

Workforce Study of Hepatology

Final Report

Prepared for:

**American Association for the Study of Liver
Diseases**

Prepared by:

The Lewin Group

Paul F. Hogan

Colleen Hirschhorn

Tim Dall

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Appendix A: Practitioner Survey and Response

Appendix B: Program Director Survey and Response

1. INTRODUCTION

The American Association for the Study of Liver Diseases has sponsored a workforce study of hepatologists. Hepatologists are board certified or board eligible gastroenterologists who specialize in liver disease. As an operational definition, hepatologists are gastroenterologists for whom 50% or more of their patient mix consists of patients with liver disease. Transplant hepatologists specialize in patients who require a liver transplant. They care for patients before, during, and after a liver transplant.

The purpose of this study is to obtain a better understanding of treatment and referral patterns of practitioners who are caring for patients with liver disease; the formal training of these practitioners; and the programs which prepare practitioners to care for patients with liver disease. Relatively little is known about treatment and referral patterns, the degree of specialization within gastroenterology in patients with liver disease, and the typical manner by which patients with progressive liver disease, leading to listing for a liver transplant, are treated. Little is also known about the training of those who are treating patients with liver disease. This study attempts to address these areas. As such, its primary purpose is the exposition of information in these areas, rather than broad assessments or conclusions.

The primary sources of information for this study are two surveys that were conducted for the study. The first was a survey of practitioners. Gastroenterologists, hepatologists, and transplant hepatologists were surveyed. Information regarding their practice, referral, and treatment patterns for patients with liver disease, training in hepatology, and overall demand were included. The second survey was targeted to directors of fellowship programs in gastroenterology. Program directors were asked to provide information regarding the hepatology training of fellows in gastroenterology. In particular, the training provided in hepatology and transplantation hepatology, as part of the gastroenterology fellowship, are explored.

2. METHOD

The hepatology workforce analysis is based largely on the results of two mail surveys: a practitioner survey and a survey of program directors. The purpose of the practitioner survey was to obtain a better understanding of the training of current practitioners, and the treatment and referral patterns of patients with liver disease. The primary purpose of the program director survey was to obtain better information regarding current training in advanced hepatology and transplantation hepatology within the gastroenterology fellowship.

2.1 Practitioner Survey

The sampling frame for the practitioner survey consists of three groups:

- the membership of the American Gastroenterological Association (AGA);
- the membership of the American Association for the Study of Liver Diseases (AASLD); and
- the membership of the United Network of Organ Sharing (UNOS).

The physicians from the AGA sampling frame will be gastroenterologists, but will not necessarily be gastroenterologists who specialize in patients with liver diseases. From the

AASLD membership list, physicians will also be gastroenterologists, but will also be more likely to have a special interest in patients with liver diseases. That is, a significant number are likely to be hepatologists. Finally, physicians from the UNOS list are likely to be gastroenterologists who are also transplantation hepatologists. Because we are interested in the practice and referral patterns of general gastroenterologists, hepatologists, and transplantation hepatologists, we use all three sampling frames.

The practitioner survey is targeted to physicians who are board certified, or board eligible, in gastroenterology and who actively care for patients. From the American Board of Internal Medicine, we obtained a list of all physicians who have been certified in gastroenterology.¹ We matched this list to each of the three membership lists. We drew most of the sample from those for which there was a match with the certification list. However, we also sampled, at a lower rate, those which we could not match. We did this for two reasons. First, we did not want to systematically exclude physicians who had recently completed their fellowship and who were board-eligible but not yet certified. Second, our ability to match is less than perfect. Some physicians may have changed their names since certification, through marriage, for example, or there may be slight variations in the spelling of the name.

In the practitioner survey, we ask two “qualifying” questions to the respondent because our information from the sampling frame is imperfect. We ask whether they are board certified or board eligible; and we ask whether they have been engaged in any direct patient care. Those who answer “yes” to both questions are “qualified” and asked to complete the survey. All others are asked to return the survey after completing only those two questions.

An initial pilot test survey was sent to a sample of 100 practitioners. No changes to the surveys were made based on the pilot test. Completed pilot test surveys were pooled with other respondents for analysis.

After an initial survey was mailed to the sample of practitioners and to all program directors, a follow-up survey was sent to non-respondents after about two weeks. The second survey mailing was followed by a telephone call. A final, third mailing, was sent to those who did not respond after the telephone call.

Table 2.1 shows the number sampled, the number “qualified” and the response rates. Overall, the response rate to the practitioner survey was 42%. A total of 321 physicians were qualified and completed the entire survey. This was 30% of the total practitioners sampled. A total of 337 surveys were completed by qualified practitioners when the results of the test mailing were included.² In addition, there were approximately 59 (including 1 from the pilot test) respondents who were qualified and completed some, but not all, of the survey. Their responses are used in

¹ The list of physicians who are certified in gastroenterology could not be used directly as a sampling frame because the address information was not necessarily up to date.

² No follow-up was conducted on the test survey sample. Hence, the response rates are low. The following table shows the response for the pilot test survey:

Pilot Test Responses				
	AGA	AASLD	UNOS	1. Total
Sent	44	38	18	100
Returned	8	11	6	25
Qualified	5	6	6	17
Qualified/Complete	5	6	5	16

some of the analyses. If these are included, there may be as many as **396** usable responses to a survey question.

**Table 2.1
Practitioner Survey: Sample and Response**

	AGA	AASLD	UNOS	Total
No. in Sample Frame	4694	912	480	6086
Sent	469	448	170	1087
Returned	157	225	79	461
Qualified	151	152	76	379
Qualified/Complete	126	124	71	321

Response rates are shown in *Table 2.2*. The highest response rate was from the AASLD membership list, where approximately 50% of those sampled responded. Unfortunately, respondents from the AASLD list were less likely than others to be both board certified or board eligible in gastroenterology and actively engaged inpatient care. Of respondents, 32% from the AASLD list did not satisfy the qualification criteria, compared to only about 3% from the AGA list and about 2% from the UNOS list.

**Table 2.2
Practitioner Survey: Response Rates**

	AGA	AASLD	UNOS	Total
Returned	33%	50%	46%	42%
Qualified	32%	34%	45%	35%
Qualified/Complete	27%	28%	42%	30%

All qualified respondents were asked a set of questions regarding demographic characteristics, education and training, work experience and practice setting. Then, respondents were asked to categorize their practice as primarily in one of four areas: internal medicine, primarily gastroenterology, hepatology without transplantation hepatology, and hepatology with transplantation hepatology at a transplant center. The criterion for a hepatology practice, as opposed to a gastroenterology practice that includes patients with liver diseases, was that 50% or more of the practice entailed caring for patients with liver disease. Respondents were directed to separate sections for general gastroenterology/internal medicine, hepatology, and hepatology with transplantation hepatology depending upon their response. Questions in these sections were specific to the practice type and concerned patient care workload, referral patterns and factors affecting referrals.

A copy of the practitioner survey instrument and a tabulation of responses are in Appendix A.

2.2. Program Directors Survey

The survey of program directors of gastroenterology fellowship programs was intended to be a census of all programs in the United States and Canada. A list of 191 programs and program directors was obtained from American Gastroenterological Association (AGA). The response rate is indicated by *Table 2.3*.

Table 2.3
Program Directors’ Survey: Respondents and Rates

	Sent	Returned	Qualified	Completed
Number	191	105	105	103
Rate		55%	54%	54%

A copy of the program director survey instrument and tabulated responses are in Appendix B.

3. RESULTS OF THE PRACTITIONER SURVEY

The initial section of the survey “qualified” the respondent. To qualify, the respondent had to be board certified or board eligible in gastroenterology and the respondent must be engaged in some direct patient care. Qualified respondents were asked to describe their practice primarily as one of the following:

- internal medicine
- gastroenterology
- hepatology without transplantation hepatology
- hepatology with transplantation hepatology
- other

In *Table 3.1*, we show the distribution of qualified respondents by both the sampling frame (membership list) from which the respondent was drawn, and by the type of practice of the respondent.

Table 3.1
Distribution by Practice Type

	AGA	AASLD	UNOS	Total
Internal Medicine	5	4	0	9
Gastroenterology	139	82	5	226
Hepatology w/o transplant	4	39	3	46
Hepatology w/transplant	0	15	67	82
Other	6	15	5	26
Total	153	156	80	389

Of the qualified respondents to the survey, 226 classified their practice as primarily gastroenterology, and 82 described their practice as primarily hepatology with transplantation at a transplant center. Somewhat surprisingly, only 46 respondents characterized their practice as primarily hepatology. Even within the AASLD sampling frame, only 25% of qualified respondents described their practice as primarily hepatology without transplantation hepatology. As part of the survey question, we defined a hepatology practice as one where more than 50% of the practice is spend caring for patients with liver disease. It may be that qualified practitioners

who are members of AASLD but who described their practice as gastroenterology may not satisfy that definition, but they may still care for a larger proportion of patients with liver disease than do other gastroenterologists. We examine this question below.

In general, the greater the sample size, the more precise are the estimates made from the sample responses. In the practitioner survey, we are interested in responses from three distinct groups of practitioners: gastroenterologists, hepatologists without transplant hepatology, and hepatologists with transplant hepatology. The sample size for hepatologists is the smallest. For a simple yes/no question, the standard error of the gastroenterologists will be less than 3 percentage points (sample size of 226); the standard error for hepatologists will be less than 7 percentage points (sample size of 46); and the standard error for hepatologists with transplantation will be less than 5.5 percentage points. This means, for example, that if we estimate based on the sample that 50% of gastroenterologists refer patients to hepatologists, the probability that the true percentage is between 45% and 55% is 0.9.

3.1. Demographic Characteristics and Fellowship Training

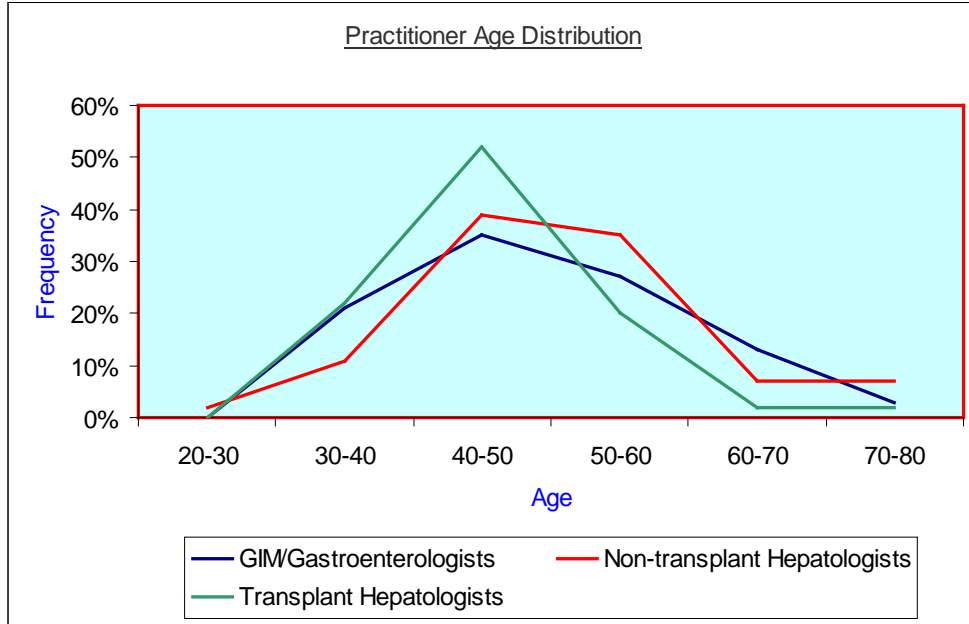
The demographic characteristics of qualified physicians in the sample, by type of practitioner, are shown in **Table 3.2** below. Transplantation hepatologists are, on average, about five years younger than other physicians. The average age of the other practitioners is about the same, between 49 and 50 years. About 89% of gastroenterologists in the sample are male. Transplantation hepatologists also have the highest proportion of males, at 91%, while 84% of hepatologists without transplantation hepatology are male.

Table 3.2
Age and Sex

Physician type	Average age (years)	Percent Male	N
Internal Medicine	49.8	78%	9
Gastroenterology	49.1	89%	226
Hepatology w/o transplant	50.1	84%	46
Hepatology w/transplant	45	91%	82
Other	48.8	73%	26
All	48.8	88%	389

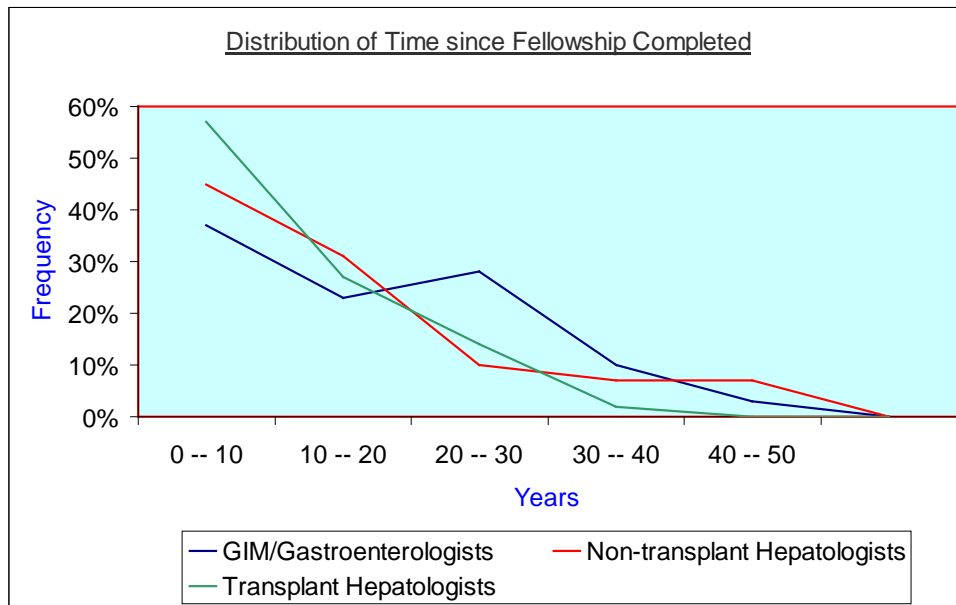
The age distribution of gastroenterologists (and internists), hepatologists, and transplantation hepatologists that responded to our survey is shown in **Figure 3.1**. The shape of the age distribution is similar for the three, with the exception that transplantation hepatologists are shifted toward younger ages.

Figure 3.1
Age Distribution of Practitioners



The following diagram, **Figure 3.2**, shows the distribution of practitioners by the number of years since they completed their fellowship training. Transplantation hepatologists have completed fellowships most recently, consistent with the age distribution of the practitioner types.

Figure 3.2
Distribution of Practitioners by years Since Completing Fellowship



Most of the respondents are graduates of U.S. or Canadian medical schools. Only about 11% of respondents are international medical school graduates (IMGs). Transplantation hepatologists have the highest portion of IMGs, at 16%. This, however, is probably a “vintage” effect. The proportion of IMGs pursuing a fellowship has been increasing over time among all specialties.³ Because transplantation hepatologists are younger, on average, than other practitioners, they have completed their fellowship more recently, when the proportions of IMGs were higher. There is little variation in the average length of fellowship training across the practice types. Both the proportion of IMGs and the average length of training are shown in **Table 3.3**.

Table 3.3
Percentage IMG and Average Fellowship Length

Physician type	Percent IMG	Fellowship Length (years)	N
Internal Medicine	6%	2.6	8
Gastroenterology	9%	2.5	226
Hepatology w/o transplant	11%	2.7	44
Hepatology w/transplant	16%	2.8	80
Other	14%	2.8	25
All	11 %	2.6	383

We asked respondents to indicate the type of hepatology training they received during their fellowship in gastroenterology. We distinguished three types of training experience:

- GI consultation or clinic. Patients with liver disease will present as part of a typical mix of patients with gastroenterological problems.
- A hepatology dedicated service. This is a service specializing inpatients with liver disease.
- A hepatology and transplant service. This includes transplantation hepatology.

Table 3.4 displays the practitioner by type of training. Not surprisingly, those respondents who classify their practice as primarily hepatology, or hepatology with transplantation hepatology are more likely to have hepatology training that included a dedicated service or a service that included transplantation hepatology. About 53% of transplantation hepatologists were trained in programs that had a dedicated hepatology service with transplantation hepatology.⁴

³ Indeed, program directors report that about 36% of fellowship students have been IMGs over the last five years. See section 4 below.

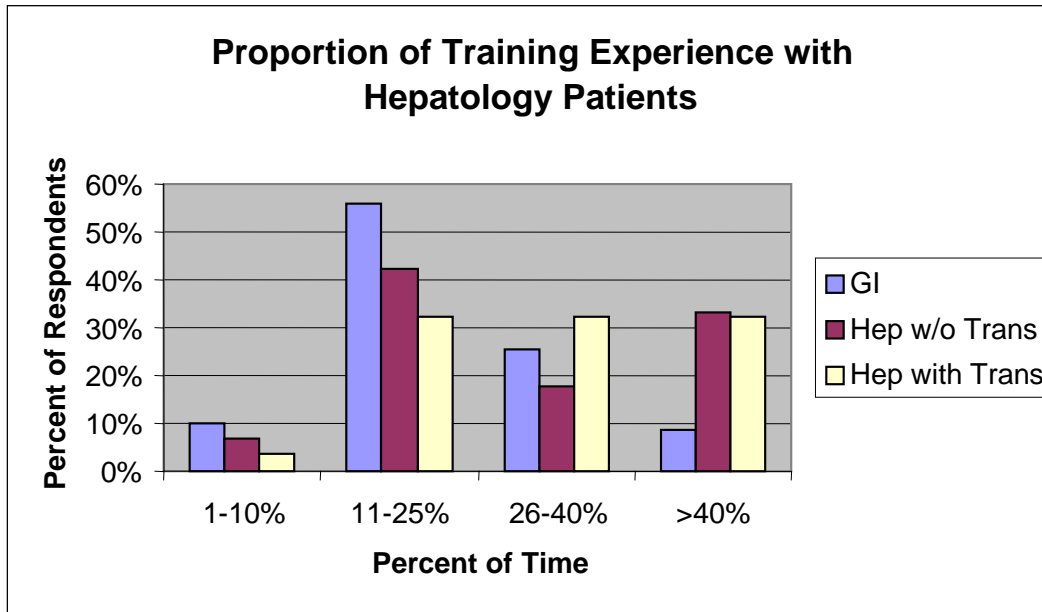
⁴ Please note the small sample size when assessing the internal medicine practitioners.

Table 3.4
Type of Training Experience in Hepatology During Fellowship

Physician type	GI Consultation or Clinic	Hepatology Dedicated Service	Transplant Service	N
Internal Medicine	55%	33%	11%	9
Gastroenterology	77%	9%	14%	226
Hepatology w/o transplant	47%	33%	20%	45
Hepatology w/transplant	32%	15%	53%	81
Other	54%	8%	37%	24
All	62%	13%	24%	385

In *Figure 3.3*, we show the distribution of respondents, by practice type, who reported that the proportion of their fellowship training experience spent treating and evaluating patients with liver disease was between 1-10%, 11 to 25%, 26 to 40% and over 40%. About 30% of hepatologists and transplant hepatologists reported that the proportion of their training time spent evaluating and treating hepatology patients exceeded 40% of their total time with patients. Only about 9% of general gastroenterology practitioners indicated such a high proportion of time spent with hepatology patients.

Figure 3.3
Proportion of Time in Training Treating or Evaluating Hepatology Patients



Finally, 84% of respondents overall reported that their fellowship faculty contained staff with specialized training in hepatology. For hepatologists and transplantation hepatologists, the percentage is over 90%. Results are shown in *Table 3.5*.

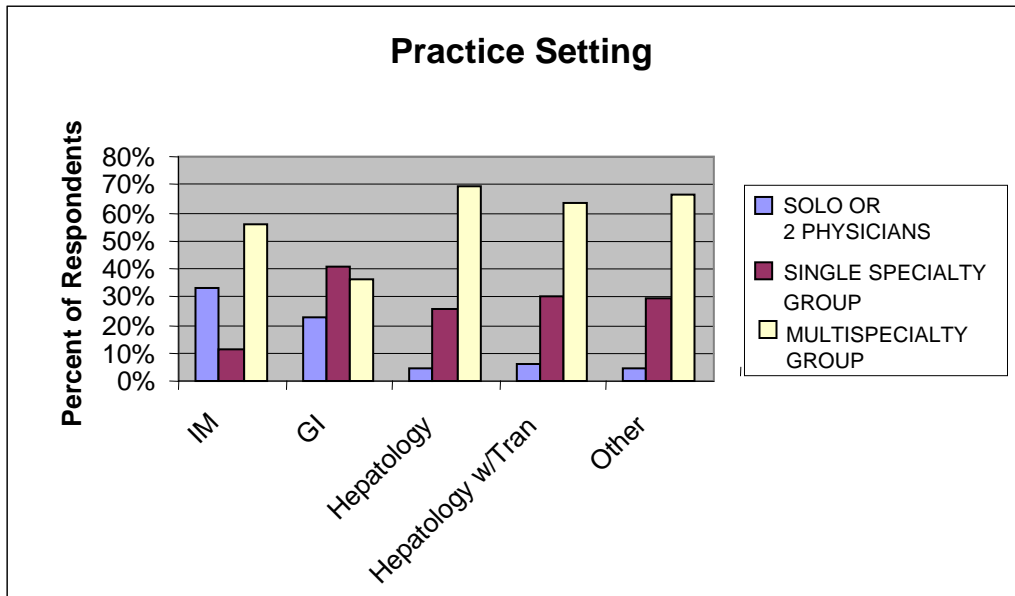
Table 3.5
Percent Reporting That Fellowship Faculty Had Specialized Training

IM	GI	Hep w/oTrans	Hep w/Trans	Other	Total
88%	79%	91%	95%	79%	84%

3.2 Practice Setting and Practice Characteristics

Over 70% of hepatologists and over 60% of transplantation hepatologists practice within a multi-specialty group. Only about 35% of general gastroenterologists practice within a multi-specialty group, while slightly more than 40% of gastroenterologists practice in a single specialty group. This appears to be consistent with a commonsense notion that more specialized physicians will tend to practice in a multi-specialty group.

Figure 3.4
Practice Setting by Practice Type



The following table shows, for those physicians who practice in multi-specialty groups, the average number of physicians in the group, the number of gastroenterologists, and the number of hepatologists. Hepatologists and transplant hepatologists practice in larger average group sizes compared to general gastroenterologists.

Table 3.6
Size of Multispecialty Group and Distribution by Type

Practitioner Type	Avg. Number of Physicians in Multispecialty Group by Specialty			N
	Total Physicians	Gastroenterologists	Hepatologists	
Gastroenterologists	55.4	7.6	1.3	173
Hepatologists	92.6	8.1	2.8	40
Transplant Hepatologists	85.7	12.2	3.9	70
All	65.6	8.8	2.3	303

In part, this can be explained by noting that over 80% of hepatologists and transplantation hepatologists practice at large institutions--a medical school or academic setting-- while most general gastroenterologists practice in a community setting. This is illustrated in *Figure 3.5*

Figure 3.5
Institutional Setting

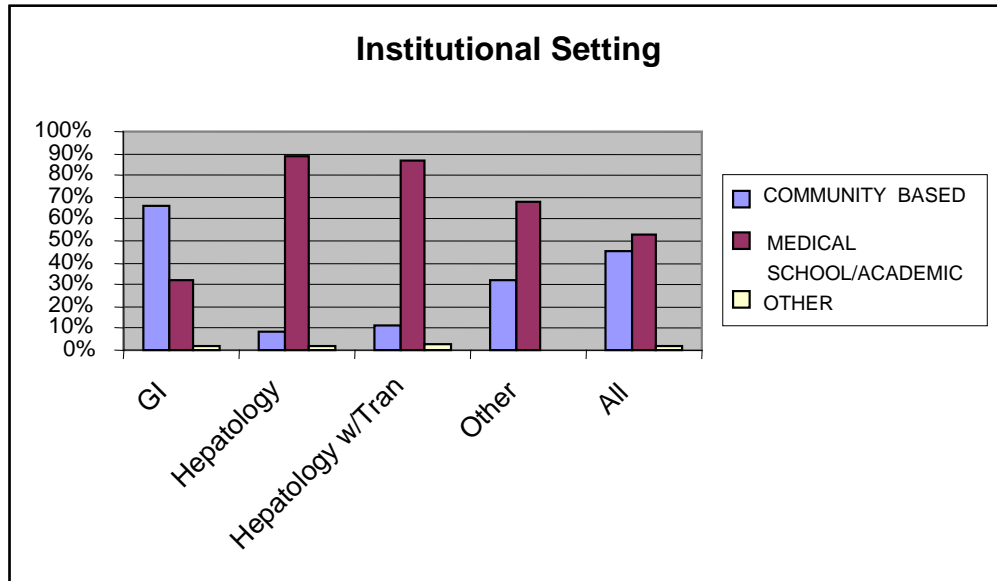
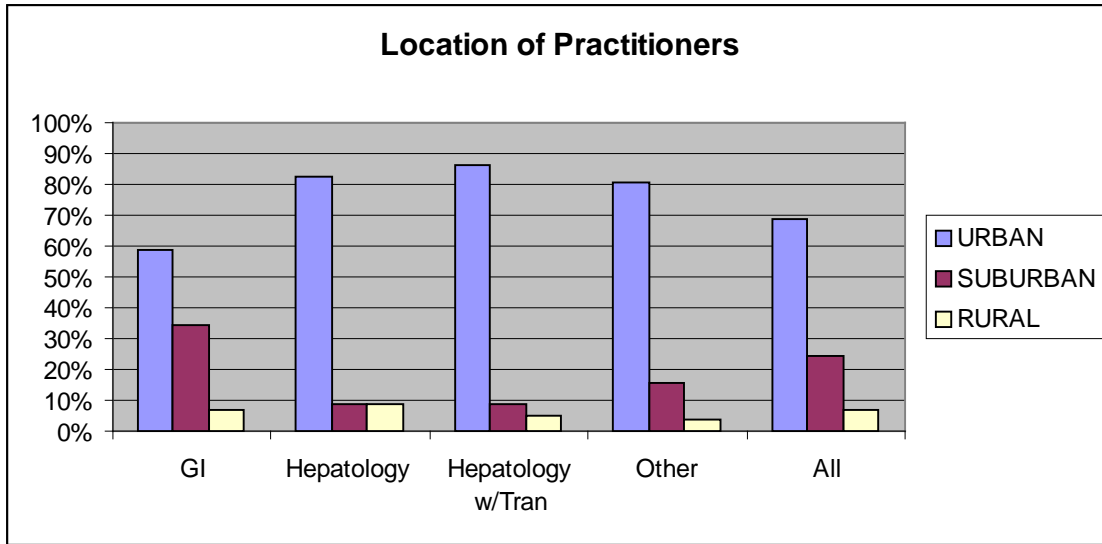


Figure 3.6 shows that about 68% of physicians in the survey practice in urban areas. However, over 80% of hepatologists and transplant hepatologists are located in urban areas. Interestingly, while over 34% of general gastroenterologists practice in suburban areas, less than 10% of hepatologists and transplantation hepatologists are in suburban locations.

**Figure 3.6
Practice Location**



Figures 3.7, 3.8 and 3.9 show the geographic distribution of practitioners responding to our survey across major regions of the U.S. and in Canada. The largest proportion of general gastroenterologists is in the Middle Atlantic states, while the largest proportion of hepatologists is in New England and in the South Atlantic states. There is a higher proportion of total transplantation hepatologists in the East North Central States.

**Figure 3.7
Geographic Distribution of Gastroenterologist Respondents**

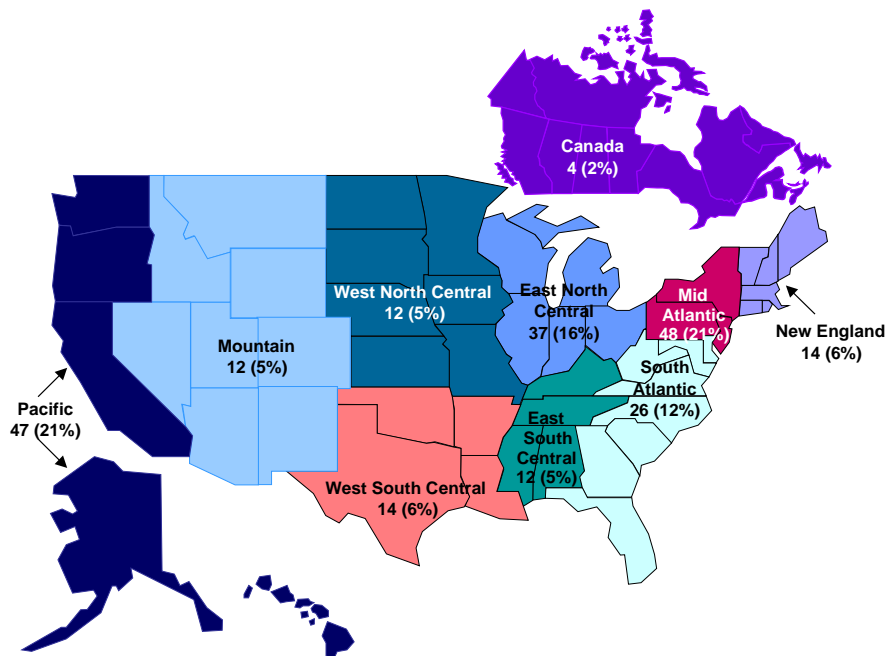


Figure 3.8
Geographic Distribution of Hepatologist Respondents

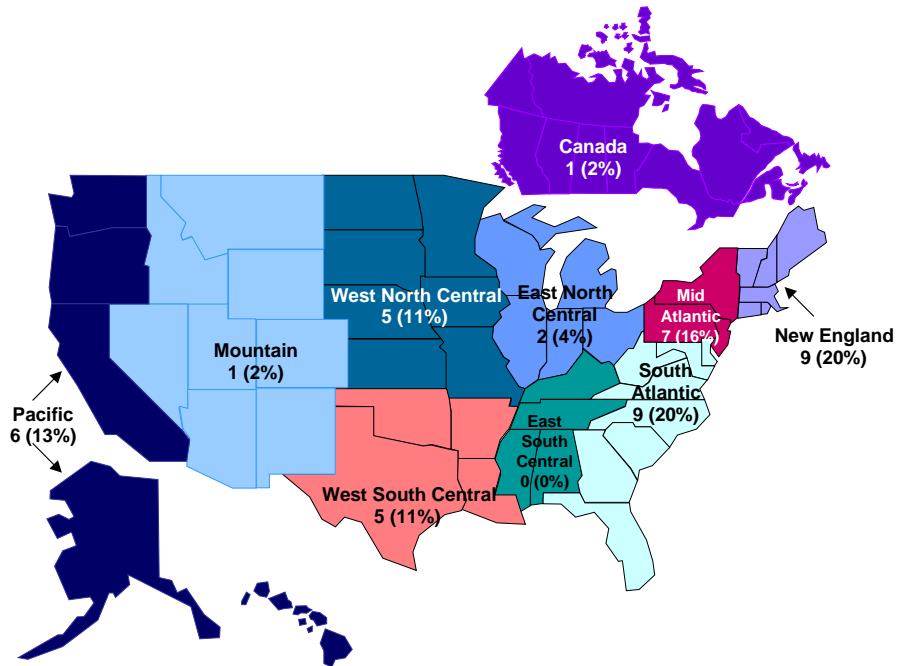
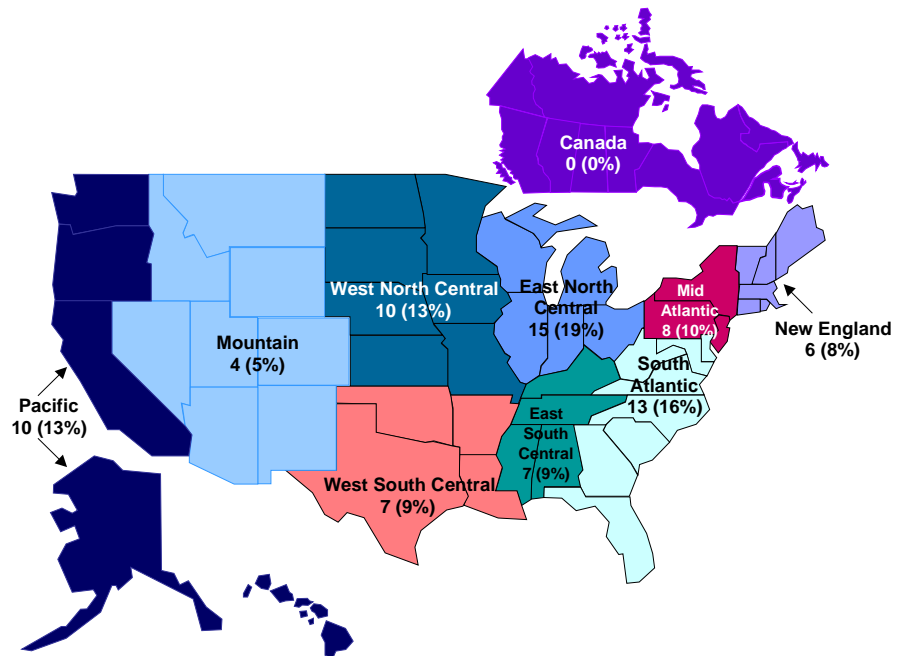


Figure 3.9
Geographic Distribution of Transplantation Hepatologist Respondents



3.3 Work Experience

The following table presents information on the hours and weeks of work, and patient load, of respondents by practice type.

**Table 3.7
Patient Related Working Time**

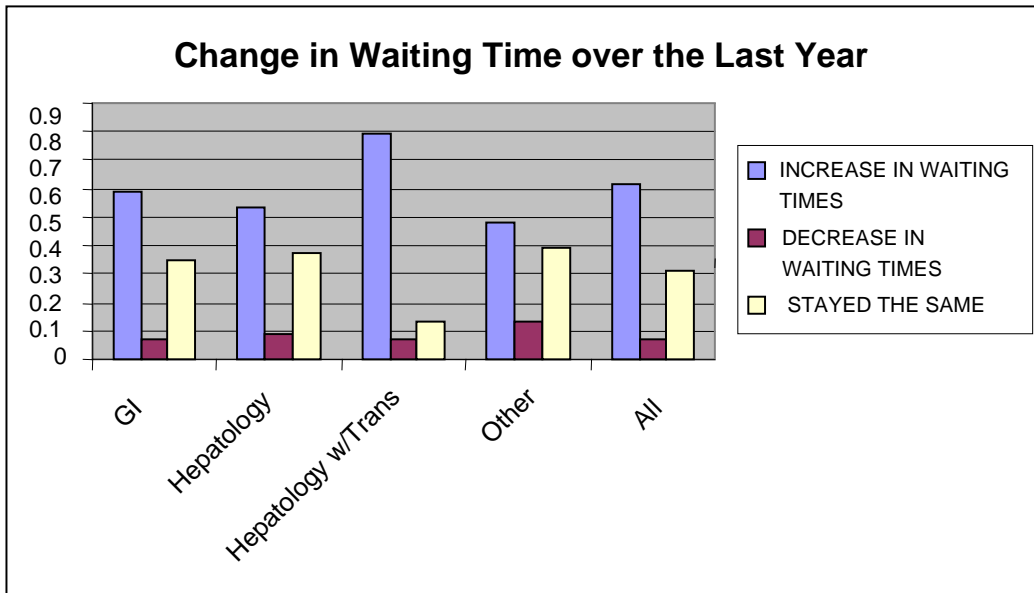
	GI	Hepatology w/o Transplant	Hepatology w/ Transplant	All
Avg. weeks seeing patients in 2000	45.5	41.6	46.1	44.6
Average hours/week seeing patients	39.5	24.2	28.2	34.5
Average patients seen, per week	60.3	37.8	50.1	54.2
Avg. wait time (wks.) for initial appoint.	4.2	6.2	6.4	4.9
N	226	46	79	371

General gastroenterologists spend more time per week seeing patients, and see more patients per week, than either hepatologists or transplantation hepatologists. Transplantation hepatologists see more patients per week, however, than hepatologists. Based on these estimates, the average time per patient, assuming a patient is seen only once per week, is about the same across the specialties. It is about 38 minutes for a gastroenterologists; about 38 minutes for a hepatologist; and about 34 minutes for a hepatologist with transplantation.

Over 98% of physicians said that they were accepting new patients. An average waiting time of 6.4 weeks for a new patient appointment with a transplantation hepatologists is the longest of the three specialties, though the waiting time of 6.2 weeks for a hepatologist without transplantation hepatology is statistically about the same. Waiting time for initial appointments with hepatologists is about two weeks longer than the waiting time for an initial appointment with a gastroenterologist.

Over 60% of all physicians surveyed indicated that they experienced an increase in waiting time for new patient’s appointments. The proportion of respondents indicating an increase in waiting time was greatest for transplantation hepatologists. Over 80% of transplantation hepatologists indicated an increase in waiting time for initial appointments for new patients. For those indicating an increase in waiting time, the average increase was about 2.4 weeks for gastroenterologists, 2.5 weeks for hepatologists, and 3 weeks for transplantation hepatologists. When both increases and decreases in average waiting times are taken into account, there is a net increase in average waiting time for all practice types. The net increase for gastroenterologists is 1.6 weeks; for hepatologists it is 1.5 weeks; and for transplantation hepatologists it is 2.8 weeks. The distribution across practice types is shown in *Figure 3.10*

Figure 3.10
Change in Waiting Time of New Patient Appointments



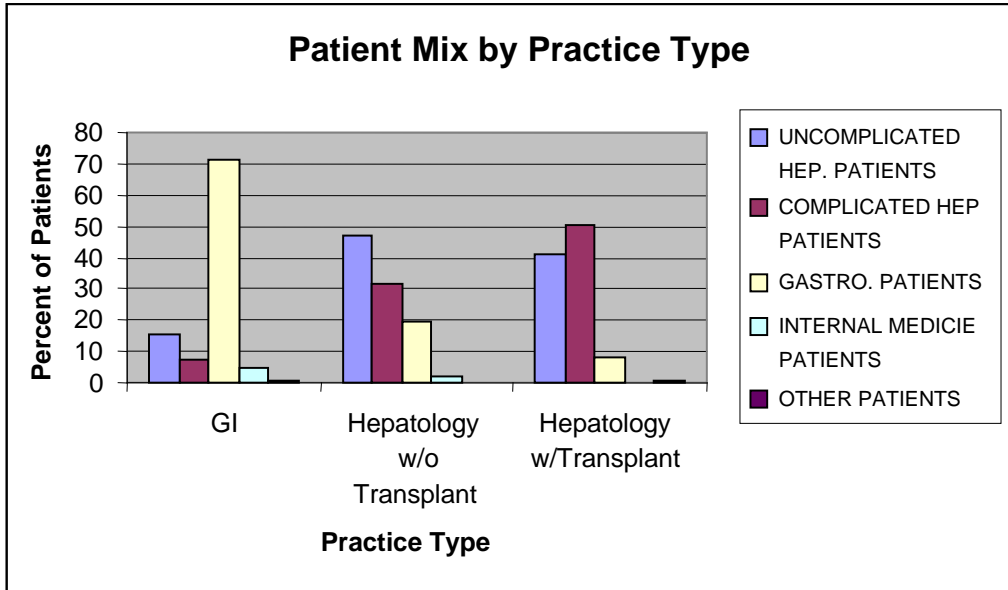
3.4 Patient Mix

Patient mix, as it varies across practice type, is shown in *Figure 3.11*. Those respondents who characterized their practice as general gastroenterology reported, not surprisingly, that over 70% of their patients are general gastroenterology patients. About 15% of patients are patients with uncomplicated liver diseases, while about 7% are patients with liver diseases with complications. Hence, about 23% of patient workload of general gastroenterologists who completed the survey consist of patients with liver disease.

For those practitioners who characterize their practice as hepatology, over 78% of their patients are patients with liver disease. About 48% of their patient workload are patients with uncomplicated liver diseases, while about 31%, on average, are patients with complicated cases of liver disease. About 20% of patient volume, for hepatologists, are patients with general gastroenterological problems, while less than 3% are general internal medicine patients.

Hepatologists who are also transplantation hepatologists have a patient mix in which over 90% are patients with liver disease. About 40% are patients with uncomplicated liver disease, and 50% are hepatology patients with complicated liver disease. Most of the remaining workload, less than 10%, are patients in general gastroenterology.

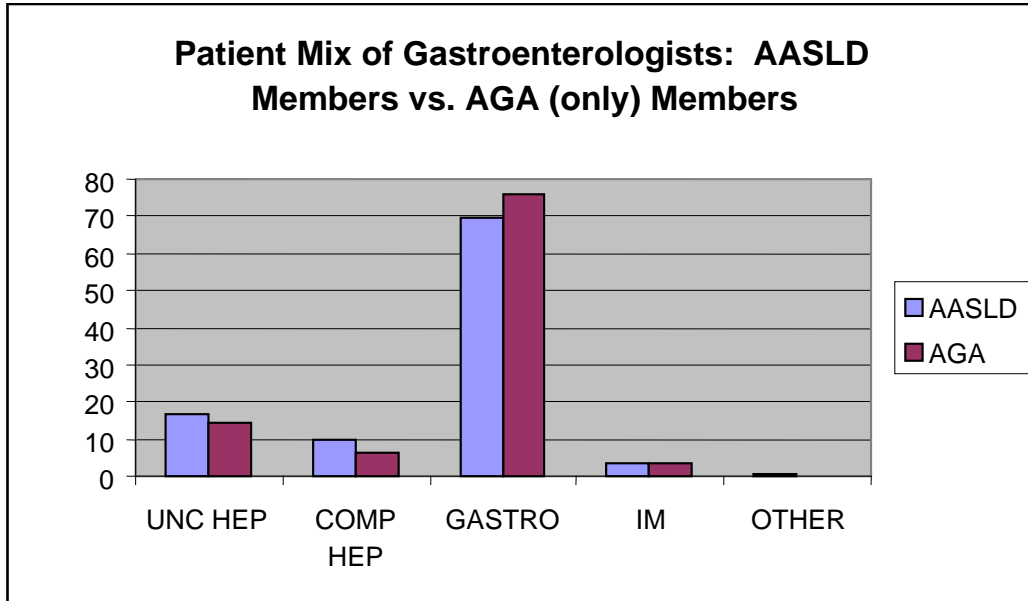
**Figure 3.11
Patient Mix**



We originally believed that a high proportion of board certified gastroenterologists who were also members of the American Association for the Study of Liver Diseases would be hepatologists. In fact, of 156 practitioners who were members of AASLD and who were board-certified or board-eligible in gastroenterology, 55% characterized themselves as general gastroenterologists, rather than hepatologists. This may have been due to our *definition* of hepatologists—that at least 50% of patient mix consists of hepatology patients. It may be the case that those gastroenterologists who are members of AASLD do have a higher proportion of hepatology patients than other gastroenterologists, but did not meet the 50% patient mix threshold. To test whether this was the case, we compared the patient mix of gastroenterologists who are not members of AASLD (but are members of AGA) with those who are members of AASLD (and may also be members of AGA.) This comparison is shown in **Figure 3.12**.⁵ While gastroenterologists who are members of AASLD have a slightly higher hepatology patient mix, the differences are small. Because the differences inpatient mix are small, we do not distinguish between the two categories of gastroenterologists in subsequent analyses.

⁵ Note that AASLD members who did categorize themselves as hepatologists or transplant hepatologists are not included in the comparison.

Figure 3.12
Patient Mix of Gastroenterologists: AASLD Members vs. Non-Members
(Percent)



3.5 Treatment and Referral Patterns of Gastroenterologists

In this section, we examine the treatment and referral patterns of those practitioners whose practice is primarily general gastroenterology.⁶ Of particular interest is the degree to which general gastroenterologists treat patients with liver disease, and the degree to which they refer patients to hepatologists or to transplant hepatologists. We also examine factors potentially affecting the treatment-referral decision.

On average, gastroenterologists responding to the survey stated that they referred about 8.2% of their patients with liver disease to hepatologists in the last year (calendar year 2000). Since about 23% of the patient workload of gastroenterologists consists of patients with liver disease, gastroenterologists refer about 2% of their patients to hepatologists or to transplant hepatologists.

Most gastroenterologists will treat patients with liver disease, depending on the nature of the disease and its complications. Only about 2.6% of gastroenterologists will refer at the point at which liver disease is suspected, and only 1.3% refers at the point of diagnosis. Hence, most gastroenterologists will treat patients with liver disease, under some circumstances, rather than refer them immediately to hepatologists. Almost 85% of gastroenterologists state that they usually treat most patients with liver disease. About 11.5% indicated that they often refer

⁶ There were nine respondents who were board certified or board eligible in gastroenterology, but who characterized their practice as primarily internal medicine. We did not include these nine respondents in the gastroenterology responses in this section. The data in this section is based on the responses of 226 board certified or board eligible respondents who characterized their practice as primarily gastroenterology.

patients with liver disease to hepatologists, again suggesting that they will also treat patients with liver disease, depending on the circumstances. This is shown in **Figure 3.13**.

Figure 3.13
Referral Practices of Gastroenterologists of Patients with Liver Disease

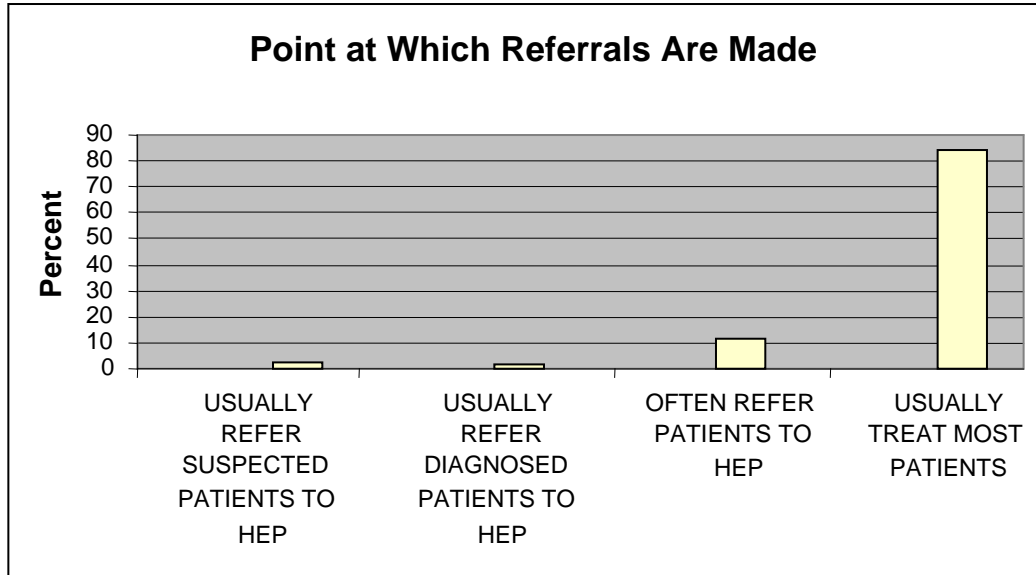


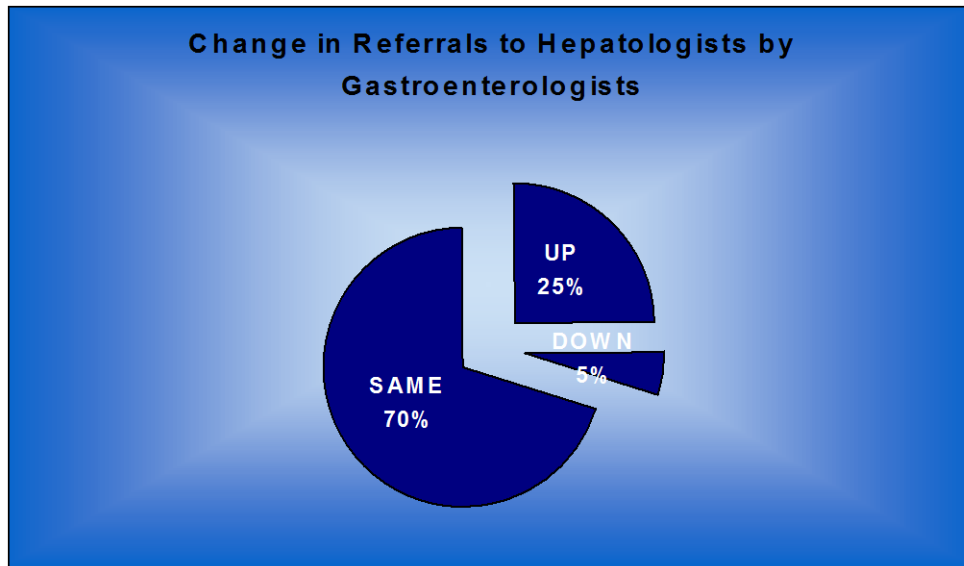
Table 3.8 below illustrates the notion that referrals by gastroenterologists to hepatologists will vary with the nature of the liver disease and the degree of complication. Only 2.7% of gastroenterologists will typically refer patients with viral hepatitis to hepatologists, but about 25% of gastroenterologists will refer complicated viral hepatitis. The percentage of gastroenterologists who will typically refer “uncomplicated” cases is greatest for metabolic and inherited liver disease, and for liver mass. The percentage of gastroenterologists who typically refer when complications are present is greatest for end stage liver disease, where 44% typically refer, and liver mass, where 39% refer. Cirrhosis, autoimmune liver disease and viral hepatitis are the diseases that gastroenterologists are most likely to treat, rather than refer.

Table 3.8
Gastroenterologist Treatment and Referral Patterns
of Patients with Liver Disease
(Percent)

Disease	Typically Treat		Typically Refer		Sometimes Treat/ Sometimes Refer	
	Uncomplicated	Complicated	Uncomplicated	Complicated	Uncomplicated	Complicated
Viral Hepatitis	96.4	69.5	2.7	25	0.9	5.5
Metabolic and Inherited Liver Disease	82.9	58.5	14	37.8	3.1	3.7
Autoimmune Liver Disease	91.3	69.3	8.3	26	0.4	4.7
Cirrhosis	91.6	71.5	6.2	20.4	2.2	8.1
Liver Mass	73.3	55.3	22.2	39	4.5	5.7
End Stage Liver Disease	NA	39.8	NA	44	NA	16.2

Most (70%) of gastroenterologists believe that their referrals to hepatologists have stayed about the same over the last five years. However, 25% believed that they had increased, while only 5% believed that they had decreased. This is indicated in *Figure 3.14*.

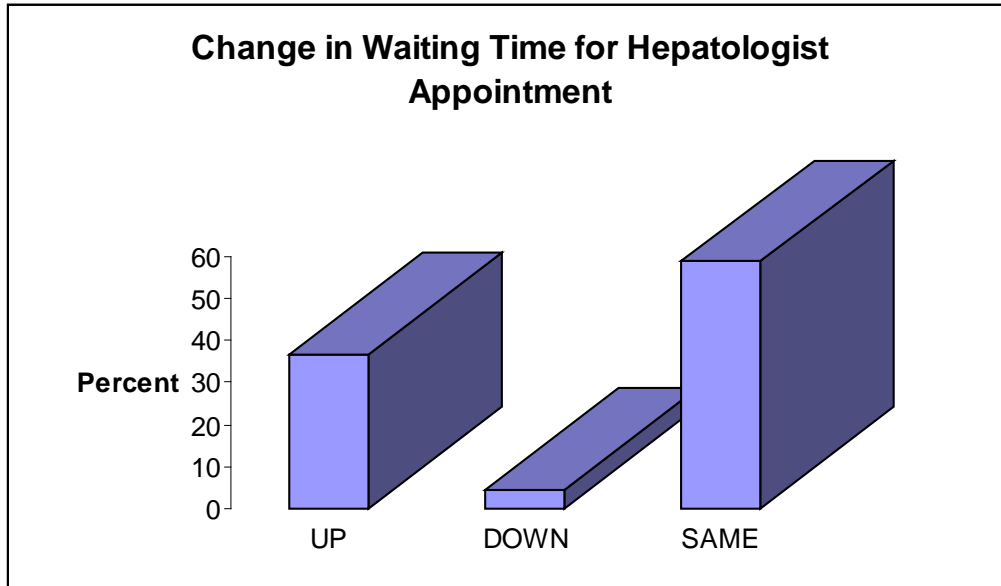
Figure 3.14
Change in Referrals to Hepatologists over the Last Five Years



Gastroenterologists report that the average waiting time for a referred patient to obtain an appointment with a hepatologist is about 3.6 weeks. Average distance to a hepatologist, as reported by the gastroenterologists in our sample, is about 35.6 miles. Over half of gastroenterologists believe that a referred patient’s *waiting time* for an appointment with a hepatologist has remained unchanged over the last five years. But, 38% believe that waiting

time has increased while less than 5% believe that waiting time has declined. This is shown in *Figure 3.15*.

Figure 3.15
Change in Waiting Time for Referred Appointment with a Hepatologist



We conducted a multivariate analysis using a logit regression model⁷ to better understand the factors affecting the likelihood that a gastroenterologist will refer a patient with liver disease to a hepatologist, rather than treat that patient. This analysis uses individual responses by gastroenterologists as data. The dependent variable, or variable to be explained, is the probability that the gastroenterologist will refer a patient with diagnosed or suspected liver disease to a hepatologist.⁸ The results are summarized in *Table 3.9* below. A positive coefficient indicates the factor increases the probability of referral, while a negative sign indicates that it decreases the probability.

⁷ A logit model is often used to estimate multivariate relations when the dependent or explanatory variable is distributed between zero and one, as in this case.

⁸ We use Question 25 of the practitioner survey. A response was defined as “usually refer” if the gastroenterologist responded either that they always refer or often refer.

Table 3.9
Factors Affecting Referrals to Hepatologist

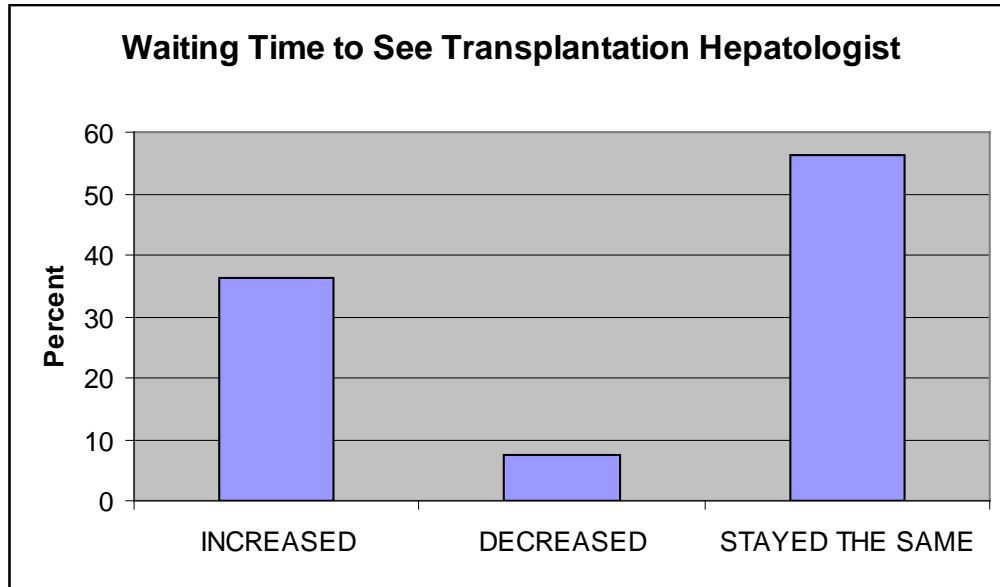
Variable	Coefficient	p-value	Comment
Own practice waiting time	1.65*	.0028	Probability of referral increases the busier the practice of the gastroenterologist
Distance to hepatologist	-2.28*	0.001	Probability of referral declines the farther away is the nearest hepatologist
Length of fellowship training	-1.26	0.067	The more training the gastroenterologist has, the less likely is referral
Fellowship faculty had specialized training hepatology	-0.74	0.25	Less likely to refer if trained in program with hepatology specialist on faculty.
Location—East-North central	2.96*	0.026	Gastroenterologist in East North Central were more likely to refer than those in other regions
Age		Not Significant	
Practice setting		Not Significant	

“*” Indicates statistically significant at the 0.05 level of significance.

The multivariate results suggest that a gastroenterologist is more likely to refer a patient with liver disease to a hepatologist the shorter the travel distance to the hepatologist and the busier (as indicated by waiting time) is the gastroenterologist’s practice. Gastroenterologists with relatively more training are less likely to refer patients with liver disease.

Over 80% of gastroenterologists referred at least one patient to a transplantation hepatologist for evaluation in the last year. Of those who referred at least one patient to a transplant hepatologist, that average number of patients referred was 4.8. The average waiting time for a referred patient to see a transplantation hepatologist was 3.8 weeks. The average traveling distance from the gastroenterologist’s office to a transplantation hepatologist for an appointment is 45.6 miles. The percentages of gastroenterologists who have experienced an increase, decrease, or no change in waiting time for an appointment with a transplantation hepatologist over the last five years are shown in *Figure 3.16*.

Figure 3.16
Change in Waiting Time for a Transplantation Hepatologist Appointment



3.6 Treatment and Referral Patterns of Hepatologists⁹

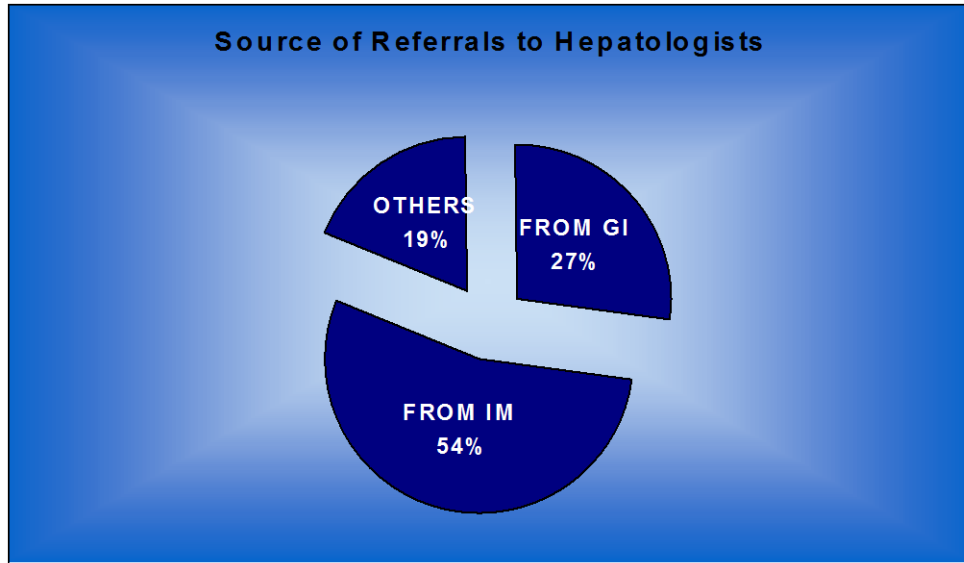
In this section we examine the treatment and referral patterns of hepatologists. We first consider the *source* of the referrals that hepatologists receive. Recall that about 78% of the patients seen by hepatologists are patients with liver disease. Hence, referrals are the primary source of patients for hepatologists.

Figure 3.17 shows the source of referrals to hepatologists. About 54% of referrals to hepatologists come from internal medicine practitioners, while the source of 27% of referrals is gastroenterologists. The reason that a higher proportion of referrals come from internal medicine specialists is, simply, that there are many more internal medicine specialists than there are gastroenterologists.¹⁰ When considering the two major sources of referrals, however, it is important to recall that there are many more internists than there are gastroenterologists. The proportion of total referrals made by gastroenterologists that are to hepatologists is likely to be significantly greater than the proportion of total referrals by internists to hepatologists.

⁹ The information in this section is based on sample size of respondents that is between 40 and 44 for most items.

¹⁰ Internal medicine practitioners outnumber gastroenterologists by about ten to one.

Figure 3.17
Source of Referrals to Hepatologists



The distribution of patients by type of liver disease that are referred to hepatologists is presented in **Table 3.10**. Viral hepatitis is the disease that constitutes the largest proportion of referrals. Moreover, viral hepatitis and metabolic and inherited liver disease are the only two diseases for which “uncomplicated” cases constitute a higher proportion of referrals than complicated cases. Recall, from the previous section, that gastroenterologists are more likely to treat viral hepatitis than to refer. The reason that viral hepatitis constitutes such a high proportion of referrals is the high incidence of the disease. End stage liver disease constitutes only a small proportion of total referrals to hepatologists.

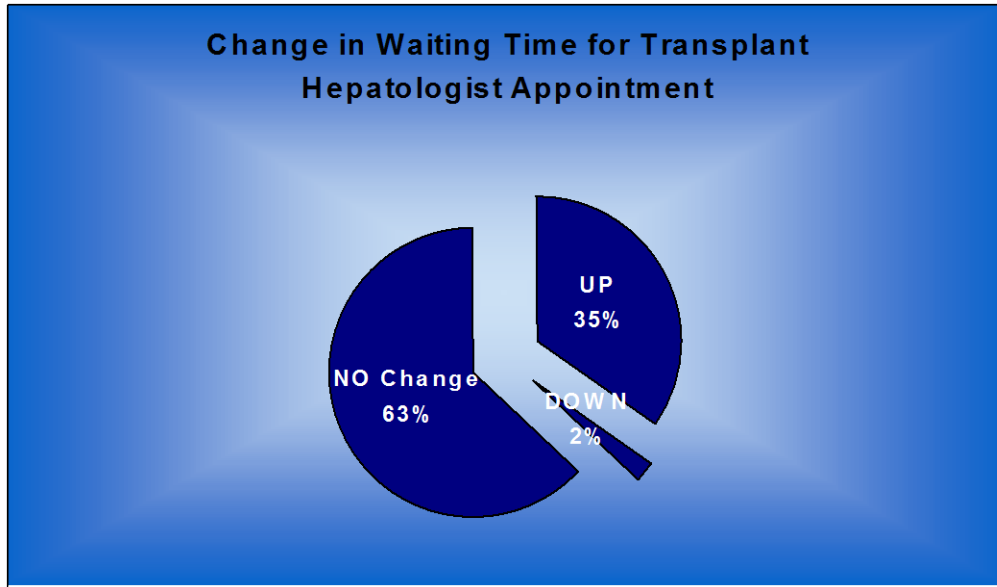
Table 3.10
Referrals of Patients by Disease

Liver Disease	Percent without Complications	Percent with Complications	Total
Viral Hepatitis	36.3	11.4	47.7
Metabolic and Inherited Liver Disease	8.9	4.4	13.3
Cirrhosis	7.2	9	16.2
Auto-Immune Liver Disease	4.1	5.1	9.2
Liver Mass	2.7	5.6	8.3
End Stage	NA	2.4	2.4
Total	59.2	37.9	97.1

Hepatologists in our sample referred an average of 15.7 patients to a transplantation hepatologist for evaluation in the past year. Average waiting time for an appointment with a transplantation hepatologist was 3.8 weeks, which is identical to the average of the waiting times reported by gastroenterologists. Average traveling distance to a transplantation hepatologist, reported by

hepatologists, was 41.9 miles. Recall that gastroenterologists reported an average traveling distance of 45.6 miles. About 34.8% of hepatologists reported that waiting time for an appointment with a transplantation hepatologist has increased over the last five years. The distribution of changes in waiting time is shown in *Figure 3.18*.

Figure 3.18
Change in Waiting Time

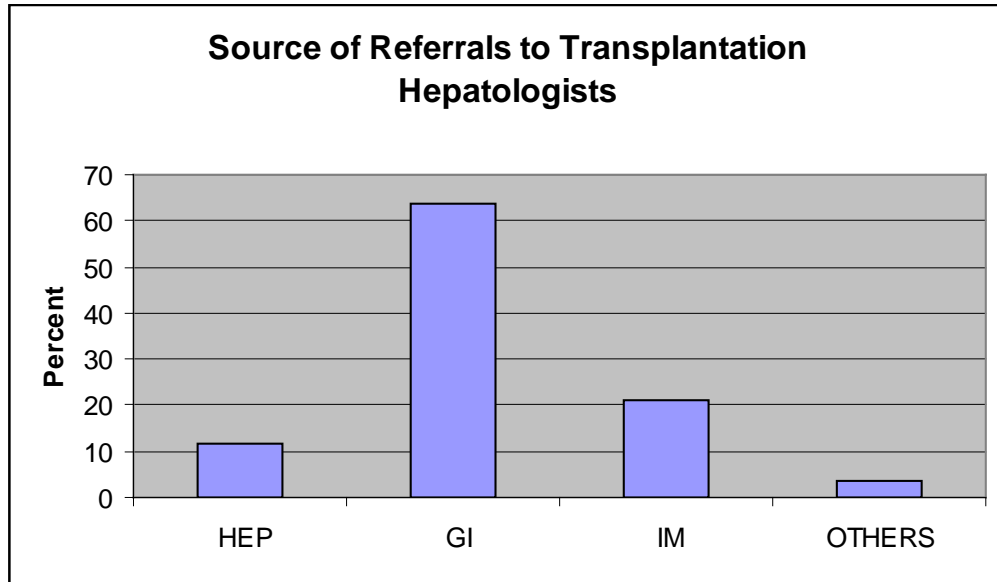


3.7 Treatment and Referral Patterns of Hepatologists with Transplantation Hepatology¹¹

In this section, we examine treatment and referral patterns of transplantation hepatologists. Recall that over 90% of patients cared for by transplantation hepatologists are patients with liver disease. Sources of referrals are shown in *Figure 3.19*. About 64% of transplant hepatologists’ referrals are from gastroenterologists. Internal medicine physicians are the source of about 21% of referrals, while hepatologists are the source of about 12% of referrals. Again, it is important to recognize that it is the large *number* of internal medicine specialists that give rise to the referrals. It is undoubtedly the case that a typical hepatologist will refer a greater proportion of his or her patients to a transplant hepatologist than either a gastroenterologist or an internist.

¹¹ The information in this section is based on a sample size of 80 respondents or more for most items.

Figure 3.19
Source of Referrals to Transplantation Hepatologists



The following information pertains to the respondents' *institution*. The average number of patients that actually received a liver transplant at the transplant facilities of the respondents in the previous year was 66.2. The average number of patients that were on the list for a transplant across the respondents' institutions was 182.

The following pertains to the individual transplantation hepatologist. The average number of patients evaluated in calendar year 2000 by individual transplantation hepatologists who responded to the survey was 109.9. The average number of patients listed for a transplant who are being cared for by individual respondents was 85.1. Finally, the average number of post-transplant patients being cared for by the transplantation hepatologist in calendar year 2000 was 179.7.

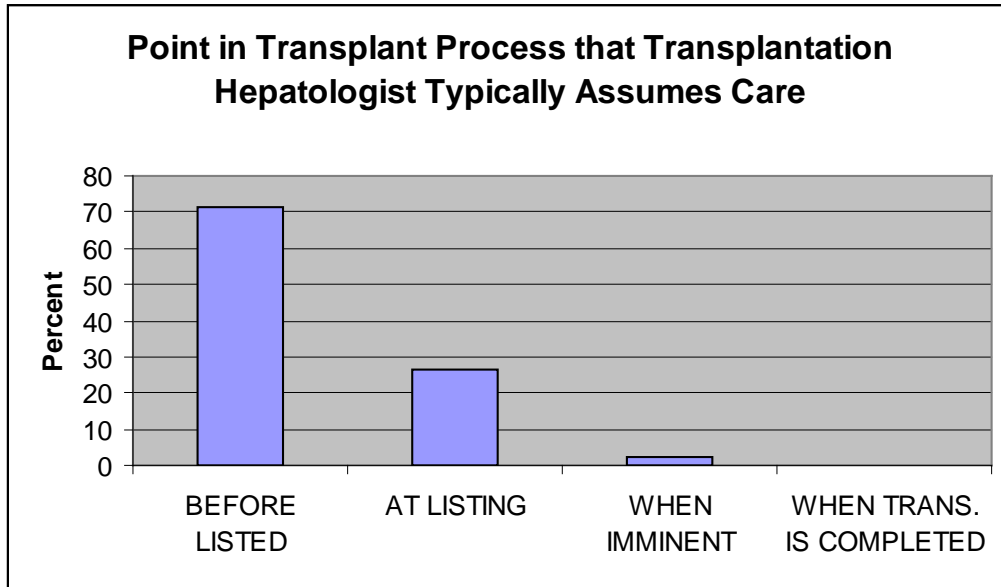
This information is summarized in *Table 3.11*.

Table 3.11
Liver Transplant Patient Workload: Calendar Year 2000

Institution's Patients		Individual Transplantation Hepatologist Patients		
Transplants	On List	Evaluated	On List	Post-transplant
66.2	182	109.9	85.1	179.7

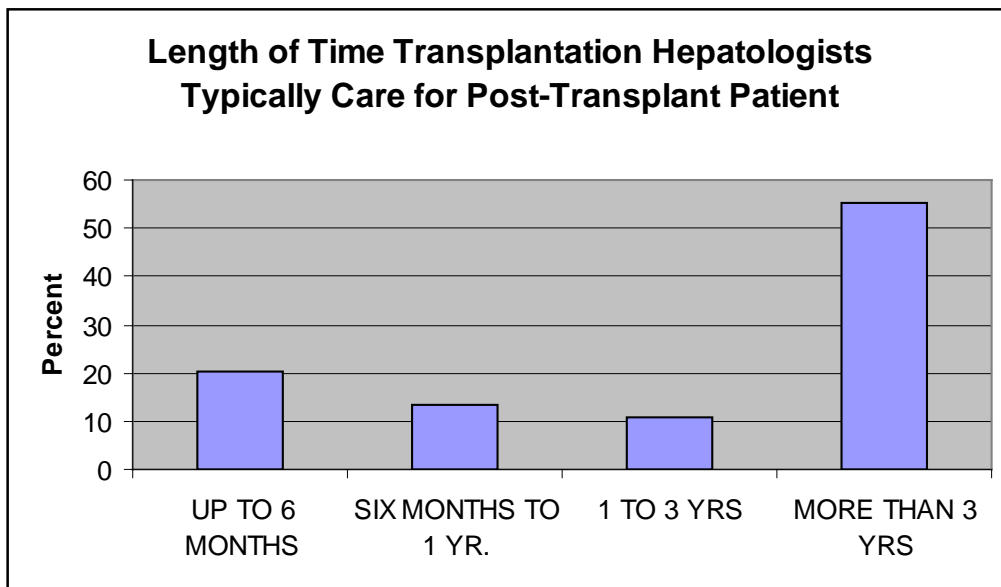
Approximately 71% of transplantation hepatologists typically assume care for a patient with end stage liver disease before the patient is actually placed on the transplant list. About 26% indicated that they typically assume care only once the patient is placed on the list, while only about 2.5% stated that their care typically begins only when the transplant is imminent. This is summarized in *Figure 3.20*.

Figure 3.20
Point at Which Transplantation Hepatologist Typically Assumes Care



Finally, most transplantation hepatologists typically care for post-transplant patients for three or more years after the transplant. This was typically the case for 55.4% of respondents. About 20.5% of respondents, however, indicated that their care ended within six months of the transplant. The distribution of responses is shown in *Figure 3.21*.

Figure 3.21
Duration of Care After Transplant



4. RESULTS OF GI PROGRAM DIRECTOR SURVEY

This section presents the findings from the survey of GI program directors. The survey was designed to collect information in the following three areas: (1) general fellowship program data; (2) characteristics of the faculty responsible for hepatology training; and (3) the nature of fellowship training in hepatology being carried out within the fellowship programs. One hundred and five program directors returned a survey.

4.1 General Fellowship Program Information

Sixty-eight percent of the 105 GI fellowship program directors responding to the survey indicated that their institution had a liver transplantation center. As of December 2000, 121 medical institutions in the United States operated a liver transplantation program, suggesting that program directors from approximately 59 percent of these centers responded to this survey.¹²

Program directors were asked to provide information regarding the number of GI fellows as well as the level of hepatology training being provided in their programs. *Table 4.1* presents program director responses with respect to the following types of information:

- total number of GI fellows;
- number of GI fellows receiving training in advanced hepatology in third year;
- number of GI fellows receiving training in advanced hepatology and transplant hepatology; and
- number of hepatology fellows not part of the training program.

**Table 4.1
GI Fellows and Hepatology Training**

		All Respondents N=102	Percent of Fellows
(a)	GI Fellows	6.3	
(b)	GI Fellows Receiving Advanced Hepatology Training In Third Year	1.6	24%
(c)	GI Fellows Receiving Advanced Training In Hepatology And Transplant Hepatology	2.4	38%
	GI Fellows Not Receiving Advanced Hepatology in Third Year Or Advanced Training In Hepatology and Transplant Hepatology ¹³	2.3	36%
(d)	Hepatology Fellows Not Part Of Training Program	0.4	6%

¹² UNOS Critical Data: Main Page, Frequently Requested Data.

¹³ The original design of our survey question assumed that all gastroenterology fellows would receive either advanced hepatology training or advanced training in hepatology and transplant hepatology. This was not the case for approximately 46 program directors who responded. Hence, we included a category for fellows that apparently do not receive either advanced hepatology training or advanced hepatology and transplant hepatology training.

An average of 6.3 GI fellows are being trained in responding fellowship programs. Twenty-four percent of these fellows are receiving advanced hepatology training in the third year of the fellowship, and another 38 percent are being trained in both advanced hepatology and transplant hepatology. Approximately thirty-six percent of GI fellows did not fit into either category describing hepatology training. Taken literally, this would imply that about 36 percent of gastroenterology fellows did not receive either advanced hepatology training or advanced hepatology training and training in transplantation hepatology.¹⁴

In approximately 55 percent of the programs, all GI fellows are receiving advanced training in hepatology or advanced hepatology and transplantation hepatology. However, in about 45% of the programs, some fellows do not receive training in either advanced hepatology or advanced hepatology and transplantation hepatology. In **Table 4.2** below, we separate programs into two categories. The first consists of those who indicated that all fellows received either advanced hepatology training in the third year of the program or advanced hepatology training and transplantation hepatology training. There were 56 respondents in this category. The second category consisted of those respondents who indicated that at least some fellows in their program did not receive either advanced hepatology training or advanced hepatology training and training in transplantation hepatology. There were 46 respondents in this category. For those in the first category, 39% received advanced hepatology training, and 63% of fellows received advanced training in hepatology and transplantation hepatology. **Table 4.2** provides a more detailed breakdown of this information.

**Table 4.2
GI Fellows and Hepatology Training**

		N=56	%	N=46	%
(a)	GI Fellows	6.2		6.3	
(b)	GI Fellows Receiving Advanced Hepatology Training In Third Year	2.4	39%	0.8	12%
(c)	GI Fellows Receiving Advanced Training In Hepatology And Transplant Hepatology	3.9	63%	0.6	9.5%
	GI Fellows Not Receiving Advanced Hepatology in Third Year Or Advanced Training In Hepatology and Transplant Hepatology			4.9	77%
(d)	Hepatology Fellows Not Part Of Training Program	.4	6%	.6	9.5%

An important “supply” issue is the proportion of international medical graduates, defined as graduates of medical schools outside of the United States and Canada, who remain in the United States after graduation and practice. The survey asked a series of questions to elicit program director perspectives on this topic. These included:

- an estimation of the percentage of fellows over the past five years that have been international medical graduates;

¹⁴ Coincidentally, 37% of responding program directors stated that hepatology training experience in their programs occurs only within a general gastroenterological clinical/consultative service. In addition, 20% of programs responding report that they provide no advance training in hepatology including transplant hepatology.

- an estimation of the percentage of fellows that leave the United States after completing fellowship training; and
- an expectation of whether the percentage of their IMG fellows would increase, decrease, or remain the same over the next five years.

Program directors reported that over the past five years international medical school graduates (IMGs) constituted an average of 36 percent of fellows in their GI training programs. Respondents indicated that a high percentage, about 93 percent, remain in United States upon completion of their fellowship training. While there is no data on precisely what proportion of IMGs do, in fact, ultimately practice in the United States, the consensus view of experts is that most ultimately do remain in the United States. Based on our discussions with experts at the Bureau of Health Professions (BHPr) and elsewhere, we estimate that at least 80 percent of IMGs practice in the United States. Hence, most IMGs contribute to physician supply in the United States. These observations appear to true for GI IMG fellows.

The majority of program directors, approximately 53 percent, expect to see a decline in the percentage of IMG fellows over the next five years. Thirty-eight percent of the program directors anticipate no change, while the remaining 9 percent expect the percentage to increase.

4.2 Fellowship Faculty

Program directors were asked to supply information on the faculty responsible for hepatology training within their fellowship program. The survey gathered information that included:

- the number of faculty responsible for hepatology training;
- the level of training or expertise of those faculty;
- a characterization of the faculty member’s area of primary focus; and
- the number of current openings for gastroenterology, hepatology, and transplantation hepatology faculty.

On average, program directors indicated that 3.9 physicians assumed responsibility for hepatology training. For each physician responsible for hepatology training, program directors were asked to characterize that individual’s level of training or expertise.¹⁵ **Table 4.3** presents information for respondents.

**Table 4.3
Faculty Responsible for Hepatology Training**

	n=50	
	Avg. #	Avg. %

¹⁵ Forty-eight percent of the program directors provided responses in accordance with survey instructions. For each physician identified in a prior survey question as responsible for hepatology training, the survey asked program directors to characterize that individual’s level of training or expertise by indicating the number of physicians to which each response applied. The sum of the individual response items was intended to reflect the number of physicians reported in survey question 6.

General gastroenterologist	.46	8.3
General gastroenterologist with expertise and experience in hepatology whose training did not include a hepatology fellowship	1.1	31.5
Hepatologist whose training did not include a clinical hepatology fellowship	.38	10.7
Hepatologist whose training included a clinical hepatology fellowship	.88	25.4
Hepatologist who is also a transplantation hepatologist	.88	24.1

GI fellowship program directors classified the overwhelming majority (91.7 percent) of the faculty members responsible for hepatology training as either hepatologists or gastroenterologists with expertise and experience in hepatology. Approximately 60 percent of the faculty members involved in hepatology training were characterized as hepatologists with various levels of advanced hepatology training. Slightly more than one-quarter (25.4 percent) of the faculty completed a clinical hepatology fellowship, while another one-quarter (24.1 percent) were identified both as hepatologists and transplantation hepatologists.

Program directors were also asked to categorize each of their faculty members responsible for hepatology training into one of three areas of primary focus: medical liver disease (non-transplant), transplantation hepatology, or both medical liver disease and transplantation hepatology.¹⁶ **Table 4.4** presents the characterizations reported by those program directors responding.

**Table 4.4
Primary Focus of Faculty Responsible for Hepatology Training**

	n=80	
	No. of positions (avg.)	% (avg.)
Medical Liver Disease (non-transplant)	2	52.4
Transplantation Hepatology	.3	5.8
Both Medical Liver Disease and Transplantation Hepatology	1.74	41.8

While the majority of the hepatology faculty’s primary area of focus was characterized as non-transplant medical liver disease, almost 42 percent of the faculty’s primary focus was concentrated in the areas of both non-transplant medical liver disease and transplantation hepatology. These findings support the program director’s characterization of the majority of faculty as hepatologists and/or transplantation hepatologists.

Information was also collected from the program directors on the number of current openings for fellowship faculty in gastroenterology, non-transplant hepatology, and transplantation hepatology. **Table 4.5** provides information reported regarding openings distributed across the various faculty types as well as the average number of openings for each type of faculty position.

¹⁶ Eighty program directors provided responses consistent with survey instructions. Program directors were asked to provide the total number of physicians in the one of three categories that best characterized their area of focus. The total for all categories should be equal to the total number of physicians reported in survey question 6.

**Table 4.5
Fellowship Faculty Position Openings**

(N=105)	Number with Openings	Percent	Avg. # of openings	Total Openings
Gastroenterology faculty	76	72%	1.45	152
Hepatology faculty	33	31%	.40	42
Transplantation hepatology faculty	37	35%	.48	50
Total	85	81%	2.33	244

The overwhelming majority (72 percent) of program directors reported current openings for gastroenterology faculty. The demand for hepatology or transplantation hepatology faculty was somewhat less, with only 31 percent and 35 percent of program directors reporting vacancies, respectively. However, a total of 66% of programs responding reported vacancies for either hepatology faculty, transplantation hepatology faculty, or both.

The following figure provides an indication of open faculty positions by region and specialty. The number represents the number of programs responding, while the percentage represents the proportion that have at least one opening.

**Figure 4.1
Proportion of Programs with Openings for Gastroenterology Faculty**

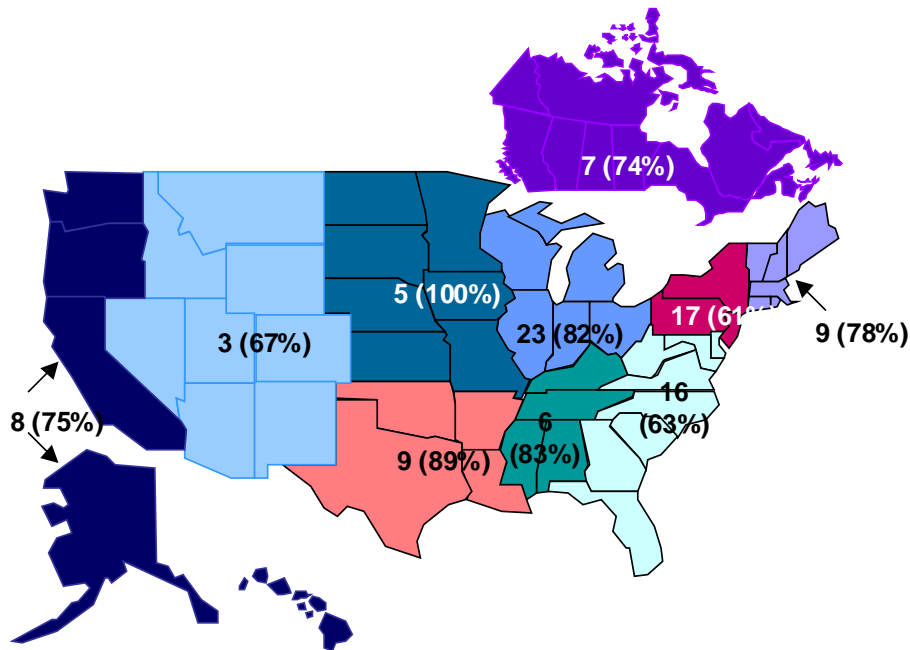


Figure 4.2
Proportion of Programs with Openings
for Hepatology Faculty

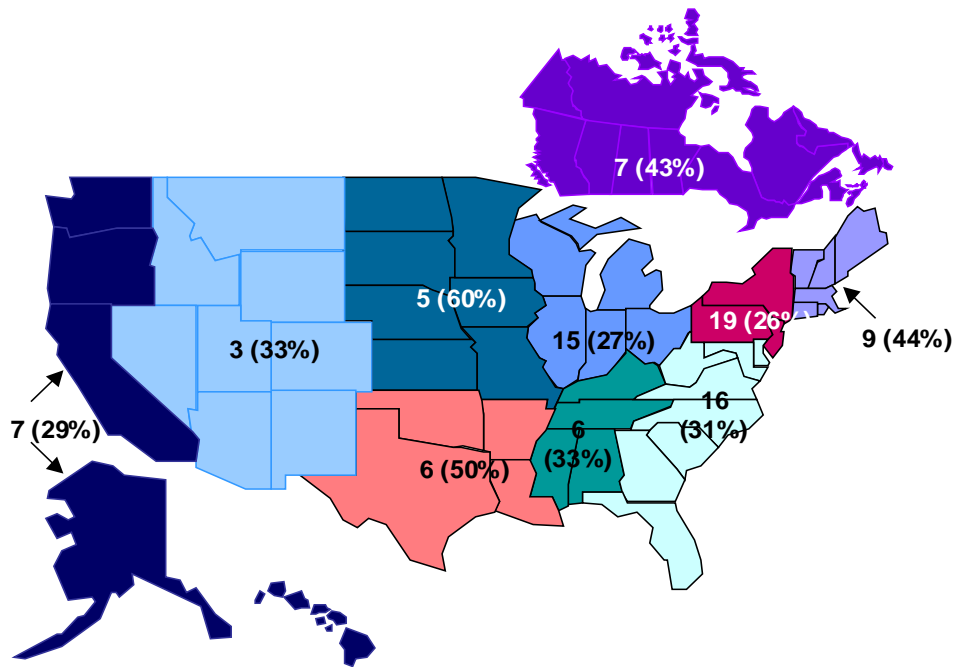
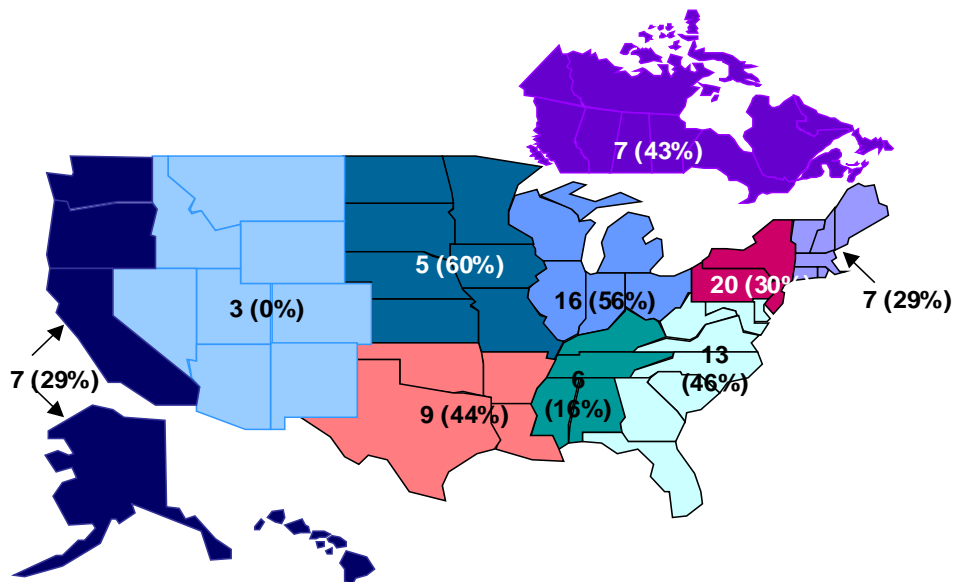


Figure 4.3
Proportion of Programs with Openings for
Hepatology Faculty with Transplantation



4.3. Fellowship Training

In order to gain a better understanding of the nature of hepatology training being offered in GI fellowship training programs, program directors were asked to provide:

- information on the types of formal hepatology training opportunities available within their fellowship program; and
- a description of the fellowship program’s hepatology training experience.

Table 4.6 provides information on the percentage of fellowship programs *offering* formal training programs in specific fields of hepatology. Note that the categories are constructed to be mutually exclusive, and add to 100%. For example, according to the respondents, 20% of GI programs offer only transplantation hepatology within a 3 year fellowship program.

**Table 4.6
Formal Training In Specific Areas of Hepatology**

	n=103
Advanced hepatology only (no transplantation hepatology)	9%
Transplantation hepatology within a three year fellowship program only	20%
Transplantation hepatology with a 4 th year required only	2%
Both advanced hepatology and transplantation hepatology within a 3 year program	28%
Both advanced hepatology and transplantation hepatology with a 4 th year required	9%
Transplantation hepatology within 3 year program and with 4 th year required	2%
All three types of hepatology training programs are offered	10%
No advanced hepatology programs are offered	20%
Total	100%

Advanced hepatology training is offered in a total of 56% percent of the fellowship programs. Training in transplantation hepatology is even more widespread, with 60% percent of the programs offering transplantation hepatology within a three year program, and 23% offering transplantation hepatology with a fourth year required. A total of 71% of the programs responding indicated that they offered some form of training in transplantation hepatology in their program. Interestingly, about 20% of respondents indicated that they did not offer any advanced training in hepatology or transplantation hepatology in their program..

Program directors were asked to indicate which of the following **best** described the hepatology fellowship training experience provided by their fellowship program:

- GI/consultation/clinic service (includes hepatology patients);
- Hepatology dedicated service (without transplant service);
- Hepatology and transplant services; or
- Other.

Table 4.7 highlights the program director’s description of the fellowship’s hepatology training experience.

**Table 4.7
Hepatology Training Experience Within Fellowship Program**

	n=103
GI consultation/clinic service (includes hepatology patients)	36.9%
Hepatology dedicated service (without transplantation service)	9.7%
Hepatology and transplant services	52.4%
Other	1.0%

The majority (52.4 percent) of program directors reported a fellowship experience that included training in both hepatology and transplant services. Not surprisingly, fellows at institutions with liver transplantation centers were more likely to experience this type of hepatology training (78 percent).

In 36.9 percent of the programs, fellows received hepatology training as part of a GI/consultation/clinic service that included hepatology patients. Seventy-eight percent of the program directors located at institutions that did not have a liver transplantation center reported that fellows experienced this type of hepatology training.

Less than 10 percent of programs provided training on a dedicated hepatology service that did not include a transplantation service. This may be related to the fact that hospitals do not generally have services dedicated exclusively to hepatology. Without liver transplantation, hepatology patients generally receive care on a general medical service.

5. SUMMARY

The purpose of this study is to obtain a better understanding of treatment and referral patterns of practitioners who are caring for patients with liver disease; the formal training of these practitioners; and the programs which prepare practitioners to care for patients with liver disease. The primary sources of information for this study are two surveys that were conducted for the study. The first was a survey of practitioners. Gastroenterologists, hepatologists, and transplant hepatologists were surveyed. Information regarding their practice, referral and treatment patterns for patients with liver disease, training in hepatology and overall demand was included. The second survey was targeted to directors of fellowship programs in gastroenterology. Program directors were asked to provide information regarding the hepatology training of fellows in gastroenterology. In particular, the training provided in hepatology and transplantation hepatology, as part of the gastroenterology fellowship, was explored.

5.1 Results of Practitioner Survey

Practicing gastroenterologists, hepatologists and transplantation hepatologists are similar in that board certification in gastroenterology is the highest level of formal credentials for their specialty. The transplantation hepatologists are about five years younger, on average, than

gastroenterologists and hepatologists, reflecting the relatively recent technology of liver transplants. Hepatologists and transplantation hepatologists are more likely to have been trained in a fellowship program that offered a hepatology dedicated service or transplant service than are gastroenterologists. They also, and partly as a consequence, spent a greater portion of their time in training treating or evaluating patients with liver diseases, and they are more likely to have had a hepatology specialist on the faculty at their fellowship program.

Hepatologists and transplantation hepatologists are more likely to practice in multi-specialty groups than are general gastroenterologists, and the group sizes tend to be larger. In part, this is because hepatologists and transplant hepatologists are more likely to practice in an academic or medical school setting than in a community-based practice compared to general gastroenterologists.

Waiting time for an initial appointment with a hepatologist or transplant hepatologist is about two weeks longer than the average waiting time for an initial appointment with a gastroenterologist, according to the respondents in the survey. This would suggest relative excess demand for the services of hepatologists and transplantation hepatologists.

Almost 60% of general gastroenterologists believe that waiting time for an initial appointment has increased over the past five years. However, about 80% of transplantation hepatologists stated that waiting times for appointments have increased over the past five years.

Over 78% of the patients treated by hepatologists, and 90% of the patients treated by transplantation hepatologists, suffer from liver diseases. This compares to 23% for general gastroenterologists. Most gastroenterologists, however, say that they typically treat most patients with liver disease. They are more likely to refer patients with liver diseases when complications are present. Factors in addition to acuity affecting the probability that a general gastroenterologist will refer a patient with liver disease include:

- how busy the gastroenterologist's practice is;
- how far away the nearest hepatologists is; and
- the length of fellowship training of the gastroenterologists, and whether there was a specialist in liver diseases on the faculty.

Over 80% of gastroenterologists referred at least one patient to a transplantation hepatologist over the last calendar year. Of those who referred at least one, the average number of referrals was 4.8. About 35% of gastroenterologists believed that the waiting time for an appointment with a transplantation hepatologist had increased over the last five years.

Hepatologists receive over 54% of their referrals from internists, and 27% from gastroenterologists. Of the major liver diseases we considered in the survey, viral hepatitis was the most frequent diagnosis of those patients referred. On average, hepatologists referred 15.7 patients to transplantation hepatologists in calendar year 2000. The average waiting time for an appointment with a transplantation hepatologists was 3.8 weeks.

Transplantation hepatologists receive about 64% of their referrals from gastroenterologists, and about 12% from hepatologists. The typical transplantation hepatologist evaluated about 110 patients for a transplant in calendar year 2000, cared for about 85 patients who were on the waiting list for transplant, and cared for about 180 patients who had received a transplant. Most transplantation hepatologists begin care for transplant candidates before they are placed on the waiting list, and continue to care for transplant patients for three or more years after the transplant has occurred.

This survey of practitioners has indicated that most general gastroenterologists will treat patients with liver disease, but many will refer more complicated cases to hepatologists. Both hepatologists and gastroenterologists refer patients to transplantation hepatologists when a transplant is indicated. There appears to be an excess demand for both hepatologists and transplantation hepatologists, as indicated by the waiting times for initial appointments compared to waiting times for gastroenterology appointments.

5.2 Results of Program Director Survey

Program directors estimated that 36 percent of fellows in their GI training programs over the past five years were international medical school graduates. An overwhelming proportion, approximately 93 percent, of these fellows remain in the United States upon completion of their fellowships. However, the majority of program directors (53 percent) expect to see these percentages decline over the next five years.

Approximately 55% of responding program directors reported that all of their gastroenterology fellows received training in advanced hepatology, or advanced hepatology with transplantation hepatology. However, 45% of respondents indicated that at least some gastroenterology fellows did not receive advanced training. Taken literally, about 36% of fellows in the programs responding to the survey did not receive advanced training in hepatology.

The overwhelming majority (92 percent) of faculty responsible for hepatology training within responding programs are either general gastroenterologists with expertise and experience in hepatology, hepatologists whose training included a clinical hepatology fellowship, or transplantation hepatologists. The majority of the faculty concentrate primarily in the area of non-transplant medical liver disease. However, nearly 42 percent extend their primary focus beyond medical liver disease to include transplantation hepatology.

Nearly three-quarters (72 percent) of the GI fellowship programs report openings for gastroenterology faculty. The demand for hepatology and transplantation hepatology was somewhat more limited, with only 31 percent and 35 percent of program directors reporting vacancies, respectively. However, 66% of programs had openings for hepatology or transplantation hepatology faculty.

Advanced hepatology training is offered in 56 percent of the fellowship programs. Training in transplantation hepatology is even more widespread, with 71 percent of the programs offering such training. Most programs (58 percent) offer this training within a three-year fellowship program, about one-quarter (23 percent) offer a program that requires a fourth year. About 20%

of responding program directors indicated that they offered training neither in advanced hepatology or transplantation hepatology.

In describing the hepatology training fellowship, program directors indicated that the majority of programs (52 percent) provided an experience that included training in both hepatology and transplant services. Not surprisingly, fellows training at institutions with liver transplantation centers were more likely to experience this type of hepatology training (78 percent). In 37 percent of the programs, fellows reportedly received hepatology training as part of a GI/consultation/clinic service that included hepatology patients. A higher percentage of program directors located at non-liver transplantation centers reported this type of hepatology training.

5.3 Conclusion

The results of the practitioner and program director survey indicate that transplantation hepatology is a well-defined discipline within gastroenterology. Almost all general gastroenterologists and hepatologists have clearly established referral patterns to transplantation hepatologists. Moreover, about 71% of programs responding offer training in transplantation hepatology. Further, about 52% of programs responding to the survey offer a transplantation clinical service for fellowship training.

Both general gastroenterologists and hepatologists treat patients with medical liver disease. The conditions under which general gastroenterologists refer patients with liver disease are less clearly defined. Most general gastroenterologists will treat most patients with liver disease. Waiting times for initial appointments with both hepatologists and transplantation hepatologists exceed six weeks, suggesting that both are in excess demand.

Appendix A:
Practitioner Survey and Response

**AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES
HEPATOLOGY MANPOWER SURVEY**

QUALIFIER SECTION

This survey is intended to collect information from physicians who identify themselves as practicing hepatologists, transplantation hepatologists and gastroenterologists.

1. Are you a board eligible or board certified gastroenterologist? (Check one of the following)

π_1 Yes **(Continue)**

π_2 No **(Stop -- Please return unfinished survey in the enclosed envelope)**

 | If yes, what year did you complete your:

 1A. Fellowship **19** ██████████

 1B. Board certification **19** ██████████

2. Are you currently engaged in **any** direct patient care? (Check one of the following)

π_1 Yes **(Continue)**

π_2 No **(Stop -- Please return unfinished survey in the enclosed envelope)**

3. What is your age?

 ___ ___ years old

4. What is your gender?

π_1 Male

π_2 Female

SECTION I: EDUCATION AND PROFESSIONAL QUALIFICATIONS

Note: You are in this section because you are engaged in some direct patient care and are either a board eligible or board certified gastroenterologist. If not, please return unfinished survey in the enclosed envelope.

5. Did you graduate from ...

π_1 U.S. or Canadian medical school

π_2 Other medical school

6. In what year did you graduate from medical school?

19 **IIIIIIIIII**

7. How long was your GI fellowship program?

IIIIIIIIII years

8. Which one of the following ***best*** describes your hepatology training experience during your fellowship program?

π_1 GI /consultation/clinic service (includes hepatology patients)

π_2 Hepatology dedicated service (without transplant service.)

π_3 Hepatology and transplant services

9. What proportion of your GI fellowship clinical training did you spend evaluating and treating hepatology patients? (Check one of the following)

π_1 1 -10%

π_2 11 - 25%

π_3 26 - 40%

π_4 More than 40%

10. Was there someone on the faculty during your fellowship training who had specialized expertise in hepatology?

π_1 Yes

π_2 No

π_3 Unsure

SECTION II : PRACTICE SETTING

11. How would you characterize your primary practice setting? (Check one of the following)

- π_1 Solo or two physician practice
- π_2 Single specialty group practice of three or more
- π_3 Multi-specialty group

(Of the professionals in your practice setting... (Do not mark if not applicable)

11A. How many are physicians? IIIIIIIIIIII

11B. How many are gastroenterologists? IIIIIIIIIIII

11C. How many are hepatologists? IIIIIIIIIIII (Defined as spending at least 50% of their practice caring for patients with liver disease)

12. Is the practice setting identified in **Question 11** a...

- π_1 Community-based practice
- π_2 Medical school/academically-based practice
- π_3 Other

13. Which of the following best describes the location of your practice?

- π_1 Urban
- π_2 Suburban
- π_3 Rural

14. In what region of the country do you currently practice? (Check only one of the following)

- π_1 New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)
- π_2 Middle Atlantic (New Jersey, New York, Pennsylvania)
- π_3 East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)
- π_4 West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)
- π_5 South Atlantic (Delaware, District of Columbia, Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia)
- π_6 East South Central (Alabama, Kentucky, Mississippi, Tennessee)
- π_7 West South Central (Arkansas, Louisiana, Oklahoma, Texas)
- π_8 Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)
- π_9 Pacific (Alaska, California, Hawaii, Oregon, Washington)
- π_{10} Canada

15. Are you currently accepting new patients?

π_1 Yes π_2 No π_3 Unsure

16. What is the average waiting time for an appointment for **new patients**? **IIIIIIIIIIII weeks**

17. **Over the past year**, have you seen waiting times for appointments

π_1 Increase π_2 Decrease π_3 Stay the same

17A. And the approximate amount of increase or decrease **in weeks** would be: **IIIIIIIIIIII weeks**

SECTION III : WORK EXPERIENCE

18. How many **weeks** did you spend **seeing patients** during the calendar year of 2000? **IIIIIIIIIIII weeks**

19. On average, how many hours do you spend seeing patients in a **typical work week**? **IIIIIIIIIIII hours**

20. On average, how many **patients** did you see in a **typical work week** during the calendar year of 2000 **IIIIIIIIIIII patients**

21. Which of the following **best** describes your current medical practice?
(Please circle only one of the following)

- Primarily general internal medicine **1** **(Go to Section IV)**
- Primarily gastroenterology **2** **(Go to Section IV)**
- Primarily hepatology **without transplantation hepatology** **3** **(Go to Section V)**
(Defined as spending at least 50% of their practice caring for patients with liver disease)
- Hepatology with transplantation hepatology at a transplant center..... **4** **(Go to Section VI)**
- None of the above **5** **(Please return the finished and remaining unfinished portions of this survey in the enclosed envelope)**

SECTION IV : TO BE COMPLETED BY PHYSICIANS DESCRIBING THEIR PRIMARY PRACTICE AS GENERAL INTERNAL MEDICINE or GASTROENTROLOGY

22. What portion of your calendar year 2000 workload consisted of ...

A. Uncomplicated hepatology patients?	IIIIII	IIIIII	IIIIII%
B. Complicated hepatology patients?	IIIIII	IIIIII	IIIIII%
C. Gastroenterology patients?	IIIIII	IIIIII	IIIIII%
D. Internal medicine patients?	IIIIII	IIIIII	IIIIII%
E. Other patients	IIIIII	IIIIII	IIIIII%
SHOULD TOTAL TO 100%	1	0	0 %

23. What proportion of your patients with liver disease did you refer to a hepatologist in the calendar year of 2000?

Referred IIIIII IIIIII IIIIII%

24. **Over the past five years**, have your referrals to hepatologists:

π_1 Increased π_2 Decreased π_3 Stayed the same

25. **With respect to patients with liver disease**, which of the following best describes you?
 Would you say that you (Check only one of the following)

- | | |
|---|---|
| π_1 Almost always refer patients suspected of having a liver disease to a hepatologist. | π_3 Will often refer patients to a hepatologist but will treat some liver patients yourself. |
| π_2 Almost always refer patients once diagnosed with a liver disease to a hepatologist. | π_4 Will usually treat most patients with liver disease yourself. |

SECTION IV (Continued) : TO BE COMPLETED BY PHYSICIANS DESCRIBING THEIR PRIMARY PRACTICE AS GENERAL INTERNAL MEDICINE or GASTROENTROLOGY

26. Please complete the following table to characterize your referral of patients with liver disease to hepatologists. Please indicate by circling either "yes" or "no" to those things you typically do for each condition.

Liver Condition	Referrals to Hepatologists							
	Without complication				With Complication			
	Typically Treat		Typically Refer		Typically Treat		Typically Refer	
A. Viral hepatitis	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂
B. Metabolic and Inherited Liver Diseases	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂
C. Auto-immune liver disease	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂
D. Cirrhosis	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂
E. Liver Mass	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂	Yes ₁	No ₂
F. End Stage Disease	Not Applicable		Not Applicable		Yes ₁	No ₂	Yes ₁	No ₂

27. Please complete the following table to provide information related to patient access to hepatologists and transplantation hepatologists.

	Hepatologist	Transplantation Hepatologist
How far away is the nearest	_____ miles	_____ miles
How long do your patients typically wait for an appointment with a	_____ weeks	_____ weeks
Over the last five years, has the waiting time for an appointment with a	Increased ₁ Decreased ₂ Stayed the same ₃ (circle one)	Increased ₁ Decreased ₂ Stayed the same ₃ (circle one)

28. In the past year, did you ever refer a patient directly to a transplant center for evaluation?

- π_1 Yes (If yes, 28A. How many patients?)
- π_2 No
- π_3 Unsure

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SECTION V: TO BE COMPLETED BY PHYSICIANS DESCRIBING THEIR PRACTICE AREA AS PRIMARILY HEPATOLOGY (At least 50% of practice caring for patients with liver disease) WITHOUT TRANSPLANTATION HEPATOLOGY

29. What proportion of your calendar year 2000 workload consisted of ... (Indicate a percentage for each below)

- | | | | |
|---------------------------------------|----------|----------|------------|
| A. Uncomplicated hepatology patients? | □□□□□ | □□□□□ | □□□□□% |
| B. Complicated hepatology patients? | □□□□□ | □□□□□ | □□□□□% |
| C. Gastroenterology patients? | □□□□□ | □□□□□ | □□□□□% |
| D. Internal medicine patients? | □□□□□ | □□□□□ | □□□□□% |
| E. Other patients | □□□□□ | □□□□□ | □□□□□% |
| SHOULD TOTAL TO 100% | 1 | 0 | 0 % |

30. What proportion of your referrals for **liver disease** come from: (Indicate a percentage for each below)

- | | | | |
|-----------------------------|----------|----------|------------|
| A. Gastroenterologists? | □□□□□ | □□□□□ | □□□□□% |
| B. Internists? | □□□□□ | □□□□□ | □□□□□% |
| C. Others? | □□□□□ | □□□□□ | □□□□□% |
| SHOULD TOTAL TO 100% | 1 | 0 | 0 % |

31. Please complete the following table to indicate what percentage of **total referrals** of patients with **liver disease** are received for each of the following conditions.

Liver Condition	% Referrals Received	
	Without Complication	With Complication
A. Viral hepatitis	%	%
B. Metabolic and Inherited Liver Diseases	%	%
C. Cirrhosis	%	%
D. Auto-immune liver disease	%	%
E. Liver Mass	%	%
F. End Stage Disease	Not Applicable	%

32. **In the past year**, how many patients did you refer to a transplantation hepatologist for evaluation? □□□□□□□□□□ **patients**
33. Approximately, how far away is the nearest transplantation hepatologist? □□□□□□□□□□ **miles away**.
34. How long does it typically take for your referred patients to get an appointment with a transplantation hepatologist? □□□□□□□□□□ **weeks**
35. Over the past five years, have you seen the waiting time for appointments with transplantation hepatologists ...

π_1 Increase π_2 Decrease π_3 Stay the same

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SECTION VI: TO BE COMPLETED BY PHYSICIANS DESCRIBING THEIR PRIMARY PRACTICE AREA AS HEPATOLOGY WITH TRANSPLANTATION HEPATOLOGY AT A TRANSPLANT CENTER

36. What proportion of your current patient mix encompasses: (Indicate a percentage for each below)

- | | | | | |
|--------------------------------|----------|----------|----------|----------|
| A. Transplantation hepatology? | | | | % |
| B. General hepatology? | | | | % |
| C. Gastroenterology? | | | | % |
| D. Internal medicine? | | | | % |
| E. Other? | | | | % |
| SHOULD TOTAL TO 100% | 1 | 0 | 0 | % |

37. What proportion of transplant referrals do you typically receive from: (Indicate a percentage for each below)

- | | | | | |
|-----------------------------|----------|----------|----------|----------|
| A. Hepatologists? | | | | % |
| B. Gastroenterologists? | | | | % |
| C. Internists? | | | | % |
| D. Others? | | | | % |
| SHOULD TOTAL TO 100% | 1 | 0 | 0 | % |

- | | |
|--|--------------------------|
| 38. How many patients at your center received liver transplants in the calendar year of 2000? | patients |
| 39. How many patients at your center are currently on the transplant list? | patients |
| 40. In the past year, how many patients did you evaluate for a transplant? | patients |
| 41. How many patients currently listed for transplant are you caring for? | patients |
| 42. How many post-transplant patients are you currently caring for? | post-transplant patients |

43. When do you **typically** assume continuous care for a transplant patient? (Check one)

- | | |
|--|--|
| π_1 Before a patient is put on the transplant list | π_3 As soon as a patient is put on the transplant list |
| π_2 When the patient's transplant is imminent | π_4 When the transplant is completed |

44. How long do you have **primary medical responsibility** for the post-transplantation patient? (Check one)

- | | | | |
|--------------------------|------------------------------|----------------------|---------------------------|
| π_1 Up to six months | π_2 Six months to 1 year | π_3 1 to 3 years | π_4 More than 3 years |
|--------------------------|------------------------------|----------------------|---------------------------|

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**Thank you for taking the time to complete this survey.
Please return in the enclosed stamped, self-addressed envelope provided.**

Would you like an opportunity to win one of ten complimentary registrations to the 2001 AASLD Post-Graduate Course, to be held November 9-10, 2001 in Dallas, TX?

If so, please complete the following information **AND** make sure your completed questionnaire is **received** by Baseline & Associates, Inc. by **March 5, 2001**.

Name: _____

Address: _____

Telephone Number Where You Can Be Contacted: _____

QUALIFIER SECTION**NUMBER OF ELIGIBLE OR CERTIFIED GASTROENTEROLOGISTS
ENGAGED INPATIENT CARE**

Q1	N
AGA	153
AASLD	156
UNOS	80
TOTAL	389

AVERAGE YEAR COMPLETE FELLOWSHIP

Q1A	AVE	N
AGA	1985	95
AASLD	1981	104
UNOS	1988	50

AVERAGE YEAR COMPLETED BOARD CERTIFIED

Q1B	AVE	N
AGA	1987	85
AASLD	1984	104
UNOS	1990	48

TYPE OF PRACTITIONER

Q21	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
AGA	4	139	4	0	6	153
AASLD	5	82	39	15	15	156
UNOS	0	5	3	67	5	80
TOTAL	9	226	46	82	26	389

AVERAGE AGE

Q3	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
AVE. AGE	49.8	49.1	50.1	45	48.8	48.76
N	9	226	46	82	26	319

SEX

Q4	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
MALE	7	202	39	75	19	342
FEMALE	2	24	7	7	7	47

SECTION I: EDUCATION AND PROFESSIONAL QUALIFICATIONS**LOCATION OF MEDICAL SCHOOL**

Q5	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
US/CANADA	8	187	36	58	19	308
INTERNATIONAL	1	37	9	22	6	75
TOTAL	9	224	45	80	25	383

AVERAGE YEAR GRADUATED

Q6	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH
YEAR	1976	1977	1977	1981	1980
N	9	226	45	81	25

AVERAGE GI FELLOWSHIP LENGTH

Q7	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
YEARS (AVE)	2.6	2.5	2.7	2.8	2.8	2.6
N	8	226	44	80	25	383

TYPE OF HEPATOLOGY TRAINING EXPERIENCE

Q8	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
GI/CONSULTATION/CLINIC	5	174	21	26	13	239
HEP DEDICATED SERVICES	3	20	15	12	2	52
HEP AND TRANS SERVICE	1	32	9	43	9	94
TOTAL	9	226	45	81	24	385

PROPORTION OF TRAINING SPENT EVALUATING AND TREATING HEPATOLOGY PATIENTS

Q9	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
1-10%	0	22	3	3	2	30
11-25%	3	125	19	25	9	181
26-40%	3	57	8	25	10	103
OVER 40%	2	19	15	25	3	64
TOTAL	8	223	45	78	24	378

WHETHER FACULTY AT TRAINING PROGRAM HAD SPECIALIZED EXPERIENCE

Q10	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
YES	7	179	41	77	19	323
NO	1	44	4	4	4	57
UNSURE	0	3	0	0	1	4
TOTAL	8	226	45	81	24	384

SECTION II: PRACTICE SETTING

PRIMARY PRACTICE SETTING

Q11	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
SOLO OR 2 PHYSICIANS	3	51	2	5	1	62
SINGLE SPECIALTY GROUP	1	92	11	24	7	135
MULTISPECIALTY GROUP	5	82	30	51	16	184
TOTAL	9	225	43	80	24	381

AVERAGE NUMBER OF PROFESSIONALS IN MULTISPECIALTY GROUP

Q11A	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
AVE # OF PHYSICIANS	115.8	55.4	92.6	85.7	15.1	65.6
N	5	163	36	56	14	274
Q11B						
AVE # OF Gastroenterologists	6.8	7.6	8.1	12.2	8.7	8.8
N	5	172	40	67	19	303
Q11C						
AVE # OF HEPATOLOGISTS	2.8	1.3	2.8	3.9	2.5	2.3
N	4	153	39	70	19	285

TYPE OF PRACTICE SETTING

Q12	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
COMMUNITY BASED	4	149	4	9	8	174
MEDICAL SCHOOL/ACADEMIC	5	72	40	70	17	204
OTHER	0	5	1	2	0	8
TOTAL	9	226	45	81	25	386

LOCATION OF PRACTICE SETTING

Q13	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
URBAN	5	131	37	69	21	263
SUBURBAN	2	77	4	7	4	94
RURAL	2	16	4	4	1	27
TOTAL	9	224	45	80	26	384

REGION OF COUNTRY

Q14	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
NEW ENGLAND	1	14	9	6	3	33
MIDDLE ATLANTIC	1	48	7	8	6	70
EAST NORTH CENTRAL	4	37	2	15	4	62
WEST NORTH CENTRAL	0	12	5	10	0	27
SOUTH ATLANTIC	1	26	9	13	6	55
EAST SOUTH CENTRAL	0	12	0	7	0	19
WEST SOUTH CENTRAL	1	14	5	7	4	31
MOUNTAIN	1	12	1	4	0	18
PACIFIC	0	47	6	10	3	66
CANADA	0	4	1	0	0	5
TOTAL	9	226	45	80	26	386

WHETHER SPECIALIST IS ACCEPTING NEW PATIENTS

Q15	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
CURRENTLY ACCEPTING	8	221	42	82	20	373
NOT CURRENTLY ACCEPTING	1	4	3	0	3	11
UNSURE	0	1	1	0	0	2
TOTAL	9	226	46	82	23	386
Q16						
AVE. WAIT--NEW PAT. (WEEKS)	3.3	4.2	6.2	6.4	5.6	4.9
N	9	226	42	82	20	379

CHANGE IN WAITING TIMES OVER PAST YEAR

Q17	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
INCREASE IN WAITING TIMES	4	132	24	65	11	236
DECREASE IN WAITING TIMES	0	16	4	6	3	29
STAYED THE SAME	5	78	17	11	9	120
TOTAL	9	226	45	82	23	385
Q17A						
AVE. INCREASE IN WEEKS	1.5	2.4	2.5	3	2.3	2.5
N	4	117	22	63	9	215
AVE DECREASE IN WEEKS	0	2.8	2.3	5.6	9.7	4.3
N	0	12	3	5	3	23

SECTION III: WORK EXPERIENCE**WORK EXPERIENCE**

Q18	GEN. INT. MED.	GASTRO	HEP W/O TRANS	HEP W/ TRANS	OTH	TOTAL
AVE. WEEKS/YR SEEING PAT	43.1	45.5	41.6	46.1	38.3	44.6
N	9	226	46	82	23	386
Q19						
AVE. HOURS/WK SEEING PAT.	23.6	39.5	24.2	28.2	32	34.5
N	8	226	46	81	23	384
Q20						
AVE. PATIENTS/WEEK SEEN	39.8	60.3	37.8	50.1	44.4	54.2
N	9	220	43	79	20	371

SECTION IV: GENERAL INTERNAL MEDICINE OR GASTROENTEROLOGY

DISTRIBUTION OF PATIENT WORKLOAD

Q22A-E	AVE. % OF TIME SPENT	N
UNCOMPLICATED HEP. PATIENTS	15.5	226
COMPLICATED HEP PATIENTS	7.7	226
GASTRO. PATIENTS	71.2	226
INTERNAL MEDICINE PATIENTS	4.9	226
OTHER PATIENTS	0.7	226

PROPORTION OF PATIENTS WITH LIVER DISEASE SPECIALIST REFERRED TO A HEPATOLOGIST

Q23	AVE % PATIENTS REFERRED	N
	8.2	226

CHANGE IN NUMBER OF REFERRALS TO HEPATOLOGISTS OVER PAST 5 YEARS

Q24	N	% OF TOTAL
INCREASED	52	24.9
DECREASED	12	5.2
STAYED THE SAME	162	69.9
TOTAL	226	100

TREATMENT OF PATIENTS WITH LIVER DISEASE

Q25	N	% OF TOTAL
USUALLY REFER SUSPECTED PATIENTS TO HEP	6	2.7
USUALLY REFER DIAGNOSED PATIENTS TO HEP	3	1.3
OFTEN REFER PATIENTS TO HEP	26	11.5
USUALLY TREAT MOST PATIENTS	191	84.5
TOTAL	226	100

CHARACTERIZATION OF SPECIALIST'S REFERRALS TO A HEPATOLOGIST

CASES WITHOUT COMPLICATIONS				
Q26 NO COMP	% TYPICALLY TREAT	% TYPICALLY REFER	% EVEN SPLIT	N
VIRAL HEPATITIS	96.4	2.7	0.9	224
METABOLIC AND INHERITED LIVER DISEASE	82.9	14	3.1	222
AUTO IMMUNE LIVER DISEASE	91.3	8.3	0.4	226
CIRRHOSIS	91.6	6.2	2.2	226
LIVER MASS	73.3	22.2	4.5	225
END STAGE DISEASE	NA	NA	NA	NA
CASES WITH COMPLICATIONS				
26 WITH COMP	% TYPICALLY TREAT	% TYPICALLY REFER	% EVEN SPLIT	N
VIRAL HEPATITIS	69.5	25	5.5	220
METABOLIC AND INHERITED LIVER DISEASE	58.5	37.8	3.7	217
AUTO IMMUNE LIVER DISEASE	69.3	26	4.7	215
CIRRHOSIS	71.5	20.4	8.1	221
LIVER MASS	55.3	39	5.7	215
END STAGE DISEASE	39.8	44	16.2	216

ACCESS TO HEPATOLOGISTS

Q27A	AVE # OF MILES	N
AVE DISTANCE TO NEAREST HEP	35.6	218
AVE DISTANCE TO NEAREST TRANSHEP.	45.6	226
Q27B	AVE # OF WEEKS	N
TYPICAL WAIT FOR HEP	3.6	197
TYPICAL WAIT FOR TRANS HEP	3.8	213

CHANGE IN WAITING TIME OVER PAST 5 YEARS FOR HEPATOLOGISTS

Q27C1	N	% OF TOTAL
INCREASED	72	36.7
DECREASED	9	4.6
STAYED THE SAME	115	58.7
TOTAL	196	100

CHANGE IN WAITING TIME OVER PAST 5 YEARS FOR TRANSPLANT HEPATOLOGISTS

Q27C2	N	% OF TOTAL
INCREASED	73	36.3
DECREASED	15	7.5
STAYED THE SAME	113	56.2
TOTAL	201	100

WHETHER SPECIALIST REFERRED A PATIENT DIRECTLY TO A TRANSPLANT CENTER FOR EVALUATION IN PAST YEAR

Q28	N	% OF TOTAL
YES	184	81.4
NO	39	17.4
UNSURE	3	1.2
TOTAL	226	100
Q28A	AVE # OF PATIENTS	N
IF YES, HOW MANY PATIENTS	4.8	191

SECTION V: HEPATOLOGY WITHOUT TRANSPLANTATION HEPATOLOGY

DISTRIBUTION OF PATIENT WORKLOAD

Q29	AVE % OF TIME SPENT	N
UNCOMPLICATED HEP PATIENTS	46.8	39
COMPLICATED HEP PATIENTS	31.4	39
GASTROENTEROLOGY PATIENTS	19.4	39
INTERNAL MEDICINE PATIENTS	2.3	39
OTHER PATIENTS	0.2	39

DISTRIBUTION OF SOURCES OF REFERRALS FOR PATIENTS WITH LIVER DISEASE

Q30	AVE % OF REFERRALS	N
FROM GASTROENTEROLOGISTS	27.1	42
FROM INTERNISTS	54	42
OTHERS	18.8	42

DISTRIBUTION OF CHARACTERISTICS OF LIVER DISEASE PATIENTS RECEIVED FROM REFERRALS

Q31	AVE % W/OUT COMP	AVE % W/ COMP	N
VIRAL HEPATITIS	36.3	11.4	25
METABOLIC AND INHERITED LIVER DISEASES	8.9	4.4	25
CIRRHOSIS	7.2	9	25
AUTO-IMMUNE LIVER DISEASE	4.1	5.1	25
LIVER MASS	2.7	5.6	25
END STAGE DISEASE	NA	2.4	25

NUMBER OF PATIENTS SPECIALIST REFERRED TO TRANSPLANT HEPATOLOGIST FOR EVALUATION IN PAST YEAR

Q32	AVE # OF REFERRALS	N
	15.7	43

AVERAGE DISTANCE TO NEAREST TRANSPLANT HEPATOLOGIST

Q33	AVE # OF MILES	N
	41.9	40

AVERAGE WAITING TIME FOR AN APPOINTMENT WITH A TRANSPLANT HEPATOLOGIST

Q34	AVE # OF WEEKS	N
	3.8	41

CHANGE IN WAITING TIME DURING THE PAST 5 YEARS

Q35	N	% OF TOTAL
WAITING TIME INCREASED	16	34.8
WAITING TIME DECREASED	1	2.2
WAITING TIME STAYED THE SAME	29	63
TOTAL	46	100

SECTION IV: TRANSPLANTATION HEPATOLOGY

DISTRIBUTION OF PATIENT WORKLOAD

Q36	AVE % OF TIME SPENT	N
TRANSPLANTATION HEP.	40.8	68
GENERAL HEP.	50.5	68
GASTRO	8.3	68
INTERNAL MEDICINE	0	68
OTHER	0.4	68

DISTRIBUTION OF THE SOURCES OF TRANSPLANT REFERRALS

Q37	AVE % OF REFERRALS	N
FROM HEPATOLOGISTS	11.6	78
FROM GASTROENTEROLOGISTS	63.8	78
FROM INTERNISTS	21.2	78
FROM OTHERS	3.4	78

AVERAGE NUMBER OF PATIENTS AT SPECIALIST'S CENTER WHO RECEIVED A LIVER TRANSPLANT LAST YEAR

Q38	AVE # OF PATIENTS	N
	66.2	80

AVERAGE NUMBER OF PATIENTS AT SPECIALIST'S CENTER CURRENTLY ON TRANSPLANT LIST

Q39	AVE # ON LIST	N
	182	78

NUMBER OF PATIENTS SPECIALIST EVALUATED FOR A TRANSPLANT IN LAST YEAR

Q40	AVE # EVALUATED	N
	109.9	75

AVERAGE NUMBER OF PATIENTS SPECIALIST IS CARING FOR WHO ARE CURRENTLY LISTED FOR A TRANSPLANT

Q41	AVE # BEING CARED FOR	N
	85.1	78

NUMBER OF POST TRANSPLANT PATIENTS SPECIALIST IS CURRENTLY CARING FOR

Q42	AVE # BEING CARED FOR	N
	179.7	77

POINT AT WHICH SPECIALIST TYPICALLY ASSUMES CONTINUOUS CARE FOR TRANSPLANT PATIENT

Q43	N	% OF TOTAL
BEFORE A PATIENT IS ON TRANS. LIST	58	71.1
WHEN PATIENT'S TRANS IS IMMINENT	2	2.4
AS SOON AS A PATIENT IS ON TRANS LIST	22	26.5
WHEN TRANS. IS COMPLETED	0	0
TOTAL	82	100

LENGTH OF TIME SPECIALIST HAS PRIMARY MEDICAL RESPONSIBILITY FOR POST-TRANSPLANT PATIENTS

Q44	N	% OF TOTAL
UP TO 6 MONTHS	17	20.5
SIX MONTHS TO 1 YR.	11	13.3
1 TO 3 YRS	9	10.8
MORE THAN 3 YRS	45	55.4
TOTAL	82	100

Appendix B:
Program Director Survey and Response

**AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES
GASTROENTEROLOGY FELLOWSHIP PROGRAM DIRECTOR'S SURVEY**

GENERAL FELLOWSHIP PROGRAM INFORMATION

1. Do you have a liver transplantation center at your institution?

π_1 Yes π_2 No

2. Please complete the following table to provide information regarding GI and hepatology fellows in your program. **Note: the numbers reported on lines (B) and (C), should equal the number reported on line (A).**

A. Total number of GI fellows	<p style="text-align: center;"> $\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi$ (Should equal total of (B) added to (C)) </p>
B. Number of fellows receiving training in advanced hepatology in third year	<p style="text-align: center;">$\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi$</p>
C. Number of fellows receiving training in advanced hepatology AND transplantation hepatology.	<p style="text-align: center;">$\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi$</p>
D. Number of hepatology fellows not part of the GI training program.	<p style="text-align: center;">$\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi\Pi$</p>

3. Over the past five years, approximately what percentage of your fellows have been international medical graduates (i.e., graduates of medical schools outside of the United States and Canada)?

$\Pi\Pi\Pi\Pi\Pi$ $\Pi\Pi\Pi\Pi\Pi$ $\Pi\Pi\Pi\Pi\Pi$ %

4. Over the next five years, do you expect that the percentage of your IMG fellows will...
(Check one of the following)

π_1 Increase π_2 Decrease π_3 Stay the same

5. What percentage of your fellows leave the United States upon completion of their fellowships?

$\Pi\Pi\Pi\Pi\Pi$ $\Pi\Pi\Pi\Pi\Pi$ $\Pi\Pi\Pi\Pi\Pi$ %

FELLOWSHIP FACULTY

6. How many physicians on your faculty are responsible for hepatology training within your fellowship program?

||||| |||||| ||||||

7. For each physician responsible for hepatology training within your fellowship (**identified in Question 6**), please characterize that individual's level of training or expertise by indicating the number of physicians to which each response applies. (**If a response applies to none of the physicians, please indicate with a zero.**)

- A. General gastroenterologist. |||||
- B. General gastroenterologist with expertise and clinical experience in hepatology whose training did not include a hepatology fellowship. |||||
- C. Hepatologist whose training did not include a clinical hepatology fellowship. (**Hepatologist defined as at least 50% of their clinical practice caring for patients with liver disease**) |||||
- D. Hepatologist whose training included a clinical hepatology fellowship. |||||
- E. Hepatologist who is also a transplantation hepatologist. |||||

8. For each faculty member responsible for hepatology training within your fellowship program (**identified in Question 6**), please complete the following table by putting the **total number of physicians** in the column that **best characterizes** their primary focus.

Area of Primary Focus		
A. Medical Liver Disease (non-transplant)	B. Transplantation Hepatology	C. Both Medical Liver Disease & Transplantation Hepatology

9. How many openings for the following positions do you have currently? (**Please indicate the number for each category. If none, please indicate with a 0**)

- A. Gastroenterology faculty ||||| B. Hepatology faculty (non-transplant)? |||||
- C. Transplantation hepatology faculty |||||

FELLOWSHIP TRAINING

10. Does your fellowship program offer a formal training program in ...

- | | | |
|---|-------------|------------|
| A. Advanced hepatology? | π_1 Yes | π_2 No |
| B. Transplantation hepatology within a three year fellowship program? | π_1 Yes | π_2 No |
| C. Transplantation hepatology with fourth year required? | π_1 Yes | π_2 No |
-

11. Which one of the following **best** describes the hepatology training experience of your fellowship program?

- π_1 GI /consultation/clinic service (includes hepatology patients)
 - π_2 Hepatology dedicated service (without transplant service.)
 - π_3 Hepatology and transplant services
 - π_4 Other
-

Thank you for taking the time to complete this survey.

Please return in the enclosed stamped, self-addressed envelope provided by March 5, 2001

GASTROENTEROLOGY FELLOWSHIP PROGRAM DIRECTOR'S SURVEY

WHETHER INSTITUTION HAS A LIVER TRANSPLANTATION CENTER

Q1	N	% OF TOTAL
YES	71	68.2
NO	33	31.8
TOTAL	104	100

GI AND HEPATOLOGY FELLOW INFORMATION

Q2A	AVE. # FELLOWS	N
NUMBER OF GI FELLOWS	6.3	102
Q2B NUMBER OF GI FELLOWS RECEIVING TRAINING IN ADVANCED HEPATOLOGY IN 3RD YEAR	1.6	102
Q2C NUMBER OF GI FELLOWS RECEIVING TRAINING IN ADVANCED HEPATOLOGY AND TRANSPLANT HEPATOLOGY	2.4	102
Q2D NUMBER OF HEP. FELLOWS NOT PART OF TRAINING PROGRAM	0.4	102

NOTE: SURVEY INDICATES THAT RESPONSES 2B + 2C SHOULD EQUAL 2A. RESTRICTING SAMPLE TO OBS. WHERE 2B + 2C = 2A:

Q2A	AVE. # FELLOWS	N
NUMBER OF GI FELLOWS	6.2	56
Q2B NUMBER OF GI FELLOWS RECEIVING TRAINING IN ADVANCED HEPATOLOGY IN 3RD YEAR	2.4	56
Q2C NUMBER OF GI FELLOWS RECEIVING TRAINING IN ADVANCED HEPATOLOGY AND TRANSPLANT HEPATOLOGY	3.9	56
Q2D NUMBER OF HEP. FELLOWS NOT PART OF TRAINING PROGRAM	0.4	56

PERCENTAGE OF FELLOWS OVER PAST 5 YEARS WHO WERE INTERNATIONAL MEDICAL GRADUATES

Q3	AVE % FELLOWS	N
	35.7	105

EXPECTED CHANGE IN PERCENTAGE OF IMG FELLOWS OVER THE NEXT 5 YEARS

Q4	N	% OF TOTAL
INCREASE	9	8.7
DECREASE	55	52.9
STAY THE SAME	40	38.4
TOTAL	104	100

PERCENTAGE OF FELLOWS WHO LEAVE UNITED STATES UPON COMPLETION OF THEIR FELLOWSHIP

Q5	AVE % FELLOWS	N
	6.7	103

NUMBER OF PHYSICIANS ON FACULTY WHO ARE RESPONSIBLE FOR HEPATOLOGY TRAINING WITHIN FELLOWSHIP PROGRAM

Q6	AVE # PHYSICIANS	N
	3.9	105

CHARACTERISTICS OF PHYSICIANS RESPONSIBLE FOR HEPATOLOGY TRAINING WITHIN FELLOWSHIP PROGRAM

Q7A	AVE # PHYSICIANS	AVE % PHYSICIANS	WGHTD. AVE: % ACROSS PROGRAMS	N
GENERAL GASTROENTEROLOGIST Q7B	1.02	27.4	26.1	104
GENERAL GASTRO WITH EXPERTISE AND EXPERIENCE IN HEP WHOSE TRAINING DID NOT INCLUDE HEP FELLOWSHIP Q7C	0.9	26.9	22.9	104
HEPATOLOGIST WHOSE TRAINING DID NOT INCLUDE HEP FELLOWSHIP Q7D	0.95	22.3	24.1	104
HEPATOLOGIST WHOSE TRAINING INCLUDED CLINICAL HEPATOLOGY FELLOWSHIP Q7E	1.4	36.9	35.6	104
HEPATOLOGIST WHO IS ALSO TRANSPLANTATION HEPATOLOGIST	1.69	44.4	42.9	104
TOTAL	5.96	157.9	151.6	

**CHARACTERISTICS OF PHYSICIANS RESPONSIBLE FOR HEPATOLOGY TRAINING WITHIN FELLOWSHIP PROGRAM
CORRECT INTERPRETATIONS OF QUESTION**

Q7A	AVE # PHYSICIANS	AVE % PHYSICIANS	WGHTD. AVE: % ACROSS PROGRAMS	N
GENERAL GASTROENTEROLOGIST Q7B	0.46	8.3	12.4	50
GENERAL GASTRO WITH EXPERTISE AND EXPERIENCE IN HEP WHOSE TRAINING DID NOT INCLUDE HEP FELLOWSHIP Q7C	1.1	31.5	29.7	50
HEPATOLOGIST WHOSE TRAINING DID NOT INCLUDE HEP FELLOWSHIP Q7D	0.38	10.7	10.3	50
HEPATOLOGIST WHOSE TRAINING INCLUDED CLINICAL HEPATOLOGY FELLOWSHIP Q7E	0.88	25.4	23.8	50
HEPATOLOGIST WHO IS ALSO TRANSPLANTATION HEPATOLOGIST	0.88	24.1	23.8	50
TOTAL	3.7	100	100	

PRIMARY FOCUS OF FACULTY MEMBERS RESPONSIBLE FOR HEPATOLOGY TRAINING WITHIN FELLOWSHIP PROGRAM

Q8A	AVE # PHYSICIANS	AVE % PHYSICIANS	WGHTD. AVE: % ACROSS PROGRAMS	N
MEDICAL LIVER DISEASE Q8B	2.15	61.1	54.8	103
TRANSPLANTATION HEPATOLOGY Q8C	0.42	10.5	10.8	103
MEDICAL LIVER DISEASE AND TRANSPLANTATION HEPATOLOGY	1.79	44.4	44.7	103
TOTAL	4.36	116	110.3	

PRIMARY FOCUS OF FACULTY MEMBERS RESPONSIBLE FOR HEPATOLOGY TRAINING WITHIN FELLOWSHIP PROGRAM

CORRECT INTERPRETATIONS OF QUESTION

Q8A	AVE # PHYSICIANS	AVE % PHYSICIANS	WGHTD. AVE: % ACROSS PROGRAMS	N
MEDICAL LIVER DISEASE Q8B	2	52.4	49.5	80
TRANSPLANTATION HEPATOLOGY Q8C	0.3	5.8	7.4	80
MEDICAL LIVER DISEASE AND TRANSPLANTATION HEPATOLOGY	1.74	41.8	43.1	80
TOTAL	4.04	100	100	

NUMBER OF CURRENT OPENINGS FOR POSITIONS

Q9A	AVE # OPENINGS	N
GASTROENTEROLOGY FACULTY Q9B	1.44	105
HEPATOLOGY FACULTY Q9C	0.44	105
TRANSPLANTATION HEPATOLOGY FACULTY	0.48	105

WHETHER FELLOWSHIP PROGRAM OFFERS FORMAL TRAINING PROGRAM IN SPECIFIC FIELDS

Q10A	% OFFER PROGRAM	N
ADVANCED HEPATOLOGY Q10B	58.4	100
TRANSPLANTATION HEPATOLOGY WITHIN A 3 YEAR FELLOWSHIP PROGRAM Q10C	62.1	100
TRANSPLANTATION HEPATOLOGY WITH A FOURTH YEAR REQUIRED	24	100

DESCRIPTION OF HEPATOLOGY TRAINING EXPERIENCE AT CENTER'S FELLOWSHIP PROGRAM

Q11	N	% OF TOTAL
GI/CONSULTATION /CLINIC SERVICE (INCLUDES HEP. PATIENTS)	38	36.9
HEPATOLOGY DEDICATED SERVICE (WITHOUT TRANS. SERVICE)	10	9.7
HEPATOLOGY AND TRANSPLANT SERVICES	54	52.4
OTHER	1	1
TOTAL	103	100