

Telescopic Sponge Counter: A Review of Contamination and Innovation Trends

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Introduction

- Innovation: Sponge Counting System (SCS) with expandable arms to reduce chance of Retained Surgical Items (RSI)
 - Improves visibility, safety, and staff confidence & satisfaction
 - Seven prototypes in use since 2022 at large Midwest academic medical center
 - Ergonomics issues with reaching and pulling sponge bags from standard box
 - Persistent contamination concerns with paperboard sponge bag boxes
 - Launched contamination initiative November 2024 to explore contamination risks from sponge bag boxes
- Purpose:** Demonstrate the need for further prototype development supporting safer container for sponge bags

Methods

- Quality improvement study using Plan, Do, Study, Act methodology
- Ergonomics Review –Observations of staff using prototype and standard sponge counter systems by ergonomics team
- Collected 51 pairs of samples (from inside and outside of sponge box), November 2024- August 2025
- Boxes swabbed were from OR cases with at least moderate aerosolization
 - Traumas, Polytraumas
 - Open Surgical Cases
 - Orthopedic
 - DIEP Flap procedures
- Boxes excluded from swabbing
 - Minimally invasive cases
- Samples processed by Microbiology Lab
- Contamination defined as Colony Forming Units (CFU) ≥ 10
- Qualitative interviews with staff asking staff perception of current sponge box/bags

Innovation Reduces Contamination

Figure 1. Contaminated Swab Counts by SCS Type

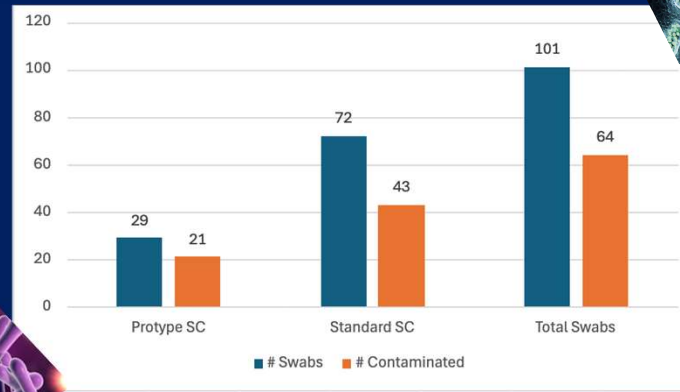


Figure 2. Current Sponge Bag Box

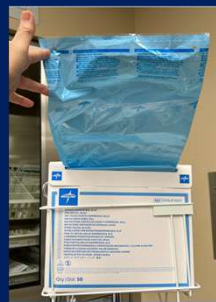
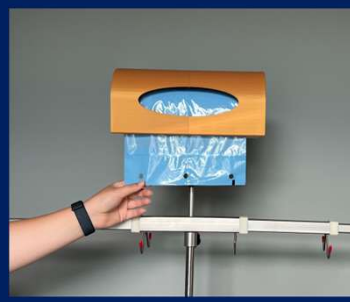


Figure 2. Sponge Bag Box Innovation



Results

- Ergonomics review recognized increased risk of injury to staff using current sponge bag dispensing process, pulling bags from top of box
- Sponge box and bag prototype designed by an RN intrapreneur, and built as KU engineering student capstone project
- Microbiology results identified these organisms:
 - Gram Negative Rods
 - Pseudomonas
 - White Staphylococcus
 - Bacillus
 - Micrococcus
 - Coryneform
 - Yeast
- Staff Comments supported concerns with contamination and injury risks**
 - OR Staff:** Always wear gloves when handling sponge box or bags, as perception is they are contaminated
 - EVS:** Reported the standard box can't be cleaned when visibly soiled



Discussion

- 63.3% Internal and external samples had unacceptable contamination with ≥ 10 (CFU)
- Current method to prevent cross-contamination is to dispose of contaminated sponge boxes when see visible blood
 - Contaminated boxes don't always show visible blood
- Adding a wipeable, single bag dispenser to the expandable SCS prototype, increases safety for OR staff and patients
- Costs from Hospital Acquired Infections and Surgical Site Infections must also be considered when creating innovations
- Innovation led to bag dispensing system improvements:
 - Made of material that can be decontaminated and reused
 - Bags are pulled from the bottom



QR Code: Photos of SCS prototype, references, contact information

