

Checklist for evaluating mitigation measures to prevent intraoperative infections



P. Schaufele R. MD¹, Dr. M. Tolosa G. MD², , Dr. Orlando Rivera A. MD³, Dr. Daniel Pineda S. MD⁴⁻⁵, Dr. Ramón Muñoz M. MD⁵, Dr. Pablo Schaufele M. MD⁴⁻⁵
.- Penco Family Health Center (CESFAM), Talcahuano, Chile. 2.- “El Santo Esfuerzo de Todos” Community Family Health Center (CECOSF), Tomé, Chile. 3.- Resident in Orthopaedics and Traumatology, Universidad de Concepción, Chile. 4.- Department of Surgery, Universidad de Concepción, Chile. 5.- Orthopedic Unit, Hospital Guillermo Grant Benavente, Concepción, Chile.

INTRODUCTION

Postoperative surgical site infections (SSIs) represent a critical and highly challenging complication in orthopedic surgery. Conditions such as osteitis, osteomyelitis, intramedullary abscesses, and implant-associated infections significantly compromise patient outcomes following osteosynthesis or arthroplasty. Current literature estimates the incidence of SSIs at 5% to 10% after fixation procedures, and 0.25% to 3% following endoprosthetic replacement in adult populations. Historically, nosocomial infection rates within our institution remained at 4.7% until 2023. However, data from 2025 revealed a concerning escalation, with the infection rate rising to 9.8%. Given the profound socioeconomic burden and social budget constraints associated with managing these complications, target interventions for our pediatric population are urgently required.

AIM

To develop a intraoperative surgical safety checklist tailored to evaluate and reinforce infection mitigation measures specifically within the pediatric orthopedic population.

MATERIAL

A comprehensive literature review of existing global surgical safety checklists was conducted. No validated tools specifically designed to meet the distinct anatomical, physiological, and clinical requirements of the pediatric age group were identified. Consequently, a novel pediatric safety checklist was synthesized by adapting established adult guidelines and integrating age-specific clinical variables.

RESULTS

The proposed pediatric checklist is designed for mandatory administration inside the operating room prior to anesthetic induction, requiring active multidisciplinary cross-checking and supervision by both the attending surgeon and anesthesiologist. The core evaluative framework comprises the following standardized domains:

Patient Identification and Anthropometrics: Direct verification of demographic and baseline biometric metrics.

Clinical Generalities: Review of relevant past medical history, comorbidities, and critical pre-operative laboratory findings.

Anesthesia Management: Verification of continuous invasive monitoring, active temperature regulation (patient warmers) to prevent hypothermia, aseptic maintenance of intravenous access lines, and timely administration of weight-adjusted prophylactic antibiotics.

Surgical Instrumentation: Comprehensive sterility checks of all internal and external surgical implants and equipment packs.

Aseptic Skin Preparation: Standardized preoperative skin antisepsis protocols executed by the nursing and surgical teams.

Surgical Team Hygiene: Strict verification of surgical hand scrubbing techniques, gowning, and personal protective equipment protocols.

Intraoperative Environment and Technique: Regulation of operating room traffic, monitoring of surgical duration, optimized tissue isolation, and meticulous surgical technique.

Wound Closure and Postoperative Care: Standardization of skin closure selection and protective sterile dressing management.

CONCLUSION

While the comprehensive nature of this checklist encompasses multiple clinical variables, targeted preoperative documentation can significantly minimize application time without disrupting operating room workflows. The implementation of this dedicated tool serves as a critical cognitive aid to optimize protocol adherence and mitigate the incidence of preventable intraoperative infections in pediatric patients.

Checklist for assessing measures to prevent surgical site infection (SSI)					
Name:	ID:				
Medical record no.:	Date:				
Diagnosis:	Weight:				
Procedure:	Height:				
Estimated blood loss / bleeding risk:	Age:				
Critical step:	Laterality:				
Verification criteria		Yes	No	N/A	Comments
A. General information					
Preoperative laboratory workup within normal limits					
Preoperative length of stay (days)					
Surgical wound classification (clean / clean-contaminated / contaminated / dirty-infected)					
MRSA colonization / decolonization status					
Comorbidities					
Allergies					
Previous surgery at the operative site					
Adequate patient hygiene (preoperative bathing)					
Skin lesions (erythema, excoriation, other)					
Dental caries / oral lesions					
B. Anesthesia team					
Use of invasive monitoring					
Active patient warming (maintenance of normothermia)					
Disinfection of high-touch surfaces between cases					
Breathing circuit filter (HME) changed between paediatric patients					
Aseptic technique for placement and handling of arterial and intravenous lines					
Type of anaesthesia					
C. Antibiotic prophylaxis					
Intravenous administration <30 min before skin incision					
Total duration <24 h					
Intraoperative redosing at 3 h or after major blood loss					
D. Sterile surgical instruments (institutional)					
Macroscopic inspection of the sterile packaging					
Colour change of the sterilization (chemical) indicator					
E. Sterile instruments supplied by an external vendor (loaner sets)					
Macroscopic inspection of the sterile packaging					
Colour change of the sterilization (chemical) indicator					
F. Patient skin preparation by nursing staff					
Use of gloves					
Mechanical cleansing (scrub) with antiseptic					
Sterile supplies (sterile kidney basin and gauze swabs)					
Hair removal avoided; if required, electric clippers used (no razor shaving)					
Tourniquet time (minutes)					
G. Patient skin preparation by the surgeon					
Kidney basin and sterile gauze swabs					
Antiseptic agent used for skin preparation					
Antiseptic drying time respected					
Verification criteria		Yes	No	N/A	Comments
H. Surgical hand antisepsis					
Skin free of lesions					
Short natural nails; no nail polish or artificial nails					
Scrub sink adjacent to the operating room					
Scrub sink with adjustable water temperature					
Antiseptic solution available					
Type of antiseptic and date the container was opened					
Scrub duration <3 minutes					
Scrub duration >5 minutes					
Correct surgical scrub technique					
Drying with two sterile towels (one per hand)					
I. Surgical team attire					
Appropriate footwear (closed, smooth, easy to clean) or boots					
Cap (clean, covering the whole head including all hair)					
Disposable cap					
Surgical mask					
Mask changed between cases					
Gloves changed					
Institutional scrub suit (top and trousers)					
J. Surgical field and technique					
Draping / sterile field correctly established					
Operative time (minutes)					
Surgical approach (open, percutaneous, mini-open, arthroscopic)					
K. Skin closure					
Suture technique (interrupted, running, subcuticular, other)					
Number of layers					
Deep-layer material (polyglactin 910 [Vicryl®], other)					
Skin material (nylon [Ethilon®], polycapron 25 [Monocryl®], other)					
L. Wound care					
Occlusive dressing					
Gauze and bandages					
Cast or splint immobilization					
M. Compliance with operating room traffic rules					
Number of personnel present in the operating room					
Mobile phone use					
Doors closed manually					
Entries by non-operating room personnel					
Entries and exits by ward staff					
Door openings to retrieve missing surgical supplies					
Air filtration / ventilation system in operation					
Temperature kept within permitted limits (19 °C) and relative humidity recorded					
Operating room cleaning and disinfection					

pabloschaufele@gmail.com