

# Gastroenterology and Hepatology Training in the Islamic Republic of Iran

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## ABSTRACT

### BACKGROUND

Training in internal medicine has significantly evolved alongside the development of science, technology and new facilities during the past fifty years. After the specialty of internal medicine, there are multiple subspecialty training programs which have started since 1985 in the Islamic Republic of Iran. In this manuscript we want to define the characteristics of the gastroenterology subspecialty training program in our country.

### METHODS

The characteristics of approved gastroenterology training centers were gathered through a questionnaire. The questionnaire consisted; the establishment date, the number and academic rank of trainers, the number of trainees, hospital beds, the number and types of diagnostic and therapeutic procedures in a year, the characteristics of training programs and their curriculum composition. The collected data was discussed and revised in a focused group of gastroenterologists from training centers and the board members of Iranian Association of Gastroenterology and Hepatology (IAGH).

### RESULTS

There are 11 training centers with 94 trainers and 65 trainees, with a ratio of trainers to trainees of 1.36. Fifty four percent of trainers are assistant professor. Yearly, 36 new fellows are admitted. Four centers have adequate facilities for training in advanced gastroenterology, and in three centers there are facilities for liver transplantation. The duration of training in internal medicine is four years, whereas in gastroenterology it is two years. The admission for this subspecialty is not university based and with other subspecialty programs, there is a national entrance examination.

### CONCLUSION

There are adequate well known training centers with a suitable ratio of trainer to trainee in the Islamic Republic of Iran. The duration of the GI fellowship is short and implementation of post subspecialty programs for completing the required capabilities of fellows is necessary. The capacity of fellowship admission should be revised according to needs of the country in the fields of health maintenance, research and medical education programs.

### KEYWORDS

Gastroenterology; Training; Iran

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## INTRODUCTION

The subspecialty of gastroenterology and hepatology, as with other branches of medicine, has grown rapidly with the achievements in science and technology during the last 50 years. With the establishment of gastroenterology subspecialty and training of more gastroenterologists in the last 30 years, the health care delivery and research activities in this field have changed considerably in our country.<sup>1,2</sup>

Endoscopy as the main diagnostic procedure started with the use of rigid sigmoidoscopy and gastroscopy, which were utilized for visualization of the rectosigmoid and upper gastrointestinal tract. Whereas now, all segments of the bowel can be visualized with newer devices such as capsule endoscopy and enteroscopy.

Alongside these improvements in technology, biomedical research has made rapid changes in the concepts of disease causality, molecular and cell biology, early detection, management and intervention. Unless recent advances in knowledge and skills are included in gastroenterology and hepatology training programs, we will be imparting less than desirable training.

The training curriculum is not uniform throughout the world.<sup>3</sup> There is a recommendation to prolong the gastroenterology and hepatology training period to three or four years with special training courses after eighteen months of general gastroenterology training.<sup>4</sup> Graduates not only should perform the most required GI procedures, but also exercise good clinical judgment, logical approach to patient problems, a cost effective approach and consideration of the ethical issues in patient management.<sup>5</sup>

In this manuscript we focus on the present status of gastroenterology training centers in the Islamic Republic of Iran, characteristics of the subspecialty training curriculum and discuss our main challenges in this field.

## MATERIALS AND METHODS

We reviewed all documents regarding the first gastroenterology training centers established that were available from Tehran and Shiraz Universities of Medical Sciences and related archives from the Ministry of Health and Medical Education, the Iranian Association of Gastroenterology and Hepatology (IAGH), and published news and articles that related to the evolution and progress of gastroenterology and hepatology.

Necessary data from all approved gastroenterology training centers during the last 30 years were collected by the completion of a questionnaire which included: the date of establishment, number and ranking of academic staff, number of fellows admitted per year, the type, number and quality of equipment and procedures, presence of an approved research center, and the methods of training and evaluation in their curriculum. The data was discussed in a focus group that consisted of 15 expert gastroenterologists in the fields of education and research, in addition to the views of pioneers in this field, over two different sessions after which a consensus opinion was obtained.

## RESULTS

### Evolution of gastroenterology training in the Islamic Republic of Iran

Prior to establishment of subspecialty wards, the care of patients with gastrointestinal and liver diseases was the duty of an internist with gastroenterology expertise or colleagues graduated in gastroenterology subspecialties from Europe and the United States. Onset of training in this field started with a fellowship program of one year duration in a few universities. The first gastroenterology ward was established in the Department of Medicine at Shariati Hospital in Tehran in 1974. The admission and graduation process in this program was university-based with no national decision. After the 1979 Islamic revolution there was a national

trend for increasing the number of physicians to compensate for increased demand due to a manpower shortage in the health care delivery system. Thus, the number of students and general physicians admitted in medical schools and university teaching hospitals for general medicine and specialty training programs gradually increased over the next ten years after the revolution.

Following the adequate number of certified programs in general internal medicine with graduation of more internists in subsequent years; multiple curriculums for subspecialty programs were designed by a task force in the Iranian Council for Graduate Medical Education. The subspecialty programs in the different fields of internal medicine like endocrinology, rheumatology, nephrology, hematology, pulmonology, and cardiology were gradually established in the six main medical schools across the country beginning from 1985.

The gastroenterology fellowship program was approved at 1987. The curriculum for gastroenterology and liver disease subspecialty was a two years program and four university hospitals (Nemazee in Shiraz; Shariati, Imam Khomeini and Taleghani hospitals in Tehran) were accredited as training centers by the Ministry of Health and Medical Education. During the next 15 years these four centers were the only centers for training gastroenterologists in Iran. After training an adequate number of gastroenterologists with their employment in other universities across the country, the establishment of new GI training centers was made possible. During the last five years, seven additional GI training programs have been accredited by the Ministry of Health and Medical Education and currently there are 11 GI subspecialty training programs in Iran (Table 1).<sup>1</sup>

A one year advanced endoscopy fellowship program has recently been offered by the gastroenterology center at Shariati Hospital, Tehran University of Medical Sciences. This program is specially designed for training

junior staff from recently established training centers in the country.

Another major development in the discipline of gastroenterology during the last 15 years in Iran was the establishment of gastroenterology research centers within the already established gastroenterology training programs.<sup>2,6</sup>

The quality of research activities also improved significantly following additional budget allocation by the government which increased the number of scientists in this field and enabled more collaborative work at the international level. The opportunity to do clinical research as part of a gastroenterology training program became available for those attending and interested fellows. The number of published paper in gastroenterology and hepatology have increased from 15 per year in 1995 to 250 per year in 2010.<sup>7</sup>

In addition to gastroenterology subspecialty trained physicians, a substantial proportion of internists are also interested in practicing in this field. The majority are members of the Iranian Association of Gastroenterology and Hepatology (IAGH) which was established at 1994. Regarding manpower status at the present time, there are about 350 adult gastroenterologists with subspecialty degrees and more than 1100 internists with gastroenterology interests.<sup>7</sup>

### The Gastroenterology and hepatology training Centers

There are 11 gastroenterology training centers with 94 trainer and 65 trainees with ratio of 1.36 (Table 1). The number of hospital beds, academic staffs, trainees and facilities are gathered in table 1. As showed in the table 1, there are 4 centers with facilities for advanced endoscopy training after gastroenterology subspecialty, and there are three centers which have liver transplant program.

The number and type of procedures which are mandatory to be performed in gastroenterology training centers are collected in table 2.

**Table 1: Adult gastroenterology and hepatology training centers in the Islamic Republic of Iran (2010).**

University (Establishment)	Main Hospital(s)	Number of Hospital Beds (Total 356)	Number of Trainers (Total 94)	Academic Rank			Number of Trainees (Total 65)	Trainer/Trainee Ratio (94/65=1.36)	Facilities for Training the Second Level Gastroenterology Training					
				Professor (20)	Associate Professor (23)	Assistant professor (51)			EUS	Therapeutic Endoscopy	ERCP	GI Motility Disorders	Liver TX Program	Enteroscopy
Tehran (1987)	Shariati	30	16	5	7	4	12	1.33	+	+	+	+	-	+
Tehran(1987)	Imam Khomeini	31	7	2	2	3	8	0.87	+	+	+	+	+	+
S. Beheshti(1987)	Taleghani	70	7	2	1	4	12	0.75	+	+	+	+	+	+
Shiraz(1987)	Nemazee, Faghihi	18	11	2	3	6	6	1.83	+	+	+	+	+	+
Guilan (2005)	Razi	21	9	0	3	6	5	1.8	-	+	+	-	-	-
Mashhad (2005)	Ghaem, Imam Reza	48	10	3	1	6	6	1.66	-	+	+	+	-	+
Isfahan (2006)	Al-Zahra	36	5	0	2	3	4	2.25	-	+	+	-	-	-
Tabriz (2008)	Imam Khomeini	38	8	4	0	4	4	2	+	+	+	-	-	-
Ahwaz (2008)	Golestan	35	9	1	0	8	4	1.25	-	+	+	-	-	-
Baghievatallah (2008)	Baghievatallah	25	6	1	2	3	2	3	-	+	+	-	-	-
Iran (2009)	Rasool Akram, Firoozgar	23	6	0	2	4	2	3	+	+	+	+	-	-

The duration of gastroenterology training program is 2 years, and the duration of internal medicine specialty program is 4 years. 36 persons admit in this subspecialty program each year. The other characteristics of this program are shown in table 3.

The expected competencies which should be attained by fellows are shown in table 4. The usual educational activities are shown in table 5.

The core procedures which should be done by each fellow for development of practical and endoscopic capabilities are shown in table 6.

**Table 2: Type and number of different procedures in GI training centers in the Islamic Republic of Iran during the 2008-2009 academic year.**

University And/ Or Center	Liver Biopsy	UGIE	Colonoscopy	Control of Non Variceal UGIB	Management of Variceal UGIB	PEG Insertion	Polypectomy	Esophageal Dilatation	Ambulatory PH Monitoring	Esophageal	ERCP	EUS
Tehran Shariati's	400	3200	1700	300	400	40	150	200	60	164	400	1000
Tehran Imam Khomeinin	283	3331	845	385	207	11	46	160	ND	ND	369	250
Shahid Beheshti	70	2208	1500	144	100	36	120	60	104	279	305	180
Shiraz	250	5000	2000	600	230	150	200	100	ND	ND	300	115
Mashhad	180	5000	900	270	270	35	180	270	ND	ND	900	ND
Isfahan	95	6835	1140	530	483	31	125	25	ND	ND	ND	ND
Tabriz	144	3608	1296	223	120	47	67	144	ND	ND	518	95
Ahwaz	30	2500	1300	150	220	50	60	20	30	30	150	ND
Guilan	120	2649	1235	248	248	30	100	30	ND	ND	ND	ND
Iran	600	3200	1180	380	260	140	ND	100	ND	ND	ND	96
Baghievatallah	ND	ND	ND	150	150	ND	150	50	ND	ND	350	50
Total	2172	37531	13096	3380	2688	570	1198	1159	194	473	3292	1786

ND = Not Determined, ERCP=Endoscopic Retrograde Cholangiopancreatography, EUS=Endoscopic Ultrasound, UGIE= Upper Gastrointestinal Endoscopy, UGIB= Upper gastrointestinal Bleeding

**Table 3: Adult gastroenterology and hepatology training curriculum in the Islamic Republic of Iran.**

Characteristics	Information
Internal medicine residency program	4 years
Number of admission for internal medicine training program	280 persons
Duration of Gastroenterology and hepatology training	2 years
Number of admission per year	36 persons
Type of admission and graduation process	National
Entry admission process	Written exam (MCQ) and OSCE
Graduation process	Written exam (MCQ) and OSCE
Minimum academic staff for each GI training program	5 gastroenterologists

**Table 4: Competencies of graduates of gastroenterology and hepatology fellowship program.**

1. Analysis the patient's problems
2. Select the suitable diagnostic methods
3. Reach the correct diagnosis
4. Avoid from unnecessary diagnostic modalities
5. Suggest the suitable therapeutic plan
6. Teach the patient and people with related disease
7. Design the preventive measures as needed
8. Follow the patients correctly
9. Manage the outpatient, endoscopy room and inpatient wards correctly
10. Document the patient's information and report it correctly as needed
11. Design the research protocols as needed
12. Perform and manage the research projects
13. Participate in continuous professional development of health personnel
14. Explain the reason, and complications of the procedures for obtaining correct consent from patient
15. Discuss the results of different diagnostic procedures
16. Use cost effective strategies in diagnosis and management of patients
17. Use evidence based principles in his/her diagnostic and therapeutic decisions
18. Report the results of research projects properly
19. Renew him/herself information timely and correctly
20. Perform the required procedures in curriculum at the level of subspecialty (table 5)

**Table 5: Educational activities in adult GI subspecialty training program in the Islamic Republic of Iran.**

Educational Strategies	Usual educational Activities	Usual Frequency
Student-Center	Grand Round	Weekly
Training by Research	Journal Club	Weekly
Problem-Solving	Management Conference	Weekly
Small-group discussion	Case Discussion	Weekly
Competency-based	Didactic Lecture	Every 1-2 weeks
Integration	Clinical and pathological Conference (CPC)	Every 1-3 Months
	Inpatient Management	Everyday
	Outpatient Management	Weekly program
	Inpatient Consultation	On demand
	Teaching the undergraduate students	Everyday

**Table 6:** Educational activities in adult GI subspecialty training program in the Islamic Republic of Iran.

Procedure	Minimum Required Number for a Fellow	Year 1	Year 2
Liver biopsy	50	X	X
Esophagogastroduodenoscopy	200	X	X
Endoscopic control of variceal bleeding	30	X	X
Endoscopic control of non variceal UGI bleeding	50	X	X
Esophageal manometry	15	-	X
Ambulatory PH monitoring	15	-	X
ERCP	50	-	X
Esophageal dilation	15	-	X
Colonoscopy	100	X	X
Polypectomy	20	-	X
PEG insertion	5	-	X
Enteroscopy	5	-	X
Esophageal stent placement	5	-	X
Anorectal manometry	5	X	X

UGI; Upper Gastrointestinal Bleeding

ERCP; Endoscopic Retrograde Cholangiopancreatography

PEG; Percutaneous Endoscopic Gastrostomy

## DISCUSSION

The Gastroenterology Training Program started in 1987 with four centers and currently there are 11 centers. Therefore, regarding the background and number of gastroenterology training centers it can be said that our country has an acceptable level.<sup>6,8</sup> These centers are training 35-40 gastroenterologists per year. In India, there are 12 training centers, with 50 gastroenterologists trained per year.<sup>9</sup> There is no GI training in private hospitals such as India, therefore all centers for training gastroenterologists are in public hospitals which belong to the main universities.<sup>9</sup>

The total number of gastroenterologists in our country is 350 (0.5/100,000 population).<sup>7</sup> There is a wide variety of distribution of gastroenterologists in different parts of the world, even in developed countries. The number of gastroenterologists per 100,000 of differs between the United States (3.9), France (3.48), Australia (2.1), Canada (1.83) and United Kingdom (1.41).<sup>10</sup>

In addition to the smaller number of GI manpower, the centers for advanced GI pro-

cedures are located in the capital city of Tehran (five centers) and in six large cities, Shiraz and Ahwaz (south), Mashhad (north-east), Isfahan (central), Tabriz (north-west) and Rasht (north). Although these are the referral centers for other parts of the country, however similar manpower status and advanced facilities for the management of complex gastrointestinal disorders are not present in many other cities. There are 32 provinces in the country and there is a need to increase the number of advanced diagnostic and therapeutic GI centers to cover the entire country in a timely fashion. We may need to establish another four subspecialty training centers for covering the needs of the east and south-eastern parts of the country and facilities for management of common GI diseases as well as training upper endoscopy and colonoscopy procedures to internists in at least 15-20 centers in the next 10-15 years. There are 94 academic staff and 65 trainees in these 11 training centers, with an academic staff trainee ratio of about 1.4. The American Gastroenterology Association core curriculum has suggested 1:1.5 (0.66) for the proportion

of academic staff to GI fellows.<sup>11</sup> According to the last revision of the core curriculum by the Ministry of Health and Medical Education at least five gastroenterologists should be present to accredit a GI department as a training center.<sup>12</sup> Regarding the number of academic staff (5-14) and the relation to GI fellows (0.75-2.25), all centers have more than the standard number of faculty.<sup>12</sup> Fifty four percent of the academic staff are junior staff and in assistant professor positions. Also, as shown in Table 1, few centers need to be equipped with advance endoscopic diagnostic and therapeutic equipment such as endoscopic ultrasound, enteroscopy, and a GI motility lab.

The duration of most GI subspecialty curriculums in the world is three years<sup>3,8</sup> following a three year internal medicine curriculum. However in Iran, internal medicine training is four years and the GI subspecialty curriculum is only two years. According to AGA core curriculum the training of gastroenterology has been divided in two levels. The first level consists of 18 months of clinical training in general gastroenterology and a six month period for research.<sup>11</sup> In the third year of fellowship, more time and freedom is available for GI fellows to be trained in advanced and complex procedures, and patient management. Therefore two years training may be adequate for the practice of general gastroenterology in health care delivery services in remote districts and small towns across the country but it is not sufficient to train fellows for referral centers which should provide more advanced subspecialty services.

There is a need to establish subspecialty fellowship courses in the fields of advanced therapeutic endoscopy, hepatology/liver transplantation, nutrition and gastrointestinal motility disorders for board-certified gastroenterologists. Such sub-specialty fellowship courses have been instituted in the US universities since 15-20 years ago.<sup>13-15</sup>

The one year course of advance endoscopy fellowship recently offered by Shariati Hospital/ Tehran University of Medical Sciences is a step forward to respond to this need.

The administrative process of fellow admission and graduation differs in different countries. Most programs have local administrative process which usually takes place in the department of Gastroenterology.<sup>8</sup> The entry and graduation of GI fellows in Iran is central and is under supervision of the Ministry of Health and Medical Education.

This examination usually is in the form of written multiple choice questions (MCQ) and an Objective Structured Clinical Examination (OSCE). The admission process is based on the ranking grades of participants. For the graduation exam the minimum pass level is 70%. At the present time the entrance evaluation process does not involve the study background, capabilities and attitudes of participants, as well as ethical or professional responsibilities. It seems the selection of trainees is only knowledge based which is not fair and not an ideal selection process. This step of training needs more attention and correction of the admission process.

Regarding educational strategies as well as teaching and learning methods, different methods are performed in all centers. Weekly, GI fellows have many formal teaching sections with faculty. In the new curriculum, trainee evaluation should be performed by different evaluation methods such as OSCE, written exam, case based discussion (CBD), log book, portfolio and a 360 degree evaluation.<sup>8,12</sup> Although at the present time the evaluation of skills and attitudes in GI fellows are very limited in a few centers. Newer methods of evaluation should be used for improving knowledge of fellows and the quality of education in this field. For improvement of education, special programs should be scheduled for training the trainers by experienced colleagues.

The estimation of manpower needs and defining the admission capacity of each center is a complex phenomenon.<sup>9</sup> At the present time, the annual admission capacity depends mostly on the attitudes of experienced colleagues and has no well-designed and acceptable needs assessment process. The number of admissions should be adjusted according to their future roles in different parts of the country. We do not have adequate facilities for doing ERCP, EUS, PH monitoring and manometry in the all cities, thus most of the graduates' main responsibilities are diagnostic and therapeutic upper GI endoscopy, lower GI evaluation and management of simple problem cases.

In addition to subspecialty training in gastroenterology in these centers, the academic staff are responsible for treatment services of admitted patients in the hospital, training of undergraduates and postgraduate students, and research and science production. According to our experiences, each academic staff supervises or performs 25-30 endoscopic procedures, in addition to 40-50 outpatient and inpatient visits per week. So, by considering the multiple duties of the academic staff there is inadequate time for research and continuous professional development. We need to lessen the different duties of academic staff or use full time services for improving research abilities and continuous professional development of these staff members.

We suggest multidisciplinary competency based courses for assistant professors in order to improve skills, educational and research activities. Due to short duration of GI fellowship, we need implementation of post subspecialty programs for completing the required capabilities of fellows.

A special program should be scheduled for the weekly programs of academic staff in education, management and research activities. The admission process of fellowship program should be changed for involvement of compe-

tencies and previous grades of the examinees. We recommend flexibility not only in content and duration of GI and hepatology training in Iran but also in our national rules for equipping gastroenterologists in different medical centers, so that those who interested to teaching, research, or clinical practice can pursue this, with sufficient career opportunities after completion the relevant training.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

### REFERENCES

1. Saberi-Firoozi M, Mir-Madjlessi SH. Development of gastroenterology and hepatology in Iran: part I-training programs and the Iranian association of gastroenterology and hepatology. *Arch Iran Med* 2009;**12**:425-31.
2. Saberifiroozi M, Mir-Madjlessi SH. Development of gastroenterology and hepatology in Iran: Part II- advances in research and therapeutic modalities. *Arch Iran Med* 2009;**12**:516-25.
3. Bisschops R, Wilmer A, Tack J. A survey on gastroenterology training in Europe. *Gut* 2002;**50**:724-9.
4. Multisociety Task Force, Friedman LS, Brandt LJ, Elta GH, Fitz JG, Gores GJ, et al. Report of the Multisociety Task Force on GI training. *Hepatology* 2009;**50**:1325-9.
5. American Association for the Study of Liver Diseases, American College of Gastroenterology, AGA Institute, American Society for Gastrointestinal Endoscopy. A journey toward excellence: training future gastroenterologists--the gastroenterology core curriculum, third edition. *Am J Gastroenterol* 2007;**102**:921-7.

6. Malekzadeh R, Dehpour AR. Report from Iran. *Liver Int* 2008;**28**:1136-9.
7. Malekzadeh R, Saberifiroozi M, Mirnaseri M. The science and practice of Gastroenterology and Hepatology in Iran: Report of Iranian Association of Gastroenterology and Hepatology 2010. (inpress).
8. Telleman H, Burgr TF, Mulder CJ. Evolution of gastroenterology training. *World J Gastroenterol* 2009;**15**:1793-8.
9. Tandon R. Progress of gastroenterology in India. *Indian J Gastroenterol* 2007;**26**:31-4.
10. Moayyedi P, Tepper J, Hilsden R, Rabeneck L. International comparisons of manpower in gastroenterology. *Am J Gastroenterol* 2007;**102**:478-81.
11. AGA core curriculum 2007 revision, [http://www.gastro.org/2007\\_Version\\_Core\\_Curriculum.pdf](http://www.gastro.org/2007_Version_Core_Curriculum.pdf)
12. The Adult Gastroenterology and Hepatology Curriculum, Ministry of Health and Medical Education, Islamic Republic of Iran, <http://cgme.behdasht.gov.ir>, 2008 version
13. Khashab M, Al-Haddad M, Fogel E. Applying for therapeutic endoscopy fellowship. *Gastrointest Endosc* 2008;**68**:337-8.
14. Kowalski T, Kanchana T, Pungpapong S. Perceptions of gastroenterology fellows regarding ERCP competency and training. *Gastrointest Endosc* 2003;**58**:345-9.
15. Sivak MV Jr. Trained in ERCP. *Gastrointest Endosc* 2003;**58**:412-4.