Consensus recommendations on surgical gloving

Executive Summary

In 2023 an independent international group of experts, systematically reviewed available literature and completed an exhaustive systematic review of over 8000 article/abstracts regarding sterile surgical gloves. Their goal was to formulate recommendations to improve the safety, protection and experience of healthcare providers and their patients.

The Surgical Glove Consensus Document is designed to assist facilities to raise awareness within their perioperative teams, encourage surgical teams to embrace the opportunity to change practice, help drive future safety initiatives for clinicians, and encourage research guided product innovations.

This systematic review led to the development of 10 consensus statements based on the literature's strength of recommendation consisting of four focus areas. The results for each focus area demonstrated that the expert group had agreed to at least one 'change practice' recommendation based on the available literature.

In 2025, the Association of periOperative Registered Nurses (AORN) provided revisions for 6 recommended guidelines which included Sharps Safety and Sterile technique. The Consensus recommendations aligned with those newly revised 2025 AORN Recommended Guidelines.

Consensus Recommendations Focus Areas:

Glove fit

For optimum comfort and performance, every team member should have a glove fitting before scrubbing into the operating room for the first time, be refitted when anything changes and have correctly fitting gloves in appropriate styles available to them.

Double gloving

Double gloving should be considered in surgery for the purpose of reducing the risk of aseptic barrier breach and exposing surgical team members to risk.

Indicator systems

When double-gloving, all scrubbed surgical team members should utilize an indicator inner glove for all surgeries to facilitate glove perforation detection.

Glove damage and change protocol

In any procedure, the surgical team may consider changing gloves at regular intervals of 60–120 minutes. Extra changes and/or shorter intervals are recommended for certain specific procedures and, of course, following a perforation.

Summary suggestions for implementation:

1. Partner with your glove manufacturer to conduct glove fittings when needed.
2. Ensure a double gloving system is available with a colored indicator underglove to encourage double-gloving for all users and procedures.
3. Develop glove change protocols individualized for specialty and procedure.
4. Expand OR education and awareness of the AORN Recommended Guidelines to encourage best practices in surgical gloves.

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Consensus on Surgical Gloving Best Practices

Surgical Glove Focus	Consensus Statement[1]	Level of Evidence/ Recommendation	2025 Revised AORN Recommended Guidelines	Considerations
Glove Fit	#1 - **All members of the surgical team should undergo a glove fitting** (glove size and type) before scrubbing into the operating room for the first time.	**IB** Expert opinion	At this time there are no specific recommendations on surgical glove fit. However, AORN affiliate Outpatient Surgery, recommends that- *"fit and feel, comfort, strength, leaks, cuffs and double gloving fit, be included to determine a good glove fit."*	**Implement all 3 Consensus statements** into facility OR policy of sterile surgical gloves. **Whether a tenured OR professional or in OR orientation, the fit, feel and comfort of sterile surgical gloves is intuitive for best practice performance for the glove wearer.**
	#2 - **Additional glove fitting** should occur in the event of manufacturer change and/or when elements of comfort or performance are impacted.	**IB** Change practice		
	#3- Appropriately fitting gloves of **variable sizes and styles should be available** to members of the surgical team regardless of gender or race.	**V** Expert opinion		
Double Gloving	#4 - **Double gloving should be considered in surgery for the purpose of reducing the risk of aseptic barrier** breach and exposing surgical team members to risk.	**IA** Change practice	**AORN Recommended Guidelines: Sharps Safety 7.2[2]** ***Scrubbed team members should wear two pairs of sterile surgical gloves (double glove) for surgical procedures.*** Under 7.2.1 - A single pair of gloves may be worn during certain types of operative or other invasive procedures (neurosurgery procedures) when clinically necessary for high tactile sensitivity and delicate manipulation of instruments and tissues. Conditional Recommendation	**The consensus panel recognized** that there are clinical or procedural circumstances whereby single gloving may be appropriate for the surgeon. **However, the level of evidence supports double-gloving for all surgical procedures for surgical team safety.**
Indicator Systems	#6 - **When double-gloving,** all scrubbed surgical team members should **utilize an indicator inner glove for all surgeries** to facilitate glove perforation detection	**IIIA** Change practice	**AORN Recommended Guidelines: Sharps Safety 7.2** ***Scrubbed team members should wear two pairs of sterile surgical gloves (i.e. double glove) that includes a visual perforation indicator system.*** High quality evidence demonstrates that perforations are detected more frequently and reliably with a visual perforation indicator glove system.	**The Consensus panel defined** an indication inner glove as a **colored** inner glove. *AORN goes further to define visual perforation indicator system as a **darker color** pair of gloves worn beneath a lighter pair of gloves.*
Glove Damage and Change	#7 - **In any surgical procedure the surgical team members may consider changing** single gloves or outer gloves at regular intervals during the procedure and/or depending on surgery specific activities. Based on the risk of glove damage this interval is **advised to be 60–120 minutes.**	**IIIA** Consider practice change	**AORN Recommended Guidelines: Sterile Technique 2.5.1** ***Change surgical gloves worn during invasive procedures every 60-150 minutes*** 2.5.2 *During invasive procedures, personnel may change gloves: after draping is complete, after touching light handles, after handling heavy/ coarse or sharp instruments, before handling implants, and after delivering the placenta in cesarean delivery procedures.*	**The Consensus panel concurred** that timing of surgical glove changes by surgical specialty based on the procedure is recommended beginning at 60 minutes. According to AORN when implementing 2.5.1 remember when a perforation occurs in the outer glove, change that glove and inspect the inner glove. Use clinical judgement to determine if the inner glove should be changed 2.5.3/2.5.4 **The Consensus panel went further to review** the ChEETah[3] study , published in the Lancet, where it was demonstrated that changing surgical gloves and instruments prior to closing the abdomen resulted in a 13% risk reduction of SSIs. **The Consensus panel reviewed** a systematic review and meta-analysis by Narice[4] where 1900 women undergoing a Cesarean section, had significant reduction in post wound complications when gloves were changed after the delivery of the placenta. And in a study by Scrafford[5], intra-operative glove changing prior to abdominal closure during cesarean section significantly reduced the incidence of post-operative wound complications.
	#8 - **During orthopaedic procedures** (excluding arthroplasty), surgical team members may **consider glove change at regular intervals of 60–120 min.**	**IIB** Consider practice change		
	#9 - **In total joint arthroplasties,** surgeons should change outer gloves at routine procedural steps, including after draping, before and after cement, before prosthetic handling, before closure, if the procedure extend beyond 60 mins and immediately when a perforation is seen.	**IB** Change practice		
	#10 - **During General Surgery** procedures, surgical team members should change gloves prior to abdominal closure as part of a bundle.	**IA** Change practice		
	#12 - **During Caesarean Sections** surgical team members should **change gloves after placenta delivery and prior to abdominal closure.**	**IA** Change practice		

References:

1. Enz, A. et.al. Surgical Glove Consensus Document. EORNA Hands Deserve Better. Systematic Review Surgical Gloving Practices. 2023
2. AORN 2025 Revised Recommended Guidelines; Sharps Safety 7.2 and Sterile Technique 2.5 (reference covers all AORN Recommended Guideline statements)
3. NIHR Global Research Health Unit on Global Surgery, Routine sterile glove and instrument change at the time of abdominal wound closure to prevent surgical site infection (ChEETAh): a pragmatic, cluster-randomized trial in seven low-income and middle-income countries. Lancet 2022;400: pp.1767-76
4. Narice, B. et al, Impact of changing gloves during cesarean section on postoperative infective complications: A systematic review and meta-analysis. AOGS. 10 April 2021, pgs 1581-1594.
5. Scrafford, J. et.al. Effect of intra-operative glove-changing during cesarean section on post-operative complications. Arch Gynecol Obstet June 2018 pp.1449-1454

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