

Gowning FactFinder

Committed to providing helpful information to our members about key patient safety issues, the International Spine Intervention Society's Patient Safety Committee has developed a FactFinder series. FactFinders will explore and debunk myths surrounding patient safety issues. The intent of this FactFinder is to discuss the effectiveness of gowning in reducing the risk of infections following interventional spine procedures.

Myth: Gowns are necessary for performance of interventional spine procedures.

Fact: Currently there is insufficient evidence to make definitive recommendations with regard to routine use of gowns for interventional spine procedures.

Historical

The past century has seen an evolution in the use of surgical gowns.¹ Oliver Wendall Holmes (1809-1894) was the first to suggest a relationship between infection and surgical attire, reporting his experience relative to puerperal fever. He encouraged physicians to mask themselves, put on clean clothes, and refrain from obstetric deliveries for 48 hours after contact with a patient with puerperal fever. Polish surgeon Johannes Vonn Mikulicz-Radeek (1850-1905) was perhaps the first to use a face mask and William Halstead (1852-1922) became the first surgeon to use rubber gloves for operations. Joseph Lister (1822-1895) revolutionized surgery by developing the antiseptic approach and his student William MacEwan (1848-1924) was the first to introduce a sterilizable gown for surgeons to wear.²

Present Day

The Centers for Disease Control and Prevention (CDC) has developed recommendations for the application of standard precautions for the care of all patients in all health care settings.³ According to these recommendations, gowns are used during procedures and patient-care activities when contact of clothing or exposed skin with blood or bodily fluids, secretions, and excretions is anticipated.

Some have advocated for the use of gowns for neuraxial procedures based on data from the reduction in central venous catheter infections and the use of gowns in the operating room to decrease bacterial contamination and lower surgical site infection rates. The infection rate is much higher for central venous catheter insertions when compared to neuraxial procedures. There are no similar infection control studies for neuraxial techniques, therefore, recommendations cannot be automatically applied.⁴⁻⁸ Without similar studies regarding neuraxial techniques, it may be useful to consider the reported infection rates for interventional spine procedures in weighing the benefit of wearing gowns.

In fact for most interventional spine procedures, infections are rare. Large series of patients undergoing spine procedures have failed to demonstrate any cases of infection⁹, yet clearly case reports exist.¹⁰ Large series of patients receiving epidural anesthesia have demonstrated low infection rates, with 95% confidence intervals demonstrating 0-10 infections per 100,000 cases.¹¹ A review of post-dural puncture bacterial meningitis showed the dominant causative organism was various strains of viridans streptococcus (a mouth commensal).⁴ After institution of the use of face masks, 50% of infections following lumbar epidurals were linked to *Staphylococcus aureus*.¹² While such large series do not exist for outpatient pain procedures, it is reasonable to consider that the infection rates for these procedures may be even lower due to the lack of indwelling catheter placement. The clear exception to this trend is discography, which has a reported infection rate of close to <1%^{13,14}; but this high infection rate is essentially nullified with the use of routine prophylactic antibiotics.¹⁵ Other more invasive procedures, such as insertion of spinal cord stimulators, may also convey a higher risk, with reports of 2-8% of patients developing infections¹⁶ thus suggesting this type of procedure may warrant extra precautions.

Gowns may be a useful extra precaution for our more invasive interventional spine procedures. Gowns are used to prevent cross-contamination between patients by keeping infectious material from coming in contact with the clothes of health care providers.¹⁷ The evidence about effectiveness of gowns, however, is conflicting, with no studies specifically examining their utility in preventing infections for interventional spine procedures. Investigations have shown that the use of gowns did not reduce patient colonization, infection, or mortality rate in neonatal intensive care units.^{18,19} Other studies have generated conflicting results. One study showed that the use of gloves and gowns was not superior to the use of gloves alone in preventing colonization of vancomycin-resistant enterococci in medical intensive care units.²⁰ A similar study found that gowns were protective in reducing vancomycin-resistant enterococci acquisitions in a medical intensive care unit when colonization pressure was high.²¹

At this time, there is insufficient data to make definitive recommendations with regard to the routine use of gowns for interventional spine procedures.²² The treating physician must weigh the risk and severity of a neuraxial infection with the possible benefit of wearing a gown.

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