

Invited Perspective

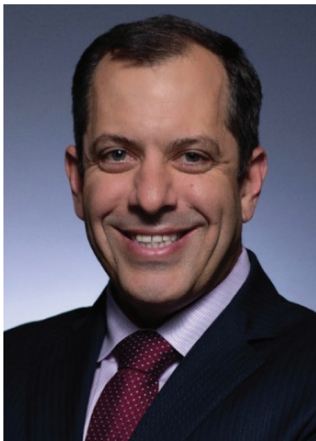
Pediatric Spine SSI: Res Ipsa Loquitur

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We have made significant progress in minimizing the rate of surgical site infection (SSI) after pediatric spine surgery in the last 15 years. SSI are now uncommon in patients with adolescent idiopathic scoliosis, although still problematic in our patients with neuromuscular scoliosis with significant

co-morbidities.¹ A spike in SSI at my institution in 2008 led us to think critically about how we could do better for these patients. Our exploration revealed no “smoking gun” (these spikes are almost always multifactorial, related to breaks in systems that allow errors to propagate through the “Swiss cheese”), and thus, we began a series of investigations.

Working with my friends at Children’s Hospital of Los Angeles and Children’s Hospital of Philadelphia, we quickly learned that gram-negative infections were accounting for a significant percentage of these infections—not only in our New York experience but much more broadly.² Seeking to understand if there was a “best practice” for SSI prophylaxis, we performed a survey of POSNA members and discovered significant variability in practice patterns.³ Unexplained clinical

variability usually means that at least some patients are receiving suboptimal care. We then formally examined the evidence in this space and, not surprisingly, found a lack of high-quality evidence to guide practice in this area.⁴ We became aware of the reality that significant practice variability and paltry evidence supported the current “best practices.”

In order to gain consensus, we convened a group of experts and developed guidelines for best practices (BPG). The resulting BPG was published in *JPO* in 2013⁵ and was the first of many such guidelines led by the Project for Safety in Spine Surgery (www.safetyinspinesurgery.com). The following year, our group experienced no SSI, leading us to reflect if infections should be a “never event.” Ten years later, rates of SSI remain much lower at our institution but also nationally as reflected in multiple papers using varying sources of data.⁶ Most recently, Sponseller et al. (with the Harms Study Group as part of the Project for Safety in Spine Surgery, 2022 Spine Surgery Safety Month) updated these guidelines reflecting some new evidence and also some new thinking (See [Best Practice Guidelines - SSI Prevention & Treatment in High-risk Pediatric Surgery](#))

In this *JPOSNA*[®] edition, Dr. Ryan Farmer shares a thoughtfully prepared quiz, and Dr. Ken Noonan provided me with an opportunity to reflect on where we have come from in the past and how we are doing

now. The questions provided in this quiz point out some important issues and realities regarding our current understanding of what constitutes best practices for prophylaxis for the prevention of SSI. But while rates of SSI certainly seem lower than in the past, it is not exactly clear why this is. As supported by both the original and updated spine BPG, we have in many cases “thrown the kitchen sink” at the problem. For many reasons, we seem to pay more attention to SSI which may itself have a positive effect via the Hawthorne effect. Unfortunately, we actually do not have that much more high-quality evidence than we had 15 years ago. It should therefore be of no surprise that some of the “answers” in this quiz (which in some cases make intuitive sense) are not supported by consensus guidelines created by many of the “experts” in the aforementioned BPGs.

SSI in pediatric spine is rare and often occurs as a result of a combination of complex interactive host, system, and clinical factors. Efforts to examine a single issue (e.g., comparative efficacy of CHG) are extremely limited by the biases which are essentially unavoidable in the design and conduct of this research. These methodological challenges to high-quality research in this area have led to some confusing findings resulting in mixed messaging about what the data is trying to tell us. When evidence is strong, it should always trump “expert opinion.” Unfortunately, the current evidence has not sufficiently improved upon knowledge present a decade ago when we were first confronted with this issue. Obviously, we need to be doing better in developing stronger evidence.

Perhaps though, “res ipsa loquitur” (the thing speaks for itself). While rates of infection after spine surgery have certainly decreased, we can and should do better. We now have accurate models that allow us to identify higher-risk patients.⁷ And many of the proposed interventions have essentially no downside risk. To me, my obligation to the patient trumps my obligation to evidence. Until convinced otherwise, why not continue to change your gloves every 2 hours, place antibiotics in the wounds, keep temperature up, limit OR traffic, use topical skin disinfectant preoperatively, etc.?” As William Cowper said more than 200 years ago, “Absence of proof is not proof of absence.”

Disclaimer

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