



TASHKENT MEDICAL ACADEMY

100 TMA ANNIVERSARY



# Journal of Educational and Scientific Medicine



**Issue 4 (1) | 2023**



OAK.uz  
Google Scholar

Supreme Attestation Commission of the Cabinet  
Ministry of the Republic of Uzbekistan

**ISSN: 2181-3175**

# Harvard University and Harvard Medical School: From History of Origins to the Present

A.K. Shadmanov<sup>1</sup>, A.O. Okhunov<sup>2</sup>

## ABSTRACT

This is another of our publications of an introductory nature. Harvard University is a private Ivy League research university in Cambridge, Massachusetts. Founded in 1636 as Harvard College and named for its first benefactor, the Puritan clergyman John Harvard, it is the oldest institution of higher learning in the United States. Its influence, wealth, and rankings have made it one of the most prestigious universities in the world. Harvard's founding was authorized by the Massachusetts colonial legislature, "dreading to leave an illiterate ministry to the churches, when our present ministers shall lie in the dust"; though never formally affiliated with any denomination, in its early years Harvard College primarily trained Congregational clergy. Its curriculum and student body were gradually secularized during the 18th century. By the 19th century, Harvard emerged as the most prominent academic and cultural institution among the Boston elite. Following the American Civil War, under President Charles William Eliot's long tenure (1869–1909), the college developed multiple affiliated professional schools that transformed the college into a modern research university. In 1900, Harvard co-founded the Association of American Universities. James B. Conant led the university through the Great Depression and World War II, and liberalized admissions after the war. The university is composed of ten academic faculties plus Harvard Radcliffe Institute. The Faculty of Arts and Sciences offers study in a wide range of undergraduate and graduate academic disciplines, and other faculties offer only graduate degrees, including professional degrees. Harvard has three main campuses: the 209-acre (85 ha) Cambridge campus centred on Harvard Yard; an adjoining campus immediately across Charles River in the Allston neighbourhood of Boston; and the medical campus in Boston's Longwood Medical Area. Harvard's endowment is valued at \$50.9 billion, making it the wealthiest academic institution in the world. Endowment income enables the undergraduate college to admit students regardless of financial need and provide generous financial aid with no loans. Harvard Library is the world's largest academic library system, comprising 79 individual libraries holding 20 million items. Throughout its existence, Harvard alumni, faculty, and researchers have included 188 living billionaires, eight U.S. presidents, numerous heads of state, Nobel laureates, Fields Medalists, members of Congress, MacArthur Fellows, Rhodes Scholars, Marshall Scholars, Turing Award Recipients and Fulbright Scholars; by most metrics, Harvard ranks among the top globally in each of these categories. Additionally, students and alumni have won 10 Academy Awards, 48 Pulitzer Prizes, and 110 Olympic medals (46 gold). They have founded many notable companies as well.

**Keywords:** History of Harvard University, Harvard Medical School, clinical bases, education system

<sup>1</sup> Professor, MD, PhD, Rector of Tashkent Medical Academy, Tashkent, Uzbekistan, e-mail: [rector@tma.uz](mailto:rector@tma.uz)

<sup>2</sup> Professor, MD, PhD, Head of the Department of General and Pediatric Surgery, Tashkent Medical Academy, Tashkent, Uzbekistan, e-mail: [general-surgery@mail.ru](mailto:general-surgery@mail.ru)



## PROLOGUE

Tashkent Medical Academy is establishing cooperation with U.S. medical institutions. At the talks in the United States, A. Shadmanov, director of the Tashkent Medical Academy, is working to reach a number of agreements, including:

Training of personnel in the field of biotechnology engineering in collaboration with Med ALLIANCE in the American curriculum;

The Center for Genomics at Harvard University agreed to develop relations at the base of a genetic scientific laboratory composed of the Center for Biotechnology at the Tashkent Medical Academy.

This cooperation also includes retraining and advanced training of specialists from Uzbekistan at the U.S. University of Medical Genetics.

It was agreed to establish cooperation in dentistry with representatives of Columbia Medical University and the dean of the College of Dentistry.



With such fruitful cooperation between the Tashkent Medical Academy and the above-mentioned universities, teachers and students have the opportunity to develop mutual mobility. This publication is based on the results

of our next visit to Harvard University and taking part in the activities of the summer school. This is another publication from the section on acquaintance with the world's leading universities [1-4].

In the summer of 2023, a visit to Harvard University took place in order to get acquainted with the activities of the summer school, visit and familiarize himself with the activities of Harvard Medical School and expand cooperation in educational, methodological and scientific activities.



We will present information about this later, but for now, we want to talk about the history, structure and main achievements of Harvard University, making it the world's most prestigious institution of higher education at the top of the top list.

## HISTORY OF HARVARD UNIVERSITY

Harvard College, around which Harvard University eventually grew, was founded in 1636 in Cambridge, Massachusetts, making it the oldest institution of higher learning in the United States.



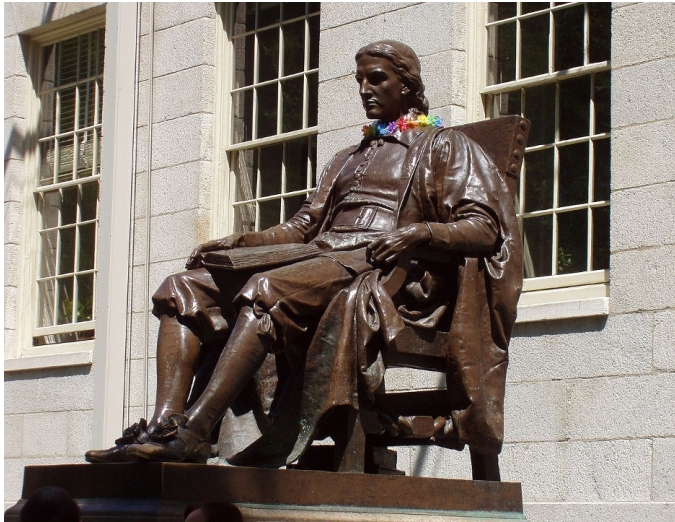
Tablets flanking the Johnston Gate

*“After God had carried us safe to New England, and we had built our houses, provided necessaries for our livelihood, reared convenient places for Gods worship, and settled the Civil Government: One of the next things we longed for, and looked after was to advance Learning and perpetuate it to Posterity; dreading to leave an illiterate Ministry to the Churches, when our present Ministers shall lie in the Dust. And as we were thinking and consulting how to effect this*



great work, it pleased God to stir up the heart of one Mr. Harvard (a godly gentleman and a lover of learning; then living amongst us) to give one-half of his estate (it is in all about £1,700) towards the erecting of a Colledge, and all his library. After him, another gave £300; others after they cast in more; and the public hand of the State added the rest. The Colledge was by common consent appointed to be at Cambridge (a place very pleasant and accommodating) and is called (according to the name of the first founder) Harvard Colledge."

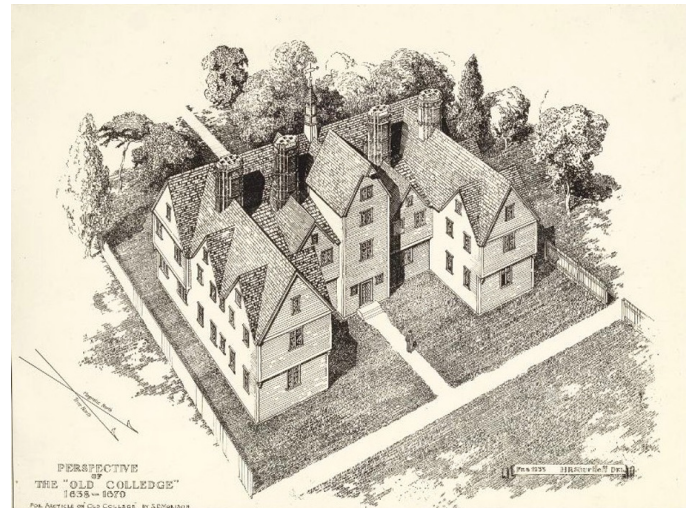
**"New England's First Fruits" (1643)**



**John Harvard statue on Harvard Yard**

For centuries, its graduates dominated Massachusetts' clerical and civil ranks and beginning in the 19th century its stature became national, then international, as a dozen graduate, and professional schools were formed alongside the nucleus undergraduate College. Historically influential in national roles are the schools of medicine (1782), law (1817) and business (1908) as well as the Harvard Graduate School of Arts and Sciences (1890).

Since the late 19th century Harvard has been one of the most prestigious schools in the world, its library system and financial endowment larger than those of any other. With some 17,000 Puritans migrating to New England by 1636, Harvard was founded in anticipation of the need for training clergy for the new commonwealth, a "church in the wilderness". Harvard was established in 1636 by a vote of the Great and General Court of the Massachusetts Bay Colony. In 1638, the school received a printing press—the only press at the time in what is now the United States, until Harvard acquired a second in 1659.



**The original college building (1638–1670)**

On March 13, 1639, the college was renamed Harvard College after clergyman John Harvard, a University of Cambridge alumnus who had willed the new school £779 pounds sterling and his library of some 400 books.

In the 1640s, Harvard College established the Harvard Indian College, which educated Native American students. It was only attended by a handful of students, only one of whom graduated.

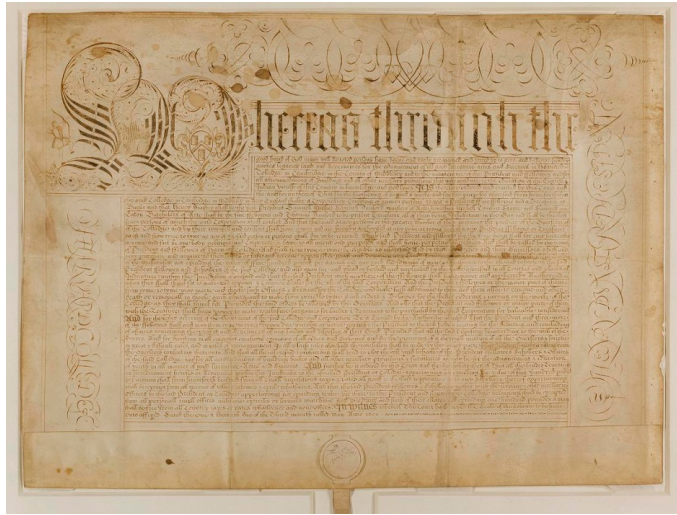


**Engraving of Harvard College by Paul Revere, 1767**

The colony charter creating the Harvard Corporation was granted in 1650 at the beginning of the English Interregnum. When the college's first president Henry Dunster abandoned Puritanism in favour of the English Baptist faith in 1654, he provoked a controversy that highlighted two distinct approaches to dealing with dissent in the Massachusetts Bay Colony. The colony's Puritan leaders, whose own religion was born of dissent from the mainstream Church of England, generally worked for



reconciliation with members who questioned matters of Puritan theology but responded much more harshly to outright rejection of Puritanism.



**Harvard Corporation charter (1650)**

Dunster's conflict with the colony's magistrates began when he failed to have his infant son baptized, believing as an adherent of the Believer's baptism of English Baptists and/or Anabaptists that only adults should be baptized. Efforts to restore Dunster to Puritan orthodoxy failed and his apostasy proved untenable to colony leaders who had entrusted him in his job as Harvard's president to uphold the colony's religious mission, thus he represented a threat to the stability of society. Dunster exiled himself in 1654 and moved to nearby Plymouth Colony, where he died in 1658. Because it had been illegal for the colony to establish a college, Charles II rescinded the Massachusetts Bay Colony charter in 1684 by writ of scire facias.

In 1692, the leading Puritan divine Increase Mather became president of Harvard. One of his acts was replacing pagan classics with books by Christian authors in ethics classes and maintaining a high standard of discipline. The Harvard "Lawes" of 1642 and the "Harvard College Laws of 1700" testify to its original high level of discipline. Students were required to observe rules of pious decorum inconceivable in the 19th century and ultimately to prove their fitness for the bachelor's degree by showing that they could "read the original of the Old and New Testament into the Latin tongue and resolve them logically". Harvard's leadership and alumni (including Increase Mather and his son Cotton Mather) played a central role in the Salem Witch Trials 1692–1693.

The town of Dedham was founded in 1636, the same year as the college. The first minister of the First Church and Parish in Dedham, John Allen, served as an overseer, and every minister through 1861 was connected to the university. Given its population and modest means, the support the community provided to the college was generous. Allen donated two cows, presumably to provide milk for the president and tutors.

During Harvard's early years, the town of Cambridge maintained order on campus and provided economic support, as the local Puritan minister had direct oversight of Harvard and ensured the orthodoxy of its leadership. By 1700, Harvard was strong enough to regulate and discipline its own people and to a large extent the direction in which support and assistance flowed was reversed, Harvard now provided financial support for local economic expansion, improvements to public health and construction of local roads, meetinghouses, and schools.



**The Harvard Corporation seal is found on Harvard diplomas. *Christo et Ecclesiae* ("For Christ and Church") is one of Harvard's several early mottoes.**

The early motto of Harvard was *Veritas Christo et Ecclesiae*, meaning "Truth for Christ and the Church". In the early classes, half the graduates became ministers (though by the 1760s the proportion was down to 15%) and ten of Harvard's first twelve presidents were ministers. Systematic theological instruction was inaugurated in 1721 and by 1827 Harvard became a nucleus of theological teaching in New England.

The end of Mather's presidency in 1701 marked the start of a long struggle between orthodoxy and liberalism. Harvard's first secular president was John Leverett, who began his term in 1708. Leverett left the curriculum largely intact and sought to keep the college independent of the overwhelming influence of any single sect.

During the American Revolution, Loyalist alumni were outnumbered seven to one by Patriots—seven alumni died in the fighting.

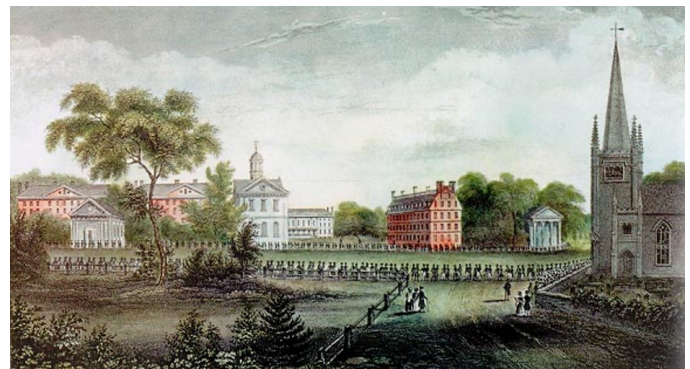
Throughout the 18th century, Enlightenment ideas of the power of reason and free will became widespread among Congregational ministers, putting those ministers and their congregations in tension with more traditionalist, Calvinist parties. When the Hollis Professor of Divinity David Tappan died in 1803 and the president of Harvard Joseph Willard died a year later, in 1804 a struggle broke out over their replacements. Henry Ware was elected to the chair in 1805 and the liberal Samuel Webber was appointed to the presidency of Harvard two years later, which signalled the changing of the tide from the dominance of traditional ideas at Harvard to the dominance of liberal, Arminian ideas (defined by traditionalists as Unitarian ideas).

In 1846, the natural history lectures of Louis Agassiz were acclaimed both in New York and on his campus at Harvard College. Agassiz's approach was distinctly idealist and posited Americans' "participation in the Divine Nature" and the possibility of understanding "intellectual existences". Agassiz's perspective on science combined observation with intuition and the assumption that one can grasp the "divine plan" in all phenomena. When it came to explaining life forms, Agassiz resorted to matters of shape based on a presumed archetype for his evidence. This dual view of knowledge was in concert with the teachings of Common-Sense Realism derived from Scottish philosophers Thomas Reid and Dugald Stewart, whose works were part of the Harvard curriculum at the time. The popularity of Agassiz's efforts to "soar with Plato" probably also derived from other writings to which Harvard students were exposed, including Platonic treatises by Ralph Cudworth, John Norris and in a Romantic vein Samuel Coleridge. The library records at Harvard reveal that the writings of Plato and his early modern and Romantic followers were almost as regularly read during the 19th century as those of the "official philosophy" of the more empirical and more deistic Scottish school.

Between 1830 and 1870, Harvard became "privatized". While the Federalists controlled state government, Harvard had prospered and the 1824 defeat of the

Federalist Party in Massachusetts allowed the renascent Democratic-Republicans to block state funding of private universities. By 1870, the politicians and ministers that heretofore had made up the university's board of overseers had been replaced by Harvard alumni drawn from Boston's upper-class business and professional community and funded by private endowment.

During this period, Harvard experienced unparalleled growth that securely placed it financially in a league of its own among American colleges. Ronald Story notes that in 1850, Harvard's total assets were "five times that of Amherst and Williams combined, and three times that of Yale". The story also notes that "all the evidence... points to the four decades from 1815 to 1855 as the era when parents, in Henry Adams's words, began 'sending their children to Harvard College for the sake of its social advantages'". Under President Eliot's tenure, Harvard earned a reputation for being more liberal and democratic than either Princeton or Yale in regard to bigotry against Jews and other ethnic minorities. In 1870, one year into Eliot's term, Richard Theodore Greener became the first African-American to graduate from Harvard College. Seven years later, Louis Brandeis, the first Jewish justice on the Supreme Court, graduated from Harvard Law School. Nevertheless, Harvard became the bastion of a distinctly Protestant elite – the so-called Boston Brahmin class – and continued to be so well into the 20th century.



**September 1836 alumni procession, the First Parish Meeting House to the Pavilion in a drawing by Eliza Susan Quincy, daughter of Harvard President Josiah Quincy**

The annual undergraduate tuition was \$300 in the 1930s and \$400 in the 1940s, doubling to \$800 in 1953. It reached \$2,600 in 1970 and \$22,700 in 2000.

Charles W. Eliot, president 1869–1909, eliminated the favoured position of Christianity from the curriculum while opening it to student self-direction. While Eliot



was the most crucial figure in the secularization of American higher education, he was motivated not by a desire to secularize education, but by transcendentalist Unitarian convictions. Derived from William Ellery Channing and Ralph Waldo Emerson, these convictions were focused on the dignity and worth of human nature, the right and ability of each person to perceive truth and the indwelling God in each person.



**Five Harvard University Presidents sitting in order of when they served (from left to right): Josiah Quincy III, Edward Everett, Jared Sparks, James Walker, and Cornelius Conway Felton**

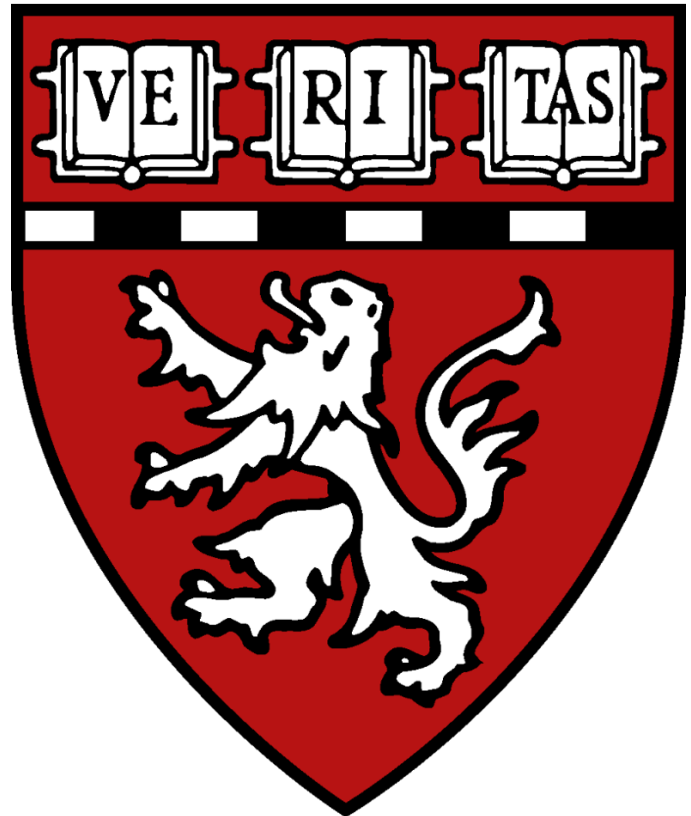
Football, originally organized by students as an extracurricular activity, was banned twice by the university for being a brutal and dangerous sport. However, by the 1880s football became a dominant force at the college as the alumni became more involved in the sport. In 1882, the faculty formed a three-member athletic committee to oversee all intercollegiate athletics, but due to increasing student and alumni pressure the committee was expanded in 1885 to include three student and three alumni members. The alumni's role in the rise and commercialization of football, the leading moneymaker for athletics by the 1880s, was evident in the fundraising for the first steel-reinforced concrete stadium. The class of 1879 donated \$100,000 – nearly one-third of the cost – to the construction of the 35,000-seat stadium, which was completed in 1903, with the remainder to be collected from future ticket sales.

### **MEDICAL SCHOOL**

Harvard Medical School (HMS) is the graduate medical school of Harvard University and is in the Long-

wood Medical Area in Boston, Massachusetts. Founded in 1782, HMS is one of the oldest medical schools in the United States. Unlike most other leading medical schools, HMS does not operate in conjunction with a single hospital but is directly affiliated with several teaching hospitals in the Boston area. Affiliated teaching hospitals and research institutes include Dana–Farber Cancer Institute, Massachusetts General Hospital, Brigham and Women's Hospital, Beth Israel Deaconess Medical Center, Boston Children's Hospital, McLean Hospital, Cambridge Health Alliance, The Baker Center for Children and Families, and Spaulding Rehabilitation Hospital.

Harvard Medical School was founded on September 19, 1782, on the initiative of Harvard President Joseph Willard. The founding faculty were John Warren, Aaron Dexter, and Benjamin Waterhouse. It is the third-oldest medical school in the United States, after the Perelman School of Medicine at the University of Pennsylvania and Columbia University Vagelos College of Physicians and Surgeons.



**Coat of arms**

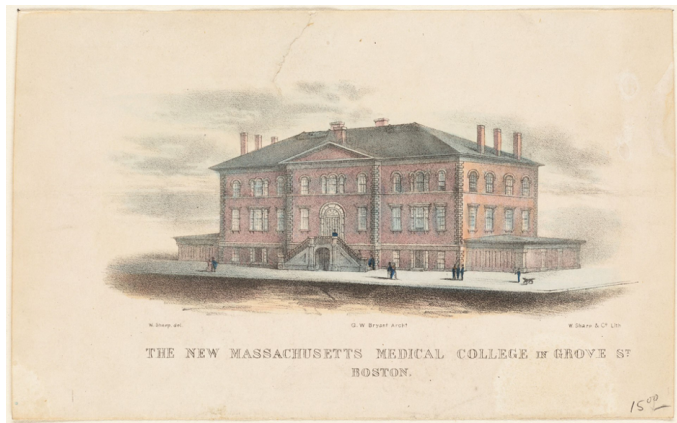
Lectures were first held in the basement of Harvard Hall, then in Holden Chapel. Students paid no tuition but



purchased tickets to five or six daily lectures. The first two students graduated in 1788.



**Massachusetts Medical College, Mason Street**



**Massachusetts Medical College, Grove Street**

In the following century, the school moved locations several times due to changing clinical relationships, a function of the fact that Harvard Medical School does not directly own or operate a teaching hospital. In 1810, the school moved to Boston at what is now downtown Washington Street. In 1816, the school was moved to Mason Street and was called the Massachusetts Medical College of Harvard University in recognition of a gift from the Great and General Court of Massachusetts. In 1847, the school was moved to Grove Street to be closer to Massachusetts General Hospital. In 1883, the school was relocated to Copley Square. Prior to this move, Charles William Eliot became Harvard's president in 1869 and found the medical school in the worst condition of any part of the university. He instituted drastic reforms that raised admissions standards, instituted a formal degree program, and defined HMS as a professional school within Harvard University that laid the groundwork for its transformation into one of the leading

medical schools in the world. In 1906, the school moved to its present location in the Longwood Medical and Academic Area.



**Harvard Medical School quadrangle in Longwood Medical Area**





## INNOVATIONS

Harvard Medical School postdoctoral trainees and faculty have been associated with a few important medical and public health innovations:

- ◆ Introduction of smallpox vaccination to America.
- ◆ The introduction of insulin to the US to treat diabetes.
- ◆ Comprehending the role of vitamin B12 in treating anaemia.
- ◆ Identification of coenzyme A and understanding of proteins.
- ◆ Developing tissue culture methods for the polio virus, which paved the way for vaccines against polio.
- ◆ Mapping the visual system of the brain.
- ◆ Development of the first successful chemotherapy for childhood leukaemia.
- ◆ Development of the first implantable cardiac pacemaker.
- ◆ Discovering the inheritance of immunity to infection.
- ◆ Development of artificial skin for burn victims.
- ◆ The first successful heart valve surgery (at Peter Bent Brigham Hospital, 1923).
- ◆ The first successful human kidney transplant.
- ◆ The first reattachment of a severed human limb.
- ◆ Discovery of the genes that cause Duchenne muscular dystrophy, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), and Alzheimer's disease, among many others.
- ◆ Establishing the importance of tumour vascular supply (angiogenesis) and seeding the field of vascular biology.

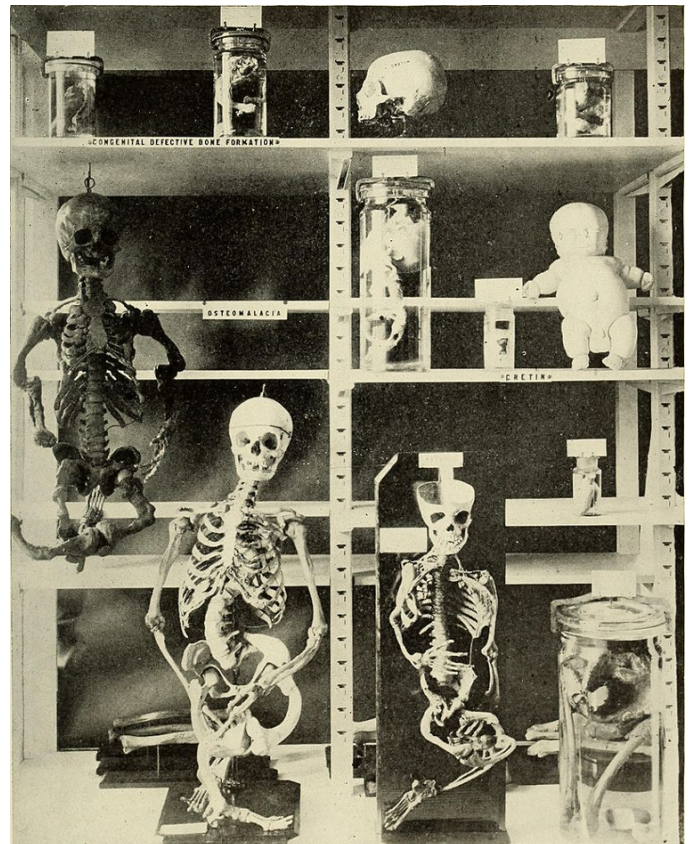


Harvard Medical School has gone through many curricular revisions for its MD program. In recent decades,

HMS has maintained a three-phase curriculum with a classroom-based pre-clerkship phase, a principal clinical experience (PCE), and a post-PCE phase.

The pre-clerkship phase has two curricular tracks. The majority of students enter the more traditional Pathways track that focuses on active learning and earlier entry into the clinic with courses that include students from the Harvard School of Dental Medicine. Pathways students gain early exposure to the clinic through a longitudinal clinical skills course that lasts the duration of the pre-clerkship phase. A small portion of each class enters the HST track, which is jointly administered with MIT. The HST track is designed to train physician-scientists with an emphasis on basic physiology and a quantitative understanding of biological processes through courses that include PhD students from MIT.

## WARREN ANATOMICAL MUSEUM



**The Warren Anatomical Museum at HMS was named after its founder John Collins Warren, the first Dean at HMS (picture taken 1910)**

The Warren Anatomical Museum, housed within Harvard Medical School's Countway Library of Medicine, was founded in 1847 by Harvard professor John Collins Warren, whose personal collection of 160 unusu-

al and instructive anatomical and pathological specimens now forms the nucleus of the museum's 15,000-item collection. The Warren also has objects significant to medical history, such as the inhaler used during the first public demonstration of ether-assisted surgery in 1846 (on loan to the Massachusetts General Hospital since 1948), and the skull of Phineas Gage, who survived a large iron bar being driven through his brain. The museum's first curator was J.B.S. Jackson.



**Phineas Gage, Skull of Phineas Gage, The iron's path, per Harlow**

John Collins Warren (August 1, 1778 – May 4, 1856) was an American surgeon. In 1846 he gave permission to William T.G. Morton to provide ether anaesthesia while Warren performed a minor surgical procedure. News of this first public demonstration of surgical anaesthesia quickly circulated around the world. He was a founder of the *New England Journal of Medicine* and was the third president of the American Medical Association. He was the first Dean of Harvard Medical School and a founding member of the Massachusetts General Hospital.



**Dr John Collins Warren c. 1850 and Re-enactment of the October 16, 1846, ether operation; daguerreotype by Southworth & Hawes.**

## ADMISSIONS

Admission to Harvard Medical School's MD program is highly selective. There are 165 total spots for each incoming class, with 135 spots in the Pathways curricu-

lum and 30 spots in the HST program. While both use a single application, each curricular track independently evaluates applicants.

For the MD Class of 2023, 6,815 candidates applied and 227 were admitted (3.3%). There was a matriculation rate of 73%. For the Master of Medical Sciences (MMSc) program in Global Health Delivery, the Fall 2020 admissions rate was (8.2%).

## GRADUATE EDUCATION

### PhD degree programs

There are nine PhD programs based at Harvard Medical School. Students in these programs are all enrolled in the Division of Medical Sciences at the Graduate School of Arts and Sciences (GSAS) and are part of the HILS (Harvard Integrated Life Sciences) inter-program federation.

### Master's degree programs

Harvard Medical School offers two types of master's degrees, Master of Medical Sciences (MMSc) degrees and Master of Science (MS) degrees.

### Postgraduate certificate programs

Harvard Medical School offers several Postgraduate Certificate programs. These graduate-level programs may run up to twelve months. Admitted participants are awarded a Certificate from Harvard Medical School upon successful completion and are eligible for associate membership in the Harvard Alumni Association.

## AFFILIATED TEACHING HOSPITALS AND RESEARCH INSTITUTES

Harvard Medical School does not directly own or operate any hospitals and instead relies on affiliated teaching hospitals for clinical education. Medical students primarily complete their clinical experiences at the following hospitals. Clinical faculty at Harvard Medical School generally hold a concurrent appointment as a physician or a surgeon at one of the affiliated hospitals. Basic science faculty at Harvard Medical School may hold the primary appointment at the school itself or at one of the affiliated hospitals.

Professor A.O. Okhunov was honoured to visit and speak at Brigham and Women's Hospital. Brigham and Women's Hospital (BWH) is the second-largest teaching hospital of Harvard Medical School and the largest hospital in the Longwood Medical Area in Boston, Massachusetts. Along with Massachusetts General Hospital, it is one of the two founding members of Mass General Brigham, the largest healthcare provider in Massachusetts. Robert Higgins, MD, MSHA serves as the hospital's current president.





Brigham and Women's Hospital conducts the second largest (behind MGH) hospital-based research program in the world, with an annual research budget of more than \$630 million. Pioneering achievements at BWH have included the world's first successful heart valve operation and the world's first solid organ transplant.

In the 2022 U.S. News & World Report hospital rankings, BWH was ranked fourteenth nationally.

Brigham and Women's Hospital was established with the 1980 merger of three Harvard-affiliated hospitals: Peter Bent Brigham Hospital (established in 1913); Robert Breck Brigham Hospital (established in 1914); and Boston Hospital for Women (established in 1966 as a merger of Boston Lying-In Hospital, established in 1832, and Free Hospital for Women, established in 1875).

In 1954, the Peter Bent Brigham Hospital became the location for the first-ever successful kidney transplant, performed on identical twins, Ronald Hendrick (the donor) and Richard Hendrick (the recipient). J. Hartwell Harrison, Chief of the Urology Department, operated on the donor, and Joseph Murray was the surgeon for the recipient. Murray later received a Nobel Prize for this and other work. Dr. Samuel A. Levine introduced the arm-chair treatment of myocardial infarction in the

1950s and his protégé Dr. Bernard Lown was an early innovator in the development of the coronary care unit in the 1960s.

After a 10-year affiliation with Faulkner Hospital in the Jamaica Plain section of Boston, BWH merged with the community hospital in 2012 to form Brigham and Women's Faulkner Hospital.

**Dana-Farber Brigham and Women's Cancer Center:**

The centre brings together a cancer institute and a hospital, creating 13 specialized disease centres.

**Carl J. and Ruth Shapiro Cardiovascular Center.**

**Brigham and Women's Orthopedic and Arthritis Center:** They specialize in research and therapies for bone and joint disease and injury.

**Brigham and Women's Neurosciences Institute:**

The BWH Neurosciences Institute offers treatments for all nervous system diseases. The institute integrates neurology, neurosurgery, psychiatry and neuroradiology, with advanced research and clinical trials.

**Mary Horrigan Connors Center for Women's Health:** BWH specializes in high-risk obstetric care, newborn intensive care, infertility services, complex gynecologic surgery, and gender-specific care.

**Osher Center for Integrative Medicine** including chiropractic care.

In 2013, the BWH Biomedical Research Institute (BRI) received \$630 million in research support from all sources. For over a decade, it has been one of the two hospitals receiving the most National Institutes of Health (NIH) funding among independent hospitals in the United States. It employs over 3,300 researchers.

BRI has worked on regenerative medicine, designing nanoparticles to attack different cancer types, and starting a clinical trial for a type of Alzheimer's disease vaccine. BWH research also includes population studies including the Nurses' Health Study and Physicians' Health Study.

The 21st century has seen dramatic shifts in the diagnostic and therapeutic approach to lung carcinomas, beginning with the discovery of epidermal growth factor receptor (EGFR) mutations and their role in directing management with targeted tyrosine kinase inhibitors. Since 2003, this has reshaped the approach at BWH's molecular diagnostic testing centre.

In 2017, the hospital began the first human clinical trials to reverse the ageing process using NAD+. The trials are headed by biologist David Andrew Sinclair.

In 2019, BWH opened the Brigham Preventive Genomics Clinic, becoming one of the first hospitals in the United States to offer DNA sequencing, reporting, and

interpretation of disease-associated genes to healthy patients seeking to reduce their risk of future disease.

There are over 10,425 alumni. Harvard Medical School has trained more current full-time academic faculty, department chairs, and medical school deans than any other single medical school. It has also trained more Nobel Prize winners in Medicine and Physiology than any other medical school.

Harvard's 209-acre (85 ha) main campus is centred on Harvard Yard ("the Yard") in Cambridge, about 3 miles (5 km) west-northwest of downtown Boston and extends into the surrounding Harvard Square neighbourhood. The Yard contains administrative offices such as University Hall and Massachusetts Hall; libraries such as Widener, Pusey, Houghton, and Lamont; and Memorial Church.

The Yard and adjacent areas include the main academic buildings of the Faculty of Arts and Sciences, including the college, such as Sever Hall and Harvard Hall.

Freshman dormitories are in, or adjacent to, the Yard. Upperclassmen live in the twelve residential houses – nine south of the Yard near the Charles River, the others half a mile northwest of the Yard at the Radcliffe Quadrangle (which formerly housed Radcliffe College students). Each house is a community of undergraduates, faculty deans, and resident tutors, with its own dining hall, library, and recreational facilities.

### TEACHING AND LEARNING

Harvard is a large, highly residential research university[75] offering 50 undergraduate majors, 134 graduate degrees, and 32 professional degrees. During the 2018–2019 academic year, Harvard granted 1,665 baccalaureate degrees, 1,013 graduate degrees, and 5,695 professional degrees.

The four-year, full-time undergraduate program has a liberal arts and sciences focus. To graduate in the usual four years, undergraduates normally take four courses per semester. In most majors, an honours degree requires advanced coursework and a senior thesis. Though some introductory courses have large enrollments, the median class size is 12 students.

### RESEARCH

Harvard is a founding member of the Association of American Universities and a preeminent research university with "very high" research activity (R1) and comprehensive doctoral programs across the arts, sciences, engineering, and medicine according to the Carnegie Classification.



**Massachusetts Hall (1720), Harvard's oldest building**



**Harvard Yard**

With the medical school consistently ranking first among medical schools for research, biomedical research is an area of strength for the university. More than 11,000 faculty and over 1,600 graduate students conduct research at the medical school as well as its 15 affiliated hospitals and research institutes. The medical school and its affiliates attracted \$1.65 billion in competitive research grants from the National Institutes of Health in 2019, more than twice as much as any other university.

### LIBRARIES

The Harvard Library system is centred in Widener Library in Harvard Yard and comprises nearly 80 individual libraries holding about 20.4 million items. According to the American Library Association, this makes it the largest academic library in the world.





**Widener Library anchors the Harvard Library system.**

Houghton Library, the Arthur and Elizabeth Schlesinger Library on the History of Women in America, and the Harvard University Archives consist principally of rare and unique materials. America's oldest collection of maps, gazetteers, and atlases both old and new is stored in Pusey Library and open to the public. The largest collection of East-Asian language material outside of East Asia is held in the Harvard-Yenching Library.



**Henry Moore's sculpture Large Four Piece Reclining Figure, near Lamont Library**

The Harvard Art Museum comprise three museums. The Arthur M. Sackler Museum covers Asian, Mediterranean, and Islamic art, the Busch-Reisinger Museum (formerly the Germanic Museum) covers central and northern European art, and the Fogg Museum covers Western art from the Middle Ages to the present emphasizing Italian early Renaissance, British pre-Raphaelite,

and 19th-century French art. The Harvard Museum of Natural History includes the Harvard Mineralogical Museum, the Harvard University Herbaria featuring the Blaschka Glass Flowers exhibit, and the Museum of Comparative Zoology. Other museums include the Carpenter Center for the Visual Arts, designed by Le Corbusier and housing the film archive, the Peabody Museum of Archaeology and Ethnology, specializing in the cultural history and civilizations of the Western Hemisphere, and the Harvard Museum of the Ancient Near East featuring artefacts from excavations in the Middle East.

## **EPILOGUE**

Among overall rankings, the Academic Ranking of World Universities (ARWU) has ranked Harvard as the world's top university every year since it was released. When QS and Times Higher Education collaborated to publish the Times Higher Education–QS World University Rankings from 2004 to 2009, Harvard held the top spot every year and continued to hold first place on THE World Reputation Rankings ever since it was released in 2011. In 2019, it was ranked first worldwide by SCImago Institutions Rankings. It was ranked in the first tier of American research universities, along with Columbia, MIT, and Stanford, in the 2019 report from the Center for Measuring University Performance. Harvard University is accredited by the New England Commission of Higher Education.

Among rankings of specific indicators, Harvard topped both the University Ranking by Academic Performance (2019–2020) and Mines ParisTech: Professional Ranking of World Universities (2011), which measured universities' numbers of alumni holding CEO positions in Fortune Global 500 companies. According to annual polls done by The Princeton Review, Harvard is consistently among the top two most-named dream colleges in the United States, both for students and parents. Additionally, having made significant investments in its engineering school in recent years, Harvard was ranked third worldwide for Engineering and Technology in 2019 by Times Higher Education.

In international relations, Foreign Policy magazine ranks Harvard best in the world at the undergraduate level and second in the world at the graduate level, behind the Edmund A. Walsh School of Foreign Service at Georgetown University.

**Competing interests – No.**

**REFERENCES:**

1. De Gavieres F., Khalmatova B., Okhunov A.O., Atakov S.S. (2023). COMPLUTENSE UNIVERSITY OF MADRID: Impressions. JOURNAL OF EDUCATION AND SCIENTIFIC MEDICINE, 1(1), 62-72. Retrieved from <https://journals.tma.uz/index.php/jesm/article/view/465>

2. Shadmanov A.K., Kawell Z., Okhunov A.O. (2023). FEATURES OF THE EDUCATIONAL PROGRAM IN FOREIGN UNIVERSITIES: ON THE EXAMPLE OF THE MEDICAL COLLEGE OF THE UNIVERSITY OF CENTRAL FLORIDA, USA. JOURNAL OF EDUCATION AND SCIENTIFIC MEDICINE, 2(2), 2-9. Retrieved from <https://journals.tma.uz/index.php/jesm/article/view/440>

3. Shadmanov A.K., Okhunov A.O., Bobokulova Sh. A. (2023). WHAT DO YOU KNOW ABOUT THE ROYAL COLLEGE OF PHYSICIANS (LONDON, UK)? RESULTS OF THE VISIT. JOURNAL OF EDUCATION AND SCIENTIFIC MEDICINE, 1(3), 2-10. Retrieved from <https://journals.tma.uz/index.php/jesm/article/view/448>

4. Shadmanov A.K., Okhunov A.O. THE UNIVERSITY OF CALIFORNIA, SAN FRANCISCO (USA) – entirely dedicated to health sciences and life sciences. // Journal of Educational & Scientific Medicine, 2023. Vol. 2, Issue 3, P. 2-14