



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

- [2] Cloud computing. Wikipedia. [https://en.wikipedia.org/wiki/Cloud\\_computing](https://en.wikipedia.org/wiki/Cloud_computing) [accessed 26.04.20].
- [3] Rosic A. What is Blockchain technology? A step-by-step guide for beginners. <https://blockgeeks.com/guides/what-is-blockchain-technology/>; 2016 [accessed 26.04.20].
- [4] Haleem A, Javaid M, Khan IH. Internet of things (IoT) applications in orthopaedics. *J Clin Orthop Trauma* 2020;11:S105–6.
- [5] Javaid M, Haleem A, Vaishya R, Bahl R, Suman R, Vaish A. Industry 4.0 technologies and their applications in fighting COVID-19 pandemic. *Diabet Metabol Syndr* 2020. <https://doi.org/10.1016/j.dsx.2020.04.032>.

### Response to Letter to the Editor on “Digital Orthopedics. A Glimpse Into the Future in the Midst of a Pandemic”



#### To the Editor:

The authors of our article titled “Digital Orthopedics: A Glimpse Into the Future in the Midst of a Pandemic” published in this journal in April 2020, are grateful to Prof Vaishya and his colleagues for their thoughtful Letter to the Editor.

We agree that ours was not an exhaustive list of the technologies that are transforming our ability to care for orthopedic patients. Rather, our paper was focused on those technologies that proved to be beneficial specifically when applied to providing musculo-skeletal care in the context of the current COVID-19 pandemic.

Cloud computing and the next step, Edge computing, are very powerful tools, particularly when it comes to augmenting human intelligence (not replacing it). The blockchain, precisely because it can create an immutable and traceable database, has the potential to bypass the challenges of electronic health record interoperability and accelerate the dawn of the personal health record. The Internet of Things and what many are now calling the Internet of Medical Things will create links between devices that will massively multiply our ability to capture data and support increasingly accurate treatment algorithms.

And of course, artificial intelligence, the basis for the next industrial revolution, and all its subdivisions such as machine learning, natural language processing, voice recognition, and sentiment analysis will not bypass orthopedics. Neither will applications in Fin-Tech; Virtual, Augmented, and Mixed Reality; and the inevitable confluence between Regenerative Medicine, Biotechnology, and Digital Health.

We agree that there is much to be excited about in the space we term Digital Orthopedics on a global scale.

Stefano A. Bini, MD\*  
Peter L. Schilling, MD, MSc

DOI of original article: <https://doi.org/10.1016/j.arth.2020.06.008>.

Dr Dustin J. Schuett, DO required Navy Disclaimer.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of the Army, Department of Defense, nor the US Government. Nothing in the presentation implies any Federal/Department of Defense/Department of the Navy endorsement.

One or more of the authors of this paper have disclosed potential or pertinent conflicts of interest, which may include receipt of payment, either direct or indirect, institutional support, or association with an entity in the biomedical field which may be perceived to have potential conflict of interest with this work. For full disclosure statements refer to <https://doi.org/10.1016/j.arth.2020.06.009>.

Department of Orthopaedic Surgery  
University of California  
San Francisco, San Francisco, CA

Shaun P. Patel, MD  
Orthopaedics Department  
Southern California Permanente Medical Group  
Orange County Irvine Medical Center  
Irvine, CA

Niraj V. Kalore, MD  
Virginia Commonwealth University Health  
West Hospital, Richmond, VA

Michael P. Ast, MD  
Division of Adult Reconstruction and Joint Replacement  
Hospital for Special Surgery  
New York, NY

Joseph D. Maratt, MD, MBA  
Methodist Sports Medicine  
Indianapolis, IN

Dustin J. Schuett, DO  
Department of Orthopaedic Surgery  
Naval Medical Center  
San Diego, CA

Charles M. Lawrie, MD  
Department of Orthopedic Surgery  
Washington University  
Saint Louis, MI

Christopher C. Chung, BS  
University of Virginia School of Medicine  
Charlottesville, VA

Garen D. Steele, MD, PharmD  
Andrews Institute, Gulf Breeze, FL

\*Reprint requests: Stefano A. Bini, MD, Department of Orthopaedic Surgery, University of California San Francisco, 500 Parnassus Avenue, MU 323-W, San Francisco, CA 94143.

<https://doi.org/10.1016/j.arth.2020.06.009>

### Letter to the Editor on “In the Era of Tranexamic Acid, Are Type and Screens for Primary Total Joint Arthroplasty Obsolete?”



#### Dear Editor

We read with much interest the article entitled “In the Era of Tranexamic Acid, Are Type and Screens for Primary Total Joint Arthroplasty Obsolete?” by Vestermark et al, (2020) published

DOI of original article: <https://doi.org/10.1016/j.arth.2020.04.056>.

No author associated with this paper has disclosed any potential or pertinent conflicts which may be perceived to have impending conflict with this work. For full disclosure statements refer to <https://doi.org/10.1016/j.arth.2020.05.053>.