Discrepancies in Periprosthetic Joint Infection Criteria Reporting and Use: A Call for CLEAR-Dx-PJI Standards

Alexandra Hohmann[1], Cristian Anthony Desimone, Natalie Lowenstein[2], Carl A Deirmengian[1], Yale Fillingham
[1]Rothman Orthopaedic Institute, [2]Brigham and Women's Hospital

INTRODUCTION: Since 2011, authoritative bodies have endorsed various criterion-based definitions of periprosthetic joint infection (PJI) with differing criteria and point systems. This study aimed to determine which PJI definitions are most prevalent in the literature and how accurately they are cited and used.

METHODS:
The 2011 MSIS, 2013 MSIS/ICM, 2013 IDSA, 2018 ICM, and 2021 EBJIS definitions, and an unendorsed definition published in 2018, were included. Back citation identified 466 studies (JOA: 288, CORR: 71, BJJ: 62, JBJS: 45) from 2012-2022 using a PJI definition. Trends in PJI definition citation and use were assessed, including 1) PJI definition claimed in methods, 2) The cited reference to this claim, 3) Description of definition in manuscript, 4) Definition modification.

RESULTS: Of 466 studies, the 2011/2013 MSIS definitions remain predominant despite newer definitions. Only 32% (147/466) detailed the PJI definition beyond its name and citation. Definitions were modified by authors in 19% (89/466) of studies. Of 99 studies using a definition with an "inconclusive" category, only 19% (19/99) provided details on the inconclusive group. The PJI definition stated in methods did not align with the cited source in 21% (99/466) of studies. Of these, 74% (73/99) cited the unendorsed definition published in 2018 while claiming to use an endorsed MSIS or ICM definition.

DISCUSSION AND CONCLUSION: The 2011/2013 MSIS definitions of PJI remain the most used definitions through 2022. Among highly-cited journals, the PJI definition claimed in the methods often (21%) contradicted the cited reference. Studies frequently failed to clearly report the definition used or cited the wrong definition. We urge authors to include a detailed reporting format, which we term the 2024 CLEAR-Dx-PJI (Citation, Legibility, and Exactness in Academic Reporting of Diagnostic Criteria for Periprosthetic Joint Infections) Standards (Table 1) when publishing studies using an endorsed PJI definition.

2024 CLEAR-Dx-PJI Standard

(Citation, Legibility, and Exactness in Academic Reporting of Periprosthetic Joint Infections)

Purpose: To improve the quality and transparency of studies using an endorsed definition of PJI.

CLEAR-Dx-PJI Elements Checklist

1. ☐ **Definition Nomenclature:** Correct nomenclature usage for endorsed PJI definition in study: 2011 MSIS; 2013 ICM/MSIS; 2013 IDSA; 2018 ICM; 2021 EBJIS/MSIS; or future endorsed definitions.
2. ☐ **Definition Citation:** Correct citation for authorized PJI definition in study. The citation directly references the original manuscript or document introducing the authorized definition. Multiple different PJI definitions should not be cited to reference the single definition of PJI used in the study.
3. ☐ **Modifications:** It is reasonably common to modify an authorized definition of PJI for various reasons in a study, such as test availability or bias minimization. If definition was modified, the modification and its rationale are transparently described for the reviewers and reader.
4. ☐ **Definition Description:** A dedicated text, figure, or table is provided confirming the criteria included, testing thresholds utilized, and final point categories along with associated diagnoses. Definition test thresholds and interpretations are used, not laboratory thresholds and interpretations.
5. ☐ **Data Completeness:** The availability of data may vary by institution, patient, sample, or study. The study includes which criteria were available for assessment in the study and specify what percent of patients or samples had each criterion available for analysis.
6. ☐ **Diagnostic Completeness:** Studies include the number of patients or samples in each diagnostic category of the definition named and cited, even when the definition utilized includes non-deterministic categories such as "Inconclusive" which are not included in the analysis.