■ EDITORIAL

The impact factor: yesterday's metric?

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One of the core objectives of *The Bone & Joint Journal* (*BJJ*) remains to publish the best, highest impact and most clinically relevant articles possible. We believe that we cover the most clinically challenging areas and that many of our papers change practice.[1-9] Yet this does not automatically translate to a traditional two-year impact factor (IF) high enough to reflect the importance of the material published.

The impact factor is embedded in academic thinking, not least because it is easy to calculate and most people can understand the concept. Unfortunately, the IF does not fully measure the true clinical and practical impact of journals like *BJJ* that have a largely clinical readership, many of whom read the articles and change their day-to-day practice based on them, but don't cite them.

The impact factor remains an area of great debate amongst researchers, publishers and academic institutions. Journals in Trauma and Orthopaedics, along with other surgical specialties, tend to have lower IFs in comparison to specialties with higher basic science and less craft emphasis. Impact factors are used as part of promotion and tenure decisions. They are used by researchers for selecting which journal to submit to, they are used by university administrators for ranking academic and research programmes within and across universities, and they are used by grant giving bodies as a way of assessing investigators. Impact factors are used by journals and their publishers to attract subscriptions, sponsored supplements and advertising.

There are some very high-ranking clinical journals that have a much lower circulation and less clinical relevance to most practitioners than the *BMJ* (IF 2012: 17.215), which is more widely read, such as *New England Journal of Medicine* (51.658), *The Lancet* (39.060) and *JAMA* (29.978). By comparison, the highest ranked orthopaedic journal is currently *American Journal of Sports Medicine* (4.439), now just ahead of the much less clinical *Osteoarthritis and Cartilage* (4.262) which held the top spot in this category for many years. On the other hand the translational effects of the work in *BJJ* and its predecessor *JBJS Br* (2.735), such as product patent and clinical practice change, are massive. Therefore the impact factor *per se* doesn't truly reflect the clinical influence it has.

In this issue, Kodumuri et al[10] evaluated the impact of 13 journals in Trauma and Orthopaedics looking at the longer-term impact of their publications. Surgical papers had a lower citation rate at two years compared with basic science or clinical medical papers but, by four years, the citation rates were similar. This reinforces the view that a longer period is required for citation rate / IF to be appropriate for clinical surgery, and that the standard two year IF as it stands may not be the best way to judge a product such as *BJJ*.

Current limitations of impact factor include:

1) A positive discrimination towards journals publishing review articles; these tend to be more highly cited than original research articles.

2) There is wide disparity in IF across different scientific disciplines depending on the method of citation. For example, Mathematics researchers rarely cite more than one or two references, whereas a typical paper in molecular biology cites more than ten.

3) The two year citation window used in the calculation method is considered too short to detect the real impact of the publication in slowly evolving disciplines such as orthopaedics. This is supported by the fact some types of journals are found to have higher impacts when increasing the two-year period used to calculate the impact factor to five years or more. For example, the five-year IF for *BJJ* (formerly that of *JBJS Br*) is 3.353 compared to 2.735 for the normal two year IF.

4) A high impact factor value of one journal does not correlate to the high citation rate of each article in that journal. A study in *Nature* in 2005 showed that 89% of their citations came from 25% of their articles.[11] The concept of citable documents is not operationalised adequately.

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