

HOD ACTION: Recommendations in Council on Medical Education Report 6 adopted as amended.

REPORT 06 OF THE COUNCIL ON MEDICAL EDUCATION (A-22)

Clinical Applications of Pathology and Laboratory Medicine for Medical Students, Residents, and Fellows

(Reference Committee C)

EXECUTIVE SUMMARY

Essential to becoming a competent physician is the ability to continually improve one's diagnostic acumen and the understanding of optimal treatment alternatives through lifelong learning. A current area of concern in medical education is whether medical school curricula and graduate medical education programs provide sufficient training in how to order complex laboratory tests and interpret the test results. Improper application of principles of clinical pathology and laboratory medicine can result in ordering incorrect or redundant lab tests and contributes to excessive costs for care.

While there is extensive inclusion of pathology in medical school curricula, the content historically has focused on anatomic pathology, with much less emphasis on clinical pathology. This pedagogy does not align with current medical practice, in which most physicians engage more in clinical pathologic applications. Many medical schools do offer elective courses in clinical pathology, but few students participate. Thus, medical schools have the appearance of teaching pathology and meeting the standards set by both the Liaison Committee on Medical Education (LCME) and Commission on Osteopathic College Accreditation (COCA), but the reality is that in most medical schools, the balance of content in the required curriculum has not been updated to align with current practice. Similarly, graduate medical education programs are recognizing the need to enhance training for residents in appropriate and cost-effective applications of laboratory medicine.

Various stakeholders have implemented initiatives to increase the knowledge of clinical pathology among medical students and residents. In 2014, The National Standards in Pathology highlighted the proposed minimum standards for all medical students to understand for practicing medicine and remaining current with medical practice. These standards evolved in 2017 into the Pathology Competencies for Medical Education (PCME), which sought to (1) create a revisable document that would be able to keep pace with current medical practice and understanding; (2) emphasize laboratory medicine; and (3) develop a shared resource of pathology competencies and educational cases highlighting the competencies for pathology faculty, educators, and students that could easily be adapted into any curriculum. The Vanderbilt School of Medicine Diagnostics and Therapeutics course and Dell Medical School Department of Diagnostic Medicine are two examples of clinical pathology integration into medical education curriculum. Additionally, innovative programs like "Choosing Wisely" can be applied in medical school and graduate medical education to bolster learning in clinical pathology and laboratory medicine.

Improving the use of clinical pathology diagnostic tools in health care will require multiple interventions across the health system, including but not limited to innovations in medical education.

REPORT OF THE COUNCIL ON MEDICAL EDUCATION

CME Report 06-A-22

Subject: Clinical Applications of Pathology and Laboratory Medicine for Medical Students, Residents, and Fellows

Presented by: Niranjan V. Rao, MD, Chair

Referred to: Reference Committee C

1 INTRODUCTION

2

3 American Medical Association (AMA) Policy D-295.930, “Clinical Applications of Pathology and
4 Laboratory Medicine for Medical Students, Residents, and Fellows,” asks that our AMA study
5 current practices within medical education regarding the clinical use of pathology and laboratory
6 medicine information to identify potential gaps in training in the principles of decision-making and
7 the utilization of quantitative evidence.

8

9 The policy stems from concern that inappropriate use and interpretation of laboratory and other
10 diagnostic tests can lead to shortfalls in patient safety, harm to patients, and malpractice claims.
11 The need for students and trainees to learn effective stewardship of health care resources is
12 important as well.

13

14 This report focuses on existing and planned educational initiatives that are intended to help
15 physicians and medical students develop knowledge and skills in the principles of decision-making
16 and the utilization of quantitative evidence. The report: 1) summarizes current Liaison Committee
17 on Medical Education (LCME) and Commission on Osteopathic College Accreditation (COCA)
18 educational standards within medical education regarding pathology and laboratory medicine; 2)
19 provides examples of integration of clinical pathology in medical education, 3) outlines relevant
20 AMA policy; and 4) makes recommendations to the HOD.

21

22 BACKGROUND

23

24 *Medical School Accreditation Standards Regarding Pathology and Laboratory Medicine*

25

26 The LCME accredits medical education programs leading to the MD degree in the United States.
27 Requirements related to pathology and laboratory medicine are addressed in LCME Standard 7:
28 Curricular Content. This standard dictates that the faculty of a medical school ensure that the
29 medical curriculum provides content of sufficient breadth and depth to prepare medical students for
30 entry into any residency program and for the subsequent contemporary practice of medicine. For
31 the purpose of this report, discussion of Standard 7 is limited solely to elements 7.2 and 7.4, which
32 are outlined in further detail below:

33

34 Element 7.2: Organ Systems/Life Cycle/Prevention/Symptoms/Signs/Differential Diagnosis,
35 Treatment Planning: The faculty of a medical school ensure that the medical curriculum
36 includes content and clinical experiences related to each organ system; each phase of the

1 human life cycle; continuity of care; and preventive, acute, chronic, rehabilitative, and end-of-
2 life care.

3
4 Element 7.4: Critical Judgment/Problem-Solving Skills: The faculty of a medical school ensure
5 that the medical curriculum incorporates the fundamental principles of medicine, provides
6 opportunities for medical students to acquire skills of critical judgment based on evidence and
7 experience, and develops medical students' ability to use those principles and skills effectively
8 in solving problems of health and disease.

9
10 In assessing compliance with Standard 7.2 and 7.4, during the site visit (typically occurring every
11 eight years), the LCME survey team asks the school to provide the following information relevant
12 to pathology and laboratory medicine:

13
14 Standard 7.2:

- 15 1. School and national data from the AAMC Medical School Graduation Questionnaire
16 (AAMC GQ) on the percentage of respondents who rated preparation for clinical clerkships
17 and electives in pathology as excellent or good.
- 18 2. Data from the Independent Student Analysis (ISA) on the percentage of respondents in
19 each class who were satisfied with the adequacy of their education in the following content
20 areas: education to diagnose disease; education to manage disease; education in disease
21 prevention; and education in health maintenance.

22
23 Standard 7.4:

- 24 1. Indicate whether skills of critical judgment based on evidence and skills of medical
25 problem-solving are taught separately as an independent required course and/or as part of a
26 required integrated course.
- 27 2. Indicate the year(s) in which the learning objectives related to skills of critical judgment
28 based on evidence and skills of medical problem-solving are taught and assessed.

29
30 The American Osteopathic Association's COCA accredits osteopathic medical education programs
31 leading to the Doctor of Osteopathic Medicine (DO) degree in the United States (programmatic
32 accreditation). Requirements related to pathology and laboratory medicine are addressed in COCA
33 Element 6.2: Osteopathic Core Competencies, which requires colleges of medicine to "teach and
34 educate students in order to ensure the development of the seven osteopathic core competencies of
35 medical knowledge, patient care, communication, professionalism, practice-based learning,
36 systems-based practice, and osteopathic principles and practice/osteopathic manipulative
37 treatment."¹ Further, Element 6.4: Clinical Education requires institutions to define the skills to be
38 performed by the students, the appropriate clinical setting for these experiences, and the expected
39 levels of student responsibilities.

40
41 However, these measures of how prepared students feel for their clerkships do not fully address
42 this issue since students are unaware of their knowledge gap, and many of their clinical role models
43 likely do not recognize this gap in their own training as evidenced by the overutilization of
44 laboratory tests. Additionally, critical judgment and medical problem-solving courses are heavily
45 focused on clinical presentation without the depth of understanding about laboratory tests.
46 Education of medical students in the United States by experts on the selection of clinical laboratory
47 tests and interpretation of the test results remains limited. Additionally, highly complex genetic
48 testing began to emerge in the clinical laboratory shortly after the year 2000, and changes in the
49 medical school curriculum have been occurring at a time when the clinical laboratory tests
50 available have dramatically increased in number, complexity, and cost. The general medical
51 student population at large has not been effectively taught when to order such complex testing and

1 how to interpret the genetic test results. Medical students graduate with little to no education on
2 how to order the correct tests, and only the correct tests, from the thousands of expensive assays
3 available. A common estimate is that one out of every five tests performed is unnecessary.² Causes
4 for inappropriate test ordering include personal, organizational, and technical factors. A physician's
5 lack of knowledge on specific laboratory tests, potential insecurities regarding differential
6 diagnosis, and lack of awareness about optimal ordering of tests contribute to the personal factors
7 that impact overutilization. Lack of adequate supervision and feedback from supervisors on
8 ordering behavior, a culture of not questioning which tests a supervisor suggests, and a lack of
9 formal education in laboratory medicine contribute to organizational factors. Ease of laboratory
10 testing and the inconvenient process of cancelling laboratory orders deemed unnecessary,
11 contribute to the technical factors impacting test ordering.³

12 *Concerns about Medical Student and Resident Knowledge of Pathology and Laboratory Medicine*

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14
15 Essential to becoming a competent physician is the understanding of the normal and pathological
16 physiology of each organ system, the ability to apply knowledge of disease mechanisms to
17 recognize pathophysiology, and the ability to continually improve one's diagnostic acumen and
18 understanding of optimal treatment alternatives through lifelong learning. The teaching of
19 pathology in medical education has traditionally been assigned to the preclinical years as a
20 component of the basic science curriculum, with an emphasis on principles of pathogenesis and
21 morphology. Historically, students have had little formal experience with the practice of anatomic
22 and clinical pathology and their practical applications to patient care within the medical school
23 curriculum.⁴ As noted in a white paper on this topic from the College of American Pathologists
24 (CAP) and the Association of Pathology Chairs (APC), "the lack of formal pathology education [is]
25 an important deficit that could lead to inappropriate use of anatomic pathology and laboratory
26 services by future clinicians in the care of their patients."⁵

27
28 Concerns regarding sufficient integration of pathology and laboratory medicine into and across the
29 medical education continuum are warranted. Three of every four medical decisions derive from lab
30 test evaluation, and the dramatic increase in the number of tests underscores the need for at least
31 minimal training in the medical education continuum as well as a better understanding of evidence-
32 based medicine across the continuum.⁶ Additionally, research from the Centers for Disease Control
33 and Prevention and others has found that poor knowledge and inappropriate use of laboratory tests
34 by physicians are in part due to a lack of formal training during medical school.¹

35
36 It is necessary to mention that other factors beyond medical education play a vital role toward
37 improving diagnosis and reducing diagnostic error. For example, the National Academies of
38 Sciences, Engineering, and Medicine (NASEM) outlined the following steps to achieve this goal:⁷

- 39
40 1. Facilitate more effective teamwork in the diagnostic process among health care
41 professionals, patients, and their families.
- 42 2. Enhance health care professional education and training in the diagnostic process.
- 43 3. Ensure that health information technologies support patients and health care
44 professionals in the diagnostic process.
- 45 4. Develop and deploy approaches to identify, learn from, and reduce diagnostic errors
46 and near misses in clinical practice.
- 47 5. Establish a work system and culture that supports the diagnostic process and
48 improvements in diagnostic performance.
- 49 6. Develop a reporting environment and medical liability system that facilitates improved
50 diagnosis by learning from diagnostic errors and near misses.
- 51 7. Design a payment and care delivery environment that supports the diagnostic process.

1 8. Provide dedicated funding for research on the diagnostic process and diagnostic errors.

2
3 There has been a significant effort in medical education to integrate instruction in laboratory
4 medicine into the curriculum; however, few students are participating in these courses. To quantify
5 the deficits in teaching laboratory medicine, a 2014 study of LCME-accredited U.S. medical school
6 programs found that 82 schools (84 percent) offered some course work in laboratory medicine
7 incorporated within the existing curriculum and 76 schools (78 percent) required this course in
8 laboratory medicine during the first two years. Coursework could include lectures, laboratory
9 sessions, small-group learning, clinical consultations, and/or electronic/digital exercises. The
10 median number of hours of instruction at the 76 schools was 12.5, with 8.0 hours devoted to lecture
11 and 4.5 hours devoted to small-group problem-based learning and/or laboratory sessions. All the
12 required coursework included a lecture component. Pathologists were involved in the teaching and
13 played a leadership role at 81 schools (99 percent of the 82 schools with any laboratory medicine
14 coursework).⁸ The study also found that, in terms of lecture time, anatomic pathology ranged from
15 61 to 302 hours in the medical school curriculum, in contrast to time devoted to clinical pathology
16 (laboratory medicine), which was about eight hours.⁹ While there are many courses available in
17 clinical pathology in medical institutions, these appear to be elective courses listed in the course
18 directory, which are taken by very few students. This was evidenced in the same study which also
19 found that 63% of respondents reported lack of student interest as a major barrier to optimizing
20 laboratory medicine education. Thus, medical institutions have the appearance of teaching
21 laboratory medicine, but the reality is that few students actually spend any time learning it.

22
23 *Pathology Competencies for Undergraduate Medical Education*

24
25 In 2014, the National Standards in Pathology were established by a national committee of experts,
26 including anatomic pathology/laboratory medicine practitioners and experts in medical education,
27 as well as members of the Undergraduate Medical Educators Sections (UMEDS) of the APC
28 and/or the Group for Research in Pathology Education (GRPE). The committee was organized
29 into subcommittees to frame competencies into three major general domains and their
30 subcategories: (1) interactions with the departments of pathology and laboratory medicine; (2)
31 anatomic pathology, to include surgical pathology/cytopathology and end of life issues (autopsy,
32 death certificates, and forensic considerations); and (3) laboratory medicine, to include basic
33 principles of laboratory testing, transfusion medicine, clinical chemistry and immunology,
34 hematology, microbiology, and molecular diagnostics.¹ The National Standards in Pathology were
35 published on the APC website to highlight the proposed minimum standards for all medical
36 students to understand for practicing medicine and remaining current with medical practice. These
37 standards were extensively revised and peer reviewed.

38
39 These standards evolved in 2017 into the Pathology Competencies for Medical Education (PCME),
40 an effort that was initiated by the Undergraduate Medical Education Committee of the APC. In
41 addition to updating the 2014 National Standards in Pathology, PCME sought to (1) create a
42 revisable document that would be able to keep pace with current medical practice and
43 understanding; (2) emphasize laboratory medicine; and (3) develop a shared resource of pathology
44 competencies and educational cases highlighting the competencies for pathology faculty,
45 educators, and students, which are developed by or with pathologists, peer reviewed, and represent
46 foundational understanding of pathobiology essential for clinical practice that could easily be
47 adapted into any curriculum.¹⁰

48
49 In addition to these standards, the PCME developed current, peer-reviewed educational cases that
50 highlight pathology competencies. The learning cases can be easily adapted to multiple educational
51 modalities. The cases demonstrate the application of medical reasoning to clinical scenarios,

1 allowing the learner to understand and apply diagnostic principles, incorporating morphologic
2 findings and laboratory values with discussion of the laboratory medicine essentials for accurate
3 diagnosis and treatment.

4
5 *Integrating Pathology into Clinical Education: Vanderbilt School of Medicine “Diagnosis and*
6 *Therapeutics” course*

7
8 Vanderbilt School of Medicine currently offers a longitudinal experience throughout the core
9 clerkship phase via their “Diagnosis and Therapeutics” course. Course sessions align with each
10 clinical discipline and highlight core principles of laboratory medicine and case-based review of
11 common testing as applied in that particular field. The course prepares students by having them
12 review high-yield information from radiology, pharmacy, and the clinical laboratories. Students
13 build competencies in effectively using clinical laboratory testing to diagnose patients,
14 understanding the role of radiological imaging in differential diagnosis, determining the strengths
15 and weaknesses of the different available therapeutic options, improving selection of tests and
16 interpretation of test results and managing situations where additional help is needed.

17
18 *Accreditation Council for Graduate Medical Education Standards*

19
20 The Accreditation Council for Graduate Medical Education (ACGME) sets standards for U.S.
21 graduate medical education (GME) residency and fellowship programs and the institutions that
22 sponsor them and renders accreditation decisions based on compliance with these standards. The
23 ACGME recognizes that knowledge of pathology is necessary to the practice of medicine,
24 regardless of specialty, and mandates pathology education across many of its accredited residency
25 and fellowship programs. Common program requirements related to the principles of decision-
26 making and the utilization of quantitative evidence are addressed in Section IV.B. ACGME
27 Competencies, as highlighted below:

28
29 Section IV.B.1.b). (2): Residents must be able to perform all medical, diagnostic, and surgical
30 procedures considered essential for the area of practice.

31
32 Section IV.B.1.c): Residents must demonstrate knowledge of established and evolving
33 biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application
34 of this knowledge to patient care.

35
36 Section IV.B.1.d): Residents must demonstrate the ability to investigate and evaluate their care
37 of patients, to appraise and assimilate scientific evidence, and to continuously improve patient
38 care based on constant self-evaluation and lifelong learning.

39 Section IV.B.1.d). (1). (g): Residents must demonstrate competence in using information
40 technology to optimize learning.

41
42 Section IV.B.1.e). (1).(c): Residents must demonstrate competence in working effectively as a
43 member or leader of a health care team or other professional group.

44
45 Section IV.B.1.f): Residents must demonstrate an awareness of and responsiveness to the
46 larger context and system of health care, including the social determinants of health, as well as
47 the ability to call effectively on other resources to provide optimal health care.

48
49 ACGME Review Committees may further specify additional requirements for competencies in
50 pathology and laboratory medicine based on the medical specialty or subspecialty.

1 *Integrating Pathology into Graduate Medical Education: Dell Medical School Department of*
2 *Diagnostic Medicine*

3
4 As evidence of the growing trend of medical schools integrating pathology and laboratory medicine
5 into the curriculum, Dell Medical School at The University of Texas at Austin (Dell Med)
6 established a Department of Diagnostic Medicine in 2017 which includes divisions of radiology
7 and pathology. The Department of Diagnostic Medicine integrated the traditional departments of
8 pathology, radiology, and laboratory medicine to improve accuracy in diagnoses, make testing
9 more convenient and efficient, lower costs, and broadly integrate patient health data with electronic
10 health records. Dell Med earned its full accreditation by LCME and graduated its first class in
11 2020. The school also features a Diagnostic Radiology Residency program which earned its
12 accreditation by the by the Accreditation Council for Graduate Medical Education in February
13 2021. Their inaugural residency class will begin July 2022.

14
15 Using an innovative approach to team-based care, Dell Med has activated an existing network of
16 medical experts in the community to work collaboratively to organize diagnostic care in a way that
17 streamlines and improves the patient experience before, during, and after testing. This unique
18 approach also aligns with Dell Med's commitment to health informatics, broadly defined as how
19 information technology and health data are used to improve patient care and health outcomes. To
20 support this effort Dell Med created a Biomedical Data Science Hub in 2018. The Biomedical Data
21 Science Hub's team of computer, information, and statistical scientists will collaborate with those
22 at other University of Texas System entities, including the Cockrell School of Engineering, College
23 of Natural Sciences, College of Liberal Arts, Texas Advanced Computing Center, Lyndon B.
24 Johnson School of Public Affairs, University of Texas Health School of Public Health, and others
25 to develop new ways to analyze complex clinical and nonclinical health-related data.

26
27 One opportunity to improve the process for educating residents on how to effectively order tests
28 was found in the "Choose Wisely" program. To promote the effective use of health care resources,
29 the American Board of Internal Medicine Foundation and Consumer Reports launched the "Choose
30 Wisely" campaign in April 2012 to raise national awareness of the "Top Five" lists of tests and
31 treatments that were overused in their specialty and did not provide meaningful benefit for patients.
32 Following the inaugural year of the campaign, eight resident physician groups in the Department of
33 Medicine at Vanderbilt University Medical Center were able to eliminate 1,572 redundant lab tests
34 and help patients avoid \$194,954 in medical bills.

35
36 DISCUSSION

37
38 Pathology is one of the major diagnostic disciplines with essential contributions to patient
39 management. Magid argues that students must be educated in proper interactions with physicians/
40 clinical laboratory scientists in anatomic pathology and laboratory medicine to understand practical
41 implications for patient assessment and management.¹ Nonpathology departments and GME
42 programs often request that pathology faculty provide educational experiences to meet ACGME
43 requirements for nonpathology trainees. Thus, pathology departments become responsible, at least
44 in part, for the education of the majority of graduate medical trainees at a given institution.¹¹

45
46 Having a national peer-reviewed repository of pathology-related competencies facilitates the use of
47 learning objectives and educational cases in individual curricula, potentially relieving some of the
48 load on pathology course directors to continually update curricula to keep current with the
49 exponential expanse of knowledge, laboratory testing, and treatment options. A national repository
50 of learning objectives and cases can be used to support pathology exposure in integrated curricula
51 to ensure exposure to an acceptable minimum amount of pathology for all students.⁶

1 Inappropriate use and interpretation of laboratory and other diagnostic tests can lead to shortfalls in
2 the quality of patient care, harm to patients, malpractice claims, and increased costs of care.
3 Improving diagnosis in health care will require multiple interventions across the health system,
4 including but not limited to innovations in medical education. Opportunities to improve the
5 diagnostic process include cultivating a culture of efficient and effective intra- and
6 interprofessional collaboration, including integration of a “diagnostic management team (DMT)
7 model which features collaborations among pathologists, radiologists, and the treating health care
8 professionals in order to ensure that the correct diagnostic tests are ordered and that the results are
9 correctly interpreted and acted upon.”¹² Innovative educational programs have included students
10 and residents in DMT sessions to help learners appreciate the impact of diagnostic ordering.
11

12 As medical education prepares students and trainees on how to care for patients most effectively
13 and efficiently, there is value in providing educational opportunities to fiscal stewardship.
14 Physicians have an ethical obligation to be prudent stewards of the shared societal resources with
15 which they are entrusted (*Code of Medical Ethics* 11.1.2). Programs like “Choosing Wisely” and
16 clinical decision support systems help physicians and patients make decisions about care that are
17 supported by evidence, not duplicative of other tests or procedures already received, free from
18 harm, and truly necessary.
19

20 RELEVANT AMA POLICY

21

22 Among other policies that are germane to this topic, Policy H-295.995, “Recommendations for
23 Future Directions for Medical Education,” notes that “...(11) Faculties should continue to evaluate
24 curricula periodically as a means of ensuring that graduates will have the capability to recognize
25 the diverse nature of disease, and the potential to provide preventive and comprehensive medical
26 care. Medical schools, within the framework of their respective institutional goals and regardless of
27 the organizational structure of the faculty, should provide a broad general education in both basic
28 sciences and the art and science of clinical medicine. (12) The curriculum of a medical school
29 should be designed to provide students with experience in clinical medicine ranging from primary
30 to tertiary care.” This and other relevant AMA policies are shown in the appendix.
31

32 SUMMARY AND RECOMMENDATIONS

33

34 Accreditation entities within medical education have established competencies related to the
35 principles of decision-making and the utilization of quantitative evidence which are available for
36 schools to use in developing curriculum. There is a need to enhance training focus on laboratory
37 medicine. The opportunity lies in educating and equipping students, trainees, and physicians with
38 the effective understanding of what tests should be ordered and when the support of an expert, such
39 as a clinical pathologist, is most beneficial. As curriculum for laboratory medicine exists but is
40 underutilized, the AMA may be able to influence current physicians, medical students and trainees
41 to pursue this knowledge throughout the medical education continuum.
42

43 The Council on Medical Education therefore recommends that the following recommendations be
44 adopted and the remainder of this report be filed:
45

46 1. That our AMA modify Policy D-155.988, “Support for the Concepts of the Choosing
47 Wisely Program,” by addition to read as follows:
48

49 (1) Our AMA supports the concepts of the American Board of Internal Medicine
50 Foundation's Choosing Wisely program.

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(2) That our AMA work with relevant stakeholders, including specialty societies in the Federation of Medicine, such as the American Society for Clinical Pathology and College of American Pathologists, to promote educational resources regarding appropriate test ordering and interpretation. (Modify Current HOD Policy)

2. That our AMA rescind Policy D-295.930, “Clinical Applications of Pathology and Laboratory Medicine for Medical Students, Residents and Fellows,” as having been fulfilled by this report. (Rescind HOD Policy)

Fiscal note: \$5,000.

APPENDIX: RELEVANT AMA POLICY

D-295.317, “Competency Based Medical Education Across the Continuum of Education and Practice”

1. Our AMA Council on Medical Education will continue to study and identify challenges and opportunities and critical stakeholders in achieving a competency-based curriculum across the medical education continuum and other health professions that provides significant value to those participating in these curricula and their patients.
2. Our AMA Council on Medical Education will work to establish a framework of consistent vocabulary and definitions across the continuum of health sciences education that will facilitate competency-based curriculum, andragogy and assessment implementation.
3. Our AMA will continue to explore, with the Accelerating Change in Medical Education initiative and with other stakeholder organizations, the implications of shifting from time-based to competency-based medical education on residents' compensation and lifetime earnings.

H-155.998, “Voluntary Health Care Cost Containment”

(1) All physicians, including physicians in training, should become knowledgeable in all aspects of patient-related medical expenses, including hospital charges of both a service and professional nature. (2) Physicians should be cost conscious and should exercise discretion, consistent with good medical care, in determining the medical necessity for hospitalization and the specific treatment, tests and ancillary medical services to be provided a patient. (3) Medical staffs, in cooperation with hospital administrators, should embark now upon a concerted effort to educate physicians, including house staff officers, on all aspects of hospital charges, including specific medical tests, procedures, and all ancillary services. (4) Medical educators should be urged to include similar education for future physicians in the required medical school curriculum. (5) All physicians and medical staffs should join with hospital administrators and hospital governing boards nationwide in a conjoint and across-the-board effort to voluntarily contain and control the escalation of health care costs, individually and collectively, to the greatest extent possible consistent with good medical care. (6) All physicians, practicing solo or in groups, independently or in professional association, should review their professional charges and operating overhead with the objective of providing quality medical care at optimum reasonable patient cost through appropriateness of fees and efficient office management, thus favorably moderating the rate of escalation of health care costs. (7) The AMA should widely publicize and disseminate information on activities of the AMA and state, county and national medical specialty societies which are designed to control or reduce the costs of health care.

H-295.864, “Systems-Based Practice Education for Medical Students and Resident/Fellow Physicians”

Our AMA: (1) supports the availability of educational resources and elective rotations for medical students and resident/fellow physicians on all aspects of systems-based practice, to improve awareness of and responsiveness to the larger context and system of health care and to aid in developing our next generation of physician leaders; (2) encourages development of model guidelines and curricular goals for elective courses and rotations and fellowships in systems-based practice, to be used by state and specialty societies, and explore developing an educational module on this topic as part of its Introduction to the Practice of Medicine (IPM) product; and (3) will request that undergraduate and graduate medical education accrediting bodies consider incorporation into their requirements for systems-based practice education such topics as health care policy and patient care advocacy; insurance, especially pertaining to policy coverage, claim

processes, reimbursement, basic private insurance packages, Medicare, and Medicaid; the physician's role in obtaining affordable care for patients; cost awareness and risk benefit analysis in patient care; inter-professional teamwork in a physician-led team to enhance patient safety and improve patient care quality; and identification of system errors and implementation of potential systems solutions for enhanced patient safety and improved patient outcomes.

H-295.921, "Federal Intervention in the Setting of Educational Standards"

The AMA strongly opposes federal intervention, through legislative restrictions, that would limit the authority of professional accrediting bodies to design and implement appropriate educational standards for the training of physicians. The AMA strongly opposes infringements and mandates on medical school curricular requirements through state and federal legislative efforts, and also recommends that state medical societies should carefully monitor such activities and notify the AMA when such intrusions take place.

H-295.995, "Recommendations for Future Directions for Medical Education"

Our AMA supports the following recommendations relating to the future directions for medical education: (1) The medical profession and those responsible for medical education should strengthen the general or broad components of both undergraduate and graduate medical education. All medical students and resident physicians should have general knowledge of the whole field of medicine regardless of their projected choice of specialty. (2) Schools of medicine should accept the principle and should state in their requirements for admission that a broad cultural education in the arts, humanities, and social sciences, as well as in the biological and physical sciences, is desirable. (3) Medical schools should make their goals and objectives known to prospective students and premedical counselors in order that applicants may apply to medical schools whose programs are most in accord with their career goals. (4) Medical schools should state explicitly in publications their admission requirements and the methods they employ in the selection of students. (5) Medical schools should require their admissions committees to make every effort to determine that the students admitted possess integrity as well as the ability to acquire the knowledge and skills required of a physician. (6) Although the results of standardized admission testing may be an important predictor of the ability of students to complete courses in the preclinical sciences successfully, medical schools should utilize such tests as only one of several criteria for the selection of students. Continuing review of admission tests is encouraged because the subject content of such examinations has an influence on premedical education and counseling. (7) Medical schools should improve their liaison with college counselors so that potential medical students can be given early and effective advice. The resources of regional and national organizations can be useful in developing this communication. (8) Medical schools are chartered for the unique purpose of educating students to become physicians and should not assume obligations that would significantly compromise this purpose. (9) Medical schools should inform the public that, although they have a unique capability to identify the changing medical needs of society and to propose responses to them, they are only one of the elements of society that may be involved in responding. Medical schools should continue to identify social problems related to health and should continue to recommend solutions. (10) Medical school faculties should continue to exercise prudent judgment in adjusting educational programs in response to social change and societal needs. (11) Faculties should continue to evaluate curricula periodically as a means of insuring that graduates will have the capability to recognize the diverse nature of disease, and the potential to provide preventive and comprehensive medical care. Medical schools, within the framework of their respective institutional goals and regardless of the organizational structure of the faculty, should provide a broad general education in both basic sciences and the art and science of clinical medicine. (12) The curriculum of a medical school should be designed to provide

students with experience in clinical medicine ranging from primary to tertiary care in a variety of inpatient and outpatient settings, such as university hospitals, community hospitals, and other health care facilities. Medical schools should establish standards and apply them to all components of the clinical educational program regardless of where they are conducted. Regular evaluation of the quality of each experience and its contribution to the total program should be conducted. (13) Faculties of medical schools have the responsibility to evaluate the cognitive abilities of their students. Extramural examinations may be used for this purpose, but never as the sole criterion for promotion or graduation of a student. (14) As part of the responsibility for granting the MD degree, faculties of medical schools have the obligation to evaluate as thoroughly as possible the non-cognitive abilities of their medical students. (15) Medical schools and residency programs should continue to recognize that the instruction provided by volunteer and part-time members of the faculty and the use of facilities in which they practice make important contributions to the education of medical students and resident physicians. Development of means by which the volunteer and part-time faculty can express their professional viewpoints regarding the educational environment and curriculum should be encouraged. (16) Each medical school should establish, or review already established, criteria for the initial appointment, continuation of appointment, and promotion of all categories of faculty. Regular evaluation of the contribution of all faculty members should be conducted in accordance with institutional policy and practice. (17a) Faculties of medical schools should reevaluate the current elements of their fourth or final year with the intent of increasing the breadth of clinical experience through a more formal structure and improved faculty counseling. An appropriate number of electives or selected options should be included. (17b) Counseling of medical students by faculty and others should be directed toward increasing the breadth of clinical experience. Students should be encouraged to choose experience in disciplines that will not be an integral part of their projected graduate medical education. (18) Directors of residency programs should not permit medical students to make commitments to a residency program prior to the final year of medical school. (19) The first year of postdoctoral medical education for all graduates should consist of a broad year of general training. (a) For physicians entering residencies in internal medicine, pediatrics, and general surgery, postdoctoral medical education should include at least four months of training in a specialty or specialties other than the one in which the resident has been appointed. (A residency in family practice provides a broad education in medicine because it includes training in several fields.) (b) For physicians entering residencies in specialties other than internal medicine, pediatrics, general surgery, and family practice, the first postdoctoral year of medical education should be devoted to one of the four above-named specialties or to a program following the general requirements of a transitional year stipulated in the "General Requirements" section of the "Essentials of Accredited Residencies." (c) A program for the transitional year should be planned, designed, administered, conducted, and evaluated as an entity by the sponsoring institution rather than one or more departments. Responsibility for the executive direction of the program should be assigned to one physician whose responsibility is the administration of the program. Educational programs for a transitional year should be subjected to thorough surveillance by the appropriate accrediting body as a means of assuring that the content, conduct, and internal evaluation of the educational program conform to national standards. The impact of the transitional year should not be deleterious to the educational programs of the specialty disciplines. (20) The ACGME, individual specialty boards, and respective residency review committees should improve communication with directors of residency programs because of their shared responsibility for programs in graduate medical education. (21) Specialty boards should be aware of and concerned with the impact that the requirements for certification and the content of the examination have upon the content and structure of graduate medical education. Requirements for certification should not be so specific that they inhibit program directors from exercising judgment and flexibility in the design and operation of their programs. (22) An essential goal of a specialty board should be to determine that

the standards that it has set for certification continue to assure that successful candidates possess the knowledge, skills, and the commitment to upgrade continually the quality of medical care. (23) Specialty boards should endeavor to develop a consensus concerning the significance of certification by specialty and publicize it so that the purposes and limitations of certification can be clearly understood by the profession and the public. (24) The importance of certification by specialty boards requires that communication be improved between the specialty boards and the medical profession as a whole, particularly between the boards and their sponsoring, nominating, or constituent organizations and also between the boards and their diplomates. (25) Specialty boards should consider having members of the public participate in appropriate board activities. (26) Specialty boards should consider having physicians and other professionals from related disciplines participate in board activities. (27) The AMA recommends to state licensing authorities that they require individual applicants, to be eligible to be licensed to practice medicine, to possess the degree of Doctor of Medicine or its equivalent from a school or program that meets the standards of the LCME or accredited by the American Osteopathic Association, or to demonstrate as individuals, comparable academic and personal achievements. All applicants for full and unrestricted licensure should provide evidence of the satisfactory completion of at least one year of an accredited program of graduate medical education in the US. Satisfactory completion should be based upon an assessment of the applicant's knowledge, problem-solving ability, and clinical skills in the general field of medicine. The AMA recommends to legislatures and governmental regulatory authorities that they not impose requirements for licensure that are so specific that they restrict the responsibility of medical educators to determine the content of undergraduate and graduate medical education. (28) The medical profession should continue to encourage participation in continuing medical education related to the physician's professional needs and activities. Efforts to evaluate the effectiveness of such education should be continued. (29) The medical profession and the public should recognize the difficulties related to an objective and valid assessment of clinical performance. Research efforts to improve existing methods of evaluation and to develop new methods having an acceptable degree of reliability and validity should be supported. (30) Methods currently being used to evaluate the readiness of graduates of foreign medical schools to enter accredited programs in graduate medical education in this country should be critically reviewed and modified as necessary. No graduate of any medical school should be admitted to or continued in a residency program if his or her participation can reasonably be expected to affect adversely the quality of patient care or to jeopardize the quality of the educational experiences of other residents or of students in educational programs within the hospital. (31) The Educational Commission for Foreign Medical Graduates should be encouraged to study the feasibility of including in its procedures for certification of graduates of foreign medical schools a period of observation adequate for the evaluation of clinical skills and the application of knowledge to clinical problems. (32) The AMA, in cooperation with others, supports continued efforts to review and define standards for medical education at all levels. The AMA supports continued participation in the evaluation and accreditation of medical education at all levels. (33) The AMA, when appropriate, supports the use of selected consultants from the public and from the professions for consideration of special issues related to medical education. (34) The AMA encourages entities that profile physicians to provide them with feedback on their performance and with access to education to assist them in meeting norms of practice; and supports the creation of experiences across the continuum of medical education designed to teach about the process of physician profiling and about the principles of utilization review/quality assurance. (35) Our AMA encourages the accrediting bodies for MD- and DO-granting medical schools to review, on an ongoing basis, their accreditation standards to assure that they protect the quality and integrity of medical education in the context of the emergence of new models of medical school organization and governance. (36) Our AMA will strongly advocate for the rights of medical students, residents, and fellows to have physician-led (MD or DO as defined by the AMA) clinical training, supervision, and evaluation while recognizing the contribution of non-physicians to

medical education. (37) Our AMA will publicize to medical students, residents, and fellows their rights, as per Liaison Committee on Medical Education and Accreditation Council for Graduate Medical Education guidelines, to physician-led education and a means to report violations without fear of retaliation.

H-310.929, "Principles for Graduate Medical Education"

Our AMA urges the Accreditation Council for Graduate Medical Education (ACGME) to incorporate these principles in its Institutional Requirements, if they are not already present. (1) **PURPOSE OF GRADUATE MEDICAL EDUCATION AND ITS RELATIONSHIP TO PATIENT CARE.** There must be objectives for residency education in each specialty that promote the development of the knowledge, skills, attitudes, and behavior necessary to become a competent practitioner in a recognized medical specialty. Exemplary patient care is a vital component for any residency/fellowship program. Graduate medical education enhances the quality of patient care in the institution sponsoring an accredited program. Graduate medical education must never compromise the quality of patient care. Institutions sponsoring residency programs and the director of each program must assure the highest quality of care for patients and the attainment of the program's educational objectives for the residents. (2) **RELATION OF ACCREDITATION TO THE PURPOSE OF RESIDENCY TRAINING.** Accreditation requirements should relate to the stated purpose of a residency program and to the knowledge, skills, attitudes, and behaviors that a resident physician should have on completing residency education. (3) **EDUCATION IN THE BROAD FIELD OF MEDICINE.** GME should provide a resident physician with broad clinical experiences that address the general competencies and professionalism expected of all physicians, adding depth as well as breadth to the competencies introduced in medical school. (4) **SCHOLARLY ACTIVITIES FOR RESIDENTS.** Graduate medical education should always occur in a milieu that includes scholarship. Resident physicians should learn to appreciate the importance of scholarly activities and should be knowledgeable about scientific method. However, the accreditation requirements, the structure, and the content of graduate medical education should be directed toward preparing physicians to practice in a medical specialty. Individual educational opportunities beyond the residency program should be provided for resident physicians who have an interest in, and show an aptitude for, academic and research pursuits. The continued development of evidence-based medicine in the graduate medical education curriculum reinforces the integrity of the scientific method in the everyday practice of clinical medicine. (5) **FACULTY SCHOLARSHIP.** All residency faculty members must engage in scholarly activities and/or scientific inquiry. Suitable examples of this work must not be limited to basic biomedical research. Faculty can comply with this principle through participation in scholarly meetings, journal club, lectures, and similar academic pursuits. (6) **INSTITUTIONAL RESPONSIBILITY FOR PROGRAMS.** Specialty-specific GME must operate under a system of institutional governance responsible for the development and implementation of policies regarding the following; the initial authorization of programs, the appointment of program directors, compliance with the accreditation requirements of the ACGME, the advancement of resident physicians, the disciplining of resident physicians when this is appropriate, the maintenance of permanent records, and the credentialing of resident physicians who successfully complete the program. If an institution closes or has to reduce the size of a residency program, the institution must inform the residents as soon as possible. Institutions must make every effort to allow residents already in the program to complete their education in the affected program. When this is not possible, institutions must assist residents to enroll in another program in which they can continue their education. Programs must also make arrangements, when necessary, for the disposition of program files so that future confirmation of the completion of residency education is possible. Institutions should allow residents to form housestaff organizations, or similar organizations, to address patient care and resident work environment concerns. Institutional committees should include resident members. (7)

COMPENSATION OF RESIDENT PHYSICIANS. All residents should be compensated. Residents should receive fringe benefits, including, but not limited to, health, disability, and professional liability insurance and parental leave and should have access to other benefits offered by the institution. Residents must be informed of employment policies and fringe benefits, and their access to them. Restrictive covenants must not be required of residents or applicants for residency education. (8) LENGTH OF TRAINING. The usual duration of an accredited residency in a specialty should be defined in the Program Requirements. The required minimum duration should be the same for all programs in a specialty and should be sufficient to meet the stated objectives of residency education for the specialty and to cover the course content specified in the Program Requirements. The time required for an individual resident physician's education might be modified depending on the aptitude of the resident physician and the availability of required clinical experiences. (9) PROVISION OF FORMAL EDUCATIONAL EXPERIENCES. Graduate medical education must include a formal educational component in addition to supervised clinical experience. This component should assist resident physicians in acquiring the knowledge and skill base required for practice in the specialty. The assignment of clinical responsibility to resident physicians must permit time for study of the basic sciences and clinical pathophysiology related to the specialty. (10) INNOVATION OF GRADUATE MEDICAL EDUCATION. The requirements for accreditation of residency training should encourage educational innovation and continual improvement. New topic areas such as continuous quality improvement (CQI), outcome management, informatics and information systems, and population-based medicine should be included as appropriate to the specialty. (11) THE ENVIRONMENT OF GRADUATE MEDICAL EDUCATION. Sponsoring organizations and other GME programs must create an environment that is conducive to learning. There must be an appropriate balance between education and service. Resident physicians must be treated as colleagues. (12) SUPERVISION OF RESIDENT PHYSICIANS. Program directors must supervise and evaluate the clinical performance of resident physicians. The policies of the sponsoring institution, as enforced by the program director, and specified in the ACGME Institutional Requirements and related accreditation documents, must ensure that the clinical activities of each resident physician are supervised to a degree that reflects the ability of the resident physician and the level of responsibility for the care of patients that may be safely delegated to the resident. The sponsoring institution's GME Committee must monitor programs supervision of residents and ensure that supervision is consistent with: (A) Provision of safe and effective patient care; (B) Educational needs of residents; (C) Progressive responsibility appropriate to residents' level of education, competence, and experience; and (D) Other applicable Common and specialty/subspecialty specific Program Requirements. The program director, in cooperation with the institution, is responsible for maintaining work schedules for each resident based on the intensity and variability of assignments in conformity with ACGME Review Committee recommendations, and in compliance with the ACGME clinical and educational work hour standards. Integral to resident supervision is the necessity for frequent evaluation of residents by faculty, with discussion between faculty and resident. It is a cardinal principle that responsibility for the treatment of each patient and the education of resident and fellow physicians lies with the physician/faculty to whom the patient is assigned and who supervises all care rendered to the patient by residents and fellows. Each patient's attending physician must decide, within guidelines established by the program director, the extent to which responsibility may be delegated to the resident, and the appropriate degree of supervision of the resident's participation in the care of the patient. The attending physician, or designate, must be available to the resident for consultation at all times. (13) EVALUATION OF RESIDENTS AND SPECIALTY BOARD CERTIFICATION. Residency program directors and faculty are responsible for evaluating and documenting the continuing development and competency of residents, as well as the readiness of residents to enter independent clinical practice upon completion of training. Program directors should also document any deficiency or concern that could interfere with the practice of medicine and which requires remediation, treatment, or removal from training. Inherent within the concept of specialty board

certification is the necessity for the residency program to attest and affirm to the competence of the residents completing their training program and being recommended to the specialty board as candidates for examination. This attestation of competency should be accepted by specialty boards as fulfilling the educational and training requirements allowing candidates to sit for the certifying examination of each member board of the ABMS. (14) GRADUATE MEDICAL EDUCATION IN THE AMBULATORY SETTING. Graduate medical education programs must provide educational experiences to residents in the broadest possible range of educational sites, so that residents are trained in the same types of sites in which they may practice after completing GME. It should include experiences in a variety of ambulatory settings, in addition to the traditional inpatient experience. The amount and types of ambulatory training is a function of the given specialty. (15) VERIFICATION OF RESIDENT PHYSICIAN EXPERIENCE. The program director must document a resident physician's specific experiences and demonstrated knowledge, skills, attitudes, and behavior, and a record must be maintained within the institution.

H-310.960, "Resident Education in Laboratory Utilization"

Our AMA endorses the concept of practicing physicians devoting time with medical students and resident physicians for chart reviews focusing on appropriate test ordering in patient care.

H-310.968, "Opposition to Centralized Postgraduate Medical Education"

Our AMA (1) continues to support a pluralistic system of postgraduate medical education for house officer training; and (2) opposes the mandatory centralization of postgraduate medical training under the auspices of the nation's medical schools.

H-480.944, "Improving Genetic Testing and Counseling Services"

Our AMA supports: (1) appropriate utilization of genetic testing, pre- and post-test counseling for patients undergoing genetic testing, and physician preparedness in counseling patients or referring them to qualified genetics specialists; (2) the development and dissemination of guidelines for best practice standards concerning pre- and post-test genetic counseling; and (3) research and open discourse concerning issues in medical genetics, including genetic specialist workforce levels, physician preparedness in the provision of genetic testing and counseling services, and impact of genetic testing and counseling on patient care and outcomes.

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