

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Case Presentation
Smart Technology to Smart Care



Osama Al Swailem MD, MA

Chief Information Officer – Associate Professor

Salam Everyone, I am King Faisal Specialist Hospital & Research Center

Bachelor of Medicine & Surgery
King Saud University

Masters & Post Doctoral Fellowship
Columbia University

King Faisal Specialist Hospital & Research Center

2014 – Present

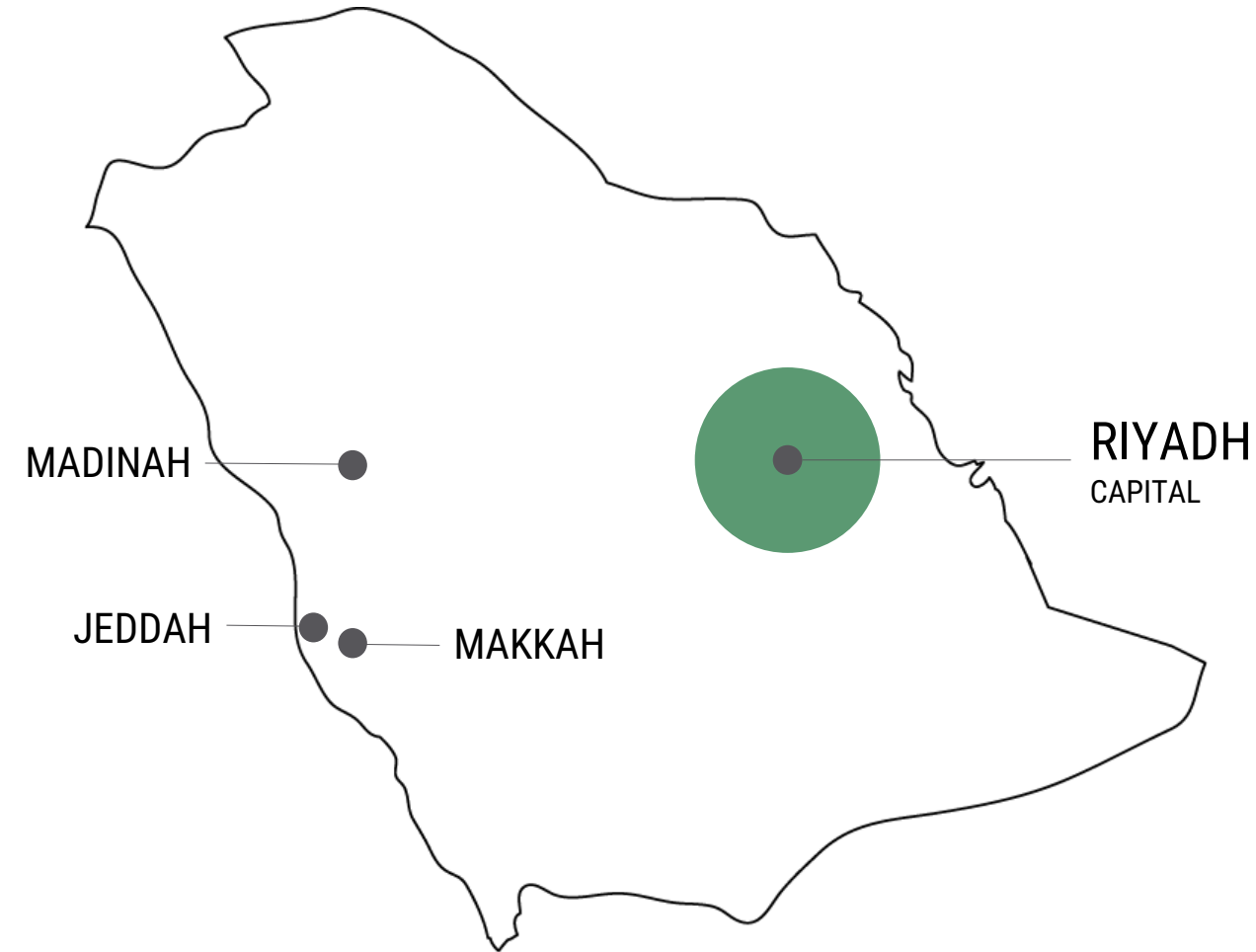
Chief Information Officer

2008 – 2014

Director Medical Informatics



ABOUT SAUDI ARABIA



Population 29.897 Million



Literacy 81%



Language Arabic



King Salman bin Abdulaziz Al Saud

DID YOU KNOW

- Saudi Arabia is the 13th largest country in the world
- Saudi Arabia is the largest country in the world without a river
- Riyadh's camel market is one of the largest in the world and sells about 100 camels per day
- Jeddah is a 3000+ year old city and houses the tomb of Eve (Arabic: حَواء Hawa), the mother of mankind

ABOUT KFSH&RC



Newspaper:

Al Riyadh

Date:

10 November 1970

KFSH&RC FACTS & FIGURES

MISSION Provide the highest level of specialized healthcare in an integrated educational and research setting

VISION To be a world-leading institution of excellence and innovation in healthcare



Est 1975



Kingdom of Saudi Arabia



9.4M Population Served



Riyadh, Jeddah & Madinah



31 Smart Centers

CY2018



1,846 Beds



31,741 Admissions



1,297,497 OP Visits



1,472 Transplants



56,932 OR Hours



13,687 Employees
68 Nationalities



95,382 ER Visits

KFSH&RC RANKINGS



#1

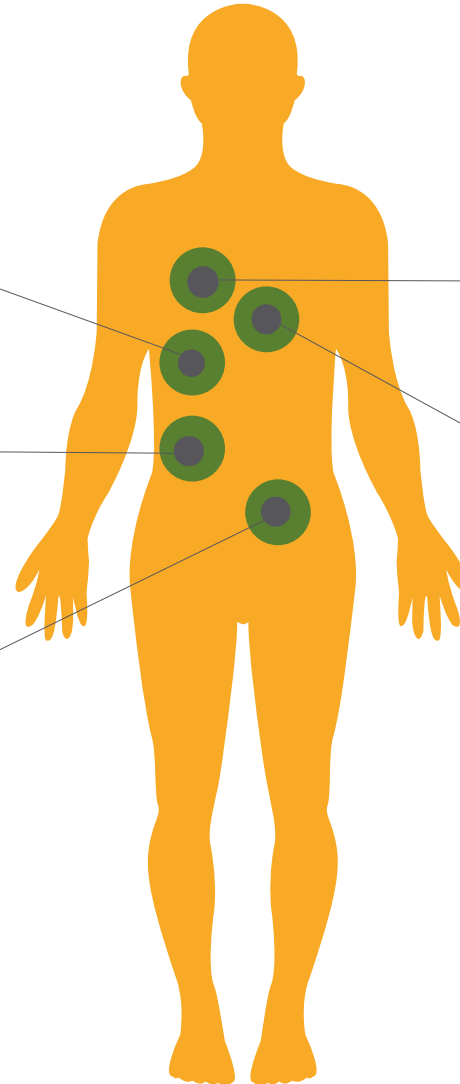
Out of 141 centers in the UK & USA in the volume of Pediatric living donor **liver** transplants

#1

Out of 257 centers in the UK & USA in the volume of Pediatric living **kidney** transplants

**TOP
4%**

Out of 272 centers in the USA reporting to Center of International **Blood & Marrow** Transplant Research



56th

Out of 71 centers in the USA in the volume of **lung** transplants

**TOP
10%**

Of **heart** transplants worldwide

RESEARCH

17 Citation Average

EDUCATION

Graduate 1 out of 5 Consultants in the Region

KFSH&RC ACHIEVEMENTS

HIMSS EMRAM 7
Ambulatory
Riyadh & Jeddah



HIMSS AMAM 6
Riyadh & Jeddah



JCIA
Joint Commission
International Accreditation



CAP
Laboratory Accreditation
College of American Pathologists



HIMSS EMRAM 6
Inpatient
Riyadh & Jeddah



CBAHI
Saudi Healthcare Accreditation
Riyadh & Jeddah



MAGNET
American Nurses Credentialing
Center



ISO 27001
Information Security





Fahad Bin Dayel, RN

Director Application & Health Informatics Services

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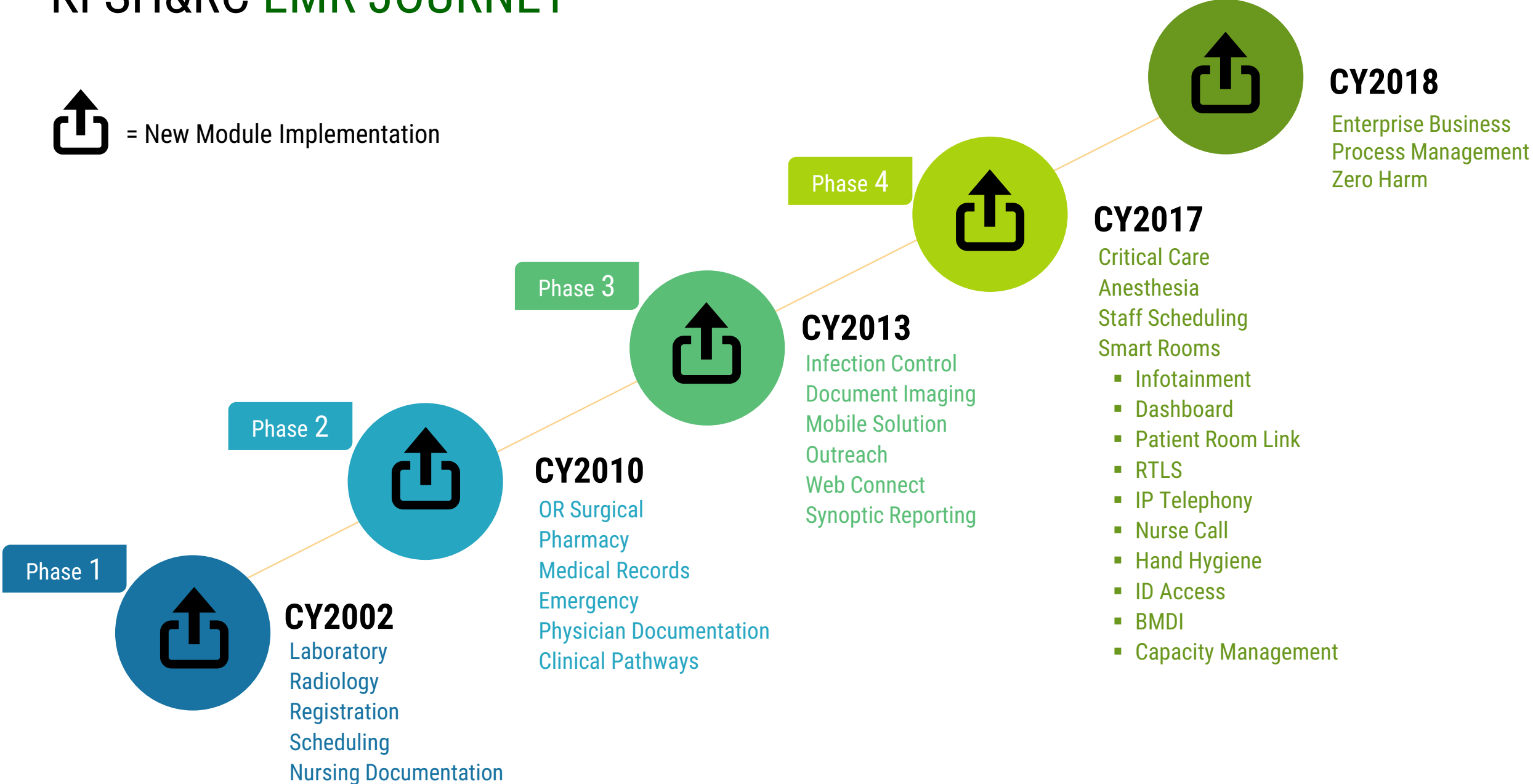
Bachelor of Science in Nursing
Master in Health Information System Management
George Mason University

King Faisal Specialist Hospital & Research Center

2018 – Present	Director Application & Health Informatics
2008 – 2018	Head of Health Informatics

KFSH&RC EMR JOURNEY

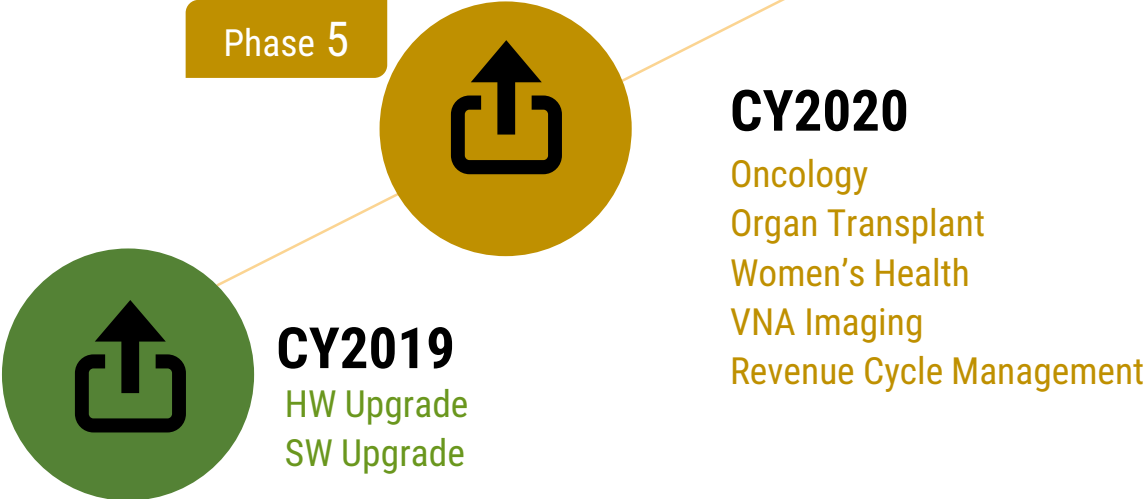
 = New Module Implementation



KFSH&RC EMR JOURNEY

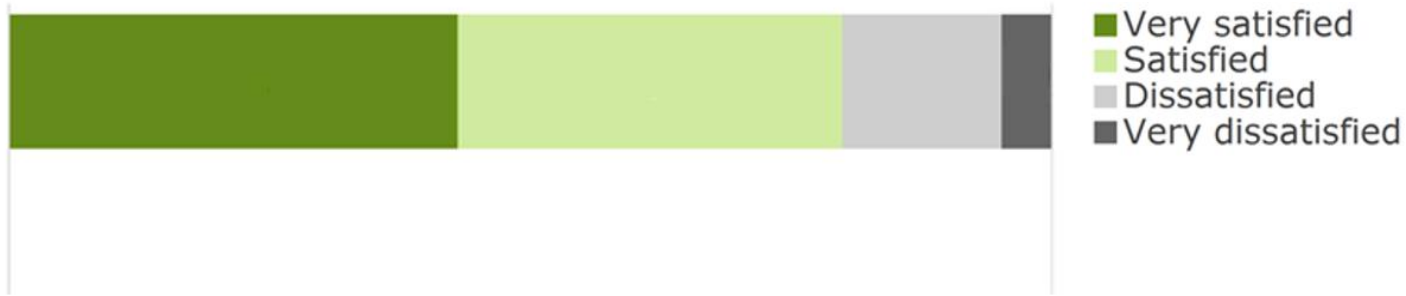


 = New Module Implementation



KLAS EMR SATISFACTION

King Faisal



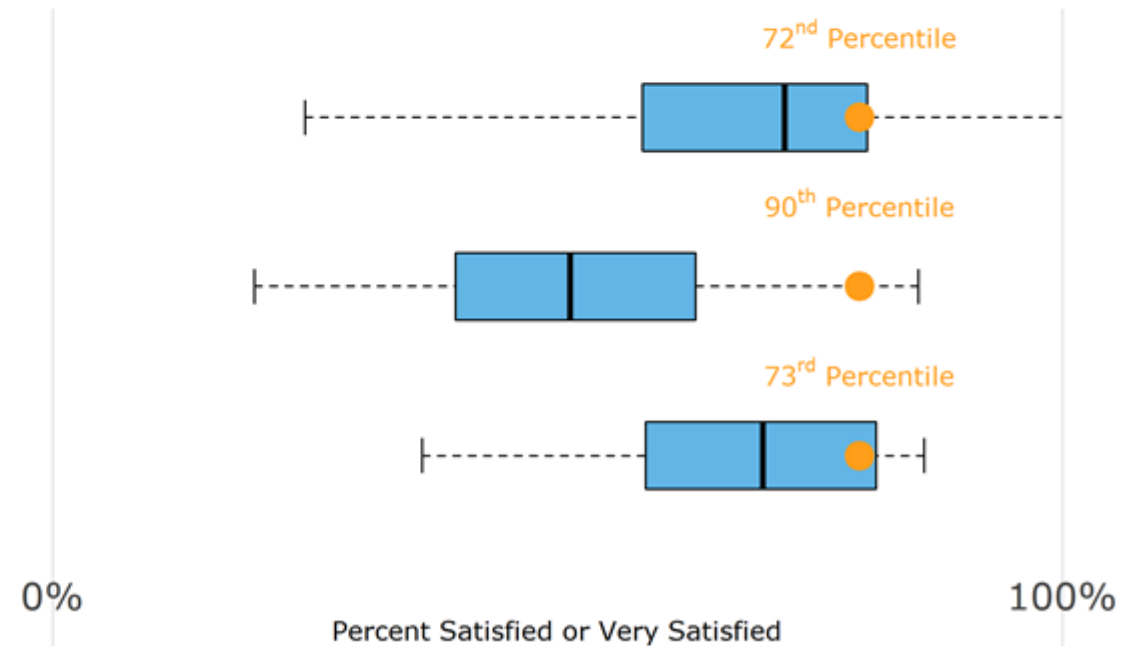
Overall EMR Satisfaction

All Clinicians (n=73,115)

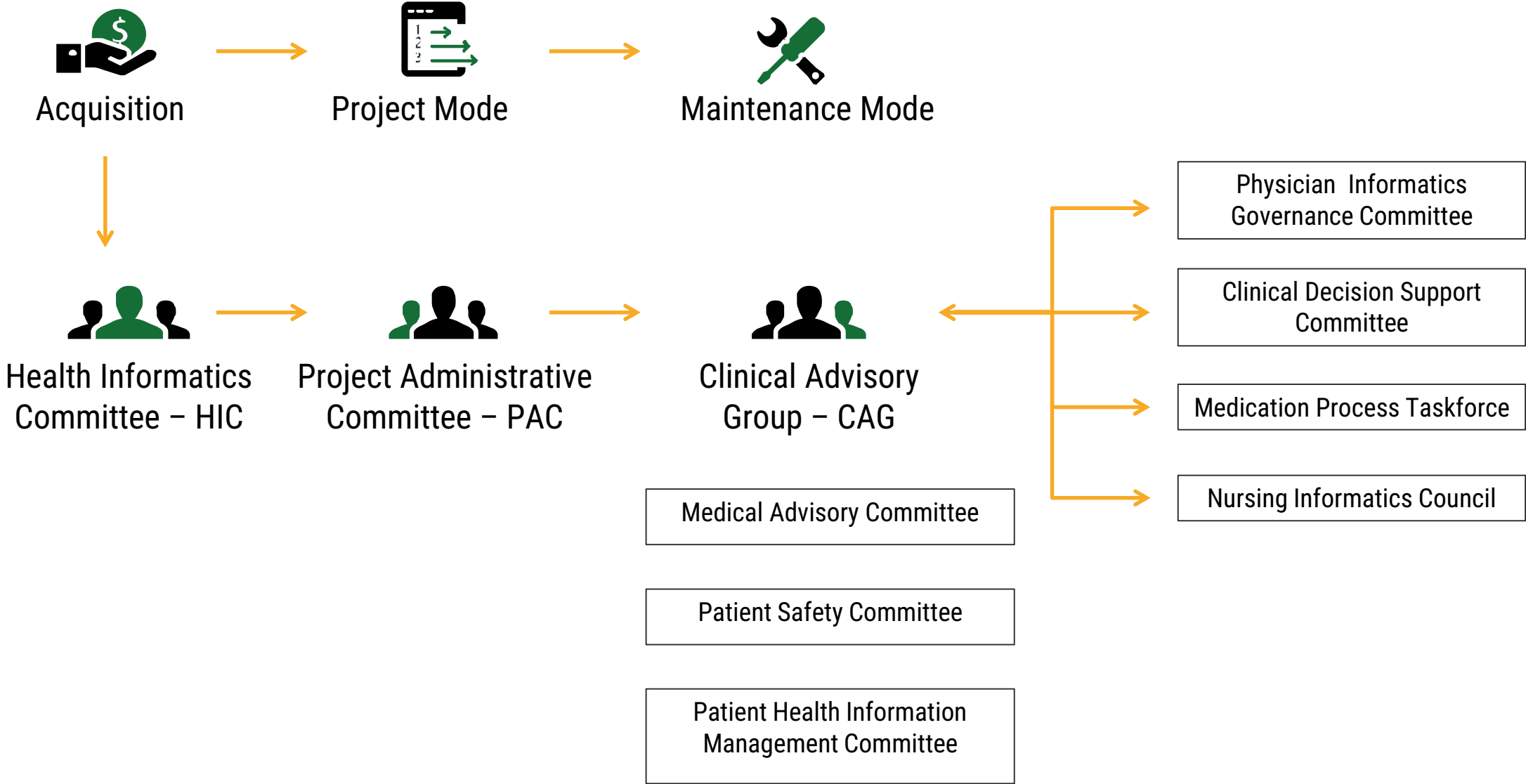
All Organizations (n=159)

Cerner Deployments (n=29)

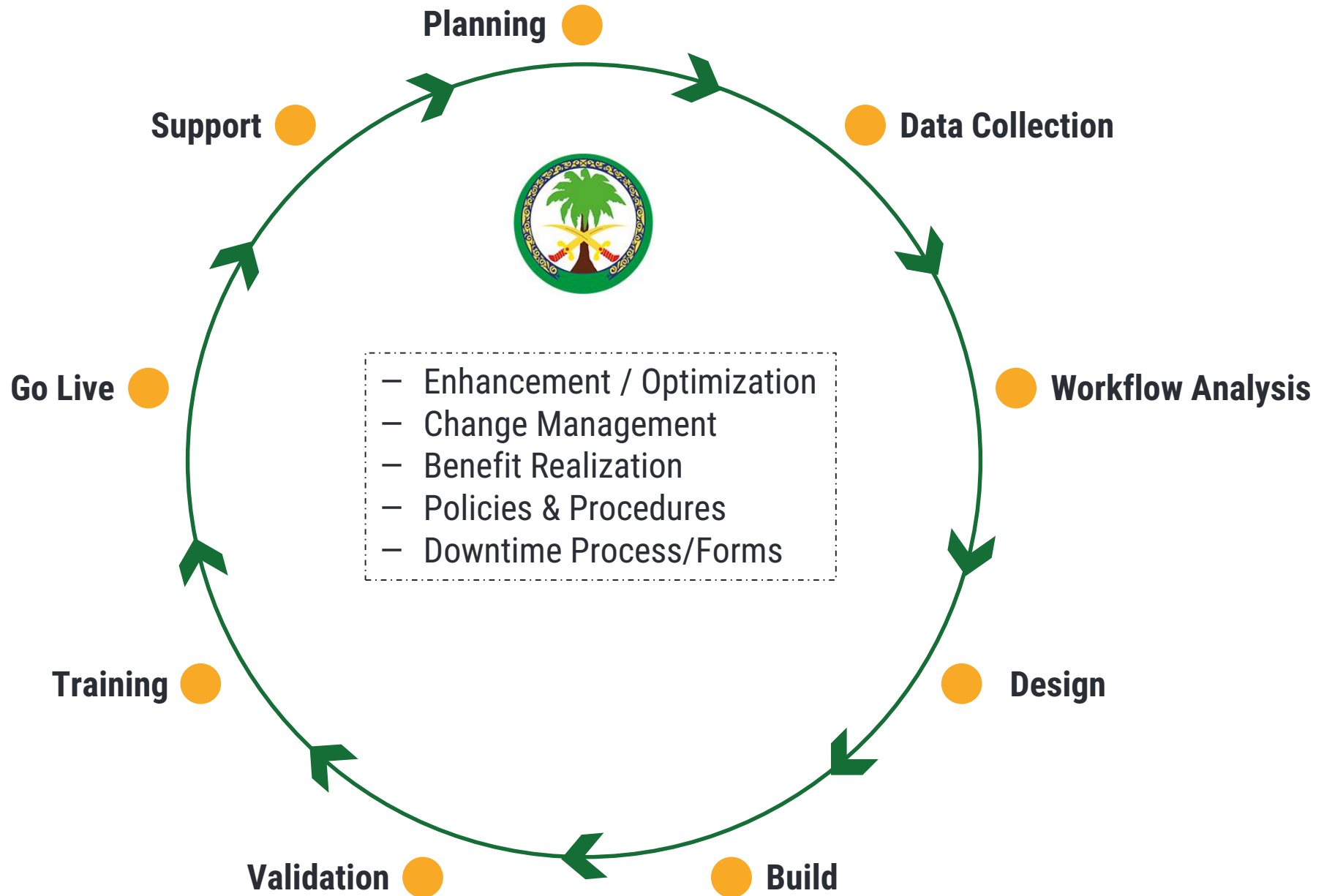
Non-US Health Systems (n=11)



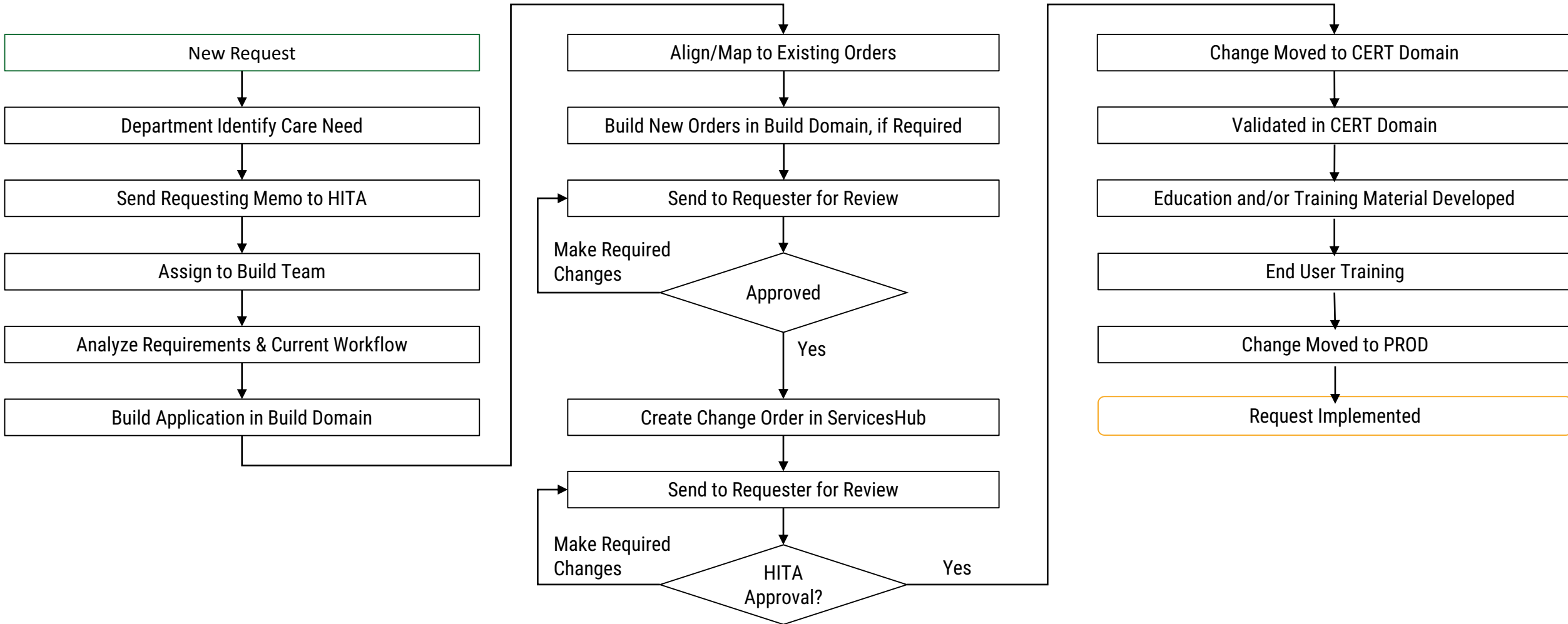
KFSH&RC EMR GOVERNANCE



IMPLEMENTATION METHODOLOGY



CHANGE CONTROL – PROCESS WORKFLOW





Case Presentation

Smart Technology to Smart Care

ABSTRACT

LOCAL PROBLEM

Transform the lingering delivery of care issues that existed prior to opening of King Abdullah Center of Oncology & Liver Disease (KACOLD): communication, person centric experience & education

DESIGN & IMPLEMENTATION

- Identify the best evidence based solutions and guidelines, in accordance with Government regulations
- Develop and implement clinical pathways to improve outcomes and communication
- Simulation and validation testing of complete solution
- Training Material pre and post go-live

HEALTHCARE IT

- Compliment current EMR
- Integration & Interoperability of full solution
- Development of clinical pathways
- Mock room design & solution testing
- Analytics

VALUE DERIVED

- Improved patient and staff safety & patient care
- Higher patient and staff satisfaction
- Improved staff efficiency
- Engaging leadership from the start, helped to drive accountability and utilization



LOCAL PROBLEM

ISSUE

Transform the lingering delivery of care issues that existed prior to opening of King Abdullah Center of Oncology & Liver Disease (KACOLD): communication, person centric experience & education

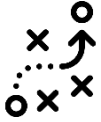
GOALS

Improve overall healthcare experience and outcomes through:

- Timely patient care
- Care team communication and responsiveness to patient needs
- Clinical decision support
- Interoperability
- Safety
- Continuum of Care
- Digital Transformation in Healthcare



WHY KFSH&RC PRIORTIZED THIS ISSUE



One of KFSH&RC strategic priorities is focused on providing excellent patient and staff experience



KFSH&RC wanted to leverage technology and information in smarter, more meaningful ways to better engage patients and transform their expectations when it comes to their care experience



Opportunity to enhance continuum of care beyond the borders of KFSH&RC



Data Latency was having a negative impact on Patient outcomes:

- A **delay in patient care** can result in complications which in return will result in a longer hospitalization; increased cost and an increased risk for mortality
- A **delay in communication** can result in patient harm or injury as well as patient dissatisfaction
- **Clinical decision support**

IMPLEMENTATION METHODOLOGY



Formation of multidisciplinary team: Physicians & Nurses, Health Informatics, Information Technology, Application Development, Integration & External Partners/Vendors



CEO – Mega Project

Director A&HI – Smart Room Project

CIO – Low Current Rooms



Simulation to capture both clinical and patient experience



Validation testing to ensure interoperability



Divide roll-out into phases



Command Center



Inauguration

INTENDED OUTCOMES



Improve Patient & Staff Safety as well as Experience



Improve Patient/Staff Communication



Interoperability of clinical devices toward accuracy & efficiency



Reduce Length of Stay (LOS)



Digital Transformation in Healthcare



Improve Pain Management Scores

King Abdullah Center of Oncology & Liver Disease

Opening: June 2017

Inpatient: 210 Beds

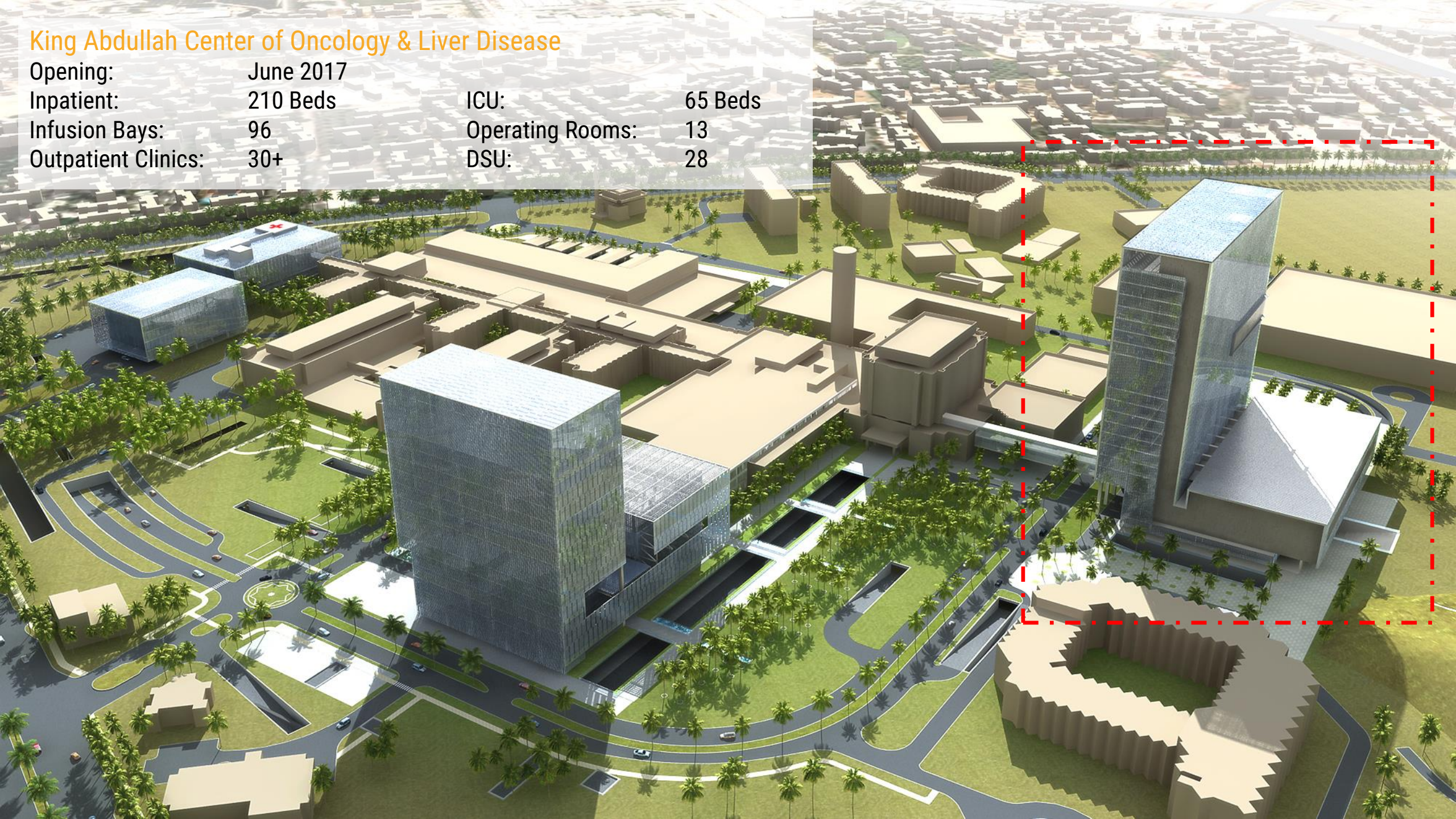
Infusion Bays: 96

Outpatient Clinics: 30+

ICU: 65 Beds

Operating Rooms: 13

DSU: 28



SOLUTION 1: Patient Status Display



Rawad Hassirah, RN

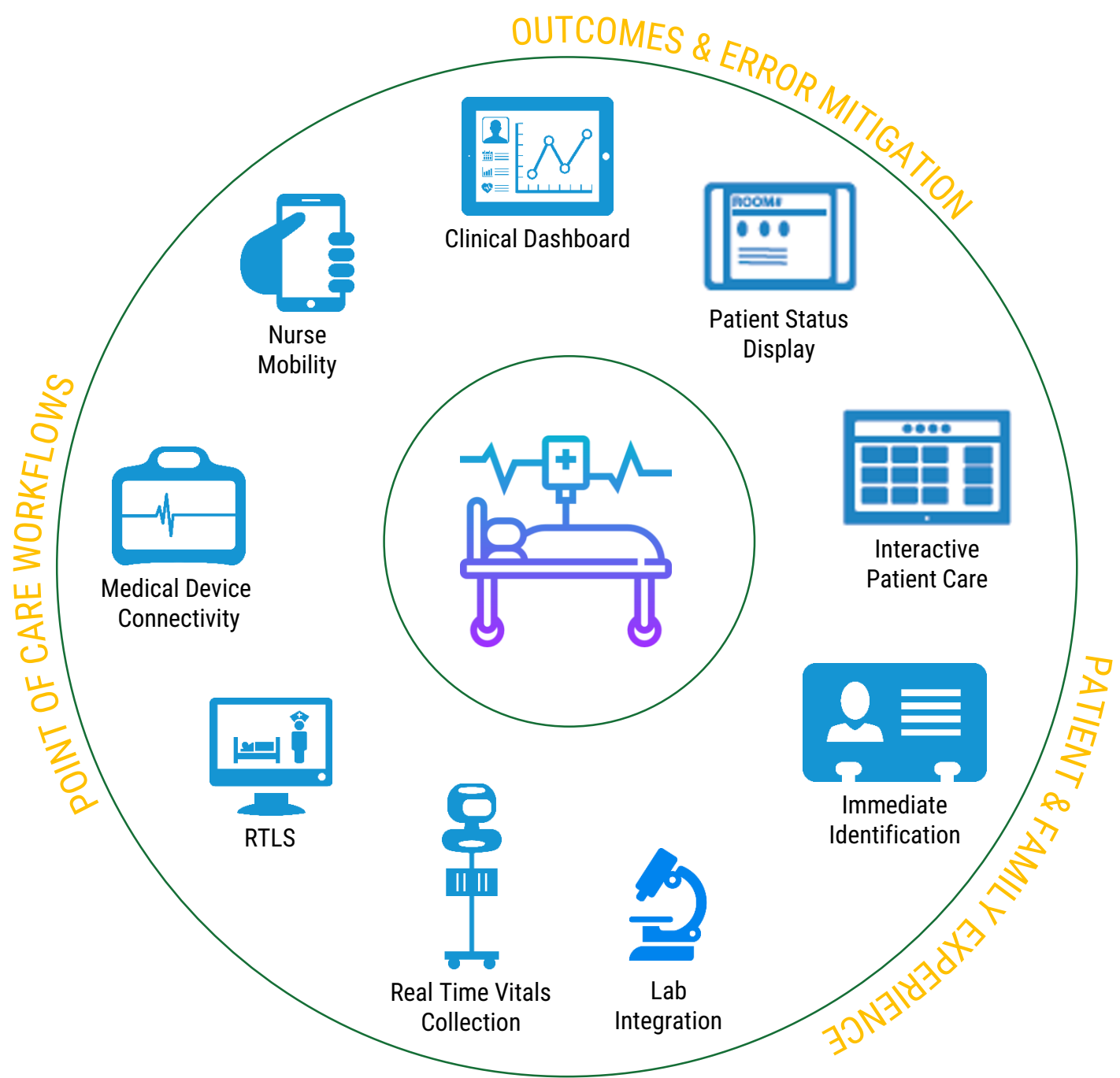
Application & Health Informatics Services – Senior Health Informatics Analyst

Salam Everyone, I am King Faisal Specialist Hospital & Research Center

Bachelor of Nursing
Lebanese National Nursing Institute

King Faisal Specialist Hospital & Research Center – Riyadh

2011 – Present	Sr Health Informatics Analyst
2007 – 2011	Staff Nurse



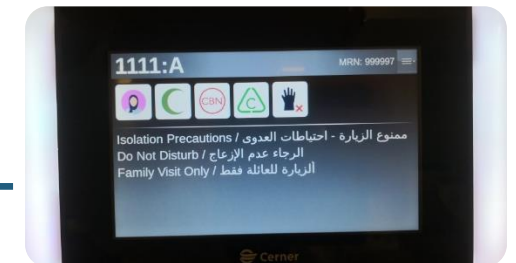
PATIENT ROOM SIGNAGE

- Immediately highlights if a patient is:
 - Nil per mouth
 - Falls risk
 - Isolation
 - Risk of a pressure injury, etc.
- Reflected immediately on patient door versus up to 2 hours previously

BEFORE



AFTER



Manual Unit Whiteboard

The whiteboard is divided into several sections. The top section is a large grid with columns for MRN, NAME, SEX, AGE, and other patient details. The bottom section is titled 'DOCTORS ON CALL' and lists the following information:

ORTHOPEDIC SURGERY	PLASTIC SURGERY	WARD CLERK	HEAD NURSE	SWITCHES
FIRST DR: Dr. Al-Bayeri 9647	FIRST DR: Dr. Faisal 2123	Sara 100	RENE ACKERMAN P 46252	PHYSIOTHERAPY PATIENTS
SECOND DR: Dr. Saif 44529	SECOND DR: Dr. N. DALAM 6003	Sabrah 100	ASST HEAD NURSE ROSEVIE P 44579	
THIRD DR: Dr. Wade 8102	THIRD DR: Dr. N. WAGH 47171		CHARGE NURSE Sarah 100	
FOURTH DR:				

Unit Digital Dashboard

The digital dashboard displays a list of patients with their names, providers, and nurses. A legend on the right explains the indicators used in the dashboard:

Name	Provider	Nurse	Indicators
457061	Dr. Ahmed	Abdullah	Green circle, Red circle with slash, Fork and knife icon
563943	Dr. Bander	Abdullah	Green circle, Red circle with slash, Wheelchair icon
456356	Dr. Bander	Sara	Green circle, Wheelchair icon
433433	Dr. Ahmed	Saad	Green circle, Red circle with slash
463221	Dr. Anwar	Sara	Green circle, Red circle with slash, Wheelchair icon

PATIENT ROOM SIGNAGE



MALE



FEMALE



MODERATE RISK TO FALL



HIGH RISK TO FALL



LATEX ALLERGY



CODE STATUS



NPO



PATIENT FOR DISCHARGE



SEIZURE PRECAUTION



COLLECT BY NURSE

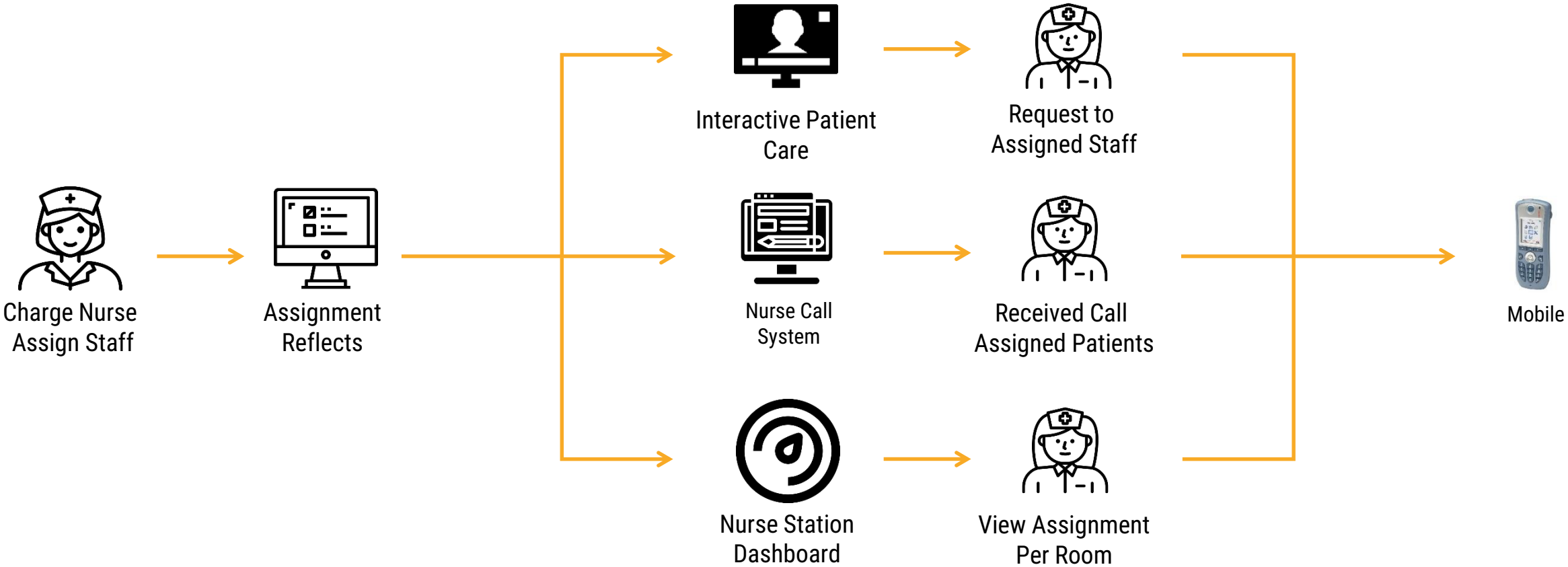


CHEMOTHERAPY PRECAUTIONS



ISOLATION STATUS

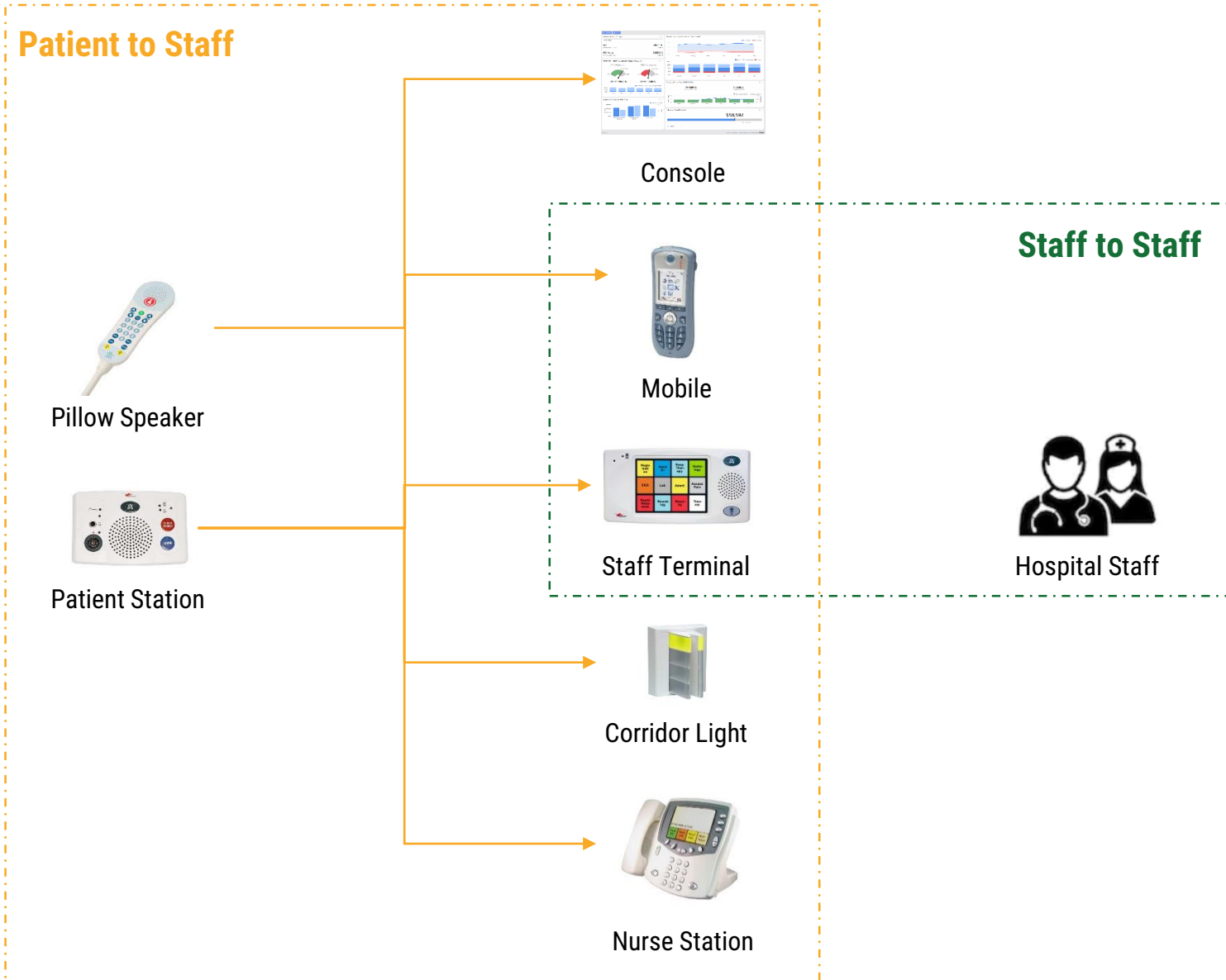
STAFF ASSIGNMENT WORKFLOW



SOLUTION 2: **Care Communication**

COMMUNICATION

Patient to Staff



- Improved Communication
- Patient Focused Delivery
- Saving Time
- Cross Departmental Communication
- Analytics

COMMUNICATION TO MEDICAL TEAM

Nurse to Ancillary Communication

CODE GREEN

1 Workflow

ENVIRONMENTAL

10 Workflows

MAINTENANCE

5 Workflows

PATIENT CARE

10 Workflows

TRANSPORT

7 Workflows

NURSE WITNESS

1 Workflow

REGISTER IN

9 Workflows

REASSESS

4 Workflows

RRT

1 Workflow



SOLUTION 3: Interactive Patient Care

INTERACTIVE PATIENT CARE



Educate patient on standard safety precautions



Provide patient personalized education materials



Provide another venue for patient to communicate with staff

DEFINED PATHWAYS

- Education
- Fall Risk
- Pain
- Food
- Medication
- Discharge

My Action Plan My To-Do List List View

Here are some things we would like you to do while you are here.

- Watch videos picked just for me
- Tell us about your hospital stay
- Nominate a nurse

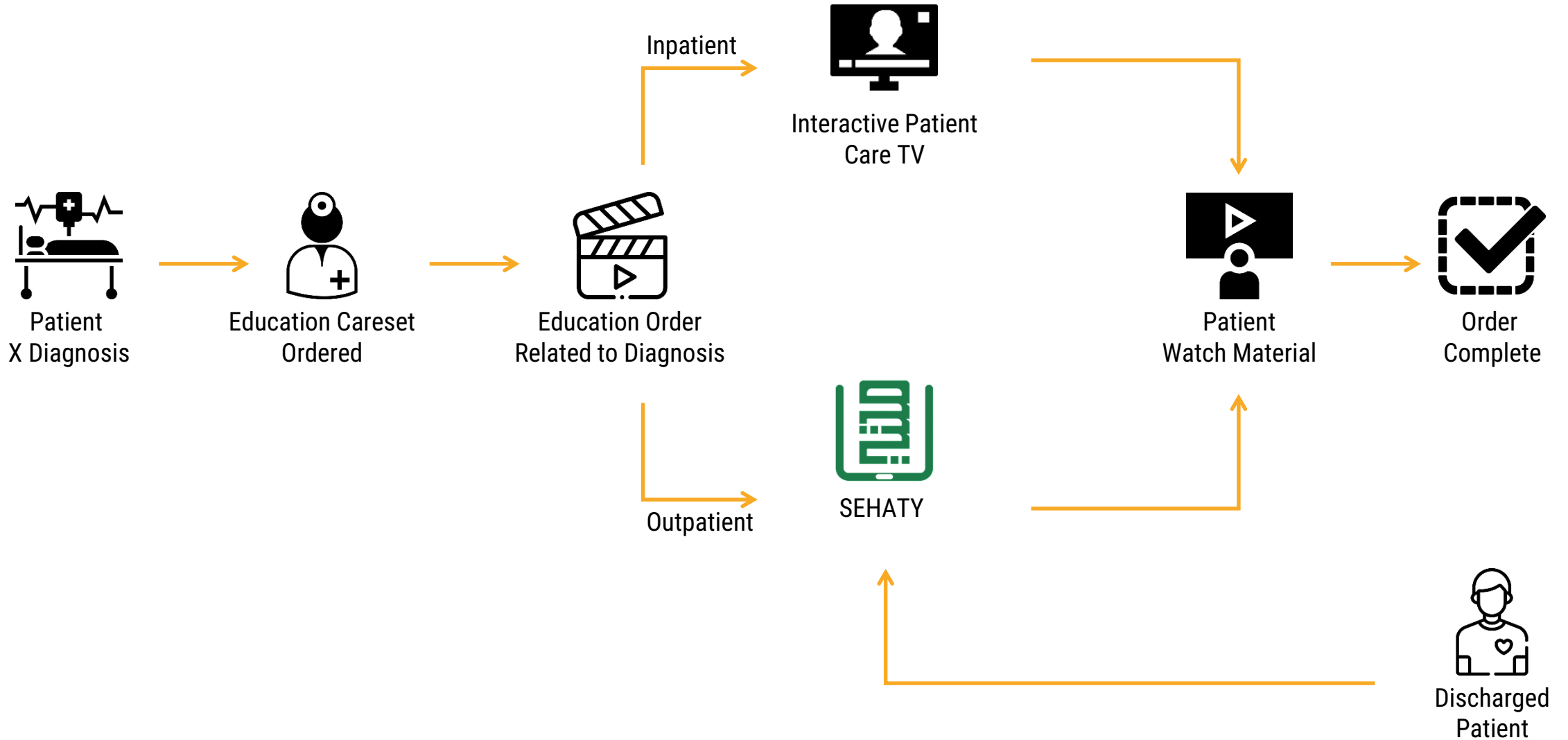
Order a meal | See my medicines | **Tell us how we can help** | Browse health videos | Watch a movie

How Can We Help?

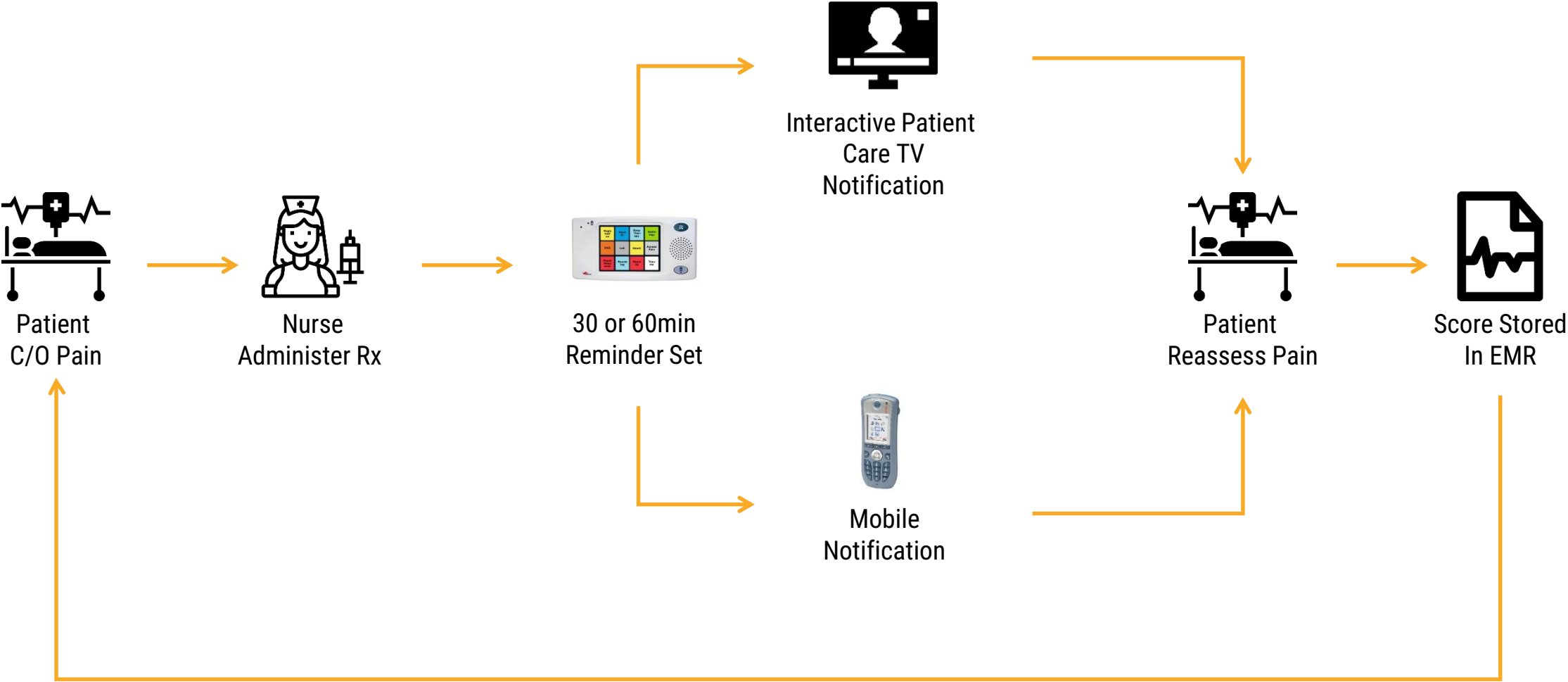
Select the type of service you need

- Room repair
- Room cleanliness
- Room temperature
- Speak to someone about my care
- Speak to a social worker
- My pain is not well controlled
- I have a question about my education
- Personal help and supplies

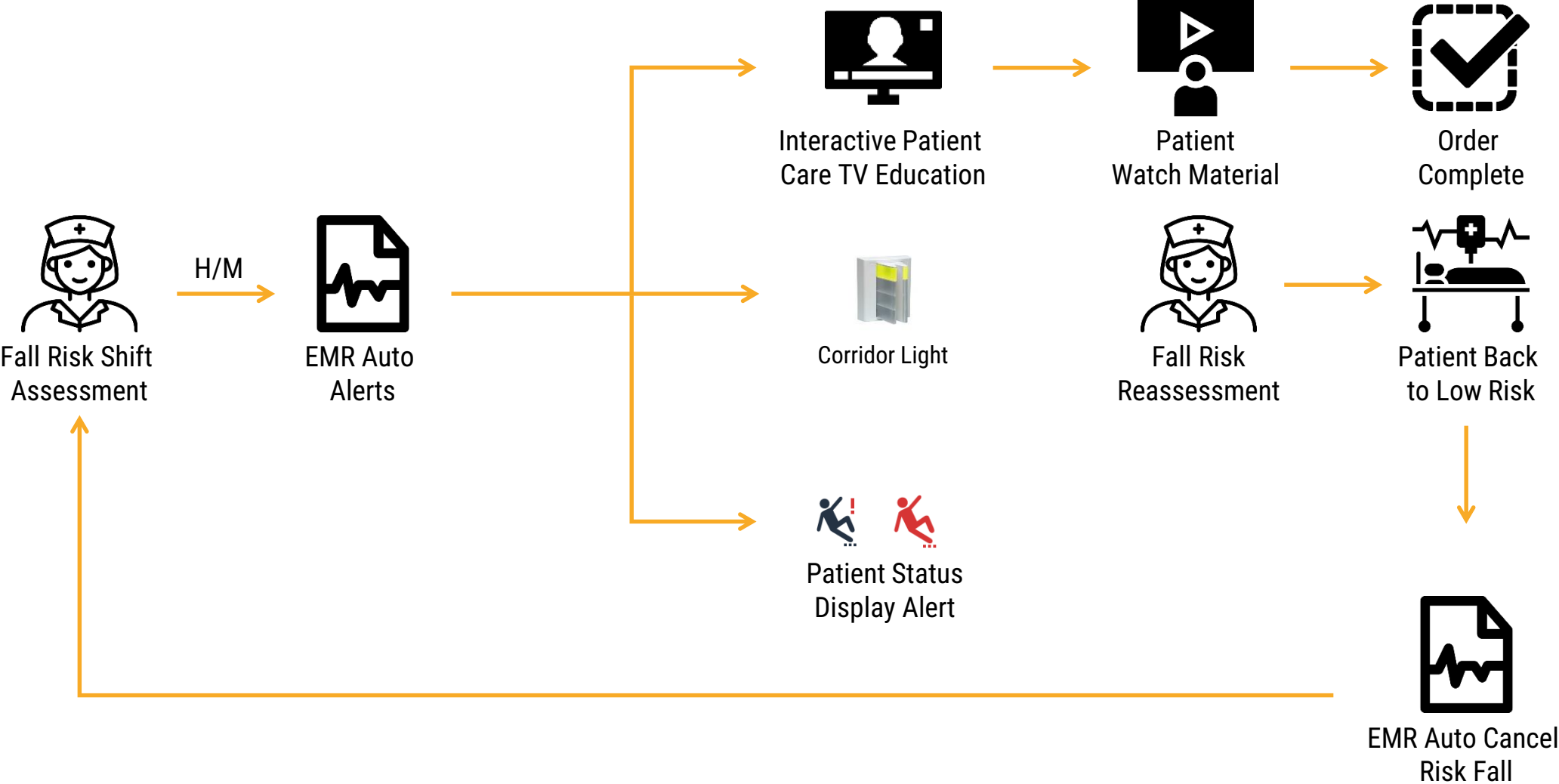
PATIENT EDUCATION PATHWAY



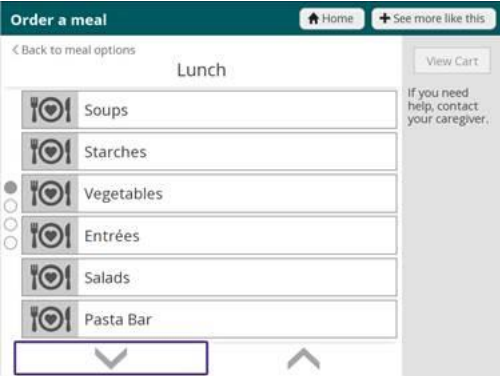
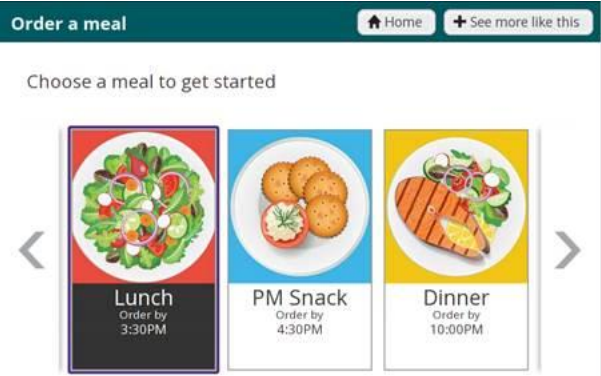
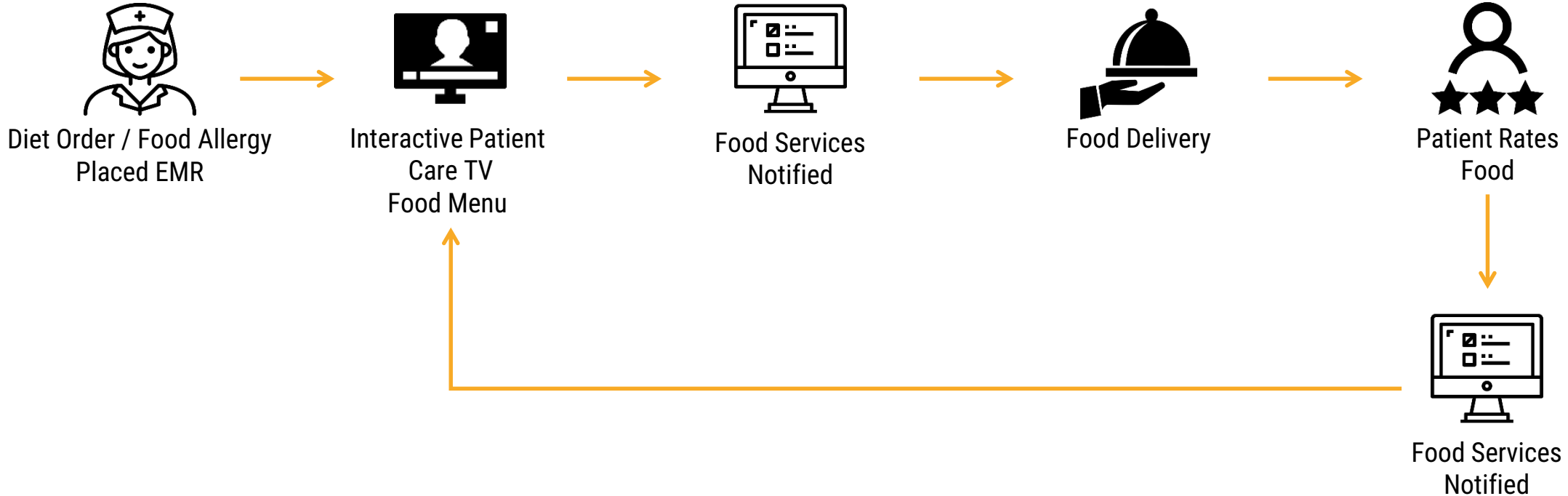
PAIN PATHWAY



FALL RISK PATHWAY



FOOD REQUEST PATHWAY



IPC ENTERTAINMENT FEATURES



Watch Movie



Play Games



Check Email



Browse Internet



Patient Bill
of Rights



Patient
Responsibilities



Food Order



Visiting Hours



My Care
Team



My Schedule

SOLUTION 4: **Hand Hygiene Monitoring**

HAND HYGIENE



CASE STUDY: OUTCOMES



Abdullah Al Turki MD, FAAP

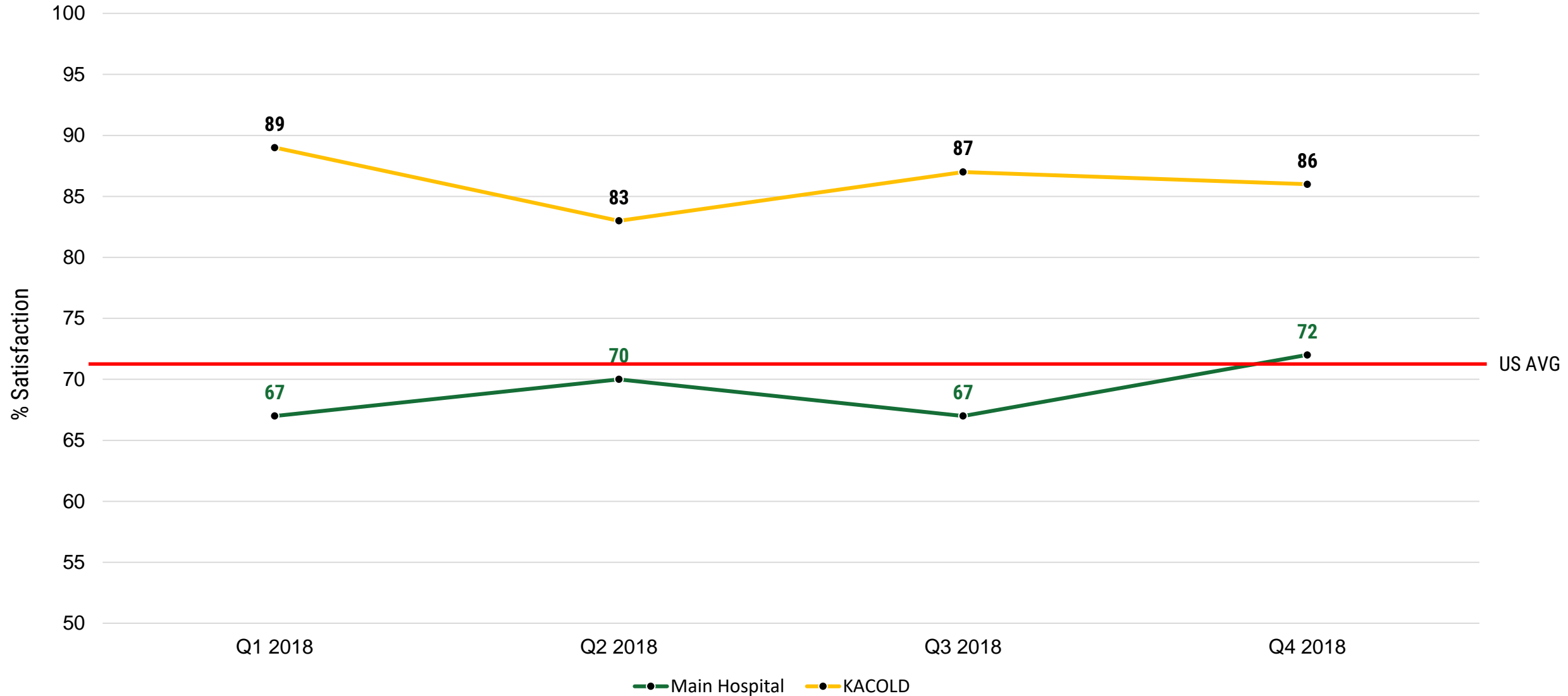
Pediatric Intensivist – Medical Informatics Officer

Salam Everyone, I am King Faisal Specialist Hospital & Research Center

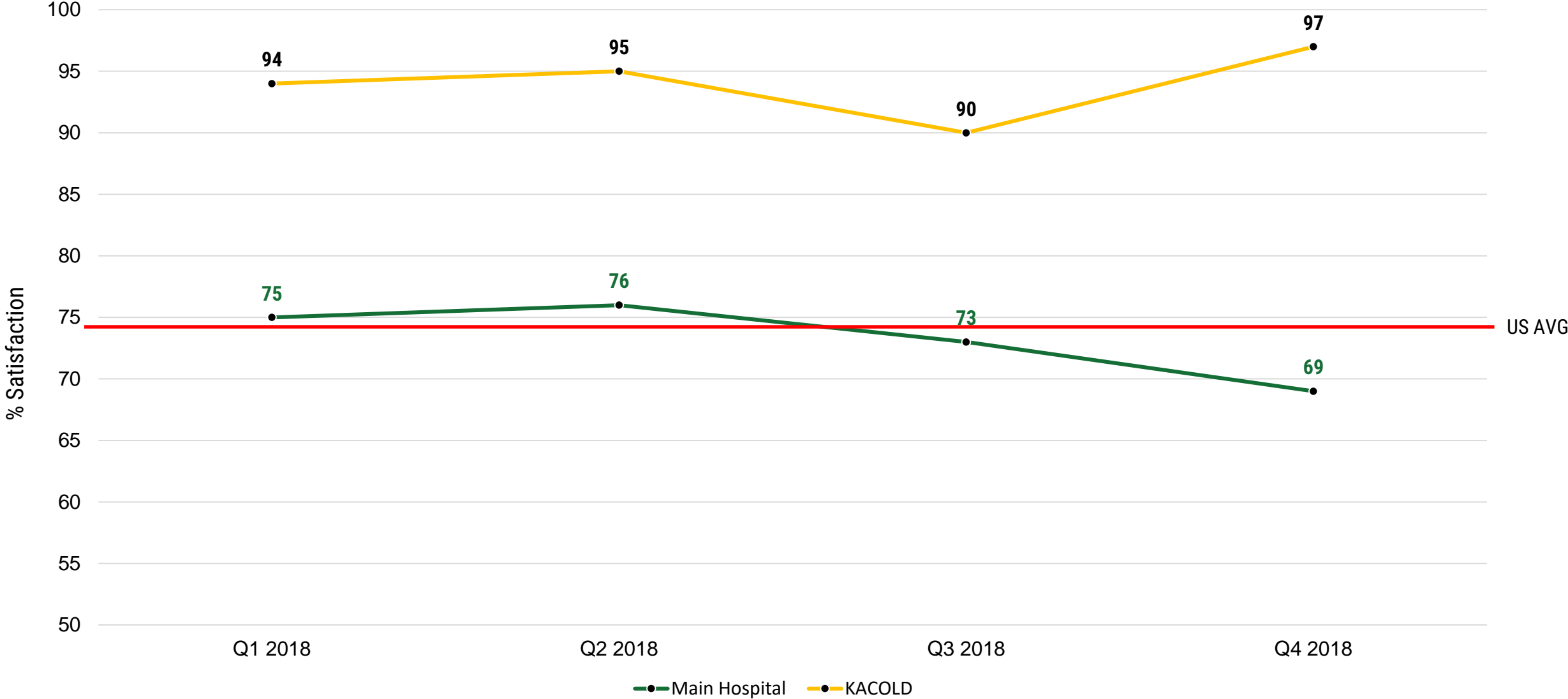
Bachelor of Medicine & Surgery
King Saud University

King Faisal Specialist Hospital & Research Center
2015 – Present Medical Informatics Officer

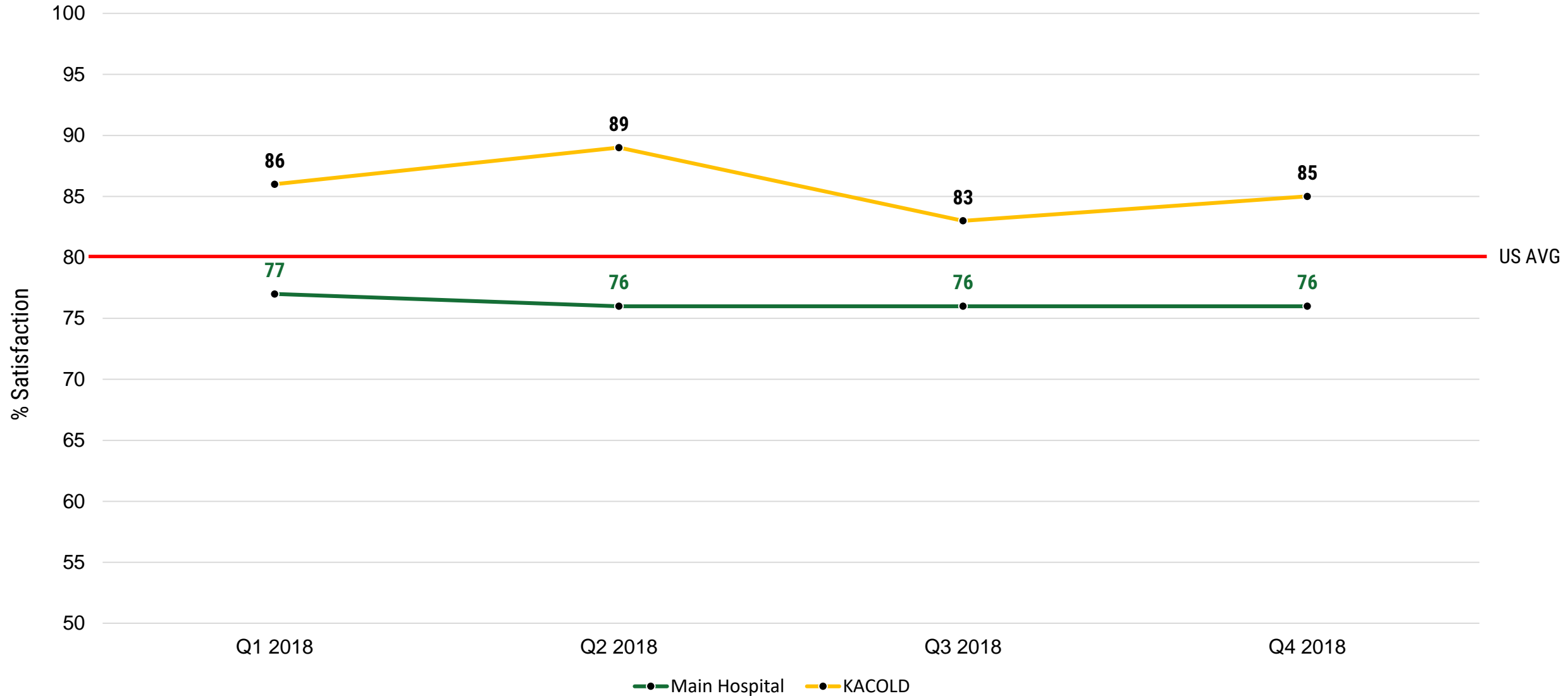
PATIENT SATISFACTION: PAIN MANAGEMENT



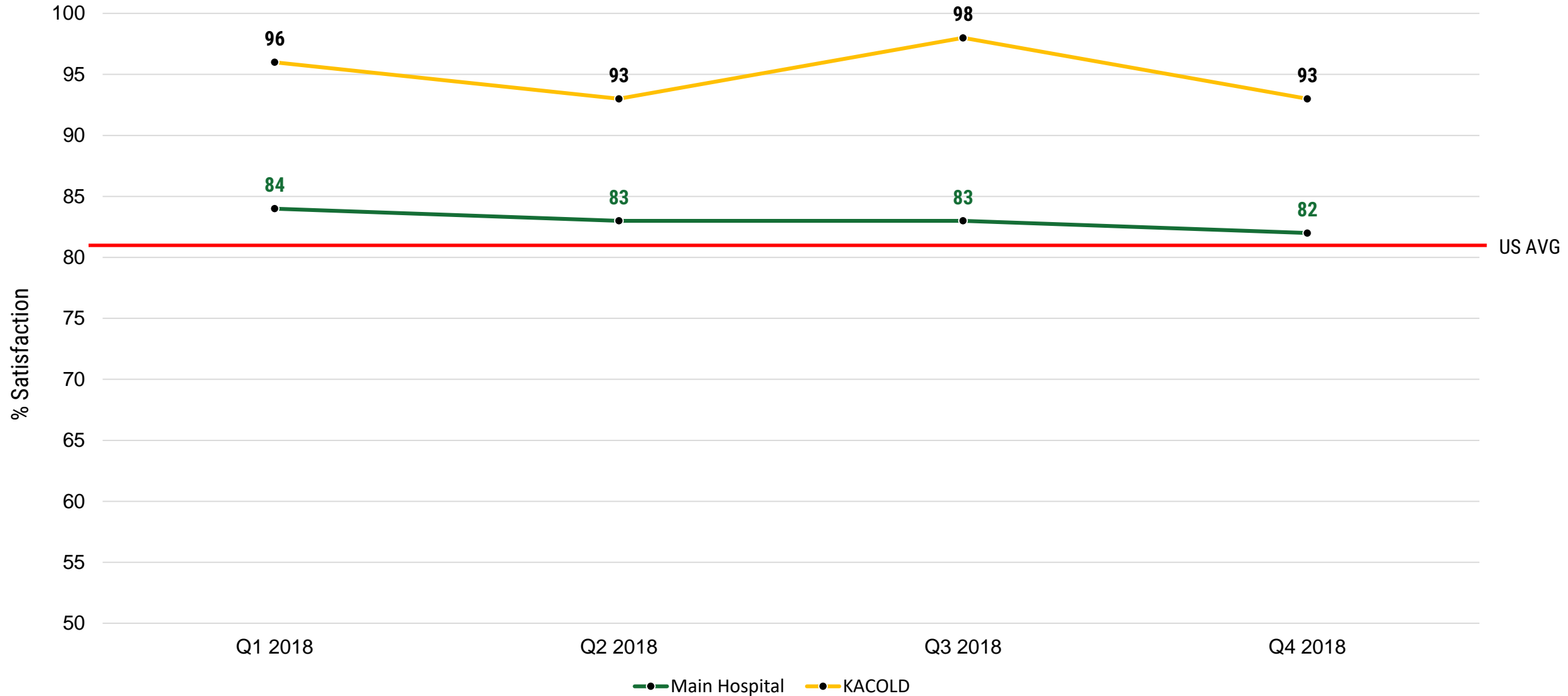
PATIENT SATISFACTION: ENVIRONMENTAL CLEANLINESS



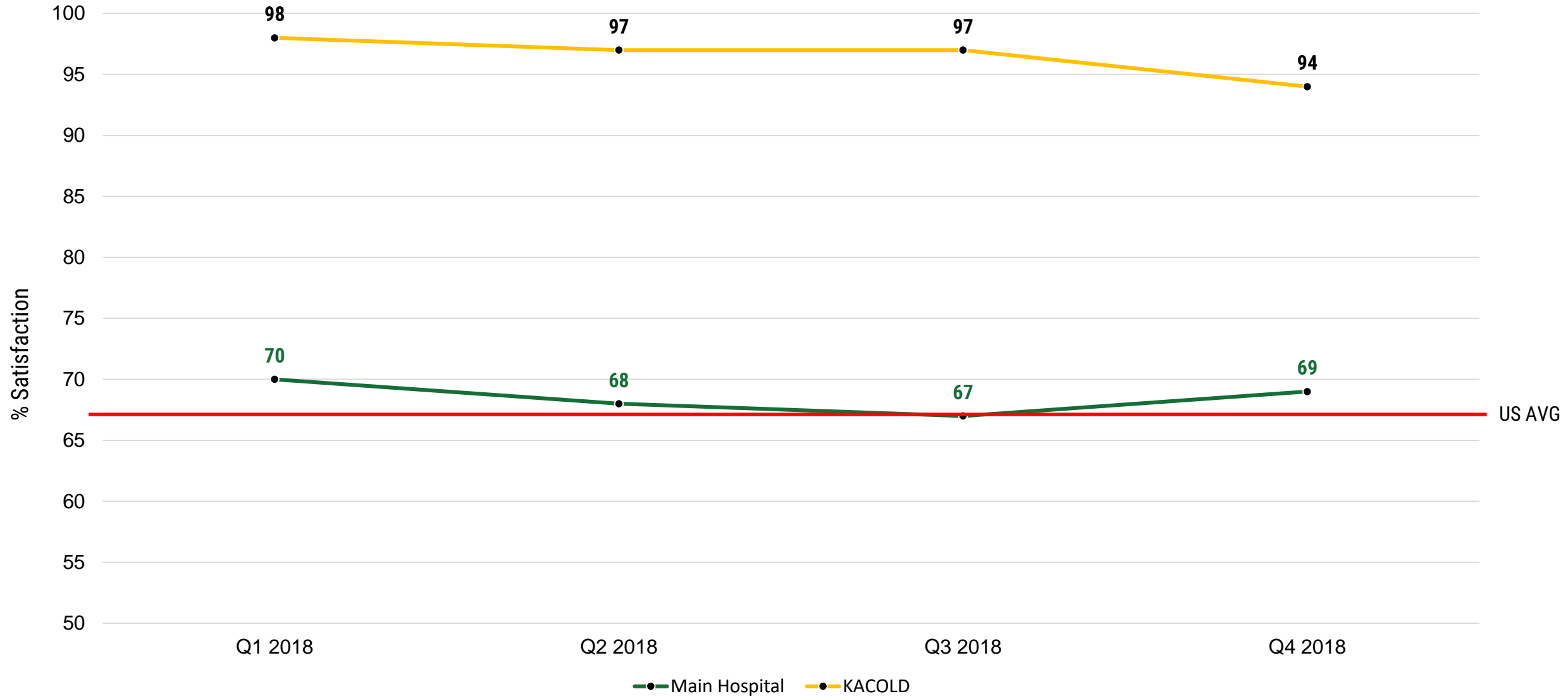
PATIENT EXPERIENCE PERCEPTION – NURSE COMMUNICATION



PATIENT EXPERIENCE PERCEPTION – PHYSICIAN COMMUNICATION

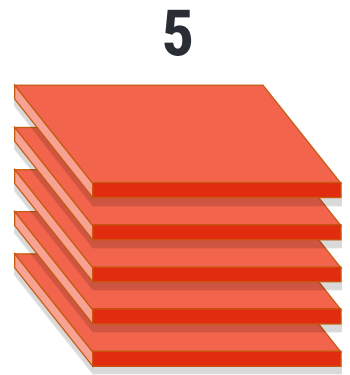


PATIENT EXPERIENCE PERCEPTION – STAFF RESPONSIVENESS

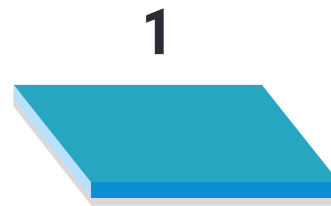


INFECTION RATES

HOSPITAL ACQUIRED METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS – MRSA



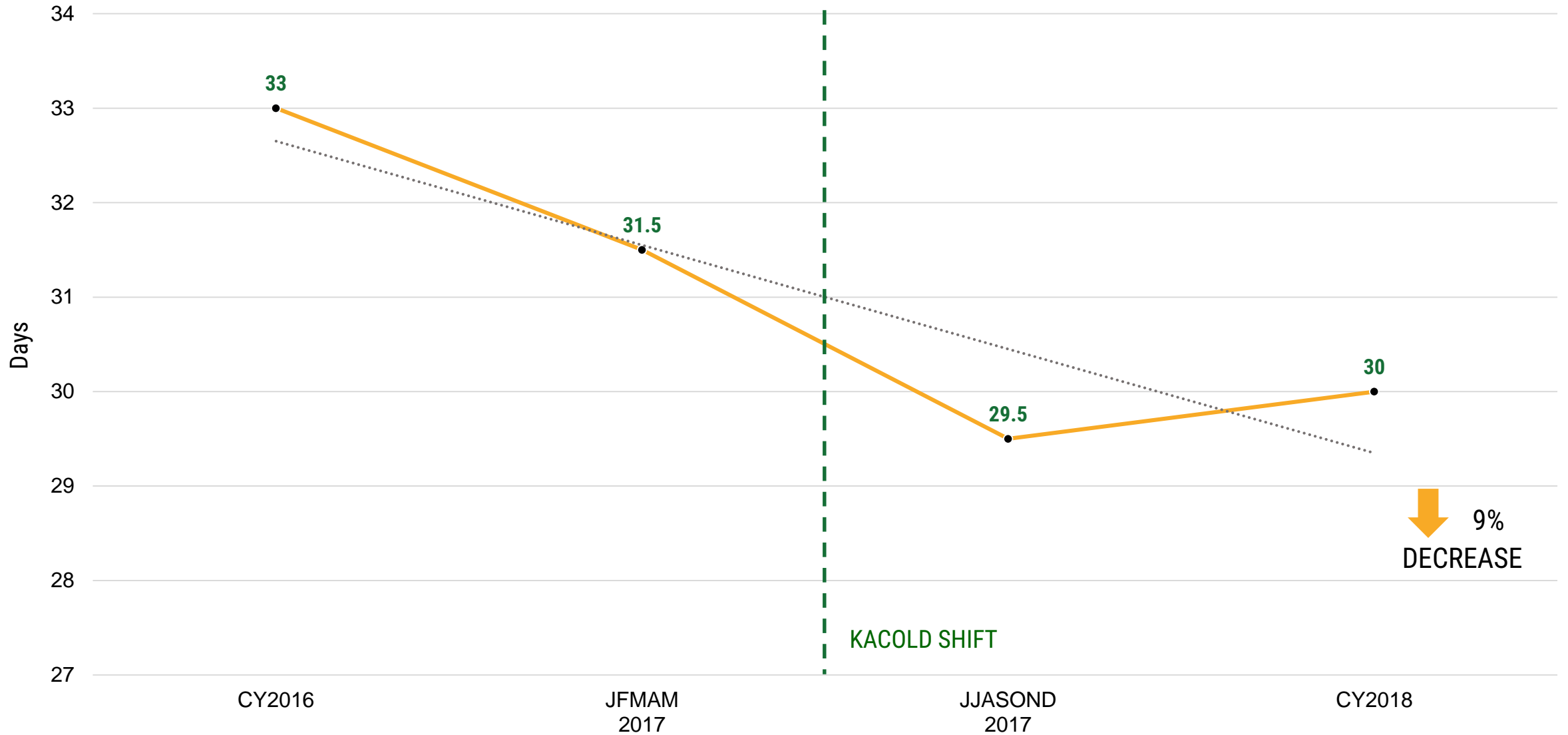
PRE KACOLD
CY2015 – 2017



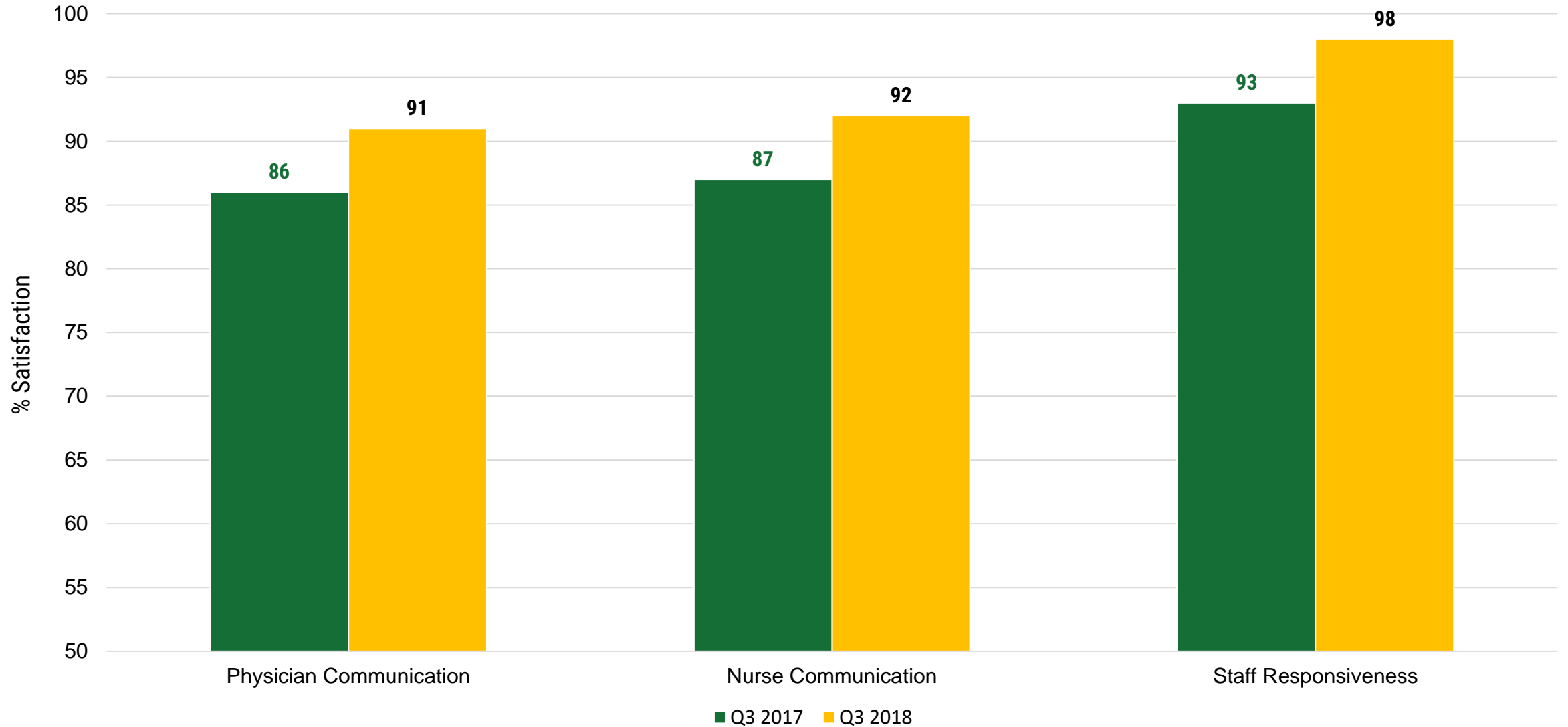
POST KACOLD
CY2017 – 2019

80%
DECREASE

LENGTH OF STAY REDUCTION



SMART TECHNOLOGY ADOPTION



BEDSIDE MEDICAL DEVICE INTEGRATION



TAT

Automated processes reduced TAT by **74%**



DATA ENTRY

Reduced entry errors by **99%**

Time saved **97%**



EFFICIENCY

Critical care time saved per Staff **70min**

Critical care time saved per Day **140min**

General Ward saved per Staff **29min**

General Ward time saved per Day **58min**



OPERATIONS

Average operating costs saved per year **SAR8.51M**

ENGINEERING LESSONS **LEARNED**



Design

- No barriers facing Patient
- Easy access for Nurses to Medication Rooms
- Ineffective design workarounds not accepted
- Radiology location
- Minimize interruption points for Nurses
- Circulation space around the patient bed
- Atmosphere toward positive Patient outcomes
- Design for Patient, Family Members and Clinicians
- Mock Room concept



Technology

- Computers inside Patient Room
- Mobile Communication w/ Nursing
- RTLS Exciter location
- Dashboard backup

LEARNINGS

SUCCESS

- Improved patient experience – evident by patient surveys
- Improved clinician experience
- Improved clinical outcome – evident by length of stay reduction
- Improved patient and staff safety & efficiency
- Eliminated data latency and transcription errors
- Decreased cost

CHALLENGE

- Change management & adoption
- Cutting edge integration technology
- Staff turnover
- Continuous training



KEY TAKEAWAYS

وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا

Whoever saves one life - it is as if he had saved mankind entirely

Surah Al Ma'idah 5:32



Aligns with KSA Vision 2030
Aligns KFSH&RC Mission & Vision



Strengthen relationship with Partners



Ability to benchmark KFSH&RC healthcare delivery model



Staff development & growth



International & National brand recognition



مستشفى الملك فيصل التخصصي ومركز الأبحاث
King Faisal Specialist Hospital & Research Centre
مؤسسة عامة. Gen. Org.