

Healthcare Sector

Authors

The U.S.-U.A.E. Business Council is the premier business organization dedicated to advancing bilateral commercial relations. By leveraging its extensive networks in the United States and in the region, the U.S.-U.A.E. Business Council provides unparalleled access to senior decision makers in business and government with the aim of deepening bilateral trade and investment

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Introduction



Source: Cleveland Clinic

U.S. hospitals engage with the U.A.E. through a multifaceted approach that spans medical treatment, education, research, philanthropy, investment, and exchange of global best practices. Prominent U.S. medical institutions have provided world-class care to patients from the U.A.E., as demonstrated by the treatment of the U.A.E.'s founding father, His Highness Sheikh Zayed bin Sultan Al Nahyan, at some of the most prestigious hospitals in the United States. In addition, U.S. institutions have hosted Emirati medical students, researchers, doctors, healthcare executives, and officials that come seeking education, training, and partnerships. Delegations of government officials and private sector partners from both countries exchange visits regularly with the intention of sharing best practices, collaborating on medical research and care, and exploring investment and philanthropic opportunities. Through such bilateral engagements U.S. healthcare institutions have found and will continue to receive support from the U.A.E. to enhance provision of care and advance cutting-edge research and innovation.

Opportunities for U.S. institutions to engage with the U.A.E have changed significantly, largely due to the U.A.E.'s response to the COVID-19 pandemic and the lessons learned around the world as a result. The majority of bilateral healthcare collaboration that took place in the U.S. was historically based around international patient care in hospitals. This dynamic, however, is shifting because of the U.A.E.'s push to develop its local healthcare capacity, both in terms of personnel as well as and research and development. Healthcare has become a key focus area for the U.A.E. government, as evidenced by the most recently announced federal strategy "We the U.A.E. 2031," which aims to rank the country in the top-10 globally for quality of healthcare. These developments have and will continue to pave the way for new opportunities for U.S. healthcare institutions to collaborate with leading U.A.E. entities in the public and private sectors.

This report will demonstrate that opportunities for collaboration open to U.S. institutions will be reshaped by the U.A.E.'s shift from an international patient care model to a local capacity-building model. It will frame the U.A.E.'s post-COVID, renewed emphasis on developing its domestic healthcare systems as the foundation for these new opportunities in the areas of international patient care, in-country hospital partnerships, education and research exchanges, bilateral investment, and global philanthropy.

The third edition of this bi-yearly study, first released in 2019, surveys U.S. healthcare institutions and their important collaborations and partnerships with U.A.E. institutions, both within the United States, the U.A.E., and abroad. As such, in its focus on the U.S. healthcare market, it complements the U.S.-U.A.E. Business Council's annual report on the U.A.E. Healthcare Sector, which discusses in more detail some of the work that U.S. healthcare institutions are doing in the U.A.E. market. Both reports highlight the leading healthcare businesses and institutions that are members of the U.S.-U.A.E. Business Council, outline the priorities of U.S. and U.A.E. health authorities, and provide up-to-date information on trends and developments in the industry.

COVID-19 Response



Source: <u>wam.ae</u>

The COVID-19 pandemic prompted a shift in the U.A.E.'s entire healthcare ecosystem, driving the country's leadership to build its local healthcare capacity in the interest of creating nationwide health security. Not only did the U.A.E. effectively mitigate the spread of disease and reduce fatalities during the pandemic, but it also responded to the global logistics challenges such as supply chain and personnel shortages. This facilitated both its expedient return to economic activity and its rise as a global leader in healthcare and life sciences.

In terms of mitigation, the U.A.E. ranked fifth globally in vaccine availability, following the U.S., China, the U.K., and Israel." It systematically kept people safe by quickly implementing measures such as mass vaccinations, testing, quarantines, and strictly enforced public masking and gathering policies. The U.A.E. health authorities wasted little time in authorizing for public use the COVID-19 vaccines produced by Sinopharm, Pfizer, AstraZeneca, Moderna, and Sputnik V. The U.A.E. also brought its strengths in other sectors, such as manufacturing, logistics, and technology to the front lines in combatting the pandemic. Abu Dhabi-based technology company G42 (now called M42), formed a joint venture with Sinopharm in early 2021 to locally manufacture the same inactivated vaccine product, created by the Beijing Institute of Biological Product, under the name Hayat-Vax." Honeywell, a U.S.based aerospace and technology company, partnered with Mubadala's aerospace subsidiary, Strata, in 2020 to produce 90,000 N-95 face masks in its factory in Al-Ain, Abu Dhabi. The U.A.E. leveraged its key geographic location and world-renowned logistics infrastructure to help countries around the world deal with the pandemic through two private institutions dedicated to COVID-19 relief: the HOPE Consortium and the Dubai Vaccine Logistics Alliance. Both initiatives centralized the U.A.E. as a hub for global vaccine distribution, utilizing shipping and logistics networks in partnership with Etihad Cargo, Abu Dhabi Ports Company (ADQ), Rafed, and SkyCell (a Swiss company that makes temperature-controlled logistics containers for pharmaceutical product transportation). The U.A.E. also pioneered the development of digital infrastructure to monitor patient data, vaccination records, and track the movement of individuals that fell sick with the virus. Mobile device applications such as ALHOSN, developed by the U.A.E.'s Ministry of Health and Prevention (MoHAP), leveraged artificial intelligence to provide individuals with guidance and to track their own COVID-19 test results for compliance with local regulations.



Source: Etihad official Facebook page

In terms of international patient care, the COVID-19 pandemic led the U.A.E. to reflect on its domestic capabilities to treat and care for its citizens and residents. This reinforced the leadership's conviction to develop its local healthcare capacity and has impacted the opportunities for U.S. institutions to interact with the U.A.E. today and in future collaborations. For more information about the U.A.E.'s development of its local healthcare system following the pandemic, please see the U.S.-U.A.E. Business Council's other reference guide outlining the "U.A.E. Healthcare Sector," which can be found here.

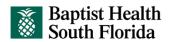
Medical Care



While official data is not made publicly available, every year there are hundreds of Emirati adults and children that come to hospitals across the United States to receive medical care from the world's leading healthcare institutions. Several Business Council member hospitals are among the top 22 hospitals in the United States, according to the U.S. News and World Report's 2023-24 Best Hospitals Honor Roll, and are also among the best hospitals in the world. As such, they attract Emirati patients seeking specialized care at the cutting edge of medicine.

Emirati patients turn to U.S. hospitals seeking specialized care in cases where the specialty does not exist in the U.A.E. or local hospitals do not offer specific treatments. Based on studies assessing the in-demand medical professionals in the U.A.E., many of these specialty areas that face shortages in the U.A.E. include adult and pediatric cardiology, gastroenterology, occupational medicine, oncology, orthopaedics, neonatology, neurology, pulmonology, sports medicine, and urology. While local capacity and treatment options continue to improve, Emiratis still seek out care in the United States because U.S. institutions rank among the world's best in terms of research, technology, and cutting-edge surgeries and treatments. Many of these include the Business Council's member institutions – for instance, Cleveland Clinic is recognized by U.S. News and World Report as the top hospital for cardiology and heart surgery; Mayo Clinic for diabetes and endocrinology, gastroenterology and GI surgery, and pulmonology and lung surgery; Stanford for ear, nose, and throat surgery; Brigham and Women's for obstetrics and gynecology; Hospital for Special Surgery for orthopedics; and Johns Hopkins for rheumatology.

Leading U.S. hospitals differentiates themselves from their peers by providing cutting-edge treatments in specific areas, creating a wide variety of options for Emirati adult and children patients. For instance:



Baptist Health is regionally ranked by U.S. News and World Report as one of the top hospitals in Florida with high performance in adult specialty treatments including colon cancer surgery; diabetes; heart attack and heart failure; kidney failure; leukemia, lymphoma and myeloma surgery; lung cancer surgery; stroke; knee replacement; Chronic Obstructive Pulmonary Disease (COPD); pneumonia; and prostate cancer surgery.



Barnes-Jewish Hospital is on the U.S. News and World Report Best Hospitals Honor Roll and is nationally ranked in 11 adult specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; ear, nose, and throat; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; orthopedics; pulmonology and lung surgery; and urology. Barnes-Jewish is one of the primary affiliated hospitals of the Washington University School of Medicine in St. Louis, Missouri.



Baylor St. Luke's is nationally ranked in six adult specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; and urology.



Brigham and Women's Hospital is ranked on the Best Hospitals Honor Roll and is nationally ranked in 12 adult specialties – most notably as 1st in the nation for obstetrics and gynecology.



Cedars-Sinai is on the Best Hospitals Honor Roll and ranks nationally in 11 adult specialties including 2^{nd} in the country for cardiology and heart surgery; 2^{nd} for gastroenterology and GI surgery; 2^{nd} for orthopedics; and 2^{nd} for pulmonary and lung surgery.



Cleveland Clinic is also an Honor Roll hospital and is ranked nationally in 12 adult specialties and 10 children's specialties. Cleveland Clinic is renowned for its cardiology, and heart surgery program, which ranks 1st in the country. Its other notable specialties include ranking 2nd nationally for urology and 3rd for rheumatology.



Dana-Farber Cancer Center is ranked 5th for cancer treatment nationally, with high performance in colon cancer surgery; leukemia, lymphoma and myeloma; lung cancer surgery; ovarian cancer surgery; prostate cancer surgery; and uterine cancer surgery.



Hospital for Special Surgery (HSS) is nationally ranked in two adult specialties: 1st in orthopedics and 2nd in rheumatology, as well as one children's specialty in pediatric orthopedics.



Houston Methodist is ranked on the Best Hospitals Honor Roll as well as nationally ranked in 10 adult specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; orthopedics; pulmonology and lung surgery; and urology.



Indiana University Health is the top hospital in Indiana and nationally ranked in 10 children's specialties including neonatology; pediatric cancer; pediatric cardiology and heart surgery; pediatric diabetes and endocrinology; pediatric gastroenterology and GI surgery; pediatric nephrology; pediatric neurology and neurosurgery; pediatric orthopedics; pediatric pulmonology and lung surgery; and pediatric urology.



Johns Hopkins is on the Best Hospitals Honor Roll and ranks first in the country for its rheumatology program. Its other 14 nationally ranked adult specialties include cancer; cardiology and heart surgery; diabetes and endocrinology; ear, nose, and throat; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; ophthalmology; orthopedics; psychiatry; pulmonology and lung surgery; rehabilitation; and urology.



Mayo Clinic is on the Best Hospitals Honor roll and ranks nationally in 13 adult specialties and 8 children's specialties. Its specialty medicine programs rank 1st in diabetes and endocrinology; 1st in gastroenterology and GI surgery; 1st in pulmonology and lung surgery; 3rd in cancer; 3rd in cardiology and heart surgery; 3rd in obstetrics and gynecology; and 3rd in orthopedics.



New York Presbyterian is an Honor Roll hospital that ranks nationally in 14 adult and 10 pediatric specialties. Most notably, it is ranked 2nd for rheumatology; 3rd in diabetes and endocrinology; 3rd in neurology and neurosurgery; and 3rd in psychiatry.



Northwestern Medicine is ranked on the Best Hospitals Honor roll and ranks nationally in 11 adult specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; ear, nose, and throat; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; orthopedics; pulmonology and lung surgery; and urology.



Penn Medicine is consistently recognized nationally and internationally for excellence in health care, and it was also ranked in the Best Hospitals Honor Roll. Notably, 531 physicians at Penn Medicine were recognized in Philadelphia Magazine's "Top Docs 2022" publication. VIII



Stanford Medicine is on the Best Hospitals Honor roll and notably ranks 1st in the United States in ear, nose, and throat surgery. It also ranks nationally in 11 specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; orthopedics; pulmonology and lung surgery; and urology.



UChicago Medicine is nationally ranked in 10 adult specialties including cancer; cardiology and heart surgery; diabetes and endocrinology; ear, nose and throat; gastroenterology and GI surgery; geriatrics; neurology and neurosurgery; obstetrics and gynecology; pulmonology and lung surgery; and urology, as well as pediatric gastroenterology and GI surgery.



UCLA Medical Center is recognized on the Best Hospitals Honor Roll and is nationally ranked in 14 adult specialties and 9 pediatric specialties. Among these, UCLA ranks 3rd in the nation for ear, nose, and throat treatments, 3rd for gastroenterology & GI surgery, and 3rd for geriatrics.

Emirati children also receive treatment at leading U.S. children's hospitals for a variety of specialties, and many of the Business Council's member hospitals are leading pediatric institutions. For instance, Cincinnati Children's is recognized by *U.S. News and World Report* as the best healthcare provider for pediatric cancer, diabetes and endocrinology (tie), neonatology, and urology; Boston Children's Hospital for diabetes and endocrinology (tie), gastroenterology and GI, and neurology and neurosurgery; and Children's Hospital of Philadelphia (CHOP) for orthopedics.^{ix}



Boston Children's Hospital was ranked the 2nd Best Children's Hospital in the country in 2023 by U.S. News and World Report. It is also nationally ranked in 10 pediatric specialties including 1st in the nation for pediatric diabetes and endocrinology, 1st for pediatric gastroenterology and GI surgery, 1st for pediatric neurology and neurosurgery, 2nd for pediatric cancer, 2nd for pediatric nephrology, and 2nd for pediatric urology.



Children's Hospital Los Angeles (CHLA) ranks 7^{th} nationally on the Children's Hospital Honor Roll as well as in 10 pediatric specialties, including 2^{nd} for pediatric orthopedics and 3^{rd} for pediatric cancer.



Children's Hospital of Philadelphia (CHOP) is 4th in the country on the Best Children's Hospitals Honor Roll. It is also nationally ranked in 10 pediatric specialties including 1st for pediatric orthopedics and 3rd for pediatric diabetes and endocrinology.



Children's National Hospital is ranked 5th in the country on the Best Children's Hospitals Honor Roll. It is also ranked nationally in 10 pediatric specialties including 2nd for neonatology and 3rd for pediatric neurology and neurosurgery.



Cincinnati Children's Hospital Medical Center was ranked the #1 Best Children's Hospital on the 2023 *U.S. News and World Report.* Additionally, it is nationally ranked in 10 children's specialties including 1st for neonatology, 1st for pediatric cancer, 1st for pediatric diabetes and endocrinology, 1st for pediatric urology, 2nd for pediatric gastroenterology and GI surgery, 2nd for pediatric pulmonology and lung surgery, 3rd for pediatric nephrology, and 3rd for pediatric orthopedics.



Lurie Children's Hospital is regionally ranked as the best children's hospital in Illinois and nationally ranked in 9 pediatric specialties including neonatology, pediatric cancer, pediatric cardiology and heart surgery, pediatric diabetes and endocrinology, pediatric gastroenterology and GI surgery, pediatric nephrology, pediatric neurology and neurosurgery, pediatric pulmonology and lung surgery, and pediatric urology.



Nationwide Children's Hospital ranked 6th on the Best Children's Hospitals Honor Roll. It notably ranked at 3rd for pediatric pulmonology and lung surgery, as well as ranked nationally in 9 other pediatric specialties including neonatology, pediatric cancer, pediatric cardiology and heart surgery, pediatric diabetes and endocrinology, pediatric gastroenterology and GI surgery, pediatric nephrology, pediatric neurology and neurosurgery, pediatric orthopedics, and pediatric urology.



Nemours Children's Hospital has branches across the country but most notably in Delaware and Florida, with each hospital ranking regionally in both states. Nemours Children's Hospital-Delaware is nationally ranked in five pediatric specialties including pediatric cancer, pediatric cardiology and heart surgery, pediatric diabetes and endocrinology, pediatric gastroenterology and GI surgery, and pediatric orthopedics.



UPMC is ranked 8th on the Best Children's Hospital Honor Roll and is nationally ranked in 10 pediatric specialties including neonatology, pediatric cancer, pediatric cardiology and heart surgery, pediatric diabetes and endocrinology, pediatric gastroenterology and GI surgery, pediatric nephrology, pediatric neurology and neurosurgery, pediatric orthopedics, pediatric pulmonology and lung surgery, and pediatric urology.

At the same time U.S. hospitals deliver best-in-class medical care to Emiratis, they also provide a holistic patient experience. When Emiratis travel to the United States for medical care, these patients tend to bring their families and stay for lengthy periods of time. U.S. hospitals cater to their needs by providing or facilitating special services including visa assistance, VIP medical transportation by road and air, luxury accommodation, and high-end concierge services.

Many American hospitals work to make Emirati patients feel supported by providing them with interpreters, Imams, and culturally appropriate care. The University of Chicago, for instance, is home to an initiative on Islam and Medicine. This center for study and dialogue at the intersection of the Islamic tradition and biomedicine helps provide UChicago Medicine with evidence-based, theologically and culturally tailored healthcare services and interventions.*



Companies across other sectors also support the overall patient experience, especially during times of emergency. For example, companies such AirMed and International SOS perform medical evacuations in crisis or emergency situations. With international call centers and 24/7 availability, these companies provide assistance throughout the emergency process, both in-person and virtually.

U.S. healthcare institutions report that the U.A.E. Embassy in Washington, D.C. has historically played a critical role in coordinating and facilitating the provision of medical care for Emirati patients in the United States, working alongside other entities like the U.A.E. Ministry of Defense, Department of Health - Abu Dhabi (DoH), and Dubai Health Authority (DHA). Hospitals work with the U.A.E. Embassy to ensure that patients receive the best possible care and that their travel to and

stay in the U.S. for treatment operates smoothly and safely. While U.S. institutions report that the Embassy continues to maintain its facilitation role, they have also noted a trend in more direct engagement with emirate-level health authorities that supplement coordination with the Embassy. U.S. hospitals appreciate this added level of engagement, as these changes are aimed at optimizing and streamlining the overall international patient care program. Additionally, this development reflects the individual emirate-level desire to collaborate directly with U.S. institutions in other areas as well, and offers opportunities to explore other partnership opportunities.

2023-24 U.S. News and World Report Best Hospitals

- Barnes-Jewish Hospital, St. Lewis, Missouri
- Brigham and Women's Hospital, Boston, Massachusetts
- Cedars-Sinai Medical Center, Los Angeles, California
- Cleveland Clinic, Ohio
- Hospitals of the University of Pennsylvania
- Houston Methodist Hospital, Texas
- · Johns Hopkins Hospital, Baltimore, Maryland
- Massachusetts General Hospital, Boston, Massachusetts
- Mayo Clinic, Rochester, Minnesota
- Mount Sinai Hospital, New York
- New York-Presbyterian Hospital-Columbia and Cornell, New York
- North Shore University Hospital at Northwell Health, Manhasset, New York
- Northwestern Medicine, Chicago, Illinois
- NYU Langone Hospitals, New York
- Rush University Medical Center, Chicago, Illinois
- Stanford Health Care-Stanford Hospital, California
- UCLA Medical Center, Los Angeles, California
- UC San Diego Health, California
- UCSF Health, San Francisco, California
- University of Michigan Health, Ann Arbor, Michigan
- UT Southwestern Medical Center, Dallas, Texas
- Vanderbilt University Medical Center, Nashville, Tennessee

2023-24 U.S. News and World Report Best Hospitals by Specialty



CANCER **University of Texas MD Anderson**



OPHTHALMOLOGY **Bascom Palmer Eye Institute**



CARDIOLOGY & HEART SURGERY Cleveland Clinic



ORTHOPEDICS Hospital for Special Surgery



DIABETES & ENDOCRINOLOGY Mayo Clinic



PSYCHIATRY McLean Hospital



EAR, NOSE, & THROAT **Stanford Health Care**



PULMONOLOGY & LUNG **Mayo Clinic**



GASTROENTEROLOGY & GI Mayo Clinic



REHABILITATION Shirley Ryan AbilityLab



GERIATRICS Mount Sinai Hospital



RHEUMATOLOGY **Johns Hopkins Hospital**



NEUROLOGY & NEUROSURGERY NYU Langone Hospitals



UROLOGY Memorial Sloan Kettering Cancer Center



OBSTETRICS & GYNECOLOGY Brigham and Women's Hospital

2023-24 U.S. News and World Report Best Children's Hospitals

- 1. Cincinnati Children's Hospital Medical Center, Ohio
- 2. Boston Children's Hospital, Massachusetts
- 3. Texas Children's Hospital, Houston
- 4. Children's Hospital of Philadelphia (CHOP), Pennsylvania
- 5. Children's National Hospital, Washington, D.C.

- 6. Nationwide Children's Hospital, Columbus, Ohio
- 7. Children's Hospital Los Angeles, California
- 8. UPMC Children's Hospital of Pittsburgh, Pennsylvania
- 9. Rady Children's Hospital, San Diego, California
- 10. Johns Hopkins Children's Center, Baltimore, Maryland

2023-24 U.S. News and World Report Best Children's Hospitals by Specialty



CANCER

Cincinnati Children's Hospital Medical Center



NEPHROLOGY

Texas Children's Hospital



CARDIOLOGY & HEART SURGERY

Texas Children's Hospital



NEUROLOGY & NEUROSURGERY

Boston Children's Hospital



DIABETES & ENDOCRINOLOGY

Boston Children's Hospital & Cincinnati Children's Hospital Medical Center



ORTHOPEDICS

Children's Hospital of Philadelphia



GASTROENTEROLOGY & GI

Boston Children's Hospital



PULMONOLOGY & LUNG

Texas Children's Hospital



NEONATOLOGY

Cincinnati Children's Hospital Medical Center



UROLOGY

Cincinnati Children's Hospital Medical Center

In-Country Hospital Partnerships



Source: Cleveland Clinic

U.S. hospitals can engage in partnerships within the U.A.E. through new opportunities that have arisen because of such shifts in the country's healthcare ecosystem and the leadership's priorities. A key priority is the building and development of local hospitals, medical facilities, and research and education centers. Leading U.S. medical institutions can find partnerships with the U.A.E. government and private sector institutions aimed at achieving the overall goal of building a world-class, indigenous healthcare ecosystem that not only serves local residents but is also a hub for regional medical tourism.

U.S. institutions will notice the commitment to collaboration that is evident across the U.A.E., where investing in international partnerships to bring best-in-class healthcare and medical research remains a top priority. Several recently-developed U.A.E. healthcare institutions serve as examples of collaboration with top U.S. healthcare providers.

Cleveland Clinic Abu Dhabi (CCAD) is the flagship partnership of the U.A.E.'s Mubadala Health (recently re-branded as M42, a partnership between Mubadala Health and G42 Healthcare) and the U.S.-based Cleveland Clinic Foundation. It is one of the first and most extensive examples of in-country development by a U.S.-based hospital in the U.A.E., with 394 beds, and treatment capacity for more than 40 medical and surgical specialties. In March 2023, CCAD opened the Fatima bint Mubarak Cancer Center, which is modeled after the Taussig Cancer Center at Cleveland Clinic in Ohio that is ranked 6th in the United States for cancer treatment.xi



Source: The National

The emirate of Sharjah has also made significant recent strides in developing its local health ecosystem, building new public-private partnerships with key U.S. hospitals in the Boston, Massachusetts health and life sciences ecosystem. In May 2023, BEEAH Group, a Sharjah-based public-private holding company dedicated to advancing sustainability initiatives and future technologies, announced a new project in partnership with Mass General Brigham and Dana-Farber Cancer Institute to develop the Jawaher Boston Medical District in Sharjah.xii This initiative will pave the way for a healthcare network in Sharjah that provides world-class healthcare in specialties such as oncology, women's health, pediatrics, cardiovascular, neuroscience, and rehabilitation – specialties for which treatment is not readily available in the U.A.E., especially in the northern emirates. It also seeks to bridge sustainability and healthcare by integrating innovative and sustainable practices into provision of care services and medical education and research.

Cleveland Clinic Abu Dhabi and Sharjah's Jawaher-Boston Medical District serve as two examples of in-country partnerships that are paving the way for U.S. healthcare institutions to increase their engagement with the U.A.E. for more holistic and bilateral partnerships.

Learning



Source: U.S.-U.A.E. Business Council

U.S. Healthcare Hubs as a Model

The U.S. boasts multiple healthcare hub cities in which healthcare providers, hospitals, universities, pharmaceutical and technology companies, investment funds, and governments collaborate to create ecosystems for healthcare provision, research, innovation, and training. Cities such as Boston, Chicago, Cleveland, Houston, New York City, San Diego, and San Francisco are some of the world's most well-known health and life sciences ecosystems. Visitors travelling to one or more of these cities for treatment, education, or research collaboration and conferences will find that each of these cities offer a range of services and unique cultural and social environments, providing opportunities to engage creatively and thoughtfully in more than just the medical field.

The U.A.E. leadership envisions the creation of its own world-class life sciences and healthcare ecosystem, as laid out in its federal and emirate-level strategies. Cities such as Abu Dhabi, Dubai, and Sharjah are developing their own ecosystems, leveraging the U.A.E.'s strategic location and infrastructure that position it as a hub for regional and international transportation, tourism, and business. Hospitals in U.S. healthcare hubs across the country can serve as models and strong partners for U.A.E. institutions striving to achieve similar local, cross-sector collaboration.

Such commitment to collaboration and learning is evident in the numerous healthcare delegations that visit the U.S. from the U.A.E., both at the federal and emirate levels. Department of Health Abu Dhabi, in its June 2023 visit to Boston, Massachusetts, met with local hospitals, medical universities, biopharmaceutical companies, and technology companies to explore the interaction of these players in the local life sciences ecosystem. In November 2023, the Dubai Health Authority sent a public health delegation to meet with U.S. health authorities such as the Centers for Disease Control and Prevention (CDC), the Federal Emergency Management Agency (FEMA), and Health and Human Services (HHS) to identify best practices for the emirate's own disease control, public health, emergency, and disaster response authorities.

Medical Education and Research

The U.A.E. has turned to leading U.S. hospitals for more than just best-in-class medical treatment. U.S. health education institutions also work with the U.A.E. to strengthen local capacity by training the next generation of Emirati doctors, nurses, researchers, and medical administrators. Emirati universities, hospitals, and healthcare entities collaborate with various hospitals throughout the United States to develop and empower their medical education and research programs. U.S. hospitals are uniquely suited to engage in visiting consultancy, education, and training partnerships as the U.A.E. continues to develop and expand its hospitals and medical education programs. In recent years, leading U.S. medical institutions, in partnership with U.A.E. hospitals and universities, have pioneered new research and clinical trials with the goal of developing a world-leading R&D and innovation ecosystem in the U.A.E. Both countries and their institutions can bring strengths to the table for literally 'out-of-thisworld' partnerships – as even U.S.-U.A.E. collaboration on space biology, for instance, engages students and researchers from both countries to develop new understandings and innovative solutions to address health challenges on earth.

- In Boston, **Brigham & Women's** Hospital's Department of Surgery offers a summer internship to eligible students from Mohammed bin Rashid University of Medicine and Health Sciences, providing students an opportunity for hands-on research and clinical observation.
- Children's Hospital of Philadelphia (CHOP), in cooperation with SEHA, remains committed to the advancement of incountry pediatric clinical capability through medical education and training. CHOP does this in part by entering an Emirati national medical student graduate into its three-year Pediatric Residency Program on an annual basis.
- **Children's National** provides four training positions to Emirati physicians during their clinical and trial rotations. It also provides work experience to a number of Emirati students from U.A.E. University, U.A.E. Higher Colleges of Technology, and Khalifa University each year. Children's National continues to execute the Visiting Physicians Program and research collaborations through the U.A.E. Ministry of Health and Prevention (MoHAP) as part of a longstanding agreement between the two institutions.
- The **MD Anderson Cancer Center** welcomed Dr. Ajlan Al Zaki as a hematology oncology fellow in 2020, an Emirati researcher who received his PhD from the University of Pennsylvania, and his MD from the George Washington University School of Medicine and Health Sciences. He was inspired to become a doctor after his grandfather was diagnosed with cancer and traveled to Texas to receive treatment at MD Anderson in 2005. Many years later, he returned to MD Anderson to give back the same standard of care as a medical provider. During the COVID-19 pandemic, Dr. Al Zaki remained in his position as an internal medicine resident at Stanford Health Care, where he treated COVID-19 patients. His current research at MD Anderson explores Chimeric antigen receptor (CAR) T-cells and reducing brain inflammation that occurs when using CAR T-cell therapies for lymphoma treatment.



Sultan Al Neyadi

Space biology research has been an important part of the Expedition 69 mission, launched in March 2023, that sent the second-ever astronaut from the U.A.E. to the International Space Station (ISS). Sultan Al Neyadi conducted the longest Arab Space Mission, spending six months at the ISS alongside American and Russian astronauts. Al Neyadi and his colleagues conducted over 200 experiments, including a study on the effects of microgravity on the human sleep cycle, research about microbial growth on stainless steel surfaces and pathogen immunity, and many observations to track the astronauts' physical and psychological responses before, during, and after their experience in space.*VI Many of these studies were made possible through collaboration with between U.S. and U.A.E. research institutions such as Harvard Medical School, Stanford University, and the Mohammed bin Rashid University of Medicine and Health Sciences.*VII

Case Study: Genomics Research and Precision Medicine



U.S. hospitals are also engaging with institutions in Abu Dhabi and Dubai to advance research in genomics and precision medicine. While both emirates largely develop and execute their own separate healthcare strategies and priorities in this field, they are united in national efforts to advance genomics research and precision medicine. In March 2023, U.A.E. President Sheikh Mohamed bin Zayed Al Nahyan and U.A.E. Vice President and Ruler of Dubai Sheikh Mohamed bin Rashid al Maktoum came together to unveil the National Genome Strategy, a project to map the DNA of every Emirati citizen.*Viii Noting that precision medicine and genomics is the future of medicine, H.H. Sheikh Mohamed bin Zayed noted at the ceremony that the implementation of this strategy, "highlights the country's position as a hub for advanced healthcare research, innovation, and future technology use."XiX As of 2023, more than 400,000 Emirati genome sequences have been mapped, with a goal of collecting 1 million samples.

Both the public and private sectors are mobilized through the Emirati Genome Project, and opportunities to collaborate abound for U.S. healthcare institutions with strong precision medicine programs. Many of these U.S. institutions are already engaged in such research in the United States. The U.S. National Institutes of Health's "All of Us" initiative for genomics research and precision medicine was launched in 2015, and authorized a total of \$1.5 billion in funding over ten years by the U.S. Congress under the "21st Century Cures Act," passed in 2016.** It is a first-of-its-kind, inclusive genomics research project that aims to enroll one million or more participants from across diverse communities in the United States over a 10-year period.** This initiative serves as an example of domestic public-private partnerships to advance this field, and brings together genomics patient data, researchers, and institutions, through localized, regional, and national facilities. Many of the Business Council's member institutions serve as healthcare providers and universities for the 'All of Us' initiative, including Brigham and Women's Hospital, New York-Presbyterian, Northwestern University, University of Chicago, and Washington University in St. Louis, which serve as regional medical centers, ensuring that program participants represent the geographic, ethnic, racial, and socioeconomic diversity of the country.** Other Business Council member institutions such as Baylor College of Medicine and Johns Hopkins University, alongside other U.S. institutions, serve as genome centers and support the initiative by generating genomic data using biological samples contributed by participants.** Mayo Clinic provides the sole 'biobank' storage facility for these samples and created it specifically for the initiative after being awarded the partnership opportunity.**

Investment



The United States has often been a destination for investment from the U.A.E.'s main sovereign wealth funds. ADQ and Mubadala, two of the U.A.E.'s largest investment funds, are the key drivers of the U.A.E.'s foreign direct investment, including in the healthcare sector through their healthcare-focused subsidiaries: PureHealth and M42, respectively. U.S. healthcare institutions are not alone in receiving investment from these groups, which build off the U.A.E.'s international connectivity and diplomatic agreements to broaden their investment profiles across the world.

PureHealth, an ADQ subsidiary, is the largest integrated healthcare services provider in the U.A.E., operating more than 25 hospitals, 100 clinics, and 160 laboratories in the country.** In May 2023, Ardent Health Services, the 4th-largest private healthcare provider in the United States, based in Nashville, Tennessee, sold a minority stake worth \$490 million to PureHealth.** This deal made PureHealth the first U.A.E.-based healthcare provider to directly own assets in a U.S. healthcare institution. Following this deal, PureHealth signed a partnership in June 2023 with Israel's Sheba Medical Center to conduct joint research, collaborate on staff training, and promote medical tourism.** In September 2023, it bought Circle Health Group – one of the United Kingdom's largest independent hospital operators, for \$1.2 billion, in its first entrance into the British market.** These major, first-time investments in the American, European, and Israeli healthcare markets demonstrate Abu Dhabi's commitment to developing its healthcare sector and partnerships on all fronts, domestically and internationally.

M42 is the tech-enabled healthcare company formed by merging the healthcare-focused branches of Mubadala Investment Company and G42, the U.A.E.'s homegrown artificial intelligence and technology company. In April 2023, M42 bought Sweden's dialysis provider, Diaverum, for an undisclosed amount. Diaverum is the third-largest dialysis service provider in the world, treating patients at 440 clinics in 23 countries. This transaction followed Mubadala's acquisition of Dental Care Alliance, a U.S.-based dental services company that supports 390 allied practices in 22 states.*** Mubadala's healthcare investments abroad are often intended to develop the U.A.E.'s healthcare sector as well, as evidenced by its partnership signed in January 2023 with U.S.-based Resilience, a biotechnology manufacturing company, to manufacture biopharmaceuticals in the U.A.E.***

Philanthropy



Source: Yousef al Otaiba

Gifts to U.S. Hospitals

Children's National Hospital has a long relationship with the U.A.E. which extends beyond medical treatment for Emiratis to encompass a broader goal of advancing pediatric care through research and innovation. In 2019, Children's National received a donation from the U.A.E. of \$30 million to support its new Children's National Research & Innovation Campus, a global hub for pediatric discovery that opened in Fall 2021. The gift supports the ongoing development of the campus, which has grown to encompass 160,000 square feet and include companies such as Johnson & Johnson's Innovation 'JLABS', the Center for Genetic Medicine Research, and the Rare Diseases Institute – all working collaboratively to find solutions for some of childhood's most challenging diseases and conditions.**

The campus operates six labs that focus on bringing advanced technologies such as precision medical imaging and medical robotics to pediatric patient care. Children's National named the main atrium of the Research & Innovation Campus in memory of the late Sheikh Zayed bin Sultan Al Nahyan, Founder of the U.A.E. In June 2022, then Chairman of the DoH Abu Dhabi, H.E. Sheikh Abdulla bin Mohammed Al Hamed, travelled to Washington, D.C. to take part in the inauguration of the Research and Innovation Campus alongside Dr. Kurt Newman, former President and Chief Executive of Children's National Hospital.

This gift is part of a larger philanthropic relationship between Children's National and the U.A.E. which first began in 2009, when the U.A.E. funded the creation of the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children's National. Since then, U.A.E. donations have yielded over \$180 million for health advances that have benefitted thousands of children and families.**

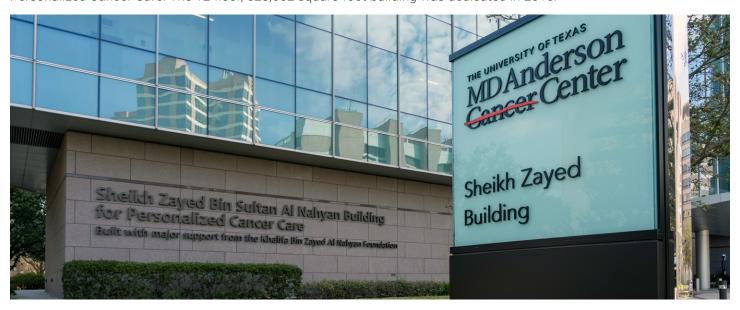
Moreover, the hospital has also received other donations from U.A.E. entities and individuals in the past decade including \$10.7 million raised by U.A.E. Ambassador H.E. Yousef Al Otaiba and his wife, Abeer Al Otaiba, as co-chairs of the Children's National 2014 ball in Washington, D.C. **xxxiii** In addition to its annual event in Washington, D.C., Children's National hosted a fundraising ball in February 2023 in Abu Dhabi that was attended by H.H. Sheikh Theyab bin Mohamed bin Zayed Al Nahyan, member of the Abu Dhabi Executive Council.**xxiiv

In February 2018, Johns Hopkins Medicine and the U.A.E. Embassy in Washington, D.C. announced a new institute for stroke research and clinical care. The Sheikh Khalifa Stroke Institute, established through a \$50 million gift to Johns Hopkins Medicine from the U.A.E., celebrated its five-year anniversary in September 2022. The Institute enables scientists at Johns Hopkins Medicine in Baltimore, Maryland to collaborate with Emirati counterparts, and has led to the Department of Health – Abu Dhabi's launch of the Standards for Licensed Stroke Centers agency and implementation of these standards at

facilities in the U.A.E. Other projects undertaken by the Sheikh Khalifa Stroke Institute through this partnership include combining real-time video with artificial intelligence to assess motor defects for stroke survivors, as well as an artificial intelligence-driven platform to map the incidence of intracerebral hemorrhages.**

This partnership with Johns Hopkins is part of an ongoing relationship that began in 2007, when His Highness President Sheikh Khalifa bin Zayed Al Nahyan made a donation to support the construction of the Johns Hopkins Hospital's new cardiovascular and critical care tower in Baltimore. The Sheikh Zayed Tower, which opened in 2012, houses the Johns Hopkins Heart and Vascular Institute, which features specialists in every branch of cardiac care, including cardiology, cardiac surgery, vascular medicine, and radiology. The Johns Hopkins Heart and Vascular Institute served as the site of the world's first human implantation of the automatic implantable defibrillator, and the first domino heart transplant procedure in the United States, among numerous other accomplishments.

MD Anderson has also partnered with the U.A.E. In 2011, the U.A.E.'s Khalifa Bin Zayed Al Nahyan Foundation announced a \$150 million grant to Houston-based MD Anderson to support the Sheikh Zayed Bin Sultan Al Nahyan Building for Personalized Cancer Care. The 12-floor, 628,652 square-foot building was dedicated in 2016. XXXVIIII



Cleveland Clinic, in addition to having an on-the-ground presence in Abu Dhabi, has extensive philanthropic and research partnerships with the U.A.E. back in the United States. A gift from the U.A.E. in March 2023 supported the creation of cancer research facilities and endowed a chair for research in cancer immunotherapy in Cleveland, Ohio and Port St. Lucie, Florida. The donation was made in honor of H.H. Sheikha Fatima bint Mubarak, the mother of H.H. Sheikh Mohamed bin Zayed Al Nahyan.**

Supporting Disaster Relief

Local communities in the United States have received assistance from the U.A.E. to rebuild their healthcare infrastructure in the wake of natural disasters. For instance, after the deadly 2011 tornadoes in Joplin, Missouri, the U.A.E. gave Mercy Hospital \$5 million to create an entire floor dedicated to pediatric care, which became its first neonatal intensive care unit.xl

In 2018, following the devastation caused by Hurricanes Harvey and Irma, the states of Texas and Florida received a donation of \$10 million from the U.A.E. to help finance recovery efforts. In Jacksonville, Florida, the Sulzbacher Center, an organization dedicated to fighting homelessness, used the funds to design and build multi-service mobile medical clinics to provide care, hygiene, and mental health services to homeless individuals.^{xii} In Houston, Texas the U.A.E.'s grant of



Source: The Joplin Globe

\$6.5 million helped expand the Houston Health Department's services for pediatric asthma, lead poisoning testing for children, and created the Children's Environmental Health Mobile Unit.** It also helped rebuild the Flores Neighborhood Public Library, which was re-opened in 2021.**

Promoting Healthy Lifestyles

The U.A.E. has also been active in raising awareness about diseases, promoting healthy lifestyles, and supporting communities in the United States.

Major League Soccer teams, Boys & Girls Clubs, and other organizations across cities in the U.S. have partnered with the U.A.E. to build or renovate over a dozen soccer fields and provide free coaching for children in underserved communities. These cities include Asbury Park, Atlantic City, Boston, Chicago, Cleveland, Dallas, Los Angeles, Miami, New York City, Philadelphia, and Washington, D.C. These facilities provide opportunities for children to stay fit, learn teamwork, and develop their passion for soccer and other sports through community partnerships.

The U.A.E. Embassy in Washington, D.C. regularly partners with the Susan G. Komen Foundation to raise awareness of breast cancer and facilitate more effective outcomes in its prevention and treatment. The Embassy is an annual official sponsor of the Susan G. Komen Race for the Cure in Washington, D.C.xlv



Source: WAM

In 2017, the U.A.E. funded the translation of the World Cancer Atlas into Arabic, a comprehensive guide which consolidates research from 185 countries, outlining the global cancer landscape. Through this undertaking, the U.A.E. Embassy in Washington, D.C. built a partnership with the American Cancer Society that eventually led to the inauguration of the "Relay for Life", a 24-hour walk to raise awareness for cancer, in the U.A.E. in 2017.xlvi

The U.A.E. Embassy also supports an annual Healthy Kidney Race. The race, launched in New York City in 2005, strives to promote awareness of kidney health and kidney diseases, and has drawn the support of nearly 100,000 runners since its inception. It was created following the kidney transplant surgery at Cleveland Clinic of the U.A.E.'s founder, His Highness Sheikh Zayed Bin Sultan Al-Nahyan.** In recent years, the Healthy Kidney races have taken place in Miami, Florida, where the 2023 edition was held on November 4th.

Similarly, on the West Coast, the U.A.E. Consulate in Los Angeles has been the biggest sponsor of the annual Thanksgiving Day Turkey Trot distance run, which attracts over 5,000 runners. This popular community event brings together thousands of runners to raise money for the Midnight Mission, a charitable organization working to tackle the challenge of homelessness in Los Angeles.xiviii In 2023, the 8th annual Turkey Trot sponsored by the U.A.E. took place in downtown Los Angeles on Thanksgiving morning, November 23rd.

Outlook

U.S. hospitals are at crossroads of opportunity for new and innovative, mutually-rewarding partnerships and collaboration in their relationships with the U.A.E., largely due to the recent trends and developments in the U.A.E.'s healthcare landscape. The U.A.E. has invested considerable time and resources into building its own healthcare infrastructure, in large part sparked by the lessons learned from the COVID-19 pandemic. This is transitioning the country's health care system from an international patient care-focused model to one with increased local capacity to serve and treat its own people as well as meet the growing demands of the global medical tourism industry.

As the availability of specialized care increases in the U.A.E. through in-country partnerships, there will be less of a need to send patients to the U.S. for many medical treatments. Major healthcare facilities such as Cleveland Clinic Abu Dhabi, Sheikh Shakhbout Medical City, and Boston Jawaher Medical District are examples of large-scale healthcare initiatives that are continuing to expand, serving not only as treatment centers for local and international patients, but also as growing hubs for research, clinical trials, and medical training and education in the region and globally. This trend will likely continue, particularly in the life sciences, putting the country on a path to global – rather than simply 'regional' – leadership in the fields of healthcare, pharmaceuticals, and medical technology innovation. In terms of pediatric care, the U.A.E. continues to collaborate with U.S. partners to develop and support its existing pediatric, women's, and family health care institutions, such as Al Jalila Children's Specialty Hospital, Danat Al Emarat Hospital for Women and Children, Latifa Women and Children Hospital, and Al Qassimi Women's and Children's Hospital. Opportunities therefore exist for U.S. pediatric hospitals to further engage with the U.A.E. to collaborate on care in both countries.

International patient care needs from the U.A.E. to the U.S. will not become a relic of the past, however, as the U.A.E.'s small population is not conducive to a complete offering of medical specialty treatments and procedures. U.S. institutions will continue to provide Emiratis with some of the best medical care and opportunities to study at the most advanced and respectable medical institutions in the world. They will continue to provide efficient, short-term care in specialty areas that face shortages in the U.A.E., including adult and pediatric cardiology, gastroenterology, occupational medicine, oncology, orthopaedics, neonatology, neurology, pulmonology, sports medicine, and urology.*\(\text{xix}\) In this respect, U.S. health care providers should continue to work with other local and international partners across the bilateral healthcare ecosystem – such as universities, financial institutions, insurance providers, and transportation companies – to enhance the efficiency of the entire patient care process, from transportation, to lodging, to payment, to follow-up appointments, to family support services.

In addition to large-scale, permanent in-country partnerships, the U.A.E.'s shifting priorities provide opportunities for leading U.S. hospitals to share advice and best practices, and to collaborate with the U.A.E.'s healthcare sector on patient care, research and development, and education. These partnerships can take the form of visiting consultancies, research and education exchanges, and virtual appointments and trainings. Because of its top-tier hospitals and medical education institutions, the U.S. will continue to be a strong partner to the U.A.E. in its endeavors.

New and mutually beneficial forms of engagement may be explored by U.S. institutions, such as partnership on clinical trials, investments in research and development of new technologies, and collaboration on public health and emergency management in the U.S., the U.A.E., and the broader Middle East, Africa, and South Asia regions – especially as the U.A.E. continues to distinguish itself as a global hub for transportation, logistics, and business. Not only will investment and philanthropic contributions continue within the United States, but U.S. and U.A.E. institutions might find even more opportunities to collaborate on humanitarian investment and philanthropy in other countries, utilizing the U.A.E.'s global leadership role in advancing sustainability and public health in the Global South.

U.S. Hospitals can also take advantage of the U.A.E.'s global networks to host, sponsor, and participate in international conferences in Abu Dhabi and Dubai, where they can feature specific physicians and doctors that excel in surgical specialties and research through speaking and thought leadership opportunities. Health-related conferences in the U.A.E. often range from localized specific topics to ones of broader and more international scope, but some of the major ones include Arab Health, which will be hosted next in Dubai from January 29th – February 1st 2024, and the first iteration of Abu Dhabi Global Healthcare Week, which will be hosted in Abu Dhabi from May 13th – 15th 2024. Overall, U.S. institutions that expand their horizons for partnerships with the U.A.E. will be the most successful in taking advantage of the opportunities for growth within the country's developing healthcare ecosystem.

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