

Revolutionizing healthcare: The transformative impact of robotic surgery

Mr. Rajesh Sivaprakasam FRCS

Robotic Renal Failure Surgeon and Medical Entrepreneur
Bartshealth NHS trust. London. United Kingdom.

Positions

Consultant Robotic Renal Failure Surgeon, Lead for Robotic Renal Failure Surgery, Research, Innovation & Education

Educator & Mentor - Year 5, Queen Mary University of London (UK & Malta) Consultants & Higher Surgical Trainees

Examiner & Director - Royal College of Surgeons (Intercollegiate)

Key opinion Leader – Digital Innovation based healthcare solutions

Ambassador for Patient charities and groups 

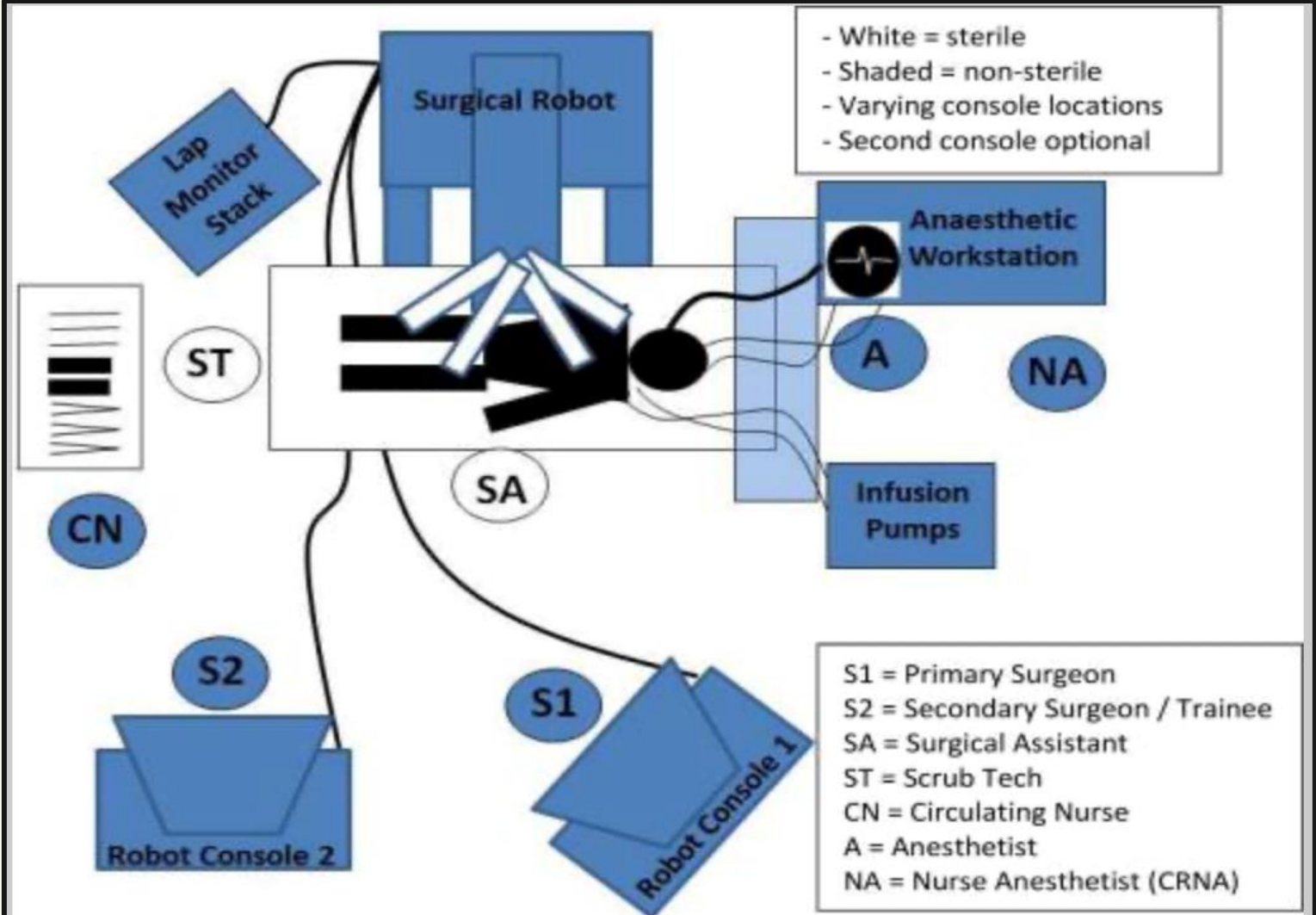
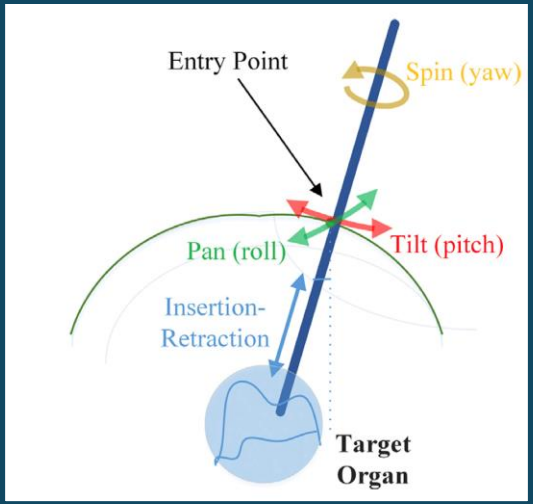
Member of All Party Parliamentary group for health equality 

Enable integration of innovation-based solutions in care delivery

↑ Engagement to digital health from patients and care providers



Robot-Assisted Surgery



Bartshealth Multispeciality Robotic Programme

- > 5 years old & performed >1000 procedures
- Seven teams
- Gynaecology, Urology, thoracic, Colo-rectal, HPB, ENT and Transplant.
- Developed many combined surgical care delivery models

- Clinical
- Research & Innovation
- Training
- Efficiency

Transformation

- **Patients**
- **Surgeons**
- **Clinical team**
- **Healthcare providers**
- **Society**

Belinda, 38 years old Londoner



Needs dialysis three times a week using AV fistula/Graft (AVF/G)

AVF/G -developed using patient's own artery & vein or a prosthetic graft and needs 1-2 proc./yr to maintain it.

Journalist, Business & Innovation editor, TED speaker, Campaigner for renal failure care

CKD with failed renal transplantation on dialysis and had multiple surgical procedures for AVF/G.

Always has a bag for multiple hospital visits, surgical procedures & unpredictable admissions.

Unmet Need



Reactive &
Restrictive (diet,
fluid, QoL)



Remains
partly/mostly
hospital-based



Single time-Point
assessment & care



Feeling not Involved &
hesitant to Selfcare



Expensive

At Barts Health

Patient - Focused

Robot assisted Renal Failure Surgery ★

Endovascular AV Fistula ★

Remote renal care with alio★★

Shared decision making for AV access ★

Staff - Focused

Point of Care Ultrasound ★

Digital Co-pilot for patient safety ★★

Improving Surgical Training & Efficiency★★

Enhanced Medical Education ★


★ - Implemented

★★ - ongoing validation


Remote Clinical Care







Current Status


All-in-one, noninvasive, clinical grade, RPM



FDA Cleared*



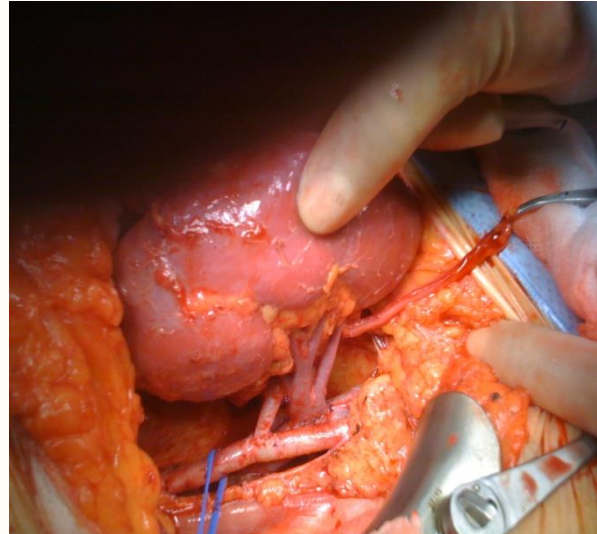
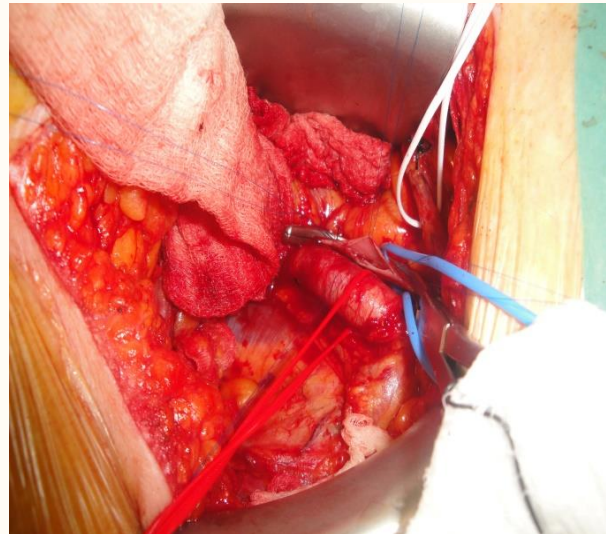
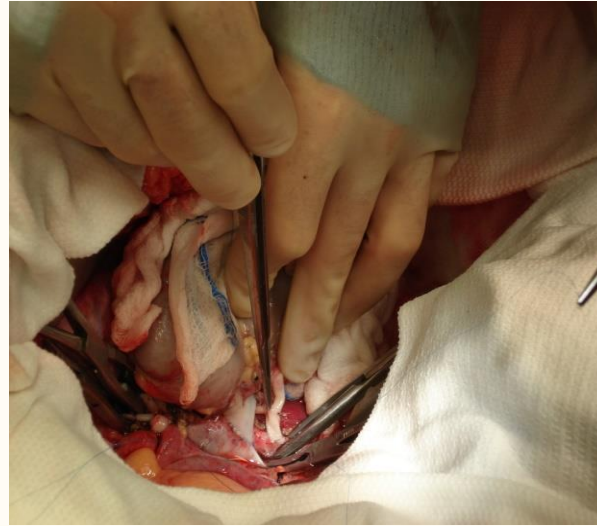
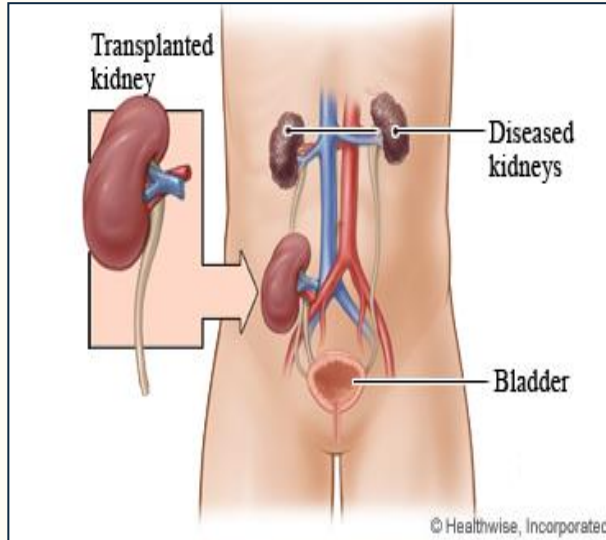
-  Heart rate (BPM)
-  Skin temperature (°C/°F)
-  Auscultation
-  Hemoglobin (g/dl)
-  Hematocrit (%)
-  Potassium Indicator



Can measure from Chest wall and Calf.

Awaiting FDA approval – BP, SaO2 and fluid status
(2025)

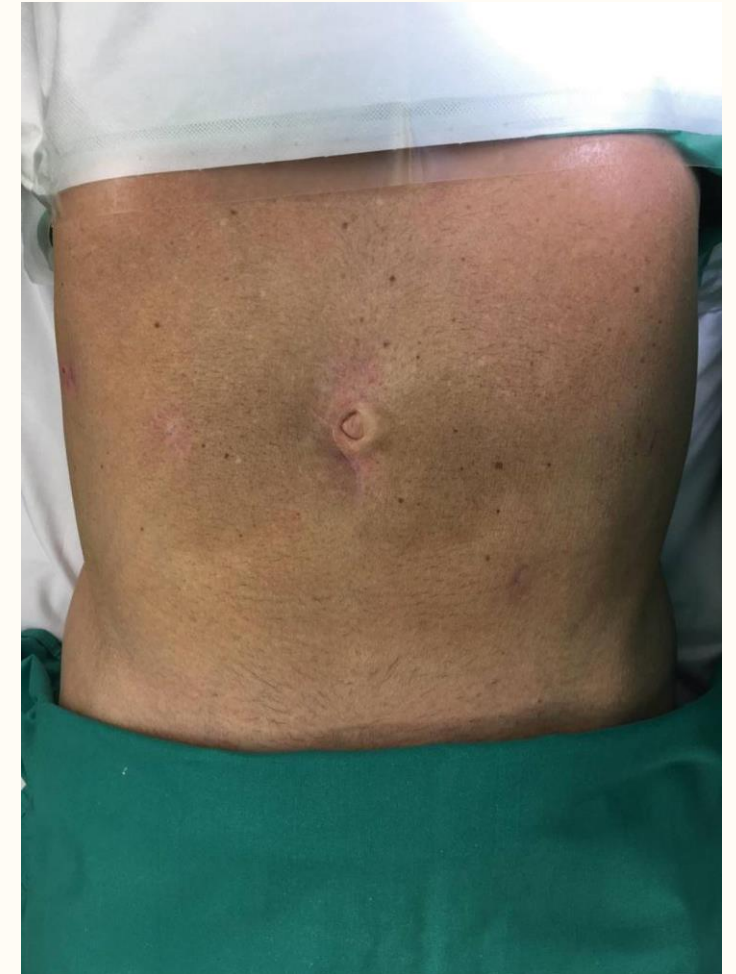
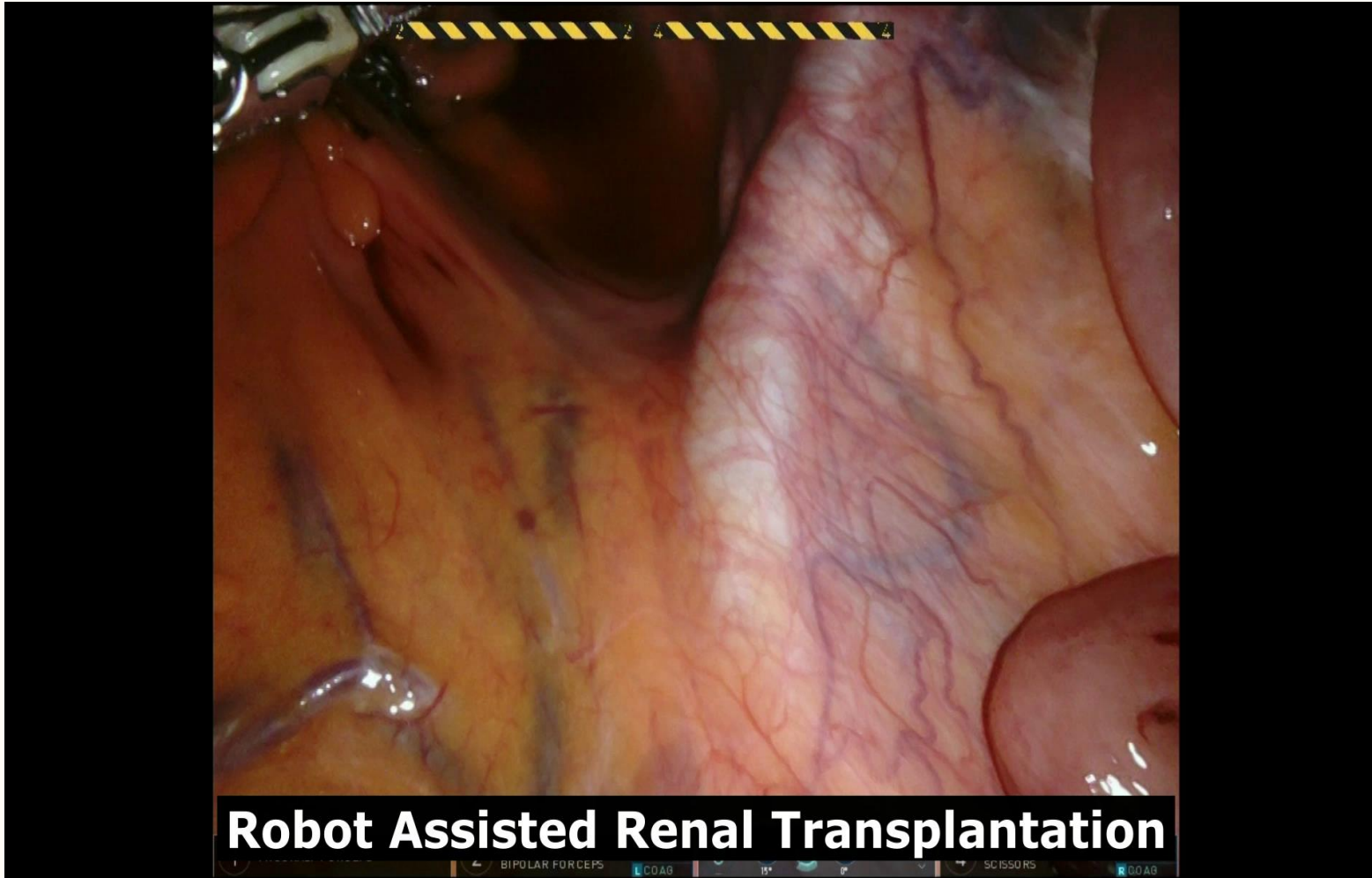
Renal Transplantation (Open) – Surgical Steps



5-7 Hospital stay with wound related issues
(Short & long-term)

Slower physical (> 6 weeks) and mental
recovery.

Robot Assisted Renal Transplantation

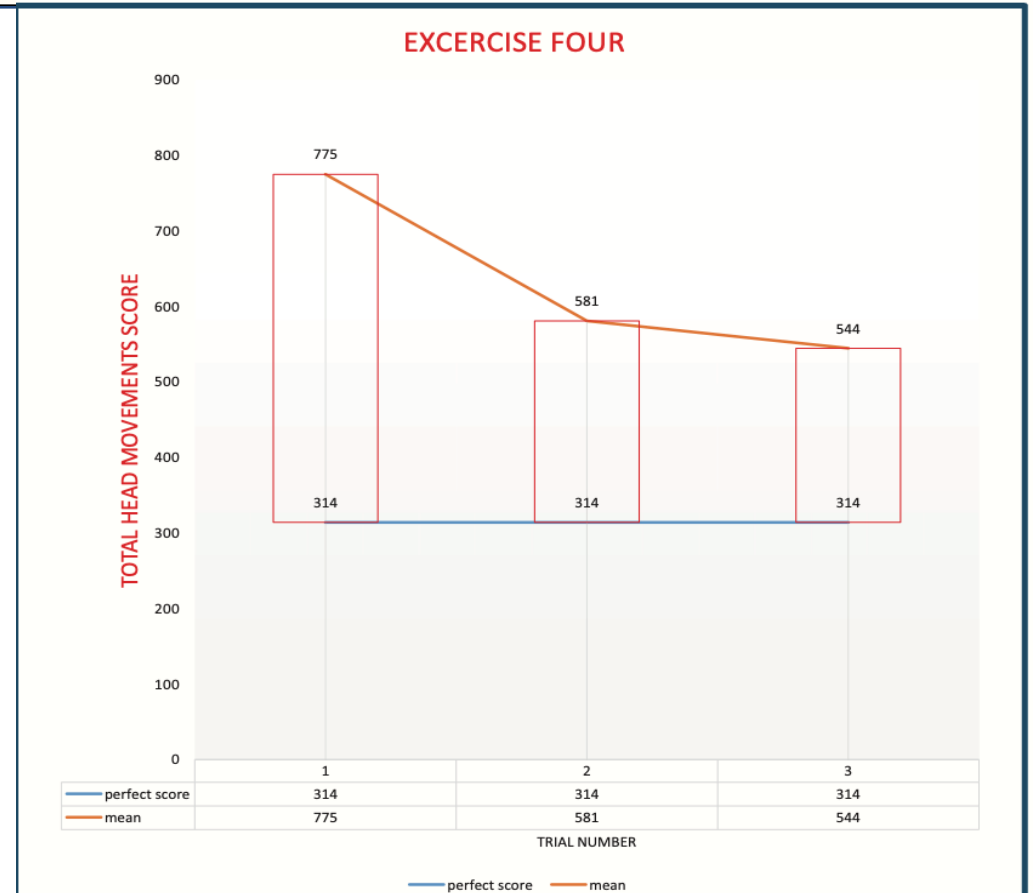
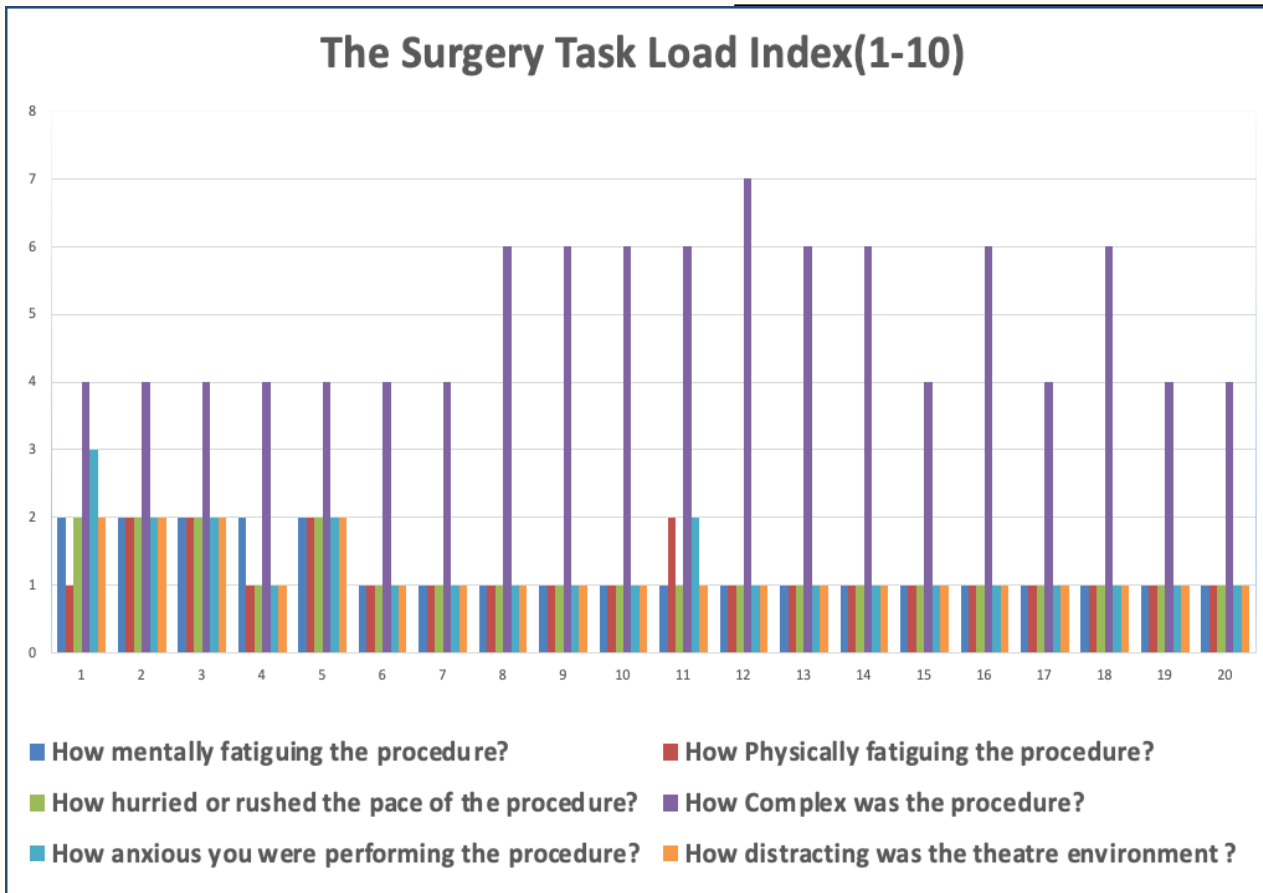


Surgeons

- Enthusiasm to **relearn** and adopt technology enabled surgical procedures.
- Need time progress in a step-wise manner guided by nominated mentor.
- Robotic Surgery warrants a clear procedure plan & avoid device related constraints.
- Enhanced learning on key aspects and accept learning curve.



More Robots



More Types - single or multiple arms, Single or multicart, Open and closed vision
Options - > 8 companies.
Variable learning Curve.

Enhanced learning (n=1)-Renal Transplant

Overall score

7

7

6

Tests			
Heart rate	73	86	82
Respiratory rate	14	17	18
Pulse-Resp Quotient	4	5	5
Stress Level (Beverky index)	Low	Normal	High
Stress response	Normal	Normal	High
Recovery ability	Normal	High	Low

Supervising

Tx at 02:00am

With a new team

Renal Transplant with a new team

Overall score

7

6

7

8

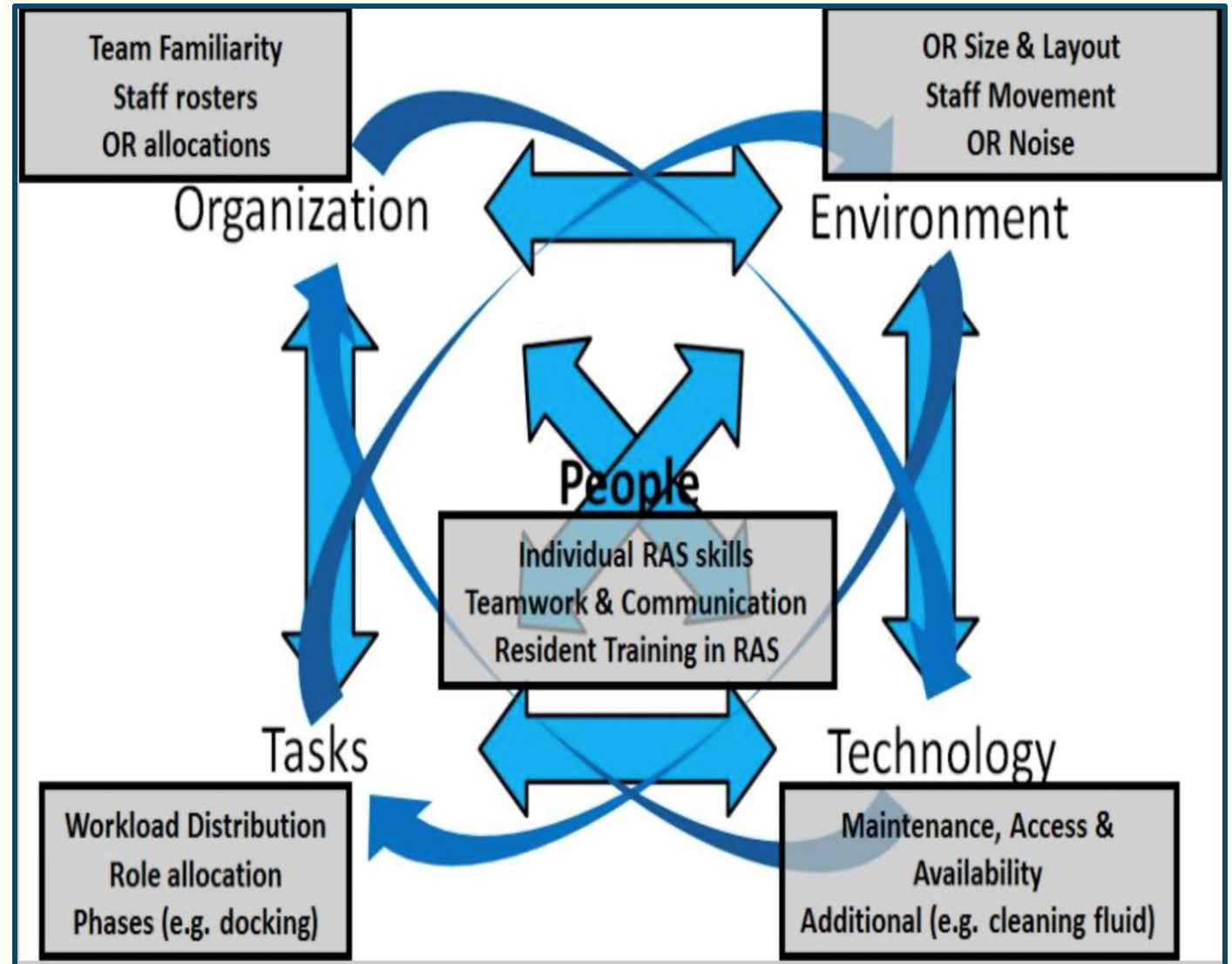
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7

Tests						
Heart rate	73	86	82	78	72	74
Respiratory rate	14	18	17	15	15	14
Pulse-Resp Quotient	4	5	5	4	4	3
Stress Level (Beverky index)	High	High	Normal	Normal	Normal	Normal
Stress response	Normal	Normal	Normal	Normal	Normal	Normal
Recovery ability	Low	Low	Low	High	High	High

Clinical Team

- Dedicated team with named individuals & allocated responsibility.
- Simulation helps and plan to repeat at regular intervals.
- Improved patient safety, team efficiency and satisfaction.
- Increase in Staff retention.



Enhanced learning - Measuring a team

The image shows a group of men in suits, some smiling, with several data panels overlaid. On the left, a vertical menu contains: Camera, Video, Image, Video Feedback, Smile Game, and Options. Three circular gauges on the right show 'HIGH Mood', 'HIGH Energy', and 'LOW Stress'. Numerous data panels are scattered across the image, each listing facial analysis metrics such as Face Certainty, Mouth, Blink Count, L Eye Shut, R Eye Shut, Head Horizontal, Head Vertical, and Eyebrows with numerical values.

Menu:

- Camera
- Video
- Image
- Video Feedback
- Smile Game
- Options

Mood Gauge: HIGH Mood

Energy Gauge: HIGH Energy

Stress Gauge: LOW Stress

Facial Analysis Data Panels (Examples):

Disgusted	39
Happy	83
Face Certainty	0.99
Mouth	1.21
Blink Count	0
L Eye Shut	0.74
R Eye Shut	0.32
Head Horizontal	15R
Head Vertical	0.83
Eyebrows	2.70

Happy	100
Face Certainty	0.88
Mouth	0.7
Blink Count	0
L Eye Shut	0.40
R Eye Shut	0.24
Head Horizontal	12R
Head Vertical	0.76
Eyebrows	2.73

Happy	100
Face Certainty	0.97
Mouth	0.16
Blink Count	0
L Eye Shut	0.59
R Eye Shut	0.19
Head Horizontal	60L
Head Vertical	0.20
Eyebrows	2.81

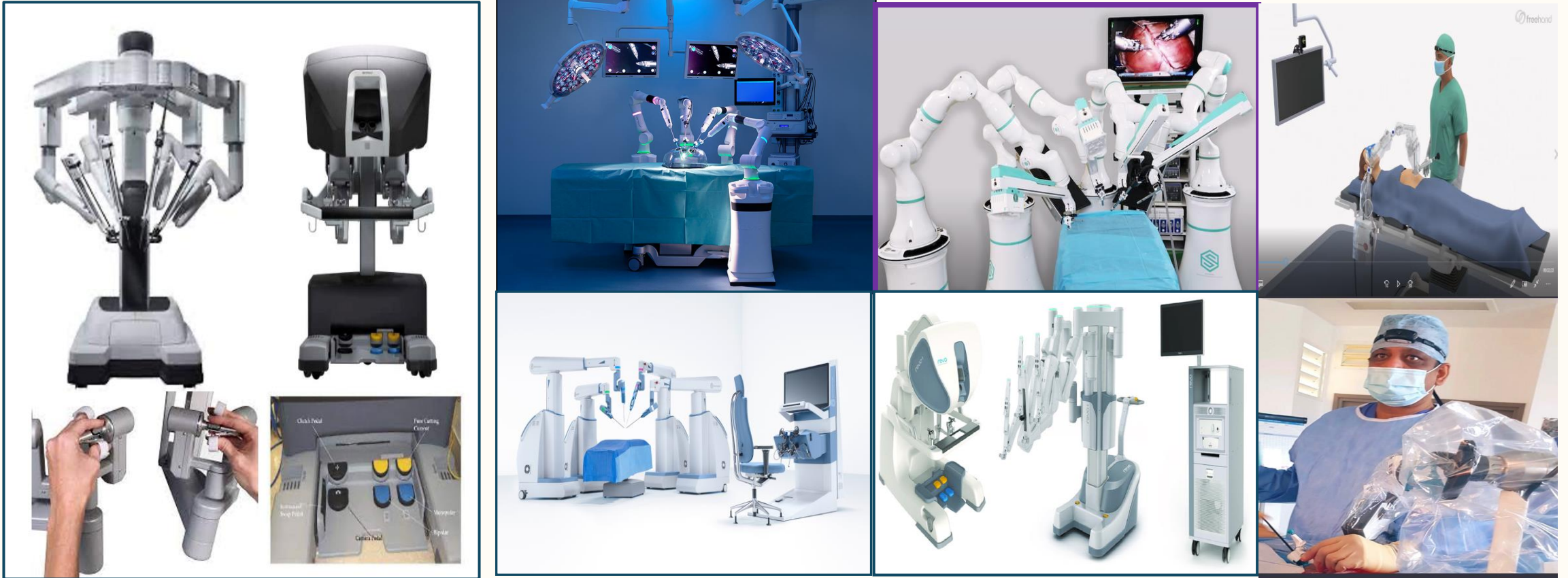
Happy	100
Face Certainty	1
Mouth	0.94
Blink Count	0
L Eye Shut	0.17
R Eye Shut	0.22
Head Horizontal	32R
Head Vertical	0.64
Eyebrows	2.44

Happy	100
Face Certainty	0.97
Mouth	0.88
Blink Count	0
L Eye Shut	0.18
R Eye Shut	0.37
Head Horizontal	20L
Head Vertical	0.64
Eyebrows	2.51

Healthcare providers

- Increasing need to offer surgical care for complex diseases.
- Need to provide enhanced treatment choices and deliver a cost-effective care.
- Changing patient expectations and improve profile of the institution.
- Increasing digital engagement of future healthcare staff.

More Robots



- More options allows us to develop a cost-effective care delivery model.
- Improving affordability of robots.

Projections

10-year growth projection:



Procedure



Bariatric



Colorectal



Hepatobiliary



Oncology



Upper gastrointestinal tract



Endocrine



Breast

Future projection



Robotic opportunity

● Surgeons who are robotically trained with meaningful usage

● Surgeons who are robotically trained, but usage is low

● No substantial offering or lack of training and low usage

0

2022

2023

2024

2025

2026

2027

2028

2029


2030

2031

2032

Society

- Increasing

► Cureus. 2024 Mar 20;16(3):e56523. doi: [10.7759/cureus.56523](https://doi.org/10.7759/cureus.56523) 

Knowledge, Attitude, Awareness, and Future Expectations of Robotic Surgery in Patients Attending Surgical Specialties Clinics


[Fahad A Al Dihan](#)¹, [Mohannad A Alghamdi](#)^{1,✉}, [Faisal A Aldihan](#)¹, [Nawaf M Alamer](#)¹, [Faisal A Alshahrani](#)¹, [Ayyob Algarni](#)²

- Surveys s

Original Article

Public's Perception and Knowledge of Using Robotics in General Surgery in Eastern Region, Saudi Arabia

Amjad Abdulhameed AlNaim, Noura AlNaim, Fatimah Al Nasser, Latifah Albash, Maryam Almulhim, Loai Albinsaad
Department of General Surgery, King Faisal University, Hofuf, Saudi Arabia

► Cureus. 2024 Mar 20;16(3):e56523. doi: [10.7759/cureus.56523](https://doi.org/10.7759/cureus.56523) 

Knowledge, Attitude, Awareness, and Future Expectations of Robotic Surgery in Patients Attending Surgical Specialties Clinics

- Inequity to

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Summary

Transformation

Patients : A more patient focused & partnered approach.
Will help to accept & adopt other digital solutions.

Surgeons: a reflective and proactive shared surgical care delivery.
Structured and well-designed training programs.

Team : Enables team cohesion, collaborative working, staff satisfaction
and retention.

Providers : Recognise & develop a technology enabled surgical care.

Society : Increasing awareness & options of robots will aid to
implement enhanced care delivery & reduce inequity.

Personal reflections

- Be aware of the physical & cognitive load to self and the team.
- Early patient engagement and careful patient selection is key.
- Partner with other robotic surgical specialists to deliver a safe & efficient care.
- Accept the need for learning curve, have procedures to maintain robotic skills and work with the same team.

Conclusions

- Robot assisted surgical care delivery is becoming an integral part of healthcare.
- Changing patient demographics warrants us to offer enhanced surgical care to both improve quantity & quality of their health.
- Adopting to the changing surgical innovation landscape is key to improve engagement of patients and future clinicians.



Thank you for your kind attention



**& Industry
Partners**