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1 **ABSTRACT.**

2

3 **Introduction:** Although medical malpractice lawsuits are common and have a tremendous financial and  
4 psychological impact on physicians, education about medical malpractice is almost non-existent in most  
5 medical school curricula around the world. Nonetheless, medical students are concerned about looming legal  
6 lawsuits during their careers and have expressed desire to become educated. The objective of the present  
7 study is to evaluate and gauge baseline medico-legal knowledge of medical students.

8 **Methods:** A survey with 25 multiple-choice quiz questions regarding malpractice risks, standards of care, and  
9 malpractice premiums was prepared with information obtained from peer-reviewed articles after a thorough  
10 literature review failed to produce a validated questionnaire for medical students. The survey was distributed  
11 to medical students across 5 consecutive years at our medical school, totaling 420 students. Data from the  
12 survey was collected via Qualtrics before undergoing statistical analysis.

13 **Results:** The completion rate for the survey was 110/420 (26.2%). The results showed that no group of  
14 students scored greater than 50% correct on the survey, with an overall median score of 40% correct for all  
15 students combined. Fourth year medical students correctly answered 1.77 more questions, on average, than  
16 first year medical students. There were no statistically significant differences in survey score between  
17 students with a personal or familial medical malpractice involvement.

18 **Discussion:** The results are an indication that students are not well-educated about medical malpractice, and  
19 that medical malpractice education potentially should be implemented in medical school to help prepare future  
20 physicians to protect their patients and hopefully avoid malpractice lawsuits.

21

22 **Key Words:** Medical Education; Malpractice; Medico-Legal; Medical students; Questionnaire

23

## 1 INTRODUCTION.

2

3 Medical malpractice is an unfortunate reality in medicine that potentially can affect all physicians. A  
4 survey conducted in 2016 found that 50% of physicians aged 55 and over reported being named in a  
5 malpractice suit at some point in their careers, and for surgeons, that number rises to 63%.<sup>1</sup> Therefore,  
6 medical malpractice education for medical students is critical as most students who enter medical training lack  
7 appropriate knowledge regarding the legal aspects of practicing medicine. Nonetheless, medico-  
8 legal education in medical school curricula typically receives little attention.

9 Medical malpractice lawsuits are extremely prevalent throughout medicine. Among physicians in  
10 surgical specialties such as General Surgery, Orthopedics, and Neurosurgery, 80% faced a medical  
11 malpractice claim by the age of 45 years.<sup>2</sup> A survey in 2016 found that 67.4% of surgical sub-specialists were  
12 named in a lawsuit, compared to 50% of primary care physicians.<sup>1</sup> Data in 2016 documented that for every  
13 100 physicians, 68 liability claims were filed.<sup>3</sup> Among physicians trained in Internal Medicine and its  
14 subspecialties, 55% faced a malpractice claim by the age of 45, with the probability increasing to 89% by the  
15 age of 65.<sup>2</sup>

16 Premiums for malpractice insurance can be formidable as well. A report of annual premiums reported  
17 by the Medical Liability Monitor (MLM) reveals that general surgeons in 2021 paid malpractice premiums  
18 ranging from \$41,775 to \$215,649 depending on their geographic location of practice in the United States.<sup>4</sup>

19 Currently, medical students have a negative perception of the medical malpractice system. A study  
20 conducted at Brown University Medical School revealed that 75% of their surveyed student body opined that  
21 the current medical malpractice system was either functioning poorly or in crisis. Results also showed that  
22 35% of students were either seriously or tremendously concerned with medical malpractice in the future.<sup>5</sup>  
23 Another survey of medical students found that 51% of students believed that their satisfaction in practicing  
24 medicine would be decreased by their concern for medical malpractice and lawsuits.<sup>6</sup>

25 Teaching of health law in medical school comprises less than 2% of the total hours in American  
26 medical curriculum.<sup>7</sup> Johns Hopkins School of Medicine and The University of Baltimore School of Law in  
27 2016 experimented with different methods of incorporating legal information into medical education. They  
28 concluded that the current model of medical education leaves little, if any, room for medical students to learn  
29 about the legal system.<sup>8</sup> This dearth of medical malpractice education leaves medical students vulnerable to  
30 the distressing and potentially shocking reality of a medical malpractice lawsuit during their eventual careers  
31 as physicians.

32 The lack of medical malpractice education for students is global as well. Further evaluation of the UK  
33 medical student malpractice survey indicated that 89% of the fifth-year students and 91% of the first-year  
34 students specified that they would like to have more teaching on legal issues throughout their medical school  
35 curriculum.<sup>9</sup> Medical schools in the Middle East fail to provide legal education training to their students, which  
36 has a negative impact on the knowledge and attitudes of future physicians in regards to the legal aspects of  
37 their medical practice.<sup>10</sup> Medical students and physicians are not the only healthcare professionals at risk. A  
38 study in Turkey found that 93.6% of nursing students reported never having received training or education  
39 regarding legal liability in medical interventions.<sup>11</sup>

40 Since medical students seemingly are not well-informed about basic aspects of medical malpractice,  
41 we prepared a survey to gauge baseline students' knowledge of medical malpractice during their undergraduate

1 years. The aim of this study is to assess medical student medico-legal knowledge through administration of a  
2 medico-legal survey designed to test specific concepts via multiple choice questions. The goal of creating this  
3 study is to help initiate further research and education to provide medical students relevant medico-  
4 legal knowledge that, hopefully, will help them avoid medical malpractice lawsuits, protect themselves and their  
5 patients, and to better prepare them if a lawsuit does occur when they become physicians.  
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## 1 METHODS

2  
3 This is a cross-sectional study evaluating medical students at a single institution utilizing a survey  
4 containing multiple choice questions designed to test medico-legal knowledge. The survey was emailed to all  
5 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year medical students through class listservs, which are electronic mailing list software  
6 containing email contact information for all medical students, at our medical school, The University of Arizona  
7 College of Medicine – Phoenix, and was also sent to the entire class that had graduated in 2020. A total of  
8 420 survey invitations were sent. The email invitation was re-sent after a period of 4 weeks to potentially  
9 increase the number of respondents. The survey was available to students over a course of six months,  
10 afterwards the data was collected and statistically analyzed. We excluded from the study incomplete surveys.  
11 No sample size calculations were performed. Students were not provided any resources prior to  
12 administration of the survey as one of the main goals of the study is to establish a baseline of medical student  
13 medical malpractice knowledge.

14 An initial thorough search of PubMed, Google Scholar, Embase, and Ovid was performed for a  
15 validated questionnaire to effectively gauge medical malpractice knowledge using the search terms “medico-  
16 legal,” “medical student,” “education,” and “medical malpractice.” While some studies regarding medical  
17 student opinions and experiences regarding medical malpractice education have been published, there have  
18 been no validated medical malpractice questionnaires constructed.

19 A web-based survey software developed by Wharton School of The University of Pennsylvania, called  
20 Qualtrics, was utilized to create the survey. After the Qualtrics survey was constructed, Institutional Review  
21 Board approval was granted (protocol number: 2010159388). Six demographic questions queried year in  
22 medical school, gender, medical doctors or attorneys in the family, and personal or family involvement in a  
23 previous medical malpractice lawsuit. Twenty-five multiple choice quiz questions then addressed medical-legal  
24 topics such as legal definitions, standards of care, malpractice risks in various specialties, types of medical  
25 malpractice, trends in malpractice data, and expert witness information (**Figure 1**). Each multiple-choice quiz  
26 question only contained one correct answer among four answer options with two quiz questions containing five  
27 answer options and one quiz question containing eight answer options. Questions were created by referencing  
28 research articles, peer-reviewed publications, and academic websites that discussed the legal aspects of  
29 medicine and healthcare.<sup>2,4,12-23</sup> The references to journal articles utilized for survey questions were omitted  
30 while participants completed the survey. The questions were designed to enumerate or enlist those major  
31 concepts and physician viewpoints to create a broad scope of queried information (**Supplementary file 1**). The  
32 Qualtrics software calculated the estimated time to complete the survey would be around five to seven minutes,  
33 however the software did not record the length of time it took each participant to complete the survey. The  
34 survey was reviewed by a medical malpractice attorney and was presented at both local and national  
35 conferences with feedback included to help refine and tailor questions appropriately to medical students.

36 Data were stratified into each class of medical students, gender, presence of medical doctor in the  
37 family, presence of lawyer in the family, and familial or personal involvement in medical malpractice. Number  
38 of correct and incorrect responses per question, and total median number correct in each stratified group were  
39 then compared for statistical significance. For data analysis, statistical significance was determined using  $\alpha =$   
40 0.05, and 95% confidence intervals (CI) were utilized.

1 Fisher's Exact Test was used to compare correct and incorrect answers of each individual question  
2 for the stratified groups. The Kruskal-Wallis Test was used to compare the total median number correct of  
3 each medical student class, and the Mood's Median Test was used to compare the total median number  
4 correct for the other groups.

5 Univariate linear regression models were utilized to determine median number of greater correct  
6 answers, standard errors, p-values, and 95% CI based on stratification criteria. Each medical student class's  
7 median number correct was compared to the first-year medical student class's median number correct. The  
8 other groups were compared to their counterpart.  
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## 1 RESULTS.

2  
3 Of the 420 surveys that were sent to the medical students, 110 completed the survey; 13 surveys  
4 were started, but not completed. Overall, a completion rate of 26.2% (110/420) was achieved (**Table 1**).

5 The median number of correct answers for all medical students was 10/25 (40% correct). There was a  
6 trend that showed a higher percentage correct with increasing year in medical school. Both first- and second-  
7 year medical students scored a median of 9/25 (36% correct), third year students scored a median of 10/25  
8 (40% correct), and both 4<sup>th</sup> year students and 2020 graduates scored a median of 11/25 (44% correct) ( $p =$   
9 0.051) (**Table 2**). A univariate linear regression model showed that 4<sup>th</sup> year medical students correctly  
10 answered 1.77 questions more than first year medical students ( $p = 0.014$ , 95% CI = 0.36-3.19). There were  
11 no statistically significant differences in overall performance between males and females, presence or  
12 absence of a lawyer or medical doctor in the family, or personal or familial involvement in a medical  
13 malpractice lawsuit.

14 When stratifying performance profiles based on year in medical school, there were no statistically  
15 significant differences between percent correct for questions 1-18 and 20-25. However, there was a  
16 statistically significant difference for which classes answered question number 19 correctly. The question was  
17 about which pair of specialties had the highest combined risk of a malpractice lawsuit. The correct answer  
18 was OB/GYN and General Surgery. 22/36 (61.1%) 1<sup>st</sup> year students, 21/27 (77.8%) 2<sup>nd</sup> year students, 18/21  
19 (85.7%) 3<sup>rd</sup> year students, and 18/20 (90%) 4<sup>th</sup> year students answered the question correctly. However, only  
20 2/6 (33.3%) of 2020 graduates answered correctly ( $p = 0.02$ ).

21 When stratifying based on gender, questions 1-17 and 19-25 showed no statistically significant  
22 difference. There was a statistically significant difference for question 18, that asked about who would rarely  
23 be deposed in a medico-legal deposition, with the correct answer being the opposing attorney. For this  
24 question, 17/48 (35.4%) males answered correctly compared to 5/62 (8.1%) females ( $p < 0.001$ ).

25 When stratifying for the presence of lawyers in the family, there were no statistically significant  
26 differences for questions 1-19, 21, or 23-25. For questions 20 and 22 there were statistically significant  
27 differences for which groups answered the questions correctly. Question 20 asked about the most common  
28 reason why physicians are sued for malpractice; the correct answer is failure to diagnose or delay in  
29 diagnosis. For question 20, 23/89 (25.8%) medical students without a lawyer in the family answered correctly  
30 compared to only 1/21 (4.8%) student with a lawyer in his or her family ( $p = 0.04$ ).

31 Question number 22 asked about what percentage of physicians believe the lawsuit was  
32 unwarranted, with the answer being 89% of physicians. Question 22 was answered correctly by 48/89 (53.9%)  
33 medical students without a lawyer in the family compared to 17/21 (81.0%) students with a lawyer in the family  
34 ( $p = 0.03$ ).

35 Stratification of the data by whether medical students had a medical doctor in the family resulted in no  
36 statistically significant differences. In addition, stratifying the results based on whether the student was  
37 involved in a malpractice lawsuit him or herself, or had a family member involved in a malpractice lawsuit, also  
38 showed no statistically significant differences.

39



## 1 DISCUSSION.

2  
3 The results of the survey demonstrated that no student class scored even 50% correct. This is an  
4 indication that students are not knowledgeable about the looming litigation that statistically will occur in their  
5 careers. Similar results to our survey were reported in a UK study that showed that only 7% of first year, and  
6 40.5% of fifth year, medical students provided the correct response to the definition of standard of care.<sup>9</sup>  
7 Three different studies have also highlighted the dearth of medico-legal knowledge among medical students  
8 and interns. One such study queried 50 medical students at Banaras Hindu University Medical School and  
9 found that only 20% of students reported awareness of laws regarding consent. Additionally, only 2% were  
10 aware of laws that protected them as medical professionals, and only 10% of students correctly defined  
11 medical negligence.<sup>24</sup> Another study involved constructing a questionnaire with 30 questions about basic  
12 knowledge of medical law, informed consent, and negligence and had 300 participants consisting of interns  
13 and residents at Srimathi Bhikiben Kanjibhai Shah Medical College complete the questionnaire. This study  
14 found that only 60% of practicing interns correctly answered a question about informed consent and 65%  
15 correctly answered a question regarding medical negligence.<sup>25</sup> The last study tested medical malpractice-  
16 related scenarios in 63 3<sup>rd</sup> semester MBBS students at Believers' Church Medical College Hospital and found  
17 that only 54% could correctly identify the tested medico-legal concepts.<sup>26</sup> Prior surveys found that medical  
18 students are both very concerned about medical malpractice lawsuits in their careers, and that they are not  
19 knowledgeable.<sup>5</sup> Our study provides more information regarding specific medical student gaps in medico-legal  
20 knowledge and underscores the students' concerns. The results of the study can be used to guide the  
21 establishment of effective educational material for medical students that could also apply to medical training  
22 internationally.

23 Not only are medical students not educated about the law in healthcare, but they are also worried  
24 about how it will impact their careers. A study in the UK noted that 88% of first year and 99% of fifth year  
25 medical students felt that medical malpractice would be of increasing concern over the next 10 years.<sup>9</sup>  
26 Another study highlighted that 95% of pediatric residents believed that medical malpractice should be taught  
27 during residency, and 69% believed that a fear of medical malpractice affected their practice as resident  
28 physicians.<sup>27</sup> In addition, 70% of medical students who were taught medical law through an innovative  
29 curriculum agreed that the course was useful.<sup>28</sup> Teaching medical students about pertinent information  
30 regarding medical malpractice and the law may help mitigate their fear about medical malpractice, and have  
31 them eventually learn practices that may help prevent lawsuits. In addition, students are open to the idea of  
32 learning about medicolegal topics, as they believe that the information will be essential to becoming a  
33 physician.<sup>29</sup>

34 An issue regarding medical malpractice education is that there are no requirements for students to  
35 have any medico-legal education, as this information is not tested on any standardized examination.<sup>30</sup> It is  
36 likely that medical students obtain medico-legal information during their 3<sup>rd</sup> and 4<sup>th</sup> clinical years, as evidenced  
37 by the trend of increasing scores in the later years in our survey. This is most likely why there was a  
38 statistically significant difference between each class's percent correct for question 19, that asked about  
39 combined malpractice risk for different specialties; each class performed better than the previous one.

40 Physicians who have been targeted in a malpractice lawsuit often are emotionally traumatized<sup>31</sup> and  
41 may not be willing to speak about their experiences, especially to medical students who are just beginning

1 their careers. Nonetheless, it is likely that the time spent in hospitals or clinics working with physicians who  
2 have an understanding about medical malpractice make a significant contribution to acquiring medico-legal  
3 knowledge.<sup>6</sup> Medical students not only learn about practicing medicine in a clinical setting, but also have  
4 reported learning about practicing defensive medicine.<sup>6</sup>

5 Teaching of medical malpractice is a challenge in medical school because: 1) medical schools already  
6 incorporate an enormous volume of medical information, and/or 2) some medical schools have shortened  
7 their preclinical years from the traditional 2 years to 1.5 years.<sup>29</sup> Thus, it is problematic for medical schools to  
8 add more material to their already crowded curricula.

9 This study has limitations. First, there are no standardized questions to test our hypothesis. To  
10 address this barrier, the survey's knowledge-based questions were constructed from recent peer-reviewed  
11 medical malpractice literature and evaluated by an attorney to improve the study's reliability. Secondly, the  
12 sample size for completion of the survey consisted of 110 medical students from one medical school, and the  
13 survey was emailed on three separate occasions to each student to improve the overall participant response  
14 rate. Since only 26% of the student population completed the survey, the validity of the study is less robust as  
15 the sample of students who chose to complete the optional survey may have differed from the sample of  
16 students who chose not to complete the survey. This limits the study's internal validity which would be  
17 improved by including more students, in addition to more medical schools, to provide further data. Lastly,  
18 theoretically, students may have researched the answers to the survey questions while completing the survey,  
19 and this could falsely increase correct responses. To prevent this potential issue, references to journal articles  
20 utilized for survey questions were omitted while participants completed the survey. Future studies should  
21 focus on constructing a validated medical malpractice survey that can accurately assess medical student  
22 knowledge about medico-legal concepts while also collecting qualitative data such as interviews or open-  
23 ended questions that could uncover reasons behind students' knowledge gaps and their perceptions of  
24 medical malpractice education. In addition, the time required to complete the survey should be recorded  
25 and/or administration of an in-person or proctored survey should be implemented to prevent bias from  
26 students searching for answers online.

27 In conclusion, the results of the study indicate that medical students are not knowledgeable  
28 about fundamental medico-legal information that will become important, not only in their careers as  
29 physicians, but also in their medical specialty selection process. These results can help create relevant and  
30 necessary educational material for medical students that would better prepare them to practice medicine  
31 throughout their training and for the rest of their careers. Ultimately, medico-legally-educated medical students  
32 should become better-equipped to protect themselves and their patients. Medical school curriculum  
33 committees can begin educating medical students by first distributing recently published medical malpractice  
34 studies to familiarize medical students with medical malpractice statistics. To further medico-legal knowledge  
35 discussion among students, a potentially effective method would be to offer accessible medical malpractice  
36 information via pre-recorded lectures or optional information sessions with law professors or medical  
37 malpractice attorneys well-versed in recent malpractice trends. These steps would provide necessary student  
38 feedback to curriculum committees to facilitate the incorporation of essential medico-legal information into  
39 medical school education.

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1 **SUMMARY - ACCELERATING TRANSLATION**

2

3 Although medical malpractice lawsuits are common and have a tremendous financial and psychological  
4 impact on physicians, education about medical malpractice is almost non-existent in most medical school  
5 curricula around the world. Nonetheless, medical students are concerned about looming legal lawsuits during  
6 their careers and have expressed desire to become educated. The objective of the present study is to  
7 evaluate and gauge baseline medico-legal knowledge of medical students. A multiple-choice survey with 25  
8 questions regarding the legal aspects of medicine was prepared and administered to medical students across  
9 5 consecutive years of our medical school. The results showed that no group of students scored greater than  
10 50% correct on the survey, with an overall median score of 40% correct for all students combined. 4<sup>th</sup> year  
11 medical students scored only slightly higher, on average, compared to 1<sup>st</sup> year medical students. The results  
12 are a strong indication that students are not well-educated about medical malpractice, and that medical  
13 malpractice education potentially should be implemented in medical school to help prepare future physicians  
14 to protect their patients and hopefully avoid malpractice lawsuits.

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1 **FIGURES AND TABLES.**

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3

**Table 1:** Demographic Data about Respondents of the Medico-Legal Qualtrics Survey

Demographic Data	N (%)
1 <sup>st</sup> Year Medical Students	36 (32.7%)
2 <sup>nd</sup> Year Medical Students	27 (24.5%)
3 <sup>rd</sup> Year Medical Students	21 (19.1%)
4 <sup>th</sup> Year Medical Students	20 (18.2%)
2020 Graduates	6 (5.45)%
Male	48 (43.6%)
Female	62 (56.4%)
Medical Doctors in Family	31 (28.2%)
Lawyers in Family	21 (19.1%)
Personal or Relatives Involved in Malpractice Lawsuit	7 (6.36%)

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**Table 2: Percent Correct of Each Survey Question by Stratification Criteria**

Question Number	First-Year Students	Second-Year Students	Third-Year Students	Fourth-Year Students	2020 Grads	p-value	Female	Male	p-value	Medical Docs in Family	No Medical Docs in Family	p-value	No Lawyer in Family	Lawyer in Family	p-value	Not Involved in Lawsuit	Involved in Lawsuit	p-value
Q1	38.9	40.7	52.4	70.0	83.3	0.07*	50.0	50.0	1	48.1	54.8	0.67	47.2	61.9	0.33	51.5	28.6	0.55
Q2	69.4	59.3	81.0	80.0	100.0	0.19	71.0	75.0	0.67	69.6	80.6	0.34	73.0	71.4	1	73.8	57.1	0.58
Q3	36.1	22.2	47.6	45.0	16.7	0.27	29.0	43.8	0.16	36.7	32.3	0.83	37.1	28.6	0.61	35.0	42.9	0.96
Q4	19.4	3.7	14.3	20.0	16.7	0.44	8.1	22.9	0.06	13.9	16.1	0.77	13.5	19.0	0.5	13.6	28.6	0.57
Q5	36.1	40.7	42.9	55.0	50.0	0.73	43.5	41.7	1	43.0	41.9	1	39.3	57.1	0.15	42.7	42.9	0.26
Q6	63.9	85.2	71.4	60.0	100.0	0.12	77.4	64.6	0.2	70.9	74.2	0.82	74.2	61.9	0.29	71.8	71.4	0.96
Q7	2.8	0.0	0.0	10.0	0.0	0.24	3.2	2.1	1	2.5	3.2	1	3.4	0.0	1	2.9	0.0	0.45
Q8	55.6	70.4	81.0	65.0	66.7	0.39	69.4	62.5	0.54	65.8	67.7	1	64.0	76.2	0.44	65.0	85.7	0.71
Q9	47.2	22.2	38.1	25.0	16.7	0.19	32.3	35.4	0.84	36.7	25.8	0.37	34.8	28.6	0.8	32.0	57.1	0.43
Q10	50.0	48.1	66.7	60.0	33.3	0.51	53.2	54.2	1	51.9	58.1	0.67	53.9	52.4	1	53.4	57.1	0.81
Q11	36.1	44.4	38.1	45.0	66.7	0.68	38.7	45.8	0.56	39.2	48.4	0.4	40.4	47.6	0.63	41.7	42.9	0.96
Q12	44.4	25.9	38.1	40.0	16.7	0.52	38.7	33.3	0.22	41.8	22.6	1	32.6	52.4	0.11	37.9	14.3	0.34
Q13	36.1	25.9	23.8	35.0	33.3	0.84	33.9	27.1	0.53	29.1	35.5	0.65	29.2	38.1	0.44	29.1	57.1	0.37
Q14	25.0	33.3	9.5	15.0	33.3	0.29	17.7	29.2	0.17	24.1	19.4	0.8	24.7	14.3	0.39	24.3	0.0	0.35
Q15	50.0	29.6	47.6	65.0	66.7	0.14	43.5	54.2	0.34	48.1	48.4	1	50.6	38.1	0.34	48.5	42.9	0.73
Q16	8.3	7.4	9.5	10.0	0.0	0.95	12.9	2.1	0.08	10.1	3.2	0.44	9.0	4.8	1	8.7	0.0	0.55
Q17	55.6	77.8	81.0	80.0	66.7	0.16	69.4	72.9	0.83	73.4	64.5	0.36	68.5	81.0	0.3	68.9	100.0	0.38
Q18	27.8	18.5	9.5	15.0	33.3	0.43	8.1	35.4	<0.001*	17.7	25.8	0.43	18.0	28.6	0.36	21.4	0.0	0.3
Q19	61.1	77.8	85.7	90.0	33.3	0.02*	75.8	70.8	0.66	70.9	80.6	0.34	73.0	76.2	1	71.8	100.0	0.44
Q20	16.7	33.3	9.5	20.0	50.0	0.12	21.0	22.9	0.82	25.3	12.9	0.2	25.8	4.8	0.04*	23.3	0.0	0.28
Q21	27.8	29.6	42.9	35.0	50.0	0.68	29.0	39.6	0.31	38.0	22.6	0.18	29.2	52.4	0.07	34.0	28.6	0.096
Q22	58.3	55.6	61.9	50.0	100.0	0.28	50.0	70.8	0.03*	57.0	64.5	0.52	53.9	81.0	0.03*	58.3	71.4	0.7
Q23	52.8	48.1	42.9	65.0	50.0	0.69	51.6	52.1	1	53.2	48.4	0.68	50.6	57.1	0.63	51.5	57.1	0.58
Q24	25.0	29.6	23.8	40.0	33.3	0.78	32.3	25.0	0.53	27.8	32.3	0.65	29.2	28.6	1	31.1	0.0	0.055
Q25	36.1	33.3	42.9	35.0	33.3	0.97	37.1	35.4	1	34.2	41.9	0.51	40.4	19.0	0.08	35.9	42.9	0.52

2

\* p < 0.05

1

**Table 3:** Correlational Analysis of Stratification Criteria

Total Correct	Coefficient	Std. Error	t	P>  t	95% CI
2nd years	0.21	0.65	0.33	0.73	[-1.07, 1.51]
3rd years	0.83	0.69	1.2	0.23	[-0.54, 2.22]
4th years	1.77	0.71	2.5	0.01*	[0.36, 3.19]
2020 grads	1.89	1.12	1.68	0.09	[-0.33, 4.12]
Gender	0.68	0.49	1.37	0.17	[-0.30, 1.67]
Med Docs in Fam	-0.01	0.57	-0.02	0.98	[-1.14, 1.12]
Lawyers in Fam	0.11	0.65	0.18	0.85	[-1.18, 1.41]
Med Mal Inv.	0.48	1.05	0.46	0.64	[-1.61, 2.59]

2

\* p < 0.05

3

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**Supplementary file 1: Medico-Legal Survey**

**General Information**

*What year are you currently in medical school? Year 1, 2, 3, 4, or 2020 Graduate*

*Gender? Male/Female/Other*

*Do you have any medical doctors in your family? y/n*

*Do you have any attorneys in your family? y/n*

*Have you ever been involved in a medical lawsuit? y/n*

*Have any of your relatives been involved in a medical lawsuit? y/n*

**Survey**

Choose the single best answer.

1) *What constitutes medical malpractice?*<sup>12</sup>

*A) The doctor made an error in the patient's medical treatment*

*B) The patient experienced a complication during surgery*

*C) The doctor caused the patient to experience emotional or physical hardship/trauma*

***D) The doctor deviated from the standard of care\****

*E) The doctor's diagnosis and/or therapy was incorrect, and the patient died*

2) *Who can be involved in a medical malpractice lawsuit?*<sup>13,14</sup>

*A) Faculty attending*

*B) First-year Resident*

*C) Medical student*

***D) Any of the above\****

3) *What is the likelihood that a highly experienced 65-year-old physician has been involved in a medical malpractice lawsuit, based on being in a high-risk specialty?*<sup>2</sup>

***A) 90%\****

*B) 75%*

*C) 50%*

*D) 25%*

4) *What is the likelihood that a highly experienced 65-year-old physician has been involved in a medical malpractice lawsuit, based on being in a low-risk specialty?*<sup>2</sup>

***A) 75%\****

*B) 50%*

*C) 35%*

*D) 15%*

5) *Suppose a malpractice claim goes to trial. What is the likelihood the physician will be exonerated?*<sup>2</sup>

*A) 91%*

***B) 78%\****

- 1 C) 53%
- 2 D) 37%
- 3
- 4 6) If a patient experiences a complication during a routine operation, does this mean that the patient will
- 5 most likely sue the surgeon?<sup>12</sup>
- 6 A) Yes, complications are not common in routine surgeries and provide grounds for a claim
- 7 B) No, complications can always arise, and the patient signed a consent form for the procedure
- 8 **C) Depends, if the surgeon did not proceed how a typical surgeon in his/her field would have**
- 9 **done\***
- 10 D) Depends on whether or not the patient died
- 11
- 12 7) Paid malpractice claims in the past 30 years have been...<sup>15</sup>
- 13 **A) Decreasing\***
- 14 B) Unchanging
- 15 C) Increasing
- 16 D) Fluctuating
- 17
- 18 8) Of the following specialties, when a medical malpractice case is lost by the physician, which specialty
- 19 has the highest mean payouts?<sup>15</sup>
- 20 **A) Obstetrics and gynecology\***
- 21 B) Radiology
- 22 C) Anesthesiology
- 23 D) Emergency Medicine
- 24
- 25 9) What is the nearest estimate of the average claim that is paid to patients if they win a medical
- 26 malpractice lawsuit?<sup>15</sup>
- 27 A) \$50,000
- 28 B) \$100,000
- 29 **C) \$300,000\***
- 30 D) \$1,000,000
- 31
- 32 10) Which specialty has the highest risk of having a medical malpractice claim against the physician?<sup>2</sup>
- 33 **A) General Surgery\***
- 34 B) Diagnostic Radiology
- 35 C) Orthopedic Surgery
- 36 D) Internal Medicine
- 37 E) Emergency Medicine
- 38
- 39 11) Approximately, how many attorneys practice in the US directly?<sup>16</sup>
- 40 A) 500,000
- 41 B) 750,000

- 1            **C) 1.3 million\***
- 2            D) 2.4 million
- 3
- 4            12) *Approximately, how much money is typically spent on defensive medicine in the U.S.?*<sup>17,18</sup>
- 5            A) \$100 billion
- 6            **B) \$50 billion\***
- 7            C) \$10 billion
- 8            D) \$100 million
- 9
- 10           13) *In the year 2019, what was a medical specialist's annual medical malpractice premium cost?*<sup>4</sup>
- 11           A) \$9,000
- 12           **B) \$21,000\***
- 13           C) \$34,000
- 14           D) \$56,000
- 15
- 16           14) *A patient signs an informed consent for surgery on her right ear. The surgeon operates on the left ear*
- 17 *by mistake. What can the surgeon be sued for?*<sup>19</sup>
- 18           **A) battery\***
- 19           B) *misrepresentation and nondisclosure*
- 20           C) *harm*
- 21           D) *assault*
- 22
- 23           15) *With respect to informed consent,*<sup>20</sup>
- 24           A) *the physician should tell the patient all possible complications*
- 25           **B) the patient can sue despite being informed about complications\***
- 26           C) *clear informed consent provides assurance against a malpractice suit*
- 27           D) *medical students can provide the informed consent*
- 28
- 29           16) *Expert witnesses in medical malpractice...*
- 30           A) *are for plaintiffs only*
- 31           B) *are for defendants only*
- 32           C) *meet the criteria to be deemed experts*
- 33           **D) should not be ultracrepidarians\***
- 34
- 35           17) *For the majority of healthcare, is an increased risk of being sued for medical malpractice associated with*
- 36 *better quality of care?*<sup>21</sup>
- 37           A) *Yes*
- 38           **B) No\***
- 39           C) *Depends on the geographic state*
- 40           D) *Depends on the specialty*
- 41

- 1 18) *In a medico-legal deposition, who would very rarely be deposed?*<sup>22</sup>
- 2 A) *the physician*
- 3 B) *the plaintiff expert witness*
- 4 C) *the defense expert witness*
- 5 D) *the nurse*
- 6 E) *the medical student*
- 7 **F) *the opposing attorney\****
- 8 G) *All of the above*
- 9 H) *None of the above*
- 10
- 11 19) *Which pair of medical specialties have the highest combined risk of receiving a medical malpractice*
- 12 *lawsuit?*<sup>23</sup>
- 13 A) *Radiology & Emergency Medicine*
- 14 B) *Urology & Anesthesiology*
- 15 **C) *General Surgery & OB/GYN\****
- 16 D) *Internal Medicine & Orthopedic Surgery*
- 17
- 18 20) *What is the most common reason why physicians are sued for medical malpractice?*<sup>23</sup>
- 19 **A) *Failure to diagnose/delayed diagnosis\****
- 20 B) *Complications from treatment/surgery*
- 21 C) *Poor outcomes/disease progression*
- 22 D) *Failure to treat/delayed treatment*
- 23
- 24 21) *Among physicians who have been sued for medical malpractice, what percentage have also been named*
- 25 *in 2-5 other medical malpractice lawsuits?*<sup>23</sup>
- 26 A) *14%*
- 27 B) *23%*
- 28 **C) *49%\****
- 29 D) *76%*
- 30
- 31 22) *Among physicians who have been sued, what percent believe that the medical malpractice lawsuit was*
- 32 *unwarranted?*<sup>23</sup>
- 33 A) *21%*
- 34 B) *47%*
- 35 C) *64%*
- 36 **D) *89%\****
- 37
- 38 23) *Which pair of specialties is least likely to be sued?*<sup>2</sup>
- 39 A) *Family Medicine & Radiology*
- 40 **B) *Psychiatry & Dermatology\****
- 41 C) *Pediatrics & Internal Medicine*

1 D) Neurology & Dermatology

2

3 24) What is the highest level of medical malpractice insurance premiums that some physician specialties must  
4 pay?<sup>4</sup>

5 A) \$20,000

6 B) \$50,000

7 C) \$100,000

8 **D) \$200,000\***

9

10 25) What is the annual risk of facing a medical malpractice lawsuit for physicians in high-risk specialties?<sup>2</sup>

11 A) 5%

12 **B) 20%\***

13 C) 40%

14 D) 60%

15

16

17 \*Correct answers bolded

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