B2. Individually count and name instrument with circulating nurse</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>B3. Count swabs in 5s, showing Raytex and tie</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>B4. Placement of sharps in kidney dish</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>*B5. Prepare swabs for cleaning</td>
<td>5,5</td>
<td>6</td>
</tr>
</tbody>
</table>

* B2, B5 were modified by the authors

The observable item “Individually count and name instrument with circulating nurse”, was performed very well by 2/10 theatre Swedish nurses. 8/10 made mistakes as not counting the instruments prior to skin closure, or not informing the surgeon of the result of the count of the instruments prior to skin closure. The observable item “Individually
count and name instrument with circulating nurse”, was not done at all by 10/10 of Indian theatre nurses.

8/10 of the Swedish theatre nurses made mistakes as not controlling Raytex and tie and not informing the surgeon of the result of the count of the swabs during the assessment of the observable item “Count swabs in 5s, showing Raytex and tie”. The observable item “Count swabs in 5s, showing Raytex and tie” was not performed at all 10/10 the Indian theatre nurses.

The observable item “Placement of sharps in kidney dish”, was not done at all by 10/10 the Swedish and the Indian theatre nurses. 5/10 of the Swedish theatre nurses and 10/10 of the Indian theatre nurses removed the knife blade without using a clamp.

The observable item “Prepare swabs for cleaning”, was done very well by 5/10 of the Swedish theatre nurses. 4/10 made same mistake by allowing the skin disinfection product pool under the patient. The item “Prepare swabs for cleaning” was not applicable in India.

Table 4
Assessing competence in technical skill “Draping”

<table>
<thead>
<tr>
<th>Theatre nurses in Sweden (n=10)</th>
<th>Theatre nurses in India (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*C1. Ensure two team-members drape together</td>
<td>Median</td>
</tr>
<tr>
<td>C2. Hand drape over right-side up and without dragging (supporting drape)</td>
<td>6</td>
</tr>
<tr>
<td>C3. Two sides first, then bottom, then top</td>
<td>6</td>
</tr>
</tbody>
</table>

* C1 was modified by the authors

During the evaluation of the modified observational tool in Sweden, the observable item “Ensure two team members drape together”, was done very well by 7/10 theatre nurses. 3/10 made mistakes by allowing the draping hang to the floor. The observable item “Hand drape over right-side up and without dragging (supporting drape)”, was done very well by 6/10 theatre nurses. 4/10 made mistakes by flipping and shaking
The observable item “Two sides first, then bottom, then top” was done very well by 10/10 theatre nurses. The assessment of the technical skill ”Draping” was not applicable in India.

Table 5

Assessing competence in technical skill “Maintaining sterile field”

<table>
<thead>
<tr>
<th></th>
<th>Theatre nurses in Sweden (n=10)</th>
<th>Theatre nurses in India (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Mode</td>
</tr>
<tr>
<td>D1. Hand instrumentation to surgeon in a sterile manner without touching working end</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>D2. Anticipate surgeon’s needs (e.g., clip-clip-scissors-ties, suction, larger swabs)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>D3. Have control of instrumentation and soiled swabs - i.e., no instruments lying on top of patient</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>D4. Maintain contact with surgeon/procedure. Posture and movement: when facing the trolley keep eye contact on procedure</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

The observable item “Hand instrumentation to surgeon in a sterile manner without touching working end”, was done very well by 9/10 of the Swedish theatre nurses. The observable item “Anticipate surgeon’s needs (e.g., clip-clip-scissors-ties, suction, larger swabs), was performed very well by 10/10 of the theatre nurses. The observable item “Have control of instrumentation and soiled swabs - i.e., no instruments lying on top of patient”, was done by 10/10 of the theatre nurses. The observable item “Maintain contact with surgeon/procedure. Posture and movement: when facing the trolley keep eye contact on procedure”, was done very well by 10/10 of the Swedish theatre nurses.

The observable item “Hand instrumentation to surgeon in a sterile manner without touching working end”, was performed very well by 8/10 of the Indian theatre nurses. The observable item “Anticipate surgeon’s needs (e.g., clip-clip-scissors-ties, suction, larger swabs)”, was performed very well by 4/10 of the theatre nurses. 6/10 theatre nurses made mistakes by not preparing the right instruments at different phases during the operation. The observable item “Have control of instrumentation and soiled swabs-
i.e., no instruments lying on top of patient”, was done very well by 6/10 of the theatre nurses. The observable item “Maintain contact with surgeon/procedure. Posture and movement: when facing the trolley keep eye contact on procedure” was performed very well by 4/10 of the theatre nurses. 6/10 of the theatre nurses were not focused with the procedure.

Frequency distribution of the rating points

The most frequent observable item rating points in Sweden were 6 (67, 3%), 5 (16, 7%) and 1 (8, %). The most frequent observable item rating points in India were 6 (26, %), 1 (26, 6 %) and term N/A (32, 7%).

6 DISCUSSION

6.1 Method discussion

Technical skills are essential to theatre nursing and can be assessed in the operating theatre and in the surgical skills laboratory (Fried & Feldman, 2008). The authors of this study have performed the assessment of theatre nurses’ competence in technical skills in real operating theatres, in India and in Sweden. This can be considered as an advantage of the study.

To the authors’ knowledge, there is only one study made about assessing technical skills of theatre nurses, with an observational tool. The aim of the study was to develop and test an observational tool for assessing technical skills of theatre nurses, ICATS-N© (Sevdalis et al., 2009).

The authors’ intention in the present study was to use the original observational tool, ICATS-N©, but the lack of definitions of the standard performances and information about observable item rating points caused the modification of the observational tool. The authors of the present study lacked working experience as theatre nurses, and this can be considered as a disadvantage of the study. A literature review (Spry, 2009; Rothrock, 2007) on theatre nurses’ technical skills was required to capture the essential in the observable items of the tool.
The observational tool was modified by the authors in two phases. During the first phase of the modification, the authors defined all the rating points (1-6) in the fifteen observable items. The short sequence observable item A3 (“Back of gown using tag”), was difficult to rate on the six-point scale.

During the second phase of the modification the authors performed pilot observations with an experienced theatre nurse in an operating theatre to test the modified observational tool. The pilot study lead the authors to a conclusion, that the rating point 6 (“a performance done so well that it could be used to train students”), could be used as a standard in the observational tool. Any observed deviation of the standard would be noted, and discussed between the authors to rate the observable items 2-5.

According to the constructors of the observational tool ICATS-N©, inter-rater reliability could not be assessed in their study (Sevdalis et al., 2009). The authors of the present study performed simultaneous assessing of the behavioral items during the pilot study to increase inter-rater reliability.

The constructors of the observational tool concluded in their study, that the tool could be used by expert theatre nurses in the context of training of students in simulations and in real operating theatres (Sevdalis et al., 2009). The authors of the present study used the observational tool to assess theatre nurses in real operating theatres in different contexts to test the applicability of the tool.

The complexity of observing performance and behavior in the operating theatre should not be underestimated. The observer is the basic tool in the observation - meaningful, useful and reliable data are dependent upon the skills of the observer (Catchpole, Mishra, Handa & McCulloch, 2009). The authors of this study experienced one disadvantage in conducting an observational study: however discrete the authors wished to be during the observations, there were distractions from the co-workers (surgeons, circulating nurses).

The study participants’ awareness of being in the study may reflect in the results, which is known as the Hawthorne effect (Polit & Beck, 2004). This effect – the observation affecting the participant’s behavior - can diminish over time, as participants become
accustomed to being observed (Brink & Wood, 2001). The authors are aware of that the Hawthorne effect may have affected the results of the observations.

6.2 Results discussion

The authors conducted the present study to evaluate the clinical applicability of a newly developed observational tool in different contexts (developed and developing countries).

Sevdalis et al. (2009) note in their study that it should be empirically demonstrated that the technical skills required of theatre nurses in different operating theatres are not significantly different in different developed countries. According to Kak, Burkhalter and Cooper (2001) the conclusions about competence assessment are largely drawn from studies conducted in the developed world with healthcare students, nurses, physicians, and other healthcare workers and very few studies have been designed and conducted in developing countries on assessing competence.

The authors have modified the observable items A1 (Gowning and using closed method), B2 (Individually count instrument with circulating nurse), B3 (Count swabs in 5’s, showing Raytex and tie), B5 (Prepare swabs for cleaning) and C1 (Ensure two team members drape together).

After the authors modified the observable item A1 “Gowning and gloving using closed method” to include the open method of gloving, it was possible to apply the observational tool in Sweden, otherwise the observable item would have been assessed as not applicable.

In India, theatre nurses did not perform gowning and gloving according to the standard of the observational tool. Disposable gowns were routinely used only when there was a known contamination risk, otherwise the theatre nurses used reusable gowns. The reusable gowns and draping sheets were in the same sterile package. Therefore, the theatre nurses needed to glove themselves before taking the gown from the sterile package. After gowning they gloved themselves with a second set of sterile gloves (double gloving). In the present study, 10/10 of theatre nurses both in India and in Sweden performed double gloving, which is a recommendation of Council on Surgical
Perioperative Safety (2010). This recommendation is not included in the observable item “Gowning and gloving using closed method”.

The observable item A3 “Back of gown using tag” was not applicable in India, because disposable gowns with tags were used only when there was a known contamination risk.

The observable item B2, “Individually count and name instrument with circulating nurse” was modified by excluding the role of circulator nurse and including an instrument list. As a result, it was possible to apply the observational tool in Sweden. Otherwise the observable item would have been assessed as not applicable. In India, 2/10 theatre nurses did perform a counting of the instruments with a circulating nurse; which according to observational tool ICATS-N© could have been assessed as done very well, but as the modified observable item was modified to include the use of an instrument list, median point of the observable item in India was calculated as 1 (not done at all).

In India, the observable item B5 “Prepare swabs for cleaning” - as the authors interpreted it - presumes that a theatre nurse performs skin disinfection of the patient prior to the surgery. This was not the case in operating theatre in India, since it is the surgeon who performs the skin disinfection prior to the surgery. Consequently, the observable item was assessed as not applicable.

The authors modified the observable item C1, “Ensure two team members drape together”, by excluding the requirement of the second team member. In Sweden, the theatre nurse performs the draping of the patient without assistance. Therefore, the technical skill, “Draping” could be assessed. In observational tool, ICATS-N©, the roles of the team members are not defined in the technical skill, “Draping”. In India, 10/10 theatre nurses assisted the surgeon during the draping, and the observable item could have been assessed, but due to the modification of the observational tool, the technical skill “Draping”, was assessed as not applicable.

In the present study, the authors found that in Sweden the most frequent observable item points were 6 (67, 3%), 5 (16, 7%) and 1 (8%). In India, the most frequent
observable item points were 6 (26 %) and 1 (26, 6 %). Not applicable observable items were 32, 7%.

In the pilot study conducted in Sweden, the most frequent item scores were 6 (62, 2%), 5 (20%) and 1 (8, 9%). After comparing the results of the pilot study and the present study, the authors draw a conclusion that it would be more appropriate to use a rating scale 1-3, and the term not applicable (N/A).

6.3 Conclusion

The present study makes evident that the technical skills required of a theatre nurse are considerably different in different contexts. The newly developed observational tool for assessing technical skills of theatre nurses, ICATS-N®, is difficult to apply without taking consideration of the responsibilities of theatre nurses in different contexts. The modification of the observational tool performed by the authors, made it possible to assess all of the fifteen observable items in Sweden. In India, ten out of fifteen of the observable items were possible to assess.

To assess the observable items in six-point scale was in the present study experienced as difficult. Analysis of the frequency of all observable item rating points, therefore, the authors recommend rating on a 3-points scale, and the term not applicable (N/A).
7 REFERENCES


8 APPENDIX A

Core skills, observable items, and rating instructions of ICATS-N© (Sevdalis et al., 2009).

<table>
<thead>
<tr>
<th>Core skill</th>
<th>Observable items</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gowning and Closing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1. Gowning and gloving using closed method</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>A2. Placement of gloved hand: clasped mid-chest</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>A3. Back of gown closed using tag</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>Setting up instrumentation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1. Established working area</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>B2. Individually count and name instrument with circulating nurse</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>B3. Count swabs in 5s, showing Reynex and tie</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>B4. Placement of sharps in kidney dish</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>B5. Prepare swabs for cleaning</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>Draping</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1. Ensure two team-members drape together</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>C2. Hand drape over right-side up and without dragging (supporting drape): open tray drape in sterile manner</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>C3. Two sides first, then bottom, then top</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>Maintaining sterile field</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1. Hand instrumentation to surgeon in a sterile manner without touching working and (e.g., clip-clip-scissor-ties, suction, larger swabs)</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>D2. Anticipate surgeon's needs</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>D3. Have control of instrumentation and soiled swabs – i.e., no instruments lying on top of patient</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>D4. Maintain contact with surgeon/procedure. Posture and movement: when facing the trolley keep eye contact on procedure</td>
<td>N/A 1 2 3 4 5 6</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Draping sequence depends on drape size/type available locally and should be reflected in the item.*
Observational tool

Observation date: ........................................................................................................

Observation site: ...........................................................................................................

Participant’s age in years: ..............................................................................................

Education (type and length): ........................................................................................

Experience as TN, years: ..............................................................................................
Core skill A: Gowning and Gloving

A1. Gowning and gloving using closed method

_Gowning:_ Theatre nurse (TN) takes the sterile gown from package in a sterile manner, and chooses an appropriate area to gown (large enough). TN holds the gown and allows it to unfold gently. TN places hands inside the arm folds and guides each arm through the sleeves by raising and spreading arms. The assistant pulls the gown over the shoulders and ties it.

_Gloving open method:_ TN picks up the glove is from the top surface of the folded cuff and holds the glove by the inner surface and pulls it onto the left hand. TN picks up the right glove by grasping the glove under the folded-down cuff with gloved left hand and pulls the glove onto the hand and flips the cuff of the glove up and over the cuff of the gown. With the gloved right hand TN flips up the turned-down cuff of the left glove and over the cuff of the gown. Bare hands touch only the inside of the gloves.

_Gloving closed method:_ TN lays the glove palm down over cuff of the gown with the fingers of the glove facing towards him/her. TN works through the gown sleeve, grasps the cuff of the glove and brings it over the open cuff of the sleeve and unrolls the glove cuff so that it covers the sleeve cuff. TN uses the same technique to proceed with the opposite hand. TN does not allow the bare hand to contact the gown cuff edge or outside glove.

<table>
<thead>
<tr>
<th>Not applicable</th>
<th>Not done at all</th>
<th>Several major mistakes</th>
<th>Major mistakes</th>
<th>Moderate mistakes</th>
<th>Minor mistakes</th>
<th>Done very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:
## A2. Placement of gloved hand: clasped mid-chest

TN holds his/her hands at midchest level or on a sterile area. The hands are not too near the face, not in the armpit and they do not flip or move under the waist, or too near the assistant’s unsterile areas.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:

## A3. Back of gown closed using tag

TN closes the gown using the tag with a help of an assistant in an area where she is in no risk to contaminate gown or gloves.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:
Core skill B: Setting up instrumentation

B1. Established working area

TN inspects the sterile items before presentation to the sterile field. TN chooses an appropriate distance from the equipment and assistants during the establishment of the working area, and chooses an appropriate size of the instrument table drape and a Mayo stand plastic drape. If instrument covering is used after setting up instrumentation, the covering drape is laid on the instrument by leaving one side folded-down.

<table>
<thead>
<tr>
<th>Not applicable</th>
<th>Not done at all</th>
<th>Several major mistakes</th>
<th>Major mistakes</th>
<th>Moderate mistakes</th>
<th>Minor mistakes</th>
<th>Done very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:
### B2. Individually count and name instrument with circulating nurse

TN counts instruments individually using the instrument list. TN performs the counting prior to procedure, prior to skin closure and at time of relief. Informs the surgeon of the result of the count of the instruments prior to skin closure.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:

### B3. Count swabs in 5s, showing Raytex and tie

TN counts swabs when opening a package of swabs and controls Raytex and tie by opening the swabs. Uses a safety routine to control the total amount of swabs by giving one of the two similar labels of the swab package to the circulating nurse (or equal). Counting of swabs is performed prior to skin closure, and at time of relief. Informs the surgeon of the result of the count of the swabs prior to skin closure.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:
### B4. Placement of sharps in kidney dish

TN uses consequent no touch technique and TN handles sharp instruments calmly and coordinated and does not allow him/herself and the surgeon to touch sharp instruments at the same time. TN informs the surgeon when a sharp instrument is placed on the neutral zone and places sharp instruments correctly on the neutral zone so that it is easy for the surgeon to catch.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:

### B5. Prepare swabs for cleaning

TN gets the solution for skin disinfection poured in the cup without contamination. TN holds an adequate distance from the patient to prevent contamination while performing the skin disinfection. TN performs the skin disinfection by using sponge forceps and by using an adequate amount of swabs. TN performs the skin disinfection on an area large enough and so that the patient’s underlay is not wet down.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:
Core skill C: Draping

C1. Ensure two team-members drape together

TN drapes on the disinfected area of the patient’s skin and does not touch the patient’s skin during the draping. TN applies the draping preventing wrinkles and air bubbles. TN does not allow the draping hang to the floor. TN ensures and creates a barrier to anesthesia’s area.

<table>
<thead>
<tr>
<th>Not applicable</th>
<th>Not done at all</th>
<th>Several major mistakes</th>
<th>Major mistakes</th>
<th>Moderate mistakes</th>
<th>Minor mistakes</th>
<th>Done very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:

C2. Hand drape over right-side up and without dragging (supporting drape)

TN drapes gently, drapes are not flipped or shaken. When draping, a cuff is formed from the drape to protect the sterile gloved hands of the person draping. TN controls the parts of the drape at all times during the drape placement, using precise and direct motions. The draping is performed in a way that the patient’s skin is not sheared.

| N/A            | 1               | 2              | 3              | 4              | 5              | 6              |

Notes:
C3. Two sides first, then bottom, then top*

TN starts draping only after the patient’s skin has dried after the skin disinfection. The draping is started first with the side positions, and then is the lower part and finally the upper part of the body draped. The portion of the drape that establishes the sterile field is not moved. TN walks around to the side that will be draped and does not extend over the patient while draping. The draping done holds tight through the operation without uncovering the undisinfected area of the patient’s skin.

<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Notes:

*Note: Draping sequence depends on drape size/type available locally and should be reflected in the item.
## Core skill D: Maintaining sterile field

### D1. Hand instrumentation to surgeon in a sterile manner without touching working end

TN gives the instruments to the surgeon in working position - for example swabs, scissors, clamp, tweezers. When giving the instruments to the surgeon he/she does not touch the working end of the instrument.

<table>
<thead>
<tr>
<th>Not applicable</th>
<th>Not done at all</th>
<th>Several major mistakes</th>
<th>Major mistakes</th>
<th>Moderate mistakes</th>
<th>Minor mistakes</th>
<th>Done very well</th>
</tr>
</thead>
<tbody>
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Notes:

### D2. Anticipate surgeon’s needs (e.g., clip-clip-scissors-ties, suction, larges swabs)

TN is “one step ahead” the surgeon and is well prepared with the right instruments at different phases during the operation.

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Notes:
### D3. Have control of instrumentation and soiled swabs – i.e., no instruments lying on top of patient

TN has a good order on the instrument table and Mayo-table and finds the instruments easily. TN has a control over the used instruments, suture needles and swabs. No heavy instruments are placed on the patient.

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Notes:

### D4. Maintain contact with surgeon/procedure. Posture and movement: when facing the trolley keep eye contact on procedure

TN keeps an eye on the surgical procedure even when for example counting swabs, instruments, or handling specimens. TN does not turn his/her back to the procedure, does not talk to the other employees. TN is focused on the procedure.

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Notes:
APPENDIX C

Information to the staff

An inquiry of participating in an observation study

I, Päivi Kylmänen study theatre nursing at specialist programme at the Red Cross University College in Stockholm, Sweden. The programme includes conducting a degree project of 15 credit points. I intend to conduct an observation study in the framework of the degree project.

The preliminary name for the study is:

THE ASSESSMENT OF TECHNICAL SKILLS OF THEATRE NURSES – Evaluation of an observational tool in India and in Sweden

I plan to perform ten observations in an operating theatre in India. Ten observations will be also performed simultaneously in an operating theatre in Sweden, by the other author of present study. Within this letter, I ask you to participate in this observation study.

The observations will be performed during total hip replacement operations in both countries. The observation begins when a theatre nurse does gowning and gloving, and ends after the dressing is laid on the patients’ surgical wound. The observations are performed with a help of an observational tool, which is developed to assess the technical skills of a theatre nurse.

In present study the following comparisons of groups will be made; the group of all observed Indian theatre nurses with the group of all observed Swedish theatre nurses, the group of observed junior with the group of senior Indian theatre nurses, and the group of observed junior theatre nurses with observed senior Swedish theatre nurses.

The data will be handled confidentially and reported in the degree project in a form that no individual participants or operation departments can be identified. The findings will be reported to the operation departments that participate the study. The participation in the study is voluntary, and you may withdraw from the study at any time you wish.
The Red Cross University College approves the study.

If you want further information, contact Päivi Kylmänen.

Stockholm, January 2009

Päivi Kylmänen

Supervisor:
Ann-Christin von Vogelsang

Supervisor:
Pia Holmér Pettersson

Röda Korsets Högskola
Box 55 676
102 15 Stockholm
Tel. 08 58751600

Data kommer att behandlas konfidentiellt och redovisas i en form där inga enskilda deltagare eller operationsavdelningar kan identifieras. Resultatet kommer att rapporteras till berörd operationsavdelning. Deltagandet är frivilligt och du kan när som helst och utan förklaring avbryta ditt deltagande.

Studien är godkänd av Röda Korsets Högskolas granskningsnämnd för empiriska studentarbeten D-nr 030/2009

Om du önskar ytterligare information angående denna undersökning kan du vända dig till mig (se nedan).

Stockholm, 2009
Student
Aleksandra Spasic

Handledare
Ann-Christin von Vogelsang

Ledningspersonal
Lektor, handledare
Pia Holmér Pettersson

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