A ROADMAP FOR A NEW ALLOPATHIC MEDICAL SCHOOL

AT

UNIVERSITY OF DENVER

A FEASIBILITY STUDY BY

DJW ASSOCIATES

CONSULTANTS TO ACADEMIC MEDICINE

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Under Chancellor Robert Coombe’s leadership, the University of Denver has embarked on an ambitious plan to transform the University from a predominantly liberal arts school to the next level of graduate and professional academic excellence. The University proposes to build on its foundation in physical and biological sciences to develop a new program in allopathic medicine leading to a Doctor of Medicine (MD) degree. This educational program will be unique in training physicians through a partnership with other health professions, community physicians and health systems, and it will be distinctive when compared to other medical schools. This educational program also will serve to generate new knowledge and will provide Colorado and the nation with more highly developed health care programs that will train physicians for the future practice of medicine.

A new medical school at the University of Denver will address the current and anticipated physician shortages that have been identified in Colorado and in the United States. The program will be designed to increase the number of physicians who are trained to provide high quality health care, who are culturally sensitive, and who would advance biomedical and scientific knowledge through research. A medical school is likely to have a positive impact on many other programs in the University by attracting more students into the science, math and possibly other health professions programs in the future. By engaging in medical research, the University will contribute to improvement in health care and attract extramural funding. Establishment of a new medical school in Colorado will have a major economic impact in the state, the region and the nation. This initiative will secure a reputation for the University of Denver as a premier institution of higher learning in the nation.

A medical school at the University of Denver is justified based on national population and physician demographics. An assessment of the number of applicants indicates that the state and national applicant pools are sufficient in number and quality to support another medical school. The idea of a medical school at the University of Denver has considerable support from the administration and faculty. In addition to providing a general medical education, the University of Denver School of Medicine can distinguish itself from other medical schools by
emphasizing the need to train physician for the future practice of medicine and developing programs in primary care, inter-professional education, public health, community medicine, rural health, and the health and wellbeing of people in other nations.

The University has significant resources to support a medical school: space, library holdings, information technology and infrastructure. Even with the resources already available at the University of Denver, the feasibility of starting this new medical school will present significant challenges. Considerable financial resources will be needed for renovation of education and research space, student scholarships, and start-up funds for medical school operations until it becomes self-sustaining. Clinical partners in the form of community physicians and health systems have expressed interest in affiliating with the University and these relationships will have to be solidified. If the decision is to proceed with further planning, the next phase will be to appoint the founding dean and senior administration, secure the funding and to identify clinical affiliates. **Once established, the new medical school at University of Denver is estimated to have an economic impact that exceeds $100 million annually.**

The educational and financial planning for the new medical school must provide a strong academic foundation and enable it to grow into a program of excellence. Matriculation of the charter class of students in 2014 will require timely approval and endorsement of the plan by the University and clinical affiliates, identification of funding and other resources, and planning activities that will result in preliminary accreditation by North Central Association of Schools and Colleges and the Liaison Committee on Medical Education. Given this support and based on our review and analysis, DJW Associates believes that a new medical school at the University of Denver is both feasible and achievable.
During the past year, University of Denver has identified an issue that will be a concern for all institutions of higher learning. After extensive capital investments to accommodate increasing student enrollment, universities will be facing a decline in student enrollment over the next few years with ensuing loss of revenues. In order to address this concern proactively, the University is considering the possibility of expanding its graduate and professional education programs by establishing an allopathic medical school. A new medical school at University of Denver is being considered because it would be a transformational event for the University and because of the positive effects it would have on the medical community as well as the Colorado and national physician workforce. No comparable opportunity has been identified that will address the needs of the University as well as professional needs. This proposal is being considered at a time when there is a national call for more medical schools in the United States.

In the past decade, new and reliable studies on the physician workforce in the United States have called for an increase in medical school enrollment in existing medical schools as well as the creation of new medical schools. Prior to 2002, the number of graduates from U.S. medical schools remained the same for the previous forty years despite our nation’s population growth and changes in work-related and retirement trends among physicians. To meet physician needs, the United States expanded graduate medical education (i.e., residency positions) and ultimately the number of physicians by “importing” a large percentage of students, both U.S. and non-U.S. citizens, who have received their medical education at foreign medical schools. These trends and the anticipated physician workforce needs clearly suggest that now is the time to produce more medical school graduates from accredited schools within the United States.

Planning for a new medical school at University of Denver is in keeping with a national trend to increase the physician workforce in the United States. Growing evidence indicates that the nation will face a shortage of physicians in the future, and the Association of American Medical Colleges (AAMC) and the Council on Graduate Medical Education (COGME) have
recommended an increase in the number of U.S. medical school graduates. The AAMC has recommended an increase of 30% per year by 2015, and since activities to increase current medical school capacity are unlikely to meet this recommendation, new medical schools will be required. The nation needs more physicians in all specialties but especially the primary care specialties of family medicine, pediatrics, and internal medicine. Shortages exist mostly in rural and underserved areas. Presently, new allopathic medical schools have been started or proposed in a number of states including Florida, California, Texas, Michigan, New Jersey, Connecticut, New York, Pennsylvania and Virginia.

A new medical school at University of Denver will add to the quality of life in the region through educational opportunities for the students, improved health care through the education of highly skilled and culturally competent physicians, increased biomedical research activity and the potential to spin-off biotechnology companies, and substantial expansion of economic growth in the region.

As a decision is contemplated, a careful review of the following key factors should be considered:

1. The conformity of a medical school with the mission and vision of the University.
2. The resources already available, including faculty and facilities, necessary to deliver medical education and patient-care training.
3. The clinical resources available for medical education at hospitals in the area and their interest in becoming a clinical education affiliate.
4. The economic impact on the surrounding community from the establishment of a medical school.
5. The adequacy of an applicant pool with strong qualifications.
6. The enthusiasm and support for this proposal from the key partners: faculty at the University of Denver, local physicians and health systems, and community leaders.
7. The design of a curriculum that would be distinctive among medical schools and that would result in the training of competent, compassionate, and caring physicians.
8. The humanitarian interest on the part of the basic science and clinical faculty to enhance biomedical research encompassing basic, clinical and translational (laboratory to bedside) research that would meet many needs in the treatment of disease.

9. The desire on the part of physicians and the local health care leadership to train physicians with an orientation to
   a. primary care,
   b. inter-professional education,
   c. rural and community medicine that will improve public health in the region, and
   d. involvement in global health.
BACKGROUND INFORMATION

The University of Denver is a private institution which was founded in 1864 as the Colorado Seminary. It is the oldest private university in the Rocky Mountain region of the United States, located in Denver, Colorado. The University’s first campus was located in downtown Denver, but concerns about the frontier town atmosphere prompted a move to its current location approximately seven miles south of city center. It is geographically positioned to draw students to an attractive locale with proximity to a major city and the Rocky Mountains.

Rapid growth following World War II enhanced the University’s reputation and enrollment. The University of Denver is now a co-educational institution that enrolls 6,400 graduate students and 5,500 undergraduate students. The University has a national presence; 60% of the student body is from outside the state of Colorado and about 10% are international students. To prepare students for the challenges of making a difference in their communities and the world, the University of Denver emphasizes critical thinking, creative problem solving and global experiences. The Cherrington Global Scholars program offers every undergraduate the chance to study abroad. As a result, almost 70% of the undergraduate student body study abroad, placing the University of Denver third in the nation among all doctoral and research institutions in the percentage of undergraduate students participating in study programs abroad.

The University of Denver is fully accredited by the North Central Association of Colleges and Schools. The faculty consists of 1,299 instructional faculty members of whom 630 are full-time.

Currently, the University of Denver offers 80 undergraduate majors in addition to a number of minors and areas of concentration, 120 graduate programs, and a doctor of jurisprudence. Its more prominent programs are in arts and humanities, business, education, international studies, natural sciences and mathematics, social sciences, interdisciplinary programs, social work, and engineering and computer science. Programs in the health sciences, which include psychology and medical physics, are limited. This history argues well for the next logical
step in the University’s development, the creation of a medical school which provides the infrastructure for other health professions programs.

The institution is led by Dr. Robert Coombe, Chancellor, who has held the position since 2005. Dr. Coombe’s vision for a medical school that will boost both the regional and national stature of the University of Denver is remarkable. The University of Denver had the first medical school in the region in the late 19th century, but the state consolidated the school with a medical school in Boulder to form the University of Colorado School of Medicine.

University administration, hospital executive officers, charitable foundations and private groups have expressed interest in an allopathic medical school at the University of Denver for several years. Leadership from the University, its clinical partners and the community are essential ingredients in establishing a new medical school.

During the past year, Chancellor Coombe, members of senior administration, and the governing board of the institution have had several discussions about a new medical school. Chancellor Coombe is interested in a medical school to develop the professional programs, to enhance the biological and physical sciences of the University, and to attract high achieving undergraduate students. A medical school would also enhance physician recruitment to the region, improve quality of care, provide opportunities for the development of more graduate education programs in the sciences basic to medicine, and play a role in the future public health needs of the area. This history suggests that the new medical school will exist in an environment of past academic achievement and future intellectual accomplishment.

In November, 2011, the University engaged DJW Associates, a national consulting firm in academic medicine, to study the feasibility, issues, and challenges of creating a new medical school. A School of Medicine Steering Committee was appointed to oversee the project (Table 1). DJW Associates met on several occasions with the leadership, faculty of the University and potential clinical partners as well as with representatives from the local community. Initial discussions by the projected partners and the consultants concluded that the proposed school would be an allopathic medical school and that it should not be either an osteopathic school or a branch campus of an established medical school.
<table>
<thead>
<tr>
<th>Table 1. University of Denver School of Medicine Steering Committee</th>
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<tbody>
<tr>
<td>Robert Coombe, PhD, Chancellor</td>
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<tr>
<td>Gregory Kvistad, PhD, Provost</td>
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<tr>
<td>Kevin Carroll, Vice Chancellor for University Communications</td>
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<tr>
<td>David Greenberg, Vice Chancellor for Institutional Partnerships</td>
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<tr>
<td>Julia McGahey, Associate Provost for Planning, Budget and Analysis</td>
</tr>
<tr>
<td>Lynn Taussig, MD, Special Advisor to the Provost</td>
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<tr>
<td>Craig Woody, Vice Chancellor for Business and Financial Affairs</td>
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DJW Associates began its work under the following set of assumptions:

- The Doctor of Medicine degree will be awarded by University of Denver, with a strong, long-term teaching and clinical affiliation with a community hospital/health system.
- A new medical school will be important for the attraction and retention of physicians in the region.
- The medical school will seek full accreditation by the Liaison Committee on Medical Education (LCME), the agency authorized by the U.S. Department of Education for the accreditation of all allopathic medical education programs in the U.S. and Canada.
- The private medical school will be nationally recognized for the high quality education of physicians, offering innovations in medical education, allowing the University of Denver to attract high-quality students from both state and national applicant pools.
- The University will have primacy in all matters related to undergraduate medical education.
- A substantial, initial financial commitment will be needed to provide faculty, staff, services and resources such as space, library, and informational technology in order to secure accreditation.
- The basic science faculty members and the clinical faculty members in the area will have their primary faculty appointments at University of Denver.
- University of Denver will receive credit for research performed by its faculty, and funding from research grants will go to the entity that incurs the majority of the costs.
- Funding from the University, hospital/health system affiliate(s), federal government, state government, foundations and private donors will be necessary for capital construction/renovation of medical education space, research space and for initial operating expenses.
• The medical school will ultimately be financially self-sustaining with its own revenue sources: tuition, research grants and contracts, clinical income, gifts and endowments.

• The first medical school class will matriculate in 2014.

• The new medical school will have a significant impact on economic development.
BENEFITS OF A MEDICAL SCHOOL AT THE UNIVERSITY OF DENVER

- **Education of physicians and other health professionals.** Medical school faculties obviously teach medical students but also residents; graduate students earning masters or doctoral degrees in the basic sciences of anatomy, biochemistry, etc.; and students in the other health professions. At some point, this may allow the University of Denver to start other health professions programs not currently in place.

- **Improvement in student recruitment.** “A rising tide floats all boats.” A medical school tends to have a positive impact on many other programs in the University. Having a medical school will attract more and better students into the science, math and health professions programs.

- **Faculty recruitment and collaboration.** The medical school will recruit faculty members who will teach and conduct biomedical research. The recruitment of medical school faculty members will enhance collaboration with other faculty members in the University in order to further develop academic programs. Joint appointments will lead to the medical school faculty participating in other educational programs in the University as well as faculties from other schools participating in medical education. Likewise, collaborative research efforts will be enhanced across faculties within the University.

- **Biomedical research.** Over $40 billion is spent on medical research in this country annually; $30 billion comes from the National Institutes of Health (NIH) alone and 45% of that amount is awarded to medical schools. Both basic and clinical/translational research will be increased with a medical school in place. Extramural research funds will come from agencies outside of Colorado.

- **Multidisciplinary health care.** Medical schools support and facilitate the multidisciplinary approach to patient care. Although multidisciplinary centers exist without medical schools, additional recognition from patients and funding agencies occurs when they are affiliated with medical schools. For example, NIH-designated comprehensive cancer centers are mostly affiliated with medical schools and academic health centers. The University of Denver’s new center on longevity/aging may benefit from the presence of a medical school.
• **Improved quality of care.** Although many health care settings provide high quality health care, studies have shown that academic health centers and teaching hospitals provide higher quality care than those hospitals not related to medical schools. This probably relates to the fact that physicians in academic settings are more likely to remain current in the diagnosis and treatment of disease, and they benefit from the intellectual stimulation of medical students and residents.

• **Physician recruitment.** Having a medical school and residency programs create a pipeline for physicians in the affiliated health systems and the community. Approximately 65% of residents and 45% of medical students nationally remain or return to practice in the area in which they are trained. In Colorado, 43% of physicians are retained in the state from undergraduate medical education, 46% of physicians remain in the state after graduate medical education (residency), and 72% of physicians who obtain both undergraduate and graduate medical education in the state remain to practice there. Having a medical school at the University of Denver will only increase the likelihood of physician retention in the state.
By definition, an academic health center consists of a medical school, a teaching hospital and at least one additional health professions school. Many universities own their own hospital and clinics in addition to having a medical school. Community medical schools are university-based or independent medical schools that use hospitals and other resources in the community in which they are located for the clinical education of medical students. The University of Denver proposes to affiliate with a hospital/health system through a strong affiliation agreement that assures the use of appropriate resources for the clinical instruction of its medical students. Clinical resources should be sufficient to ensure the breadth and quality of ambulatory and bedside teaching. They include adequate numbers and types of patients (acuity, case mix, age, gender, etc.) as well as physical resources (conference rooms, student on-call space, etc.). The following are some of the requirements of a primary affiliated hospital.

- An advisory board should be formed consisting of the University chancellor (or his designee), the health system/hospital president (or his/her designee) and other relevant staff to enhance communication between the two partners and to the members of the respective boards regarding the collaboration.
- The hospital should maintain full accreditation by the Joint Commission.
- LCME accreditation standard IS-12-A states: “Medical students should learn in clinical environments where graduate and continuing medical education programs are present.” In order to link medical student education to the later stages of the medical education continuum, medical students should spend time in settings where graduate and continuing medical education programs are present. The graduate and continuing medical education programs at training sites where medical students are located should be accredited by the appropriate accrediting bodies.
- Usually the academic chair (responsible for the education and research programs) and service chief (responsible for the care of patients) of each clinical department is the same person, although this is not absolutely necessary. At the time the medical school starts, if the current service chiefs wish to be the academic chairs, they would be
considered for the position. The medical school and health system/hospital should collaborate and work cooperatively in the selection of the subsequent academic chair/service chiefs.

- The medical school and health system/hospital should participate in the recruitment, selection and funding of physicians who wish to have faculty appointments and who enhance the reputations of the two institutions. For example, if a physician scientist or basic scientist can be identified who would bring new diagnostic or therapeutic programs to the hospital, an attractive recruitment package could be developed by both partners.

- The health system/hospital would be expected to provide the opportunity for first and second year medical students to learn history and physical examination skills approximately one-half day each month. The students may all be in the hospital at the same time or may be divided into two or more groups on different days.

- Students should work with attending physicians and have access to patients in the hospital and in clinics during the core clerkships in the third year of medical school. The core clerkships are internal medicine, pediatrics, surgery, obstetrics and gynecology, psychiatry, and family medicine. The class size has not been established, but assuming an average class size of 125 students, approximately 20 students would participate on each service at any one time. Students would be expected to make rounds with physician faculty, conduct histories and physical examinations, write orders which must be reviewed and countersigned by a physician, assist/observe in surgical procedures, participate in diagnostic and therapeutic procedures (phlebotomy, IVs, etc.), and monitor patient care. Approximately 50% of the class actually will be working in the hospital at any one time because most of the family medicine clerkship and 30% of the other clerkships will be in outpatient settings.

- During the fourth year of medical school, students work with specialty and subspecialty physician faculty as they see patients in their clinics and care for patients in the hospital. Students are usually given more responsibility with direct supervision as they gain more experience and as the faculty gains confidence in their abilities. Less than one-half of the fourth year class will be in the hospital at any one time because a majority will be on clerkships at other institutions or in physician offices.
• Students should have the opportunity to participate in clinical research initiatives with physician supervision including access to patient records, compliance with federal research regulations and compliance, and conformity to research guidelines as appropriate.

• Call rooms and lockers, or other secure space to store personal belongings, should be available for student use. Some clerkships do not require overnight call.

• The medical school and hospital should agree to comply with the Health Insurance Portability and Accountability Act (HIPAA) of 1996 to protect the privacy of patients.

• Relaxation space/student lounge for students and residents should be provided.

• A program to address infectious diseases, needle sticks and other environmental hazards as well as the source of payment for such incidents should be well known to students, faculty and staff.

• Appropriate instructional facilities and information resources should be provided. Such facilities include areas for student study and for conferences. Sufficient information resources, including library holdings and access to other library systems, must either be present in the facility or readily available. A sufficient number of computers are needed that allow access to the internet and to other educational software.

• An affiliation agreement between University of Denver and the health system/hospital affiliate should address the responsibilities of each party, including the following:
  a. Assurance of student and faculty access to appropriate resources for medical student education.
  b. The primacy of the medical school over academic affairs and the education/evaluation of students. In the relationship between the medical school and its clinical affiliates, the educational program must remain under the control of the school’s faculty.
  c. The primary role of the medical school in appointment/assignment of faculty members with responsibility for medical student teaching. All physicians with a primary teaching role must have a faculty appointment in the medical school.
d. Specification of the responsibility for treatment and follow-up when students are exposed to infectious or environmental hazards or other occupational injuries.

e. The mutual obligations of the medical school and the affiliated site to create an appropriate learning environment that promotes the development of professional attributes.

The obligations of a teaching health system/hospital to the medical school and its students cannot be underestimated. In order to accomplish these and other requirements, a significant culture change on the part of the health system/hospital administration and its staff must take place. The culture of a teaching health system/hospital perceives its mission to be the education of health. At the same time, a teaching health system/hospital must continue to put patient needs first and remain financially viable. The presence of students and residents can inherently increase the operational costs of the health system/hospital (e.g. increased use of surgical gowns, gloves, etc.) and sometimes the “through-put” or time required for patients undergoing diagnostic or surgical procedures. On the other hand, residents and students provide a number of services to the health system/hospital that would otherwise be required of other staff (e.g. starting intravenous fluids, patient transport, etc.).

Graduate medical education is funding primarily by Medicare. Medicare provides reimbursement to help off-set the costs of a teaching hospital in the form of direct medical education payments (resident salaries and benefits, faculty compensation, etc.), indirect graduate medical education payments (which subsidizes the teaching hospital for higher patient care costs), and disproportionate share payments (payments for a hospital taking a disproportionate share of indigent patients). Since the 1997 Balanced Budget Act, the number of residents at each teaching hospital funded by Medicare has been capped. However, if a hospital has never had residency programs, Medicare funding of new positions is available. Medical school accreditation standards indicate that students should be educated in the presence of residents in order to become familiar with all levels of medical education. However, residents do not have to be present in all specialties. A program can be started in one or more disciplines, but care should be taken to avoid the “cap” if Medicare funding is
requested. Medicaid and other sources of funding (hospitals, foundations, etc.) can also pay for graduate medical education. Colorado needs more residency positions, so once a medical school is established, additional residency programs can be considered at locations that have not heretofore had such programs.

Once identified, the clinical affiliate may participate in the funding of the medical education program in a number of ways:

a. Share the medical school administrative costs – dean, administrative assistant, assistant dean for clinical affairs, clinical chairs.

b. Start-up funds and salary guarantees for a specified time for recruited department heads and faculty. The precise amount of start-up funds provided by the medical school and the hospital will vary by rank and discipline and therefore cannot be included in the affiliation agreement but should be agreed upon at the time of each recruitment.

c. The hospital\health system may provide funds for medical student scholarships. These may be in the form of individual scholarships or a percentage of tuition. The average scholarship funding for medical schools is 16% of tuition.

d. A hospital payment to the medical school for use of the medical school/university brand and/or start-up operational expenses may be considered.

e. The hospital\health system may provide the costs of clinical education of students – clinical faculty, clerkship directors, etc. For example, if the hospital\health system already employs physicians, an educational/research component of the salary should be identified so that the dean has oversight and responsibility for that component.

f. Graduate medical education and continuing medical education programs are usually funded by the hospital\health system.

g. Actual and in-kind funding of undergraduate, graduate and continuing medical education programs by the hospital\health system should be recorded in the medical school budget in order to reduce the relative impact of tuition on the costs of the medical education program.
JUSTIFICATION FOR A NEW MEDICAL SCHOOL

The justification for a new medical school at University of Denver is based on several dynamics, including the current and future trends in the population demographics of the region, the trends in the physician workforce, the diversity of the physician workforce, the balance of primary care and other specialty physicians in the region, the distribution of physicians between urban and rural settings, the medical student applicant pool, the potential for clinical affiliations with physicians and hospitals, and the opportunities for biomedical research.

Many factors affect the size of the physician workforce such as changes in work ethic, gender changes in the physician workforce, lifestyle issues, and family concerns. Younger physicians place greater emphasis on balancing work and family or personal issues, and they are less likely to work in rural or underserved areas than their predecessors. Therefore, although there are more physicians working in Colorado today, the productivity of that core of physicians may not be significantly greater. Compounding these generational changes in the physician workforce, there are more women entering the profession and although they are more likely to select primary care residencies such as pediatrics, internal medicine and family medicine, they are less likely to practice in rural areas where these specialties, especially family medicine, are in demand. There are also indications that physicians are leaving the workforce at an earlier age due to malpractice insurance rates and increasing regulations. These are the issues that control the supply of physicians, or the number of physicians determined by existing entry levels, work ethic and retirement rates. More important to physician workforce requirements is a projection of physician need, which is the number of physicians that will be required to address preventive, acute and chronic care of patients in the future, and the physician demand, which is the number of physicians required to provide all the health care services patients might want or can afford in the future. Population growth, population aging accompanied by an increase in multiple chronic diseases, patient education and the demand for the “best that medicine has to offer,” and the global interconnection of tourist communities in Colorado given airline travel and the mobility of disease vectors.
increase the future need and demand for physicians to a point greater than the current supply ratios.

For the past ten years, the population demographics of Colorado have changed significantly. According to the U.S. Census Bureau, Colorado had a population of 4.3 million people in the 2000 census, which increased to 5.1 million in 2010. Among the 50 states and District of Columbia, the state now ranks as the 22nd most populous. By 2030, current Census projections are that Colorado will be the 21st most populous state with 5.7 million people.

Colorado’s population is substantially more diverse that it was ten years ago. Colorado currently has a population which is 70% Caucasian, 4% African-American, 3% Asian, 21% Hispanic and 2% other races. On the other hand, according to the Colorado Department of Local Affairs, by 2030 Colorado’s population will be 7.0 million and even more diverse. This study projects the population to be 61% Caucasian, 29% Hispanic, 4% African-American, 4% Asian and 1% Native American. Diversity in the physician workforce has improved, but an increase in culturally competent physicians is especially important given the changing demographics of the state’s population.

The physician workforce in Colorado has kept up with the growth in population, but physician need and mal-distribution of physicians remain problematic. Colorado’s physician-to-population ratio (259 per 100,000 population), which ranks 18th nationally, is slightly more than that of the nation (244) which is considered to be underserved (AAMC State Physician Data Book, 2011). Two factors driving the physician shortage are the aging of the population and national health care reform. The percentage of people over age 65 will increase by 79% between 2000 and 2030 from 539,000 to 957,000 (U.S. Census Bureau). The aging population with the accompanying increase in chronic diseases will have an impact on the future need and demand for physicians.

The Council on Graduate Medical Education estimates a national shortage of 85,000 physicians by 2020, and the AAMC has reported a need of 30% more physicians by 2025. Of the active physicians in Colorado, 25% are over 60 years of age and 33% are women. There is a shortage of African-American and Hispanic physicians.
An appropriate balance of primary care and other specialists is necessary to provide care in a properly functioning health care system. The primary care workforce includes family medicine, internal medicine, pediatrics and internal medicine-pediatrics in its definition, but it may also include obstetrics and gynecology in its designation of “core” specialties.

Characteristically, physicians are located more in urban than rural areas, creating a mal-distribution of the physician workforce. The rural counties are more likely to need primary care as well as other specialties in the future. Figure 1 shows the Health Professional Shortage Areas (HPSA’s) for Colorado. Colorado’s declining rate of family practitioners follows a national trend. Recent AAMC data reported the number of active primary care physicians in Colorado as 92.3 per 100,000 population compared to 91.0 physicians per 100,000 nationally. According to data from the University of Colorado School of Medicine and the Caring for Colorado Foundation, 16-22% of students select a primary care discipline. This exceeds the national level of 10-12% but does not approach the suggested level of 50% by the Council on Graduate Medical Education. The recent opening of an osteopathic school in Colorado is expected to increase the percentage of primary care physicians.

**Figure 1**

[Image of Health Professional Shortage Areas (HPSAs) map for Colorado]
The Colorado physician workforce study conducted by the Colorado Health Institute and the Colorado Trust in 2005 projects the need for more physicians in the future, especially in primary care. In the study, 39% of Colorado physicians reported practicing primary care compared to 45% nationally. As in the rest of the United States, physicians in Colorado disproportionately practice in urban areas (89%) compared to rural areas (11%). The study determined that by 2025, Colorado will need 2200 more primary care providers, including more than 1,000 physicians, 480 physician assistants and 660 nurse practitioners. The 2011 Colorado Health Professions Workforce Policy Collaborative recommended an increase in public funding for health professions education programs, protection of funding allocated for loan repayment and support for policies to increase the number of clinical experiences and residencies. The Collaborative further advocates for Colorado to “grow their own,” meaning Colorado could train more health professionals from the state, especially those from rural areas, with the expectation that they would remain in the state to practice.

The Colorado Health Institute conducted the Colorado Rural Physician Workforce Survey in 2009. The average age of rural physicians was 50.6 years, 29% were women, 88% were white, 5% were international medical graduates and only 18% graduated from a medical school in Colorado. Fourteen percent (14%) of the rural physicians surveyed planned to leave practice in the next 12 months because of retirement, overwork, the burden of practice management, professional isolation or relocation.

Medical students should train in the presence of residents in order to learn about the next level in the continuum of medical education. Colorado has approximately 330 first-year residency positions, most of which (218) are at the University of Colorado. According to the Colorado Health Institute, there are 179 first-year positions in the primary care specialties of family medicine, internal medicine, obstetrics and gynecology, and pediatrics, but many of the residents in internal medicine and pediatrics will sub-specialize in various disciplines. According to the AAMC, the ratio of residents/fellows in Colorado (22.8 per 100,000 people) and the ratio of residents/fellows in primary care programs (9.0 per 100,000) are both less than the national ratios (26.2 and 10.2, respectively). Additional residency positions may need to be considered, especially in primary care. Medicare funding of graduate medical
education has been capped since 1997 unless the sponsoring agency (hospital, clinic, etc.) has never had residents. The federal government is being encouraged to increase Medicare funding for residencies.

Colorado has a large number of medical school applicants but a relatively small number are admitted to medical school within the state. In 2010, the state had 651 medical school applicants. Only 251 of these students matriculated to medical school and of these, 128 students went to medical schools outside of Colorado (Association of American Medical Colleges Database). In addition, 400 students did not apply and/or were not admitted to U.S. allopathic medical schools and resorted instead to international or osteopathic medical schools. A private medical school, such as the one proposed by University of Denver, attracts applicants from throughout the U.S. and would therefore have access to an even larger pool of students than public schools which are often expected to accept more in-state residents. The number of applicants to private schools last year, for example, ranged from 3,000 to 14,000 per school. Therefore, the opportunity exists for the new University of Denver School of Medicine to attract applicants from Colorado as well as from other states. The state’s only other allopathic medical school had 3,875 applicants for 160 places, 76% of which were filled by Colorado residents. There is a need to increase the number of students in the professional pipeline, many of whom will ultimately practice in the area in which they receive their training.

The potential partnership between the University and a clinical affiliate presents a unique opportunity for biomedical research. In addition to research in the basic sciences, the proposed collaboration between University of Denver and a clinical partner will present a special opportunity for the medical school to engage in translational research, ranging from basic investigations to clinical trials. The emphasis could be on translating basic laboratory research to clinical interventions for disorders that are common to the people of Colorado and the nation. University assistance with research design, bio-statistical support, research compliance and bioinformatics will facilitate this type of biomedical research. The benefits of a multi-center approach to biomedical research, using a heterogeneous population, are considerable when viewed from the perspective of extramural funding agencies. This is
particularly important at this time when the National Institutes of Health is considering more emphasis on translational, community-oriented, clinical research.

The University of Colorado recently was awarded a Clinical Translational Science Award by the National Institutes of Health (NIH). According to the NIH web site, “The University of Colorado Denver and its affiliates will use this award to speed biomedical discoveries from laboratories to the lives of citizens. The university and its partners will create an unprecedented statewide network of research, health care and community facilities. Working together, the new Colorado Clinical and Translational Sciences Institute (CCTSI) will turn biomedical findings into improved patient and community health. The CCTSI will coordinate the efforts of scientists, health care providers, and advocates from two research universities, six health care professional schools, five hospitals, a health care network, and more than a dozen community health programs. The Institute's five goals are to: 1) convert laboratory discoveries into clinical use; 2) bring clinical advances into communities; 3) apply new technologies to deliver personalized medicine; 4) train future researchers; and 5) advance child and maternal health.” With the CCTSI in place, the University of Colorado School of Medicine may be interested in collaborating with the University of Denver on research projects in the future.

Finally, a medical school at the University of Denver will enhance other programs within the University. Using much of the infrastructure in place, medical school faculty members will collaborate with faculty members in other schools and departments to promote teaching and research. The University can expect more applicants and students interested in science and mathematics. Additional graduate programs in the sciences basic to medicine (anatomy, behavioral sciences, biochemistry, microbiology, pathology, physiology and pharmacology) also can be developed. The only other health-related programs at the University of Denver now are psychology and social work, so additional health science programs can be offered as well.

In summary, the opportunity exists for University of Denver to address the shortage of physicians in Colorado and the nation, to partner with clinical entities in an effort to improve
access to health care, to address serious issues of primary care for under-represented rural areas and minorities, and to engage in translational and population-based research.
This proposal is for a professional education program in allopathic medicine leading to an MD degree that is consistent with the accreditation standards of the Liaison Committee on Medical Education (LCME), the accrediting agency for all allopathic medical education programs in the U.S. and Canada. The curriculum will be at least 130 weeks in duration and will contain the basic science, clinical, behavioral and socioeconomic subjects required of a medical school in the 21st century.

The medical school faculty and dean will be responsible for defining the institutional objectives, curriculum objectives, curriculum content, and expected learning outcomes. In addition, the medical school will focus the educational program on issues that are reinforced by strong programs at the University of Denver and ones that are important to the future health care of Colorado and the nation. The University also will define components of the curriculum that will distinguish the medical school from others in the nation (described in the next section). This program will provide students with a general medical education and will emphasize primary care, inter-professional education, public health, community medicine and disparities in health, disease and services. Competence, cultural sensitivity, and communication skills will be fundamental dimensions of the program. The medical school at the University of Denver will graduate physicians who are prepared for the life-long learning that will be needed to survive the unpredictable changes in the health care delivery system.

Although the medical school will emphasize primary care, students will receive a general medical education that will prepare them to enter training for any medical specialty. Students also will have the opportunity to participate in basic biomedical and clinical research. The University of Denver’s proximity to well-established health systems in the area provides the opportunity for students to participate in translational research that takes basic discoveries to the bedside. In addition, students will have sufficient opportunities to participate in service-learning activities that enhance their roles as citizens and professionals.
The University of Denver envisions an integrated health science education program that is built on evidence-based medicine and on collaboration with other health professionals. Unlike more traditional programs in which the education of health professionals is by independent academic units with an exclusive curriculum focused on each discipline, the University of Denver School of Medicine will attempt to vertically and horizontally integrate its health science education into a comprehensive educational program that is patient-centered.
The following represent suggestions for curriculum design that serve to distinguish the University of Denver School of Medicine from other medical schools.

**Primary Care, Public Health, Community Medicine and Global Health**
An educational, research and clinical focus on the current need for additional primary care physicians (internal medicine, pediatrics and family medicine) and other general specialists in obstetrics and gynecology, psychiatry and surgery appears to be consistent with the needs of Colorado and the nation. Accreditation requirements call for a medical education program to prepare medical students to enter any specialty. Today, even with special emphasis, no more than 50% of students are likely to enter a primary care specialty, but if this percentage of University of Denver students entered primary care, the program would be considered a major success.

The ultimate goal of primary health care is better health and well-being for all patients. The primary care physician is the physician first contacted by the patient and is responsible for the continuing, coordinated care of various medical conditions. The primary care physician counsels and educates patients on health behaviors, diagnostic procedures and treatment options. The primary care objective is the integration of health into the patient’s lifestyle and to reduce social disparities in health. Primary care has been shown to increase access to care and to reduce health care costs. Primary care physicians and other providers are projected to be a valuable resource in the face of health care reform and improving the health of the public, especially in rural and underserved areas.

Public health is the science and art of improving quality of life by preventing disease, and promoting health. Public health incorporates the interdisciplinary approaches of epidemiology, biostatistics, health services, environmental health, community health, behavioral health and occupational health. It emphasizes population health and threats to population health by informing, educating and empowering people about health issues in the local, regional, national and global environments.
The specialty that deals with the health and disease of a population or of a specified community is community medicine, which incorporates the basic principles of both primary care and public health. In addition to the care of individual patients, it emphasizes preventive medicine and epidemiology for members of a given community or region. For example, if the primary care physician sees several patients with the same disorder (e.g. asthma) in a short period of time, community causes (e.g. industrial pollutants) are considered and managed in an effort to improve the health of both the community and the individual patient. In their training, physicians become knowledgeable about the health resources of the community and focus on community diagnoses and treatments as well as those of individual patients. Community medicine principles can be applied in any “community” – local, regional, national or global.

Community medicine with a focus on rural areas could be a strength of the new medical school since training and research opportunities may well develop through an alliance/connection with clinical affiliates and the University of Colorado Denver. A medical school with an educational program that emphasizes the concepts of community medicine and the health of the population would be unique among medical schools and would provide a much needed service to the region. The opportunity for population-based research and clinical care also creates important community engagement for the School of Medicine and the University.

The University of Denver has a strong program in international affairs. Perhaps, global health would complement the other international programs on campus. The opportunity to travel to other countries to provide care or to conduct research will be attractive to medical school applicants and to the faculty. Many medical schools are involved in global health, but it is not usually promoted as a distinguishing characteristic of the university or medical school.

**Inter-Professional Education**

Since the Institute of Medicine recommended more inter-professional team care in an attempt to improve the quality of health care, there has been an emphasis on training physicians, nurses, pharmacists, nutritionists and other health professionals together in order to improve
communication among the professions and about patients. Starting a medical school offers the opportunity for interdisciplinary studies and team-based learning with some even leading to joint degrees. However, the University of Denver does not have many health professional education programs. The nursing, physician assistant or other health professions programs located at potential affiliates may be natural starting points.

Regis University in Denver has undergraduate and graduate programs in nursing, pharmacy, physical therapy, health care ethics, health services administration and information management, and the administration has expressed interest in an inter-professional education program with a medical school at the University of Denver. Regis University is also redesigning its curriculum and its simulation center to establish a virtual environment and to better accommodate inter-professional learning. An electronic health record is also available for the education of health professionals.

There are other potential areas of collaboration within the University of Denver such as in business management, and the existence of a medical school on campus will likely stimulate other program developments at the University.

**Quality of Care**

Since the Institute of Medicine published its report on “Crossing the Quality Chasm” in 2001, physicians have re-dedicated themselves to improving the quality of patient care, but “quality of care” issues have not been widely introduced into the medical school curriculum. For years, organized medicine and practicing physicians have encouraged medical schools to teach more about the quality of care and the managerial aspects of providing health care in private practices and in large, complex hospital systems. Quality of care and the “business of medicine” could be another distinguishing feature of the medical school.

**Scholarly Concentrations**

A distinguishing feature of the medical education curriculum at the University of Denver School of Medicine also could be the opportunity for students to select from several vertical themes or “areas of concentration” that focus on developing knowledge and skills. Some
areas of concentration might include subjects that will better prepare physicians for the future practice of medicine, such as community medicine and population-based health care, quality of care assessment and improvement, cost containment, and clinical research. Other student may wish to focus on the art and science of medicine, such as medical ethics, medical humanities, geriatrics, genomics or a specific scientific discipline. Students may choose an area of concentration during the first year and pursue knowledge in that thematic area throughout the four years of their education, resulting in a research project and publications. Some students may expand their areas of concentration into joint doctoral or masters degrees.

**Preliminary Curriculum Model**

In order to address the health care needs of Colorado and the nation, the University of Denver intends to create an allopathic medical school which will focus on educating physicians for the future. Medicine in the future will transition to a model which will emphasize health promotion, disease prevention, primary care, quality improvement, medical informatics, inter-professional education and care, and cost containment. Physicians also will be involved more in clinical and translational research. These concepts are best integrated into a concept that is a “medical neighborhood” rather than a medical home which has been espoused by many primary care specialties. A medical neighborhood not only involves prevention, acute and chronic care, mental health, oral health and a variety of providers, but the model can be established in urban, rural, and global environments.

The University of Denver School of Medicine proposes the following education program. All students will be subject to the same curriculum content but, midway through the first year, students will select one of the following areas of concentration. After completing the specified curriculum and area of concentration, students will receive a certificate of achievement from the University or affiliate in that specialization. This model takes advantage of University of Denver’s strong international program and the strengths of potential clinical affiliates and foundations while remaining sensitive to limited training experiences in underserved areas.

1. Primary care, inter-professional education and care, improved quality of care, and cost containment, with emphasis on underserved areas
Potential partners – Federal Qualified Health Centers, Health Departments, Area Health Education Centers, Kaiser Permanente, Regis University, Colorado Health Foundation. Other foundations and health systems may be considered.

2. Clinical and translational research

Potential partners - National Jewish Health, University of Colorado, Regis University, Kaiser Permanente, and other health systems and foundations.

3. Primary care, public health, community health and global health

Potential partners – One Health, Centura Health, Regis University, Denver Health, Area Health Education Centers, Colorado School of Public Health, The Colorado Trust and other foundations.

If the University of Denver focuses on a medical education program that emphasizes primary care and rural health, the medical student admissions process should stress these attributes in the selection of students. Some of the desired attributes of rural physician applicants include having lived in a rural area, having graduated from a rural high school, having family members (e.g. spouse) from a rural area, interest in outdoor activities, autonomy and independence, self-reliance, interest in team care, self-directed learning, desire for longer-term patient relationships, and community involvement. Non-traditional students (older students, veterans, etc.) may be more likely to have an interest in primary care specialties because they tend to be more mature and are more interested in a shorter residency and decreased debt.

**Accelerated Primary Care Program**

The School of Medicine should consider a curriculum or a curriculum track which accelerates the training of primary care physicians like the Texas Tech University Accelerated Family Medicine Program. In this program, a special curriculum track is developed that allows students to graduate from medical school in three years instead of four. It has been approved by both the Liaison Committee on Medical Education and the American Board of Family Medicine. This program shortens the training period and lowers the student debt, promoting
entry into the specialty. Other primary care disciplines could possibly be incorporated into this track.

**Combined Bachelors\Doctor of Medicine Program**

Most European medical schools and some U.S. medical schools have a 6 or 7 year combined BA/MD curriculum or curriculum track. High school students are admitted to college and to medical school provided a certain academic performance is maintained. This type of curriculum shortens the training schedule and decreases student debt, but has the disadvantages of having students with lower levels of maturity and greater levels of attrition (approximately 15%).
MEDICAL SCHOOL MISSION AND VISION

Creation of a medical school at University of Denver should be consistent with the mission of the institution:

“The mission of the University of Denver is to promote learning by engaging with students in advancing scholarly inquiry, cultivating critical and creative thought and generating knowledge. Our active partnerships with local and global communities contribute to a sustainable common good.”

To fulfill its institutional mission, the University of Denver promotes the following goals and values:

**Community.** We will create a diverse, ethical and intellectually vibrant campus community to provide a challenging and liberating learning environment.

**Learning.** We will provide an outstanding educational experience that empowers students to integrate and apply knowledge from across the disciplines and imagine new possibilities for themselves, their communities and the world.

**Scholarship.** We will invigorate research and scholarship across the University to address the important scientific, sociopolitical and cultural questions of the new century.

**Values.** In all that we do, we strive for excellence, innovation, engagement, integrity and inclusiveness.
Subject to approval by the University administration and Board of Trustees, a medical school is consistent with the foregoing institutional mission, goals and values. It is also consistent with the vision of the institution:

**Vision.** The University of Denver will be a great private university dedicated to the public good.

The following statements of mission and vision for a medical school are provisional. They are likely to be refined and amended by the founding dean and senior faculty should the medical school become a reality.

**School of Medicine Mission.** At the University of Denver School of Medicine, our graduates will be prepared to be culturally competent leaders and innovators in the medical profession. The medical school prepares physicians to assume their role and responsibilities as members of inter-professional health care teams, local communities and society. Our students progress through the profession by acquiring a general medical education and demonstrating clinical proficiency, cultural competence, compassionate care for the health and wellbeing of others, and the highest degree of professionalism. Consistent with the University’s mission, the School of Medicine is committed to service through the provision of health care to our community, the nation and the world.

**Vision.** The vision for University of Denver School of Medicine is to be nationally recognized for improving health care locally, regionally, nationally and globally. The School of Medicine envisions:

- Leadership in medical education as a result of curricular innovation and research.
- Promotion of inter-professional education to advance teamwork in the care of patients.
- Enhancement of economic development through research and service in our community.
- Patient-centered care in collaboration with our clinical partnerships.
• Improvement in the health and understanding of an increasingly diverse community.
• Advancement of health by promoting primary care, inter-professional education, community medicine, public health and international partnerships.
• Development of a state-of-the-art model of health care for underserved patient populations.
“The hardest conviction is to get into the minds of the beginner that the education in which he is engaged is not a college course, not a medical course, but a life course.”

Sir William Osler

Throughout their medical education, students will be regularly evaluated on the following competencies with the expectation that each will achieve the level expected of a graduate of the University of Denver School of Medicine.

1. Knowledgeable and skilled in the basic and clinical sciences.

   Graduates must be broadly trained as generalists, capable of entering any medical discipline. They should have exceptional clinical skills and sophisticated training in medical informatics and technology, clinical research and critical thinking that would lead to life-long learning.

2. Culturally and socially competent.

   Graduates must be sensitive to the cultural mores and health care needs of the people of the community in which they practice. To do so, graduates must be both patient centered and community oriented.

3. Capable of working with other health professionals.

   Graduates must be able to communicate and collaborate with other health professionals in order to promote health and manage diseases cost-effectively, efficiently and safely.

4. Professional and personal.

   Graduates must demonstrate personal and ethical behavior that brings honor to the profession and to the institution. Above all, graduates should show caring, compassion, maturity and be capable of placing others, especially patients, above self.

5. Engaged in the health of the public.
Graduates must have didactic and practical experience in public health, health promotion and disease prevention as these concepts are used in primary care, rural health, community medicine and global health.
The School of Medicine can be organizationally similar to other schools within the University (Figure 2). The organizational structure in (Figure 3) is one that is common in universities with medical schools. The Dean of Medicine also holds the title of Vice Chancellor for Health Affairs. An alternative structure is for the Dean/Vice Chancellor to report to the Provost for Academic and Student Affairs in the same fashion as other deans for academic matters such as appointments and promotions but report directly to the Chancellor for all clinical matters (Figure 4). The Dean/Vice Chancellor can also act as the provost for the health sciences with responsibilities for both clinical and academic functions in the health science schools and institutes (Figure 5).

**Figure 2**

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CHANCELLOR

PROVOST

MEDICINE
OTHER SCHOOLS
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**Figure 3**

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CHANCELLOR

VICE
CHANCELLOR
HEALTH AFFAIRS

MEDICINE
HEALTH SCIENCES

PROVOST
ACADEMIC/STUDENT AFFAIRS

EDUCATION,
ARTS &
SCIENCES
OTHERS
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The University and Board of Trustees must operate in compliance with the Liaison Committee on Medical Education (LCME) standard that states that “oversight of the medical school must be composed of persons who have no personal or pecuniary interest or other conflict of interest in the operation of the school, its associated hospitals, or any related
enterprises.” University of Denver will be responsible for the appointment of the dean, with the participation and endorsement of the clinical affiliate or other primary affiliates, and for developing academic procedures and policies. The dean or designee should be incorporated into the administrative structure of the clinical affiliate, and conversely, a senior representative of the primary clinical affiliate should be incorporated into the organizational structure of the medical school. This arrangement will be particularly important if the University and the hospital partner concurrently decide to initiate graduate medical education programs. University of Denver will be solely responsible for the appointment of basic science chairs, while the University and the primary hospital/health system affiliate will jointly select and appoint clinical chairs.

A medical school committee advisory to the dean and consisting of representatives from both University of Denver and the primary hospital/health system affiliate(s), should be considered to coordinate educational, research and clinical activities for the affiliation. In accordance with accreditation standards, the medical school will have primacy over academic affairs and the education and evaluation of students. All physicians with primary teaching responsibility will have medical school faculty appointments at University of Denver.

The future development of educational, research and clinical programs and the anticipated development of new educational programs should dictate the organizational structure within the School of Medicine. The faculty of the basic sciences may be organized into one or more basic science departments. The University may wish to establish separate departments in order to emphasize its interest in primary care, the health of the public, community engagement, rural health and international health. The clinical departments may be organized as currently structured in the hospital system, and the clinical academic chairs may also serve as the clinical chiefs at the discretion of the University and hospital/health system administrations.
The medical school faculty structure will be developed under the University’s existing regulations, but with due regard for the fact that the medical school structure presents certain issues that are different from those in other academic units.

The basic science faculty is involved in teaching the subjects basic to medicine mostly during the first two years of the curriculum and in integrating basic science content into the clinical clerkships. These faculty members also may be involved in basic (usually laboratory) research. At least 14 basic science faculty members (2 in each discipline and preferably more) will be necessary to administer the basic science curriculum, augmented by faculty members from other disciplines within the University and by physician faculty members from the clinical affiliates. The basic science faculty members are similar to other members of the University of Denver faculty with the same privileges and benefits, except that salaries should be consistent with Association of American Medical Colleges (AAMC) salary profiles.

Physicians interested in participating in the clinical education of medical students must be recruited and appointed as clinical faculty members. At least 100 community-based, clinical faculty members willing to devote effort to educational programs will be needed throughout the curriculum of the medical school. The curriculum requirements for the clinical faculty include integration of clinical material into the basic science courses, teaching the core clinical clerkships during the third year, and providing oversight for the clerkships and electives of the fourth year. They should also be involved in student advising and counseling.

The clinical services at community hospitals usually are organized into clinical departments, and many but certainly not all physicians may choose to become faculty members. In order to compensate clinical department chairs and clerkship directors for time-consuming teaching activities and administrative functions, the hospital/health system that employs the faculty members/administrators can identify a portion of the distribution of effort that is devoted to academic activities under the responsibility of the dean and, thus, provide an in-kind contribution to the medical education program. Alternatively, the medical school can
reimburse those individuals, especially the administrators, at least a modest amount on a part-time basis. This payment method defines and reinforces their responsibilities as faculty members/administrators as well as encourages allegiance to the medical school.

The clinical faculty members must have a commitment to the medical school mission and objectives, and they must have a clear, written understanding of their academic obligations. Conversely, clinical faculty members should be respected by the University for their contributions. The University community and structure must be inclusive of the clinical faculty and offer privileges to these faculty members commensurate with those offered to the current faculty at the University of Denver – membership to the fitness center, book store discounts, etc. For clinicians, the concept of “tenure” is more one of title than a monetary tenure base. The tenure base alone would not be sufficient to retain most clinicians on the faculty, but the availability of “tenure” as a title may be helpful in the recruitment of outstanding clinicians and clinical researchers.

The basic science faculty members should be eligible for promotion and tenure similar to other faculty members in the University. If the University wishes to grant tenure to clinical faculty members of the medical school, this could be accomplished by (a) setting the tenure base at a pre-established amount of funding provided for associate professors and professors (e.g. $25-50 thousand), and/or (b) providing tenure to only individuals holding endowed chairs for which the tenure base would be established at the interest generated by the endowment. An alternative to granting tenure to the basic and clinical faculty would be to provide three to five year contracts to faculty members at the associate professor and professor ranks. This would allow for periodic review and limit the University financial commitment for tenure. In summary, the University should not be expected to grant tenure to faculty members if it does not do so for the rest of the faculty, but it could consider granting a partial tenure base or time-limited contracts to those faculty members holding endowed chairs or receiving University funds in the form of faculty “lines”.
The medical school should consider developing the following “tracks” for the basic science and clinical faculty. Position descriptions detailing the faculty responsibilities and criteria for promotion should be established for the four tracks defined below.

a. Academic Track – Faculty members in this track will be full-time and conform to the University regulations and expectations for scholarship, teaching and service. Both basic science and clinical faculty members (usually administrators such as the dean, associate deans, etc.) could be appointed in this track.

b. Clinical Academic Track – Faculty members in this non-tenured track (department chairs, clerkships directors, etc.) will receive a designated amount of funding from the University for teaching and research on a part-time basis.

c. Clinical Track – This non-tenured track will be for faculty members who provide clinical education and service to the medical school on a voluntary basis.

d. Research Track – This non-tenured track will be predominately for basic science or clinical faculty members performing research. Although such positions will not be needed at the outset of the new medical school, the University should anticipate this as a future need.

The University and the hospital/health system affiliate(s) should develop a written agreement that defines the manner in which grants and contracts will be awarded, managed, and credited to the units participating in research, both basic and clinical. Every effort should be made to develop an agile but functional system that will encourage faculty participation, facilitate adherence to the many federal requirements, and award direct and indirect costs to the unit where the research is conducted and the costs are incurred.
A new medical school at the University of Denver will have a significant economic impact on the region and the state through its education, research and clinical care. One hundred twenty-five new medical students moving into the Denver community each year (500 total) as well as administrators, faculty members and staff with relatively high salaries all contribute to the local economy. Funding for additional graduate programs that can be developed by a medical school faculty (masters and doctoral programs in the basic sciences, allied health programs, etc.) further add to the economy. Funding for biomedical research and biotechnology represents another major source of extramural funding to a university and to the local/regional economy. Forty-five percent of all federal research funds to universities are generated by their medical schools. The basic and clinical research created by this funding enables growth in the private sector of products, devices, and services that improve the health and economic strength of the community. A medical school, with its associated biomedical and bioengineering research and training programs, can create new industries and can train staff who become employed in these industries, providing the conditions for industrial expansion. Community medical schools (those that partner with local hospitals) also contribute to the care of patients by facilitating the recruitment of physicians.

Recently, the Association of American Medical Colleges engaged the consulting firm, Tripp-Umbach, to determine the economic impact of allopathic medical schools and teaching hospitals. Much of the following information is taken from this 2009 study. The economic impact of medical schools on the respective states where they were located as well as the nation as a whole was determined. The direct economic impact on state and national economies, the direct and indirect employment generated, and the government revenues generated by medical schools and teaching hospitals were measured. Since medical schools and teaching hospitals are major employers with significant payrolls, other businesses benefit from the expenditures of the school and its faculty, staff and students on goods and services. In addition local businesses benefit from patients, patient visitors, students and their families, medical meetings and visitors. These direct expenditures are re-circulated in the economy,
creating a multiplier or indirect effect of 2.3 such that for every dollar spent, $2.30 of total economic impact is generated.

The economic impact of the medical schools in the nation as a whole was estimated to be $512 billion, accounting for some 3.3 million jobs and more than $22 billion in state tax revenues including income and sales taxes, corporate taxes and stock/franchise taxes produced by businesses doing business with medical schools. For the 136 currently accredited medical schools (including those with preliminary and provisional accreditation), the average economic impact is $3.7 billion. However, the relative size of medical schools varies greatly.

In the Tripp-Umbach study, only the top 24 states and the District of Columbia were ranked. Colorado was not ranked independently but was included in a group of 20 remaining states with medical schools. These funds included direct and indirect spending by member institutions for capital improvements, goods and services; spending by staff, faculty and residents; spending by patients and visitors; spending by students; and the multiplier effect. Based on the average economic impact for each state, the one allopathic medical school in Colorado had an economic impact of $2.5 billion dollars annually. The University of Colorado School of Medicine estimates its annual economic impact at $6 billion. A community medical school at the University of Denver is not likely to have an initial economic impact of this magnitude because any affiliated hospital and health care system has been in place and already contributes to the economy.

Also of significant importance is the economic impact of a physician in practice. The main contributor to the economy is the impact of the physician on jobs and services. Four studies of physicians, providing outpatient services only, value the annual impact of a physician on the local economy from $343,706 to $1.53 million depending on the location and type of specialty. A recent study by the Robert Graham Center for Policy Studies in Washington, D.C. found that in Colorado, family physicians have an economic impact of $892,177 per doctor annually. Other primary care physicians can be expected to generate a similar
economic impact, and surgical and technology-based specialties can be expected to have an even greater effect on the economy.

Finally, Colorado has more than 350 biotechnology companies in fields such as pharmaceuticals, medical instrumentation, genetic engineering, tissue engineering, and agriculture (Colorado BioScience Association). The state’s research universities have incubators and centers for research that are pioneering significant advances in biotechnology. A University of Denver School of Medicine would fit well into the state’s fast-growing activities in the biotechnology industry.

Based on these studies, the economic impact by 2025 of the University of Denver School of Medicine on the community and region will likely be in excess of $100 million annually. Although difficult to be exact, this number is based on the following. The projected budget for planning and operations (which is an absolutely minimal budget) by year 8 is $20 million. The living expenses for 500 students @ $20,000 each will be $10 million. Incremented 3% per year, these direct expenditures will increase to $36.9 million, which when turned over in the economy 2.3 times, provides a total economic impact of $84.9 million. This does not include capital construction or renovations, increases in faculty and staff, and other expenditures. Long-term, the economic impact attributed to new capital construction; new basic science faculty, students, and staff; increased research funding; clinical expansion and other factors will be considerably more.

The economic impact also affects the local health systems. All medical students must have health insurance, which when combined with that of the faculty and staff would have a positive although unpredictable effect on hospital revenues. These projections are true only if the primary clinical affiliate for the medical school is relatively close and the students remain in Denver for the entire four years of their training. If they spend only the first two years in Denver and then move to other sites for the third and fourth years of their training, the economic impact to Denver and immediate vicinity will be much less, although the impact on the state economy would be the same.
These projections for the University of Denver School of Medicine compare favorably to estimates by Tripp-Umbach for a new community-based medical school. The total economic impact of a proposed new medical school was projected to be $124.7 million by 2025. If the physicians who remained to practice in the state, the commercialization of research, increases in spending at affiliated clinical partners and the expansion of the biotechnology industry were also included, the estimate increased to $1.4 billion.

The conclusion of the Tripp-Umbach report was that medical schools and teaching hospitals have “substantial economic and social impact within the counties and cities where they have operations. Substantial local and regional tax impacts…are measured in the billions. Communities in all regions of the country typically rely on these organizations for job creation, advanced research, new business development, and education of medical professionals.”
Many of the resources required for initiation of the new program in medical education are in place. The University and the health systems provide extensive human capital and infrastructure to offer an excellent educational experience.

**Faculty:** The medical school will require faculty members skilled in the basic and clinical medical sciences to teach the courses required for accreditation and a high quality medical education. The University of Denver currently has several faculty members in biochemistry, biological sciences, neurosciences, medical physics, molecular biology, and psychology who could participate part time in the basic science component of the medical curriculum. Many of them have taught in medical schools and have expressed an interest in teaching in the medical curriculum although they are fully engaged in their own discipline. The University of Denver currently has evidence of significant scholarly productivity with approximately $6 million in research funding from the National Institutes of Health, National Science Foundation or pharmaceutical companies. Additional faculty members and administrators with experience in medical education and research will need to be recruited. At the outset of the medical school, a minimum of two members of each basic science discipline, defined here as biochemistry, anatomy, microbiology, physiology, pharmacology, behavioral science, and pathology, will be necessary to satisfy accreditation standards. These full-time medical school faculty members could be supplemented by existing faculty members from other departments within the University through joint appointments in the medical school and by physicians from the clinical affiliates. Research collaboration across disciplines is not uncommon and will be expected.

Physicians in the community will serve as clinical faculty members. At least 100 physicians will be needed to implement the full curriculum. DJW Associates met with several physicians and potential clinical affiliates who expressed interest in participating on the medical school faculty. It is suggested that the University could establish a web site to determine how many physicians actually support the idea of a medical school and how they would like to be involved.
General Teaching Facilities: Some locations for space have been identified for the administration and basic science components of the medical education program during the initial years of the curriculum and are being considered. Renovations will likely be necessary to accommodate faculty offices and other functions such as gross anatomy and histology laboratories.

A new building will be required as the student population increases to full capacity (estimated 500 students). In this case, a location on the current University campus would be most convenient to students, faculty and staff. Incorporating the medical education administrative and educational space into the proposed biomedical research building should be considered. Planning and capital construction to facilitate clinical skills training, standardized patients, simulation, and inter-professional education and training also should be considered.

Clinical Teaching Facilities: Several large health systems – Centura Health, Colorado Permanente Medical Group, Denver Health, Exempla Healthcare, HCA HealthOne, and Jewish Health System - are located in Denver and they are convenient to the University campus. They are all accredited by the Joint Commission. In general, the systems have the patients sufficient for a medical school affiliation, although the types and numbers of patients are limited in some cases. Many of the physicians in these health systems are currently engaged in teaching medical students and residents, and many are engaged in clinical/translational research. The health systems all have access to electronic or paper library holdings and have well developed electronic medical records. The health systems have residency and fellowship programs, but additional residency positions are warranted. Therefore, the School of Medicine and the health systems should investigate the need for graduate medical education programs in primary care and other disciplines either locally or at remote training sites.

Centura Health is a management company for Adventist Health Systems and Catholic Health Initiatives. In 2010, the statewide system had 14 hospitals with 83,000 admissions, 61,000 surgical procedures, 908,000 outpatient visits, 10,600 deliveries as well as home health visits and long-term care. Approximately 400 physicians are employed and 6,500 physicians are on
staff. The system had $2.5 billion in total revenues. The focus for the near future is to build clinically integrated networks centered on team-based care.

Colorado Permanente has 950 physician employees who provide 90% of the necessary care to more than 535,000 patients. They are the sole provider for the faculty and staff at the University of Denver. They have a daily inpatient census of 300 patients, most of whom are admitted to Exempla Healthcare hospitals and The Children’s Hospital. They have 120 researchers doing mostly translational research.

Denver Health is a large health care system that has had a long history of teaching medical students and residents. Approximately 3,500 students in all of the health professions participate in the care of patients each year. Last year, Denver Health admitted 25,000 patients with 4,600 surgical procedures, 3,400 deliveries, and 63,000 emergency room visits. The system also maintains a poison and drug center, behavioral health services, occupational health and safety programs, public health clinics, a detoxification center and federal qualified health centers. The system has successfully undergone a lean management process to improve quality of care.

Exempla Healthcare is a community-based organization that consists of three hospitals and a network of clinics throughout the Denver metropolitan area as well as some rural connections. There are approximately 2,100 physicians affiliated with Exempla, 120 of whom are employed. In 2009, the system admitted 84,092 patients, cared for 153,000 emergencies, and had more than 510,000 outpatient visits. As stated above, many of the patients in the Exempla Healthcare system are admitted by the Colorado Permanente physician group.

HCA HealthOne has 7 hospitals within the system as well as surgery centers, occupation and rehabilitation clinics, radiation centers, multiple specialty clinics and some 3,000 affiliated physicians of whom 160 are employed. In 2011, the system cared for more than 75,200 inpatients, 13,000 deliveries, 23,500 surgical patients and 300,000 emergencies. HealthOne has 25 academic affiliations and has long had an interest in teaching medical students and
residents. In addition to major hospital programs in the Denver area, the system has
developed a regional network of some 30 affiliations in rural Colorado, Wyoming, Kansas
and Nebraska.

National Jewish Health, previously National Jewish Medical and Research Center, is a
clinical and research institute specializing in pulmonary, immunologic and allergic disorders
and their treatment. 2011 total revenues were $225M with $66M in research funding.
National Jewish Health has had an agreement with the University of Colorado School of
Medicine since 1995, serving as the medical school Department of Immunology and
providing graduate education for residents, fellows and graduate students. National Jewish
Health expressed interest in participating with University of Denver as a degree granting
institution by providing faculty and space for student education and research. The system has
18 locations in Colorado.

All of the health systems above have expressed interest in working with the University of
Denver School of Medicine. The School of Medicine may identify a primary affiliate but
more than one may be more appropriate to meet the needs of the School’s curriculum (see the
section on An Innovative Focus of the Curriculum Design). The opportunity to affiliate with
major health care systems with an extensive clinical base such as those identified above are
powerful reasons for establishing a medical school at this location. The University also has
the potential to affiliate with several other clinics and hospitals in rural Colorado.

**Library Services and Information Resources:** University of Denver has a well- maintained
library that is sufficient to support the medical school in its initial stages. The University’s
library has many print and electronic journals and texts that are used in health professions
education. The University Library currently has access to 297 medical journals, 4 core
medical databases, 3 specialized databases, and 2 consumer health databases. Library
holdings include 15,872 books in both print and electronic format. Additional holdings will be
necessary for specific medical subjects. The library is currently being renovated but, when
completed, will have study seating for 1864 students, 33 group study rooms and
approximately 200 computers. There is an extensive library loan system, and the Library is a
member of the Colorado Alliance of Research Libraries. The annual budget for the Library is $10 million.

The information technology and expertise at the University of Denver, especially with medical education and clinical practice, is robust. Electronic mail services are provided to all faculty and students, and all buildings on campus are wireless. The University uses the Banner System for administrative computing and Blackboard is the learning management system. The Office of Teaching and Learning is adaptable and facilitates pedagogies. The underlying network is stable and can be expanded. Support services are available for most computer products, and lecture capture is currently being studied. Learning applications for medical students will probably be internet-based, and there is interest in developing an electronic medical record learning model as well as a clinical skills center. An extensive distance learning system is in place and it can be expanded for medical school use. “Telepresence Centers” are in place to provide the foundation technology for distance learning. Several computer classrooms and a testing center is available. The annual budget is $11.5 million. Students are charged an information technology fee of $75 per quarter.

Because information technology is becoming an effective adjunct to medical education, considerable investment in personnel and resources will be necessary by the University. Fully interactive telecommunications will be useful, especially for education and administrative purposes, but it can also be used for research, patient presentations and integrating the basic and clinical sciences. A library and information technology consultant with medical school experience may be helpful for evaluating current systems and for identifying specific needs and curriculum start up.

**Finances:** The medical school budget will be funded with a combination of research grants and contracts, clinical revenues, gifts, endowment income, and student tuition. A mission-based management and budget process should be considered such that the education, research and clinical components of the school will be supported by appropriate revenue sources. During the first six years, the University will build the educational components of the medical education program. The research component for the medical school will emerge from future
collaborations between the University and the clinical partners. The clinical programs with
large numbers of patients of varied case mix are currently in place, and the University and
clinical affiliates will need to work out a mechanism for directing actual and/or in-kind
revenues to the support of the medical school and its programs.

Appendix 1 is the proposed budget for two planning years and the first eight years of the
Medical School’s operations based on a class starting with 50 students and increasing to 125
students per year (total of 500 at full operational capacity). Salaries of administrators and
basic science faculty (consistent with AAMC 2011 median salary profiles for all schools),
staff salaries (based on University of Denver nonexempt Grade 2 minimum salary profiles at
the entry level) and operating expenses are incremented 3% annually. The salaries of the
clinical faculty consist of a university base of $25,000 to $75,000 with the expectation that the
remainder of the individual salaries will be generated from clinical or research revenues.
Fringe benefits for full time University of Denver employees are calculated at 29% per year
with annual increments. The initial departmental structure consists of a single basic science
department with divisions of anatomy, biochemistry, microbiology, pharmacology,
physiology, behavioral science and pathology and clinical departments of internal medicine,
family medicine, pediatrics, obstetrics and gynecology, surgery, psychiatry, and preventive
medicine. Additional departments can be created as appropriate. The budget allows for at
least two faculty members in each basic science division to be recruited prior to the year their
respective courses will be taught. Development funds and a small amount of miscellaneous
funding is included. Medical schools usually generate revenues from indirect costs on grants
and from a portion of clinical revenues. However, since the amount of funding from grants
and contracts and the contributions from the clinicians or clinical affiliates are not fixed at this
time, revenues from these categories are not included in the proposed budget. The projected
tuition of $42,000 with fees of $2,000 is slightly below the national average for students in a
private medical school. It also is incremented 3% annually. Revenues from all of these and
other sources can be expected to increase significantly in the future. Renovation and
construction costs are not included in this operations budget.
The budget shown in Appendix 1 will increase as additional resources become available through grants and other contributions, but it sets forth a realistic albeit \textit{minimum} budget for the necessary components of a medical education program. This budget provides funding for the academic foundation of the new medical school enabling it to grow into a program of excellence.

\textbf{Potential Funding Sources:} Colorado has several charitable foundations that have expressed interest in supporting the medical education program at the University of Denver.

The Boettcher Foundation was created in 1937 to benefit the citizens of Colorado and grants are restricted to Colorado agencies. The Foundation provides capital grant funding to not-for-profit entities for arts and culture, community and social service, education, and health. The University of Denver SOM could, therefore, address and be considered for funding in at least two of these categories. According to Mr. Timothy W. Schultz, President and Executive Director, the Foundation has $275M in assets and awards some $14M annually. In addition to capital grants, the Boettcher Foundation also funds early-career biomedical research investigators, student scholarships, and other programs. The Boettcher Foundation has been a strong supporter of the University of Denver programs in the past, and Mr. Schultz expressed interest in the University’s expansion of the health professions if they result in the improvement of Colorado health care.

The Colorado Health Foundation’s vision is to make Colorado the healthiest state in the nation. To achieve this vision, the Foundation invests in initiatives that encourage healthy living, increase the number of Coloradans with health insurance, and improve access to quality, coordinated primary care. The Colorado Health Foundation has assets of approximately $1.26B and awards some $96M annually to fund six graduate medical education programs, a school for medical laboratory training, the Colorado Health Symposium, the Colorado Health Report Card and other programs. Anne Warhover, President and CEO, and Glenn Levy, Senior Director for Hospital Partnerships and Medical Education, expressed interest in supporting an education program which provides inter-
professional team training that would be the model for primary care in the future, especially in rural Colorado.

The Colorado Trust is a granting agency dedicated to advancing the health and well-being of the people of Colorado. The Trust’s Health Profession Initiative is a three-year, $10 million effort to increase the number of health professionals in Colorado in all disciplines. The initiative also aims to stimulate partnerships among training programs and community-based health professionals and organizations to strengthen the health professions training infrastructure. Ned Calonge, MD, President and CEO of the Colorado Trust and former health commissioner for the State of Colorado, indicated that the Trust has approximately $400M in assets and awards $15M per year for programs that focus on improving access to care for all of Colorado.

**Other policies and services:** The University and the health system partners have many of the required policies and services in place that can benefit the new medical school. Among others, there are policies dealing with appointment and promotion, teacher-learner interactions, and diversity of faculty and students. Conflict of interest policies are also in place for administrators, trustees and faculty. The University has an Institutional Review Board to preserve the rights and welfare of human research subjects, to explain the potential risks and benefits of clinical research to patients, and to assure informed consent by patient subjects. Such policies and regulations help to assure that the medical school faculty and students remain within federal and state guidelines for performance and behavior.
A medical school building should serve the academic needs of students from the medical school and possibly students of other schools in the health sciences. The building should reflect state-of-the-art technologies and it should provide for the latest in space for various pedagogies and student learning. The building should integrate the most recent advances in information technology to improve information dissemination and student learning. Medical information technology resources could also include an electronic medical record system in order to train students in its use for the future. Maximum utilization of multifunctional electronic classrooms should be available for didactic and virtual training in the health sciences.

In addition to educational space in large lecture halls and small group rooms of varying capacity, a medical school building may also incorporate study space, library, student relaxation space, student lockers, simulation center, computer laboratory, a clinic for standardized patients and objective structured education evaluations (OSCEs), bookstore, cafeteria, coffee shop, distance learning technology, and teaching laboratories. Some of these space needs may not be necessary if they are immediately available in other facilities.

For new medical schools, consideration should be given to constructing the building in modules. For example, Florida State University built three medical school buildings which surrounded a cloister garden. The school was built in phases over the course of two years, with education and administration having priority followed by a research module which requires different utilities and air-handling. Renovation of space for medical school use could use the same modular approach.

The research module should house laboratories for the advancement of research in biomedical science, clinical and translational medicine, medical education, primary care, rural health, quality of care, patient safety and other types of research.
Temporary space requirements for a medical school for two years until a medical education building is constructed/renovated should include at a minimum:

1. Dean’s office -150 nsf.
2. Executive assistant and waiting space – 150 nsf.
3. 2 Lecture/ large conference rooms with space for 75 students – 1500 nsf (May be able to rotate one large conference room for both classes with proper scheduling).
4. 5 small group rooms that would accommodate 10 students each (They do not have to be contiguous) – 750 nsf.
5. 1 laboratory (for up to 75 students) for gross anatomy with appropriate air handling – 900 nsf. Students need to have a place to change clothes before and after being in the lab.
6. 1 wet laboratory for histology, neuroanatomy, microbiology and physiology – 800 nsf.
7. Access to computer laboratory and support for training (students will have their own laptops).
8. 5 offices for deans for admission, medical education, student affairs, basic sciences, registrar and staff – 900 nsf.
9. Access to space in the current library for holdings and student study.
10. Offices or desk space for 14 basic science faculty and 4 staff -2,000 nsf.
11. Access to clinic space for patient interviewing, physical diagnosis.

A new medical school building for a school with 125 students in each class should include:

1. 2 large lecture halls – one that seats 150 students (and faculty) and one that seats 300 students (for two classes of students and faculty). Computer connections at each seat should be considered in one or both lecture halls.
2. 15 small group rooms with seating for 10 students in each room. These can also be used for study areas.
3. Anatomy laboratory – 3,000 nsf (for 31 dissecting tables with four students at each table). Requires high-volume air exchange.
4. Rooms adjacent to the anatomy laboratory for students to change clothes and showers – 300 nsf for men and 300 nsf for women.

5. Morgue – 600 nsf for cadavers and prosected materials.

6. Computer classroom to seat one-half the class – 1000 nsf.

7. Clinical learning center with 10 clinic rooms for teaching physical examination skills and for Objective Structured Clinical Examinations (OSCEs) 100 nsf each. There should be video capability in each room so that students can be observed doing a history and physical examination from an adjacent room 200 nsf.

8. Library 4,000 nsf. The library should be primarily electronic and have seating for 100 students/faculty members. If possible, it should have a 24 hour available separate study area.

9. 7 student laboratories with benches for 20 students in each laboratory 500 nsf each (histology, microbiology, neuroanatomy, physiology).

10. Lounge space and lockers for students – 2,000 nsf.

11. Café/coffee shop and seating 600 nsf.


13. 50 Faculty and staff offices 6,000 nsf.

14. 3 Faculty conference rooms 200 nsf each.

15. 20 Research laboratories 12,000 nsf. Consider putting the laboratories on the top floor or “stacking” them to facilitate HVAC and air-handling. A cold room 150 nsf in the research area.

16. Dean’s office suite (dean; associate deans for academic affairs, student affairs, medical education, faculty affairs, admissions, administration and finance, research; registrar; conference room; and staff) 2,800 nsf.

17. Student support services (financial aid; academic, career, personal counseling) 1,200 nsf.

18. Information technology 800 nsf.

19. Distance learning 600 nsf.

20. Simulation center 1,000 nsf. This can be used for other health science students and can also be leased to hospitals, organizations, and corporations in the community.
21. Vivarium 2,000 nsf.


23. (Optional) 8 Student learning “community” spaces each designed to accommodate 32 students 9,600 nsf. Such “communities” would be used to break the class into smaller groups to promote collegiality and teamwork. Each “community” includes four spacious small group teaching rooms surrounding a common area for the students. The common areas each have a collection of library reference materials, copy machines, computers, multimedia equipment, lockers and a dining/social area.

24. The building should contain wireless communication systems, specialized video and teaching assistance tools for the lecture halls and teaching laboratories.

Future increases in class size should be considered in the planning of space needs.
IMPLEMENTATION PLAN

The following is a general plan for the implementation of a medical school at University of Denver. The implementation timeline (Appendix 2) provides a visual illustration of how various tasks must be accomplished assuming that the charter class matriculates in 2013.

University of Denver must:

- Formally and publicly approve a plan for moving forward.
- Determine if funding sources can be identified for the renovation of educational space and for the initial operational costs of the medical school.
- Identify primary health system(s) as clinical affiliates.
- Recruit a founding dean.
- Seek approval for development of a medical education program by the North Central Association of Schools and Colleges.
- Meet with the LCME secretariat to discuss a new medical education program leading to the MD degree, and deposit the entry fee required by the LCME in the amount of $25,000.
- Appoint a steering committee and subcommittees for the institutional setting, education program, medical students, faculty and educational resources that will lead to preliminary accreditation.
- Identify temporary/permanent space for the new school.
- Approve a construction plan for medical school administration and education space.
- Initiate fund raising for construction, scholarships, endowments and initial operating costs.
- Adopt an organizational and governance structure.
- Establish affiliation agreements with clinical partners.
• Prepare a business plan and budget for the first five years of operation.
• Recruit other medical school senior administrators and faculty.
• Develop institutional and educational objectives, curriculum and student services.
• Develop and/or augment necessary library and information technology staff and resources.
• Achieve preliminary LCME accreditation.
• Recruit the charter class of medical students.
The University of Denver is an “authorized institution” by the Colorado Department of Higher Education and, therefore, approval by the Department of Higher Education is not needed to start a medical school. Notification and approval by the North Central Association of Schools and Colleges is required. This is likely to require an accreditation site visit, sometimes in conjunction with the Liaison Committee on Medical Education (LCME) accreditation visit, and coordination of accreditation/approval processes.

LCME Accreditation of medical education programs serves to assure that they meet national standards of educational quality. Attendance at an LCME-accredited medical school is required for students to obtain financial aid via Title VII of the U.S. Public Health Service Act, and it is required for enrolled U.S. medical students to be eligible to take the United States Medical Licensing Examination, the only pathway to medical licensure. Medical schools also must be LCME accredited in order for their graduates to be accepted into graduate medical education programs for specialty training that are accredited by the Accreditation Council for Graduate Medical Education.

Any new medical education program seeking LCME accreditation must follow the steps outlined in the LCME policy document, *Rules of Procedure*. The school is expected to have the necessary faculty, curriculum and student support services in place for the first year in order to admit the charter class and to obtain preliminary accreditation. The program is reconsidered during the second year of the curriculum to assure that the additional curricular components are in place and provisional accreditation is granted. A full survey visit by the LCME is scheduled for late in the third year or early in the fourth year when full accreditation may be granted, allowing the original students in the entering class to graduate from an LCME fully accredited program. According to the LCME, a developing medical school in the U.S. must complete the following five steps to become fully accredited. A school should not recruit applicants before reaching preliminary accreditation.

**ACTIONS FOR APPROVAL AND ACCREDITATION**
Step 1 – Applicant School: A medical school obtains "Applicant School" status when:

1. It has paid the $25,000 application fee to the LCME to begin the process of applying for preliminary accreditation; and
2. LCME Secretariat staff has determined that the school meets the basic eligibility requirements to apply for accreditation.

Step 2 – Candidate School: A medical school obtains "Candidate School" status when:

1. It has paid the $25,000 application fee to the LCME to begin the process of applying for preliminary accreditation; and
2. LCME and CACMS Secretariat staff have determined that the school meets the basic eligibility requirements to apply for, and
3. The school has submitted the required medical education database and planning self-study documents, which have been favorably reviewed by the LCME, and
4. Approval has been granted by the LCME for a site visit for preliminary accreditation.

Step 3 – Preliminary Accreditation: A medical school achieves "Preliminary Accreditation" status when:

1. It submits a modified medical educational database and a self-study summary to the LCME; and
2. An LCME team completes a survey visit at the medical school and prepares a report of its findings for consideration by the LCME at its next regularly scheduled meeting; and
3. The LCME reviews the survey team's report and determines that the program leading to the M.D. degree meets the standards outlined in the LCME document, Guidelines for New and Developing Medical Schools; and
4. The LCME votes to grant preliminary accreditation to the program for an entering class in an upcoming academic year.

Once preliminary accreditation is granted, the program may begin to recruit applicants and accept applications for enrollment. If the program does not enroll a charter class within two years of its receipt of preliminary accreditation, it must reapply for preliminary accreditation as a new program and pay a reapplication fee.

Step 4 – Provisional Accreditation: A medical school achieves "Provisional Accreditation" status, after it receives preliminary accreditation and enrolls a charter class, when:

1. It submits a modified medical educational database and a self-study summary to the LCME; and
2. An LCME team completes a limited survey visit prior to the midpoint of the second year of the curriculum to review progress toward implementation of the educational program leading to the M.D. degree and the status of planning for later stages of the
program, and prepares a report of its findings for consideration by the LCME at its next regularly scheduled meeting; and

3. The LCME reviews the survey team's report and determines that the program leading to the M.D. degree meets the standards outlined in the LCME document, *Guidelines for New and Developing Medical Schools*; and

4. The LCME votes to grant provisional accreditation to the program.

Once provisional accreditation has been granted, students enrolled in the program can continue their medical studies in the third and fourth years of medical education, and the program can continue to enroll new students.

**Step 5- Full Accreditation: A medical school achieves "Full Accreditation" status, after it receives provisional accreditation, when:**

1. It submits a modified medical educational database and a self-study summary to the LCME; and
2. An LCME team completes a full accreditation survey visit that takes place late in the third year or early in the fourth year of the curriculum, and prepares a report of its findings for consideration by the LCME at its next regularly scheduled meeting; and
3. The LCME reviews the survey team's report and determines that the program leading to the M.D. degree fully complies with all LCME accreditation standards; and
4. The LCME votes to grant full accreditation to the program for the balance of an eight-year term that began when the program was granted preliminary accreditation status.

The minimum requirements for accreditation in the actual categories corresponding to the major headings and related accreditation standards described in the LCME publication, *Functions and Structure of a Medical School*, are as follows.

**Institutional Setting**

- Formal delineation of the relationship between the medical school and the parent university.
- Definition of the governance structure of the medical school, including the composition and terms of membership of any governing board.
- Development of a job description for the dean, with approval of the description from appropriate university authorities.
- Appointment of the founding dean.
- Appointment of the senior leadership within the dean’s staff, particularly in the areas...
of academic affairs, student affairs, hospital relationships, and administration and finance.

- Appointment of administrative leadership (e.g., department chairs or their equivalent) for academic units that will have major responsibilities for medical student education, especially in those disciplines to be taught during the two years of the curriculum.

- Chartering of the major standing committees of the medical school, particularly those dealing with the curriculum, student advancement, admissions and faculty promotion and tenure.

**Educational Program**

- Definition of overall objectives for the educational program.
- Creation of a working plan for the curriculum as a whole, consistent with the educational objectives.
- Detailed layout of the first year of study, including required courses and content, and identification of the resources needed for the delivery of required courses.
- Specification of the types of teaching and student evaluation methods best suited for the achievement of educational objectives.
- Design of a system for curriculum management and review.
- Design of a system for educational program evaluation, including the designation of outcome measures to indicate the achievement of overall educational objectives.

**Medical Students**

- Clearly defined admissions policies and selection criteria.
- Adequate resources to assure essential student services in the areas of academic counseling, financial aid, health services, and personal counseling.
- Written standards and procedures for the evaluation, advancement and graduation of students and for disciplinary action, including appeal mechanisms to assure due process.
• Standards of conduct for the teacher-learner relationship, including written policies for addressing violations of such standards.

Faculty
• Written policies and procedures for faculty appointment, promotion, and tenure.
• Hiring of sufficient faculty to provide the first year of instruction for the medical education program, and other faculty as needed for the implementation of institutional plans regarding medical student admissions, curriculum planning and management, and achievement of other missions or goals.
• A recruitment plan and timetable for hiring faculty to deliver the second year of the educational program.

Educational Resources
• Budgets and supporting financial resources for the first five years of operation.
• Classroom space and supporting educational infrastructure for the first year of instruction.
• Plans for providing classroom space and any supporting educational infrastructure for the second year of study.
• Library and information technology services appropriate to the needs of the school for education, research and patient care.
• Identification of clinical teaching sites.
Notwithstanding the considerable resources and enthusiasm for starting a new medical school at the University of Denver, there are some concerns that should be acknowledged and considered.

1. The University Denver Board of Trustees should be comfortable that a medical school is consistent with the current mission and vision of the University.

2. The student applicant pools nationally and in Colorado appear to be more than sufficient to accommodate a new medical school. As the number of new allopathic medical schools increase in the U.S., the qualifications of the applicant pool must be monitored.

3. The faculty of the University of Denver is favorably inclined toward the development of a medical school, but the funding, space and other factors necessary for start-up and operations may elicit faculty concern.

4. Considerable new funding will be needed for space renovation/construction and operations for the new medical school.

5. The medical school will require the enthusiastic support of community physicians serving as clinical faculty members and hospital/health system affiliates providing the patients for the clinical education of students.

6. Considerable financial and/or in-kind support from clinical affiliates will be necessary to implement the proposed medical education program.

7. The medical school will need the moral and financial support of local foundations and the business and commercial interests of Denver and the state of Colorado.

These concerns, although they require careful consideration, do not alter our conclusion that a medical school at the University of Denver, in collaboration with a strong clinical health system, is feasible and achievable.
The University of Denver has responded to a call for the training of more physicians by numerous health care authorities. The University has the administrative and academic foundation necessary for the development of a new program in allopathic medicine leading to a Doctor of Medicine degree. By affiliating with the strong clinical education, service and research programs of any one of several potential clinical affiliates, the University has the potential to create an excellent system of medical education in the United States. The importance of this affiliation, academically and financially, cannot be underappreciated. The medical school should be attractive to a pool of applicants that is sufficient in number and quality.

The educational program will consist of basic science, clinical, behavioral and socioeconomic subjects required for today’s medical education. In addition, this program has the potential to present a very innovative focus that might include primary care, inter-professional education, the health of international communities, population-based research, rural health, and quality of care assessment and improvement. Medical students will have the opportunity to engage in basic or clinical/translational research and service learning. The existing programs at the University of Denver, Regis University and the clinical affiliates offer the opportunity for interdisciplinary and inter-professional studies. The graduates of the University of Denver School of Medicine will be knowledgeable and skilled in the basic and clinical sciences. They will have didactic and practical experience in public health, health promotion and disease prevention; they will be culturally and socially competent; they will be capable of collaborating with other health care professionals; and they will be professional and personal in their behavior towards patients and others.

Some of the resources required for initiation of the new school, including basic science and physician faculty support, temporary general space, clinical teaching facilities, information technology and library resources are already in place or have the potential for developing to the levels required for a medical school. New medical administration, education and research space will have to be constructed, and sufficient funds will have to be acquired for the
construction and to launch the curriculum and other components of the educational program. Considerable financial and/or in-kind assistance will be required from the clinical affiliates. The long-term economic impact of a new medical school for the community and for the State of Colorado will be considerable.

The educational and financial planning for the new medical school must provide a strong academic foundation and enable it to grow into a program of excellence benefiting the institution, the Denver community, the region and the nation. Matriculation of the charter class of students in 2014 will require timely approval and endorsement of the plan by the University and clinical affiliates, identification of funding and other resources, and planning activities that will result in preliminary accreditation by the Liaison Committee on Medical Education. Given this support and based on our review and analysis, DJW Associates believes that a new medical school at University of Denver is both feasible and achievable.
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16. Medicare Direct Graduate Medical Education (DGME) Payments, Association of American Medical Colleges
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University of Denver School of Medicine
Accreditation Timeline 2012-14

A. Governance Structure
- Dean Appointed

B. Associate Deans Appointed
- Chairs Appointed
- Faculty Appointed

C. Committees Appointed
- Objectives Defined
- Curriculum Established
- Curriculum Mgmt.
- Student Adm. Policies
- Student Counseling
- Student Eval. Criteria
- 5 Year Budget
- Space Defined
- Library & IT Established
- Clinical Teaching Sites

D. Submit Database to LCME

E. LCME Review of Database

F. LCME Site Visit

G. Begin Admitting Students

H. 1st Class Matriculates
## Financial Proforma: Direct Expense Only

### 4 Year Curriculum

**PARAMETERS**

<table>
<thead>
<tr>
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<th>Plan 1</th>
<th>Plan 2</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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**REVENUE**

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## Financial Proforma: Direct Expense Only

*analysis does not include any capital expense*

### 4 Year Curriculum

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### Clinical Division Expense

| clinical compensation                                                  | - | - | - | 735,000 | 1,557,050 | 1,778,762 | 1,832,124 | 1,887,088 | 1,943,701 | 2,002,012 |
| clinical fringe                                                        | - | - | - | 218,663 | 467,115 | 538,075 | 558,798 | 580,280 | 602,547 | 625,629 |
| total clinical                                                         | - | - | - | 953,663 | 2,024,165 | 2,316,837 | 2,390,922 | 2,467,368 | 2,546,248 | 2,627,640 |

### Basic Science Division Expense

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UNIVERSITY OF DENVER SCHOOL OF MEDICINE
Financial Proforma: Direct Expense Only

4 Year Curriculum

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<td>2,217,036</td>
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<td>272,500</td>
<td>380,675</td>
<td>392,095</td>
<td>403,858</td>
<td>415,974</td>
<td>428,453</td>
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Estimated Indirect Costs from Controller

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FTE REQUIREMENT

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<tr>
<td>New faculty and staff</td>
<td>8</td>
<td>22</td>
<td>17</td>
<td>15</td>
<td>24</td>
<td>19</td>
<td>-</td>
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<tr>
<td>total by year</td>
<td>8</td>
<td>30</td>
<td>47</td>
<td>62</td>
<td>86</td>
<td>105</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>New faculty (not admin)</td>
<td>-</td>
<td>7</td>
<td>10</td>
<td>7</td>
<td>22</td>
<td>7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>total by year</td>
<td>-</td>
<td>7</td>
<td>17</td>
<td>24</td>
<td>46</td>
<td>53</td>
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</tbody>
</table>
Financial Proforma: Direct Expense Only

*analysis does not include any capital expense*

4 Year Curriculum

<table>
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<th>Plan 1</th>
<th>Plan 2</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
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</thead>
<tbody>
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<td>64</td>
<td>86</td>
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<td>158</td>
<td>158</td>
<td>158</td>
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<td>158</td>
</tr>
</tbody>
</table>

TOTAL FTE BY YEAR

4