International Consensus on Periprosthetic Joint Infection: What Was Discussed and Decided?

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Periprosthetic joint infection (PJI), with all its disastrous implications, continues to pose a challenge to the orthopedic community. Practicing orthopedic surgeons have invested great efforts to implement strategies to minimize surgical site infection (SSI). Although high-level evidence supports some of these practices, many have little or no scientific foundation. As a result, there is a remarkable variation in practices across the globe for prevention and management of PJI.

Some of the many questions the orthopedic community faces on a daily basis, include:

- Should a laminar flow room be used for elective arthroplasty?
- How much, and which antibiotic should be added to cement spacers?
- What metric should be used to decide on the optimal timing of reimplantation?
- What are the indications and contraindications for irrigation and debridement?
- How many irrigation and debridement in a joint should be attempted before resection arthroplasty needs to be considered?

The medical community understands the importance of high-level evidence and engages in the generation of such whenever possible. The community also recognizes that some aspects of medicine will never lend themselves to the generation of high-level evidence nor should it attempt to do so. It is with the recognition of the latter that The International Consensus Meeting on Periprosthetic Joint Infection was organized. Delegates from various disciplines including orthopedic surgery, infectious disease, musculoskeletal pathology, microbiology, anesthesiology, dermatology, nuclear medicine, rheumatology, musculoskeletal radiology, veterinary surgery, pharmacy, and numerous scientists with interest in orthopedic infections came together to evaluate the available evidence, when present, or reach consensus regarding current practices for management of SSI/PJI. The process of generating the consensus has spanned over 10 months. Every stone has been turned in search of evidence for these questions, with over 3,500 related publications evaluated. The evidence, when available, has been assessed. Otherwise, the cumulative wisdom of 400 delegates from 52 countries and over 100 societies has been amassed to reach consensus about practices that lack higher level of evidence. The members of the Musculoskeletal Infection Society (MSIS) and the European Bone and Joint Infection Society (EBJIS), the 2 societies with a mission is to improve care of patients with musculoskeletal infection, have contributed to this initiative immensely.

The delegates have been engaged every step of the way by communicating through a social website generated for this purpose, with over 25,000 communications exchanged. The consensus document has been developed using the Delphi method under the leadership of Dr. Cats-Baril, a world-renowned expert in consensus development.

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The design of the consensus process was to include as many stakeholders as possible, allow participation in multiple forums, and provide a comprehensive review of the literature. The topics that were covered included the following: mitigation and education on comorbidities associated with increased SSI/PJI, perioperative skin preparation, perioperative antibiotics, operative environment, blood conservation, prosthesis selection, diagnosis of PJI, wound management, spacers, irrigation and debridement, antibiotic treatment and timing of reimplantation, 1-stage versus 2-stage exchange arthroplasty, management of fungal or atypical PJI, oral antibiotic therapy, and prevention of late

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PJI. Every consensus statement has undergone extreme scrutiny, especially by those with expertise in a specific area, to ensure that implementation of these practices will indeed lead to improvement of patient care.

After synthesizing the literature and assembling a preliminary draft of the consensus statement, over 300 delegates attended a face-to-face meeting in Philadelphia, were involved in active discussions, and voted on the questions/consensus statements. The delegates first met on July 31, 2013, in smaller workgroups, to discuss and resolve any discrepancies and finalize their statements. Then, they met in the general assembly for further discussion of questions and consensus statements. After revising the consensus statements, the finalized consensus statement was assembled and forwarded to the Audience Response System that evening, with voting occurring on the next day. On August 1, 2013 the delegates came into the general assembly and voted on the 207 questions/consensus statements that were being presented. The voting process was conducted using electronic keypads, where one could agree with the consensus statement, disagree with the consensus statement, or abstain from voting. The strength of the consensus was judged by the following scale: 1) Simple Majority: No Consensus (50.1%-59% agreement), 2) Majority: Weak Consensus (60%-65% agreement), 3) Super Majority: Strong Consensus (66%-99% agreement) and 4) Unanimous: 100% agreement. Of the 207 questions, there was unanimous vote for one question (controlling operating room traffic), 202 questions received super majority (strong consensus), 2 questions had weak consensus, and only 3 questions did not achieve any consensus.

The document generated[1] is the result of innumerable hours of work by the liaisons, leaders and delegates dedicated to this initiative. We are certain that the "best practice guide" set forth by this initiative will serve many of our patients for years to come.

It is essential to state that the information contained in this document is merely a guide to practicing physicians who treat patients with musculoskeletal infection and should not be considered as a standard of care. Clinicians should exercise their wisdom and clinical acumen in making decisions related to each individual patient. In some circumstances this may require implementation of care that differs from what is stated in this document. ■

Reference

1. Cats-Baril W, Gehrke T, Huff K, Kendoff D, Maltenfort M, Parvizi J. International consensus on periprosthetic joint infection: description of the consensus process. *Clin Orthop Relat Res.* 2013;471(12):4065-4075.