Periprosthetic joint infection (PJI) remains a major concern for surgeons and patients. It presents a large burden for healthcare systems, requiring expensive, invasive treatments, which are not always successful.\(^1\)\(^2\) Effective treatment starts with accurate diagnosis.

Previous definitions of PJI have been helpful and provided reference standards for diagnostic studies,\(^3\)\(^4\) but no single definition has been adopted.\(^6\) The European Bone & Joint Infection Society (EBJIS) has therefore worked with the Musculoskeletal Infection Society (MSIS) and the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) Study Group for Implant-Associated Infections (ESGIAI) to produce a new definition, derived from the most robust evidence on diagnosis of PJI. This fulfils the two primary roles of a definition. Firstly, it provides a practical guide for clinicians to decide if an infection is present or not, based on widely available investigations. Secondly, it facilitates researchers to perform studies in patients with confirmed infection or not.

The elements of the definition were chosen on the specificity or sensitivity of each test. Unfortunately, we do not have any perfect tests, and currently we have no tests which can reliably exclude infection. A test with a high specificity (such as histology) is only positive in those with infection and so can be used to confirm the presence of infection. Sensitive tests can suggest the presence of infection but will not confirm it unless they also have high specificity. As new tests are evaluated, they can be added.

The novel ‘traffic light’ approach divides patients by the likelihood of infection (green or amber) or confirmed infection (red). It recognizes the difficulty of trying to create a simplistic ‘black or white’ definition of PJI.\(^6\)\(^7\) This mirrors the approach in the recent Consensus Definition of Fracture-Related Infection.\(^9\)

We hope that this work helps clinicians of all expertise and allows informed discussions with patients about the diagnosis of PJI. The definition is now undergoing validation trials and we welcome further work on this.

References

Author information:
M. McNally, MB, BCh, MD, FRCS(Oth), EBJIS Past-President, The Bone Infection Unit, Nuffield Orthopaedic Centre, Oxford University Hospitals, Oxford, UK.
R. Sousa, MD, PhD, EBJIS Executive Committee Member, Porto Bone Infection Group (GRIF), Orthopaedic Department, Centro Hospitalar Universitário do Porto, Porto, Portugal.
M. Wouthuysen-Bakker, MD, PhD, ESGIAI Chair, Department of Medical Microbiology and Infection Prevention, University of Groningen, University Medical Center Groningen, Groningen, Netherlands.
A. F. Chen, MA, MBA, Director of Research, Arthroplasty Services, Director of Research, Arthroplasty Services, Brigham and Women’s Hospital, Boston, Massachusetts, USA.
A. Soriano, MD, EBJIS Vice-President, ESCMID Fellow, Head of Infectious Diseases Department, Hospital Clinic of Barcelona, Barcelona, Spain.
H. C. Vogely, MD, PhD, EBJIS General Secretary, Orthopaedic Surgeon, Department of Orthopaedics, University Medical Center Utrecht, Utrecht, Netherlands.
M. Claus, MD, EBJIS Treasurer, Head of the Center for Musculoskeletal Infections, Department of Orthopaedics and Trauma Surgery, University Hospital Basel, Basel, Switzerland.
C. A. Higuera, MD, FAAM, MSIS President, Levitz Center for Orthopaedic Surgey, Cleveland Clinic, Florida, USA.
R. Trebše, MD, PhD, EBJIS President, Head of Bone Infection, Orthopaedic Hospital Valdotta, Ankanara, Slovenia.

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INFOGRAPHIC
Infographic: The EBJIS definition of periprosthetic joint infection
A PRACTICAL GUIDE FOR CLINICIANS

Correspondence should be sent to M. McNally; email: martin.mcnally@ouh.nhs.uk

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The EBJIS definition of periprosthetic joint infection

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<table>
<thead>
<tr>
<th>Infection Unlikely</th>
<th>Infection Likely</th>
<th>Infection Confirmed</th>
</tr>
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<tbody>
<tr>
<td>All findings negative</td>
<td>Two positive findings</td>
<td>Any positive finding</td>
</tr>
<tr>
<td>A X B X C</td>
<td>A B or A C</td>
<td>A or B</td>
</tr>
</tbody>
</table>

**A CLINICAL**

- **Clinical features**
  - Clear alternative reason for implant dysfunction

- **C-reactive protein**
  - CRP > 10mg/l

**B LABORATORY**

- **Synovial fluid**
  - Leukocyte count ≤ 1500
  - PMN ≤ 65%

- **Microbiology**
  - All cultures negative
  - No growth on sonication

- **Histology**
  - Negative

**C RADIOLOGY**

- **Nuclear imaging**
  - Negative 3-phase isotope bone scan

- **Positive white blood cell labelled scintigraphy**

**Infection Unlikely**

- Early radiographic loosening
- Wound healing problems
- Recent fever/bacteraemia
- Purulence around prosthesis
- CRP > 10mg/l

**Infection Likely**

- Leukocyte count > 1500
- PMN > 65%

**Infection Confirmed**

- Sinus tract communication with the joint +/- visualization of prosthesis
- Leukocyte count > 3000
- PMN > 80%
- Positive Alpha-defensin
- ≥ 2 positive samples with the same microorganism
- > 50 CFU/ml any organism on sonication
- Presence of ≥ 5 neutrophils in ≥ 5 HPF
- Visible microorganisms