

# Chronic hepatitis C infection: how much are physicians aware of?

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## Abstract

**Aim:** The purpose of our study is to measure the awareness of hepatitis C among physicians employed in Istanbul, and investigate the relationship between awareness and the specialization field, age and presence of chronic hepatitis/positive family history.

**Material and methods:** Level of awareness of 125 family physicians and 76 internal medicine physicians, employed within Istanbul Province, on hepatitis C infection were evaluated using standard questionnaire. Relationship between their awareness and age, specialization, presence of any chronic hepatitis and chronic hepatitis C in any relatives were investigated.

**Results:** The mean age of the physicians was  $30.9 \pm 7.1$  years (range: 23–45 years) and 58% of them were women. Seventy-five (37.3%) physicians were between ages of 23–28, 67 (33.3%) physicians were between ages of 29–32, and 59 (29.4%) physicians ages was greater than 32. Twenty-one (10.4%) physicians had hepatitis or a first-or second-degree relative with hepatitis. Physicians were found to be insufficient in answering the questions on hepatitis C virus transmission routes and who should be screened. When examined based on transmission routes, there were no significant differences between physicians' specializations and positive familial history, but physicians aged 23–28 had significantly poorer awareness at some points. Internal medicine specialists had better awareness on screening tests compared to family physicians but there were no significant differences between positive familial history and physicians' age.

**Conclusions:** Physicians' awareness should be improved to prevent hepatitis C virus transmission and to identify existing conditions.

## Introduction

Hepatitis C virus (HCV) infection is a global health problem. One hundred and seventy million people are still chronically infected worldwide and are at risk of cirrhosis and cancer. Four million people are added to this figure every year and 350.000 people die due to HCV-related conditions annually [1, 2]. The primary route of transmission is parenteral, but HCV is also known to be transmitted through needle-stick injury, sexual intercourse and maternal transmission [3, 4]. Chronic HCV infection usually has an asymptomatic course unless it leads to complications, which constitutes the major problem in diagnosis [5, 6]. A study in Turkey where 36.554 people were screened according to the epidemiological screening method has found an

anti-HCV seroprevalence of 0.9% [7]. Based on this ratio, it is estimated that approximately 722 thousand patients are anti-HCV positive in Turkey, and based on the rate of progression to chronic disease of 85%, approximately 614 thousand people are estimated to have chronic hepatitis C. Considering that nearly 4000 people are treated for chronic hepatitis C every year based on the IMS (International Medical Statistic) reports, one can conclude that a great number of individuals remain undiagnosed and continue their lives untreated among the society. Undiagnosed cases represent risks for not only transmitting the disease but also developing chronic hepatic complications such as cirrhosis and hepatocellular carcinoma. Similarly, a study from the USA has reported that 45–85% of patients with chronic HCV infection were unaware of their disease [8].

A cure rate of up to 95–100% has been achieved with the current therapies in chronic HCV infection [9]. However, the facts that the patients are not aware of their conditions added to the inadequate knowledge and awareness of healthcare providers on hepatitis C constitute obstacles in preventing the spreading of the disease as well as in identifying and treating the existing cases. Moreover, due to poor awareness of medical practitioners, some HCV-positive people have not been advised to seek further medical care. Some studies show that the majority of health professionals lack the knowledge and skills for caring HCV-positive people effectively. These studies also show that social prejudice toward self-reported behavior and fear of contracting hepatitis C, negatively affect health professionals [10]. Few studies are done regarding HCV awareness [10–12]. Although, in Turkey there is one study investigating the awareness of medical school students, nurses and dentists about HCV, there is no study showing the awareness of physicians about HCV [13].

Studies have shown that age of physicians and their specialties are important markers for HCV awareness [10, 11].

## Aim

The purpose of our study is to measure the awareness of hepatitis C among physicians employed in Istanbul, and investigate the relationship between awareness and the specialization field, age and presence of chronic hepatitis/ positive family history.

## Material and methods

### Study subjects

One hundred and twenty-five family physicians and 76 internal medicine physicians, employed within Istanbul city, were included in the study. Physicians who are employed in health care centers as general practitioners and public hospitals as internal medicine specialists, chosen in equal numbers from each districts of Istanbul Province, were invited to attend the questionnaire. The physicians who accepted to fill out the questionnaire were accepted for the study.

The included physicians were invited to face-to-face interviews and were asked to complete *in situ* a standard, printed questionnaire that was prepared previously. The physicians were informed beforehand that their names or other personal identifiers would not be listed on the questionnaire form. Physicians' age, gender, specializations, employed institutions and whether they or their relatives had hepatic disease were questioned. Physicians who had or whose first- or second-degree relative had chronic hepatitis B or C were evaluated as positive familial history.

## Questionnaire

The participating physicians were asked the prevalence of chronic HCV in Turkey, the most common route of HCV transmission and whether asymptomatic patients with chronic HCV infection could have cirrhosis. The rate of accuracy of the responses was calculated in percentage. The physicians were also given 10 separate choices regarding chronic HCV infection transmission routes [14], and 16 separate choices regarding the patient profile for whom anti-HCV test should be requested [15] and they were asked to mark whether the statements were true or false. Relationships of the responses to physicians' specialization, age and familial history were investigated.

## Ethics statement

All participants provided written consent for participation in the study. Ethics approval for conducting this study was received from the Ethical Committee of the Hospital (Date: 11.03.2015, Ethics Committee Issue Number: 71306642-050.01.04 Resolution Number: 5/16). All procedures were in accordance with the ethical standards of the committee on human experimentation of our institution and with the Declaration of Helsinki.

## Statistical analysis

The IBM SPSS 22 (IBM SPSS, Turkey) programme was used for statistical analyses of data. Ratios of true and false answers given to questions were presented in percentage. The relationship between physicians' specialization, age, presence of hepatic disease in physicians or in their relatives and the accuracy of responses were examined using  $\chi^2$  test. Statistical significance was set at  $p < 0.05$  in these analyses.

## Results

The study included 125 (62.1%) family physicians and 76 (37.9%) internal medicine physicians, employed in Istanbul Province. Most of the physicians were women (58%) and their mean age was  $30.9 \pm 7.1$  years (range: 23–45 years). 75 (37.3%) physicians were between ages of 23–28, 67 (33.3%) physicians were between ages of 29–32, and 59 (29.4%) physicians ages was greater than 32. Of the physicians, 77% worked in hospitals, 22% in maternal and infant health center and 1% in community health centers.

Four (2%) of the physicians had chronic hepatitis (B or C) while 12 (6%) had never been tested. Seventeen (8.4%) of the physicians had a relative with chronic hepatitis. HCV positivity, either in the physician or a relative, was identified in a total of 21 (10.4%) physicians.

According to the questionnaire results, 70 (35%) of the physicians answered that HCV prevalence in Turkey was below 1%, and 131 (65%) answered that it was above 2%. For the questions on routes of transmission, the most common responses were transfusion, tooth extraction and post-IV drug injection (68%, 15% and

11%, respectively). For the question, "Can patients with chronic HCV be asymptomatic and present with hepatic cirrhosis?", 86% of the physicians answered yes and 14% answered no. The correct response rate of this question was significantly higher in internal medicine physicians (80% vs. 93%,  $p = 0.017$ ) (Table I). Relation-

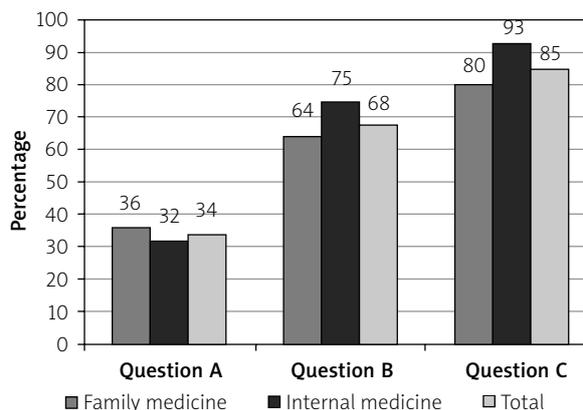
**Table I.** Rate of accurate responses to the following questions

Variable	Factors	Correct answer	N (%)	P-value		
A. What do you think is the prevalence of chronic HCV in Turkey?	Specialty	Family medicine	45 (36)	0.554		
		Internal medicine	24 (32)			
		Total	69 (34)			
	Physician family history of chronic hepatitis	Positive	6 (28)		0.492	
		Negative	64 (35)			
		Total	70 (35)			
	Physician age	23–28 years	19 (25)		0.25	
		29–32 years	25 (37)			
		> 32 years	21 (35)			
		Total	65 (32)			
	B. What is the most common route of hepatitis C transmission in Turkey?	Specialty	Family medicine		80 (64)	0.121
			Internal medicine		57 (75)	
Total			137 (68)			
Physician family history of chronic hepatitis		Positive	15 (71)	0.101		
		Negative	135 (75)			
		Total	150 (74)			
Physician age		23–28 years	32 (43)	0.059		
		29–32 years	45 (67)			
		> 32 years	32 (54)			
		Total	109 (54)			
C. Can patients with chronic HCV be asymptomatic and present with hepatic cirrhosis?		Specialty	Family medicine	100 (80)	0.017*	
			Internal medicine	71 (93)		
	Total		171 (85)			
	Physician family history of chronic hepatitis	Positive	17 (81)	0.545		
		Negative	154 (86)			
		Total	171 (85)			
	Physician age	23–28 years	62 (83)	0.436		
		29–32 years	57 (85)			
		> 32 years	46 (77)			
		Total	165 (82)			

Number of correct responses to questions in the questionnaire are given in the table ( $\chi^2$  test, \* $p < 0.05$ ).

ship between physicians' specializations and the correct answer is shown in Figure 1.

Almost all of the physicians correctly responded that HCV may be transmitted with blood transfusion but 11% of them responded that the disease may not be transmitted with sexual contact, 14% answered that illegal drug and IV injection will not transmit the disease, 26% responded that there could be no maternal transmission and 31% answered that sharing scissors, razors and toothbrush with others would not result in transmission. In addition, 17%, 1%, 3% and 4% of the physicians inaccurately responded that transmission may occur by kissing, sharing clothes, using the same restroom or handshaking, and working in the same environment, respectively. When examined based on transmission routes, there were no significant differences between physicians' specializations and positive familial history, but physicians aged 23–28 had significantly poorer awareness at some points. Compared by age groups, it was detected that physicians in the 23–28 age group answered the 4<sup>th</sup> (93% vs. 100% and 98%), 5<sup>th</sup> (93% vs. 98% and 100%), and 6<sup>th</sup> (96% vs. 100% and 100%) questions correctly in less proportion. Also in question 8, it was observed that physicians in



**Figure 1.** Rate of accurate responses to between the speciality of physicians in Table I

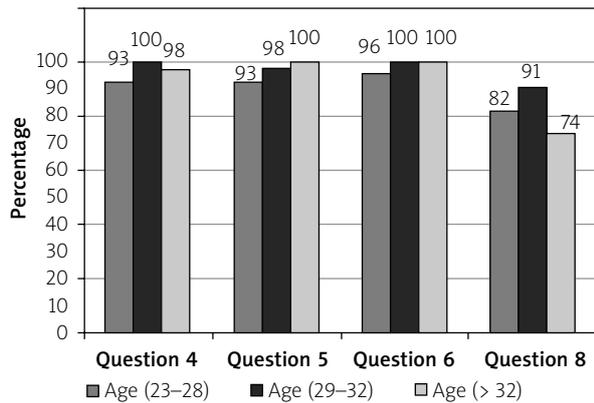
the 29–32 age range answered the question correctly in a significantly higher proportion (respectively 82%, 91%, 74%) than physicians in other ages (Table II). Significant relationship between the ratio of correct answers for HCV transmission and the physicians' age is shown in Figure 2.

The question that who should be screened for anti-HCV was examined; There were significant relationship

**Table II.** Questions on the routes of chronic HCV transmission and their answers

Quest.	1) Blood transfusion 2) Sexual contact 3) Living or working in the same place with a person with chronic HCV 4) Using the same toilet with a person with chronic HCV 5) Skin contact (handshakin getc.) with a person with chronic HCV					6) Sharing clothes with a person with chronic HCV 7) Sharing scissors, toothbrush or razors with a person with chronic HCV 8) Kissing a person with chronic HCV 9) Maternal transmission of chronic HCV during delivery 10) With injections of illegal drug use				
	Family phys.	Internal disease spec.	P-value	Familial history (+) phys.	Familial history (-) phys.	P-value	Age (23–28)	Age (29–32)	Age (32+)	P-value
1	124 (99%)	76 (100%)	0.329	21 (100%)	180 (100%)	–	75 (100%)	67 (100%)	59 (100%)	–
2	109 (87%)	69 (91%)	0.438	17 (81%)	162 (90%)	0.276	67 (89%)	58 (86%)	54 (91%)	0.673
3	120 (96%)	73 (96%)	0.985	20 (95%)	174 (96%)	0.846	70 (93%)	66 (98%)	58 (98%)	0.177
4	122 (98%)	73 (96%)	0.538	21 (100%)	175 (97%)	0.247	70 (93%)	67 (100%)	58 (98%)	0.029*
5	120 (96%)	75 (99%)	0.25	21 (100%)	175 (97%)	0.247	70 (93%)	66 (98%)	59 (100%)	0.033*
6	124 (99%)	74 (97%)	0.308	20 (95%)	179 (99%)	0.279	72 (96%)	67 (100%)	59 (100%)	0.049*
7	81 (65%)	58 (76%)	0.087	16 (76%)	124 (69%)	0.47	55 (73%)	47 (70%)	41 (69%)	0.853
8	104 (83%)	62 (82%)	0.769	18 (86%)	149 (82%)	0.691	62 (82%)	61 (91%)	44 (74%)	0.046*
9	91 (73%)	58 (76%)	0.581	15 (71%)	134 (74%)	0.797	56 (74%)	48 (71%)	47 (79%)	0.584
10	107 (86%)	66 (87%)	0.805	19 (90%)	154 (85%)	0.484	65 (86%)	58 (86%)	50 (84%)	0.935
Total	1102 (88%)	684 (90%)	0.204	188 (90%)	1606 (89%)	0.730	662 (88%)	605 (90%)	529 (89%)	0.461

Number of correct responses to questions in the questionnaire and the total number of correct all the questions are given in the table. Quest. – Questions, spec. – specialist, phys. – physicians ( $\chi^2$  test, \* $p < 0.05$ ).



**Figure 2.** Questions on the routes of chronic HCV transmission and their answers. Rate of accurate responses to between the age of physicians in Table II

between specialty but there were no significant differences between positive familial history and physicians' age. Internal medicine specialists had better awareness on screening tests compared to family physicians. In total (64% vs. 72%) and in questions 1 (80% vs. 93%), 2 (84% vs. 96%), 3 (78% vs. 91%), 4 (58% vs. 79%), 6 (69% vs. 88%), 10 (52% vs. 71%), and 16 (30% vs. 46%), we found that internal medicine physicians had a significantly high correct percentage (Table III). Significant relationship between the ratio of correct answers for the conditions that anti-HCV test should be used and physicians' specialization is shown in Figure 3.

### Discussion

About 20–30% of the patients with untreated chronic HCV develop cirrhosis and advanced liver disease leading to HCC after 20 years. The annual ratio of devel-

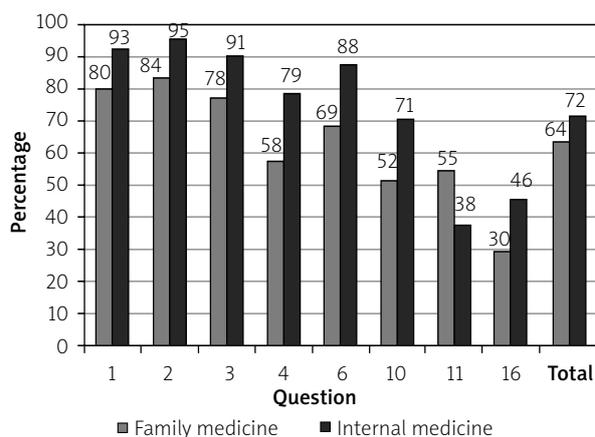
**Table III.** Responses to the question, “For which of the following groups you request HCV tests?”

Quest.	1) Patients with elevated hepatic functions tests 2) Patients with parenteral illegal drug use 3) Healthcare professionals in contact with HCV 4) Patients transfused before 1995 5) Patients transfused after 1995 6) Dialysis patients 7) Inmates 8) People with multiple sexual partners 9) Patients with sexually transmitted diseases						10) People with tattoos or piercing 11) All healthcare workers 12) Pregnant women 13) People with non-sexual contact with chronic HCV patients 14) All patients presenting to the polyclinic 15) Symptomatic individuals with familial history 16) Asymptomatic individuals with familial history			
	Family phys.	Internal disease spec.	P-value	Familial history (+) phys.	Familial history (-) phys.	P-value	Age (23-28)	Age (29-32)	Age (32+)	P-value
1	100 (80%)	71 (93%)	0.01*	19 (90%)	152 (84%)	0.409	68 (90%)	55 (82%)	48 (81%)	0.22
2	105 (84%)	73 (96%)	0.005**	20 (95%)	158 (87%)	0.238	67 (89%)	61 (91%)	49 (83%)	0.343
3	97 (78%)	69 (91%)	0.017*	18 (86%)	149 (82%)	0.691	60 (80%)	56 (83%)	50 (85%)	0.755
4	72 (58%)	60 (79%)	0.002**	15 (71%)	117 (65%)	0.536	54 (72%)	47 (70%)	30 (51%)	0.019*
5	102 (82%)	57 (75%)	0.264	18 (86%)	142 (78%)	0.419	61 (81%)	55 (82%)	47 (79%)	0.934
6	86 (69%)	67 (88%)	0.002**	15 (71%)	139 (77%)	0.584	62 (82%)	52 (77%)	39 (66%)	0.072
7	32 (26%)	28 (37%)	0.091	9 (43%)	51 (28%)	0.163	23 (30%)	21 (31%)	19 (32%)	0.991
8	79 (63%)	58 (76%)	0.053	11 (52%)	127 (70%)	0.097	56 (74%)	46 (68%)	35 (59%)	0.152
9	69 (55%)	49 (64%)	0.195	11 (52%)	107 (59%)	0.553	47 (62%)	39 (58%)	32 (54%)	0.585
10	65 (52%)	54 (71%)	0.008**	10 (48%)	109 (60%)	0.267	44 (58%)	39 (58%)	35 (59%)	0.994
11	69 (55%)	29 (38%)	0.019*	13 (62%)	86 (48%)	0.212	36 (48%)	33 (49%)	35 (59%)	0.387
12	59 (47%)	33 (43%)	0.602	13 (62%)	79 (44%)	0.112	33 (44%)	34 (50%)	29 (49%)	0.711
13	112 (90%)	65 (86%)	0.388	20 (95%)	158 (87%)	0.238	64 (85%)	60 (89%)	54 (91%)	0.517
14	120 (96%)	72 (95%)	0.677	21 (100%)	172 (95%)	0.155	71 (95%)	65 (97%)	56 (95%)	0.755
15	82 (66%)	53 (70%)	0.545	12 (57%)	123 (68%)	0.319	51 (68%)	42 (62%)	43 (72%)	0.476
16	37 (30%)	35 (46%)	0.018*	7 (33%)	65 (36%)	0.815	28 (37%)	27 (40%)	20 (33%)	0.729
Total	1286 (64%)	873 (72%)	0.000**	232 (69%)	1934 (67%)	0.403	825 (68%)	732 (68%)	621 (66%)	0.251

Number of correct responses to questions in the questionnaire and the total number of correct all the questions are given in the table. Quest. – Questions, spec. – specialist, phys. – physicians ( $\chi^2$  test, \* $p < 0.05$ , \*\* $p < 0.01$ ).

oping HCC was found as 1–7% [16]. Because the condition is asymptomatic in 70–80% of the patients, a very low proportion of them present to healthcare facilities and most of these patients have advanced stage liver disease and complications at the time of presentation. Another important factor associated with the low number of treated cases is the poor awareness [17]. There has been a dramatic increase in success rates among treated individuals. In 90's, sustained virologic response (SVR) with standard interferon therapy was 5–20%, which was increased to 54–63% with the pegylated interferon and ribavirin combination and then to 70–75% with the advent of protease inhibitors in 2011 [18–20]. Currently, SVR can be achieved in 95–100% of the cases with combined use of the latest generation NS5A and NS5B inhibitors [9]. On the other hand, because a HCV vaccine has not been developed and given the absence of post-exposure prophylaxis, spreading of HCV can only be prevented by improving the awareness and identifying and treating infected individuals.

To fight against HCV, it is so important to know how virus transmits. HCV is usually transmitted with IV drug injection in developed countries, while the transmission is often through blood transfusion and medical materials in developing countries [21, 22]. Significant HCV transmission is reported during schistosomiasis treatment in Egypt, the country with highest seroprevalence and during kala azar treatment in India [21]. Perinatal and sexual transmission risks are known to be low in HCV. The rate of transmission during delivery in HCV-infected mothers has been reported as 2.7–8.4% and 15–20% of the acute hepatitis cases have been associated with sexual contact [14, 21]. In our study, we observed a significant awareness deficiency about HCV transmission. Awareness about HCV transmission among physicians has been studied by some researchers in some countries. In a similar study to our study, Feng *et al.* have reported that 89% of the respondents thought that hepatitis C was not transmitted by kissing, hugging, or sharing eating utensils. Eleven percent mistakenly believed that the disease was not transmitted from mother to infant, by sharing a needle or syringe, by sharing a razor or toothbrush, or by having sex with a partner with HCV infection [10]. Rana *et al.* in a study investigating the awareness of orthopedic surgeons about HCV, have reported that; The majority of surgeons (56%) were unaware that HCV infection was a sexually transmitted disease and 82% did not know about the possibility of its transmission perinatally. Of all the subjects 93% knew that HCV could be transmitted through blood transfusions and 88% knew about its transmission through a needle-stick injury [23]. In comparison to other studies, we found that data of



**Figure 3.** Responses to the question, “For which of the following groups you request HCV tests?” Rate of accurate responses to between the speciality of physicians in Table III

our study was similar to Far East countries and we saw that HCV awareness was much worse in Pakistan. In our study we also found that young physicians were significantly less aware. Therefore experience is thought to be one of the most important factors in preventing HCV transmission.

Centers for Disease Control and Prevention (CDC) published a guideline on HCV screening in 1998 [24]. The guideline updated by NIH in 2002 was finalized by United States Preventive Services Task Force (USPSTF) in 2013 [15, 25]. The guideline states that individuals with elevated hepatic functions tests, those at risk of parenteral, sexual, vertical and percutaneous transmission and those with positive familial history should particularly be screened. In addition, the latest USPSTF guideline states that individuals born between 1945 and 1965 should be screened because this age group represented 75% of the chronic HCV population in the United States. In their studies with physicians, Ferrante *et al.* have reported that awareness on which patient profile should be screened was low [11]. In our study, we observed a significant awareness deficiency on this subject too. In our study we also observed that internal medicine physicians have a better awareness about the HCV transmission routes. We believe that the family physicians' inadequate training and seeing fewer patients with hepatitis C are factors which play role in this case.

This study has several limitations. It was conducted with family physicians and internal medicine physicians in Istanbul Province, so the results can't be generalized to other physicians. Also our study can not be used to generate population estimates because of the small number of respondents. Majority of the participants in our study were aged between 20–40. So it caused to

be non-homogeneous distribution in terms of all physicians' age. In addition, the small sample size limited our power to detect statistically significant differences between subgroups. However, since Istanbul is the country's largest and most cosmopolitan city, we believe that it reflects the overall average. This study was designed through family physicians and internal medicine physicians, because we believed that these physicians are screening more patients with risk of HCV and are encountered more often in these patients than other physicians. Being the first study investigating objectively the HCV awareness of physicians in Turkey is one of the main strengths of our study.

## Conclusions

Considering that 0.9% of our population is infected, it is evident that complications and mortality associated with chronic HCV will be an important healthcare issue in the upcoming years. The priority is identifying and treating existing patients. In our study; physicians were found to be insufficient in answering the questions on HCV transmission routes and who should be screened. When examined based on transmission routes, there were no significant differences between physicians' specializations and positive familial history, but physicians aged 23–28 had significantly poorer awareness at some points. Internal medicine specialists had better awareness on screening tests compared to family physicians but there were no significant differences between positive familial history and physicians' age. Physicians' awareness should be improved to prevent hepatitis C virus transmission and to identify existing conditions. We therefore believe that raising HCV awareness of physicians in primary and secondary care is the most important step in fight against chronic HCV.

## Acknowledgments

Our study has been accepted as a poster presentation at the 2015 convention APASL.

## Conflict of interest

The authors declare no conflict of interest.

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## Appendix (answers and questions)

### Table I:

- A) In your opinion, what is the prevalence of chronic hepatitis C in Turkey? (0.7–0.9%)
- B) What is the most common transmission way of hepatitis C in Turkey? (Blood transfusion)
- C) Can chronic hepatitis C patient be asymptomatic and present with symptoms of cirrhosis? (Yes)

### Table II: What are the modes of transmission of hepatitis C?

- 1) Blood transfusion (Yes)
- 2) Sexual contact (Yes)
- 3) Sharing living or working place with a chronic hepatitis C patient (No)
- 4) Using the same bathroom with a chronic hepatitis C patient (No)
- 5) Skin contact with a hepatitis C patient (No)
- 6) Wearing the clothes of a chronic hepatitis C patient (No)
- 7) Using the same tooth brush, scissors or sting with a chronic hepatitis C patient (Yes)
- 8) Kissing a chronic hepatitis C patient (No)
- 9) Transmission from the mother to the baby during child birth (Yes)
- 10) Via injection or illegal drugs (Yes)

### Table III: You would test for HCV in which of the following cases?

- 1) Patients with liver dysfunction (Yes)
- 2) Patients having a history of illegal intravenous drug use (Yes)
- 3) Health personel in contact with hepatitis C patients (Yes)
- 4) Patients who had blood transfusion before 1995 (Yes)
- 5) Patients who had blood transfusion after 1995 (No)
- 6) Patients on dialysis (Yes)
- 7) People in prison (Yes)
- 8) Patients having multi-sexual partners (Yes)
- 9) Patients having sexual transmitted diseases (Yes)
- 10) People with piercings or tattoo (Yes)
- 11) All health personel (Yes)
- 12) Pregnant women (Yes)
- 13) Patients who have had non-sexual contact with hepatitis C patients (No)
- 14) All patients presenting at the outpatient clinic (No)
- 15) Symptomatic patients who have a positive family history for hepatitis C (Yes)
- 16) Asymptomatic patients who have a positive family history for hepatitis C (Yes)