

EORNA Recommendations

The recommended practices are developed with the purpose to provide guidance for perioperative nurses in their nursing care in relation to surgery to achieve patient safety. The recommended practice are aimed for perioperative nurses in countries in Europe, and internationally. Nurses' code of ethics (ICN, 2012), nurses' specialist framework (ESNO, 2015), nurses' core competences (QSEN, 2003; Cronenwett et al., 2007; Cronenwett, 2009) and description of competence (EORNA, 2009) are important fundamental documents according to the recommendations.

Intentions with the recommendations are that every unique patient should be offered safe perioperative nursing care from the perspective of evidence based nursing by all co-workers and members in the surgical team.

These recommendations may be of advantage for practice in healthcare and especially in the operating rooms. EORNA recognizes the various settings in which surgical procedures are performed and where perioperative nurses practices.

The recommendation was developed by the EORNA Perioperative Nursing Care Committee.

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Explanations

Anesthesia professional	Anesthesia providers or anesthesiologist/anesthetist or nurse anesthetist or anesthesia nurse
Circulating nurse	The nurse who has the function of non-sterile position in the operating room, is a registered nurse or operating room nurse or nurse assistant/enrolled nurse (depending of the country's regulation and traditions)
Counting procedure	A quantitative and qualitative procedure
Instrument nurse	The same role as the scrub nurse function
Instruments set	A standardized set/tray/box of instrument needed for an operation
List of content	List of instruments or items in an instrument set/tray/box
Operating room nurse	the nurse who is a registered nurse and have a specialization in operating room nursing care, and are responsible of the instrumentation and the operating room nursing care, intraoperatively (i.e. in the Nordic countries)
Scrub nurse	the nurse who is scrubbed and are the one who is performing the instrumentation to the surgeons, and are part-responsible for the instrument, materials and equipment during surgery (i.e. in Great Britain)
SSCP	Surgical Safety Counting Procedure

Recommendation on prevention of inadvertent retained surgical items

The following recommendation of prevention of inadvertent retained surgical items (RSI) has been developed by Perioperative Nursing Care Committee of EORNA. This recommendation may be of usefulness in various settings where surgical procedures are performed. The operating room nurse has the mandatory responsibility of the surgical safety counting procedure of instruments, materials and other sterile items that are used in the patients' body during a surgical intervention.

This recommendation is based on a literature review and the evidence based comprehensive and thoroughly “**Guideline for Prevention of Retained Surgical Items**” authored by AORN, Association of periOperative Registered Nurses in United States of America. The Guideline by AORN was published 2016.

Forewords

The SSCP, surgical safety counting procedure, are performed differently in countries around Europe depending on regulations, traditions and routines, but the members in the surgical team must be sure that nothing is left behind, and that the patient had received the best possible care. Organizations should establish a standardized approach for prevention of unintended retained surgical items procedure.

Statement/Short Summary

A surgical safety counting procedure, SSCP, is required to ensure patient safety and accountability of all the items used in a surgical intervention (soft goods, instruments, sharps and miscellaneous items). The objective is to prevent the unintended retention of surgical items in a surgical patient's body. The occurrence of RSI (inadvertent retained surgical items) is considered as preventable.

Key Words

Perioperative nursing, surgical count, surgical count procedure, surgical count process, patient safety, retained surgical items, surgical instruments, surgical sponges

Purpose

The purpose of the recommendation is to provide guidance to the operating room nurse to perform a proper quantitative and qualitative procedure of sterile surgical items (soft goods, instruments, sharps and miscellaneous) relative to a surgical intervention, so that the patient is safeguarded.

The second purpose of the recommendation is to provide guidance to the operating room nurse to act and cooperate with the surgical team in a safe and proper manner, so that the occurrence of an inadvertent retained surgical item in the surgical wound is prevented.

Introduction/Background

Surgical safety counting procedure is an essential procedure for patient safety (AORN, 2016; Joint Commission, 2013; ORNAC 2011; WHO, 2009).

To leave accidentally a foreign object in a patient body during surgery is a mistake that is rare, but it is serious and if it happens it may result in serious complications to the patient, including reoperation to remove the item, and risk of; infection, bowel perforation, fistula, or even death (Stawicki et al., 2009). It also has negative consequences, legal, financial and others, to the health care professionals and the health service organization (Hariharan & Lobo, 2013). Factors that affect sterile surgical equipment being left unintentionally may be acute surgery, unexpected surgical procedure change, extensive bleeding, and instrument/scrub nurse replacement during on-going surgery, multiple surgical team involved, prolonged and complicated surgery, and more situations (Gawande 2011; Gawande, Zinner, Studdert & Brennan, 2003). The WHO Guidelines for Safe Surgery and the Surgical Safety Checklist (2009) offer supports for the operating room nurses' counting procedure of sterile surgical items relative to surgery. Clear routines for controlling sterile surgical items are essential for patient safety (Tchangai, Tchaou, Kassegne, & Simlawo, 2017; Smith & Burke 2014). Communication and teamwork in the surgical team is of importance for prevention of inadvertent retained surgical items (RSI) according to Stawicki et al. (2013) and several more authors, meaning an improved system of communication with multiple checks during surgery will guarantee the intention of the prevention of RSI. Freitas, Mendes and Galvão (2016) concluded that the WHO (2009) guidelines advocates the surgical count procedure. The surgical team members may need more practice training in closed-loop communication and call-out for situation awareness (Härgestam Lindkvist, Brulin, Jacobsson & Hultin, 2013). When interprofessional surgical team training starts in the beginning of the specialization in medical and nursing educations this communication, and teamwork, will be a good practice for a closed-loop communication experience (Wallin et al., 2015; Johnson & Kimsey, 2012). The study by Steelman and Cullen (2011) shows that operating room nurses and technicians meant that distraction, multitasking, not following count procedure and time pressure were the most frequent causes for failure regarding to sponges. The consequences that may occur are that patients suffer from complication related to RSI.

The American College of Surgeons, ACS, (2016) emphasizes *"recognizes patient safety as an issue of the highest priority and strongly urges individual hospitals and health care organizations to take all reasonable measures to prevent the unintended retention of surgical items in the surgical wound"*.

"Counting is a human process that's very prone to error, especially in a busy environment where multiple things are happening simultaneously" Gail Horvath, a patient safety analyst of the ECRI (European Commission against Racism and Intolerance). ECRI emphasizes the need of written standards and guidelines for safe counting, which are followed by the operating room professionals of Health Services Organization. ECRI also states the need of a culture promoting team accountability and nurse empowerment to speak up.

Responsibility for the surgical safety counting procedure

The responsibility, the role or the function of an operating room nurse in Europe seems to vary depending on in which country you work and have had the education to become an operating room nurse.

In some countries there are two specialized operating room nurses in the operating room caring for the patient; one as the role of a circulating nurse and the other has the role as instrument nurse or one might say a scrub nurse. The title scrub nurse is to some extent unclear, in some countries the scrub nurse is the least educated with little or no responsibility and the circulating nurse has the overall responsibility.

In the Nordic countries the operating room nurses have the function as an instrument/scrub nurse, and have the overall responsibility, in collaboration with the nurse anesthetist, for the nursing care in the operating room.

In some countries in Europe the circulating nurse is a registered nurse and are responsible for the surgical safety counting procedures and for the nursing care in the operating room.

In other countries it is healthcare personnel as surgical technicians and first assistants working in the surgical team and have responsibility for the instruments and materials used.

In this recommendation we mean when one nurse has the function of performing the instrumentation during the surgical intervention we call that role: an instrument/scrub nurse. The other role is the circulating nurse.

The responsibility for each role has to be defined by each country in Europe, because it varies today, 2019. Anyhow, the Surgical Safety Counting Procedure, SSCP, must be performed by one of the persons (nurses, technician or first assistant) responsible pre- per- and postoperatively to ensure patient safety.

The problem

Inadvertent retained surgical items, RSI, are most commonly detected immediately after a procedure, after a fluoroscopy, X-ray, during routine follow-up visits or from the patient's complaints about pain or discomfort. Most common location for RSI, are in the abdomen and the pelvis after surgery, and the sponges i.e. gossypibomas, are the items which is mostly left behind (Gümüş et al., 2012).

Unintended retained surgical items associated with surgical procedures may cause serious complications for patients such as:

Based on literature review:

- Adhesion
- Encapsulation
- Infection
- Abscess
- Obstruction
- Fistula
- Perforation

- Pain
- Unnecessary suffering
- Vascular complications as:
 - Thrombosis
 - Embolization
 - Arrhythmia
 - Tamponade
 - Perforation
- Death
- For references – please, see the list of literature

Factors that cause items to be left unintentionally can be:

Based on literature review:

- Incorrect count
- Interrupted counting/security control
- Distractions, as technology, electronic activities, patient care activities, behavioral activities, the physical environment
- Long surgical procedure
- Emergency surgery
- Unexpected or unforeseen change in operating method/technique
- Unexpected change in the patients' health/vital functions
- High Body Mass Index (BMI)
- Extensive bleeding, more than 500 ml
- Relief of operating room nurse
- More than one surgical team involved
- Extracted or complicated surgical procedure
- Occurrence of a safety variance during the surgical procedure
- Fatigue
- Surgery performed during evenings, nights or weekends
- False security at radiology control checkup
- The absence of policies and procedures
- Failure to comply with existing policies and procedures
- Problems with hierarchy and intimidation
- Failure in communication with physicians
- Failure of staff to communicate relevant patient information
- Inadequate or incomplete education of staff
- For references – please, see the list of literature

The PNC Committee of the EORNA Board of Directors recommendation on Surgical Safety Counting Procedure

Based on literature review and by WHO Checklist for Safe Surgery, a surgical safety counting procedure, SSCP, are to be as followed:

The SSCP, surgical safety counting procedure should be performed:

- Before the surgical procedure starts
- When a new item is added during the surgical procedure
- Before closing a cavity within a cavity
- Before wound closure begins
- Final count should be performed after skin closure and before the patient leaves the operating room
- When suspected discrepancy
- When permanent relief of the instrument/scrub nurse/person or circulating nurse or both

Special Observations

- Systems for safe handling of sterile instruments, sponges, peanuts and other materials should be available in relation to surgical interventions.
- Unsterile instruments used in the operating room for purposes other than for surgery should be clearly labeled in order to be distinguishable from surgical instruments.
- Waste and laundry must remain in the operating room until the final surgical safety counting procedure, SSCP, is completed.
- If a surgical retained item is metallic there will be a risk if/when a patient have a MRI, Magnetic Resonance imaging procedure. The heating metallic item may damage internal tissues.
- If an instrument or an item or a part of an item is left in the surgical wound, the surgeon should inform the patient or the patient's representative. This should be documented in the patients' health record.
- At very rare occasions instrument counts may be waived for surgical invasive procedures in which accurate instrument counts may not be achievable or practical. When instrument counts are waived, intraoperative imaging will be performed before the patient is transferred from the operating room, unless this puts patient's safety at risk (AORN, 2016).

Preconditions for the surgical safety counting procedure, SSCP

At surgical procedures/operations, the operating room nurse or the instrument/scrub nurse (depending on regulation per country) is responsible for prescribed safety controls of surgical items. “Soft goods” such as sponges, peanuts and other non-woven or cotton gauze materials must be marked with sequentially numbered sponges, bar coding or radiofrequency identification (RFID), which can be traced (Murphy, 2019). All instruments in a set must have a table of content, a list of all instruments. The instrument sets should be standardized as recommended by WHO Guidelines (2009) and instruments that are not routinely used should be removed from the set and the list of content (the fewer instruments, the easier and faster it is to perform the surgical safety counting procedure, and it is preferable for the sterilization process). If, during an operation, deviations from current routines have occurred, the surgeon is responsible for carrying out safety control measures and this should be documented by both the operating room nurse and the surgeon.

A surgical safety counting procedure, SSCP, includes a quantitative and a qualitative safety control preoperatively, peroperatively (immediately before wound closure) and directly after the surgery, postoperatively. The quantity stands for the number of items in a set that must be in accordance to the list of content.

A qualitative safety control include inspection and the function of the instruments, bioburden materials, completeness of the items, and without rust and cracks.

The SSCP should be performed loudly by the instrument/scrub nurse and the circulating nurse together. The operating room nurse should count and record the number of sponges, peanuts etc., and if the content of the instrument set conform to the instrument list, and check that all material is intact and sterile.

The SSCP shall be made without interruption and time shall be allocated for this routine. Distractions should be minimized during the procedure.

Waste should not leave the operating room until after the surgical procedure and when the person responsible for the SSCP, gives permission.

Anesthesia professionals

Surgical items and anesthesia items must be held separate including waste, depending on the risk of discrepancies when the safety surgical counting procedure is performed per- and postoperatively.

Anesthesia professionals are not allowed to use any sterile items from the instrument set, they shall have own marked instrument only for use by the anesthesia professionals. Anesthesia professionals shall communicate when throat packs and similar devices are inserted in the oropharynx part of the patient, and inform when the items are removed from the patients’ throat or mouth.

Remove any items or equipment used for anesthesia procedures, such as clamps and needles used for central line placement and dressing gauze, before the skin disinfection procedure and the sterile draping starts or when surgery starts.

Anesthesia professionals may assist in retrieving and open sterile items, for example a suture or sponges, and the issues must be informed to the operating room nurse. Opening extra items/equipment without properly information and documentation will lead to discrepancy at the end of the procedure.

Soft goods

New technologies to facilitate to track sponges, peanuts etc. are constantly under development for example radiofrequency identification (RFID), X-ray detectable threads, bar coding and more. Sponges and peanuts used during surgical procedures should always have a traceable system in each individual item. Soft goods should be packaged in a standardized system such as 1, 5 or 10/package. Every package should be marked with an individual number on two receipts.

Preoperative SSCP, surgical safety counting procedure

A preoperative safety counting should be achieved before the patient enters the operating room, for not interrupting the instrument/scrub nurse when counting.

A preoperative counting procedure will be a baseline for the numbers/quantity check of instruments and materials and a baseline of the inspection of the instruments and materials/quality check (Cromb, 2019).

Sponges, peanuts etc.:

Both of the receipts/identification numbers (2) of the package should be separated, one is given to the circulating nurse and one is kept sterile, at a special place at a back table, not on the Mayo stand.

Each sponge should be fully separated, counted and the traceable marker (i.e. x-ray detective thread, RFID etc) shall be checked by the instrument/scrub nurse and circulating nurse. The count is carried out audibly. The sponges should not be cut into smaller pieces.

Each peanut should be lifted out from the package and counted and the traceable marker shall be checked by the instrument nurse and circulating nurse. Then replace the peanuts back in the package or in a special box on the back table. The count is carried out audibly.

In the event that a non-standardized number of sponges, peanuts etc is found in the package (e.g. 6 or 4 instead of 5 sponges, 9 or 11 sponges instead of 10) the package should be sealed in a bag, marked and isolated and taken out from the operating room. This should be brought up to the management of the Operating Room Department and be returned to the Company.

Sponges, aimed for the surgical procedure with traceable markers on, should not be used outside the surgical field (e.g. by anesthetists).

If an item fall from the surgical sterile field, immediately inform the instrument/scrub nurse or the circulating nurse. Dropped items need to be appropriately managed to ensure that they are properly accounted for.

Instruments and needles:

An instrument set must have an individual number inside in the sterile set and outside the package for traceable function. Inside the instrument set a table of content/a list of all instruments/items must be available for safe counting procedure.

The instruments should be in accordance with the instrument list.

Additional sterile instruments may be opened and used during the operation, the same safety counting procedure shall be performed.

Needles will be inspected and situated at a safe place or on a needle holder for not causing any injury. Sharps should rather stay in the package until it will be used by the surgeon.

In the event, that the instruments in a set are not correct according to the instrument list, or are inaccurate or incomplete, the whole instrument set should be taken out from the operating room. New set of instrument should be brought in and a new safety counting procedure must be performed before the surgery starts.

Defective instruments should be removed and documentation according to local routines or regulations.

If bioburden will be discovered the whole instrument set should not be used. New set of instrument should be brought in.

In case of breakage of an instrument or an item, the surgeon must be informed and the item should not be used during surgery.

All instruments, needles, sponges and other equipment should be documented in the patients' health care record (AORN, 2016).

Peroperative SSCP, surgical safety counting procedure

During the WHO (2009) Surgical Safety Checklist phase TIME OUT; the instrument/scrub nurse or the circulating nurse shall verbally confirm to the surgical team members that the instruments and sponges etc. are sterile and are correct according to number and function.

When a new package of sponges is added to the surgical field, it should be performed as in the preoperative phase; each sponge should be fully separated, counted and the traceable marker shall be checked by the instrument/scrub nurse and circulating nurse. The count is carried out audibly. This should be documented in the patients' health care record or according to the routines or regulations.

A new package of peanuts is added in the sterile field; the same routine as in the preoperative phase shall be performed by the instrument/scrub nurse and circulating nurse, and to be documented in the patients' healthcare record.

If one or more extra instruments or supplies are added during the surgery it/they should be counted by the two nurses and be documented in the patients' health care record according to the routines or regulations.

Sponges, directly after being used in the sterile field, are placed in a safe system for a visible assessment, for example a "pocketed sponge bag system" and each sponge is placed in a structured way i.e. from bottom to top or "five in a row" depending on the system.

One sponge shall be placed in each pocket of the pocketed bag system and placed so the nurses can visualize the traceable mark.

Each sponge is emptied of blood or fluid by squeezing the liquid/blood in a plastic sterile bag and sucking it up in the suction (if the sponge is thrown away, it is risk to splash blood and by sucking it takes a more accurate measurement of the bleeding) and visualize that the sponge is complete before it is given away to the circulating nurse.

Miscellaneous items such as needles, guide wires etc. should be counted, as same as, for the instruments and sponges. When opening a "needle-letter", the package will be saved in a systematic order at the back table and the used needles should be placed in a sharp container.

During or when closing after a laparoscopic surgery a magnetic tip probe may be of advantage to seek for lost miscellaneous items such as small needles. Needles that are minor than 10 mm are difficult to locate in radiographic screening.

If an item is broken when returned from the surgeon this should be announced loudly and a search should start immediately, otherwise it will be risk of extended surgery and longer in time and delays may occur. When an item is missing, the instrument/scrub nurse should reorganize the sterile field to get an overview, the circulating nurse search in the operating room, and the surgeon perform an exploration in the surgical wound in a methodological way or order an intraoperative radiograph until the lost item is found. This is depending on the patient's health status and condition.

Before closing the surgical wound the surgeon are responsible to remove the sponges, instruments and other items from inside the patients' body, and the SSCP should be performed with no interruptions or no distractions and a SSCP should be performed thoroughly.

At the counting procedure (and inspection of instruments for completeness - a qualitative safety check) each item should be separated and the instrument/scrub nurse and circulating nurses counts aloud. If the SSCP is interrupted it should restart.

The surgeon should perform a methodical wound exploration both visible and by touching before closing the surgical wound, for items that still may be in the wound (AORN, 2016).

Safety counting procedure is performed by reading through the table of content consecutively, one instrument after the other, and compare with the instruments used during the operation. The SSCP of the instruments includes inspection and function of each. Inform the surgeon of the result of SSCP, immediately when the counting procedure is completed.

Every item in the instrument set must be written on the table of content or at the board or in the count sheet (depending on what system is used) before proceeding the counting to the next item.

In a case of bilateral procedures (i.e. bilateral inguinal hernia repair), sponges, sharps, instruments and miscellaneous items must be completed at each incision closure (ORNAC, 2011).

Counting procedures should not be performed during critical phases of the surgical intervention, including time-out periods, critical dissections, phases of confirming and opening implants, during the patient's induction and emergence from anesthesia, and handling of specimens (AORN, 2016).

Relief of professionals

In case of permanent relief during surgery of the instrument/scrub nurse or the circulating nurse a structured handover must be given about the patient, surgical procedure, the process (what the surgeons have done and what the next steps are in the procedure) according to SBAR (Randmaa, Mårtensson, Leo Swenne & Engström, 2014, WHO 2007). The verbal report includes also a complete count of the instruments, sponges, used material, implants, equipment and specimens etc. or alternative is a new updated TIME OUT may be held for the whole surgical team to be aware of the actual situation. This count result should be documented by the nurse relieved.

Short duration relief of the instrument/scrub nurse or circulating nurse, the counting should be complete of the items in use and a handover given by a structured model as SBAR.

Postoperative SSCP, Surgical safety counting procedure

During the WHO (2009) Surgical Safety Checklist phase SIGN OUT; the instrument/scrub nurse and circulating nurse gives a clear verbal statement of whether the final SSCP was correct to the surgeon and surgical team members (WHO, 2009). Meaning that the number and completeness of instruments, sponges, needles etc. corresponds to what has been uptake and used during surgery. The sharp container must be closed and sealed properly for avoid any injuries.

Immediately after surgery the safety counting procedure is performed by reading through the table of content consecutively, one instrument after the other, and compare with the instruments used during the operation. The SSCP of the instruments includes inspection and function of each. Inform the surgeon of the result of SSCP, immediately when the counting procedure is completed.

Every item in the instrument set must be written on the table of content or at the board or in the count sheet (depending on what system is used) before proceeding the counting to the next item.

Sponges, peanuts etc should be counted in the "pocketed sponge bag system" for assessment of what was taken up and the two individual numbers/receipts should match each other. Sponges that have not been used should be pocketed in the pocketed sponge bag system for checking that any sponge is missing.

All items should remain in the operating room until the final counting has been performed and are completed (WHO 2009).

The instrument/scrub nurse and/or the circulating nurse gives permission to take out any items from the operating room. All items should be removed from the operating room after the patient has left the room for preventing any count discrepancies for the next patient who will enter the operating room (Steelman & Cullen, 2011)

Wound dressing

Wound dressing should be withheld from the sterile field until the surgical wound is closed.

Sponges with an imaging such as x-ray detectable thread, bar code, radiofrequency ID should not be used as a wound dressing.

If a packing or fabric bind is used i.e. after nose surgery or in the vagina after prolapse, this must be with another material than a surgical sponge with imaging detective marker on. This should be documented in the patients' record as a wound dressing.

Therapeutic packing

When sponges are used as a therapeutic packing in a cavity within the patient and the patient leaves the operating room a standardized procedure must be established and the content in the documentation must communicate where the sponges are located.

Under special circumstances, (damage control surgery) the surgeon may decide that the patient needs a therapeutic packing left in the patient's surgical wound. In this case, the number and types of items placed in the surgical wound must be documented in the patient's healthcare record. A clear handover according to SBAR must be performed to the next caregiver in the intensive care unit.

When the patient is returned to the operating room for a subsequent procedure or to remove therapeutic packing, the surgical team should determine from the record the number and type of radiopaque soft goods that should be removed. The type and numbered of the removed radiopaque soft goods must be documented in the patients' healthcare record. The surgeon should inform the patient or patient's representative of any surgical soft goods purposely left in the wound at the end of the procedure and the plan for removing these items. (AORN, 2016)

Documentation

All equipment, such as instruments, needles, sponges and other material should be documented in the patients' health care record. This is for items to be traceable if something is missing. Names and position of the persons who performed the SSCP, surgical safety counting procedure should be recorded, and the result of the count should be noted as correct or incorrect. If a discrepancy was found and an action taken, this should be documented in the record (AORN, 2016; WHO, 2009)

If not a surgical safety counting procedure has been conducting relative to surgery, the reason must be documented in the patient healthcare record (WHO, 2009).

In case of defective, broken or fragmented instruments or items are detected during the qualitative control, the item should be removed and documented according to local routines or

regulations should be done. Especially the personnel at the sterilization department must receive this information.

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