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On Patient Safety: Infection Prevention in Orthopaedics: Pearls and Pitfalls of a Global Perspective

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From the Column Editor,

The World Health Organization (WHO) recently published surgical site infection prevention recommendations in an effort to improve care in low- and middle-income countries. The author of this guest column, Cyril Mauffrey MD,

A note from the Editor-in-Chief: We are pleased to publish the next installment of “On Patient Safety” in Clinical Orthopaedics and Related Research®. The goal of this quarterly column is to explore a broad range of topics that pertain to patient safety. We welcome reader feedback on all of our columns and articles; please send your comments to eic@clinorthop.org.

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FACS, FRCS from Denver Health Medical Center, is the ideal candidate to highlight the difficulties in implementing such guidelines and protocols in geographical areas that need them the most. Originally from France, Dr. Mauffrey grew up in South East Asia and graduated from the University of Turin School of Medicine in Italy. He has maintained many ties with the Far East—through mission work in India, as well teaching and lecturing in China, Korea, and India. Currently, he is leading an international effort to develop guidelines for the diagnosis and treatment of long bone infections. Dr. Mauffrey’s unique and truly global perspective on healthcare and patient safety is worth your time.

—Michael J. Lee MD

The World Health Organization (WHO) recently published recom-

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mendations on pre, intra, and postoperative measures for surgical site infection (SSI) prevention [3, 4]. These recommendations represent a renewed effort to improve care in low- and middle-income countries, specifically with respect to healthcare-associated infections (of which SSIs are the most common) [2, 5]. The WHO guidelines are truly global, in that they also can (and should) apply to high-income countries where SSIs are proportionally less frequent, yet still represent one of the largest burdens in terms of cost to patients, hospitals, payers, and society in general. The WHO documents take into account the balance between harm and benefit, the level of evidence, costs, and resource implications.

While those of us practicing in resource-rich environments can easily implement the WHO recommendations, in many places where failing to do so is literally a life-or-death proposition, it is not so easy. Today, more than 50% of people on the planet still do not have access to the Internet (this includes physicians, policymakers, and hospitals). And for those who do, the fee required to access key

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scientific publications might render it out of reach—particularly those in resource-poor environments. Finally, even with accessible scientific information and knowledge, the implementation of guidelines and protocols remains a challenge in an environment where the culture of quality and safety is not the priority.

Implementing the WHO guidelines requires the awareness that such guidelines exist. Limited access to knowledge is sadly common in many low- and middle-income countries. I have lived and practiced medicine on three different continents and have witnessed busy rural hospitals in South East Asia and India with no easy access to the Internet. How can local health-care providers keep current with the latest WHO infection prevention recommendations if providers in those countries that need it the most cannot access the guidelines? One hope is that the universal Internet access (by 2020) pledge made by Mark Zuckerberg and Bill Gates is successful [1]. In the meantime, it is in the hands of the WHO to promote and properly distribute their documents to those who truly need it. Local physicians should consider traveling to the nearest town with Internet access. Universal Internet access will enable global organizations like WHO to share important documents and recommendations where they are most needed strategically, at no cost.

But even this is not sufficient since financial restrictions also will impede universal access to scientific information. The goal of open access publication of biomedical research is to create free access to scientific information on the receiving end. Open access allows the dissemination of research; guidelines and recommendations free of charge for the users wherever they are and whatever their financial means [7]. I coauthored a recent editorial on open-access publications [8] highlighting how critical this modern publication option is for low- and middle-income countries. The transfer of fees from users to authors is a key ethical consideration for clinician-scientists in high-income countries who want to improve access to critical information in areas where clinical application of that information will have the greatest impact. This is easier said than done. And, importantly, the biggest challenge lies not in access, but in implementation.

Applying guidelines and protocols, particularly infection prevention measures, requires providers to embrace a culture of patient safety and quality. Successful patient-centered culture is achieved when providers buy in and the leadership establishes a no-blame culture, which facilitates accountability of each provider for every patient. In addition, key infrastructure—including education about how to

implement checklists, guidelines, and protocols, as well as resources for continuous data monitoring—are essential. In Chandausi (Uttar Pradesh Province), India, I vividly remember the smiling faces of some of my patients who were a few hours post-femoral supracondylar osteotomy for polio syndrome deformity correction. There were no universal protocols or surgical safety checklists in this clinic. Though the surgeons, mostly from larger surrounding cities, were well-educated and well-informed about the WHO infection prevention documents and checklists, there was no culture of safety and quality. One key educational strategy to achieve this critical component is the modification of the professional culture prevalent in surgery. In other words, we must address the leadership styles of some surgeons. In addition, it is important to establish a positive, nonpunitive reporting culture, and to develop a systems-based approach emphasizing team training. Finally, teaching more-effective approaches can be helpful.

How do you maintain the culture of accountability and implement the WHO infection prevention protocol on every patient, all the time? How do you keep up the momentum? The solution is capturing reliable data and sharing it with healthcare providers. The systematic review and meta-analyses [2, 5] referenced by the WHO guidelines

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highlight the variability in quality of data collection, definitions of complications, and reliability of the data itself. In fact, mapping of retrieved studies revealed a scattered global picture with poor records of healthcare-associated infections in entire regions, especially in Africa and the Western-Pacific region [2]. And data is key, because to maintain enthusiasm for WHO guidelines one must have proof that it helps on patients. On the front end, the knowledge and understanding that application of infection prevention guidelines will reduce SSIs based on robust data analysis is a crucial aspect of the workforce training and education. On the back end, healthcare providers will need proof that their intervention is working. In remote rural areas where patients may never be seen again, proof is a rare commodity. Dr. Billi Haonga's work was presented at the Orthopaedic Trauma Association meeting in San Diego, CA, USA a few years ago. He is from Tanzania and has adapted well to his "traveling patients" in a way that takes advantage of available resources and cheap technology. Dr. Haonga has one of the largest series of femoral SIGN nails inserted without the use of intraoperative fluoroscopy. He uses the "squat and smile test" through the smartphone application WhatsApp [6, 9]. Since most patients,

wherever they are in the world, have access to a smartphone, they are asked to shoot a video of them squatting with 150° of knee flexion and smile (Dr. Haonga's definition of a successful outcome). This virtual encounter can be used to verify surgical wounds and perform rapid and simple postoperative checks.

WHO guidelines on infection prevention fulfill an essential role both for countries with resources and those without. However, we still fall short of universal access to information and application of such recommendations. Policymakers and government agencies must focus on training and education to establish and promote a culture of patient safety and quality in those areas that need it most. Quality of data collection and no-blame culture of reporting complications are key components to achieving this task. To this end, the challenge of "traveling patients" in low- and middle-income countries remains and must be resolved with innovative technology (such as telemedicine) in a way that would can capture reliable data. This mission is too important to pass up; information technology experts, healthcare providers, and policymakers must come together to drive the process and facilitate quality care, everywhere.

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