

Clinical Services Plan: Case Study 17

Musculoskeletal Services

Advancing patient care and innovation

JHAH's five-year Clinical Services Plan
Transformation Project 16B

Champion
Ms. Lamia Zayer



نحن نهتم
We Care

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مرکز جونز هوبكنز
أرامكو الطبي
Johns Hopkins
Aramco Healthcare



Case Study 17: Musculoskeletal Services

Advancing patient care and innovation

Project details



The objective

- To elevate the impact of JHAH's Musculoskeletal (MSK) services and position the organization as a leader in musculoskeletal healthcare.

The priorities

To embed high standards of care and outcomes

- Implementation of Patient Reported Outcome Measures (PROMs)
- Knowledge sharing in shoulder surgery and rehabilitation
- Implementation of Residency programs for Orthopedic Surgery and Physical Therapy
- Advancing MSK research and publication
- Driving innovation in MSK care.

To host a high-profile international MSK conference

- Bringing together MSK leaders from across the region
- Showcasing cutting-edge research and clinical advancements
- Providing hands-on workshops and interdisciplinary collaborations.

The timeline

- **Project kick-off:** January 2024
- **Project completion:** December 2024

The project team

Sponsor:

- Dr. JJ de Gorter, Chief of Staff

Champions:

- Ms. Lamia Zayer, Dr. Abdulaziz Abidi

Team members:

- Dr. Abdulaziz Abidi
- Rabiah Hillal
- Gitu Mirchandani
- Ibtihal Al Attallah
- Kawthar Hussain
- Dr. Akram Shaban
- Hayat AlMushcab
- Yussra Ibrahim
- Laurence Smith
- Saleh AlWadie
- Mey Khonaizi
- Dr. Babiker Sulaiman
- Shukti Afaisan
- Dr. Mojieb Manzary
- Wissam Zein
- Dr. Fahd Algurashi
- Maha Makled

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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 MSK project was included as Objective #16B in the CSP.

Project background



In announcing that Musculoskeletal (MSK) services would be a priority within the CSP, JHAH Chief of Staff Dr. JJ de Gorter highlighted some alarming statistics. He reported that nearly two billion people worldwide suffer from some form of musculoskeletal condition, making it a major global health challenge. Among these, knee osteoarthritis is one of the most prevalent conditions, affecting approximately 365

million people. Additionally, musculoskeletal disorders remain a leading cause of disability with low back pain being the single leading cause of disability in 160 countries.¹

He concluded: “Musculoskeletal conditions can affect us from childhood to older age. They range from complaints that arise suddenly and are short-lived such as fractures, sprains and strains, through to long-term conditions such as osteoarthritis. With an ageing population, the number of people living with functional limitations is rapidly increasing.”

Recognizing the growing burden of MSK conditions, JHAH committed to making MSK care a priority under its CSP. The MSK program was established to:

- Improve patient outcomes through high-quality, integrated MSK services
- Enhance training and education for the next generation of MSK specialists
- Lead innovation in musculoskeletal healthcare.

It was also designed to address key challenges:

- Rising patient demand for MSK services
- Need for standardized patient outcome tracking
- Limited postgraduate residency programs for orthopedic and rehabilitation specialists.

The project was initially launched with a very expansive remit and multiple workstreams. It was quickly recognized that delivering a focused list of priorities with a disproportionate impact would be preferable to making slow progress across a wider range. For this reason, the project champion Lamia Zayer – JHAH’s Senior Director of Specialized Therapy and Clinical Services (responsible for respiratory therapy, rehabilitation services, clinical

nutrition and food services) – was asked to assess the upside and investment required, and propose a maximum of two focus areas.

Ms Zayer made her recommendations on the basis of a rigorous filtering process, which included:

- Collating and assessing key performance metrics
- Discussion and engagement with stakeholders
- Benchmarking with practices at other leading hospitals
- A capability assessment of the existing services.

Her conclusion was that, in its first 12 months of activity, the project should prioritize two outcomes:

- To embed high standards of care and outcomes
 - PROMs (Patient Reported Outcome Measures)
 - Shoulder (knowledge sharing)
 - Residency approvals and launch, for orthopaedics and physical therapy
 - Research
 - Innovation
- To host a high profile MSK conference attended by MSK leaders from throughout the region.

This recommendation was reviewed and approved by the CSP Transformation Board, and Ms Zayer assembled a team to assist with the design and delivery of the program. On 17 March 2024, the team gathered for a half-day offsite at which the broad goals were translated into deliverable activity. Ms Zayer opened the event with a quote from the famed basketball player Michael Jordan: “Talent wins games, but teamwork wins championships”. During the course of his career, Jordan won a remarkable six NBA championships with the Chicago Bulls, so he can certainly be considered an authority on the topic.

Priority One: To embed high standards of care and outcomes

Project delivery and outcome

High standards depend on a number of variables: data, processes, people, new ideas. The focus of Priority One was structured around these themes.

PROMs

Patient Reported Outcome Measures refers to the “assessment of a wide variety of health-relevant concepts”, generally structured around five distinct categories: health-related quality of life, functional status, symptoms and symptom burden, health behaviors, and the patient’s healthcare experience.²

Figure One: MSK program launch (March 2024)





The project successfully developed a PROMs policy which was approved for implementation, enabling the team to proceed with delivery.

The policy listed six core purposes:

- To ensure the effective choice, implementation, management and utilization of Patient Reported Outcome Measures (PROMs) across the organization.
- To clearly define the roles and responsibilities of key stakeholders involved in PROMs.
- To standardize procedures for PROMs implementation, data collection, analysis and utilization.
- To enhance patient care and outcomes through the systematic use of PROMs data.
- To support data-driven decision-making at all levels of the organization.
- To enhance JHAH's clinical credentials through publication of outcomes data.

Within the PROMs policy framework, specific deliverables during 2024 included:

- Launch of the Quality Metrics Quarterly Report, integrating PROMs with NSQIP (National Surgical Quality Improvement Program) metrics, as shown in Figure Two.

- Delivery and implementation of the PROMs Knee Report.

Looking ahead, PROMs is playing an important role in JHAH's journey to a Value Based Care model. It has already been a major factor in its rise up the rankings in Newsweek's listing of the best hospitals in Saudi Arabia – up from number 12 to number five in the latest ranking.³

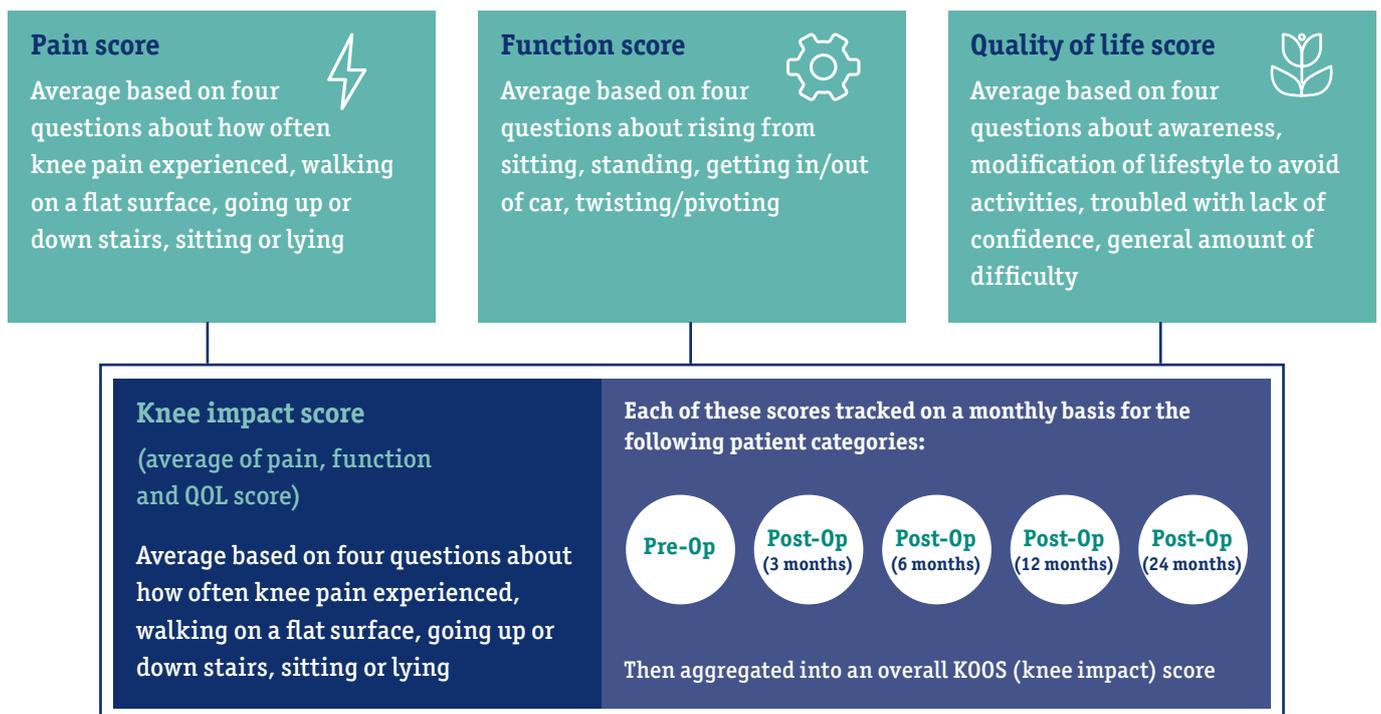
Shoulder (knowledge sharing)

The collaboration between JHAH and Johns Hopkins Medicine (JHM) means that the hospital regularly benefits from knowledge sharing visits from JHM experts. In 2024, the knowledge sharing program resulted in a series of recommendations which were fully implemented. This included:

- Implementation of a clearer perioperative workflow
- Standardization of therapy scheduling.

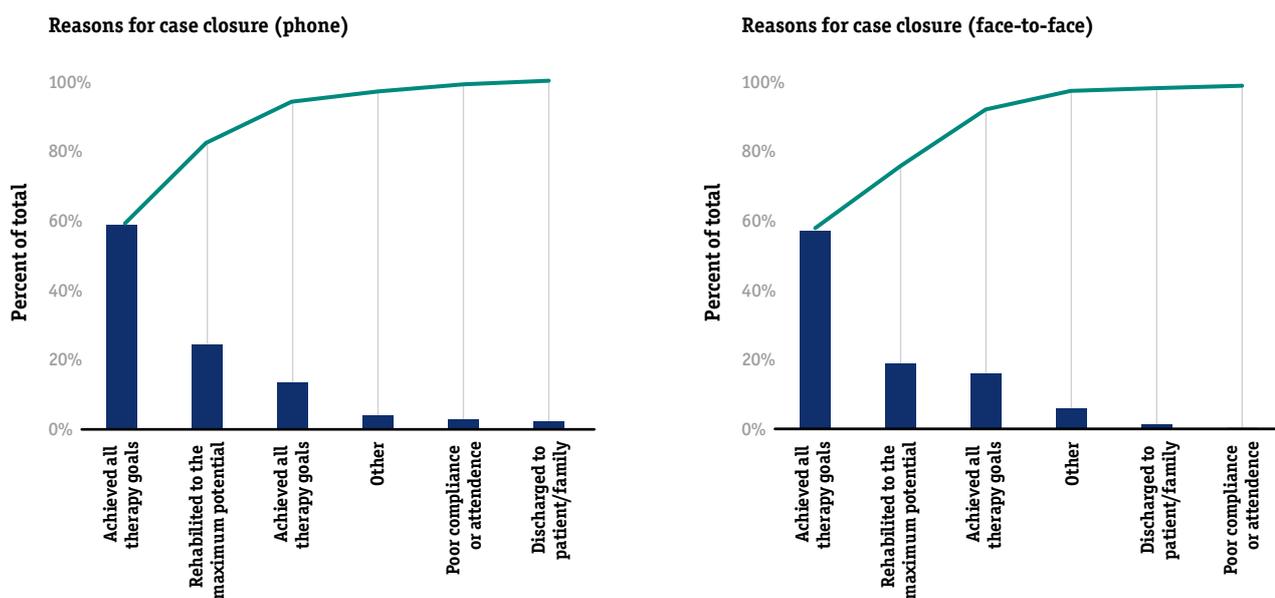
By December 2024, of the 16 knowledge sharing recommendations, seven had been fully implemented, four were on track for successful implementation in 2025, two were being handled within a separate CSP project, two had been deferred pending the required resourcing, and one was behind plan.

Figure Two: Quality Metrics Quarterly Report template



Note: KOOS = Knee Income and Osteoarthritis Outcome score
For more information: www.orthotoolkit.com

Figure Three: Analysis included in published research paper (selected)



Ms Zayer said: “Knowledge sharing is vital to continuous improvement. The JHM recommendations were realistic and practical. We look forward to further knowledge sharing over the coming years.”

Residency approval

Residency has been described as a “crucial phase” in a physician's training, following the completion of medical school. It is a supervised clinical training period coupled with an intensive, full-time job to provide “hands-on experience and increasing autonomy in delivering healthcare under the guidance of experienced attending physicians”.⁴

As part of the project, two important milestones were achieved in relation to residency approval.

In the field of Orthopedic Surgery, JHAH received approval for its Orthopedic Surgery Residency Program under the Saudi Commission for Health Specialties. The program offers residents expert mentorship, comprehensive clinical exposure and advanced surgical training. With a focus on interdisciplinary collaboration and global outreach, it advanced the JHAH's regional leadership leader in orthopedic.

In the field of Physical Therapy, JHAH became the first healthcare organization to receive accreditation from the Saudi Commission for Health Specialties for a Musculoskeletal Physical Therapy Residency Program. Starting in October 2025, the program offers three clinical years alongside leadership and scientific training,

equivalent to a master's degree in physical therapy, and highlights JHAH's commitment to excellence in musculoskeletal care and physical therapy education.

By March 2025, seven residents had benefited from the program.

Dr. Abdulaziz Abidi, Chair of the Surgery Department, commented: “We are proud of the Orthopedic Department’s Residency Program approval, which strengthens our contribution to the medical profession in the Kingdom as well as providing support and capacity for clinical excellence.”

Research

Two research papers were submitted for publication in 2024.

The first was a paper entitled *“The Effect of Telerehabilitation Assessment for Adults with Musculoskeletal Conditions on Access to Care Beyond the Covid-19 Pandemic: A Retrospective Case-Control Analysis”*. It was authored by Lina El-Sabbagh, Hanan AlQahtani, Alanood Adil Al-Sultan, Haya Jassem AlDossary, Husain Al-Resheidi, Akram Abdelhamid, and Dina W. Buraik, and was published in Digital Health in 2024. The paper involved a retrospective unmatched case-control analysis of a total of 724 Electronic Medical Records, with patients who received a phone assessment being compared with those who received face-to-face care. The paper concluded: “Initial telerehabilitation phone assessments compared to face-to-face care were



associated with improved access to care, and there was no difference in the number of therapy sessions associated with achieving treatment goals.” Some of the analysis undertaken by the paper is shown in Figure Three.

A second paper, currently in the planning stage, is entitled *“Prevalence of Patella Baja in Primary Total Knee Arthroplasty”*, authored by Dr. Mojiebalhaque Manzary, Dr. Hayat AlMushcab and Dr. Anwar AlOtaibi. It will be submitted for publication in 2025.

Innovation

In December 2025, the project team scheduled an ‘innovation think tank’ to assess different MSK innovations with the potential to revolutionize treatment and patient care over the decade ahead. The think tank involved a validation of shortlisted technologies, an assessment to identify the impact of the technologies in terms of process, stakeholders, investment, infrastructure, scale, approval and ease of adoption, and finally a prioritization of these technologies according to a short-, medium- and long-term timeframe.

Some of the innovations included in the shortlist are:

(Physical therapy)

- Tele-rehabilitation solutions
- Antigravity treadmills
- Arm Assists
- Wearable robotic braces
- Gait analysis
- Wearable technologies for post-surgery rehabilitation.

(Surgical)

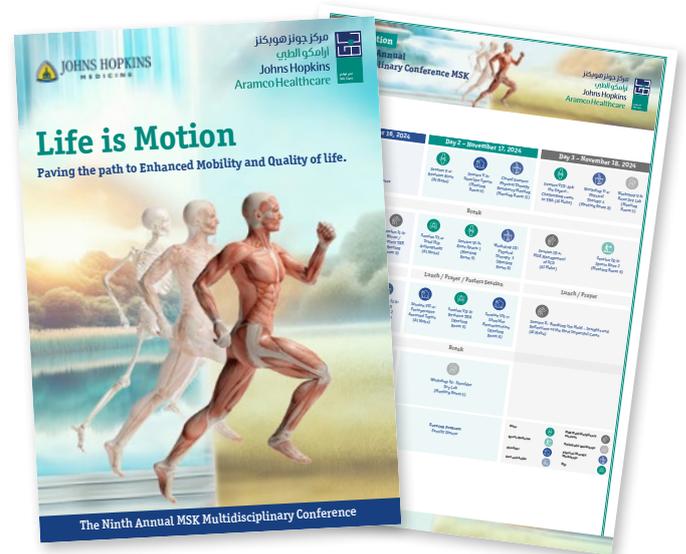
- Robotic total knee replacement
- Intra-operative knee sensors
- Smart implants
- Total knee replacement: patient-specific instrumentation
- Osteotomies around the knee: patient-specific instrumentation
- Next-generation cast systems
- 3D-printed implants
- Total ankle replacements
- Bio-integrative implants for arthroscopy
- Total knee replacement: hand-held navigation technologies
- Digital templating
- Augmented reality.

Priority Two: To host a high profile MSK conference attended by MSK leaders from throughout the region

Project delivery and outcome

The JHAH Multidisciplinary Musculoskeletal International Conference adopted the theme ‘Life Is Motion’ and was held over a three-day period in November 2024 at the Kempinski Al Othman Hotel in Al Khobar. The theme was chosen to reinforce the energy and dynamism of MSK healthcare in “paving the path to enhanced mobility and quality of life.” The promotional imagery reflected this energy, as shown in Figure Four:

Figure Four: MSK Conference imagery



The event was inaugurated by JHAH’s Chief Executive, Dr. Michael Walsh, and Chief of Staff, Dr. JJ de Gorter, who welcomed an impressive number of experts for three impactful days of learning and collaboration.

“The theme 'Life is Motion' served as a powerful reminder of the vital role we play in restoring and preserving mobility – a cornerstone of a healthy and fulfilling life. It was heartening to see this theme resonate across all aspects of the conference, reinforcing our shared mission to innovate and improve musculoskeletal care,” said Dr. Chaudhary, Orthopedic Surgeon Consultant and Head of MSK Conference Scientific Committee.

Ms Zayer said: “The worldwide family of MSK professionals should not see themselves as competitors with one another. We might work for different employers and be based in different countries. However, we are all here to serve our patients, helping them to lead lives that are as

active and pain-free as possible. That can best be achieved when we share openly with one another, learning from one another's experiences, so that we can all enhance the quality of our care and build patient trust in our profession. As a leading hospital in the region, JHAH has a particular responsibility to share our learning with the wider community."

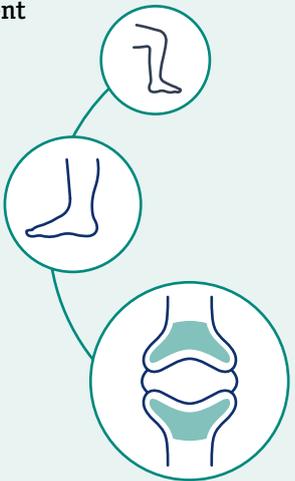
With this goal in mind, Ms Zayer oversaw a conference program that provided outstanding learning opportunities for many categories of MSK professionals, including:

- Orthopedics surgeons
- Subspecialists in arthroplasty, sports medicine, upper extremities, foot and ankles
- Physical therapists
- Orthopedics residents
- General practitioners
- Rehabilitation medics
- Occupational therapists
- Orthotists
- Nurses
- Medical students.

The conference was designed to deliver against five core objectives, as shown in Figure Five.

The conference involved multiple elements, not just a series of plenary presentations in a single vast hall. This was important to maximize relevance for such a diverse group of delegates – each with particular areas of interest and learning styles. The final agenda reflected this multifaceted philosophy, and included:

- Keynote speakers across ten sessions in two rooms:

Room one	Room two
<p>Introduction and welcome</p> <p>Non-operative management of hip and knee joint pain</p> <p>Knee arthroplasty</p> <p>Challenging cases in total knee replacement</p> <p>Revision knee</p> <p>Total hip arthroplasty</p> <p>Perioperative assorted topics</p> <p>Challenging cases in total hip arthroplasty</p> <p>MSK management of sickle cell disease</p> <p>Breaking the mold: Insights and reflections on the most impactful cases</p>	<p>Primary total knee replacement</p> <p>Total shoulder arthroplasty</p> <p>Foot and ankle</p> <p>Shoulder (sports)</p> <p>Knee (sports)</p> <p>Shoulder reconstruction</p> <p>Physiotherapy</p> <p>Knee 2 (sports)</p> 

- Panel discussions, for example an 'ask the expert' session on 'Challenging total knee replacement cases', involving four specialists and moderated by JHAH's Dr. Mojib Manzary
- Workshops on topics such as 'shoulder arthroscopy' and 'running-related injuries'
- An exhibition hall with over 30 scientific posters that showcase innovations in medical devices and rehabilitation technologies (examples included: 'The effects of dry needling on cervicogenic dizziness in adults with neck pain', and 'The impact of cognitive load on performance for recreational cyclists')
- Networking during breaks and over dinner.

As part of the conference, JHAH hosted a one-day public symposium on sports injury prevention, reinforcing its commitment to community health and education. The 350 distinguished attendees included Olympic champions, sports medicine consultants, physical therapists, rehabilitation specialists and clinical nutritionists, offering a comprehensive approach to injury prevention and optimal performance.

In her address, Lamia Zayer stated: "Together, we're not just preventing injuries – we're building a healthier, more active Kingdom. This initiative reflects our dedication to public health and wellness, bringing together clinical experts and elite athletes to empower the community with injury prevention strategies."

The results for the wider conference were impressive:

- 430 attendees
- 93.8 percent satisfaction rate (responses to delegate survey)



- 40 scientific presentations across plenary and parallel sessions
- Seven interactive workshops offering hands-on training
- Five panel discussions featuring leading experts
- 30 CMEs hours, split between 22 conference CMEs and eight workshop CMEs.

Looking ahead



Reflecting on the first 12 months of the program, many of the early indicators suggest the enhancements are being recognized and appreciated by patients:

- 93.5 percent patient satisfaction
- 95-98 percent satisfaction among orthopedic consultants

- An increase in total patient numbers, as well as in the number of patients 'back referred' to JHAH (this is when Saudi Aramco employees and their eligible dependents who have opted for their healthcare to be delivered by a network provider are 'back referred' so they can gain access to certain specialty services)
- Zero infection rate for total knee replacement surgeries
- Reduced post-surgical complications through standardized care pathways.

Looking ahead, the priorities during the next phase of the project will include:

- Expanding the MSK residency programs
- Exploring AI-driven rehabilitation solutions
- Establishing JHAH as a FIFA-accredited Medical Center of Excellence
- Continuing cutting-edge research and innovation in robotic surgery and smart implants.

Figure Five: MSK conference objectives

	Objective	Detail
	Knowledge sharing	Facilitate dissemination of the latest research findings, surgical techniques and clinical best practices among healthcare professionals, researchers and industry experts.
	Professional development	Provide opportunities for continuous medical education, skills enhancement and professional networking for all those involved in the care of patients with musculoskeletal conditions.
	Interdisciplinary collaboration	Foster collaboration and interdisciplinary interactions among healthcare providers, researchers, educators and industry stakeholders to address complex challenges, exchange ideas and promote innovation in the fields of joint replacement surgery and sports-related injuries to upper and lower limbs.
	Patient-centered care	Emphasize the importance of patient-centered care by discussing evidence-based approaches, personalized treatment strategies and holistic rehabilitation programs aimed at optimizing outcomes and improving the quality of life for individuals undergoing joint replacement surgery or recovering from a sports injury.
	Innovation and technology	Showcase cutting-edge technologies, surgical techniques, implant designs, rehabilitation tools and sports equipment that have the potential to advance the fields of arthroplasty and sports medicine, enhance surgical outcome and optimize athletic performance and injury prevention.

Ms Zayer emphasized that the opportunity was not simply to make small, incremental changes. In such a rapidly changing speciality, it was important that the project team pursued a grander ambition.

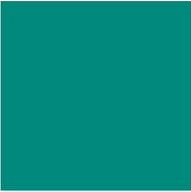
She concluded: “Our musculoskeletal program represents the fusion of cutting-edge research, innovative patient care and interdisciplinary collaboration. The goal is not simply to advance MSK care; it’s also about transforming the landscape of musculoskeletal medicine to deliver exceptional patient outcomes.”

Sources

1. Vos, T., et al. (2023). Global Burden of Disease Study 2021. *The Lancet*; World Health Organization (2023). Musculoskeletal Conditions. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions>; Cui, A., et al. (2020). Global Epidemiology of Knee Osteoarthritis: Incidence, Prevalence, and Risk Factors. *Annals of Translational Medicine*, 8(5), 69
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About the project champion



Lamia Zayer

Lamia Zayer BScPT, MSc-NeuroPT is Senior Director of Specialized Therapy and Clinical Services at Johns Hopkins Aramco Healthcare, leading four divisions: Respiratory Therapy, Rehabilitation Services, Clinical Nutrition and Food Services.

She was educated at King Saud University, and the Massachusetts General Hospital Institute of Health Professionals. She also has a certificate in clinical teaching from the University of Toronto, a certificate in Executive Leadership from Columbia Business School, and is an evidence-based practice trainer and speaker at Tufts University.

She has authored multiple articles in the field of physical therapy, with her primary research interests including neurology rehabilitation, stroke, and evidence-based research.



Also available



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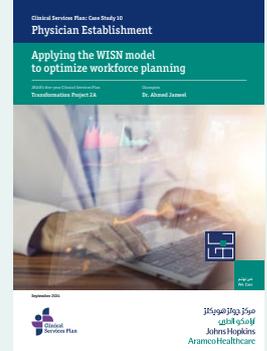
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Note: Additional CSP case studies are constantly under development. Please email or call your JHAH contact for information on future editions.

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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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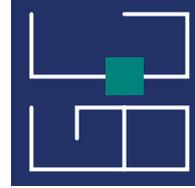
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