Clinical Services Plan: Case Study 15

Telehealth

How virtual technologies enable 24/7 healthcare access

JHAH's five-year Clinical Services Plan

Transformation Project #3Aii

Champion

Dr. Kanaan Kanaani

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We Care

February 2025

Clinical Services Plan

مركز جونز هوبكنز أرامكو الطبي
Johns Hopkins Aramco Healthcare

Case Study 15: Telehealth

How virtual technologies enable 24/7 healthcare access

Project details

The objective

- To launch an out-of-hours telehealth service, providing virtual healthcare access to JHAH registered patients.

The priorities

- To define the scope of services.
- To define and build policies and protocols including clinical governance protocols, drug formulary, information technology, patient communication and performance monitoring.
- To run a 12-month pilot, review lessons learned and recommend the post-pilot arrangements.

The timeline

- **Project kick-off:** June 2023
- **Project closure:** February 2025

The project team

Sponsor:

- Dr. JJ de Gorter, Chief of Staff

Champion:

- Dr. Kanaan Kanaani

Team members:

- Dr. Bayan Alajaji
- Fahad AlHarthi
- Rawan Al Jehairan
- Nada AlKhalifa
- Mohammed Almatooq
- Dalia Basrawi
- Daniel Bregaglio
- Asim Chaudhri
- Yussra Ibrahim
- Rasiel Kabli
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About the Clinical Services Plan

Johns Hopkins Aramco Healthcare (JHAH) serves more than 140,000 Aramco employees, their relatives and retirees with a comprehensive range of inpatient and outpatient services. JHAH has carried forward the legacy set by Saudi Aramco of healthcare for all, putting caring for its community at the heart of everything it does.

In 2023, JHAH launched its five-year Clinical Services Plan (CSP). The CSP was developed in response to changing patient expectations and the realization that JHAH must evolve if it is to survive and thrive. The Plan's vision is that JHAH will become the Kingdom's first choice for outstanding integrated healthcare.

The CSP contains 16 strategic objectives to deliver against five goals (service excellence, access, people, sustainability and reliability), and is supported by four delivery principles (accountability, pace, pragmatism and outcomes).

The Telehealth project was included as Objective #3Aii in the CSP.

Project background

The first telephone call was made on 10 March 1876, when the Scottish-born inventor Alexander Graham Bell contacted his assistant to announce: "Mr. Watson, come here. I want to see you."[1] The first video call followed 50 years later, on 8 April 1927, when future US President Herbert Hoover held a jerky, 18-frame-per-second call with AT&T President Walter Gifford.[2] The first internet use is less easy to identify, but is often traced to 1965 when Larry Roberts, chief scientist at the Advanced Research Projects Agency (ARPA), enabled two separate computers to 'talk' to each other for the first time[3].

As we all know, since those early days, the pace of technology adoption has been exponential. By 2018, over half the world's population – 3.4 billion people – were connected online, revolutionizing sectors as diverse as

entertainment, financial services, retail, education and travel.[4]

The concept of using remote communications to enhance healthcare delivery traces its origins to the 1980s, when NASA provided an ATS-3 satellite to connect leading physicians with Red Cross response teams in the aftermath of natural disasters such as the 1985 Mexico City earthquake. At the time, there were a number of constraints to widespread adoption, including consumer behaviour and technological limitations.

With the turn of the century, many of the technological barriers ceased to apply, due to three breakthroughs: high-speed, reliable internet; robust cyber security; and the proliferation of portable devices such as laptops and smartphones.

Notwithstanding the speed of these changes throughout society, the practice of healthcare was relatively slow to adopt. As recently as five years ago, the overwhelming preference of physicians and patients was to interact in-person. Writing for the National Center for Biotechnology Information, family medicine doctor Julia Shaver MD noted: "Before March 2020, telemedicine use in the United States was on a steadily increasing trajectory, but its absolute integration remained low, and the logistics were complex." [5]

In Saudi Arabia, as in most of the rest of the world, it was the Covid pandemic which acted as the catalyst for remote healthcare acceptability. A recent article in the Global Journal of Health Science by Abdullah Ghthaith Almutairi (Health Education and Awareness Director, King Khaled Hospital) *et al*, entitled "Telehealth in Saudi Arabia: Its Evolution, Present Infrastructure, and Forward-Looking Implications", explored the impact in detail. It concluded that, while a number of MoH initiatives since 2011 had aimed to encourage telemedicine, widespread adoption was "not without challenges (due to) concerns related to patient privacy, technology infrastructure and resistance from some healthcare professionals due to lack of familiarity with digital tools posed obstacles".

At JHAH, a few limited exercises were run to varying degrees of patient acceptance – for example, in 2018, two 'nurse extender roles' were created to liaise with patients remotely. It was evident that, despite the technical advances, the challenge of consumer behaviour remained. Habits can be difficult to shift, and patients who had spent their entire lives engaging with medical professionals face-to-face were instinctively wary of losing something familiar.

The pivot came when the pandemic made effective virtual healthcare services a necessity not just an aspiration. As the authors note: "With social distancing measures in place and an increased emphasis on remote care, telehealth platforms in Saudi Arabia witnessed a surge in usage. Hospitals and clinics, with the support of the government, transitioned to teleconsultations, ensuring that non-emergency medical needs were addressed without compromising patient or healthcare provider safety." [6]

As policymakers fought to control the spread of the virus, in-person access was limited to essential cases. Through necessity, a large proportion of primary care consultations switched to the virtual world. Patients realized that, in many cases, a phone- or video-based discussion was perfectly acceptable, and in fact provided many benefits such as being extremely time efficient.

As the pandemic restrictions eased, the challenge at JHAH was how the benefits of virtual healthcare could be carried forward, especially in widening access to primary care physicians. The challenges around primary care access had been longstanding, and multiple initiatives were being rolled out to improve the patient experience (many of these are detailed in Case Studies 05 and 06). These were successfully building up the number of bookable slots during working hours; however, they had not yet focused on the issue of out-of-hours access. So patients who needed to speak with a qualified primary care doctor after the in-person service had closed were faced with the options of either waiting until the following day (in pain and worry), or making the often inconvenient journey to the Emergency Department (often placing an unnecessary strain on this service).

Dr. Kanaan Kanaani had been Chair of JHAH's primary care department and previously the Chief of Primary Care Service Division One during the pandemic, and was a passionate advocate of the benefits of leveraging remote technologies for better, faster and more personalized healthcare services. There was no one more suited to lead a high-profile project within the Clinical Services Plan in which the impact – whether on patient experience, accurate diagnosis, treatment or cost – could be evaluated within a tightly controlled one-year pilot. For him, this was part of a natural evolution in service accessibility. He says: "When Covid hit, phone-based consultations were essential. Patients and doctors quickly embraced it as a viable alternative. It was finally seen as being part of the service that any quality healthcare provider should make available."

Project delivery

In early 2023, the full potential of telehealth to improve access was still not being realized. As Covid receded, telehealth continued to be part of the primary care service, but availability was limited to be working hours of the clinic, meaning that the last available telehealth appointment was at 7pm. If any symptoms developed overnight, patients had the unenviable choice of either waiting until the following morning (the first slots being at 7am), or heading to JHAH's Emergency Department.

For some patients, the challenge of access was exacerbated by their physical isolation. Many Aramco employees are based at oil and gas plants and refineries in remote, sometimes dangerous, border areas throughout the Eastern region of Saudi Arabia; this presents practical difficulties with travelling to the Dhahran and Al Hasa hospitals.

Time-poor patients, especially women with childcare responsibilities, were also disadvantaged by the current primary care offering. Long waiting times for scheduled appointments and restricted opening hours meant many were unable to prioritize their healthcare in a timely manner.

Improving primary care access was one of the early priorities identified when the Clinical Services Plan transformation was launched. The project team highlighted a broad range of changes to be assessed, from the number of physicians employed to the opening hours of the primary care clinic. From the outset, telehealth was highly ranked on the list of opportunities. The belief was that, properly organized, it would provide easy and convenient access, bringing primary care expertise to patients in their homes around the clock, while maintaining high levels of service excellence and strong clinical oversight.

A multidisciplinary team

A project team was assembled to support Dr. Kanaan in the delivery of the pilot. The team included representatives from specialist departments across JHAH including Primary Care, Information Technology, Risk and Quality, Pharmacy, Patient Communications, and with on-site project management supported provided by Asim Chaudhri from Greybeard Healthcare Consulting (a Middle East-based firm specializing in healthcare transformation). It met on a weekly basis throughout the pre-launch period, with the priority actions assigned to three core workstreams. Each of these workstreams had a nominated leader, who was responsible for overseeing progress and reporting any issues or obstacles for rapid resolution. The workstreams were:

- **Governance and quality:** to ensure all care offered to patients aligned with JHAH standards and governance requirements.
- **Technology integration:** to ensure the contractor's physicians had secure access to patient information on JHAH's Epic system, in order to offer patient-centered professional advice.
- **Communications:** raising awareness of the service so that utilization rates would justify its cost.

Dr. Kanaan remains proud of the work of the multidisciplinary team, whose collective efforts ensured a holistic solution was devised. He says: "It's like a jigsaw; the project won't be successful if one piece of the puzzle is missing."

Figure One: Conditions precedent for launch

1	Clinical governance
2	Risk management plan
3	Workflows
4	Workforce recruitment
5	Physician credentialing and privileging
6	Physician training
7	Location
8	Licensing
9	Technology: connectivity
10	Technology: applications
11	Communications: patients and families
12	Communications: primary care physicians

The first task was to identify a partner able to provide the service on a contracted basis for the period of the pilot. After a four-month selection process, in which criteria such as licensing, capacity, pricing and technology were rigorously assessed, a preferred partner emerged. TruDoc (vision: 'Making health and wellness accessible and affordable to all, only one call away') was identified as JHAH's preferred delivery partner for the pilot, and was invited to participate in the project team discussions whenever necessary.

A close partnership between JHAH and TruDoc, with fully aligned objectives, was an essential success factor in both a timely launch and continual finetuning and optimization of the service throughout the pilot period. For example, while the physicians were staffed by TruDoc in a Riyadh contact center, each one of them underwent JHAH credentialling and privileging to ensure they met the required standard. In parallel to the work of the JHAH project team, TruDoc set about recruiting physicians who not only possessed the necessary technical knowledge, but also had the right attitude and competence for a remote role. Once successful candidates had been selected, ample time was set aside for training both by TruDoc and by JHAH. The goal was that, by the date of launch, the service would be consistent, high quality and seamless, regardless of which physician answered the phone on any given occasion.

Conditions precedent

As the launch date approached, the project team reported to the Chief Of Staff that a broad suite of Conditions Precedent had been satisfied (see Figure One). This included a number of items which had been identified by the Risk Management representative on the project team, such as Patient Identification.

Another criterion was that the service could be accessed through multiple channels, including as a scheduled out-of-hours appointment made on MyChart or as an unscheduled phone call to a dedicated patient number. This multipronged philosophy proved essential, with calls during the first year split approximately 40 percent to 60 percent between the two options.

Once the Chief of Staff had satisfied himself that each of these Conditions had been met, he confirmed the service was ready to launch. The first patient call was accepted shortly after 7 p.m. on 17 September 2023.

Robust risk mitigation has been a vital step. "Of course, you never eliminate every single possible risk," says

Figure Two: Patient information leaflet – Benefits and scope

Dr. Kanaan. "On the day of Go-Live, the IP address changed (we were using a dynamic IP address) which causes mayhem for integration. We were compelling to delay the launch; ironically, the experience actually strengthened the bonds within the team since everyone acted in a professional, transparent and constructive manner as we identified a solution."

Patient access

After a review of different options, the team concluded that maximum access would be enabled by offering patients two clear routes to the service. The first was via a booked appointment slot, accessed via the already-familiar MyChart app, allowing them to book an available 15-minute appointment slot with a named physician, at any convenient time throughout the night. The second option, which now accounts for the majority of interactions, was a direct, on-demand call to the service routed through the JHAH call center Interactive Voice Response (IVR) telephony system.

Start narrow then expand

At the time of launch, the scope of service available from the telehealth physicians was kept deliberately narrow. While this inevitably had a small detrimental impact on the patient experience (since they understandably assumed the virtual service would mirror the in-person service), it was felt necessary to build confidence before a broader suite of responsibilities could be taken on. For this reason, for the first two months, the service was limited to:

- Clinical assessment and advice
- Prescriptions from a narrow Drug Formulary
- Sick leave.

After the immediate two-month post-launch period had concluded, the project team analyzed the early experience.

- Among the most regular symptoms reported during the pilot period have been yellow fever, urinary tract infections, respiratory infections, gastro-enteritis, abdominal pain, sick note requests and enquiries about test results.
- Once connected, the doctors use a protocol-based decision-making tool, as well as their access to the patient's medical history, to diagnose and provide treatment or advice.
- Those who may need immediate or urgent care are advised to go to the nearest emergency department; a follow-up call is then scheduled to check the situation has been resolved. In the first six weeks of operation, 50 patients were triaged in this way.
- At launch, there were a number of limited internal announcements, but these were deliberately low key to prevent the service from being overwhelmed in its early days. Over time, these were gradually scaled up, until the 24/7 messaging became integral to the primary care offer.

Having monitored these results, the team gained sufficient confidence to approve a gradual extension of the service. During the following ten months, this included:

- **Diagnostic referrals:** An additional expansion has been providing the telehealth doctors with the ability to make a limited number of referrals – for example for lab tests (at launch, referrals could only be made as a result of an in-person visit). This was possible due to growing confidence that the hospital would not be overwhelmed with a large number of inappropriate referrals.
- **Pediatrics:** Based on the early success, additional doctors were recruited in February 2024 who were pediatric specialists. This service expansion had an immediate and substantial impact in reducing the number of pediatric visits to the emergency department for non-emergency complaints. "Now people can contact a doctor in the middle of the night if they're having a panic attack or their child is ill. This saves time, unnecessary anxiety and the inconvenience of travelling to a hospital," explains Dr. Kanaan.
- **Extension to 'working hours'.** It was recognized that some patients value a virtual appointment during working hours, not just between 7p.m. and 7 a.m. For this reason, so availability has been progressively expanded, and now covers 19 hours daily (noon until 7a.m.).

Clear messaging

Throughout the pilot period, the messaging about the service was focused on the benefits and the scope. For example, the 'Telehealth' patient information leaflet highlighted five benefits and nine services as shown in Figure Two.

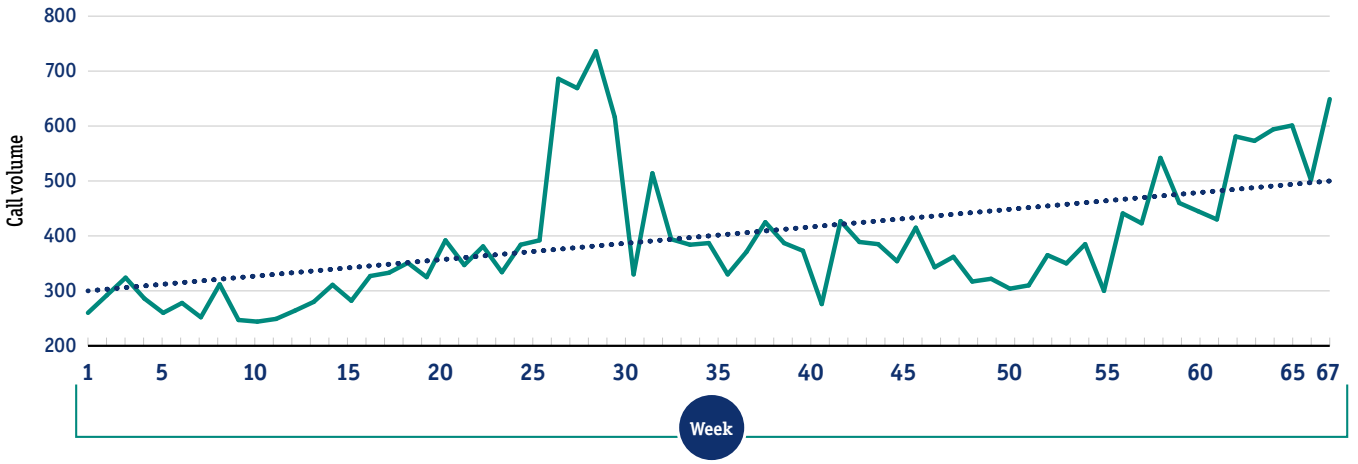
Why choose telehealth?

- **Accessible care:** Healthcare at home for those with limited mobility
- **Ultimate convenience:** Skip the hassle of travel, traffic, parking and long wait times
- **Broad spectrum of care:** Addresses a variety of healthcare needs, all from the comfort of your home
- **Quick and timely:** Quick access to medical advice
- **Proactive health management:** Stay on top of your health with ease.

What concerns can telehealth address?

- Treatment for common illnesses
- Counselling and education

Figure Three: Telehealth usage



- Addressing mental health issues
- Addressing symptoms and conditions
- Providing expert advice on healthcare options
- Answering queries regarding laboratory test results
- Providing prescriptions on a case-by-case basis, depending on the patient's condition
- Support with prescription refills for existing and non-controlled medications (see note)
- Request lab tests or diagnostics.

Note: Unless the patient has not had a primary care visit in the last six months.

Project outcome and benefits

Digitalization of healthcare at JHAH continues to gather momentum. In 2024, of the 552,000 total primary care patient encounters, 33.8 percent took place virtually (this includes all virtual consultations, of which those delivered on an outsourced out-of-hours basis were an important element).

Clinical effectiveness

In the early days of the pilot, clinical analysis was undertaken of a random sample of enquiries, to ensure the patient's needs had been met and any clinical processes had been followed in line with guidance.

The result was that, in almost 98 percent of cases, the case was closed without the need for further resources, referrals or diagnostics. In no cases was there a serious shortcoming, although a few opportunities were identified to tighten the arrangements.

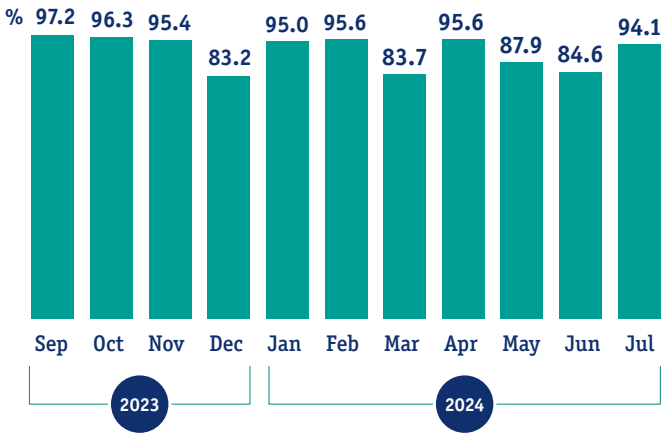
Demand and utilization

Strong word of mouth in the early weeks drove a steady increase in usage, with the weekly volume of calls rising from around 250 at launch to more than 500, as shown in Figure Three.

The current run rate is approximately 20,000 calls per annum, of which the majority were clinical:

- 56 percent of total calls were clinical:
  - 73 percent of these calls were resolved without further care required
  - 21 percent of patients subsequently were seen in Primary Care; six percent were directed to the Emergency Department.

Figure Four: Patient satisfaction with teleconsultation service



- 44 percent of total calls were non-clinical:
  - 28 percent of appointments scheduled.

A number of other patient-related metrics were closely monitored:

- 92 percent patient satisfaction, on par with satisfaction levels for equivalent JHAH services
- 100 percent of calls answered within the target 60-second window (the international benchmark is focused on two minutes or below) [7]
- 3.2 percent abandoned or missed calls
- 8.9 percent no-shows to scheduled online appointments.

The patient satisfaction result has held steady throughout the pilot, never falling below 80 percent, as shown in Figure Four.

Operational outcomes

The post-pilot review highlighted a number of operational benefits, including:

- 7,500 visits to Primary Care or Emergency Department avoided
- Financial benefit commensurate with JHAH's return on investment threshold for investment in new services
- Reduced pressure on car parking.

Solving issues

The raw numbers tell an important part of the story. But any hospital is only as good as the difference it makes to patient lives. There have been a number of positive stories about successful interventions, of which Figure Five gives a flavor.

Figure Five: Patient stories

Patient story - pediatrics

A first-time mother who worked in the Aramco finance team had struggled to access primary care services when her 11-month-old son experienced a fever.

"It was very difficult – I needed to drive home and then come back with him and then take him back home without taking time off. I tried the usual medicine to ease his flu-like symptoms but it wasn't working so I was getting a little worried. One day, I was able to speak with a doctor at 9.30pm who gave me some excellent advice and provided reassurance. I picked up the prescribed medication the following day from the pharmacy."

Patient story – adult

A middle-aged gentleman living in a Riyadh resident compound contacted the JHAH teleconsultation line, in some distress about his persistent chest pain. After conducting a thorough assessment, the telehealth team swiftly recognized the urgency of his condition and determined that immediate hospitalization was necessary. However, the patient was unable to navigate to the hospital independently and had trouble contacting emergency services for an ambulance. The telehealth team quickly intervened coordinated with ambulance services to dispatch help directly to the patient's home. He was promptly transported to the hospital, where medical professionals addressed what turned out to be a life-threatening condition. The patient made a remarkable recovery as a result of the timely intervention and expert care.

From a patient perspective, it was quickly clear that 24/7 access is no longer viewed as an optional luxury, but as an essential pillar of any well-functioning healthcare ecosystem. For this reason, JHAH attention has already been turning to how much further, and how quickly, the practice of remote medicine can be applied in other departments.

Cost savings

Cost was not a key driver of the initiative; however, significant savings were realized based on an estimation of the proportion of virtual calls which would otherwise have required either an in-person primary care or urgent care visit.

During the first 12 months, it was estimated that 7,500 such visits were avoided, translating into a net cost benefit was $745,000.

Beyond the pilot phase

On October 2024, the project team presented a detailed data pack to the CSP Steering Committee in which the experiences of the first 12 months were enumerated. As a result, the Steering Committee determined that the pilot had been a success and that 24/7 virtual access should be a permanent element of JHAH's services. As a result, a long-term contract was agreed with TruDoc, and the work of the project team formally transitioned to business as usual.

Lessons learned

Reflecting on the experience of bringing a valued new service into operation, Dr. Kanaan notes six success factors.

Dr. Kanaan is keen to highlight a couple of these success factors, which required additional focus as the complexity of the issues became apparent:

Information technology: "This was perhaps the biggest challenge since we were dealing with two different platforms. We needed to enable these platforms to connect without creating any cybersecurity or patient confidentiality exposure, supported by tailored training. It was important that the I.T. teams in both organizations felt at liberty to challenge, scrutinize and test one another in a spirit of collaboration not confrontation."

Figure Six: Telehealth key success factors

Clinical oversight: "This project could not have been delivered without the support and expertise of Dr. Bayan Alajaji. She chaired a daily huddle in which she would review all the overnight activity, following up on any diagnostic results and turning the spotlight on anything requiring further investigation." As a doctor of medicine from the Arabian Gulf University who had also worked as a resident physician for the Saudi military (National Guard Hospital and Kind Abdulaziz Air Base Hospital), Dr. Bayan was closely acquainted with the requirements of delivering a robust healthcare service to a demanding cohort.

Looking ahead, Dr. Kanaan sees many opportunities to further embed the benefits of virtual healthcare into the patient experience: "The service has been live for 18 months, but general awareness still remains low. During 2025, we will be moving up a gear in the frequency and volume of our communications. Our Marketing colleagues have proposed a ramp-up plan which includes more patient testimonials, booths at Aramco events, and even podcasts and webinars. From my side, I am keen to explore bringing the advantages of telehealth to a wider population – beyond JHAH's regular list of eligible service users."

By the end of the decade, it is likely that patients will look back in astonishment at the amount of time they used to spend unnecessarily attending in-person appointments, when every aspect of most discussions could be readily conducted in a virtual setting. This was one reason that a recent Harvard Business Review article argued: "The telehealth era is just beginning." Warming to this theme, authors Robert Pearl (faculty member of the Stanford University schools of medicine and business) and Brian Watling (executive director of telehealth services at Intermountain Healthcare), proposed five telehealth-driven opportunities that, taken together, would result in a 20 percent improvement in clinical quality, a 20 percent increase in access to care, and a reduction in cost of 15-20 percent . These opportunities were: reducing expensive and unnecessary trips to Emergency, reversing the chronic-disease crisis, addressing disparities in healthcare, making specialty care faster and more efficient, and providing access to the best doctors. [8]

With such a wide-ranging agenda, it's no wonder that Dr. Kanaan notes: "None of us can know exactly what the future will hold for telehealth. But we can be certain of one thing: We'll all be busy!"

Sources

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About the project champion

Dr. Kanaan Kanaani

Dr. Kanaani is a Family Medicine Consultant at Johns Hopkins Aramco Healthcare, where he has previously chaired the Primary Care Service Department.

He was educated at King Faisal University, Dammam, Saudi Arabia (Bachelor of Medicine and Bachelor of Surgery), the University of Toronto, and the American College of Healthcare Executives (Executive Leadership Certification).

Before joining JHAH, he was a Family Medicine Specialist at Saudi Aramco Medical Services Organization (SAMSO), and served as the Head of the SAMSO Learning and Development division.

He is a recognized board examiner at the Saudi Commission for Health Specialties (SCFHS) and holds a Clinical Teaching Certificate from the University of Toronto.

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Scanning the horizon for healthcare innovations

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Recovery in the comfort of the patient's home

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Note: Additional CSP case studies are constantly under development. Please email or call your JHAH contact for information on future editions.

This case study is one in a series that showcases stories from implementation of the JHAH Clinical Services Plan (CSP). The JHAH Board approved the CSP in June 2022. It is an ambitious multiyear program to enhance and modernize a wide range of clinical activities. For more information about the CSP or any projects included in the program, contact the CSP Program Management Office: pmo@jhah.com.

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