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CORR Curriculum — Orthopaedic Education

CORR® Curriculum — Orthopaedic Education: Orthopaedic Surgery Education in China

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Introduction

Although the fourth-largest country by sheer size, China is home to 1.34 billion people making it the most populous country on earth. China's geography is incredibly diverse—Western China is more agricultural and rural, while Eastern China is much more technology- and business-driven [9]. Economically, the income levels are much lower in the rural areas compared to the urban areas. This economic gap between the urban and the rural has adversely influenced the health of the rural population in China. In fact, rural mortality is about 30% higher than urban mortality [13].

In 2009, in an effort to curb healthcare inequality in the region, the Chinese government abandoned a free-market approach to healthcare coverage and launched a major healthcare-reform initiative with the goal of providing affordable healthcare insurance for all its citizens by 2020. In 2012, it was reported that approximately 95% of China's population had modest healthcare coverage [2], a remarkable feat considering the size and diverse geographical locations of its population. By contrast, in 1999, only 7% of those living in rural regions and 49% of those living in urban areas had health insurance [2].

There has always been a relatively low number of physicians per population in China, and this seems to be an ongoing problem as the number of citizens with healthcare coverage increases. A 2014 Organization for Economic Co-operation and Development (OECD) report found that China had 1.6 physicians per 1000 population in 2012, which is fewer doctors per capita than the OECD average (3.2 physicians) [8]. Though the National Health and Family Planning Commission reported that there were more than 11,000 licensed orthopaedic surgeons in China in 2014 [7], the Chinese Orthopaedic Association (the largest orthopaedic society in China) reported there being approximately 130,000 orthopaedic practitioners, of which 30,000 are members of the association [3]. In contrast, the AAOS found that there are approximately 28,000

A note from the Editor-in-Chief:
We are pleased to offer the next installment of CORR® Curriculum—Orthopaedic Education*, a quarterly column. The goal of this column is to focus on the mechanics of resident education. We welcome reader feedback on all of our columns and articles; please send your comments to eic@clinorthop.org.*

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practicing orthopaedic surgeons in the United States [1, 4, 10, 12]. There is pressure on China to graduate more physicians and community-health workers so those doctors and nurses can deliver care in areas beyond the big cities like Hong Kong and Shanghai.

Medical School in China

There are two major types of medical school programs in China: The more-common 5-year program (considered a Bachelor's degree) and an 8-year program (considered a Medical Doctorate degree or Doctorate of Clinical Medicine) [6].

For the 5-year medical school program, the first 2.5 years consist of basic education (such as English and Mathematics) as well as Microbiology, Anatomy, Physiology, Biochemistry, and Pathology. The next 1.5 years consist of basic clinical rotations (Surgery, Introduction to Surgery, Internal Medicine, Obstetrics and Gynecology, Epidemiology and Infectious Disease, Critical Care, Pediatrics, Psychiatry). In the 5th year, students have a 4-month clinical rotation in Internal Medicine, a 4-month rotation in surgery including Orthopaedic Surgery, a 1-month rotation of Obstetrics and Gynecology, a 1-month rotation in Pediatrics, and a 2-month rotation in either otolaryngology, radiology, or ophthalmology. The last year in school is meant to provide a broad rotating experience in medical specialties. At that point, the graduate received his or her basic medical degree [6].

Medical licensure is obtained after 1 year of clinical experience postgraduation, similar to an internship in the United States. The graduate must also take the medical licensure exam. There are two parts to the exam: A written assessment and a clinical skills examination. The clinical skills exam calls for students to treat simulated patients with standardized scenarios.

In China, there are a growing number of 8-year medical degree programs. Only the best qualified applicants are encouraged to enroll in the 8-year program. The goal of this longer program is to cultivate professional physicians, emphasizing advanced clinical and research experience.

Orthopaedic Residents in China

Following medical school, there are multiple pathways to becoming an orthopaedic surgeon. One way is for the orthopaedic resident to focus solely on 5 years of orthopaedic clinical education. An orthopaedic resident would complete 3 years of basic clinical education, in which he or she rotates through different surgical services and pursues licensure after the first postgraduate clinical year is completed. After basic education, residents must complete an additional 2 years of clinical orthopaedic subspecialty rotations.

Residents may also pursue either a Masters or PhD degrees beginning right after medical school and combined with a clinical program. The research requirement for these advanced degrees includes publishing papers in English language journals. In China, the development of advanced-degree programs in graduate medical education has produced a growing number of "clinician scientists" who publish articles in English language journals. English has become a more-common course in Chinese medical schools during the last 30 years, and resident graduate students are expected to continue their use and study of the English language. China is striving to become a major member of the academic community, and its government—and thus, Chinese scholars—have placed a greater emphasis on publishing research in English speaking journals and pursuing knowledge from overseas. Graduate students may be provided government sponsorship to study in the West for certain selected fields, with the understanding that they will bring new knowledge or skills back to China at the conclusion of their studies.

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Resident Training

Residents are trained in qualified hospitals, a large majority of which are located in major cities. Because hospitals in rural areas are poorly equipped, it is all but impossible to obtain quality education in that setting. Additionally, practice in these underserved areas is not popular because of the lack of resources, in which many doctors feel there is a lower standard than is found in more urban centers. Most medical graduates do not practice medicine in rural areas, resulting in a shortage of doctors outside the major cities. Although the Chinese government is carrying on a policy of urbanization for the rural areas, even with the improved economy, this problem remains unsolved. As in other countries, this maldistribution of medical care might be improved by providing adequate resources to practice, as well as providing incentives for the providers to make a rural practice more attractive.

Residents are expected to be active learners who receive increased autonomy as they demonstrate progressive competence to their faculty. Residents may see patients alone in their own clinics, with indirect supervision, and perform surgery with both direct and indirect supervision, depending on the complexity of the procedures involved. Additionally, training programs tend to be smaller (three or so per year group is typical) so that the faculty gets to know the trainees better, facilitating closer monitoring of a trainee's educational process. The development of a "clinician-scientist" track for residents has allowed for a concerted research effort to develop for not only orthopaedic surgery, but other medical specialties as well, resulting with increased research publications in English-language journals.

Though circumstances vary from hospital to hospital, residents normally are part of a larger orthopaedic team. For example, it is common for an associate chief (senior surgeon on the team) to have two attending surgeons work for him, each supervising two residents. An associate chief may lead a subspecialty area of orthopaedics or a general-orthopaedic team. The two residents typically would be of a senior and junior level, with increased autonomy and teaching responsibilities for the senior resident.

Looking Ahead

Although medical education in China is gravitating toward that in the West, clinical education is not standardized [5], and individual education or clinical experience may vary widely across differing centers. For example, a standardized case mix or volume has not been established for residents. Rather, general guidelines recommending a full breadth of orthopaedic experience for residents to complete their education is recommended. The actual practice varies by region and by hospital, making uniform standards difficult.

Two additional reform items have been identified: (1) Improving medical students' satisfaction with their education and (2) reducing resident workload. Residents in China, like other countries, still work long hours to accomplish care for patients. Part of this is due to having too few doctors compared to other countries. The duty-hour restrictions that have been implemented in other countries are not yet in place in China. Furthermore, faculty themselves are subjected to overwork as well, making fatigue a common problem for doctors in China. Despite these barriers, a pervasive attitude amongst Chinese doctors is to "Treat patients just like you would want to be treated."

Medical practice in China lacks uniform national standards for all specialties, including orthopaedic surgery [5]. While this can be remedied by having an organization that oversees certification of the medical specialties (similar to the American Board of Medical Specialties), this may not be practical because of the large population in diverse areas. One

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solution may be to have regional certification standards aligned with the already existing overarching national standards. Though the overall trend is to improve education in China, uniform standards in education (as with the Accreditation Council on Graduate Medical Education and American Board) and with certification (as with the American Board of Orthopaedic Surgery) do not really exist. Chinese leadership has recognized this problem, and efforts are currently being made to implement uniform education and certification standards as part of a long-term plan [11].

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