

A new definition for periprosthetic joint infection

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A rise in periprosthetic joint infection (PJI) rates has the orthopedic community moving to develop it's first-ever agreed upon definition and diagnostic criteria to help better treat patients.

The proposed criteria, published in the November issue of *Clinical Orthopaedics and Related Research*, was developed by a Musculoskeletal Infection Society working group led by Javad Parvizi, M.D., director of Research at the Rothman Institute at Jefferson. The group analyzed available research, much of which was conducted at Jefferson, to develop the new definition and criteria.

"Our aim was to develop a "gold standard" definition to serve as a roadmap for diagnosing patients with suspected PJI that could be universally adopted by the industry," said Dr. Parvizi.

PJI occurs in a replacement joint and is often found deep inside the joint prosthesis. It has become a major concern for the orthopedic community as antibiotic-resistance organisms have increased the prevalence of post-surgical periprosthetic infections. Deep periprosthetic joint infection is currently the most common indication for revision of total knee arthroplasty and the third most frequent indication for revision of total hip arthroplasty. The criteria will also be published in the December issue of the *Journal of Arthroplasty*.

The group's recommendations include sterile sampling of the periprosthetic tissue or fluid for the presence of virulent organisms, such

as [Staphylococcus aureus](#) (*S. aureus*), the culprit in [staph infections](#); and testing the [blood serum](#) surrounding the joint for elevated levels of known biomarkers for [systemic inflammation](#) and infection, C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR). They recommend certain considerations as the level of [serum markers](#) is affected by age, sex and medical comorbidities.

Aspiration and supplementary testing of the synovial fluid, the [viscous liquid](#) that lubricates the joints and feeds the cartilage is suggested to look for elevated white blood cell counts, specifically the percentage of neutrophils (PMN%), plentiful in infected bone marrow.

The appearance of joint during surgery, presence or absence of a sinus tract, and the result of histological analysis of tissue obtained during surgery (frozen section) are also recommended to consider in diagnosing PJI.

"Patients with PJI could suffer unintended consequences if their infection is not identified and treated hastily," said Dr. Parvizi. "Without an industry-wide definition, research, diagnosis and treatment cannot be uniform."

Numerous other Jefferson research studies are underway that will help fine-tune the recommendations in the future.

Recent research conducted by Parvizi et. al. tested levels of C-reactive protein (CRP) in the synovial fluid of septic patients. Their findings showed significantly elevated levels of CRP, with levels of 46.27 mg/L in the synovial fluid of septic patients compared to 1.64 mg/L in aseptic patients. The initial findings of this study have been published in *Clinical Orthopedics and Related Research* and won the Mark Coventry Award for basic science research at the 2011 American Knee Society annual meeting in July and the Clinical Research Award from the American

Association of Hip and Knee Surgeons (AAHKS). It will be presented at a podium presentation on Saturday, November 5th at the AAHKS annual meeting in Dallas.

"It's important to get to the root of the cause of PJI so that we can begin to get ahead of it at Jefferson and across the industry and turn the tide," said Dr. Parvizi. "Using this definition, we will now be more confident in our diagnosis and be able to provide appropriate treatment for patients."

To date their criteria has been evaluated and endorsed by the Knee Society, the Hip Society, the Infectious Disease Society of North America (IDSNA), the American Association of Orthopedic Surgeons (AAOS) and the CDC.

More information: [www.clinorthop.org/journal/119...
Joint_Infection.html](http://www.clinorthop.org/journal/119...Joint_Infection.html)

Provided by Thomas Jefferson University

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