Establishing Best Practice Guidelines for Surgical Site Infection in High-Risk Pediatric Spine Surgery

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INTRODUCTION:

Surgical site infection (SSI) is a serious complication of pediatric posterior spinal fusion. Prior “best practice guidelines” (BPG) have identified strategies to reduce the risk of acute deep SSI, but there still exists large variability in practice. Further, there is still no consensus on which patients are “high risk” for SSI and how SSI should be diagnosed or treated in pediatric spine surgery. We sought to develop an updated, consensus-based BPG informed by available literature and expert opinion on defining SSI risk in pediatric spine surgery and on preventing, diagnosing, and treating SSI in high-risk patients.

METHODS:

This study was a combination of a systematic review and a Delphi process. Following a systematic review of the literature, an expert panel of 21 pediatric spine surgeons was selected from the Harms Study Group based on extensive experience in the field of pediatric spine surgery. Using the Delphi process and iterative survey rounds, the expert panel was surveyed for current practices (Table 1), presented with the systematic review, given the opportunity to voice opinions through a live discussion session, and asked to vote regarding preferences privately (Table 2). Two survey rounds were conducted electronically, after which a live conference was held to present and discuss results. A final electronic survey was then conducted for final voting. Agreement ≥ 70% was considered consensus. Items near consensus were revised if feasible to achieve consensus in subsequent surveys (Table 3).

RESULTS:

The initial consensus rounds identified 15 high-risk patient characteristics, 12 preventative strategies, 2 diagnostic strategies, and 5 treatment strategies that attained consensus (Tables 2 and 4). After live discussion, recommendations that did not initially reach consensus were revised, broadened, combined, or converted to a negative consensus item as listed in Table 3. A final voting survey after revising recommendations resulted in consensus for 2 additional high-risk characteristics, 5 preventative strategies, 4 additional diagnostic interventions, and 4 additional treatment interventions as presented in Table 4. All 21 experts agreed to the publication and implementation of these items in their practice.

DISCUSSION AND CONCLUSION:

We present a set of updated consensus-based BPGs for defining high-risk and preventing, diagnosing, and treating SSI in high-risk pediatric spine surgery. We believe that this BPG can limit variability in practice, guide future research, and decrease the incidence of SSI in pediatric spine surgery.