

Guideline Research Gaps

Autologous Tissue Management

- Best practices for preservation, storage (including packaging materials, storage times, and storage temperatures), transport, transfer to and from the sterile field, and autotransplantation of autologous
 - cranial bone flaps,
 - parathyroid tissue,
 - skin grafts, and
 - vein grafts
- Research to support or refute replantation or autotransplantation of contaminated autografts
- Research on cranial bone flaps:
 - preparation methods
 - methods of decontamination
 - thawing methods
 - prevention of contamination during elevation, replantation, and handling
 - how long cranial bone flap should be kept for?
 - best temperature parameters for cranial bone flaps
 - processes for what to do when you have a frozen bone flap that is near the end of the set storage duration time frame
- Research on skin:
 - compare histological changes seen after preservation to actual outcomes in patients once the skin is used as a patient graft.

Complementary Care

- Optimal preoperative time frame, standardization of technique and assessment for all interventions
- Preoperative counseling techniques, individualization
- Dose of oral ginger dietary and herbal supplementation
- Interventions to reduce pediatric patients' anxiety
- Efficacy of parental acupuncture, clown humor, videos of the patient's voice, low sensory stimulation, and video game stress diversion interventions
- Reiki techniques and use in perioperative settings (eg, pre and intra)
- Safe use of intraoperative music interventions
- Efficacy of cryotherapy techniques
- Efficacy of pulsed electromagnetic fields (PEMF)
- Efficacy of acupuncture
- Massage and reflexology massage techniques

Construction and Design

- The ideal temperature and humidity for an OR (if one goes up, does it change the range of the other?)
- The maximum level of humidity that is safe for an OR from an infection control perspective
- The maximum temperature that is safe for an OR
- An acceptable particle count in an OR
- Particle counts in relation to SSI
- Use of gasketed ceilings in an OR compared with monolithic ceiling

Environmental Cleaning

- optimal cleaning methods for perioperative setting
- most effective material for cleaning and disinfection of environmental surfaces
- identification of surfaces posing greatest risk of pathogen transmission
- operational guidelines for cleaning frequency in perioperative setting, particularly terminal cleaning
- extent of cleaning and disinfection required in unoccupied perioperative areas
- effect of enhanced environmental cleaning on reduction of MDRO transmission in perioperative setting
- clinical benefit of no touch room disinfection devices (eg, UV, H2O2) on prevention of SSIs and other HAIs
- potential harm of using no touch room disinfection devices (eg, UV, H2O2) in operating rooms, such as effect on sterile supplies and environmental parameters (eg, temperature, humidity)
- determination of validated consensus benchmarks for cleanliness
- correlation of cleanliness measures with clinical outcomes (eg, patient colonization, infection)

Environment of Care

- Alarm fatigue in the perioperative setting

Electrosurgical Unit

- Types and causes of injuries related to the use of electrosurgical devices
- Interventions to prevent injury when using an ESUs
- The effect of monopolar electrosurgery on all types of jewelry including GPS bracelets and microdermal implants

Flexible Endoscopes

- Comparison of reusable and single-use flexible endoscopes, including
 - patient outcomes,
 - functionality,
 - medical economics and insurance reimbursements,
 - variation in procedure volume,
 - environmental impact,
 - access to care,
 - efficiencies,
 - compliance with processing measures, and
 - incorporating single-use endoscopes as a supplement to an established reusable endoscope program.

- Whether the benefits of ethylene oxide sterilization outweigh the harms in a nonoutbreak setting
- Comparison of single HLD to repeated HLD or other sterilization methods for supplemental enhanced processing methods for duodenoscopes
- Distance that droplets travel from the decontamination sink during endoscope processing and interventions that minimize the distance
- Ideal cleaning solutions to remove residue that is not water-soluble
- Whether simethicone residue enhances biofilm formation
- Whether automated cleaning cycles can meet or exceed cleaning requirements when biofilm is present
- Clinical significance of borescope inspection findings
- Clinical significance of normal wear and tear of endoscopes and how to distinguish this from damage requiring repair
- Whether endoscope channels may be flushed with 70% to 90% ethyl or isopropyl alcohol to facilitate drying
- Compare varying times, air pressures, and air quality (instrument air, HEPA-filtered air) for drying endoscope channels
- Whether automated drying systems may be effective in a shorter amount of time than manual drying
- Comparison of the performance of drying storage cabinets to standard storage cabinets using endoscopes that are dried before being placed into storage
- Validate methods to practically verify endoscope dryness before placing the endoscope in storage
- Optimal frequency for replacing, disinfecting, or sterilizing water bottles for endoscopy
- Whether flexible endoscopes used with single-use, FDA-cleared endoscope sheaths should be disinfected using intermediate-level disinfection (70% isopropyl alcohol) or HLD
- The most effective microbiological surveillance sample collection methods for detection of biofilm

Hand Hygiene

- the effect of dermatitis on hand hygiene
- the effect of prevention strategies, on the development of hand dermatitis.
- effectiveness of hand hygiene in the presence of jewelry on the hands and wrist of health care personnel
- to determine whether the length of the fingernail or the artificial nail itself poses a risk for the transmission of microorganisms
- to determine whether wearing nail polish affects hand contamination or patient outcomes, including the rate of SSI
- whether enhanced nail lacquer products (ie, UV-cured nail polish) affect the performance of hand hygiene and the microflora on the hands of health care personnel.
- whether quality of water supply affects reduction of microorganisms on hands when performing hand hygiene or surgical hand scrub
- effect of contaminated dispensers on hand hygiene effectiveness
- best method for preventing contamination of hand hygiene product dispensers
- optimal method for dispensing hand hygiene products

High-Level Disinfection

- Whether the Spaulding classification should be modified and items should be sterilized rather than high-level disinfected
- Research to support or refute high-level disinfectant resistance to various microorganisms

Hypothermia

- The association between unplanned patient hypothermia and patient outcomes
- Effects of preoperative hypothermia on surgical outcomes
- Compare the effectiveness of different passive insulation methods
- Compare the effectiveness of different methods of active warming
- Cost benefit analysis of hypothermia prevention measures
- Determine the potential harms of using warmed anesthesia gases, especially in pediatric patients
- Comparing whether in-line warmers or fluid warming cabinets are more effective for warming IV fluids
- Evaluate the use of radiant warmers intraoperatively for the prevention of unplanned hypothermia

Information Management

- Perioperative nursing documentation
- Workflow

- Health equity
- Education and competency evaluation
- Patient perception of
- Information security
- Informed consent
- Satisfaction with care
- Standardization
- Systems
- Terminologies
- Certified HIT
- Human factors
- Electronic systems
- Copy and paste
- Addendums
- HCR interdisciplinary teams and protection
- Clinical Documentation Improvement programs
- Equipment interoperability
- Information interoperability

Instrument Cleaning

- Electrolyzed water as an FDA-cleared step in surgical instrument processing
- Structural durability of specific devices processed using both optimal and suboptimal conditions (poor water quality, wrong temperature, incorrect cleaning solutions, soaked in saline, wiped with saline, OB-specific - instruments left bloody over an extended period repeatedly)
- What abnormalities, when discovered using magnification and borescopes, are important to recognize as being a risk to incomplete processing or otherwise threaten patient safety
- Recontamination of medical devices/surgical instruments during final rinse for multiple reasons - sink drain, poor water quality, critical water contaminated with pathogens - and the importance to patient outcomes (ie, does recontamination during final rinse before sterilization matter?)
- Comparison of organizations where a two sink basin system is used to those where a three-sink basin system is used in decontamination - outcomes being effective processing (are the items sterile after being sterilized?), efficiency of workflows (does it take longer in one or the other configurations?) errors in processing (does one or the other result in human error in processing?) and incidence of SSI or other patient adverse events (inflammation related to endotoxin on instruments that does not result in SSI, but prolongs wound healing)
- Outcomes (SSI, nonunion incidence) comparing orthopedic implants that are included in instrument sets and sterilized repeatedly versus those that are provided sterile and opened on demand at point of use without reprocessing

- Error reduction using electronic instrument tracking
- Reusable versus single use decontamination brushes - effectiveness, cost effectiveness, correct use per IFU
- Evaluation of worker knowledge of SDS and the Chemical Exposure Safety Plan in general
- Water quality table - are these measures enough? Does controlling to these measures improve outcomes - patient adverse events (SSI, inflammatory response) and prolong medical device life?
- Effects of using CHG in splash basins on medical devices and surgical instruments in general.
- Is there an ideal multi-enzyme precleaning solution blend to address all target soils?
- What is the best method of disinfecting a mechanical washer-disinfector after processing instruments that are known or suspected of contamination with prions?
- What is the incidence of organizations "guessing" about how to process loaned items because the IFU was not provided?
- What are the main drivers of errors in instrument processing? Is it time pressure? Pressure from members of the perioperative team?
- Is there a best methods for point of use treatment for complex orthopedic devices including reamers?
- Effects of transporting instruments between locations on useful life of the instrument
- Effective PPE selection in decontamination area specific to chemicals used (looking at respiratory protection in general as part of the organizations' respiratory protection program)
- Updates to effective prion deactivation and removal from surgical instruments
- Optimal cleaning verification markers (is there one that is best?) and implementation of cleaning verification in practice
- Updates to intraocular instrument processing?
- Evaluation of IUSS processes - not the sterilization process, but the cleaning and handling leading up to it - does correct decontamination (ie, according to the IFU) occur reliably when IUSS is used?
- OneTray outcomes studies when organizations use them off label for storage
- Best way to remove biofilm from a variety of surfaces on complex instruments.

Laser Safety

- The benefits of doing a pre-procedure laser checklist.
- The benefits of doing a pre-procedure laser time out.
- The benefits of teeth protectors.
- The benefits to holstering the laser fiber.

Local Sedation

- Staffing – RN circulator vs circulator and monitor nurse
- Competencies/Education-EKG interpretation, etc
- Certifications-BLS vs ACLS

Manual Chemical High-Level Disinfection

- Processing semi critical items by sterilization rather than high-level disinfection or liquid chemical sterilization
 - Bacterial resistance to high-level disinfectants
 - Viral resistance to high-level disinfectants
- Best practices for processing endocavitary ultrasound probes
- Health hazards associated with use of high-level disinfectants
- Benefits/harms of high-level disinfection performed at the point of care
- Rinsing cleaned semi critical items with utility (ie, tap) water rather than treated (eg, reverse osmosis, distilled) water prior to high-level disinfection
- Rinsing items processed by high-level disinfection with sterile or critical water (ie, water that has been extensively treated to remove microorganisms and other materials) rather than utility water
- Best practices for monitoring temperature of activated high-level disinfectants, both before use and during storage
- Benefits/harms of adding activated high-level disinfectant solution to an existing container of activated high-level disinfectant solution
- Best practices for high-level disinfection of semi critical devices that cannot be fully immersed
- Best practices for storage of semi critical devices processed by high-level disinfection

Medication Safety

- Review of Perioperative Medication Errors by:
 - a. type (ie, omission, timing, dose, medication give),
 - b. frequency or incidence,
 - c. person who administered the medication (ie, anesthesia professional, Surgeon, RN, NP, PA),
 - d. location where the error occurred (ie, pre, intra, post), and
 - e. how they are identified (ie, incident reporting system, chart review, AI bot).
- Best practices for labeling medications on the sterile field
- Prevention of exposure to hazardous medications during surgery

Minimally Invasive Surgery (MIS)

- Best practices for MIS emergencies (eg, unplanned conversion to open procedure, gas embolism, hemorrhage, robot malfunction) and hybrid OR emergencies

- Team roles (eg, RN circulator, additional personnel)
- Workflow processes
- Items (eg, supplies, instruments, equipment)
- Preoperative risk factors for MIS complications in more diverse patient populations (eg, gender diverse patients, racial minorities, patients with complex comorbidities)
- Fluid distension media used in MIS procedures
- Optimal intervals for reporting fluid deficit
- Best practices for managing and measuring fluid and accurately determining the fluid deficit
- Maximum safe thresholds for fluid volume deficit in hysteroscopy and cystoscopy
- Technology in MIS
 - Evaluation of baseline knowledge and attitudes of OR personnel during introduction to new technology
 - Perioperative RN role in the implementation of new technology (eg, augmented or virtual reality, telecommunications technologies, robotic platforms, computer-navigation systems)
 - Perioperative RN interventions for safe patient care during robotic-assisted surgery in orthopedics and spine procedures (ie, non-Da Vinci platforms)
 - Complications and risks associated with using advanced technologies for all surgical specialties
- Effective quality improvement and change management strategies in MIS and the hybrid OR
- Intraoperative MR environment
 - Perioperative RN role
 - Workflow practices - best practices for draping and removing the drapes while maintaining sterility
 - Positioning considerations
 - Checklists and time out processes
 - Efficient workflow practices for perioperative teams in MIS
 - Positioning of equipment to enhance the team performance
- Practices to prevent ergonomic injuries in the OR
- Communication in MIS
 - Effective team communication during robotic-assisted procedures where the surgeon is isolated at the console away from the rest of the team
 - The use of briefings, debriefings, structured language, and sender-receiver acknowledgement practices in communication during MIS
 - Coordination of care to prevent errors
 - Telecommunications technologies and their application in perioperative nurse education

Moderate Sedation/Analgesia

- Evaluate the benefits and harms of patient-controlled sedation and establish patient selection criteria.

- Evaluate the benefits and harms of BIS monitoring during RN-administered moderate sedation/analgesia, including the outcomes of anesthetic medication use, anesthesia awareness, postoperative complications (eg, delirium), ability to distinguish between moderate and deep sedation/analgesia (define BIS values for each level), patient satisfaction, recovery time, and costs.
- Compare bolus dosing with titration of sedation in patients receiving moderate sedation/analgesia.
- Evaluation of the safety of nurse-administered propofol sedation that is published outside of gastroenterology and pulmonology journals.
- Compare moderate sedation/analgesia with propofol that is administered by an anesthesia professional to RN-administration under the direct supervision of a qualified licensed independent practitioner (eg, surgeon, endoscopist, dentist, podiatrist). The comparison should control for the confounding variable that anesthesia professionals may be caring for higher acuity patients who may be at greater risk for sedation complications.
- Need definitions for regular use, occasional use, and nonuse of cannabis products that are stratified to help determine risk for sedation complications. Effect on sedative doses from use of cannabidiol (CBD) oil or ointments containing more than 0.3% tetrahydrocannabinol (THC).
- Pre-sedation assessment criteria for pediatric patients to help determine whether the patient is a candidate for RN-administered moderate sedation/analgesia.
- Safety and efficacy of sedative administration by non-intravenous route in adult patients.

Positioning

- The most effective method of protecting the patient's eyes.
- Effectiveness of neurophysiological monitoring to identify potential positioning injuries.
- Effectiveness of repositioning the patient during the procedure.
- The most effective way to prevent the patient from sliding in the Trendelenburg position.
- The most effective face positioner in the prone position.
- The most effective methods to prevent the patient's abdominal pannus from resting on the thighs.

Pneumatic Tourniquet

- Benefits versus harm of tourniquet use
- Hard-fast contraindications of tourniquet use (malignancy, infection, sick cell anemia, previous revascularization, diabetic neuropathy)

- Increased risk with high BMI, low preoperative hemoglobin, age over 60 years, previous VTE
- Type of skin protection, adjunctive therapies with skin protection (hyperlipid creams)
- Antibiotic timing with inflation and deflation regarding SSI
- Efficacy and safety of exsanguination, especially benefits versus harms of elastic wrap use
- Potential adverse events related to lower inflation pressures, including estimations using the Arterial Occlusion Pressure formula
- Safety margin parameters, different ranges provided in literature
- Benefits versus harm of shorter inflation times, comparing consistent methods to shorten the inflation time
- Documentation requirements
- Inspecting the tourniquet under the sterile drapes during the procedure
- Respiratory acidosis, lactic acid build up, other systemic responses to pneumatic tourniquet use and their respective harms
- Informing and not informing surgeons at regular, established times

Pressure Injury Prevention

- The most effective support surface in preventing pressure injury in perioperative patients.
- The most effective technology-based skin assessment method.

Radiation Safety

- Distance at which no protection is needed.
- Circulator exposure levels in various cases to justify not needing a dosimeter.
- What is the minimum radiation protection for personnel during O-arm, C-arm, bi-plane, single plane, and intraoperative CAT scan?
- Radiation exposure levels for all personnel during O-arm, C-arm, bi-plane, single plane, and intraoperative CAT scan.
- Modern day incidence of tissue reactions and or stochastic effects in patients and non-physician staff members. Maybe say it as what is the effects of medical radiation on patients and personnel today? Most literature is old other than association with cataracts.
- Benefits of performing a radiation safety time out.
- Benefits of radiation protective devices for non-physician personnel.
- What is the best combination of protective devices or is one protective device better than another? Is just wearing garments adequate or do you get better protection by wearing garments and standing behind a mobile shield.

Safe Patient Handling and Movement

- Use of safe patient handling equipment in the OR

- Number of injuries in the OR as a result of moving the patient, moving equipment, prepping, etc
- Use of ceiling lifts in the OR
- Use of boom lifts in the OR
- Use of air-assisted transfer devices in the OR
- Changing the culture of the OR so that the safety of the perioperative team is valued

Sharps Safety

- Decreasing sharps injuries in the OR
- Use of neutral zone
- Use of safety scalpels

Skin Antisepsis

- Decolonization
 - Surgical patients who would benefit most from decolonization. Need for a risk factor scoring tool similar Pressure Ulcer tool.
 - What is role of antiseptics in decolonization and prevention of SSIs
 - Is CHG body wash, used as decolonizing agent associated with increased antimicrobial resistance
- Preoperative Bathing
 - Effect of preoperative bathing on decreasing SSI incidence and identification of ideal product (soap vs. antiseptic) and number of preoperative baths necessary to decrease incidence
- Hair at the Surgical Site
 - Effect of depilatory, combined with preoperative bathing and surgical skin prep antiseptic on skin integrity
- Selection of Surgical Site Antiseptic
 - Ideal antiseptic for neonates
 - Ideal antiseptic for vaginal preparation of patient's with iodine allergy
 - Ideal antiseptic for open wounds
 - Evaluating clarity of different tints of antiseptics on different skin pigmentations
 - Comparison of one type of alcohol-based antiseptic directly to another alcohol-based antiseptic on the reduction of SSIs or skin flora
- Application of Surgical Site Antiseptic
 - Does sequential/repeat application antiseptic before skin incision reduce incidence of SSIs
 - Does patient jewelry on or near surgical incision during surgical site preparation affect SSI outcomes
- Quality

- Effect of bundled interventions that include preoperative skin antisepsis elements on reduction of SSIs

Specimen Management

- More research is needed on the rates, types, contributing factors, and associated patient harm for specimen errors that occur in the preanalytical phase of specimen management.
- More research is needed on use of FMEA to reduce the rate of specimen errors or near miss events in the preanalytical phase.
- Does displaying labeled photographs of the procedure site in the OR correlate to an increase in correct site identification?
- Does review of specimen information during team communication events (ie, hand-over processes, debriefing) correlate to a reduced rate of specimen related errors?
- What items on specimen management should be included in the debrief process?
- How inclusion of quality control checks and follow up on identified errors during the pathology accessioning process (eg, collection) may reduce the risk of patient harm.
- Would a double check of specimen containers and paperwork by a second licensed person reduce the risk of specimen related errors and patient harm?
- Does use of a dedicated space for specimen handling and the use of memory aids (eg, checklists, procedure list, charts, logs, custom labels) reduce the risk of specimen-related errors and patient harm?
- Study the process and efficacy of vacuum sealing with refrigeration for containment of specimens 2cm and larger for short durations of time prior to accessioning the pathology department.
- Compare vacuum sealed containment with refrigeration to vacuum sealed containment with formalin for efficacy of specimen containment during temporary storage or transport to off-site locations (ie, longer periods of time prior to accession in the pathology department).
- Does vacuum sealed containment with refrigeration or formalin have a statistically significant effect on hollow organs or tissues (eg, uterus, bowel) compared to non-hollow tissue and organs?
- Does vacuum sealed containment with refrigeration or formalin have a statistically significant effect on specimens smaller than 2 cm?
- Research on the effect of labeling more than one specimen at a time.
- Does the placement of the specimen label on the container lid compared to the side of the container increase the risk of specimen identification errors during any phase of specimen management (preanalytical, analytical, postanalytical)?
- The use of pneumatic tube systems for specimen transport
- Temporary storage parameters that can be used effectively for most or all specimen types (eg, refrigeration at 4 degrees C).
- Processes used for management and accountability of radioactive seeds used during Radioactive Seed Localization (RSL) procedures.

- Whether certain types of explanted medical devices (eg, orthopedic plates and screws) present a potential for transmission of disease if decontaminated prior to returning to a patient or family.
- Care of amputated limbs intraoperatively.
- Does use of a standardized forensic evidence kit correlate to more consistent practice in forensic evidence collection?
- Management of placental specimens requested for return to the patient or family.
- Management and handling of highly infectious specimens.

Sterile Technique

- The efficacy of different types of masks and their correlation to OR contamination or surgical site infection (SSI) risk
- Reusable versus disposable gown and drape products and their correlation to SSI risk
- The effect of surgical helmet systems (hoods and togas) on bacterial contamination and correlation to OR contamination levels compared with traditional personal protective equipment for scrubbed personnel (gowns, head coverings)
- Glove contamination or perforation during draping, after use of heavy or coarse instrumentation, after manipulation of rough edges of bone, and prior to touching implants
- The efficacy of isolation technique separate from a bundled approach
- Contamination levels of devices placed over the field (eg, navigation equipment, video monitors, O-arms) compared to contamination of the sterile field below when the item is draped
- Bacterial contamination of nonsterile items that might be placed on the sterile field despite the recommendation not to do so (eg, antiseptic solution, vancomycin powder)
- Table covering and table bacterial contamination levels
- The efficacy of physically monitoring a sterile covered table
- OR contamination level (particle and bacterial counts performed using active and passive collection)

Sterilization

- Conflicting manufacturer's IFUs – What are the consequences of conflicting manufacturer's IFUs (device/packaging/sterilization)? Outcome measures – surgical complications, errors related to misunderstanding (ie, getting it wrong), efficiency issues.
- What effect do physical layout, traffic patterns and functional workflow patterns have on effectiveness of instrument and device reprocessing in the health care setting?

- Consolidated or satellite sterilization departments – Do these consolidated or satellite operations provide consistent quality (ie. consistently & correctly processed instruments and medical devices) to the point of use? How is this quality being measured?
- Given the research on Phacoemulsification handpieces, do the same issues of steam penetration in narrow lumens exist in similar devices?
- Wicking contamination – What is the risk of contamination of sterilized contents of packaged trays if handled while warm/hot? (currently limited evidence, but widely accepted logic not to handle packages).
- Residual moisture in steam sterilized packages in actual practice (not in a laboratory setting where steam quality is tightly controlled) – Can it be considered safe to use sterilized packages that met all sterilization parameters if moisture is found within the package at the point of use?
- Is there a greater risk of postoperative infection or greater risk of surgical complications for when instruments are sterilized in what is traditionally known as “terminal sterilization” compared to IUSS?
- Is ink transferred to instruments from count sheets toxic to patients?
- What long term effects on human health exist among healthcare workers who use chemical sterilants according to manufacturer’s IFU? Are current practices safe?
- Considering the environment, which sterilization method has the least negative impact?
- Is there a more reliable method to evaluate and monitor sterilization processes (both steam and chemical) than we are currently using (physical parameters, chemical indicators, biological indicators)?
- Are infection and complication rates lower among patients whose implants were sterilized by the manufacturer versus sterilized by the health care organization?
- Evaluation of the adequacy of education/competency programs among personnel who perform sterilization processes whose first language is not English.

Sterilization Packaging Systems

- Performance comparison of differing types of packaging in practice.
 - PICO - Which, if any, sterilization package is superior in practice for instrument sets? For powered medical devices? For rigid lumened devices? For flexible lumened devices?
- Sterilization performance when disposable organizers (eg, paper pouches, paper/plastic pouches, sleeves, tip protectors) are used within a rigid container.
 - PICO - Does use of disposable organizers and accessories affect achieving sterilization in a package when following the manufacturer’s

IFU (ie, IFU for sterilizer, package, device being sterilized, and accessories)?

- Reconciling IFUs.
 - PICO – Is sterilization impeded when manufacturer’s IFUs are reconciled and there is unresolved conflict among IFUs?
- Standardization and how it improves practice in sterile processing departments.
 - PICO – what are the important steps of packaging processes that demonstrate improvements (ie, elimination of errors and omissions in instrument sets) in practice? Does this improvement differ in large versus small organizations?
- Transporting sterile packages between facilities.
 - PICO – How does transporting sterilized packages affect contents of the package? When transit occurs in motorized vehicles (eg, organization-operated trucks/vans, personal vehicles), how do environmental conditions affect content sterility? In what ways does vibration during transport affect medical device performance?
- RSI risk associated with sterilization package accessories
 - Are there risks associated with using sharp tip protectors?
- Validated benchmark thresholds for cleanliness markers*.
 - What are acceptable levels of residuals* of the following on instruments prior to packaging for sterilization:
 - i. Protein
 - ii. Carbohydrate
 - iii. Hemoglobin
 - iv. Endotoxin
 - v. Lipid
 - vi. Sodium ion
 - vii. Bioburden
 - viii. ATP
 - ix. Detergent residuals
 - x. Enzymatic cleanser residuals
 - Do these residuals interfere with sterilization?*

*these questions may be relevant to other guidelines as well – Sterilization, Instrument Cleaning, HLD, and Endoscopes.

Surgical Attire

- Most effective type of hair covering in the perioperative setting.

- Outcome studies linking SSIs to surgical attire.
- Arm covering during perioperative skin antisepsis.
- Antimicrobial scrubs and effect on SSI rates and safety to the wearer.

Surgical Smoke

- Team communication and surgical smoke safety.
- Long term prospective study to understand long-term effects of surgical smoke on OR personnel health compared with general population (comparing cancer rate of OR personnel with cancer rate of general population).
- Evaluation of effects of negative pressure from surgical site smoke evacuator and wound contamination from operating room air, one study demonstrated that evacuators decrease bacterial contamination of wounds, but cannot prevent entirely.
- Evaluation of the effects of adjunct air cleaning technologies on SSI rate when smoke evacuator is used near surgical site.
- Real-time breath assessments of short-term high-level VOCs in surgical staff exposed to surgical smoke.
- Air flow direction related effects of laminar air flow.
- Types of inhaled anesthesia related to levels of anesthetic gases released in surgical smoke/exposure to staff members.
- HBV: need additional research to validate/support study findings detecting HBV in surgical smoke. Further animal studies are recommended to determine infectivity of HBV in surgical smoke.
- Research on filter type/combination effectiveness. Electric filter effectiveness?
- Development of smoke evacuation systems specific to outpatient ESU dermatologic surgeries producing small amounts of smoke.
- Larger studies on patient satisfaction with smoke evacuation.
- Quantifying 'small', 'medium', 'large' amounts of surgical smoke related to required smoke evacuation.
- Activated carbon filters in N95s for use as secondary protection for residual surgical smoke (removes VOCs from ss before they are inhaled).
- HPV vaccination for healthcare workers involved in ablation/fulguration procedures on tissue containing HPV.
- Electrostatic precipitation as part of smoke evacuation filtration system or used alone. Do electrostatic precipitation systems filter chemicals from surgical smoke? Does electrostatic precipitation create ozone?
- Is there an elevated risk of HPV upper airway lesions for HCW who are exposed to surgical smoke produced from ablation procedures on HPV containing tissue?

Unintentionally Retained Surgical Items

- The impact of distractions, noise, and unnecessary interruptions on the risk for RSIs.

- Timing for counting processes (eg, before patient in the room, after patient in the room)
- Comparing standardized sequences of counting processes (eg, count board vs count sheets, proximal to distal from the patient)
- Types of miscellaneous items that could be retained and methods of preventing retainment
- Preventing device fragments of instruments (eg, traditional and minimally invasive), guidewires, and supplies
- Preventing retained foam pieces from negative pressure wound therapy devices
- Sizes of needles seen on intraoperative radiologic images for reconciling count discrepancies
- Comparison of different adjunct technology devices
- Effect of radiofrequency and radiofrequency identification on electromagnetic interference of patient devices (eg, temporary or implanted pacemakers, implanted cardioverter defibrillators, medication pumps, nerve stimulators).

Venous Thromboembolism (VTE)

- Ideal means to prevent pulmonary embolism (PE) and whether a reduction in deep vein thrombosis (DVT) will lead to a reduction in the incidence of PE
- Whether graduated compression stockings limit the hemodynamic performance of intermittent pneumatic compression devices by preventing filling of veins
- Whether application of intermittent pneumatic compression is safe for patients with preexisting DVT
- The most effective graduated compression stocking length for prevention of VTE in surgical patients, considering patient adherence and cost
- The safety and efficacy of using elastic bandages for VTE prevention in bariatric patients or patients who have a factor that prevents correct fitting of graduated compression stockings
- Comparison of multimodal protocols with early mobilization to a protocol without early mobilization to determine the specific benefits of early mobilization
- The optimal method, sequence, and frequency of foot and ankle exercises
- The safety and efficacy of using intermittent pneumatic compression devices for pediatric patients
- Validation of the Surgical-Thrombo-Embolic-Prevention STEP protocol and COBRA tool for VTE assessment in surgical patients
- Continued validation of the Caprini in other specialty surgical populations
- Nurse-driven protocol for nurse initiated mechanical prophylaxis
- Perioperative nurse interventions for VTE prophylaxis on VTE outcomes
- Additional research to better understand certain risk factors including ethnicity, HIV status, low BMI, antidepressant use.
- Validation of a bleeding risk assessment tool in surgical patients.

- Optimal compression techniques, area of compression, and time of inflation for IPC devices in the prevention of VTE.
- Optimal initiation time of IPC prior to surgery.
- The effect of preoperative mechanical prophylaxis (eg, use of IPC) on perioperative VTE prevention.
- Whether the use of IPC devices increases fibrinolytic activity.
- Whether mechanical VTE prophylaxis modifies the risk of compartment syndrome in the lithotomy position.
- The optimal timing and appropriate distance of postoperative ambulation for the prevention of VTE.
- Optimal timing and methods for effective patient/family education about VTE prevention.

Other

- The delegation of perioperative RN activities, skills, and procedures.