The Changing Face of Pediatric Orthopedics

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In my 16 years of practice, there has been tremendous change in the field of pediatric orthopedics in both demographics and scope of practice. Because of scientific and technological advances, efforts of the Pediatric Orthopaedic Society of North America (POSNA), and a changing workforce, the nature of pediatric orthopedics is changing dramatically and will continue to do so.

In the late 1990s, a "typical" pediatric orthopedic surgeon was treating fractures, developmental dysplasia of the hip, clubfeet, and other congenital deformities. Surgery for adolescent idiopathic scoliosis was moving toward anterior instrumentation and correction of the spine. The concepts of early-onset scoliosis and thoracic insufficiency syndrome were in their infancy. Children with anterior cruciate ligament tears were treated with braces until skeletal maturity, often leading to life-altering meniscal pathology. Essential medical treatments for genetic conditions, including bisphosphonates for osteogenesis imperfecta and corticosteroids for Duchenne muscular dystrophy, were considered experimental.

The field itself also was at a crossroads. In 1993, there were 410 active members in POSNA (vs 653 in 2014), and the vast majority were male.[1] In the late 1990s, there were approximately 30 pediatric fellowship spots and 10 fellows being trained per year. Simultaneously, approximately 20 to 30 active POSNA members were retiring annually, leading to a projected shortage of pediatric orthopedic surgeons.[1] A 2007 American Orthopaedic Association survey found that 59% of members believed that pediatric orthopedics was the most underserved specialty for a variety of reasons, including perceived lower reimbursement, higher volume of nonoperative treatment, and lifestyle issues (such as on-call burden).[2]

Owing in part to efforts of POSNA in resident/fellow education and mentorship, the practice of pediatric orthopedics in 2016 is dramatically different from a decade ago. The number of fellowship programs has increased to 44 programs, offering a total of 71 fellowship spots, of which 60 were filled by US applicants in 2014. Interestingly, the current active membership of POSNA is 19% female, and the 2014 fellowship class was 34% female. This is in contrast to the 4.4% of all AAOS members who are female. If current trends continue, POSNA could be 40% female by 2025 as senior, predominantly male members retire.[1]

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Pediatric orthopedic practice in 2016 is also dramatically different owing to the development of subspecialization in areas of pediatric sports medicine, hand surgery, trauma, and the treatment of adolescent hip pathology. In fact, a recent survey of fellowship graduates showed that 30% of graduating fellows were going to do a second fellowship.[3]

While technological advances have driven the care of many pediatric orthopedic conditions such as spinal deformity and sports injuries, there also has been a resurgence of interest in the nonoperative treatment of clubfeet using the Ponseti method and of early-onset scoliosis using Mehta casting. Children with clubfeet even a decade ago were being treated with wide comprehensive releases and capsulotomies, leading to stiff painful feet as young adults. Now comprehensive releases are rarely used. Owing to advances in posterior spinal instrumentation as well as studies showing some decline in pulmonary function after thoracotomy and anterior spinal fusion, the treatment of adolescent scoliosis is predominantly done through the posterior approach. Advances in screening

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have led to a dramatic decrease in the surgical treatment of hip dysplasia. Medical treatment, such as corticosteroids for Duchenne muscular dystrophy, has prolonged length of life and improved quality of life as well as decreased the number of spinal fusions performed. Recombinant factor replacement for hemophilia has almost eliminated the horrible morbidity associated with hemophilic arthropathy and the need for synovectomy, arthrodesis, and arthroplasty, as well as the infectious issues, such as human immunodeficiency virus (HIV) and hepatitis, associated with the use of pooled blood products. The use of growth-friendly spinal implants, such as the Vertical Expandable Prosthetic Titanium Rib (VEPTR; DePuy Synthes), magnetically driven growing rods (MAGEC; Ellipse), and spinal tethers have improved pulmonary outcomes and presumably life expectancy in young patients with early-onset scoliosis who a decade ago may have had an in situ spinal fusion. These are just a few examples, and there are many more.

The articles in this issue highlight some of these changes. Tibial osteotomy and deformity correction, as described in the article by Burton and Hennrikus (pages 16-18), are classic techniques used by pediatric orthopedists over the past decades and will continue to be useful. The article by Hosseinzadeh and Talwalkar (pages 19-22) reviews unique aspects of pediatric compartment syndrome. While the basic concepts of compartment syndrome have not changed, the signs of compartment syndrome, the 5 Ps we all learned a decade ago (pain, paresthesia, paralysis, pallor, and pulselessness) have now been replaced in children with the 3 As (increasing analgesia, anxiety, and agitation). Finally, the article by Sferopoulos (pages 38-41) describing a case of a giant bone island in a child reminds us that we have a lot more to learn as pediatric orthopedists regarding the molecular nature and cause of disease.

The next few years will continue to be an exciting and dynamic time in the field of pediatric orthopedics. Not only is the workforce itself changing and growing, but so are the definitions of what a pediatric orthopedic surgeon is and does. While subspecialization is the trend in most aspects of medicine, it will be important to continue to monitor this trend to ensure that pediatric orthopedics does not become too highly specialized. With the tremendous inflow of new talent, ideas, and technology, the future for pediatric orthopedics has never looked brighter.

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