The perception of a growing shortage of physicians has led to calls for an increase in the number of US medical school graduates. In response, new MD- and DO-granting medical schools have been opened or are in the planning stages, medical school branch campuses are being created or expanded, and existing schools have increased enrollments. Also, new medical schools have opened in the Caribbean, which send their students to take clinical clerkships in the US. As US medical student education requires clinical experiences, often throughout all years of the curriculum, the increases in enrollment in US and non-US schools have the potential to overburden the resources for clinical education, including faculty, clinical sites, and numbers of patients. This report provides data on current and projected enrollments in US MD- and DO-granting medical schools and describes, where information is available, the growth in international medical schools. Then the report summarizes the implications of these increases and notes areas of actual or potential concern.

**Recent Increases:**
Between 1995 and 2005, the number of students entering US MD-granting medical schools increased about 4.5% and DO-granting schools increased 72% (see Table 1). One new allopathic medical school recently graduated its first class but two existing schools merged (leaving the total number of schools unchanged). Several new DO-granting schools have opened. In addition, in recent years a number of both MD- and DO-granting medical schools have either opened or expanded geographically-separate campuses. A geographically-separate campus is defined by the Liaison Committee on Medical Education as “an instructional site separate from the main or home campus of the institution, which offers at least one full year of instruction at that location.”

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**Table 1**

<table>
<thead>
<tr>
<th>Total Entering Students (# of Schools)</th>
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<tbody>
<tr>
<td>1995</td>
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<tr>
<td>------</td>
</tr>
<tr>
<td>US MD programs²</td>
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<tr>
<td>US DO programs³</td>
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*Includes 2 schools with four-year branch campuses

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A number of new international medical schools that cater to US citizens have opened in recent years. Of four-year medical schools with the curriculum offered in English in the Caribbean/Central American region, 4 started before 1980, 9 began instruction between 1980 and 2000, and 18 have started since 2000.¹

Enrollment increase projections over the next decade: US MD, US DO
First-year enrollment in 2012 for MD-granting schools is projected to be between 18,500 and 19,500,² which is an approximately 9-15% increase from 2005. This increase comes both from the formation of new medical schools and the expansion of existing institutions.

Projections for DO-granting schools anticipate a first-year class size of 4700 by the fall of 2011.³ This would represent an increase of 21% from 2005.

There are no data on expansions in enrollment of international medical schools. However, since many of the schools in the Caribbean opened only recently, it is expected that students from these institutions will be seeking clinical placements in the US in the near future.

Clinical Teaching Sites and Faculty

A description of the current structure of clinical education illustrates the resources that are required. Medical students receive clinical training in both inpatient and ambulatory settings. In general, outpatient teaching may occur both in hospital clinics and in the community (in clinics or physician offices).

MD-granting schools
During 2004-2005, the 125 MD-granting medical schools used a total of 935 hospitals as major inpatient teaching sites for required clinical clerkships. Of these, 83 were medical school or university owned; 520 were non-for-profit, private; 76 were for-profit, private; 140 were federal (Veterans Administration or Department of Defense); and 116 were state, county, or city public hospitals. Individual medical schools used a total of from 2 to 22 hospitals for all their required clinical clerkships.⁷

2004-2005 students in MD-granting schools spent the following average percent of total time in the ambulatory setting during required clinical clerkships:⁷

- Ambulatory care (95%)
- Family medicine (92%)
- Pediatrics (44%)
- Neurology (34%)
- Obstetrics-gynecology (34%)
- Psychiatry (27%)
- Internal Medicine (24%)
- Surgery (21%)

This teaching may occur in settings associated with a teaching hospital or in the community. In addition, many medical schools require additional clerkships, such as emergency medicine and medical/surgical subinternships, as well as selectives. Medical students also participate in clinical electives at their own institutions or at other medical schools.

To support clinical teaching in MD-granting schools, during 2004-2005 there were 101,464 full-time, 18,472 part-time, and 144,353 volunteer faculty in clinical departments.⁷ There are no data as to what percent of these faculty contribute actively to the teaching program.
Volunteer clinical faculty in the community make a significant contribution to other kinds of clinical experiences in addition to clerkships and clinical electives. For example in 85 medical schools (68%) during 2004-2005, all students spent time in community-based ambulatory settings during the course that teaches basic clinical skills and in 89 medical school (71%) spent time in the community in a course that introduces medical practice.¹

**DO-granting schools**

During 2004-2005, 20 DO-granting schools used a total of 522 hospitals for clerkships. For individual clerkships, the average number of clinical sites per school ranged from about 23 for psychiatry clerkships to 43 for internal medicine clerkships.³ In DO-granting medical schools, students spend an average of 39% of their time during the third year in the outpatient setting.⁸

During 2004-2005, there were a total of 887 full-time, 1021 part-time, and 13,667 volunteer clinical faculty in DO-granting schools.⁷ Many students in DO-granting schools have a significant percent of their clinical clerkship training with allopathic physicians both in in-patient and ambulatory settings.⁸

**International medical schools**

There has been little information about the educational experiences of US citizens attending international medical schools.⁷ In general, US citizens at international medical schools have options of where to complete their clinical training, and many chose clinical facilities in the US. These students train at hospitals that may or may not currently be affiliated with US medical schools and work with supervising physicians who may or may not be US medical school faculty.

**Implications of Increases in Medical School Enrollment**

The expansion of enrollments in US and international medical schools has the potential to stress clinical education in several ways.

**Availability of faculty:**

There already are concerns that recruitment of volunteer clinical faculty to teach has become more difficult. Pressures for clinical productivity compete with the increased time required to teach students in the ambulatory setting.¹⁰-¹² Adding to the number of medical students in a region may saturate the available community-based faculty who are willing to devote time to clinical teaching.

Medical schools are not evenly distributed across the US. Many larger cities have a number of MD- and DO-granting schools. For example, New York City has 8, with 1 in development; Chicago has 7; and Philadelphia has 5. This distribution pattern has the potential to create competition for teaching sites and faculty among medical schools, and between medical schools and residency programs.

To support recruitment and retention, MD-granting medical schools typically have provided a variety of incentives for some or all volunteer clinical faculty who teach. In 2004-2005, only 44 schools provided monetary payments. In contrast, 117 schools provided access to the library, 106 held recognition dinners or provided certificates, 80 offered free or discounted continuing medical education, 40 offered access to athletic facilities or sports events, and 39 supplied or discounted computers or software.⁷ If it becomes more difficult to recruit volunteer faculty, the incentives may have to be increased, which has financial implications for the medical school.
Full-time clinical faculty also may be under competing time pressures. Fewer full-time faculty in MD-granting schools are on tenure tracks and the financial guarantees associated with tenure at many medical schools have decreased or disappeared. Reimbursement systems may be designed in ways that do not provide sufficient incentives for full-time clinical faculty to teach.

Availability of an adequate patient base:
To support clinical teaching, many medical schools have developed a broadly dispersed network of affiliated hospitals. Even in some states with few or a single medical school, there has been a need to create branch campuses to disperse students so that sufficient patients are available. Increases in the aggregate number of medical students may swamp the available clinical sites and patient base in a region. This is especially the case if the number of resident physicians also increases. In response, there will need to be even more dispersion of clinical education, which has implications for the structure and delivery of the clinical education program. For example, some medical schools currently are employing videoconferencing and web-based electronic delivery systems for didactic presentations, so that faculty expertise need not be duplicated among clinical sites. Another response has been the enhanced use of simulation technology, as well as standardized patients.

Discussion and Recommendations

In aggregate, the number of medical students from allopathic, osteopathic, and international medical schools who require placements for clinical education has risen in recent years and a more significant increase is anticipated within the next 10 years. Medical education also continues to disperse into the community, often at a distance from the location of the medical school. The ability to support expansion will depend on the availability of increased resources, including faculty, clinical sites, access to patients, and educational support technology. These enhanced resources for clinical education, in turn, will require increased in financial and in-kind support.

This issue must be addressed comprehensively by all stakeholders, including US allopathic and osteopathic medical schools, affiliated hospitals and other health-care delivery sites, medical and education associations, and policy-makers, and should take into account, wherever possible, international medical schools. The Council on Medical Education, therefore, recommends that the following be adopted and that the remainder of this report be filed.

1. That our American Medical Association, in collaboration with the Association of American Medical Colleges; the American Osteopathic Association; the American Association of Colleges of Osteopathic Medicine; and other relevant stakeholder groups, such as the Educational Commissions for Foreign Medical Graduates:
   a. collect data on the strategies being used by existing and developing medical schools to meet their current and anticipated resource needs for clinical education;
   b. identify the current and anticipated gaps in resources for clinical education; and
   c. develop a strategic plan to address the identified gaps, including (1) creating an advocacy agenda and (2) identifying model programs and best practices and disseminating the results. (Directive to Take Action)
2. That our AMA continue to monitor the expansion medical schools and the increase in the number of medical students taking their clinical education in the US. (Directive to Take Action)
3. That our AMA report to the House of Delegates at the 2008 Interim Meeting the results of its data gathering related to medical education expansion and its advocacy activities in
support of adequate resources for medical student clinical education. (Directive to Take Action)

Fiscal Note: $15,750, includes staff time for data collection and analysis, dissemination of results, and a meeting involving relevant stakeholders.

Complete references for this report are available from the Medical Education Group.