

ROUNDTABLE DISCUSSION

Mission Trips and Longitudinal Program Development in Global Orthopaedics

As described in the ongoing Global Burden of Disease Project, musculoskeletal disease accounts for the second most common cause of disability worldwide, with a large proportion of low back pain, neck pain, osteoarthritis, gout, rheumatoid arthritis, low bone mineral density, and other musculoskeletal disorders.¹ Injuries and trauma continue to represent an ongoing cause of major disability, disproportionately so in low and middle income countries, with more deaths from trauma worldwide than HIV/AIDS (human immunodeficiency virus/acquired immune deficiency syndrome), malaria, and tuberculosis combined.²⁻⁴

Given the increasing awareness of the high burden of orthopaedic disease in low-resource nations, and explicit calls for global access to “essential” surgical care by the World Health Assembly / World Health Organization,^{5,6} a critical examination is warranted of the international orthopaedic service many surgeons in high income countries are involved in today. The need remains high for global orthopaedic development, with a call to identify sustainable, effective, data-driven programs to lead the way.⁷

We present a discussion amongst a group of experienced orthopaedic surgeons with varied backgrounds in global orthopaedics, focusing on the evolution of care from episodic missions to long-term development abroad.

I'd like to welcome you all to our 2nd Annual Roundtable Discussion for the Orthopaedic Journal at Harvard Medical School. We will be focused today on Global Orthopaedic Surgery, and more specifically, the interplay between traditional clinical mission trips and longitudinal efforts at capacity building and program development. We have with us a hand-picked group of experts in this field.

To start with a very open ended question, what do you think is the ultimate role and purpose of an orthopaedic mission trip and doing work abroad, whether a semi-annual trip or something other than that?

DR. THORNHILL: I can tell you about Operation Walk. I think it really depends on who you're trying to help. What we're trying to do is to develop metrics by which we can measure our success and our sustainability. That's the reason we go to the same place each year with Jeff Katz. I just reviewed a paper in which we looked at our 10-year history with 552 joints replaced in 350 people, so you're helping people, you're helping the local population, you're helping sterilization at the local hospital, and I think you're helping the residents to get down there in a learning environment to perhaps continue to do that the rest of their career.

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How do you all think we can understand what the most effective way is to provide care for those who would have that unmet need? Any thoughts on how to analyze, measure, and objectively assess if the work being done is the most effective approach to achieving that goal?

DR. MAY: The mission trip has traditionally been characterized as typically a week spent in a country, with international surgeons coming and performing some clinical role. I think the goal of a surgical mission really is to meet a need that would otherwise go unmet. If there are people who have conditions who at present are not being treated, the role of missions traditionally has been to meet that clinical need. People have very strong feelings, positive and negative, about the idea of a “mission trip”, but I think on the positive side its main benefit is to provide care that otherwise would not have been provided. I’m sure today we are going to talk a lot about ways such mission trips are evolving over time in a positive way to go beyond just clinical need.

DR. DYER: There is tension between both short-term and long-term objectives to that goal. If your objective is to crank out cases during your time, the best way to do that is to turn up with everything packaged. Interact as little as possible with the people in the hospital and facility, because you’ll always be faster and produce more clinical throughput than if you’re working with staff not on your team. But when you leave after the week, you leave nothing but that footprint; nothing else is left. If instead you engage with the local staff and nurses and sterilizers etc., as Dr. Thornhill is describing with Op Walk, you now leave behind more skills. And so there is a tension between short and long-term effectiveness. There are some hospital missions that are all about getting whatever they can done in, say, 10 days, and generally sacrifice the long-term goals for the short-term clinical care.

DR. MAY: Do you think those two have to be mutually exclusive? Because I think as you mention you are more efficient in the context of bringing the whole team and doing it yourself, but you can as a part of that get into education, capacity building, and have it reach as many people as you can. I am certainly in your camp as far as wanting to develop capacity and the resources to have it be self sustaining once you’re gone, but in the meantime, I do think there’s a need to take care of the people at hand.

DR. DYER: I think you’re right, but it has taken a huge effort, like Dr. Thornhill’s version of Op Walk, which really operates differently from many of the other Op Walks, which may parachute in and perhaps not return even to the same site. In contrast, your group suffers some cost in the short term but gains great benefit in the long term.

DR. THORNHILL: If I look at what we’ve accomplished, I would say one of the most important things we have left in the imprint where we work is that the hospital has completely revamped its sterilization process. In the Dominican Republic (DR), they were first

doing only 75 joint replacements per year at this hospital, and now there are over 200 joint replacements per year by the local surgeons even when we are not there. You have to know the culture of the people and the healthcare system. All of our people are means tested, and some of the stuff we’ve talked about on data collection, some of the best things Jeff Katz has done for us is to look at the metrics and see what’s good, what’s bad, and what elements of Op Walk Boston are mandatory to keep going on a longitudinal basis.

That raises a good point about clinical research being done on these trips in a low-resource setting. Do you think that’s important, or that all trips should include this component?

DR. THORNHILL: I’m not sure it’s possible to have everyone do it, and I don’t think everything has to fit in the same box. I wouldn’t criticize a program that doesn’t do it. For us, it’s a very important way to look at evidence-based studies and know whether we’ve been effective. Many of these studies are done by our Harvard medical students or other students, and this paper I was referring to has all the work we’ve been doing.

Yes, that is referring to work done by Jennifer Bido and the research team with Dr. Jeffrey Katz, an example of integrating in parallel research and QI work along with clinical work abroad.

There is a lot of technology available now for work overseas – what do you think are some ways technology can be leveraged for more efficient and effective work?

DR. SNYDER: The advent of cell phone and smart phone technology... has revolutionized our ability to continue interaction and compensates for the lack of available infrastructure available to these individuals. We can leverage this technology by creating an electronic medical record based on a smart phone app that allows an identifying picture of the patient and finger print, relevant demographic information, a listing of the diagnoses, relevant physical findings (template based on diagnosis to facilitate consistency in record keeping), picture of pre-op x-ray, a brief operative note, intra-operative x-rays and final radiographs at the completion of surgery, and an outline of the post operative plan. The app would also then include regularly scheduled questions posed to the patient with re-

“In the Dominican Republic (DR), they were first doing only 75 joint replacements per year at this hospital, and now there are over 200 joint replacements per year by the local surgeons...”

gard to pain, function, complications, and sequential pictures of the wound to assess healing. We can track the outcomes of the services provided, as well as compare the effectiveness of Global Health Care services, to those provided our own patients. A version of this app is being developed for our trip to Colombia, an adaptation of the record currently used by Smile Train.

Regarding the balance between clinical work and education, do you think it is feasible to link education over multiple trips into an integrated curriculum over time?

DR. DYER: I definitely do have a strong opinion about this, and perhaps the best way is to start by explaining how I became involved in all this. Malcolm and I, after the earthquake in Haiti, were 2 of the surgeons who went, and it was really the fulfillment of much of the reason I went into medicine itself, because I was interested in trauma and disaster relief, though it took 18 years from the time I was a military officer thinking I wanted to become a doctor until I was in Haiti with Malcolm responding to a disaster, and a lot of things evolved in my understanding. But during those 2 weeks in Haiti, I think we both realized that aside from the trauma of the disaster, the system of Haiti was not equipped even for the routine daily trauma— road accidents or a fall from height— and even though we could do a lot treating the immediate trauma, the best path would be to dedicate a lot of time to help train and support Haitian orthopaedic surgeons to care for their own patients there over time. So even though it was a great honor to help then after the earthquake during that short-lived time of the first visit, I think I've done far more by a sustained engagement over the 7 years now I've been there since then, trying to build capacity in Haiti, and that is really all about education. So although you can do surgery for a week and get a bunch of operations done, if you can teach somebody to do all that surgery all year when you're not there, that's a real gift.

Do you think the week trips can be utilized as a part of a long-term curriculum?

DR. DYER: That's exactly how I do it. It's set up where during the week that I'm there, they will bring operations that there is no local capacity to do yet, some technical injury that they are unable to do. I do no surgery on my own there but rather guide my colleagues through operations which after that they know how to do.

What should teams be doing between trips abroad to help achieve long-term goals?

DR. SNYDER: We believe that identifying appropriate caregivers and allied medical professionals at the local hospitals and clinics that we attend on mission trips is most important to continue the evolution of medical and surgical care provided to our global health patients. Therefore we are organizing an exchange program where the physicians, nurses and allied professionals that we work with on the ground during the mission trips can come to Boston to spend a few weeks training and observing their contemporaries at Bos-

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ton Children's Hospital. Boston Children's has made available grants for such exchange. This type of global health training could be expanded Harvard-wide. Additionally, training videos and computer simulations such as those being developed by TOUCH SURGERY could be used to teach medical professionals how to perform the procedures. Email and video conferencing on a regular basis should become an ongoing process to extend the impact of the mission beyond episodic surgery. Rick Schwend, a former HCORP resident and incoming president of POSNA has also developed use of webinars and the use of real time iPad imaging in the operating room to assist local surgeons remotely when performing complex surgeries.

DR. THORNHILL: You know the elephant in the room is funding - everybody who goes with us, it's all vacation time and volunteer. There are certain rules and regulations both federal and local that preclude some of it, and there are some departments like Anesthesia that have embedded within their program some time, and some have endowments, but endowments are getting harder and harder to even obtain.

Regarding trainees, with even more limited resources, and young attendings looking towards an academic career in global orthopedics, how can they position what they do as an asset for the dept. rather than something seen as time away and a burden on their colleagues?

DR. THORNHILL: We've created, and the other groups from the Harvard Combined program, various buckets, and yes, accounts receivable are good things to have, but also so are peer-reviewed publications. And then there is a whole other bucket of education that unfortunately we are not yet where we academically credit people for those things, and that is one thing we can aim to improve on.

DR. SMITH: I'm going to be a little more skeptical than people have been so far. I think that working overseas is enormously rewarding and certainly was a seminal moment for George and me. But reflecting on it, other than the emergency to help for disaster, it's extremely difficult to make a real difference. I think that a Western surgeon has real difficulty going to do something, without the equipment and the services to do something close to what he or she is used to doing.

And the resources I've seen overseas do not allow him to do that unless, as I see Tom has been doing, to take everything with them, and I think it's marvelous what they have been able to accomplish. As far as setting up the resources, to go somewhere, you will see such an enormous need, if you don't have an exit strategy, you will never leave. The ideal is to have a long-term program with long-term aims that transitions the visitor out over time and the local staff take over. So far in my experience that has been a vision, pie in the sky.

DR. THORNHILL: I think you have to have an exit strategy, because you need to have a de minimus, those sort of things you have to have at home locally and on your mission. Unless those things are fulfilled, you can't successfully do it, so I think an exit strategy is mandatory.

So if you think there may be infrastructure, population, and systems level issues in these places, do you think there should be encouragement for clinicians to obtain further training in public health and systems level training? Is that realistic to have orthopaedic surgeons doing?

DR. THORNHILL: Orthopaedics really is more difficult than many fields, with implants and procedures that can't be done in many places. I think the department of emergency medicine here have some people who, when they work there, work in a horizontal period of time, and it's easier to do that and they do some marvelous work, not necessarily operations but building infrastructure, clean water, etc. The other thing, though, we do, and I remember George talking about it at a Grand Rounds, is understanding the cultural differences between the patients you treat here and the patients you treat wherever you go because it is very profound not only in the collection of the data but in the interpretation of the data.

DR. DYER: Orthopaedics may be harder to do than other branches of surgery, but it is certainly no less important, and in fact in some case more important to be done than many other interventions. There are more deaths from road traffic accidents than from tuberculosis, malaria, HIV combined, and has been clearly identified by the Lancet Commission as 1 of 5 essential surgeries needed, i.e. treatment of open fractures. Yes it's hard, sterility is a challenge, but I don't think we can just ignore it. Yes it's hard, but we have got to do it.

DR. SMITH: I'm not suggesting we ignore it, just that we are realistic about it. The last time I went to a hospital overseas, in Uganda, it was probably a 50-bed ward with about 6 ignored massive sarcomas, and the rest besides a few appendicitis, were all orthopedic trauma patients, all lying there getting bed sores because hips hadn't been fixed, open pelvises with excrement, people with osteomyelitis, a child presented with his entire radial shaft sticking out of his arm. The level of disability and personal suffering from simple things that we treat

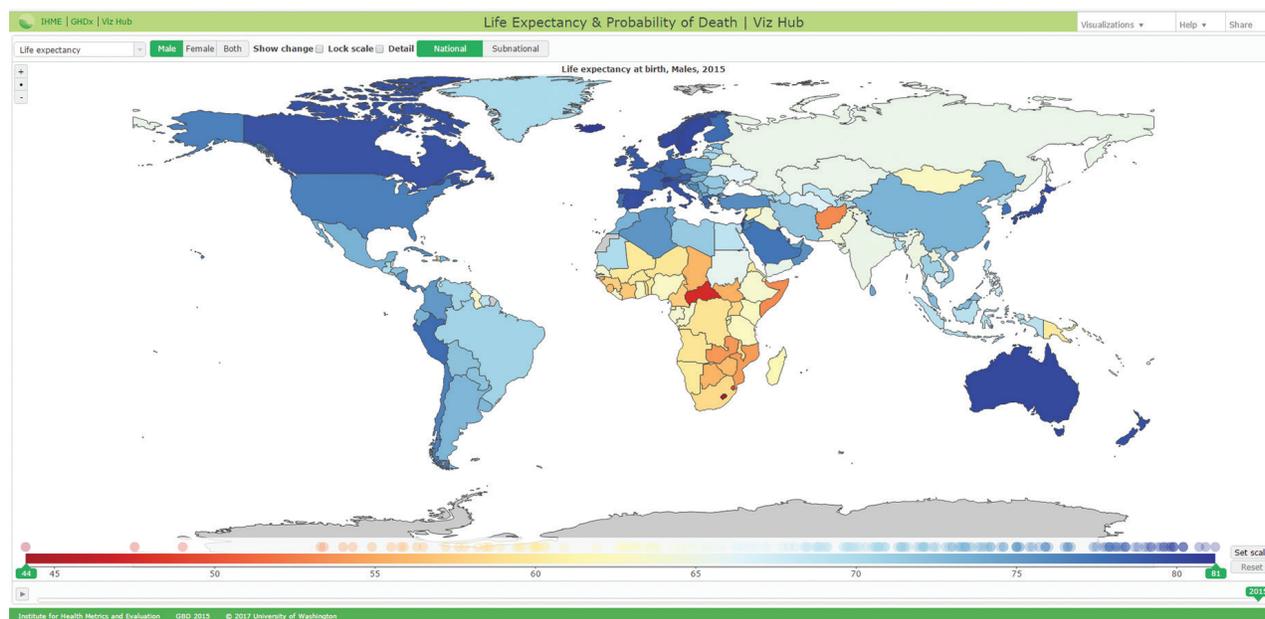
here routinely is enormous. There was a study about 2 years ago from Uganda about the likely economic outcome of simply fixing a tibia fracture in a taxi driver, and they illustrated that there were 5 or 6 people whose whole education and even livelihoods depended on that man getting back to work, and he couldn't. The social impact of that is incredible. The size of the problem though is so big, that trying to have broad expectations of any program is difficult. Which is why I advocate just going in and doing just one little bit well.

DR. MAY: This speaks to the clear heterogeneity of people's experiences. You take Dr Dyer's situation, and education is a key component there, and building up the people there to do the work is really important. But you look at the example of Lew Zirkle, founder of the SIGN Nail, starting in Vietnam. It wasn't the education or people there—they had surgeons available but needed the implants. They had sterile environments, they had the hospital, they just needed the implants, so he come up with that solution: the implant they needed to do the surgery. So you have to be flexible and tailor what you do to what is available or change it to what you can do. We're trying to do our best in all these various environments. One program certainly doesn't fit all.

DR. SMITH: You asked about trainees here. They would have massive problems working in places like this because you haven't been trained to work in those environments, without CT or other advanced testing. Few can put their hands on a patient and tell what's going on. You need to have an almost Victorian or last-century approach to medicine with physical exam, rather than press a button and get a scan, and that's not the training now.

DR. THORNHILL: If you instill in residents the importance of it and give them an opportunity I think that's important. One of the common questions of residency applicants now is, "Are there any international or mission-based activities in the program"? If you can take that small group of interested individuals, and you can get them interested in doing that and teach the next generation, that's important. I remember when Colleen Sabatini came to me and talked about doing it, I said then that this is not a real resident thing, but turns out it really is a resident thing, and they are a key part of what we do.

"We're trying to do our best in all these various environments. One program certainly doesn't fit all."

FIGURE 1 World Map Visualizing Life Expectancy and Probability of Death in Male Adults

Institute for Health Metrics and Evaluation (IHME). Life Expectancy & Probability of Death Data Visualization. Seattle, WA: IHME, University of Washington, 2016. Available from: <http://vizhub.healthdata.org/le/>. (Accessed [2017 May 10])

DR. DYER: Well a great example is Rameez, our host and moderator today, creator of this event. When he was at Harvard medical school, he came to me and said, “Hi, I’m Rameez, and I want to do academic international orthopaedics.” We were fortunate to match him as a resident, and from the day he started as an intern, he asked, “When can I start on this?” And it’s been a lot of fits and starts and patience on Rameez’s part to make this work, but he has absolutely made this into a viable part of not only his career as a resident but also a career as an orthopaedic surgeon. He’s figured out how to get the right training, he actually just matched today in pediatric orthopaedics, and I think that is an ideal specialty in part because it can be at times low-tech. I’m certain he has gotten better at practicing Civil War era medicine, by putting his hands on people and understanding what’s wrong with them, and I’m sure it has made him a better surgeon. I think it goes both ways. Our trainees benefit the people they work with, and that experience benefits them.

Thank you for those comments, and highlighting that in our program, like many others, there certainly is a growing interest in not only doing this work but also in asking questions regarding what is the best way. I think people are no longer just saying that I’d like to go somewhere, but now also saying how can I make the most difference in the most objectively effective and meaningful way.

I appreciate all of you taking the time to speak about this issue, as usual possibly raising as many questions as we have tried to answer. I am so glad we had the opportunity today to touch on some of the big picture aspects of global orthopaedic work for the next generation to promote sustainable improvement in the access to surgical care worldwide.

For a video and transcript of the full, extended discussion, including further topics on resident autonomy and structural innovations to enable time for teaching, go to the journal’s website at:

<http://www.orthojournalhms.org/18/roundtable.html>

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