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Project Report

Implementing a Pediatric Residency Program in Central Asia in Compliance with ACGME-International Standards: First Experience from Kazakhstan

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Abstract: The Graduate Medical Education (GME) became an essential part of the physician's professional curriculum all over the world, no matter the specific model developed across different countries. The "Residency" represents the main GME model in North America, where it is regulated and organized according to the standards of the Accreditation Council for Graduate Medical Education (ACGME). This model has been exported outside North America through the ACGME International (ACGME-I) program. This article reports the first experience of implementing an ACGME-oriented Pediatric Residency Program in Central Asia at the Nazarbayev University School of Medicine in the Republic of Kazakhstan. The vision, general project, main organizational aspects, and challenges of this Pediatric Residency Program are described and discussed in this article.

Keywords: residency; pediatrics; ACGME; graduate medical education; Kazakhstan; Central Asia

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1. Introduction

The Graduate Medical Education (GME) is a delicate and fundamental step for the professional development of every physician, but it also represents a fundamental aspect of any health system's organization and sustainability. Therefore, the implementation and maintenance of appropriate professional standards is currently a major challenge all over the world, no matter the specific medical/educational system in place in the individual country.

Among the states of Central Asia, the Republic of Kazakhstan (RKZ) experienced the most rapid economic and financial development in the last few decades. After independence in 1990, the country had to face some important changes in its internal re-organization and, probably, the implementation of a new health care system has been—and is still—one of the most challenging aspects [1]. In addition to several logistical aspects, the quality and standardization of the medical education are among the main priorities of the national government [2], which led to the foundation of the School of Medicine in 2015 at the Nazarbayev University (NU), according to the educational model and academic organization in the United States of America (USA).

Thanks to the strategic partnership with the University of Pittsburgh School of Medicine (UPSOM) and the University of Pittsburgh Medical Center (UPMC), the Nazarbayev University School of Medicine (NUSOM) successfully started its educational activity in 2015, leading to the achievement of an internationally recognized Medical Doctor (M.D.; according to the World Directory of Medical Schools and WFME) diploma, starting with the first cohort of graduates in 2019 [3].

Concomitantly, NUSOM has planned the implementation of several Residency Programs since 2017. Among those, Pediatrics was recognized as one of the medical priorities

for NUSOM and, in general, for the national health system. Indeed, at the moment of the NUSOM residency project planning, according to the 2016 UNICEF data, Kazakhstan counts a population of almost 18 million inhabitants, whose median age is quite young (around 30 years) and the pediatric population (aged 1–17 years) is nearly 5.5 million. Importantly, at least half of the pediatric population is currently settled in rural areas, where an efficient system of general pediatric care would be fundamental to improve and maintain an appropriate level of care for children. In the RKZ, the share of children in the total population is >30% and the population growth rate is increasing with the progressively improved living conditions [4,5]. The life expectancy in Kazakhstan increased from 64 years in 1995 up to 72 years in 2015, according to the World Bank data [6]. Therefore, it is clear that children's healthcare and wellness must be a priority in the public health agenda of the RKZ government, considering that the welfare of the pediatric population is the essential pre-condition to improve the health status of the general population and, at the same time, to reduce the healthcare-related costs in a medium- and long-term period [7,8].

In this perspective, the NUSOM Pediatric Residency Program has been quickly implemented with the aim to grow rapidly and train medical doctors from all the recognized RKZ national universities.

2. Pediatric Residency Program

2.1. Vision

The NUSOM Pediatric Residency Program is based on a 3-year curriculum aiming to educate and train young physicians to be skilled and knowledgeable medical specialists in Pediatrics, who will be able to work as both hospital-based pediatricians and community general practitioners. This program will also offer the opportunity to be involved and trained in clinical and translational research, which will provide the background of knowledge and practical experience to those who may be interested in the academic career and/or in a pediatric sub-specialty track (through the eventual implementation of some specific clinical fellowships).

In this perspective, the creation of a Clinical Academic Department (CAD) of Pediatrics inside the NU-affiliated University Medical Center (UMC) hospitals has been planned, too. Notably, UMC includes the National Research Center for Maternal and Child Health (NRCMCH), which is a tertiary pediatric hospital whereby complexes and complicated pediatric patients from all over the country can find specialized medical assistance. Through this ever-increasing integration between university and hospital, the NUSOM Pediatric Residency Program should be able to provide a comprehensive clinical experience in Pediatrics according to the current medical evidence and updated clinical practice, which will be the mainstay to improve the general system of pediatric healthcare in the RKZ. Indeed, more and more residents will be admitted into this program every year: their activity and commitment in different cities and settings after completing their pediatric specialization through this Program will spread specific medical expertise and clinical competency in Pediatrics all over the country. Moreover, if this Program succeeds, this pilot NUSOM model of post-graduate medical education could be extended inside the RKZ and shared with all other national medical schools and hospitals.

2.2. Project

The NUSOM Pediatric Residency Program has the standard structure developed by the Accreditation Council for Graduate Medical Education (ACGME) with 3 years of training [9]. Such a model of post-graduate medical education can radically change the way to deliver the medical training in the RKZ by opening it to the international standards of healthcare and evidence-based medicine.

The mission of the ACGME is "to improve health care and population health by assessing and advancing the quality of resident physicians' education through accreditation", through "structured approach to evaluating the competency of all residents and fellows", "high-quality, supervised, humanistic, clinical educational experience, with customized

formative feedback" and "clinical learning environments characterized by excellence in clinical care, safety, and professionalism" [10].

Therefore, the ACGME Program Requirements for Graduate Medical Education in Pediatrics were adopted as a roadmap to design the NUSOM Pediatric Residency Program, which was started in 2019, through the tight cooperation between the appointed NUSOM Program Director and the Program Director of the strategic partners, namely UPMC. As expected, it was not possible to perfectly adhere to all the ACGME points (as stated on the ACGME reference documents) [9] since the beginning: in fact, some adaptations were necessary, because of the peculiarities of the local hospital settings and organization. Moreover, some issues related to the national regulations on the graduate medical training must be addressed with the RKZ Ministry of Health and the Ministry of Science and Education, which could have been solved only partially, despite the educational autonomy given to the Nazarbayev University.

In Table A1 of the Appendix A, the general (Oversight, Introduction) and organizational (Personnel, Residents Appointment) aspects of the newly implemented NUSOM Pediatric Residency Program, have been summarized, based on the model of the ACGME Program Requirements for Graduate Medical Education in Pediatrics.

In Table A2 of the Appendix A, the implemented Educational Plan of the NUSOM Pediatric Residency Program has been schematically described and compared with the ACGME Program Requirements for Graduate Medical Education in Pediatrics (Part IV.C: Curriculum Organization and Residents Experiences).

2.3. Implementation

The NUSOM Pediatric Residency Program started successfully in September 2019, in agreement with the original roadmap and timeline. The clinical experiences have been organized in 8-week rotations in different pediatric subspecialties: this plan is different from the usual organization of the rotations of the Pediatric Residency Program at UPMC, where most rotations last 4 weeks; however, after long discussion and careful assessment of the local academic setting and hospital sites in Astana, the NUSOM Pediatric Program Director and the strategic partner consultants agreed on such a 8-week rotations formula as the most appropriate one, at least for the initial implementation of the Program.

Our Program admitted the fourth cohort of pediatric residents in September 2022 and this year also graduated the first cohort of residents (n = 3). Overall, in the period 2019–2022, 15 residents were selected and admitted to the NUSOM Pediatric Residency Program.

During these initial years, the clinical experiences remained the same overall. The current organization of the clinical rotations is summarized in Table 1. Indeed, starting from January 2021, the Clinical Academic Department (CAD) of Pediatrics at UMC was finally implemented; notably, the NUSOM Pediatric Residency Program Director was also appointed as Chair of the UMC Pediatric CAD. This situation led to a progressive integration between academy (NUSOM) and the main hospital site (UMC), in addition to a deep reorganization of the clinical workflow at the Pediatric CAD, which consists of several functional units ("Programs") specific to the available pediatric subspecialty (see Figure 1) where inpatient and outpatient activities are fully integrated and managed by the same staff of pediatric specialist physicians. Indeed, before the creation of the Pediatric CAD at UMC (as well as in most hospital settings in the RKZ), inpatient and ambulatory activities were managed by different physicians and had a different administration.

Table 1. Overview of the current clinical experiences/rotations included in the NUSOM Pediatric Residency Program, according to the final plan (starting from PGY-1 academic year 2022–2023).

Post-Graduate Year-1 (PGY-1)
1st Block * - Pediatric Nephrology - Pediatric Rheumatology - Pediatric Hematology
2nd Block * - Neonatology - Pediatric Intensive Care - Pediatric Gastroenterology
Post-Graduate Year-2 (PGY-2)
1st Block * - Delivery room/Neonatal Intensive Care - Pediatric Oncology - Pediatric Neurology
2nd Block * - Pediatric Cardiology - Pediatric Infectious Diseases - Pediatric Emergency Care
Post-Graduate Year-3 (PGY-3)
1st Block - Pediatric Immunology - Pediatric Endocrinology - Pediatric Surgery (- Pediatric Primary Care [longitudinal])
2nd Block - Pediatric Radiology - 1st Pediatric Elective - 2nd Pediatric Elective (internship abroad?) (- Pediatric Primary Care [longitudinal])

* The order/distribution of rotations could be organized differently between the two blocks (due to hospital needs), but all the rotations will be maintained inside the specific PGY, as indicated in the table.

Since the UMC Pediatric CAD represents a referral hospital of national relevance, here only complex and/or severe children affected with chronic disorders are admitted to the inpatient ward and, therefore, some essential clinical experiences (such as pediatric infectious diseases, pediatric cardiology, and pediatric emergency care) cannot be (fully) provided at this main hospital site; these clinical rotations just mentioned have been running in other city hospitals thanks to a specific cooperation and agreement with NUSOM.

Thus, the clinical training of the NUSOM Pediatric Residency Program has been mainly provided by the direct and daily clinical experience during each rotation at the hospital. In October 2022, we finally completed the post-graduate training "pyramid" for the first time, since we had the first graduates from our Program (with some being appointed as "Senior Residents" and, in future, "Clinical Fellows") and all Program post-graduate years (PGY-1, PGY-2, PGY-3) are represented, each one with at least three residents. Thanks to this achievement, further improvements could be planned and implemented. In November 2022, NUSOM pediatric residents started having periodical nightshifts at the Pediatric Service of the Pediatric CAD at UMC, and specific learning activities for the residents have been organized (weekly pediatric English lectures by NUSOM Faculty, protected time for clinical research supervised by the Program Director, Journal club), in addition to other educational events organized in cooperation with UMC (e.g., online or onsite lectures by foreign medical experts and opinion leaders).

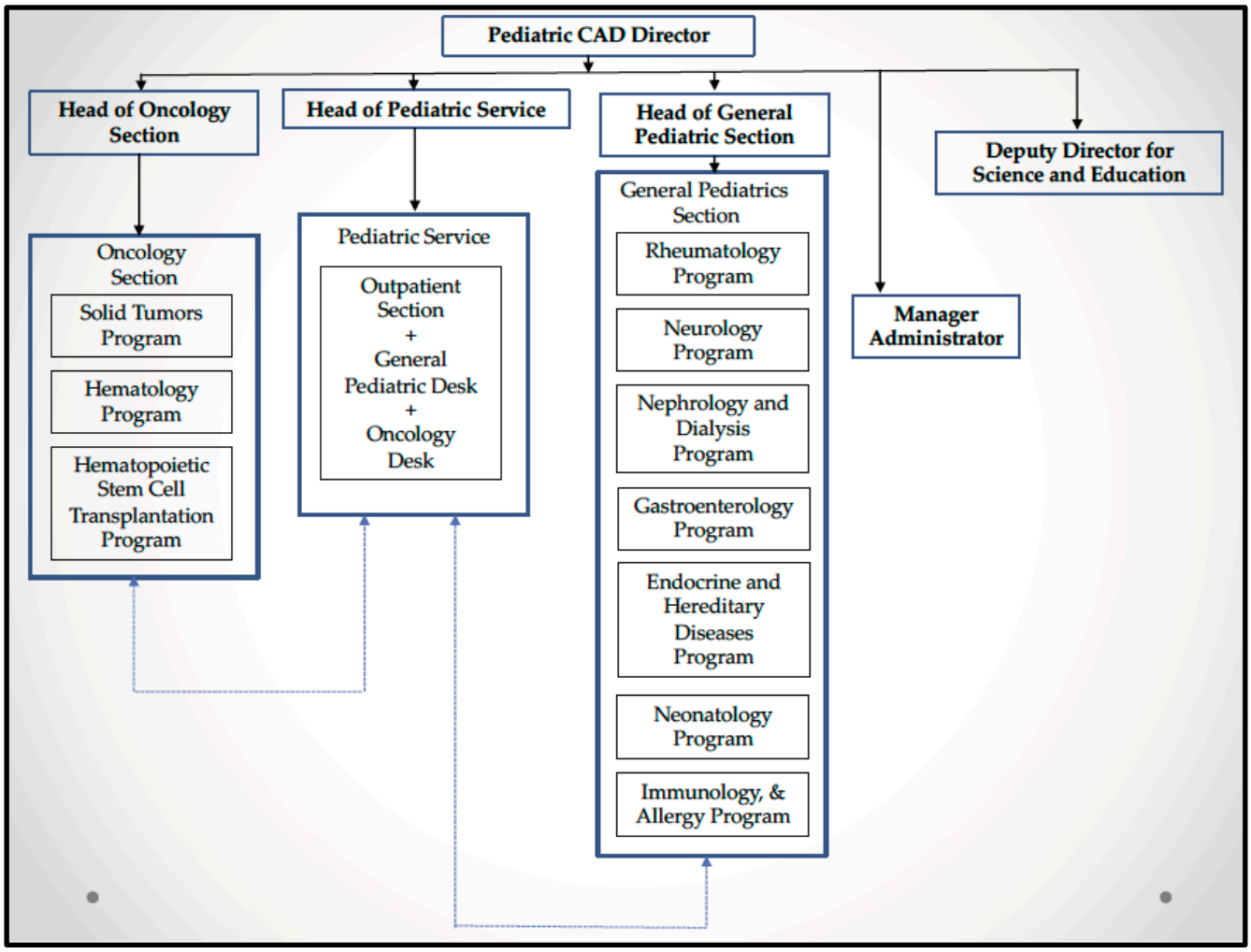

Figure 1. Current organization of the UMC Clinical Academic Department of Pediatrics, which represents the main hospital site supporting the clinical experiences of the NUSOM Pediatric Residency Program.

3. Discussion

3.1. Challenges

The medical practice and the healthcare organization in Kazakhstan [10] present several and important differences from North America and, of course, this makes it impossible to faithfully replicate the ACGME model in the short-term period. As specifically discussed in the following paragraphs, organizational, educational, and administrative challenges had to be faced in these first years since the implementation of our NUSOM Pediatric Residency Program. Moreover, the COVID-19 pandemic clearly and negatively impacted on the "maturation" of our Program and, therefore, only minor changes could be safely done to prevent us disrupting and/or destabilizing a new system of post-graduate pediatric training which had been just established.

Thanks to the implementation of the UMC Pediatric CAD, our residents can be exposed to all the relevant and/or chronic pediatric disorders and several levels of newborn care. The absence of a general pediatric care setting and few specific pediatric subspecialties at the UMC Pediatric CAD have been compensated by the cooperation with other pediatric city hospitals and by the implementation of residents' nightshifts at the UMC Pediatric CAD, where a "Pediatric Service" (dedicated to address and solve unexpected and acute medical issues outside the daytime) was established. However, more efforts are needed to further improve the residents' experience in the management of common pediatric

problems: indeed, the participation of residents in outpatient general pediatric visits and their rotation in primary pediatric care facilities (which are not included in the Pediatric CAD according to the current structural organization of our medical center, although these are present at UMC) are under consideration and are likely to be implemented soon. Of course, these aspects are related to administrative issues. Most of them can be appropriately addressed and solved at the hospital level; however, other administrative aspects depend on the peculiarities of the health system organization in the country, as well as on the RKZ health and labor codes to which our Program must comply, of course, despite the educational autonomy of the NU for its academic programs [11].

As regards the educational domain specifically, many challenges had to be addressed and their full solution is still in progress. In general terms, the medical staff culture of professionalism, teaching, and learning required specific attention: indeed, the language barriers between our English-based academy (NUSOM) and the hospital site (UMC), which is almost exclusively Russian–Kazakh speaking now, has slowed down the professional growth of our medical supervisors in this sense, so far. As emphasized by Bush et al., at the beginning of a new graduate medical education program at any institutions, [12] the local practitioners may take time to become familiar with the competency-based clinical training, even though some of them have already been involved as clinical preceptors with NUSOM medical students and they are experienced clinicians. In detail, one immediate issue and important aspect that we had to address in our Program was to prepare the medical staff for the formal academic assessment and professional feedback to the residents. The organization of workshops and master classes at the local hospital sites was one of the most immediate solutions that we could implement to improve these academic tasks, thanks to the ongoing cooperation and support from our US strategic partner. In detail, the professional development events for local clinical supervisors were especially focused on developing skills for providing residents with customized, direct, and timely formative feedback in the ward; moreover, during the first year of the Program implementation, the Director supervised and reviewed the feedback practice, which is currently carried out by each clinical supervisor with autonomy. Finally, as regards the evaluation of specific learning domains, to assess residents' clinical work as much as possible according to the ACGME criteria, clinical supervisors were provided with specific Russian–Kazakh assessment forms based on the main ACGME pediatric milestones learning outcomes in terms of patient's care, medical knowledge, professionalism, interpersonal communication skills, practice-based learning/improvement, and system-based practice [9,13]. Of course, as discussed by Barr et al., single workshops are not sufficient to grant that faculty and clinical supervisors can reach the appropriate level of expertise in providing feedback and correctly assessing residents and, therefore, "the process of designing and implementing milestones-based assessment [as we also established in our Program] will be an iterative process" [14].

Despite the educational autonomy of NU and the innovative curriculum of the NUSOM Pediatric Residency Program, the integration and inclusion of our residents at the hospital sites have not created any major issues. Moreover, in 2022 our Program has been approved as equivalent to the other existing residency programs reporting to the RKZ Ministry of Higher Education and Science and, thus, our graduates from the NUSOM Pediatric Residency Program are eligible to obtain the RKZ Board Certification in Pediatrics. Notably, our innovative curriculum was then able to reconcile and merge the clinical needs of our medical center and hospitals with the educational priorities of the residents, in terms of clinical experiences and development of specific and tailored medical skills, which is an essential point to build a successful and sustainable pediatric residency program [15].

Therefore, as regards the implementation of the NUSOM Pediatric Residency Program starting from the ACGME Program Requirements for Graduate Medical Education in Pediatrics [9,13], the main organizational and educational aspects were followed in our project. However, our Program is managed and coordinated by the School of Medicine and, thus, by the University, instead of individual medical institutions; moreover, although the

duration of our Program is 36 months (in accordance with the aforementioned ACGME guidelines), inside it the duration of each individual rotation is 8 weeks in order to facilitate the coordination and increase the educational value of each clinical experience, considering the absolute novelty of this post-graduate training program in the country. These are the two main (organizational and educational, respectively) differences compared to the ACGME guidelines. Of course, some specific aspects described in the organizational and educational sections of the ACGME Program Requirements [9] also had to be adapted to the local situation, as highlighted in the Tables A1 and A2 of the Appendix A.

Finally, as mentioned, the COVID-19 pandemic negatively impacted on our Program development in these first years of activity. Indeed, well-established pediatric residency programs abroad also had to face several issues related to the pandemic, such as reduced clinical experiences affecting both ambulatory and inpatient activities, and reduced teaching interactions [16]; of course, our program experienced the same problems and, despite the adoption of remote learning to compensate some in-person learning experiences, the full development of the extra-clinical active learning activities (including the use of the NUSOM simulation center, for instance), was delayed.

3.2. Perspectives

Of course, as regards our NUSOM Pediatric Residency program, there is still a long way before considering the application for an ACGME International (ACGME-I) accreditation, which currently accredits some programs and/or institutions from several areas of the world: indeed, ACGME-I is currently operating in China, Guatemala, Haiti, Jordan, Kenya, Kingdom of Saudi Arabia, Lebanon, Oman, Pakistan, Qatar, Singapore, and United Arab Emirates [17]. Presumably, an additional 3–5 years' activity and experience will be required to implement all aspects that are necessary for this accreditation. Indeed, in addition to creating and refining the appropriate culture of medical academic teaching, several logistics, regulatory, and administrative issues (also related to the national health system organization and national laws in the RKZ) still must be systemically and comprehensively addressed. However, the further development of the Pediatric CAD at UMC (which is accredited by the Joint Commission International), the implementation of NUSOM-UMC Pediatric Fellowships Program (reflecting the subspecialties included in the Pediatric CAD: solid oncology, hematology, hematopoietic stem cell transplantation, endocrinology, gastroenterology, neurology, rheumatology, nephrology, allergy and immunology) and, in general, the creation of NU Medicine as an integrated ecosystem of biomedical innovation, research and patient care (established to improve diagnostics, therapeutics, disease prevention and health outcomes) should definitely promote the process of ACGME-I accreditation.

In addition to certifying the level of our post-graduate training in Pediatrics, the ACGME-I accreditation could create additional career opportunities abroad for our graduated residents. However, the main objective of our Residency Program is to train physicians to become medical leaders and, more in general, to contribute to the improvement of pediatric care in Kazakhstan, also considering that the main source of funding to support the Program directly and indirectly comes from the government at the moment; nonetheless, the completion of an internationally accredited program may further contribute to this practical objective of national relevance, because these physicians could be eligible for additional and specialized training abroad in order to bring to Kazakhstan new and updated medical skills, procedures, and technologies which are not currently available here.

Moreover, the further step of the post-graduate medical education in Pediatrics, namely clinical fellowships for several pediatric subspecialties, has been already planned and will be implemented soon in 2023: indeed, no equivalent program is currently available in the RKZ. Notably, once again, the implementation of the Pediatric CAD at UMC opened the road to the creation of these innovative clinical fellowships for the RKZ: the tight cooperation between hospital and academy allowed us to design this NUSOM-UMC Pediatric Fellowships Program, after the successful resolution of all the legal and administrative

aspects related to the start of such a pilot program in the hospital setting, which is regulated by medical certification rules specific to the RKZ, being remarkably different from those in place in the US, of course.

Finally, this year we could complete the post-graduate training "pyramid" for the first time, which also represents the completion of a "clinical learners–teachers chain", not only for residents, but also for medical students. Indeed, our pediatric residents have all been actively involved in the active learning of the pediatric clerkship and active/elective internships in addition to the specific bed-side teaching in the pediatric ward. The participation and facilitation in case-based learning sessions and case-student conferences became an essential part of the residents' work (in addition to the clinical activities), which is another important point of the US-based ACGME model.

4. Conclusions

Training young physicians in Pediatrics according to the evidence-based medicine and international standards (such as those described by ACGME-I) is the first step to create the medical workforce which could successfully address the growing health needs for children in developing countries like Kazakhstan, where the population still has a remarkable demographic growth rate and, notably, is also younger than in developed countries. In this demographic context, addressing the health needs of children is an urgent priority since the wellness of the pediatric population is essential to prevent many chronic diseases and complications in adulthood: that will significantly promote a good health level in the general population and, accordingly, optimize the health system management and contain medical direct and indirect costs at the national level. Despite the organizational, educational and administrative issues encountered at the start of our new post-graduate medical training in Pediatrics, the implementation of such a program according to the ACGME(-I) objectives and recommendations is expected to significantly raise the level of the pediatric healthcare at the hospital level and, in the mid/long-term period, at the national level.

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Appendix A

Table A1. General (Oversight, Introduction) and organizational (Personnel, Residents Appointment) aspects of the newly implemented NUSOM Pediatrics Residency Program following the model of the ACGME Program Requirements for Graduate Medical Education in Pediatrics.

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
Introduction	Length of the Program (Int.C)	*36 months*	36 months	
Oversight	Sponsoring Institution (I.A.)	*Organization or entity that assumes the ultimate financial and academic responsibility for program of graduate medical education*	NUSOM	
	Participating Sites (I.B)	*A participating site is an organization providing educational experiences or educational assignments/rotations for residents.*	UMC hospitals non-UMC hospitals (Astana)	Non-UMC hospitals: - one Children City Hospital - Pediatric Infectious Diseases Hospital - Cardiac Surgery Research Center
		The program, with approval of its Sponsoring Institution, must designate a primary clinical site (I.B.1)	NRCMCH and RDC	NUSOM-affiliated UMC hospitals
		There must be a program letter of agreement (PLA) between the program and each participating site (I.B.2)	PLA between NUSOM and all participating sites	
		The PLA be renewed at least every 10 years (I.B.2a.1)	yearly PLA renewal	Compliance with local RKZ regulations and laws
		The PLA be approved by the designated institutional official (DIO) (I.B.2b.1)	NUSOM Dean	
		The program must monitor the clinical learning and working environment at all participating sites (I.B.3) *At each participating site there must be one faculty member designated by the program director as the site director, who is accountable for resident education at that site, in collaboration with the program director.* (I.B.3a)	The Program Director is responsible for the primary clinical site (UMC Pediatric CAD).	In addition to NUSOM Faculty, the medical directors of each clinical site will be actively involved in the program.
		The program director must submit any additions or deletions of participating sites routinely providing an educational experience, required for all residents, of one-month full time equivalent (FTE) or more through the ACGME's Accreditation Data System (ADS) (I.B.4)	Not applicable	The implementation of these procedures is currently ongoing. It will be complete at the moment of the ACGME-I accreditation request.
	Faculty Systematic Recruitment and Retention (I.C)	*The program, in partnership with its Sponsoring Institution, must engage in practices that focus on mission-driven, ongoing, systematic recruitment and retention of a diverse and inclusive workforce of residents, fellows (if present), faculty members, senior administrative staff members, and other relevant members.*	One administrative manager has been assigned to this program.	Gradual recruitment of additional staff (both academic and administrative) has been planned.
	Resources (I.D.)	*The program, in partnership with its Sponsoring Institution, must ensure the availability of adequate resources for resident education*	NUSOM	Part of residents' salary is covered by the state grant
		There must be inpatient and outpatient facilities available to the residents to achieve all of the required educational outcomes (I.D.1.a)	The designated hospital sites have both facilities	
		There must be an emergency facility that specializes in the care of pediatric patients and that receives pediatric patients who have been transported via *the Emergency Medical Services system* (I.D.1.b)	UMC NRCMCH	
		Residents must have access to teaching and patient care work space, including meeting rooms, computers, and medical and electronic resources to achieve all of the required educational outcomes. (I.D.1.c)	Residents have full access to resources required for patient care at the UMC hospitals. NUSOM will grant other educational re-sources.	NUSOM has a medical library.

Table A1. *Cont.*

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
		The program, in partnership with its Sponsoring Institution, must ensure healthy and safe learning and working environments that promote resident well-being (I.D.2)	Residents have access to all benefits and facilities provided to NU students.	Residents can apply for campus accommodation, sport facilities and other services.
		Provide for access to food while on duty (I.D.2.a)	Residents have access to the hospital and NUSOM canteens.	
		Provide for safe, quiet, clean, and private sleep/rest facilities available and accessible for residents with proximity appropriate for safe patient care (I.D.2.b)	Dedicated NUSOM rooms are available at the hospital sites.	
		Provide for clean and private facilities for lactation that have refrigeration capabilities, with proximity appropriate for safe patient care (I.D.2.c)	To be discussed and implemented, yet.	
		Provide for security and safety measures appropriate to the participating site (I.D.2.d)	UMC hospitals are JCI accredited	
		Provide for accommodation for residents with disabilities consistent with the Sponsoring Institution's policy (I.D.2.e)	To be implemented yet.	Current NU and UMC policies require a medical certificate to apply for the Program.
		Residents must have ready access to specialty-specific and other appropriate reference material in print or electronic format (I.D.3)	NUSOM Library UMC Library	
		The program's educational and clinical resources must be adequate to support the number of residents appointed to the program (I.D.4)	Appropriate	
		The program must provide a volume, variety, and complexity in diagnoses and age, of pediatric patients necessary for residents to achieve all of the required educational outcomes (I.D.4.a)	Patients' volume and varietry at UMC and non-UMC hospitals are appropriate,	The current hospital and academic system could support at least 6–8 pediatric residents per year
		The presence of other learners and other care providers, including, but not limited to, residents from other programs, subspecialty fellows, and advanced practice providers, must enrich the appointed residents' education (I.E)	Other NUSOM residency programs	Family Medicine and Radiology Residents have rotations at the UMC Pediatric CAD.
PERSONNEL	Program Director (II.A)	*There must be one faculty member appointed as program director with authority and accountability for the overall program, including compliance with all applicable program requirements*	NUSOM Pediatric Program Director	
		The program must demonstrate retention of the program director for a length of time adequate to maintain continuity of leadership and program stability (II.A.1.c)	To be defined	The current Program Director has been working in this position for 3.5 years.
		At a minimum, the program director must be provided with the salary support required to devote 20 percent FTE (at least eight hours per week) of non-clinical time to the administration of the program. (II.A.2)	To be defined	
		The program director must have responsibility, authority, and accountability for: administration and operations; teaching and scholarly activity; resident recruitment and selection, evaluation, and promotion of residents, and disciplinary action; supervision of residents; and resident education in the context of patient care. (II.A.3)	NUSOM Program Director currently supervises all these activities and tasks.	Other NUSOM Faculty and Pediatric CAD Leadership members are now involved in these tasks.

Table A1. *Cont.*

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
	Faculty (II.B)	*At each participating site, there must be a sufficient number of faculty members with competence to instruct and supervise all residents at that location* (II.B.1)	In each Program of the UMC Pediatric CAD, the Program Lead will be the contact point for residents.	
	Faculty members must: (II.B.2)	- *be role models of professionalism* (II.B.2.a) - *demonstrate commitment to the delivery of safe, quality, cost-effective, patient-centered care* (II.B.2.b) - *demonstrate a strong interest in the education of residents* (II.B.2.c) - *devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities* (II.B.2.d) - *administer and maintain an educational environment conducive to educating residents* (II.B.2.e) - *regularly participate in organized clinical discussions, rounds, journal clubs, and conferences* (II.B.2.f) - *pursue faculty development designed to enhance their skills at least annually: as educators; in quality improvement and patient safety; in fostering their own and their residents' well-being; in patient care based on their practice-based learning and improvement efforts* (II.B.2.g)	NUSOM adopted a strict policy in terms of professionalism, which is applied to students, residents, faculty and clinical preceptors. NUSOM (along with UPMC and UPSOM) organizes professional development workshops for faculty and clinical preceptors/supervisors.	The residents' clinical supervisors are not NUSOM Faculty, but UMC Program Leads accept and sign a specific agreement between the hospital site and NUSOM. Similar arrangements are made with non-UMC hospital sites.
	Faculty Qualifications (II.B.3)	*Faculty members must have appropriate qualifications in their field and hold appropriate institutional appointments*	The Program Director is a medical specialist in Pediatrics and has an NU appointment as Associate Professor. Other young faculty are Assistant Professors and Instructors, with pediatric professional backgrounds.	
		Physician faculty members must have current certification in the specialty (II.B.3.b)	All clinical supervisors are UMC Program Leads, and they have a recognized certification in the field of Pediatrics.	
		Any non-physician faculty members who participate in residency program education must be approved by the program director (II.B.3.b)	Non-physician NUSOM faculty will deliver a few lectures on their expertise topics with a focus on pediatric application and/or translational aspects.	
	Core Faculty (II.B.4)	*Core Faculty members must have a significant role in the education and supervision of residents and must devote a significant portion of their entire effort to resident education and/or administration, and must, as a component of their activities, teach, evaluate, and provide formative feedback to residents.*	Program Leads and Section Heads, in addition to key NU Faculty, will participate and have been included in the Clinical Competency Committee.	
		Core faculty members must be designated by the program director (II.B.4.a)	Yes	
		Core faculty members must complete the annual ACGME Faculty Survey (II.B.4.b)	Not applicable	
	Program Coordinator (II.C)	*There must be a program coordinator* (II.C.1)	One administrative manager has been assigned to the program.	This manager currently supervises all the NUSOM residency program.
		At a minimum, the program coordinator must be supported at 50 percent FTE (at least 20 h per week) for administrative time (II.C.2)	Not applicable	Compliance with this requirement will be achieved when the program will be consolidated.
	Other Program Personnel (II.D)	*The program, in partnership with its Sponsoring Institution, must jointly ensure the availability of necessary personnel for the effective administration of the program*	Not applicable	Additional personnel will be added according to the program development in future.
RESIDENT APPOINTMENTS	Eligibility Requirements (III.A)	*An applicant must meet one of the following qualifications to be eligible for appointment to an ACGME-accredited program* (III.A.1)	Not applicable	Applicants are currently M.D. from Kazakhstani Medical Schools registered in the *World Directory of Medical Schools*.
		The program director must not appoint more residents than approved by the Review Committee. (III.B)	4–6 positions are currently available every year	This number is regulated by the state grants availability and NUSOM budget
		Resident Transfers (III.C)	Not applicable	Our program is different from other residency programs in RKZ.

Table A2. Educational Plan of the newly implemented NUSOM Pediatrics Residency Program following the model of the ACGME Program Requirements for Graduate Medical Education in Pediatrics (Part IV.C: Curriculum Organization and Residents Experiences).

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
IV.C.1		*The curriculum must be structured to optimize resident educational experiences, the length of these experiences, and supervisory continuity.*	All the clinical experiences have been organized in 8-week rotations (6 per each academic year).	At UPMC, most rotations are 4-week experiences, but a longer period has been considered more suitable to fulfill this point for the initial development of the NUSOM residency program activity.
IV.C.2		*The program must provide instruction and experience in pain management if applicable for the specialty, including recognition of the signs of addiction.*	General pain management will be addressed in all rotations, including PICU, pediatric emergency care, and oncology rotations.	Addiction management is not very developed in the RKZ; specific experiences in the near future will be arranged to fulfill this point.
IV.C.3		*The program must be structured to provide at least 30 months of required residency education at the primary clinical site and other participating sites.*	Over 36 months of residency, the residents will work 30 months at least.	4 weeks of vacation will be given to residents every year.
IV.C.4		*The program must have planned educational experiences*	- Pediatric lectures - Pediatric journal club - Protected time for clinical research - Hospital-based clinical conferences	
IV.C.5		*The curriculum should be organized in educational units.*	The residents will be exposed to an appropriate number and variety of clinical experiences.	
	5.a	*An educational unit should be a block (four weeks or one month) or a longitudinal experience.*	The residents will pass through inpatient and outpatient experiences.	The duration and organization of educational units has been adapted based on local factors and hospital organization.
	5.a.1	*An outpatient educational unit should be a minimum of 32 half-day sessions.*	The outpatient longitudinal experiences have to be fully developed yet.	This organization will fulfill the 32 half-day sessions requirement after additional improvement will be made, following the creation of the Pediatric CAD at UMC.
	5.a.2	*An inpatient educational unit should be a minimum of 200 h*	Each 8-week inpatient rotation will provide at least 400 h of effective training.	
IV.C.6		*The overall structure of the program must include:*		
	6.a	*a minimum of six educational units of an individualized curriculum;*	PGY-3 will include two elective rotations.	This specific aspect has been adapted to the local situation.
	6.a.1	*The individualized curriculum must be determined by the learning needs and career plans of each resident and must be developed through the guidance of a faculty mentor.*	PGY-3 individualized curriculum will be agreed with the Program Director and approved by Clinical Competency Committee.	

Table A2. *Cont.*

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
	6.b.	*a minimum of 10 educational units of inpatient care experiences, including:*	Almost all clinical experiences will have an inpatient component, which definitely corresponds to the minimum required.	
	6.b.1.	*inpatient pediatrics (there must be five educational units and no more than one of the five required educational units should be devoted to the care of patients in a single subspecialty)*	Each rotation is organized by pediatric subspecialty at the current status.	
	6.b.2.	*neonatal intensive care (there must be two educational units)*	In PGY-1/2 the residents will spend an appropriate amount of time in the NICU	
	6.b.3.	*pediatric critical care (there must be two educational units)*	In PGY-1 the residents spend 8 weeks in the PICU	
	6.b.4.	*term newborn care (There must be one educational unit)*	In PGY-1, the residents will have 8-week experience in the neonatology department and additional specific experience in the delivery room during PGY-2.	This rotation will be preparatory for additional longitudinal experiences.
	6.c	*a minimum of nine educational units of additional subspecialty experiences, including:*	Fulfilled (see Figure 1)	
	6.c.1.	*adolescent medicine (there must be one educational unit)*	Such an experience has to be specifically implemented, yet.	Adolescent medicine is not developed yet as a specific branch of Pediatrics in the country. However, adolescent patients will be seen in any rotations.
	6.c.2.	*developmental-behavioral pediatrics (there must be one educational unit)*	This component will be addressed during the rotation in the Neurology Program, where these aspects are also considered.	Specific experiences are under consideration to be implemented in the near future.
	6.c.3.	*four educational units of four key subspecialties from the following subspecialties*	All main pediatric subspecialties are covered	
	6.c.4.	*three additional educational units consisting of single subspecialties or combinations of subspecialties*	All main pediatric subspecialties are covered	During PGY-3, residents have a specific rotation in radiology (with a focus on pediatrics). Moreover, a combined rotation in pediatric surgery is under consideration..
	6.d	a minimum of five educational units of ambulatory experiences, including:	The ambulatory experiences are going to be implemented in each rotation, even though some will be mainly ambulatory based (e.g., Allergy and Immunology).	The implementations of the Clinical Academic Department (CAD) of Pediatric is contributing to overcome this limitation in a short time.
	6.d.1.	ambulatory experiences to include elements of community pediatrics and child advocacy (and there must be two educational units)	This will be fully implemented in the next year.	At the moment the UMC-based pediatric general practice is not under the Pediatric CAD supervision, but a discussion on this matter has been already started.

Table A2. *Cont.*

Content	Section	ACGME Specifications [9]	NUSOM Pediatric Residency Program	Notes
	6.d.2.	pediatric emergency medicine and acute illness (there must be three educational units of pediatric emergency medicine, at least two of which must be in the emergency department; Residents must have first-contact evaluation of pediatric patients in the emergency department)	During PGY-2, 8 weeks are spent in the Pediatric Emergency Care Department of a non-UMC hospital.	
	6.e	*a minimum of 36 half-day sessions per year of a longitudinal outpatient experience*	This requirement will be implemented and fulfilled within the next two years.	
	6.e.1.	*The sessions must not be scheduled in fewer than 26 weeks per year.*	See above	
	6.e.2	There must be an adequate volume of patients to ensure exposure to the spectrum of normal development at all age levels, as well as the longitudinal management of children with special health care needs and chronic conditions	The patients' volume and variety have been judged as appropriate based on the site visits with the strategic partner.	
	6.e.3	There must be a longitudinal working experience between each resident and a single or core group of faculty members with expertise in primary care pediatrics and the principles of the medical home.	This requirement will be implemented and fulfilled within the next two years.	
	6.e.4	PGY-1 and PGY-2 residents must have a longitudinal general pediatric outpatient experience in a setting that provides a medical home for the spectrum of pediatric patients	This requirement will be implemented and fulfilled within the next two years.	.
	6.e.5	PGY-3 residents should continue this experience at the same clinical site or, if appropriate for an individual resident's career goals, sessions in the final year may take place in a longitudinal subspecialty clinic or alternate primary care site.	PGY-3 includes two rotations dedicated to developing an individualized curriculum.	
	6.e.6	*The medical home model of care must focus on wellness and prevention, coordination of care, longitudinal management of children with special health care needs and chronic conditions, and provide a patient- and family-centered approach to care*	The NRCMCH can provide this model of clinical care.	However, some aspects related to the national health system organization have not allowed us to fully develop this model, yet.

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