Medical Education Reform in China

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Practical Lessons from Wuhan University

Edited by

Renslow Sherer, Feng Youmei and Yu Xiangting

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FOREWORD

Attempts in medical education reform in China have explored over a long period of time the core issues of teaching and learning, growth and needs, and knowledge acquisition and application. However, constrained by the traditional notions and models of education, such explorations have not yet identified a path that responds to the rapid change in science and technology. Many higher education institutions have made an enormous effort toward this goal for more than a decade, but due to the lack of a replicable model, a nationally uniform and generalizable approach has yet to be established.

In 2008, Wuhan University Medical School and the University of Chicago School of Medicine signed a collaboration agreement to reform medical education in China. Thanks to more than eight years of hard work, three classes of Wuhan University students educated in the reform program have graduated. This book, Medical Education Reform in China, written by Professor Renslow Sherer and his team, provides an objective and detailed introduction to the content and preliminary outcomes of our collaboration. I am convinced that the new model of medical education reform that the two schools have explored whole-heartedly and painstakingly will attract the attention of others in the profession. If future feedback can lead to resonation in readers and to replications of the model, it will undoubtedly be a great honor and reward for the faculty members who have worked diligently for this reform.

I served as the dean of Wuhan University Medical School at a time when medical education reform was sweeping over China. I had the honor of visiting the University of Chicago School of Medicine, Ohio State University School of Medicine, and Georgia State University School of Medicine, and I learned a great deal about medical education from the sharing and observation experiences on these campuses. But it was at the University of Chicago that I was exposed to something I had never seen before, leading me to the decision to usher in bold educational innovations and to sign the agreement of collaboration. Specifically, this decision of mine was due to a visit to the school one day, when Professor Scott Stern demonstrated to me a lecture session in the CPPT course (Clinical Pathophysiology & Therapeutics). I was deeply impressed by this second-year course that integrated clinical science education and students' earlier

learning in basic sciences. This approach to teaching would completely correct the shortcomings of my medical school's curriculum at that time—content disconnection, fragmentation, repetition, and omission—and more importantly, it would enhance our students' ability to learn independently. It would integrate what was taught at the earlier stage of students' medical education with what was taught at a later stage, in order to develop students' ability to synthesize and refine their knowledge. It would make medical education more relevant and lively, and would effectively accomplish "the three earlies"—early patient contact, early experience in research, and early exposure to practice. It would fit in with the "big data" era, greatly stimulating students' independent thinking, innovative learning, and the application of skills. Thus, we looked forward to working with the University of Chicago medical faculty and we had reason to believe that this collaboration would bring about a revolutionary change in our school's medical education.

The eight-year process of friendly collaboration between the two schools is a living demonstration of their enthusiasm for and devotion to medical education reform. It is precisely for the sake of this great cause that the faculty and students of the two schools have worked together in sincerity and with selfless dedication. This monograph on China's medical education reform truthfully represents the process, content, and results of the collaboration between the two schools. I hope that its publication will set off a new wave of medical education reform in China. As the initiator and a participant in this reform work, I feel extremely happy and proud to see the collaboration between the two schools continue and expand. It is also my hope that this book will inspire discussions among those who care about China's medical education, and that they will generously share with us their knowledge and insight.

Zhou Yunfeng, MD
Wuhan University

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We would like to express our gratitude to the many people whose effort and enthusiasm, in one way or another, helped make this book possible.

First and foremost, we would like to thank the students and faculty of Wuhan University Medical School and its affiliated teaching hospitals for their new vision for medical education and their courage to embark on an audacious reform initiative in 2008. They are the inspiration for this book which tells the story about their long, arduous, and fruitful journey.

We would like to thank Wuhan University leadership and Wuhan University Medical School leaders as well as administrators for their support and guidance throughout the reform process.

Many thanks to the University of Chicago medical faculty who have provided generous support to and shared valuable experience with Wuhan University Medical School faculty and students. Without their contribution, the reform effort, upon which this book is based, would not have been so successful.

We are also grateful to the leadership of the University of Chicago for their support and guidance throughout the reform process, including the Section of Infectious Diseases and Global Health, the Department of Medicine, the Pritzker School of Medicine, the University of Chicago Center in Beijing, the Office of Global Engagement, and the Center for Global Health.

Our gratitude also goes to the medical students from the University of Chicago and from Wuhan University who were involved in WUMER project's research work. The information generated through this research provided important material for this book.

We are deeply indebted to our original funders, the Alphawood Foundation. Without their inspirational vision and support, this book would not have been possible.

Last but not least, we express our thanks to those who saw the authors through this book and enabled us to publish it. Thank you to all those who read, offered comments, and assisted in the editing, proofreading, and design of the book.

INTRODUCTION

RENSLOW SHERER AND IVY JIANG

Background: Challenges to China's Healthcare System and Medical Education

China faces a daunting challenge to provide equitable, accessible, and affordable healthcare services to its 1.3 billion citizens. In fact, medical care and public health in China in the current era are in crisis due to the privatization of public health and health care services in the past two decades (Gao et al. 1999; Lam, Wan, and Ip 2006; Reynolds and Tierney 2004). In the 1980s and 90s, China's impressive economic growth unfortunately did not lead to comparable improvements to health care disparities and quality of care (Gao et al. 1999). The privatization of services and an over-reliance on sub-specialty care instead undermined access to affordable basic and preventative care, leading to a crisis in public health (Field, Geffen, and Walters 2006).

As the economy shifted towards a market system and government funding for community level hospitals dwindled, health care providers and institutions were forced towards higher reimbursement specialty care. Primary care practice was largely abandoned as it became financially unsustainable. Medical education thus moved towards early specialization. More recently, however, the Chinese government has recognized the gaps this over-specialized system has permitted to grow, including infectious and chronic disease prevalence and the growing needs of an aging population. In 1999, the Chinese Ministry of Health declared the key role that community medicine would play in the restructuring of the healthcare system towards a primary care based model. The setting for an increasing share of health care will shift from inpatient hospitals to community health centers. Thus the development and expansion of medical school training in community medicine has been a growing priority of medical education reform in China.

Among the elements of health care that have been characterized as inadequate to meet the country's needs is medical education (Field, Geffen, and Walters 2006; Gao et al. 1999; Lam, Wan, and Ip 2006; Reynolds and

Tierney 2004). The structure and curricula of the majority of medical schools in China are in serious need of revision and reform at the time of this writing (i.e., 2014). The current system with its heavy reliance on didactic training, rote memorization, and a passive clinical apprenticeship for medical students is insufficient to meet the needs for modern health care and disease prevention. In particular, deficiencies in medical education are limiting the development of Chinese physicians who are competent in the practice of medicine. A sound basis in critical thinking, the application of evidence-based medicine, and the art of the case presentation and thorough differential diagnosis are largely lacking in current medical education in China. Similarly, forward-looking health worker training in public health is needed that accommodates the current limitations of Chinese health care and anticipates the rapid acceleration of Chinese society into state-of-the-art medical care. In sum, there is an urgent need for broad reform of medical education nationwide, and for exploratory pilot programs to identify best educational practices (Dummer and Cook 2007; Schwarz, Wojtczak, and Zhou 2004; Sherer et al. 2008; Sherer et al. 2013).

In recognition of these shortcomings, China's former Ministry of Health, now the National Health and Family Planning Commission, established a Medical Education Reform Task Force in 2000 to assess the situation, which resulted in broad, nationwide support for innovation and research in medical education (Lam, Wan, and Ip 2006). In the same period, the China Medical Board began promoting the adoption of international standards for medical education and pilot innovations in medical education at several universities in China (Schwarz, Wojtczak, and Zhou 2004). While the standards have provided a valuable long-range goal and a metric for the evaluation of medical school curricula reforms, the reform initiative of the China Medical Board has yielded mixed results, often encumbered by local obstacles to implementation and limited by the obvious differences in the culture and context of medical education in China and in the United States and Europe (Baozhi and Yuhong 2003).

Nonetheless, great changes have been made in Chinese medical education since 2008, as a series of medical education policies facilitated medical education change after the Chinese government announced a major comprehensive health reform effort in 2009 (Zhang et al. 2013). Changes that have taken place include the establishment of national medical education standards, adoption of international standards, integration of courses, new teaching and learning methods such as small group learning, lifelong learning, and courses in humanities, ethics, society, and the doctor-patient relationship (Schwarz, Wojtczak, and Zhou 2004).

In addition, the Ministry of Education has sought input from expertise outside the country to help reach its goal of improving the quality of medical education (Schwarz, Wojtczak, and Zhou 2004). Quite a few medical schools have adapted some U.S. or European schools' courses or curricula with the assistance from the latter.

It was in this national climate of reform that Wuhan University (WU) Medical School, China, sought to reform its curriculum and pedagogy by adapting the medical curriculum of the University of Chicago (UC), U.S., with support and assistance from the U.S. partner. The WU-UC collaboration started in 2008, and in 2009, a pilot curriculum was launched at WU with 50 medical school freshmen. Those students graduated in 2014 after completing their five years' study under the new training paradigm, along with their peers taught in the traditional curriculum (Sherer et al. 2013).

The Purpose of This Book

Through describing and reflecting on the medical education reform experience of Wuhan University, this book is intended to offer guidance and a roadmap to medical school leaders and faculty members in China who are interested in medical education reform. It is written for medical school leadership and faculty, as well as other readers such as medical students, health and education policy leaders in China at the local and national level, and medical educators and students in the United States and worldwide.

For fifteen years, we (authors of the University of Chicago) have collaborated with medical educators at Wuhan University, first with the targeted mission of training physicians and health workers in HIV care and treatment, and then with an ambitious partnership between Wuhan University and the University of Chicago to reform the WU medical school curriculum and teaching pedagogy. This book is based on Wuhan University's experience in medical education reform, describing how it adapted and modified a U.S. medical school's curriculum and methods, and discussing lessons and insights gained through this process. Specific objectives of this book are:

1. Describe the history, process, content, and outcomes of one medical education reform initiative in China, i.e., the Wuhan University Medical Education Reform (WUMER) Project
2. Provide examples of innovation in medical education reform practices

3. Provide examples of project evaluation research in medical education reform
4. Offer recommendations to medical school leaders, faculty, students, and researchers in China who are embarking on medical education reform
5. Offer guidance to international partners engaged in collaborations for medical education reform

Chapter 1 narrates the origin and process of the Wuhan University Medical Education Reform Project, including a brief introduction to Wuhan University Medical School and the history of the Wuhan-Chicago collaboration. Chapter 2 highlights the curricular innovations carried out by Wuhan University Medical School leadership and faculty. A more detailed description of the content and structure of the new curriculum is given in Chapter 3 along with a comparison with the traditional approach. Chapter 4 describes the project evaluation research within WUMER that both prepares for and monitors the reform process. Chapter 5 considers the reform obstacles that we encountered and their solutions that we attempted, as well as extended impact of the WUMER project in Wuhan and elsewhere. Chapter 6 shares the lessons we have learned from the WUMER experience that may be of use to other reformers in China and abroad. Finally, in Chapter 7, future directions of the reform are discussed.

We, the authors, are primarily responsible for the content of this book. We wish to acknowledge the key contributions that have been made to the entire reform process by our colleagues at the Wuhan University Medical School, for without their selfless dedication and diligence, this reform work would not have been possible. Similarly, we are greatly indebted to the faculty of the Pritzker School of Medicine at the University of Chicago who contributed extensively to the reform effort.

References

Baozhi, Sun, and Zhao Yuhong. 2003. “Medical Curricula in China and the USA: A Comparative Study.” *Medical Teacher* 25 (4): 422–27.

Dummer, Trevor J.B., and Ian G. Cook. 2007. “Exploring China’s Rural Health Care Crisis: Processes and Policy Implications.” *Health Policy* 83 (1): 1–16.

Field, Michael, Laurie Geffen, and Theanne Walters. 2006. “Current Perspectives on Medical Education in China.” *Medical Education* 40 (10): 938–9.

Gao, Tongqiang, Kuninori Shiwaku, Tetsuhito Fukushima, Akio Isobe, and Yosuke Yamane. 1999. "Medical Education in China for the 21st Century." *Medical Education* 33 (10): 768–73.

Lam, Tai-pong, Xue-hong Wan, and Mary Sau-man Ip. 2006. "Current Perspectives on Medical Education in China." *Medical Education* 40 (10): 940–9.

Reynolds, Teri A., and Lawrence M. Tierney. 2004. "Medical Education in Modern China." *JAMA* 291 (17): 2141.

Schwarz, M. Roy, Andrzej Wojtczak, and Tongfu Zhou. 2004. "Medical Education in China's Leading Medical Schools." *Medical Teacher* 26 (3): 215–22.

Sherer, Renslow, Hongmei Dong, Zhou Yunfeng, Scott Stern, Yang Jiong, Karl Matlin, Yu Baoping, Aliya N. Husain, Ivy Morgan, Brian Cooper, Feng Juan, and Sujata Mehta. 2013. "Medical Education Reform in Wuhan University, China: A Preliminary Report of an International Collaboration." *Teaching and Learning in Medicine* 25 (2): 148–54.

Sherer, Renslow, Xien Gui, Faxian Zhan, Caroline Teter, Diana Liu Ping, and Randolph F. Wykoff. 2008. "Rapid Antiretroviral Therapy Scale Up in Hubei Province, China: An International Partnership to Train and Mentor County, Township, and Village Health Care Workers." *Health Affairs* 27 (4): 1140–7.

Zhang, Qin, Liming Lee, Larry D. Gruppen, and Denian Ba. 2013. "Medical Education: Changes and Perspectives." *Medical Teacher* 35 (8): 621–7.

CHAPTER ONE

ORIGIN AND PROCESS OF THE WUMER PROJECT

IVY JIANG AND RENSLOW SHERER

Chapter Summary: In this chapter, recent trends in medical education in China are considered and compared to health care and medical education in the United States. The origins of the Wuhan University Medical Education Reform (WUMER) Project collaboration between Wuhan University (WU) and the University of Chicago (UC) are briefly introduced, and the results of an initial assessment of the WU Medical School curriculum and pedagogy are presented. The initial phases of reform implementation, including a more detailed presentation of the baseline assessment and the direction of the resulting reforms are considered, with emphasis on the identification of faculty in Wuhan for the reform effort, the use of language and translation, and the process of reform.

A Brief Introduction to Wuhan University Medical School

Founded in 1943, Hubei Provincial School of Medicine (湖北省省立医学院) was subsequently renamed Hubei Medical College (湖北医学院) (1953) and then Hubei Medical University (湖北医科大学) (1993). In 2000, Hubei Medical University was merged with Wuhan University and became Wuhan University Medical School (武汉大学医学部).

In 2008, Wuhan University Medical School had about 1,200 full-time faculty members, 4,700 full-time students, including more than 2,000 graduate students. After the merger in 2000, the medical professional ranking of Wuhan University rose to 15 from 19 of the original National Medical Schools. Under the jurisdiction of Wuhan University Medical School are eight faculties and three affiliated teaching hospitals—Renmin Hospital (also known as the First Clinical College), Zhongnan Hospital (the Second Clinical College), and the Stomatological Hospital. Its eight

components were: Wuhan University School of Basic Medicine, First Clinical College, Second Clinical College, School of Stomatology, College of Pharmacy, School of Public Health, HOPE School of Nursing, and Medical Vocational and Technical College. There were also three research institutes: the Wuhan University Institute of Medical Virology, the Medical Structural Biology Research Center, and the Animal Experiments Center.

About 5-15% of medical students at the Wuhan University Medical School with the highest grades and evaluations were enrolled in the seven-year and eight-year programs in which their standard bachelor of science medical degree was supplemented with a master's degree (7-year program) or doctoral degree (8-year program). For these students, medical school was extended with supplemental courses and an expectation of basic or clinical research as part of their requirement for graduation. The WUMER Project focused its energies on the five-year program because it has the largest number of students and remains the mainstay of medical education in China. At the start of the reform in 2009, there were 257 medical students per year in the 5-year program, as well as 19 students in the 7-year program and 11 students in the MD-PhD 8-year program.

Origins of the Wuhan-Chicago Collaboration

Collaboration between the University of Chicago (UC) and Wuhan University (WU) began in 2003. In a partnership in Hubei Province from 2003 to 2008 with Project HOPE (an international non-governmental health organization), WU and UC partnered on a successful antiretroviral therapy and HIV care initiative that resulted in the training of over 10,000 health workers and a reduction of HIV mortality from 49% to 8% (Sherer et al. 2008). During this period, physician skills and knowledge improved, and the mortality from AIDS declined by 83% from 2002 to 2006.

From 2003 to 2008, faculty from the Section of Infectious Diseases at the UC collaborated with Dr. Gui Xi'en of WU and officials of the Hubei Provincial Center for Disease Control and Prevention in physician training and public health disease prevention for HIV, TB, and other public health issues. Three UC Infectious Disease faculty members served as visiting faculty at WU for a month with support from Project HOPE. In addition to conducting lectures and bedside teaching at the Zhongnan and Renmin Hospitals of WU, these UC physicians visited Center for Disease Control and Prevention clinics in rural Hubei Province and mentored physicians caring for hundreds of people living with HIV.

The UC campus also contributed to the education of Chinese physicians in HIV and Infectious Diseases. In November, 2005, five Chinese physicians from Sichuan Province participated in the three-day mini-fellowship at the International Infectious Disease Training Center. In November, 2006, three Chinese fellows spent one month at UC with support from the William Jefferson Clinton Foundation, one of whom—Dr. Gao Shicheng—was from WU. These physicians spent time on the medical wards, in the HIV ambulatory care center, in several laboratories such as microbiology, virology, immunology, and molecular diagnostics, and received intensive training from the faculty of the UC Section of Infectious Diseases. Dr. Gao Shicheng later became the Director of the Infectious Disease ward at the Zhongnan Hospital at WU following this training.

From HIV Training to Medical Educational Reform

At the completion of this initiative, WU invited the UC collaborators to provide technical assistance for their medical education reform effort. During the HIV health worker training collaboration, deficiencies in the current system of medical education were identified. Physicians in practice at the village, township and county levels were observed to lack some fundamental skills in clinical reasoning, case presentations, and differential diagnosis. These weaknesses interfered with their ability to effectively manage patients. At the same time and during the previous decade, the national government had called for radical reform of the health education system. Led by the China Medical Board, pilot programs in medical education reform were initiated at several major medical schools in China, as noted previously.

In May, 2007, Dean Zhou Yunfeng and Vice Dean Yang Jiong of WU visited UC and met with the Associate Dean of the Medical School, the Chairman of the Department of Medicine, and members of the Section of Infectious Diseases. Dr. Scott Stern, Director of the *Clinical Pathophysiology & Therapeutics* (CPPT) course presented an overview of CPPT. Building on the good will established by the long collaboration between the two institutions, these officials of WU and UC executed a Letter of Agreement to Collaborate for medical education and educational research.

WU's medical education reform initiative began in 2008, when the dean of the Wuhan University Medical School (WUMS) invited representatives from the UC Pritzker School of Medicine (PSOM) to provide technical assistance for a complete restructuring of WU's medical curricula, beginning with the five-year clinical baccalaureate program.

This unique invitation to actively participate in every aspect of WUMS's comprehensive medical education reform came as the result of a successful collaboration in HIV training (Sherer et al. 2008).

In response to the expressed invitation from Dean Zhou Yunfeng of WUMS, the Section of Infectious Diseases and the Department of Medicine at the University of Chicago began a project —the Wuhan University Medical Education Reform (WUMER) Project—to support undergraduate medical education reform at WUMS for five years. The scope of the WUMER Project included the following objectives:

1. Provide technical assistance to Wuhan University for reform in medical school education methods, curricula and evaluation, including curricula on infectious diseases and public health
2. Support faculty, resident, and fellowship exchanges to achieve medical education reform in order to meet international standards
3. Provide interactive internet-based live case conferences between Wuhan and Chicago
4. Provide medical education training material development and translation, including telemedicine and internet-based training methodologies
5. Provide technical assistance for state-of-the-art public health control, prevention, and treatment practices for infectious diseases such as HIV, sexually transmitted diseases, and tuberculosis, in partnership with Wuhan University and the Hubei Provincial Center for Disease Control and Prevention

In 2008, a private funding source was secured to support a five-year effort for this collaboration. Thus began an extensive bilateral collaboration known as the Wuhan University Medical Education Reform Project between Wuhan University and the University of Chicago. Renslow Sherer, MD, was appointed to be the director of the Project.

Recognizing the Need for Reform

WUMS embarked on innovations as a result of recognition by its leadership that the school must reform in order to raise its medical education to a level comparable to modern international standards and to train their medical students to become life-long learners fully equipped to practice medicine in the 21st century in China. The leadership conducted an initial assessment of the school and identified several areas of needs. From 2008 to 2009, UC and WU faculty conducted an assessment of the

WU curriculum and teaching methods. Prior to the WUMER Project, the existing WU medical school curriculum had not been revised or reformed for more than four decades. It was based on the style of medical education that relied heavily on rote memorization, large lectures for the conveyance of information, three initial years of classroom learning with little connection to clinical medicine, and summative examinations at the end of each course. Furthermore, the faculty of the medical school was composed of basic science faculty and clinical science faculty. These faculty members were physically separated by the distance from the basic science school on the medical school campus to the two teaching hospitals, and, more importantly, they were separated by decades of independent teaching practices and curricula that did not foster cooperation, regular dialogue, or structured interaction between faculty members. This was true between basic science and clinical faculty members, and between basic science faculty members from distinct disciplines. Basic science faculty were primarily based at the research facilities at WU and had little knowledge of or engagement with clinical medicine. Individual disciplines, such as biochemistry and physiology, were taught in isolation from each other and from the clinical sciences, with few or no connections drawn among the basic sciences, nor between the basic and clinical sciences. There was little leadership for change or improvement in the teaching of the basic sciences, and no incentives or pressures for interaction among faculty to reduce topic duplication or improve student understanding of the relationship between related topics such as cell biology and biochemistry.

Additional obstacles were presented by the clinical clerkships in years four and five. The clerkship leadership was often assigned to random faculty members for a six-month period, so that no single faculty member had a durable commitment to teaching, nor to change or improvement within the course. There was no regular opportunity for faculty development and no explicit development of junior faculty as teachers within the medical school. The clinical experience lacked a clear structure for the content of the training. The quality of clerkship training was highly variable and often dependent on the amount of time available to the faculty member to teach, and there were marked variations in faculty motivation and interest in teaching. More consideration of the challenges and obstacles to medical education reform in greater detail is presented in Chapter 5.

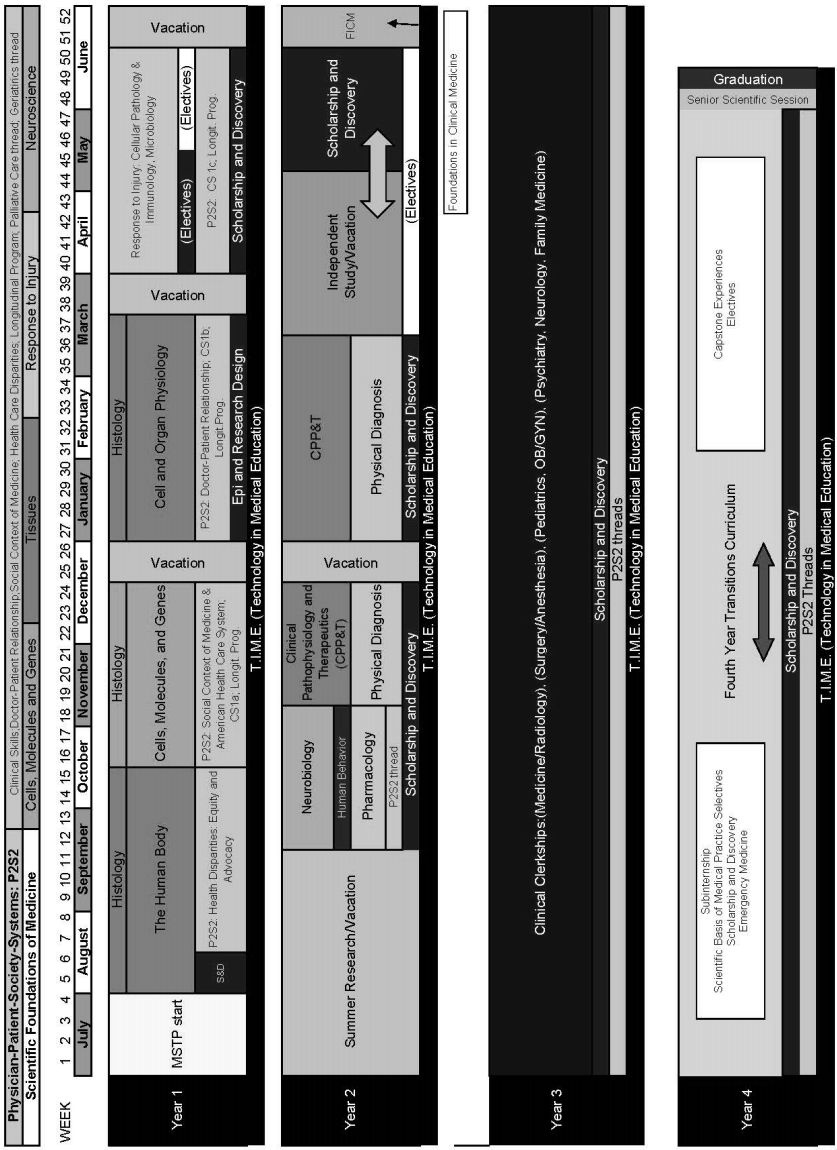
Planning, Leadership, and Administration

The University of Chicago Pritzker School of Medicine undertook its education reform process in 2005 and the new curriculum—the Pritzker Initiative—was unveiled in 2009 (Humphrey and Brukner 2010). A graphic representation of the key elements of "The Pritzker Initiative" is shown in Figure 1-1. Both the reform process itself and the curricular content from this initiative served as templates for modification and adaptation at WU. Key elements of the UC medical curriculum included communication, clinical skills, and patient contact in all years; integrated basic sciences in both years one and two, and the integrated CPPT course in year two; longitudinal immersion in scholarship and research in the Scholarship and Discovery Program, starting in year one; innovative transitional courses at the end of the basic science years prior to clinical clerkships, and again at the end of the 4th year prior to internship; a strong emphasis on formative evaluation and pass/fail courses; and ongoing immersion in the social dimension of medicine and health care.

This timely experience allowed the collaborative WUMER Project to address the process of reform planning and implementation in addition to the curriculum content and sources. The WUMER Project engaged the nucleus of UC faculty members who participated in the design of the Pritzker Initiative. Upon the inception of the WUMER Project in 2008, a Steering Committee was created consisting of Karl Matlin, the key member who oversaw Pritzker's basic science curriculum transformation; Scott Stern and Aliya Husain, engineers for Pritzker's flagship integrative course CPPT; Adam Cifu, medicine clerkship director; and approximately 10 other core members. These areas represented the major disciplinary foci of the WUMER project areas of reform. The WUMER Steering Committee was designed to guide the development and implementation of the medical education reform in specific domains in clinical and basic sciences. The Steering Committee members served as mentors for the reform project, assisted in course development, and participated in the routine evaluation of the progress of trainees, course offerings, and activities.

The WUMER Project was directed by Renslow Sherer, M.D., Professor of Medicine in the Section of Infectious Diseases and Global Health of the University of Chicago, and by Dean Zhou Yunfeng at Wuhan University. UC medical school faculty members from all basic sciences, all clinical departments, and the UC medical school administration participated in the faculty exchanges. Project support included administrative staff to oversee logistics, translation and preparation of training materials, and internet case conference management.

Figure 1-1 University of Chicago Pritzker School of Medicine curriculum map (2009)



At Wuhan University, Dean Zhou Yunfeng provided the overall leadership and direction to the effort to implement broad and innovative reforms from 2009–2013. Vice Dean Yang Jiong was subsequently designated as the Director of the medical education reform process with broad responsibilities for direction and oversight of the reform process, closely assisted by the divisional deans—Yu Baoping, Vice Dean for Medical Education, and Dai Jibin, Vice Dean of the Basic Science Division for reform within their disciplines. Additionally, a total of 44 faculty members of Wuhan University Medical School and the two teaching hospitals—Renmin Hospital and Zhongnan Hospital—were identified to be the core curriculum reform task force.

Leadership at WUMS identified reform Course Directors for each discipline and convened them into a Faculty Reform Committee within the Medical School, while WU convened a larger university-wide oversight committee. Experience with modern medical school training in Europe and the US, English language competence, and commitment to medical education reform were among the criteria for selection of Course Directors. Protected time for reform activities was provided for the Course Directors (before this time, clinical clerkship leadership consisted of an ad hoc rotating 6-month assignment). Course Directors led iterative curriculum review and re-design initiatives within each discipline, modeled on the Pritzker Initiative process and outcome (see below). In contrast to their past experience, Course Directors engaged in significant inter-departmental cooperation in the development of the reform curriculum. The contents of each course to date have received review and recommendations by University of Chicago medical faculty.

From 2008 to 2009, UC and WU medical school faculty conducted an introduction of key WU medical school faculty to the University of Chicago Pritzker School of Medicine curriculum and pedagogical approach. Planning meetings via teleconferences and leadership and faculty exchanges took place from August, 2008 to July, 2009, and we conducted a literature review on medical education reforms and innovations in China and the US. Following leadership exchanges and an exploratory Memorandum of Understanding in 2006–2007, Wuhan University and University of Chicago leaders signed a Letter of Agreement in 2008 articulating the terms of their collaboration for five years.

Expected Reform Outcomes

The principal expected outcome of this effort was the creation of a state-of-the-art medical school curriculum and training methodology at Wuhan University that met current Chinese and international standards. Reform outputs included:

1. Annual graduation of medical students with skill sets that meet current international standards
2. A cadre of highly trained expert medical school clinical faculty at both teaching hospitals
3. Innovative internet-based training technologies and medical education methodologies
4. High quality training methods and materials for the control, prevention, and treatment of such public health issues as HIV, STIs, and TB
5. Contribution to the Chinese national initiative to reform undergraduate and graduate medical education and potential for future replication of the model program in additional provinces in China

Monitoring and Evaluation

The WUMER Project evaluation research was designed to monitor the progress of the project, to inform mid-course reform refinements and adjustments, to provide information to stakeholders, and to publicize WUMER experience to share with other reformers. Our research was directed towards the following questions:

1. Was there a need for reform in the existing curriculum at Wuhan University in 2009, in the opinions of the students and faculty? What areas of study, what types of educational practices, and what forms of student and course evaluation might be appropriate for reforms?
2. What was the level of satisfaction with the reform curriculum among students and faculty, and how did that compare to the traditional curriculum?
3. Compared to students in the traditional curriculum, what was the performance of students in the reform curriculum on standard and new forms of examinations and other measures of student performance?

Outcome measures included surveys of faculty and student satisfaction with their curriculum and courses, subject knowledge assessments with students, curriculum materials analysis, and analysis of internal performance indicators at WU. Additional outcomes measures included pre- and post-training performance outcomes from students and faculty, and timely establishment and ongoing refinement of each course component of the reformed curriculum and practice at Wuhan University. Six-monthly and annual performance reports were reported to the donor and the WUMER Faculty Steering Committee since inception.

Needs Assessment to Identify Areas for Reform

The WUMER Project and the WU medical education leadership undertook an assessment of the strengths and weaknesses of the existing curriculum and teaching methods at WU in 2008–2009. This included initial surveys of faculty and students, focus groups of faculty and students, individual interviews with the leadership and key faculty members, and a thorough review by UC faculty consultants and WU reform leaders of the existing medical curriculum and pedagogy. These exploratory actions yielded qualitative and quantitative data that helped sketch out the framework of the reform and provided a sound basis for ensuing reform planning. The results of this assessment are summarized below.

2009 Baseline surveys and 2011 assessment of clerkships

The faculty and student's baseline surveys administered in 2009 were designed to gauge their perceptions of their traditional curriculum components and structure and pedagogy (The results are described briefly below in order to introduce the direction and content of reforms, and in greater detail in the context of the overall WUMER Project research effort in Chapter 4).

A total of 79 faculty members and 72 students from years four to six volunteered to participate in the surveys. It was found that only half of faculty and students felt that curriculum was satisfactory. Most faculty and students believed that earlier patient contact was needed—the majority of students wanted earlier patient contact and believed that this would benefit their learning, while less than 20% of students and faculty thought that students' clinical experience had been adequate. The findings on issues of public health and clinical care were revealing—the majority of faculty and student respondents reported insufficient training in the role of community health agencies, public health issues, disease screening, risk assessment

and counseling, occupational health, health disparities, social determinants of health, and global health issues. Most students and faculty respondents on this survey identified the need to decrease lecture time and supported an increase in small group activities, clinical case discussions, and opportunities for independent learning. Common comments from faculty and students regarding the traditional curriculum included the need for greater integration between basic science and clinical medicine.

Regarding the proposed reform, two thirds of the faculty members expressed cautious optimism about the reform courses, and one third expressed reservations about the potential benefits of the changes. Common concerns included the large class size and both the youth of students and the historical tradition of student passivity in the Chinese educational system. In addition, faculty respondents noted an English language curriculum may limit the comprehension of some students and faculty, and that the movement towards more small-group learning sessions would require increases in faculty time and class room capacity.

In 2011, a year before the reform curriculum students' clinical rotations began, we did an investigative study of WU's existing clinical education via interviews with clerkship directors and student clerks and onsite observations of students in the wards. Both faculty and students noted the high variability in the learning experience that seemed wholly dependent on the specific faculty that they worked with and on the particular patients that they happened to have cared for, and they noted that there was no structured training in clinical medicine to ensure that all clerks came away with the same basic knowledge of the specialty.

Review of curriculum and instruction by WUMS leadership and UC consultants

In addition to the surveys and interviews, WUMS leadership and course directors and UC faculty consultants met and held discussions about WUMS' existing curriculum and instructional methods. Through reviewing the overall curriculum and individual courses, participants of these discussions recognized that there were unnecessary repetitions among basic course contents and that necessary connections among basic sciences and between basic and clinical sciences were lacking. Relatively new trends in medical education, such as doctor-patient communication, medical ethics, community medicine, research and scholarship, were absent or weak in the traditional curriculum. As far as teaching and learning methods were concerned, they noted that too much time was spent by students in large lecture halls, and that lecture content was often

jammed with facts to memorize that were taken directly from the textbook. At the same time, there was too little time for student self-directed learning and learning in small groups with faculty supervision, including too few opportunities for case-based discussions. Students' opportunities to interact with patients as doctors-in-training were restricted to the clinical clerkships in years four and five of medical school, and that the opportunities to interact with patients in the first three years were wasted. At the same time, there was a lack of structure for clinical encounters during the clinical years, so that students often were inadequately mentored for their optimum performance in those key clinical years. Instructional time devoted to clinical reasoning and medical decision making was also far from adequate.

In addition, there was an overemphasis on summative evaluations and too few opportunities for substantive formative feedback were available to students. Faculty members noted the lack of organized research training for students in conducting basic, clinical, and social science research on key health issues. Course leaders and clinical faculty members also noted a severe lack of prioritization of time, credit, and compensation of their teaching duties, and in particular noted that they lacked protected time in their daily work that was exclusively designated for preparing and teaching. Finally, both students and faculty had limited or no venues to participate in decision-making regarding the direction and modifications of the curriculum.

These discussion results, when juxtaposed with the survey and interview results mentioned earlier, presented evidence that WU faculty and students had common perceptions of the status quo and shared consensus regarding areas needing improvement.

The major limitations in medical education in WUMS in 2008–2009 are presented in Table 1-1, as are potential remedies from the UC approaches and the current medical education literature with which to address these shortcomings.

Table 1-1 Limitations in WUMS traditional curriculum and potential remedies

Limitations	Remedies
Lack of student participation in curricula	Formal and informal means of student input
Lack of protected time for course leadership	Course Director job with protected time
Over-emphasis on lecture-based learning	Reduction in lecture time
Lack of emphasis on self-directed learning	More time for self-directed learning
Lack of opportunities and support for group learning	More teaching via small groups
Lack of patient contact until years 3-4	Patient contact starting in year 1
Lack of structure for clinical encounters	Structured curriculum in history taking
Duplication of basic science content and lack of integration between basic sciences	Integration of basic science courses
Lack of clinical relevance in basic sciences	Use of clinical vignettes in basic sciences
Lack of integration of basic and clinical sciences	Year 2 CPPT Course*
Lack of effective use of internet	Internet access to CPPT Web for WUMS
Unstructured clinical clerkship	Structured clinical clerkship curriculum
Lack of community medicine clerkship and department	Creation of Department of General Practice and clerkship in community medicine
Over-emphasis on summative evaluations	More formative evaluations
Lack of research and scholarship development	Scholarship and Discovery adapted course
Lack of medical education research	Faculty and students' role in education research

Note: *CPPT = Clinical Pathophysiology and Therapeutics

Approach to Reform: Learning from the University of Chicago Medical Curriculum

The needs assessment results suggest broad support for a more robust curriculum with greater emphases on course integration, clinical relevance of basic sciences, student group-learning, the development of critical thinking in students, communication skills, public health, and the social contexts of medicine, even if there may be some disagreement on how to accommodate such changes. The curricular deficiencies that underlie our findings echo those discussed in other recent analyses of medical education in China and are in line with recommendations made by the China Medical Board itself (Dummer and Cook 2007). These similar issues were also the target of medical education reform at UC, which offered a timely example for WU to adopt and adapt.

While assessing the WUMS's traditional curriculum, the WUMER Faculty Steering Committee also conducted a reflective review of UC's curriculum reform process that was initiated in 2005 and formally introduced as the Pritzker Initiative in 2009 to all entering class students, reflecting on the characteristics of the reform elements that were conducive to modification and adaptation in Wuhan. As a result, the curriculum design, components, and pedagogical approach in the Pritzker Initiative were adapted and modified to meet the identified needs for medical education reform at Wuhan University. A more detailed description of the process and the outcome of these adaptations will follow in Chapter 3.

As a result of the preliminary discussions with the WU leadership and faculty, the assessment of the current curriculum, and an analysis of the medical curriculum of the University of Chicago, planning for the reform curriculum at WU was completed in the first year of the WUMER Project. The key features of the reform curriculum are listed below, and enumerated in more detail in Chapters 2 and 3.

The key features of the current four-year medical curriculum at the University of Chicago included the following elements:

1. Integrated basic science courses in both years one and two
2. The integrated CPPT course in year two
3. Preparatory courses at the end of year two that help students transition to clinical clerkships, and again at the end of the fourth year prior to internship
4. Communication, clinical skills, and patient contact training in all years