Knowledge Toward Cancer Pain and the Use of Opioid Analgesics Among Medical Students in their Integrated Clinical Clerkship

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Abstract

Introduction: Among the focal issues of barriers to pain management include the physicians' lack of knowledge about cancer pain and negative attitudes towards opioids. Many physicians and educators attribute this, at least in part, to limited exposure to pain and palliative care education during medical school.

Aim: The researcher investigated the medical students' knowledge about cancer pain and the use of opioid analgesics.

Methods: The subjects were a sample of 50 students of the University of the Philippines College of Medicine in their integrated clinical clerkship year. Descriptive statistics (frequencies, means, standard deviation, rating scales) were used to determine mean knowledge score and level of confidence with opioid use. The study also identified specific areas where students exhibited good or poor knowledge of opioids.

Results: Approximately sixty-nine (69%) of the study respondents mentioned that pain management was given to them during their Anesthesiology lectures while a few recalled that they had these lectures during their Family Medicine rotation in Supportive, Palliative and Hospice Care. More than a third (35%) of the respondents admitted to not being confident with morphine use at present. The top three reasons cited as limitations in choice of opioids for cancer pain include fear of addiction, lack of adequate knowledge and experience and fear of side effects and complications. Out of a maximum of 13 correct answers, the mean knowledge score of the medical students was 6.6 ± 2.9. Less than 16% of the respondents had adequate knowledge on cancer pain and opioid use.

Conclusions: The results show that basic knowledge of the role of opioids in cancer pain management among medical students in their integrated clinical clerkship year at the University of the Philippines is poor. The findings imply a need to look into making revisions in the medical curriculum to include a training program that will enable all students to graduate with basic competency in pain management and palliative care.

Introduction

Pain is an important problem for patients with cancer, occurring in half of all cancer patients and more than 90% of patients with advanced disease. Pain related to cancer is a complex, multidimensional phenomenon composed of sensory, affective, cognitive, and behavioral components. The World Health Organization (WHO) has identified cancer pain as a major international problem and pain control has become a critical element in the comprehensive care of many cancer patients. Pain and quality of life are phenomena that share several fundamental characteristics. Pain control plays a key role in determining health-related quality of life (HRQOL). Pain, when it is ongoing and uncontrolled, has a detrimental, deteriorating effect on virtually every aspect of a patient's life. It produces anxiety and emotional distress; undermines well-being; interferes with functional capacity; and hinders the ability to fulfill familial, social, and vocational roles. With such broad-based effects, it is apparent that pain would have the effect of diminishing quality of life. In patients with moderate or severe pain, interference with sleep, daily life activities, enjoyment of life, work ability, and social interactions have been reported.[1]

Every year, 6 million patients worldwide suffer from cancer pain. Every year, about 200,000 Filipinos suffer from cancer pain despite the availability of well established, simple and cost effective methods of cancer pain relief.[2]

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The failure to manage pain properly is due to several factors. In developing countries, it is likely to be related to geography and limited resources. Legal restrictions also present barriers. In developed countries, failure to manage pain properly is usually related to a "disease" rather than a "symptom" model of care, which minimizes symptom management. Other factors include lack of physician education and failure to follow existing guidelines. Patients fear addiction, drug tolerance, and side effects. Despite adequate resources, pain is still undertreated,[3] especially in cancer patients.

The International Association for the Study of Pain (IASP) has published a core curriculum on pain for the international needs of medical schools since 1988.[4] The contents of the IASP pain curriculum are included quite well in the curriculum of the University of Helsinki in Finland and the quality of pain education had slightly improved.[5]

Pain is a common symptom in many diseases. Current medical education addresses pain as a symptom that will lead to diagnosis rather than a symptom that will require treatments. Pain is often inadequately treated, especially in cancer patients. There is evidence that undertreatment of pain is a result of inadequate medical education. Consequently, in the United States in 1995, the Texas legislature passed Senate Bill 1454, which requires each medical school in Texas to report on content and extent of undergraduate education on pain medicine. Analysis of this pain treatment survey indicated that pain education is not a required course in any Texas medical schools. Pain medicine is taught in relation to other subject matters and comprises an average of 7.5 percent of the medical schools' 4-year curriculum hours. This led to the formation of the Pain Treatment Education Task Force of the CATCHUM Project (Cancer Teaching and Curriculum Enhancement in Undergraduate Medicine), a consortium of the Texas Medical Schools dedicated to educating undergraduate medical students about cancer prevention. The task force is comprised of pain experts who represent the major disciplines of medicine concerned with pain including internationally known experts in the field. The tasks set out for this group to accomplish include: developing a pain based curriculum, disseminating and implementing the curriculum into the eight Texas Medical Schools, and assessing the progress made in institutional change in the curriculum, instruction, faculty expertise, clinical activities, etc., through outcome measures. The Concept Curriculum on Pain for Medical Undergraduates is the product of this effort.[6] CATCHUM has yet to assess the long-term effectiveness of their efforts to improve their curriculum.

In the studies done by Turner and Weiner,[7] Niemi-Murola, Po¨yhia¨ and Kalso,[8] Po¨yhia¨ and Kalso,[9] Watt-Watson and co-workers,[10] Sloan and co-workers,[11] and Po¨yhia¨and co-workers,[5] in the medical schools they surveyed in the U.S. and Finland, teaching of pain related topics is fragmented, important topics are poorly covered and specific curricula for pain are uncommon.

Studies done in 1997–98 have documented deficiencies in U.S. medical schools' education about pain management in both the clinical and preclinical years.[12–15] These data, along with greater public and professional awareness and mandates from organizations such as the American Council of Graduate Medical Education and the American Association of Medical Colleges, have led residency programs and medical schools to either initiate or improve teaching about pain management education. A longitudinal, observational study by Sulmasy and coworkers tried to assess the U.S. medical students' perceptions of the adequacy of their schools' curricular attention to care at the end of life using national data from the Graduation Questionnaire of the Association of American Medical Colleges from 1998–2006, comparing national trends with those at New York Medical College (NYMC), where a required 1-day clinical rotation to a palliative care hospital began in 1998.[16] The fraction of graduating U.S. students reporting that their instruction time on death and dying was at least adequate rose from 70.8% in 1998 to 79.5% in 2006 ($p < 0.001$); instruction time in pain management rated as at least adequate rose from 34.3% in 1998 to 55.3% in 2005 ($p < 0.001$); training in palliative care rated as at least adequate rose from 59.9% in 2000 to 74.8% in 2006 ($p < 0.001$).

In Canada, the University of Toronto Centre for the Study of Pain undertook a project aimed at developing, implementing, and evaluating an integrated pain curriculum, based on the International Association for the Study of Pain curricula for students of Dentistry, Medicine, Nursing, Pharmacy, Physical Therapy, and Occupational Therapy. Overall evaluations were positive, and statistically significant changes were demonstrated in students' pain knowledge and beliefs.[10]

Germany also compared favorably to its United States and Canadian counterparts with regard to

formal lectures and educational reading material in pain therapy and palliative medicine. A curriculum for palliative medicine for physicians and medical students on the basis of international examples was created in 1996 and approved by the German Association for Palliative Care (DGP). However, German medical teaching institutions have not incorporated this curriculum into their teaching routine due to the fact that the German government must amend legislation as it relates to the education of physicians in training prior to implementation.[17]

In most other schools in other parts of the world however, students enter medical school with little academic or personal knowledge about pain and with negative attitudes toward opioids.[18–19] In Philippine medical schools, pain management, and information about pain is poorly integrated into the medical school curriculum. The Philippine Medicine Proper curriculum consists of a 4-year study of basic and clinical sciences and 1-year of senior internship. At the University of the Philippines-Philippine General Hospital, 3rd year medical students go though what is called integrated clinical clerkship (combined didactic lectures and short clinical exposures), prior to their junior internship at the hospital in their 4th year. So far, this state university is the only one with an established training program in Supportive, Palliative and Hospice Care (SPHC). It is only by academic year 2006–07 that medical students in their integrated clinical clerkship began to have lectures on cancer pain and pain management and to undergo short rotations at the SPHC clinic. The purpose of this study was to assess the baseline knowledge toward cancer pain and opioid analgesic use among medical students in their integrated clinical clerkship year while they are doing their SPHC rotation under the Department of Family and Community Medicine.

Methods

Subjects

The descriptive cross sectional survey was conducted among 5th year medical students currently enrolled for the school year 2006–07. The students of the University of the Philippines College of Medicine (UPCM) are considered homogenous, having passed the National Medical Admission Test (NMAT) with scores not lower than 90 percentile and consistently maintaining good academic records. There are only The fifth year medical students were chosen as subjects because they were at that point in their education wherein they should've had all the theoretical input that they will need for their clinical rotations in the hospital.

Sampling

The calculated sample size of 50 allowed the current investigator to detect a 10% change from baseline rates ($P = 0.75$, $\Delta = 0.10$ and $z = 1.64$). A systematic random sampling of the 140 currently enrolled medical students was done until a sample of 50 students was attained. All respondents agreed to participate and answered the questionnaires completely, after their informed consent was secured, in accordance with the Ethics Committee's Guidelines on research involving human subjects.

Survey Scales

A survey of cancer pain knowledge

The questionnaire developed by Gallagher, Hawley and Yeomans[20] was adapted and modified by the investigator. It was checked by four academic physicians in the University of the Philippines, Department of Family and Community Medicine for clarity, wording, and content. The survey was not tested for test—retest reliability or validity. This self-administered Cancer Pain Management Survey included questions about: (a) confidence with morphine use and goals for relief of cancer pain; (b) their knowledge about opioids. The respondents were also asked to fill in some demographic data and their source of information on pain management. They were likewise requested to state their opinion on the appropriateness and frequency of referral of patients with cancer pain either to a Hospice and Palliative Care specialist or to a Pain specialist, to both or to neither one of them.

Survey Methods

The survey used a 3-point Likert-type response to each knowledge statement, answered by checking the box corresponding to "agree," "disagree," and "don't know." The content validity of the knowledge statements as representative of the expected knowledge competency for a medical student was established through literature review and consultations with a pain management and 3 palliative

care experts. The outcome measure is the percentage of students with adequate knowledge, correctly answering ≥ 70% of the knowledge questions (scoring ≥ 9 points out of 13).

Data Analysis

Microsoft Office Excel 2003 was used for data encoding. For each of the 13 knowledge statements, answers were coded 0 point if the answer was incorrect or the respondent checked the "don't know" box and 1 point if the answer were correct. The number of correct answers was then tallied. The higher the total score, the more adequate would be the level of knowledge of the students. The SPSS statistical software (Version 10; SPSS, Inc., Chicago, Ill) was used for all analyses.

Limitations of the Study

This study had several limitations. First, it was done only at one medical institution, and second, the survey had a small number of respondents. However, the current investigator assumed that the respondents are representative of the entire class, since there is only one section for each year level at the University of Philippines College of Medicine and the standards of medical education set by this premier state university is consistently high. The current investigator regarded as basically comparable the students' exposure to and assimilation of their lectures. However, no demographic data was collected, by which comparisons between respondents and non-responders to this survey could be made. Likewise, no attempt was made to control for potential confounders and effect modifiers in the data collection and analysis.

Results

Lectures on Cancer Pain Control

There were 51 out of the total 140 integrated clinical clerks (LU5) students who took part in the survey. Majority of them (92.2%) had received lectures on pain management. About two thirds of them (68.6%) had lectures on pain management during the Anesthesia or Pain module while less than one fourth (21.6%) had it during their Family Medicine, specifically Supportive, Palliative and Hospice Care, module.

Concerns limiting their choosing opioids for pain management

Less than half (43.1%) cited opioid addiction and abuse, 17.6% admitted to having lack of adequate knowledge and experience with opioid use and 15.7% mentioned opioid side effects and complications.

Cost as influence in choice of pain medications

Majority (84.3%) indicated that their choice of pain medication is influenced by cost.

Level of confidence with opioid use

On a scale of 1 to 5, one being the least confident and 5 being the most confident, less than half (46%) the respondents rated themselves 3 in their level of confidence with opioid use for cancer pain.

Goals for pain relief

About two thirds (66.7%) would have as goal adequate pain relief without distress while about a third (31.4%) wanted absolute and complete pain relief. Only 2% target pain relief on an as needed (prn) basis.

Knowledge scale

Out of a maximum of 13 correct answers, the mean knowledge score of the medical students was 6.6 ± 2.9. Less than 16% of the respondents had adequate knowledge on cancer pain and opioid use while majority (84.3%) had poor knowledge. (Table 1).

Choice of service to whom referral for pain control would be made

Most of them (80%) agreed that it is appropriate to refer patients with cancer pain to hospice care and palliative medicine specialists and 67% of them would do so often. However a greater majority (92.2%) think it is appropriate to refer patients with cancer pain to the Pain Service and 80% would do so often.

The current investigator thinks that both the palliative care specialist and the pain specialist are capable and equipped to effectively manage cancer pain and have their specific but complementary roles to play in the multidisciplinary approach to pain management. The pain specialists are adept

Table 1. Distribution of Medical Students as to Responses to Knowledge Questions, Cancer Pain Management Survey, During their Integrated Clinical Clerkship Year (n = 50).

Knowledge statement	Responses to knowledge statement			Percentage of students with correct answers
	True/Agree n (%)	False/Disagree n (%)	Don't know n (%)	
Opioids should not be used until the final stages of an illness.	5(9.8%)	*38*(74.5%)	8(15.7%)	38(74.5%)
Morphine for cancer pain makes people more comfortable.	*36*(70.6%)	3(5.9%)	12(23.5%)	36(70.6%)
Morphine for cancer pain shortens life.	2(3.9%)	*34*(66.7%)	15(29.4%)	34(66.7%)
Pain medicine should be saved in case the pain gets worse.	11(22%)	*34*(68%)	5(10%)	34(66.7%)
Increasing requests for analgesics usually indicates unrelieved pain.	*27*(54%)	15(30%)	8(16%)	27(54.0%)
Patients who complain of pain out of proportion to its cause are usually substance abusers.	15(30%)	*23*(46%)	12(24%)	23(46.0%)
Opioids are the number one cause of confusion and falls in the elderly patient who uses them.	5(9.8%)	*20*(39.2%)	26(51%)	20(39.2%)
When switching from oral morphine to parenteral morphine, I use the same number of milligrams.	0(0%)	*18*(35.3%)	33(64.7%)	18(35.3%)
Physical dependence while on opioids is a sign of addiction.	28(54.9%)	*13*(25.5%)	10(19.6%)	13(25.5%)
Doses of opioids for breakthrough pain should be 10% of the total daily dose, every 1 h to 2 h as needed.	*10*(19.6%)	5(9.8%)	36(70.6%)	10(19.6%)
Opioids are not indicated for dyspnea in patients with advanced cardiopulmonary disease.	20(39.2%)	*8*(15.7%)	23(45.1%)	8(15.7%)
Any patient given opioids for pain relief is at 25% or more risk for addiction.	11(22%)	*7*(14%)	32(64%)	7(14.0%)
When opioids are taken on a regular basis, respiratory depression is rare.	*5*(9.8%)	19(37.3%)	27(52.9%)	5(9.8%)

*Adapted from the British Columbian Physicians' Survey (Gallagher, Hawley and Yeomans, 2004). Correct responses in italics.

at anesthetic techniques for pain control while the palliative care specialists are proficient at psychosocial interventions in pain control.

Discussion

Pain is one of the most commonly experienced and feared symptoms of advanced cancer. Most cancer patients experience pain, usually of moderate to severe intensity, and most also have a number of distinct types of pain.[3] Most pain in cancer responds to pharmacological management using orally administered analgesics and adjuvants. Current treatment is based on the World Health Organization (WHO)'s concept of an 'analgesic ladder' which involves a stepwise approach to the use of analgesic drugs and is essentially a framework of principles rather than a rigid protocol.[21] This allows considerable flexibility in the choice of specific drugs and the WHO ladder should be regarded as

but one part of a comprehensive strategy for managing cancer pain. Symptomatic drug treatment is used in an integrated way with disease-modifying therapy and non-drug measures. The most important part of the WHO method, and the reason for its success, is the efficient use of oral opioids for moderate to severe pain. Morphine is the benchmark 'step 3' opioid and the Expert Working Group of the European Association of Palliative Care has published guidelines for the use of this drug in cancer pain management.[22]

Pain management is considered adequate if there is congruence between the patient's reported level of pain and the appropriateness of the analgesic therapy.[23] Regrettably, undertreatment of cancer pain is well documented and can involve up to 40% of patients.[24] Undertreatment is usually attributed to an inappropriate use of opioids for reasons often conceptualized in terms of barriers related to health care provider, patient, family, institution and society.[25]

Practicing physicians acknowledge uneasiness in caring for patients with terminal illness. This stems partially from a lack of knowledge in areas and topics pertaining to end-of-life care, such as cancer pain management. Many physicians and educators attribute this, at least in part, to limited exposure to pain and palliative care education during medical school.[26]

Medical educators note that medical students' attitudes, behavior, and clinical knowledge in the area of palliative care can be positively influenced by education. Nevertheless, deficiencies continue to exist in the area of undergraduate palliative care education as this relates to program availability, content, and structure.[26]

The purpose of this survey was to assess the knowledge toward cancer pain and opioid analgesic use among medical students in their integrated clinical clerkship year at the University of the Philippines-Philippine General Hospital.

Knowledge Scale

Out of a maximum of 13 correct answers, the mean knowledge score of the medical students was 6.6 ± 2.9. Less than 16% of the respondents had adequate knowledge on cancer pain and opioid use while majority (84.3%) had poor knowledge.

Most (54%–74%) of the LU5 medical students scored correctly on statements such as: opioids should not being used only until the final stages of an illness; morphine for cancer pain make people more comfortable; morphine for cancer pain shortens life; pain medicine should be saved for when the pain gets worse; and increasing requests for analgesics usually indicating unrelieved pain.

Almost 75% of the students disagreed with the statement that "Opioids should not be used until the final stages of an illness". The fact that a good percentage of the students got this statement right could mean that at least they are well-informed about the recommendation that morphine be used sooner in palliative care. Palliative care is based on the WHO 3-step ladder that starts with non-opioids, moves to weak opioids, and finishes with strong opioids. However, one has to judge what is most appropriate for the patient at their stage of the illness instead of just automatically following the steps in any given patient. The recent trend is to move onto strong opioids, especially morphine, sooner rather than later.

The current investigator was also interested in identifying the common mistakes in cancer pain and pain management committed by the medical students. The question with the most incorrect answer is the one on "When opioids are taken on a regular basis, respiratory depression is rare." Majority (90.2%) of the students either did not know the answer or disagreed with the statement, resembling the results reported in an earlier study.[27] It can be inferred that students continue to be concerned about respiratory depression as an adverse effect of opioid use. Hence, it should be underlined in succeeding lectures on cancer pain and pain management that respiratory depression does not occur in patients with pain since pain acts like a physiological antidote to respiratory depression, albeit the mechanism to this is unclear. It can be stressed to them that it is morphine overdose that causes respiratory depression; therefore as long as morphine is titrated and the dose reduced if drowsiness occurs, then there should be no danger of respiratory depression.[28]

The question with the 2nd most incorrect answer is the one on "Any patient given opioids for pain relief is at 25% or more risk for addiction," which is similar to the results reported by other investigators.[19,27] As most (86%) of the students either did not know the answer or agreed with the statement, it can be deduced that they continue to be concerned about addiction as an undesirable effect of opioid use. For this reason, it should be emphasized in succeeding lectures on cancer pain and pain

management that psychological dependence is a very rare phenomenon in the palliative care population. It can be pointed out to them instead that it is physical dependence to morphine that will develop with continued use, such that a "withdrawal" syndrome is precipitated when there is sudden termination of administration, thereby necessitating careful dose titration when there is sufficient reason to discontinue its use.[28]

The question with the 3rd most incorrect answer is the one on "Opioids are not indicated for dyspnea in patients with advanced cardiopulmonary disease." As a large percentage (86%) of the students either did not know the answer or agreed with the statement, it can be presumed that they are not aware that opioids represent an extremely effective treatment for dyspnea due to cardiopulmonary syndromes in patients with advanced cancer. It should be highlighted in succeeding lectures on cancer pain and pain management that if used appropriately, opioids do not hasten death in dyspneic cancer patients; rather, they reduce physical and psychological distress and exhaustion, and early use improves quality of life. It can be underscored to the students that clinically significant hypoventilation following opioid therapy depends largely on the history of previous exposure to opioids and the rate of increase of the opioid dose. As with opioid use in pain management, the principles of starting at a regular low dose in opioid-naïve patients followed by appropriate dose titration applies. Opioid therapy for dyspnea is administered similarly to, and often concurrent with, opioid therapy for pain control.[29–31] It can be explained to the students that available evidence supports the role of opioids in relieving dyspnea in malignant and nonmalignant conditions.[32]

Many (70.4%) of students did not know the answer to the question: "Doses of opioids for breakthrough pain should be 10% of the total daily dose, every 1 h to 2 h as needed." According to Payne, breakthrough pain, most commonly defined as an abrupt, short-lived, and intense pain that "breaks through" the around-the-clock analgesia that controls persistent pain, is likely to be underdiagnosed and undertreated because of the lack of consensus on its definition and unwarranted concerns among health care professionals and patients about overmedicating.[33] Hence, it is not surprising that medical students would not know how to calculate adequate doses of opioids for its treatment. Therefore, succeeding lectures on cancer pain and pain management could heighten awareness of breakthrough pain in cancer and nonmalignant conditions, with the aim of improving the recognition, diagnosis and effective treatment of breakthrough pain.

The fact that majority of students (93.8%) expressed their desire to receive more lectures on pain management may indicate a willingness to learn when to use opioids and how to prescribe them safely and effectively. More importantly, these results may show the potential for medical students to improve their knowledge on cancer pain management and to change their attitude towards opioids when the medical curriculum addresses clinical concerns and side effects.

Reassessing Medical Education

According to Bruera, palliative care faces two major challenges at the administrative level.[34] The first is to ensure increased patient access, as well as access at an earlier stage of the disease trajectory. This will require new and innovative administrative arrangements to secure seamless access by patients to palliative interventions, eliminating geographical and financial obstacles to care. The second objective is the development of an evidence-based body of knowledge that will ensure that patients receive highest quality care. This can only be achieved by the establishment of strong academic components in most universities and cancer centers, and by securing research funding resources that are currently not generally available.

MacDonald has described a useful framework for finally incorporating academic palliative care standards into the practice of oncology.[35] In addition to primary cancer prevention (i.e. smoking cessation), secondary prevention (i.e. early diagnosis with mammography or Pap smear), and tertiary prevention (i.e. preventing early death by administering antineoplastic therapies such as surgery, radiation, and/or chemotherapy), palliative care would be considered the quarternary level of prevention—preventing unnecessary suffering among patients and their families.

Similar to what is already happening in the U.S, Canada, United Kingdom, and many countries in Europe, a multidisciplinary team needs to be assembled to design, implement, evaluate, and institutionalize in the Philippine medical school curriculum a training program to enable all students

to graduate with basic competency in pain management and palliative care.

Conclusion

The results show that basic knowledge of the role of opioids in cancer pain management among medical students in their integrated clinical clerkship year at the University of the Philippines is poor. The findings imply a need to look into making revisions in the medical curriculum to include a training program that will enable all students to graduate with basic competency in pain management and palliative care.

Recommendations

This survey can be replicated at other institutions, using a bigger sample size, among first year medical students. These students can then be followed up from the first year through residency training to examine the interrelationships between the amount, timing, and modalities of pain and palliative care education and clinical experience, and improved practices.

The ultimate goal of medical education, as well as clinical interventions, is improved patient care. Education can help to produce the improvements in physician knowledge, attitudes, and self-perception (confidence/comfort, and skill) that are necessary prerequisites. Our data suggest that educational strategies must also take into account the top three reasons cited by the students that limit their writing prescription opioids for cancer pain, i.e. fear of addiction, lack of adequate knowledge and experience and fear of side effects and complications. The medical curriculum should address these knowledge deficits among the students.

On the other hand, formal didactic methods will not be successful if used alone. Although better knowledge and self-perception make improvements in clinical practice possible, reinforcement of the principles taught in the classroom needs to occur in the clinical setting for this change to be sustained.[36–37] Trainees must have good clinical role models to imitate.[38–40]

The current investigator recommends that Palliative Care specialists be included among the multidisciplinary team of faculty tasked to teach cancer pain management courses. Their approach towards total pain control is to address not only the physical dimension, but the emotional, psychosocial and spiritual dimensions of pain as well.

The goal of gradually improving patient outcomes is ultimately the aim of reinforcing the knowledge, good attitudes and practices (e.g. by continued learning, and by positive feedback from faculty) of the medical students when the proposed changes above are incorporated in the medical curriculum.

Disclosure

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