نحن نهتم
We Care

Case Study 08: CATH LAB

Tackling the bed crunch

JHAH's five-year Clinical Services Plan
Transformation Project 3Cii

Project Champion
Dr. Faisal Al Qoofi

Clinical Services Plan

مركز جونز هوبكنز أرامكو الطبي
Johns Hopkins Aramco Healthcare

Case Study 08: CATH LAB

Tackling the bed crunch

Project Details

The Objective

- To prepare for a significant growth in demand.

The Priorities

- Assess new service opportunities.
- Provide a more streamlined patient experience.
- Build the capacity for greater volume.

The Timeline

- **Project kick-off:** January 2023
- **Project closure:** June 2024

The Project Team

Champion:

- Dr. Faisal Al Qoofi

Sponsor:

- Dr. J.J. de Gorter

Team members:

- Dr. Mohammed Abdul
- Somaya Hajri
- Dr. Saad Hasaniah
- Norsyma Jaffar
- Gitu Mirchandani
- Mohammed Mudhki
- Kastoru Ramasamy

For more information

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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 'Cath Lab' review was included as Objective #3Cii in the CSP.

Project Background

Cardiovascular disease was described in 2022 as a "public health priority" by the Saudi Health Council[1], who estimated that more than 30 percent of adults in the Kingdom are at risk of a CVD event – with the challenge exacerbated by such factors as sedentary lifestyles, consumption of fatty foods, and low fiber intake. The Council also highlighted the "range of comorbidity conditions or risks" such as diabetes melliyus (12.3 percent), smoking (16 percent), hypertension (22 percent) and high cholesterol or dyslipidemia (35-40 percent).

For this reason, JHAH regards a modern, high performance Cath Lab – able to make accurate diagnoses through tests on the heart's arteries and chambers, and then perform procedures such as ablations, angiograms, angioplasty pacemaker implantation or transcathter valve replacement – as being strategically important for the continued safety and wellbeing of patients.

Once the decision had been taken to modernize JHAH's clinical services through the five-year CSP program, it was immediately recognized this needed to include a review of the Cath Lab service (which was then performing under 150 procedures per month) – to ensure it would be able to meet the increasing demand from patients. A project scope was agreed that included bed availability, increased volumes, new services, better utilization, enhanced cost management, and employee engagement.

Project Delivery

The project team segmented the workload into two main priorities:

- **The development of new services.** This element of the project was driven by an evaluation of emerging best practices at other leading Cath Lab services, and an assessment of the potential beneficial impact from their introduction at JHAH.
- **Building an infrastructure able to handle greater throughout.** This element of the project looked at the key process flows within the Cath Lab. It quickly identified that a major constraint was the lack of availability of recovery beds within the hospital. This often led to patients waiting in a local hospital for a number of days until bed capacity was freed up.

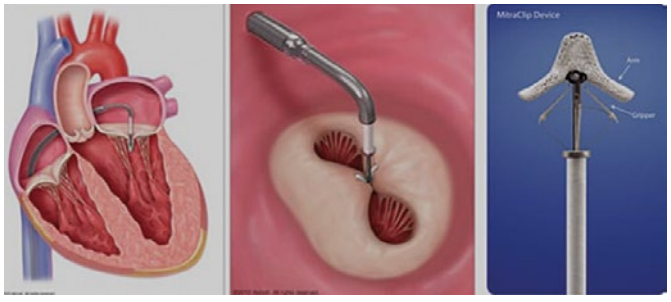
The Outcome

New services launched during late 2023 with significant benefits to patients suffering cardiac problem included:

Mitral clip

The purpose of this procedure is to correct leaky heart valves which, left untreated, can lead to death in 57 percent of cases[2]. The procedure involves the implantation of a small chip which is guided through a leg vein until it is attached to the heart's mitral value, and helps to restore normal blood flow (see Figure One).

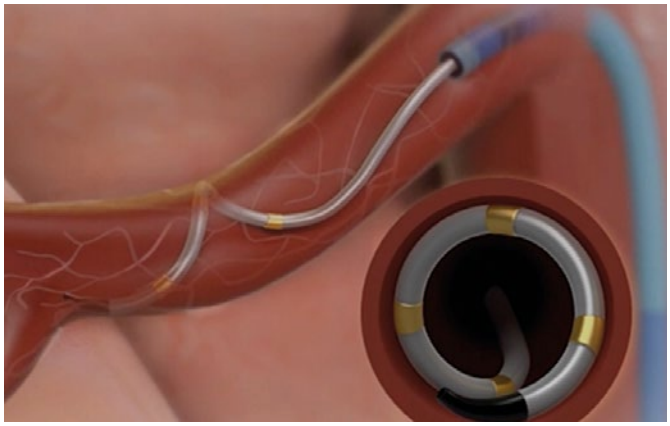
Figure One: Mitral clip



Renal denervation

This procedure, which received FDA approval in the United States in November 2023, lowers blood pressure by denervating the sympathetic nerves surrounding the renal arteries (see Figure Two). It has been described as a "turning point" in hypertension care[3].

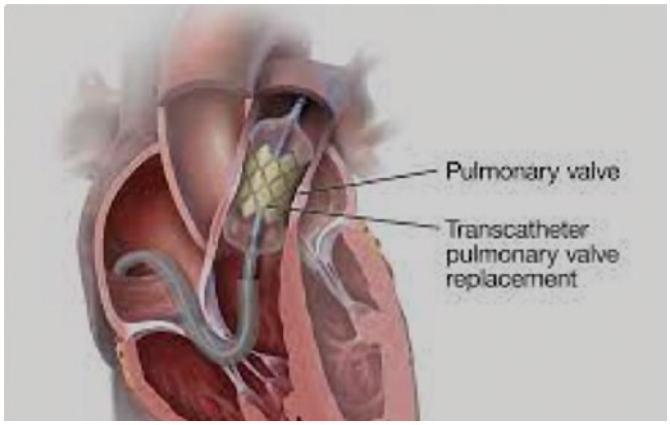
Figure Two: Renal denervation



Transcatheter pulmonary valve replacment

This is a minimally invasive structural heart disease treatment to replace a diseased pulmonary valve which can be leaky or narrowed (see Figure Three).

Figure Three: Transcatheter pulmonary valve replacement



However, the team recognized there was little point introducing innovative new services, if the capacity challenge remained unaddressed. For this reason, the project focus quickly switched to identifying options for enhanced capacity and thereby throughput.

An analysis of the Cath Lab pathways and metrics highlighted the extent of the constraint. At JHAH, in a typical day, four patients were being assigned to day

surgery for invasive cardiac procedures, including cardiac catheterization, implant procedure, structural heart cases, and EPS and ablation procedures. Unfortunately, only two patients could return due to the day surgery area being occupied with cases from the Operating Room department. Hence, the other two patients were being routed to the inpatient floor regardless of the procedure result. A rising number of cases were being rescheduled and delayed due to bed crunches; this affected Cath Lab utilization, caused a dip in patient satisfaction and – most importantly – was leaving vulnerable patients untreated.

Some measures had already been introduced to mitigate the wider consequences – for example, in some cases that met the SDD criteria, a streamlined discharge process was in effect (particularly for PCI, EPS, ablation and implants) from Cath Lab recovery. However this was insufficient to tackle the extent of the challenge. That would require at least two dedicated recovery beds.

A number of options were considered within the hospital. Each option carried a potential impact on other hospital services and activities, so the assessment needed to be multidisciplinary. In the event, the evaluation was undertaken with insight from professionals from many JHAH teams – Risk Management, Cardiology, EPIC, Facilities, Pharmacy, Cardiac Rehabilitation and Admissions. The final determination was to set aside two beds within the Post-Anesthesia Care Unit team, and the first patient was received and discharged through this route in March 2024 (see Figure Four).

Figure Four: A new Cath Lab recovery bed

Patient safety is, of course, paramount at all times – and especially during a process change. For this reason, it was necessary to closely monitor the early patients – clinical nurse educators provided nurses with detailed instructions on patient observation and care as they emerged from Cath Lab procedures and were taken to the recovery beds. Within the first two months, the Cath Lab nurses monitored and discharged 23 patients without incident.

There has been a measurable impact upon volumes. The number of monthly procedures now regularly reaches 250, from less than 150 before the review (see Figure Five). Moreover, patient satisfaction with JHAH's overall Cardiology service is now above 90 percent, having previously been stuck in the mid 80s.

Figure Five: Benefits realization (Cath Lab procedures per month)

Lessons learned

In closing the project, a number of factors were highlighted that drove a successful outcome. These included:

- Clarity of objectives.
- Looking over the immediate horizon to spot opportunities and challenges.
- Staying aware of the 'big picture'.
- Being open to innovation.
- Being alert to the threat of competition.

In hindsight, the team recognizes it might have been wise to engage with colleagues from functions such as Facilities as soon as the potential need for a change in bed allocation became apparent. This means looking a few steps ahead, beyond the immediate tasks, and bringing into the fold all those with relevant expertise who can contribute to the decision-making and an agreed conclusion.

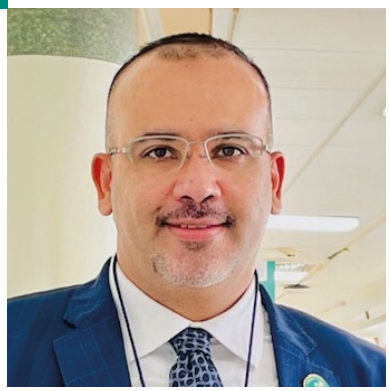
While the project was underway, the project team was constantly reviewing and interrogating key performance metrics, and sharing these with the entire Cath Lab team. It will be important, as the service emerges from the project structure and returns to its regular operations, that this openness to change and awareness of performance data remains ingrained in this Cath Lab culture.

Reflecting on the experience of leading the project, Dr. Al Qoofi remarks: "The Clinical Services Plan is a great development opportunity. This project highlighted the importance of teamwork at multiple levels, and the need for shared strategic thinking between all project stakeholders."

Notes:

1. Saudi Health Council National heart Center, 'Cardiovascular Disease: A Public Health Priority', March 2022
2. MitraClip (transcatheter mitral valve repair), 'Repair your leaking heart valve', Abbott 2024
3. Medronic, 'This is the turning point in hypertension care', undated (see website: https://www.medtronic.com/us-en/healthcare-professionals/therapies-procedures/cardiovascular/renal-denervation.html)

About the Project Champion



Dr. Faisal Al Qoofi

Dr. Al Qoofi is an Interventional Medicine and Cardiology Consultant at Johns Hopkins Aramco Healthcare.

He was educated at Kind Saud University, Riyadh (Bachelor of Medicine and Surgery), at the University of Calgary, Canada (where he studied General Cardiology and Interventional Cardiology), and at the North Shore University, Illinois, USA (Advanced Interventional and Structural Fellowship).

Before joining JHAH, he was Director of The Structural Heart Disease Program at the Libin Cardiovascular Institute.

His areas of professional expertise include complex coronary intervention, structural heart disease intervention including Trans-Catheter Aortic Valve Replacement (TAVR), Mitral Valve Intervention including mitral clip, and the closure of Atrial Septal Defects (ASD).

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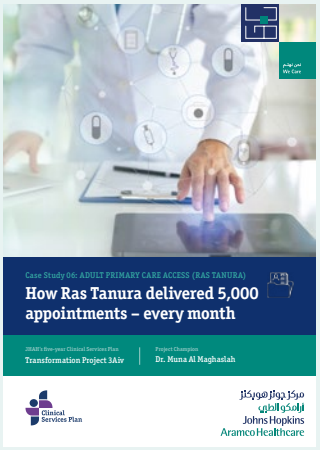
Case Study #05: ADULT PRIMARY CARE ACCESS (DHAHRAN)

The doctor will see you now



Case Study #06: ADULT PRIMARY CARE ACCESS (RAS TANURA)

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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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