

### Internal Medicine Residency Program in Iran: Exclusive Features and an International Comparison

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**Background:** Internal Medicine (IM) is one of the main medical specialties. The objective of this study was to evaluate the features of the Iranian IM residency training program, residents' duties and salary and to compare them with some countries.

**Methods:** Using the Iranian Ministry of Health and Medical Education (MOHME) directive for IM residency training program, the features of educational curriculum, compulsory working hours, residents' duties and salary were extracted and compared with some countries whose full details were available online.

**Results:** The annual capacity of IM residency admission in Iran is near 300 residents in 35 countrywide medical universities. Medical doctors can apply for this residency after achieving adequate scores in the Iranian residency entrance exam. The training curriculum of IM is designed uniformly for all universities by MOHME and is consisted of a 4-year training of gastroenterology, endocrinology, nephrology, pulmonary diseases, hematology and rheumatology plus cardiology, neurology, intensive care, emergency medicine, radiology and dermatology in hospital departments and continuity clinics. A residency training period in Iran is similar to Turkey and Canada and is shorter than most European countries. Average weekly working hours for IM residents is 84 hours in Iran, which is higher than Turkey, European countries, Canada and the USA. Two to eight years of medical service in underserved areas have been assigned for Iranian graduates of IM residency before receiving certification for working in larger cities.

**Conclusion:** Residency training in each country is influenced by different factors. Training of residents with more knowledge and skills that did not bear remarkable job burnout during their training period is a challenging goal for medical education policymakers.

**Keywords:** Education; Internal medicine; Iran; Residency

### آموزش رشته تخصصی بیماری‌های داخلی در ایران: ویژگی‌ها و مقایسه با سایر کشورها

**مقدمه:** رشته تخصص بیماری‌های داخلی یکی از اصلی ترین تخصص های پزشکی است. در این مقاله، ویژگی‌های برنامه آموزشی، وظایف و حقوق دستیاران این رشته در ایران مورد ارزیابی قرار گرفته و با برخی از کشورها مقایسه شده است.

**روش‌ها:** با استفاده از دستورالعمل وزارت بهداشت، درمان و آموزش پزشکی (IMHME)، ویژگی‌های برنامه درسی آموزشی، ساعت کار اجباری، وظایف و حقوق دستیاران استخراج شد و در مقایسه با برخی کشورها که اطلاعات کامل آنها در دسترس بود، مقایسه شد.

**یافته‌ها:** ظرفیت سالانه پذیرش دستیار طب داخلی در ایران حدود ۲۸۰ نفر در ۳۴ دانشگاه علوم پزشکی سراسر کشور است. برنامه درسی آموزشی تخصص داخلی به طور یکنواخت برای همه دانشگاه‌ها توسط IMHME طراحی شده و شامل آموزش ۴ ساله مباحث فوق تخصصی گوارش، غدد درون ریز، نفرولوژی، ریه، هماتولوژی و روماتولوژی به همراه قلب، مغز و اعصاب، مراقبت‌های ویژه، طب اورژانس، رادیولوژی و پوست در بخش‌های بیمارستان و کلینیک‌ها است. دوره آموزش دستیار داخلی در ایران شبیه به ترکیه و کانادا است و کوتاه‌تر از اکثر کشورهای اروپایی است. میانگین ساعات کاری هفتگی برای دستیاران داخلی در ایران ۸۴ ساعت است که بالاتر از کشورهای اروپایی ترکیه، کانادا و ایالات متحده است. دو تا هشت سال خدمات پزشکی در نواحی کم برخوردار برای کسب مجوز خدمت در شهرهای بزرگ برای فارغ‌التحصیلان این رشته در نظر گرفته شده است.

**نتیجه‌گیری:** آموزش دستیار طب داخلی در هر کشور تحت تاثیر عوامل مختلفی نظیر وضعیت اقتصادی، نیروی کار، اولویت‌های سلامت ملی و امکانات موجود می‌باشد. آموزش دستیاران با دانش و مهارت‌های بیشتر که دچار فرسودگی شغلی قابل توجهی در طول دوره‌ی آموزش نشده‌اند یک هدف چالش برانگیز برای سیاست‌گذاران آموزش پزشکی است.

**کلمات کلیدی:** آموزش؛ طب داخلی؛ ایران؛ اقامت

### التعليم في فرع طب الأمراض الداخلية في إيران: الخصائص والمقارنة مع الدول الأخرى

**مقدمة:** يعتبر طب الأمراض الداخلية والباطنية تخصصاً أساسياً من بين تخصصات الطب البشري. في هذه المقالة سنتناول خصائص البرنامج التعليمي ووظائف المتخصصين في إيران في هذا الفرع ومقايسته مع الدول الأخرى.

**الطريقة:** بالاستفادة من قانون وزارة الصحة والتعليم العالي تم استخراج خصائص البرنامج التعليمي وساعات العمل الإلزامية ووظائف ورواتب المتخصصين وتم مقارنتها مع بعض الدول التي كانت هذه المعلومات متوفرة عنها.

**النتائج:** سويلاً يتم قبول ٢٨٠ متخصص في فرع الداخلية والباطنية في ٣٤ جامعة علوم طبية في كل إيران. البرنامج الدراسي للمتخصصين قد خطط من قبل وزارة الصحة والتعليم العالي ويشمل الدراسة لمدة أربع سنوات في مجالات الرضوية، الفدر الصم، الكلية وأمراض الرئة والأمراض التنفسية، الأمراض الروماتيسم وأمراض المفاصل، القلبية، المخ والأعصاب، العناية المسندة، طب الإسعاف، الأثمة، الجلدية وذلك في أقسام المستشفى والعيادات المرتبطة به. مدت الدورة التخصصية في إيران مثل تركيا وكندا ولكننا أقصر من أكثر الدول الأوروبية. معدل ساعات العمل الأسبوعية للمتخصص الداخلي في إيران ٨٤ ساعة أي أعلى من الدول الأوروبية وكندا وتركيا والولايات المتحدة. ومن أجل السماح للعمل في المدن الكبرى يجب العمل من السنتين إلى ثمان سنوات في المناطق النائية والحرمة.

**النتيجة:** التعليم التخصصي في فرع الداخلية في أي دولة يخضع لتأثير عوامل مختلفة مثل الوضع الاقتصادي، البير العاملة، وأولويات الصحة الوطنية والإمكانات الموجودة. تطوير مستوى المتخصصين تعليمياً وعلمياً بالممارسات التي من الممكن تصحيح قديمة بعض الشيء. بسبب طول الفترة التدريبية يعتبر تحدياً كبيراً لواجب البرنامج التعليمي الطبي

**الكلمات المفتاحية:** التعليم، طب الداخلية، إيران، الإقامة

### ایران میں انٹرنل میڈیسن کے علاج میں مہارت کی تعلیم. خصوصیات اور دیگر ملکوں سے موازنہ

**بیک گراؤنڈ:** انٹرنل میڈیسن میں مہارت کا موضوع علم طب میں بنیادی ترین مہارتوں میں سے ایک موضوع ہے۔ اس تحقیق میں ایران میں انٹرنل میڈیسن کی تعلیم کے نصاب کی خصوصیات، اس موضوع میں ریزیڈنٹس کی ذمہ داریاں اور حقوق کا دیگر ملکوں سے موازنہ کیا گیا ہے۔

**روش:** وزارت صحت کے دستور العمل کے مطابق، تعلیمی نصاب کی خصوصیات، کام کے اوقات، اور ریزیڈنٹس کی ذمہ داریوں اور حقوق کی تفصیلات حاصل کی گئیں اور ان کا بعض ملکوں سے موازنہ کیا گیا جن کے بارے میں ہمیں مکمل معلومات حاصل تھیں۔

**نتیجہ:** ایران کی چونتیس یونیورسٹیوں میں ہر سال انٹرنل میڈیسن کے مہارتی موضوع میں دو سو اسی افراد کا داخلہ ہوتا ہے۔ وزارت صحت نے ملک کی تمام یونیورسٹیوں کے لئے یکساں طور پر انٹرنل میڈیسن میں مہارت کا تعلیمی نصاب بنایا ہے۔ اس نصاب کے تحت چار سال تک، امراض نظام باضمہ، اندرونی غدود کے مسائل، نفرولوجی، پیپھیٹوزوں کے امراض کی تفصیلات، ہماٹولوجی، اور رھیوٹومالوجی، کارڈیالوجی، نیورولوجی، انٹنسیو کیر یونٹ، ایمرجنسی میڈیسن، ریڈیالوجی، اور امراض جلد کی تعلیم دی جاتی ہے۔ ایران میں انٹرنیٹ ڈاکٹروں کی تعلیم ترکی اور کینیڈا کی طرح ہے البتہ اکثر یورپی ملکوں سے اس کورس کی مدت کم ہے۔ ایران میں انٹرنل میڈیسن کے ڈاکٹروں کو ہر پختہ چوراسی گھنٹے کام کرنا پڑتا ہے جو یورپی ملکوں اور امریکہ ترکی اور کینیڈا سے زیادہ ہے۔ اس مہارت کے فارغ التحصیل ڈاکٹروں کے لئے طبی سہولتوں سے محروم علاقوں میں دو سے آٹھ سال کی پریکٹس رکھی گئی ہے تا کہ اس کے بعد وہ اپنی پسند کے بڑے شہروں میں کام کر سکیں۔

**سفارشات:** ہر ملک میں انٹرنل میڈیسن کے ڈاکٹروں کی ٹریننگ اس ملک کے مختلف مسائل جیسے اقتصادی امور، افرادی قوت، حفظان صحت کے قومی پروگرام اور موجودہ وسائل کے تحت انجام پاتی ہے۔ ریزیڈنٹس کو اپ ٹو ڈیٹ سائنس اور مہارتوں کا حامل بنانا تا کہ وہ اپنے کام میں اپنی تعلیم نہ بھول جائیں تعلیمی پالیسیاں بنانے والوں کے لئے ایک چیلنج ہے۔

**کلیدی الفاظ:** تعلیم، انٹرنل میڈیسن، ایران، کینیڈا

## INTRODUCTION

Internal Medicine (IM) is one of the major specialties in medicine, which has been taught for over a century in the world's best medical schools (1). It is also one of the oldest medical specialties in Iran; and thousands of IM specialists have been graduated from several medical universities across the country since 1951. At first, internal medicine specialty training consisted wide-range topics including infectious diseases and tropical medicine, cardiology, neurology; which later due to progressive specialization within medicine, these fields turned to separate specialties (2).

The annual capacity of IM residency admission in Iran is near 300 residents in 35 countrywide medical universities. The curriculum of IM residency program in Iran has been designed based on the healthcare priorities of the country and with regard to the training program of the leading countries in this field (2-4). Similarly, in other parts of the world, the IM residency curriculum has been designed according to the country needs, priorities and particulars (5-12). The present study provides a general overview on features of IM residency program in Iran compared with some countries in this field of medicine.

## METHODS

Details of the Iranian curriculum for IM residency training programs, including working hours, rotations, income and length of residency training were extracted from the Ministry of Health and Medical Education (MOHME) guideline and directives for IM residency training program (2, 3). These features were compared to the programs of some other countries. To extract the details of IM residency programs in other countries, an extensive search of reliable indexing databases including PubMed and Google Scholar has been performed using the keywords "Internal medicine" AND "residency" AND "program" AND/OR "curriculum". Relevant articles and documents were obtained and reviewed. In addition, a search on Google has been carried out to find the potential directive documents or instructions of IM residency in other countries (in original language) which have not been published as an article. It should be noted that we focused on comparing the Iranian IM residency program with countries leading in this field of medicine whose details of their program were available on the online sources. Iranian MOHME directives were the basis of information from the resident's salary.

## RESULTS

### *IM residency training in Iran*

Iranian graduating medical students can apply for IM residency after achieving adequate scores in the residency entrance exam, which is given once yearly by the National Center for Evaluation of Medical Education. The training curriculum of IM residency is devised uniformly for all universities by Iranian Ministry of Health and Medical Education and is consisted of a 4-year training of major and collateral rotations in specialized hospital wards and divisions as well as continuity clinics.

There are specified learning goals and objectives in the

Iranian curriculum of IM residency. These objectives are stipulated as specific competencies and skills in the curriculum and correspond to activities expected of residents on each clinical rotation. These are representative (but not comprehensive) headings of the expectations of the faculty and supervising physicians on these rotations and include: peritoneocentesis, emergency peritoneal dialysis, plurocentesis, catheter insertion for hemodialysis, lumbar puncture, working with mechanical ventilator, articular fluid aspiration, fine needle aspiration, articular injection, liver biopsy arterial blood gas testing, pleural biopsy, jugular/femoral catheterization, central venous pressure monitoring, spirometry, bone marrow aspiration/biopsy, cut down, chest tube insertion, rectosigmoidoscopy, cricothyroidectomy.

Internal medicine residency training in Iran consists of 1-month rotations through different medical units. All rotations are compulsory and include general medicine, hematology/oncology, cardiology/CCU, intensive care, neurology, emergency ward, nephrology/dialysis, pulmonology, gastroenterology, endocrinology, rheumatology, infectious diseases and topical medicine, radiology and dermatology. Clinical toxicology rotation is a compulsory part of education in some universities containing clinical toxicology department. In addition, Iranian residents are required to spend one month working outside the university hospitals, i.e. in community clinics or tertiary hospitals in small cities and/or rural areas.

### *Iranian IM residency program versus some other countries*

Table 1 summarizes the educational details, length of training program, residents' incomes and obligations of IM residency program in Iran, Turkey, and the University of Washington in the United States and University of Alberta in Canada (2, 3, 5, 6, 13-16). As can be seen, all programs have many features in common. However, if the dereferences are taken into account: A) the shortest training period relates to the United States. B) Iranian residents experience the longest weekly working hours compared to other countries. It should be noted that the weekly working hours of the 1<sup>st</sup> year residents is 95 and for 2<sup>nd</sup> year residents is 88 in Iran. C) The points of difference in the rotations are immunology/allergy division which is only offered in Turkey, night float (night medicine) which is only included in the American program and the two specific rotations for Canadian residents including junior attending on clinical teaching unit (CTC) and multidisciplinary clinical teams (MCT). All the other rotations are included either in all programs or at least in two programs. D) To answer to healthcare needs of underserved areas in Iran, graduating residents are committed to provide a 2-8 year service in small cities and rural areas. E) The Canadian residents receive the highest yearly income.

The Iranian and Turkish programs are uniformly designed by the health ministry of each country are mandatory for all medical schools, while the plan of rotations should be followed more or less completely by faculty staff of the universities. However, the IM residency programs in the US and Canada are more flexible and liberal, especially when the number of elective/selective rotations is taken into account. Nonetheless, in the US and Canada, although each university

**Table 1. Features of Iranian residency program for internal medicine versus some other countries**

Features	Country/University			
	Iran	Turkey	United states/ Washington University	Canada, University of Alberta
Clinical training-duration				
General medicine	10 mo.	6 mo.	10 bl.	10 mo.
Hematology/Oncology	3 mo.	6 mo.	2 bl.	2 mo.
Cardiology/CCU	4 mo.	3 mo.	3 bl.	2 mo.
Intensive care	3 mo.	5 mo.	3 bl.	3 mo.
Neurology	1 mo.	1 mo.	1 bl.	1 mo.
Emergency ward	7 mo.	5 mo.	2 bl.	---
Nephrology/Dialysis	3 mo.	3 mo.	---	2 mo.
Pulmonology	3 mo.	3 mo.	---	2 mo.
Gastroenterology	3 mo.	3 mo.	---	2 mo.
Endocrinology	3 mo.	3 mo.	---	---
Rheumatology	3 mo.	3 mo.	---	---
Infectious diseases and topical medicine	2 mo.	3 mo.	---	---
Radiology	1 mo.	1 mo.	---	---
Dermatology	1 mo.	---	---	---
Working outside the center/ Community general internal medicine	1 mo.	---	1 bl.	2.5 mo.
Immunology/Allergy	---	2 mo.	---	---
Geriatric	---	2 mo.	1 bl.	---
Elective/Selective	---	1 mo.*	9 bl.**	18 mo.****
Ambulatory care	---	---	5 bl.***	1 mo.
Night float	---	---	2 bl.	---
Junior attending on clinical teaching unit	---	---	---	2 mo.
Multidisciplinary Clinical Teams	---	---	---	0.5 mo.
Length of training period (year)	4 yr.	4-5 yr.	3 yr.	4 yr.
Average working hour/week	84	72	75-80	72
Yearly salary (\$US); range	3,900-4,900	7,800-8,600	50,000-65,000	55,000-70,000
Compulsory service in small cities and rural areas (year) for graduates	2-8 yr.	1 yr.	---	---
Abbreviations: CCU: cardiac/coronary care unit; mo.: Months; bl.: block (each block means 4 weeks); yr.: year				
* Includes any of the internal medicine subspecialties				
** Includes but not limited to: Cardiology, Dermatology, Endocrine, Emergency Medicine, Medical Genetics, Gastroenterology, Hematology/Oncology, Hospital Medicine, Infectious Disease, Neurology, Nephrology, Pulmonary, Rheumatology and Neuro-radiology				
*** Includes but not limited to: Clinic block, Addiction Medicine, Autoimmune, Cardio/Respiratory, Dermatology, Endocrinology, Dermatology, Global Health, Hepatology, HIV Medicine, Homeless Healthcare, Metabolic Disorders, Musculoskeletal, Nephrology, Neuro/Musculoskeletal Disorders, Respiratory Medicine, Rheumatology, Rural Medicine, Women's Health				
**** Includes but not limited to: Emergency Medicine, Endocrinology, Geriatric Medicine, Infectious Diseases, Medical Oncology, Occupational Medicine, Palliative Care, and Rheumatology				

may design its own version of the IM training program, they all should adhere to the minimum requirements of the Accreditation Council for Graduate Medical Education (ACGME) and The Royal College of Physicians and Surgeons of Canada (RCPSC), respectively.

**DISCUSSION**

IM specialty can be considered as the cornerstone of the healthcare system. Internists play the key role in the diagnosis and management of acute and chronic adulthood

disorders (17). A well-trained knowledgeable internist comes from a comprehensive residency training program; i.e. a curriculum tailored to foster residents' skills, competencies and clinical reasoning.

In this paper we evaluated the details of IM residency programs in some countries. There was some originality in each program. The innovative idea of CTU is a distinct Canadian particular of IM residency program. It was devised by the Association of Canadian Medical Colleges in 1962 (18). Under the supervision of the attending medical staff, the main objective of this rotation is to train future clinical teachers from senior residents able to train junior residents or interns (18). The night float rotation schedules for night-time clinical services. Residents on this rotation, typically work 5 days a week with 2 days off. The work shift is 7 pm to 8 am 7 days a week (except for Fridays which night float resident presents in morning report). Each day attending to morning report session is mandatory, but daily department rounds and noon conference attendance are not required. In addition, residents are exempt from all continuity clinic responsibilities during this rotation (19, 20). The MCT rotation in IM residency training at the University of Alberta has been developed since 2014. In this 2-week rotation in the second year of residency, clinical practice outside the hospitals and in multidisciplinary environments is in focus. According to the developer, this rotation intends to allow residents to work in diverse environments such as multidisciplinary clinics, ambulatory allied health assessments, community rehab programs, day programs, home visits and home palliative care. In addition, team-based approach in community settings, collaboration, manager and medical expert roles is emphasized in this part of the Canadian IM residency program (14).

specialty differ among countries. To take as an example, length of IM residency training is 3 years in the US and Chile (7, 21); while it is 4 years in Iran, Turkey and Canada (2-6,15). In most European countries, such as Spain, Poland, Greece and the United Kingdom, this period is 5 years and the duration of training in this field in Slovakia is longer than most countries (7 years) (5,8-12).

In this paper, we showed that the average weekly working hour in Iran is higher than the US, Canada, and Turkey. In 2003, restrictions on working hours of residents in all specialties were announced by the ACGME in the US (21, 22). Accordingly, working hours of residents was capped at 80 hours per week, and in addition, the residents may not work more than 24 consecutive hours (with 6 additional hours for transfer of care and educational activities). Moreover, residents should have at least 24 consecutive hours off per week and at least 10 consecutive hours off between shifts, and may take call no more frequently than 1 night in 3 (21,22). After implementation of this framework, residents were found to be more satisfied with their career, residents provided better patient care and the proportion of meeting criteria for emotional exhaustion in residents was lower in comparison to the period before this new limitation (22). Since 2004 and based on a European Union (EU) working hour directive, a limit of 48 hours per week with 11 hours compulsory rest in 24 hours has been issued for the residents of EU countries (11).

In conclusion, medical residency training in each country is affected by various factors such as the economic situation, national health priorities, workforce and facilities. Training of more skilled and knowledgeable specialists who have not suffered from job burnout is a challenging goal for medical education policymakers.

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