

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



# SUMMARY

## LOCAL PROBLEM

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High rates of advanced stage cancer at presentation due to lack of early, preemptive & preventative screening & detection

## DESIGN & IMPLEMENTATION

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- Identify the best evidence based guidelines, in accordance with Government regulation, pertaining to Preventative care
- Identify a way to capture the preventative care workflow in the EMR

## GOALS

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- Identify the elements of preventative care that are evidence based & recommended based on age, gender, documented results and known chronic problems
- Utilize our EMR to help improve care
- Provide proactive and preventative health management services to our patients

## VALUE DERIVED

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- Enterprise wide standardization of preventative care and chronic disease screening
- 88% increased levels of chronic disease diagnosis entered in EHR
- Improved Patient Outcomes through early detection and treatment: 267% increase in Colorectal Cancer and 600% in Breast Cancer identification
- Ability to utilize captured data towards research, reporting and publications





# Osama Al Swailem MD, MA

Chief Information Officer – Associate Professor

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Salam Everyone, I am King Faisal Hospital & Research Center

Bachelor of Medicine & Surgery  
**King Saud University**

Masters & Post Doctoral Fellowship  
**Columbia University**

**King Faisal Specialist Hospital & Research Center**

2014 – Present

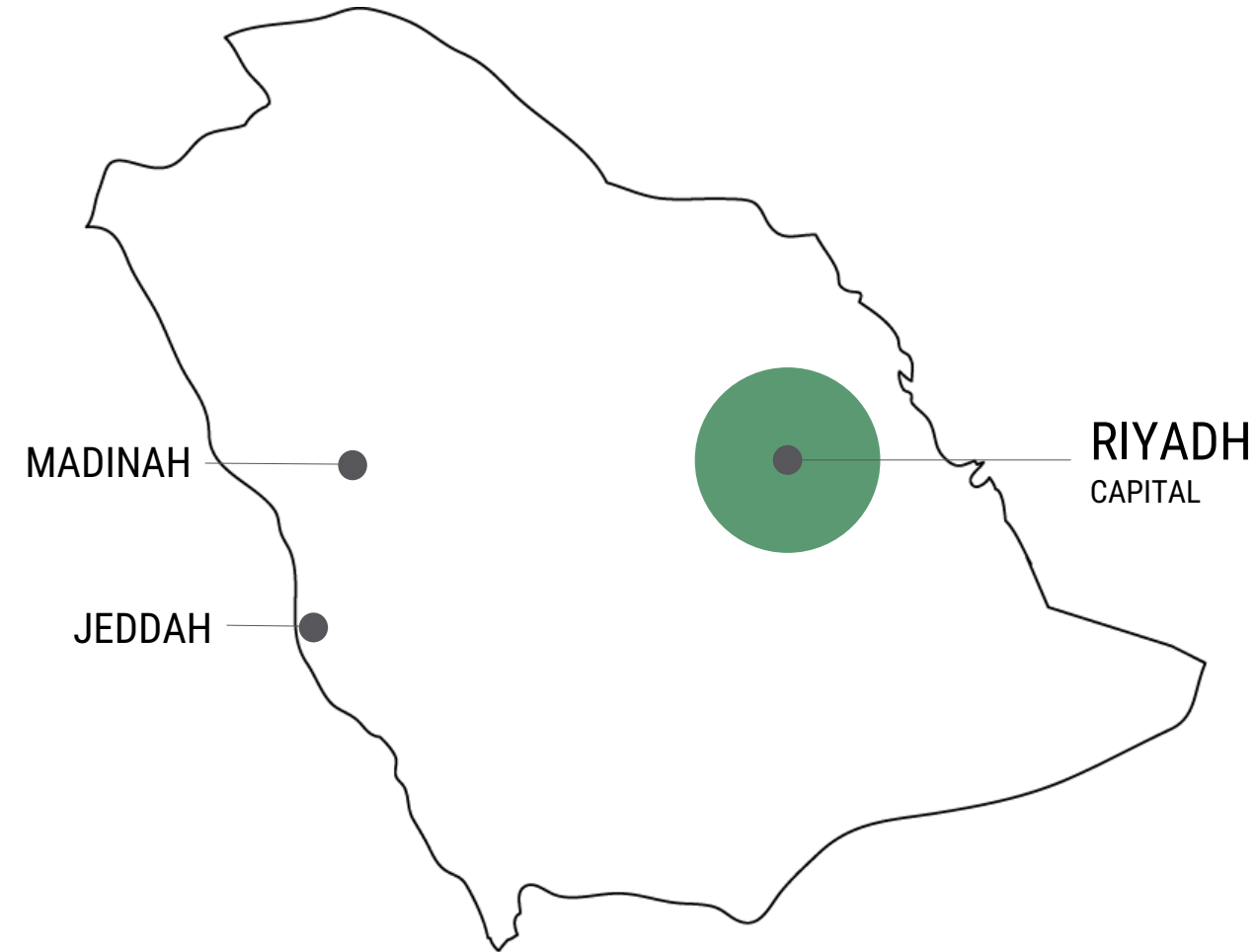
Chief Information Officer

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

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- Saudi Arabia is the 13<sup>th</sup> 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

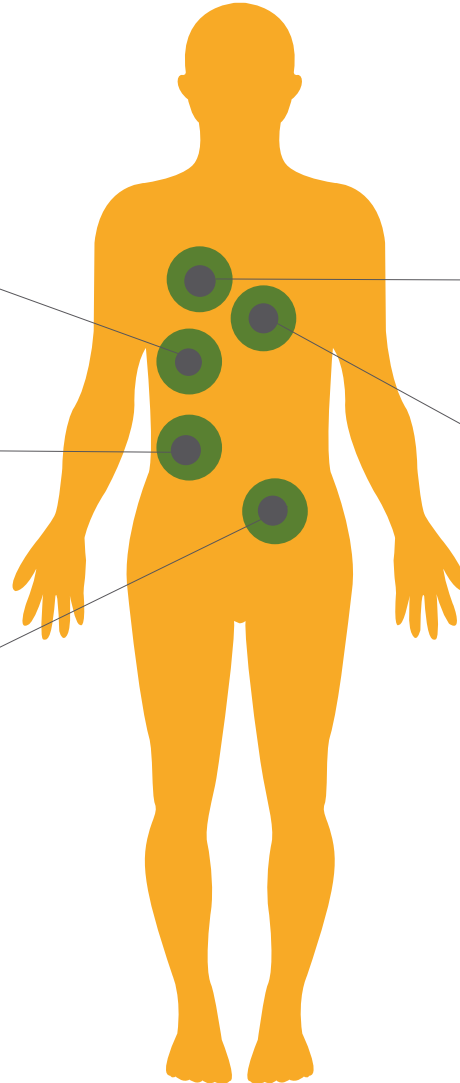
**#1**

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



**56<sup>th</sup>**

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





# Fahad Bin Dayel, RN

Director Application & Health Informatics Services

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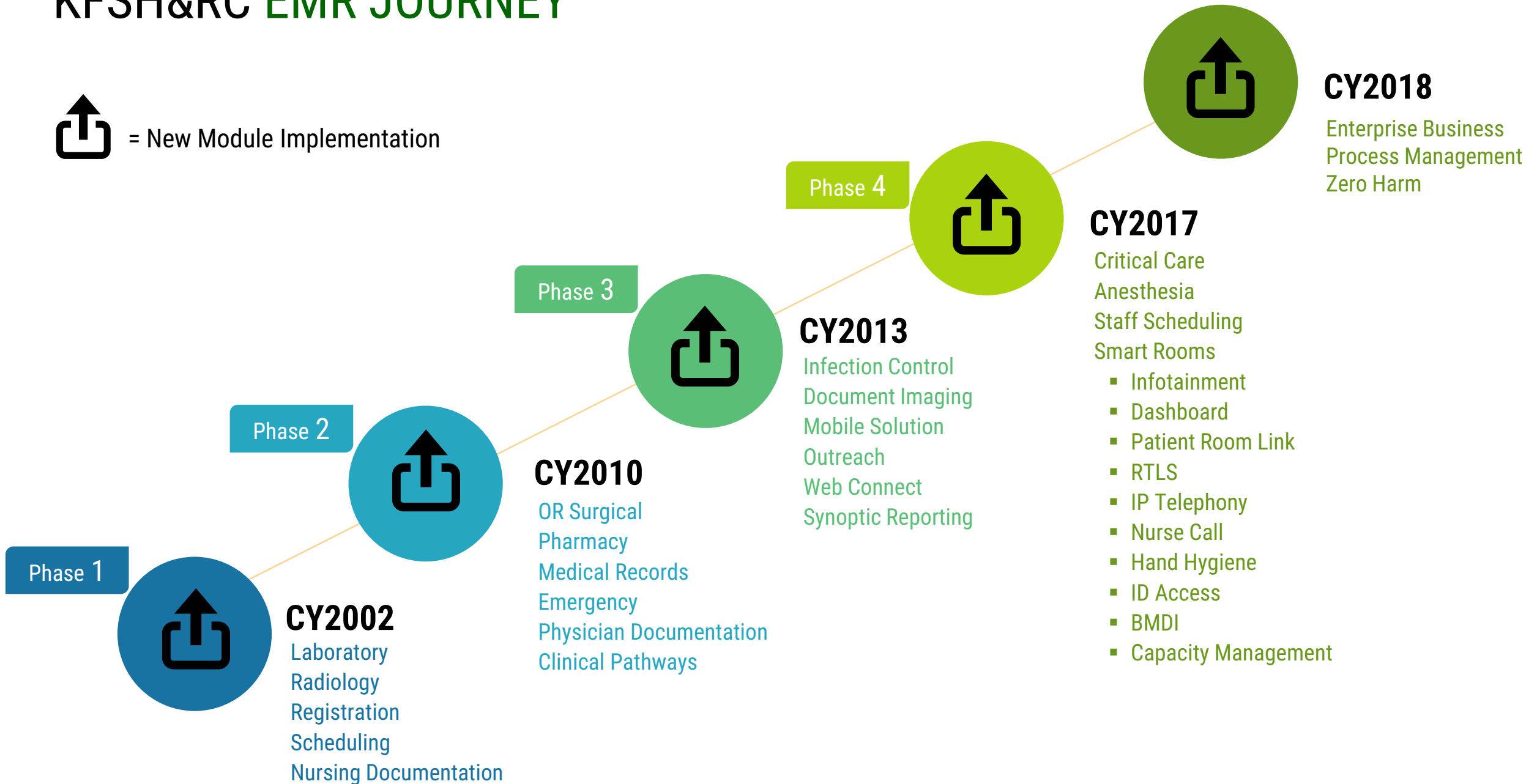
Bachelor of Science in Nursing  
Master in Health Information System Management  
**George Mason University**

**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



Phase 5



**CY2020**

Oncology  
Organ Transplant  
Women's Health  
VNA Imaging  
Revenue Cycle Management

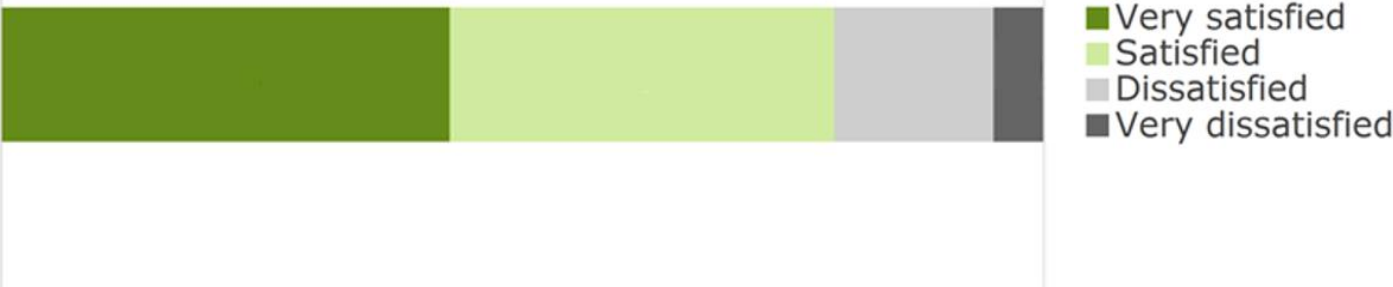


**CY2019**

HW Upgrade  
SW Upgrade

# KLAS EMR SATISFACTION

King Faisal



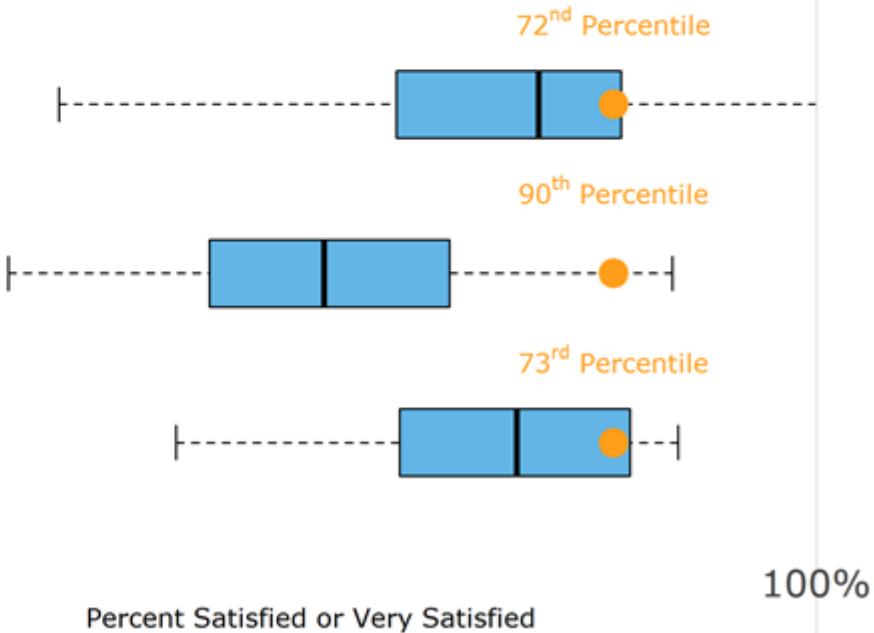
## Overall EMR Satisfaction

All Clinicians (n=73,115)

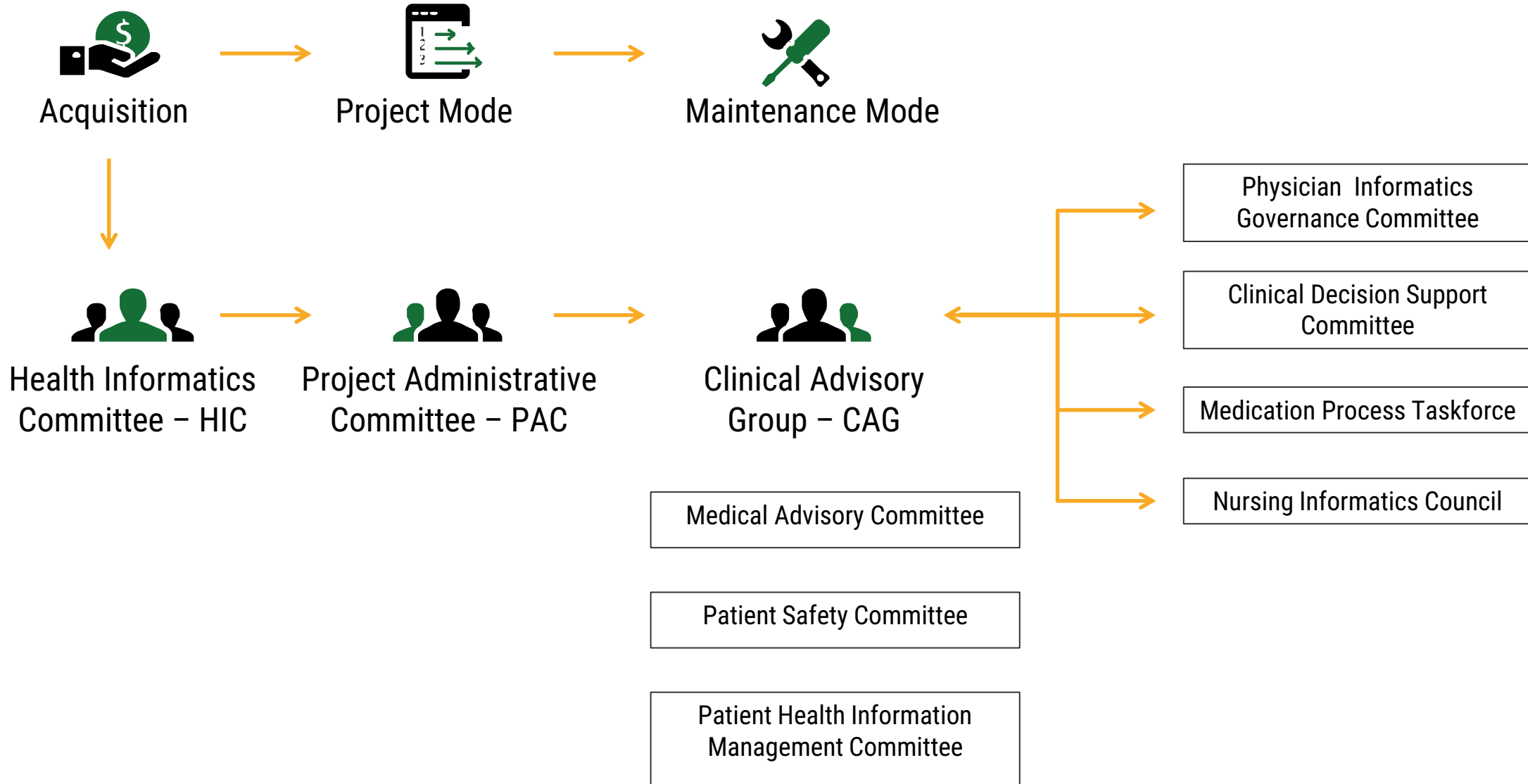
All Organizations (n=159)

Cerner Deployments (n=29)

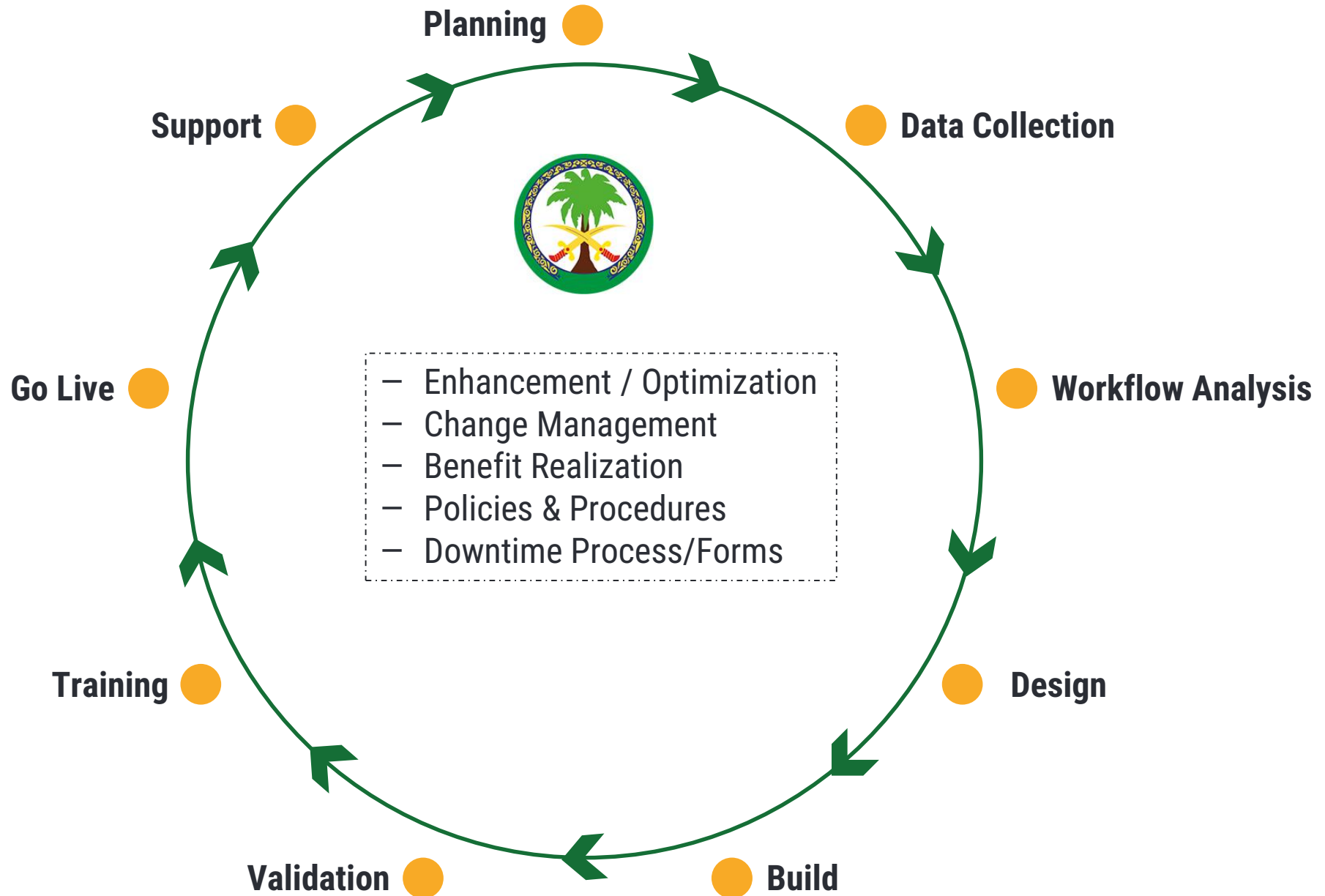
Non-US Health Systems (n=11)



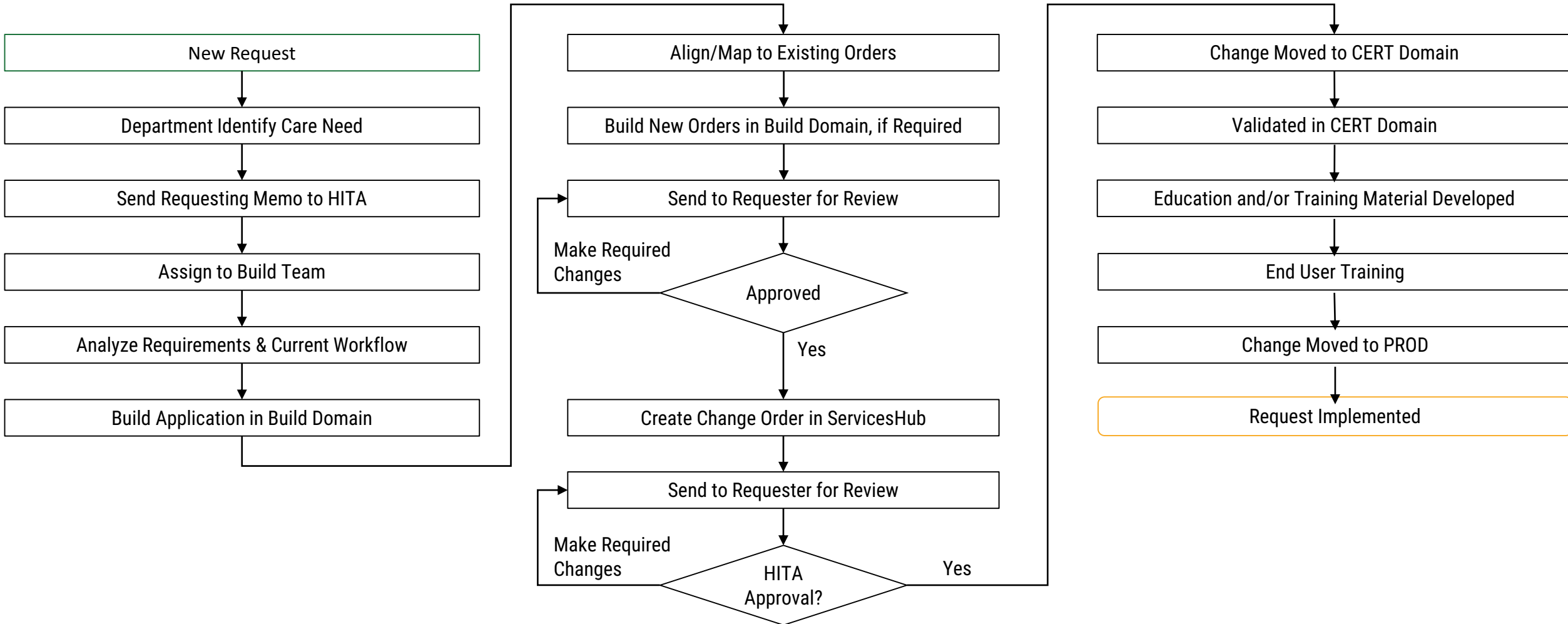
# KFSH&RC EMR GOVERNANCE



# IMPLEMENTATION METHODOLOGY



# CHANGE CONTROL – PROCESS WORKFLOW







Case Presentation

## **Smart Technology to Smart Care**

# LOCAL PROBLEM

## ISSUE

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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

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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

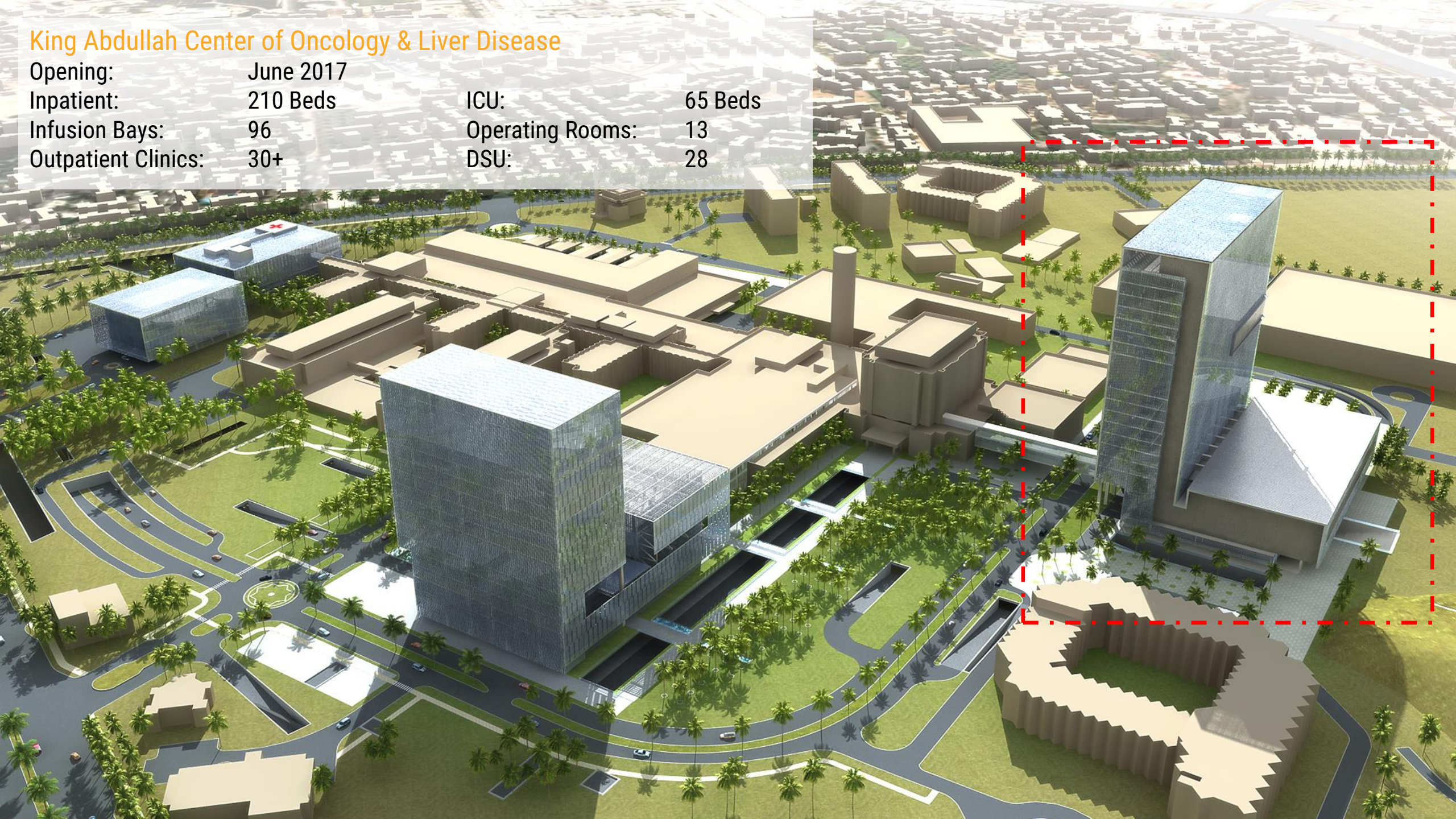
Infusion Bays: 96

Outpatient Clinics: 30+

ICU: 65 Beds

Operating Rooms: 13

DSU: 28







## Adele Sandeman, RN

Application & Health Informatics Services – Senior Health Informatics Analyst

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Salam Everyone, I am King Faisal Hospital & Research Center

Diploma in Nursing, ITIL Certified

**King Faisal Specialist Hospital & Research Center**

2002 – Present

Sr Health Informatics Analyst

# ENABLER: HEALTH MAINTENANCE

## **Preventative Care is a Pillar of Family Medicine**

- Use the EMR to help us provide preventative care
- Multi disciplinary team used to implement evidence based expectations



Adult/Travel Vaccines



BMD Screening



Mammogram Screening



Diabetes Screening



Fecal Occult Blood Screening



Lipid Screening



Obesity Screening



Pap Smear



Tobacco Counseling



# DESIGN STRATEGY

## CORE FACTORS

- Ease of Use
- Integration with our EHR
- Analytics to Measure Success & Opportunities
- Multi-Disciplinary Involvement

## RULES

Does patient qualify for expectation?

- Gender
- Age
- Documented Problems
- Documented Procedures
- Documented Diagnosis
- Documented Results
- Orders

## EXPECTATION

Addressed during Patient Visit

- System Generated
- Added Manually

## SATISFIER

Expectation Completion

Satisfaction Periods:

- Orders = 14 days
- Results = defined period

Manual satisfiers:

- Done Elsewhere = satisfied
- Postponed = not satisfied
- Refused = not satisfied
- Cancelled = removed

# IMPLEMENTATION METHODOLOGY



Formation of multidisciplinary team: Family Medicine Department Physicians & Nurses, Health Informatics, Information Technology, User Support, Training, Application Development & External Partners/Vendors



Developed the Health Maintenance Tab (HMT) within the EMR to incorporate government regulations & Family Medicine Department best practice and evidence based guidelines



Avoid Alert Fatigue by utilizing real time 'static' notifications: upon opening of patient chart, based on patient age, gender, documented results or known chronic problem/diseases



Interoperability with the current EMR utilizing existing solutions



Training & awareness campaigns targeting Clinicians on the importance of Preventive Medicine



Frequent reporting to ensure utilization and adoption

# INTENDED OUTCOMES



Promote preventative healthcare outcomes



Standardization through the creation of preventive workflows within the EMR for targeted patients



Utilization of best practice guidelines supported by Government Regulations



Streamline the identification of patients who require screening



Develop a clinician friendly solution



Improve awareness of the importance of preventive medicine



Advanced analytics

# ADOPTION



Buy-in from management through reinforced compliance



Awareness campaign and training of physician and nurses in groups and individual sessions



Training materials and pocket reference cards



Moved the Health Maintenance Tab as the first view in the EMR

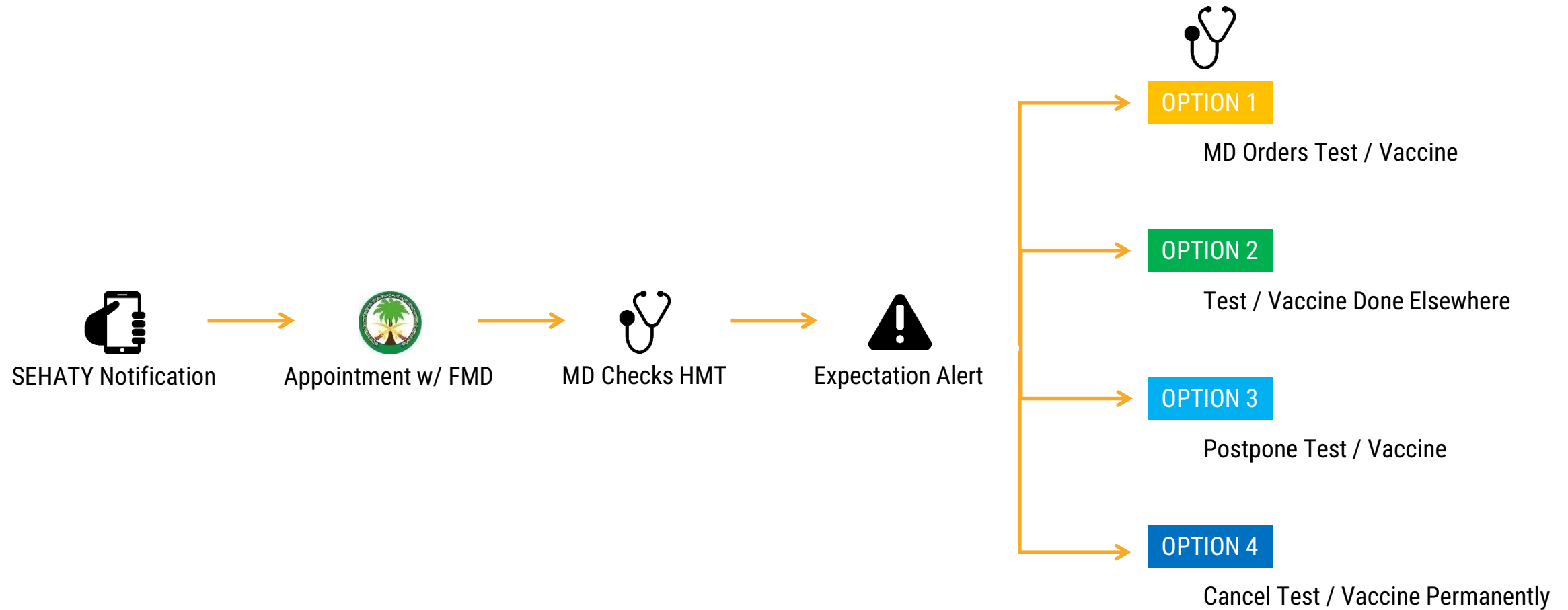


Running quarterly reports to check compliance & utilization



Having super users in the department for encouragement and support

# HEALTH MAINTENANCE EXPERIENCE



# CLINICAL INTELLIGENCE

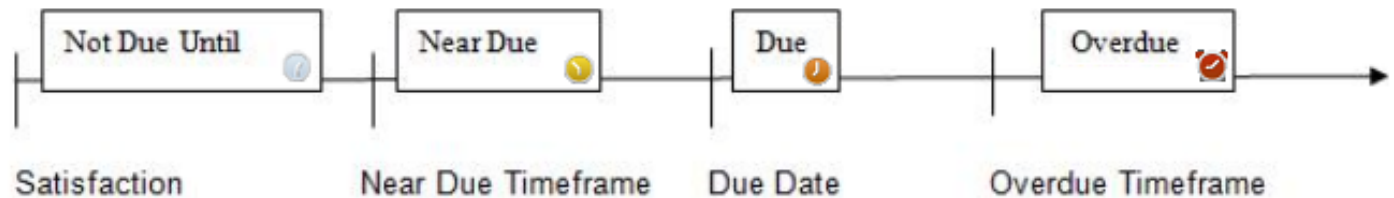
**Disease related decision support is built into the HMT around age; gender and documentation for:**

- Screening for Preventative & Chronic Diseases
- Vaccination
- Recontracting

## **Future Development**

- Chronic Disease Management
- Pediatric Clinic
- Well Baby Clinic

Standard Expectation (Refuse and Postpone actions will update status but the indicator will follow the below logic)



Pending Expectations + Add					Pr
	PPD	High	Overdue	15/01/2019	Q 1 Year(s)
	Hepatitis A Vaccine	Low	Overdue	28/02/2019	Q 186 Day(s)
	Varicella Vaccine	Low	Due	24/09/2019	Variable
	Typhoid Vaccine	Low	Due	24/09/2019	Variable
	Hepatitis B Vaccine	Low	Near Due	15/10/2019	Variable
	Breast Cancer Screening	Medium	Not Due Until	15/01/2020	Q 2 Week(s)
	Influenza Vaccine	Low	Not Due Until	15/04/2020	Q 1 Year(s)
	Meningococcal Polysaccharide Vaccine	Low	Not Due Until	14/01/2021	Q 3 Year(s)
	Pap Smear	Medium	Refused	25/08/2021	Q 3 Year(s)



# SEHATY PATIENT PORTAL

- Patient able to view targeted screening based on age, gender, documented results or known chronic problem/diseases
- When last screening was performed
- Recommended frequency of screenings
- Active status of received Vaccines
- Immunization Chart
  - Immunizations given by KFSH&RC
  - Historical Vaccines given outside of KFSH&RC



Please schedule an appointment with your family physician for any health expectations that are due

## Health Maintenance

HEALTH MAINTENANCE

Expectation	Frequency	Last Screening Date
Obesity Screening	Annually	05 August 2015
Lipid Screening	Every 3 Years	05 August 2015
Diabetes Screening	Annually	05 August 2015
Tobacco Counseling	Annually	
Pap Smear	Every 3 Years	

## Immunization

MOH PATIENT IMMUNIZATION

OTHER IMMUNIZATION

Vaccine	Description	Taken Date
Influenza	Influenza Virus Vaccine, Inactivated	17 Oct 2018
MCV	Meningococcal Conjugate Vaccine	09 May 2018
Influenza	Influenza Virus Vaccine, Inactivated	18 Oct 2017
Influenza	Influenza Virus Vaccine, Inactivated	15 Nov 2016
Influenza	Influenza Virus Vaccine, Inactivated	12 Jan 2016



# Abdullah Al Khenizan, MD

Chairman Family Medicine – Riyadh

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Salam Everyone, I am King Faisal Hospital & Research Center

Bachelor of Medicine & Surgery – **King Saud University**  
Master in Health Systems & Quality Management – **Liverpool University**  
Master in Medical Law – **Edinburgh University**

**King Faisal Specialist Hospital & Research Center – Riyadh**  
2010 – Present      Chairman & Consultant Family Medicine





Case Presentation

# **Population Health Using Clinical Decision Support to Improve Cancer Screening**

# FAMILY MEDICINE



55,000+ Employees & Eligible Dependents



Primary & Secondary Health Care Services

- Scheduled Clinic
- Walk-In Clinic



Tertiary Care Patients with Chronic Diseases



Pre Marital Screening



Pediatrics Care



Occupational Health Services



Support Service & Follow-up Treatment for ER



Nursing Clinic

- Pre Employment Screening
- Annual Re-Contract – All Employees
- Travel Medicine Clinic
- Well Baby Clinic
- Diabetic Clinic
- OB Screening Clinic
- Driver Assessment Clinic
- Nutrition Clinic



Occupational Health

- Food Handlers
- Needle Stick Injuries
- Tuberculosis Contacts & Converters
- Fit Testing
- Ergonomic Assessment of Workplace

# LOCAL PROBLEM

## ISSUE

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High rates of advanced stage cancer at presentation due to lack of early, preemptive & preventative screening

## GOALS

---

- Identify the elements of preventative care that are evidence based & recommended based on age, gender, documented results and known chronic problems
- Utilize our EMR to help improve care
- Provide proactive and preventative health management services to our patients



# WHY KFSH&RC PRIORTIZED THIS ISSUE



Colon cancer is the #1 malignancy for males in Saudi Arabia with lower survival rates compared to Western countries

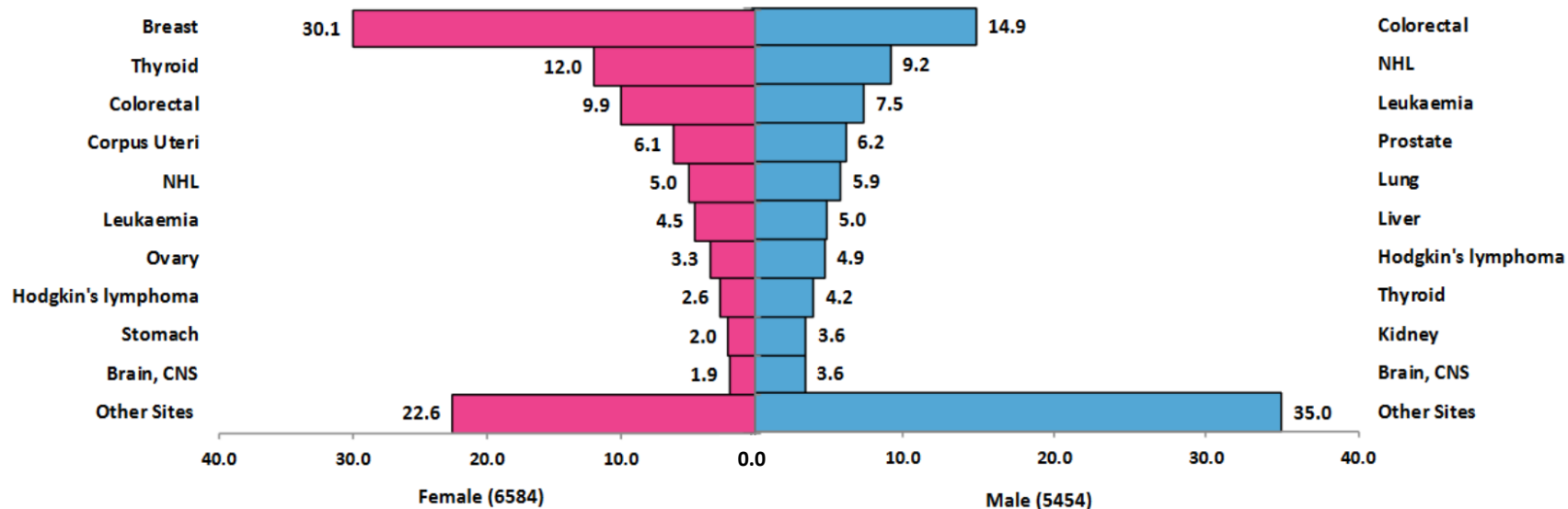


Breast cancer is the #1 malignancy for females in Saudi Arabia



Cervical cancer screening is an international standard of care for any cancer prevention program

## SAUDI CANCER REGISTRY



# IMPROVED OUTCOMES

- Departmental awareness campaigns
- Continuous training
- Moved the HM to the first tab in EMR
- Monthly audits



Health Maintenance (Ages 19 and older)

Full screen

Print

Pending Expectations

+ Add

Present – September 2022

Show satisfiers

Sort by:

Due Indi

Pap Smear

Medium

Overdue

03/04/2014

Q 3 Year(s)

Pap Smear Order

Done Elsewhere

Postponed

Refused

Cancel Permanently

Breast Cancer Screening

Medium

Near Due

32/10/2019

Q 2 Week(s)

Mammogram Order Riyadh

Mammogram Order Jeddah

Done Elsewhere

Postponed

Refused

Cancel Permanently

Tobacco Counseling

Medium

Near Due

10/12/2019

Q 26 Week(s)

Tobacco Counseling

Done Elsewhere

Postponed

Refused

Cancel Permanently

Fecal Occult Blood Screening

Medium

Not Due Until

39/09/2020

Q 2 Week(s)

FOB Order

Done Elsewhere

Postponed

Refused

Cancel Permanently

Diabetes Screening

Medium

Not Due Until

14/09/2022

Q 2 Week(s)

Glucose Fasting Order

Done Elsewhere

Postponed

Refused

Cancel Permanently

Lipid Screening

Medium

Not Due Until

14/09/2022

Q 2 Week(s)

Lipid Profile Order

Done Elsewhere

Postponed

Refused

Cancel Permanently

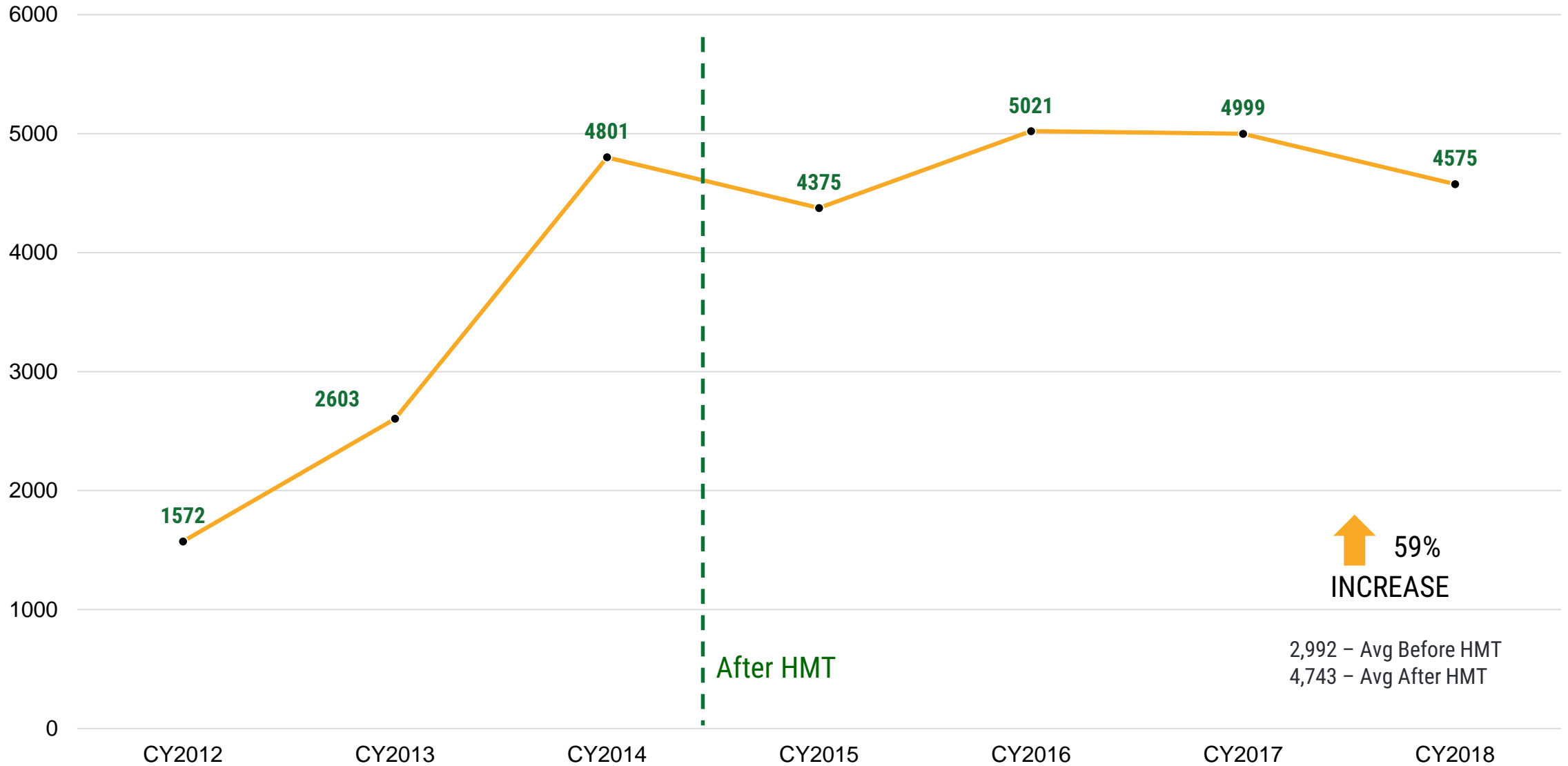
Recently Satisfied Expectations

September 2009 – Present

Show all cano

Expectation	Status	Satisfy Type	Administration Date	Satisfy Reason	Priority	Last Satisfied By	Approximate Du...	Comments
<div><div></div>PPD</div>	Satisfied	Result	16/10/2018		High			
<div><div></div>Influenza Vaccine</div>	Satisfied	Result	14/10/2018		Low			
<div><div></div>MMR Vaccine</div>	Canceled	Manual	15/01/2018	Immune - Blood test Low		Carbonel, Maribel...		
<div><div></div>Varicella Vaccine</div>	Canceled	Manual	02/11/2015	Immune - Blood test Low		Bawingan, Caden...		
<div><div></div>Hepatitis B Vaccine</div>	Canceled	Manual	29/10/2015	Immune - Blood test Low		Bawingan, Caden...		
<div><div></div>Tobacco Counseling</div>	Satisfied	Order	11/06/2019		Medium			
<div><div></div>Pap Smear</div>	Satisfied	Result	04/04/2011		Medium			
<div><div></div>Lipid Screening</div>	Satisfied	Result	15/09/2019		Medium			
<div><div></div>Fecal Occult Blood Screening</div>	Satisfied	Result	10/09/2019		Medium			
<div><div></div>Fecal Occult Blood Screening</div>	Satisfied	Order	10/09/2019		Medium			
<div><div></div>Fecal Occult Blood Screening</div>	Satisfied	Result	30/09/2018		Medium			
<div><div></div>Fecal Occult Blood Screening</div>	Satisfied	Order	30/09/2018		Medium			
<div><div></div>Diabetes Screening</div>	Satisfied	Result	15/09/2019		Medium			
<div><div></div>Breast Cancer Screening</div>	Satisfied	Order	18/09/2019		Medium			
<div><div></div>Breast Cancer Screening</div>	Satisfied	Result	21/02/2010		Medium			

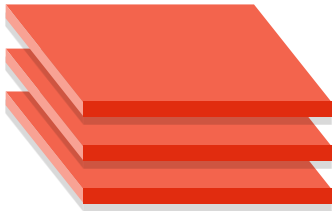
# FOB TESTS ORDERED



# + CANCER RESULTS FOB TEST



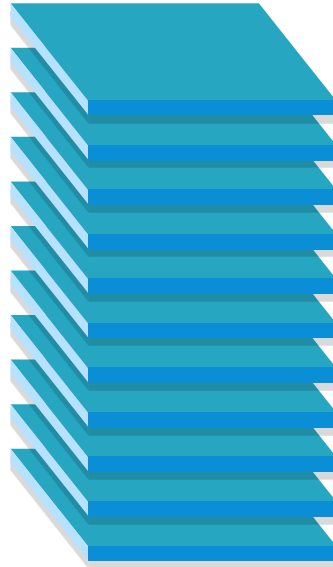
3



BEFORE HMT

CY2012 – 2015

11



AFTER HMT

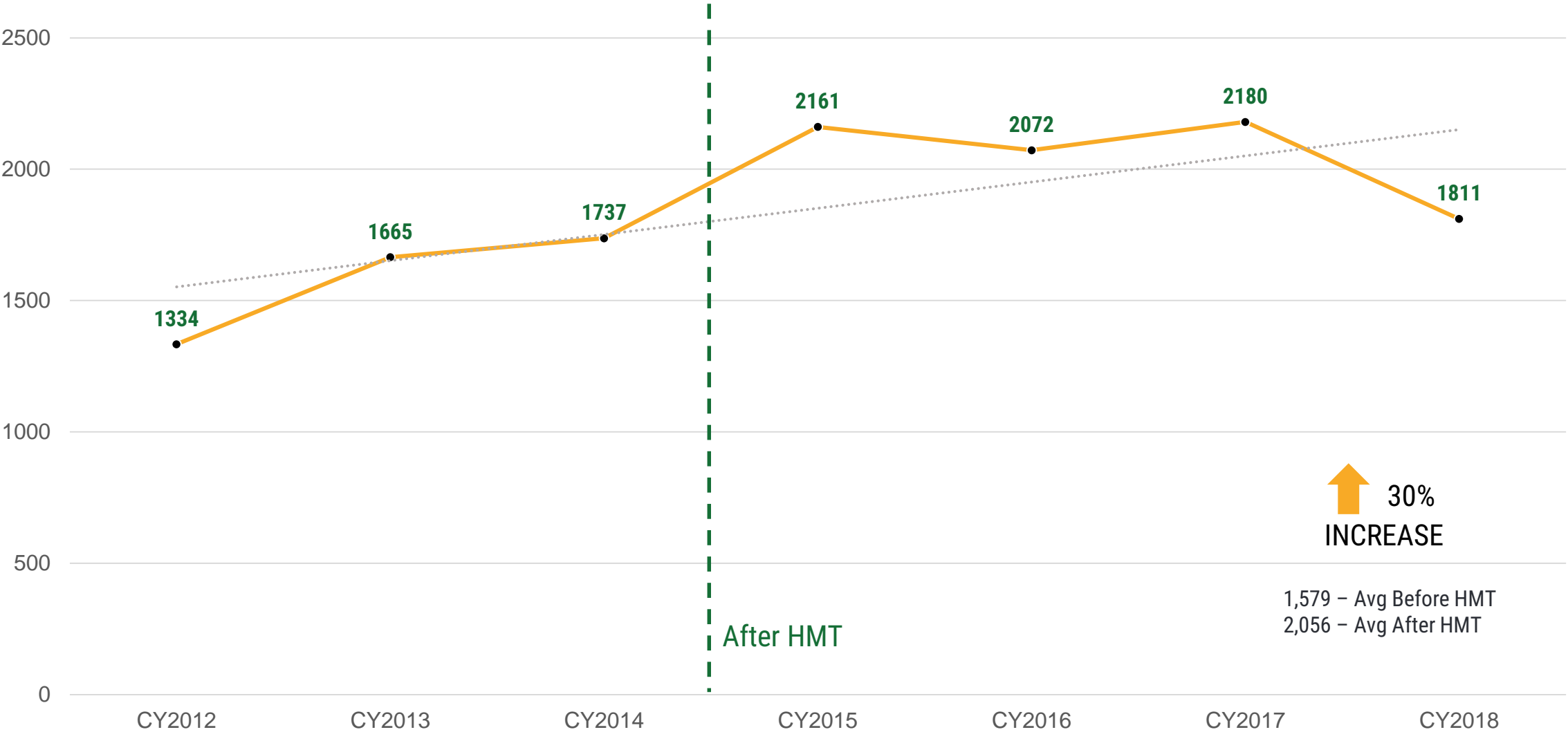
CY2015 – 2018



267%

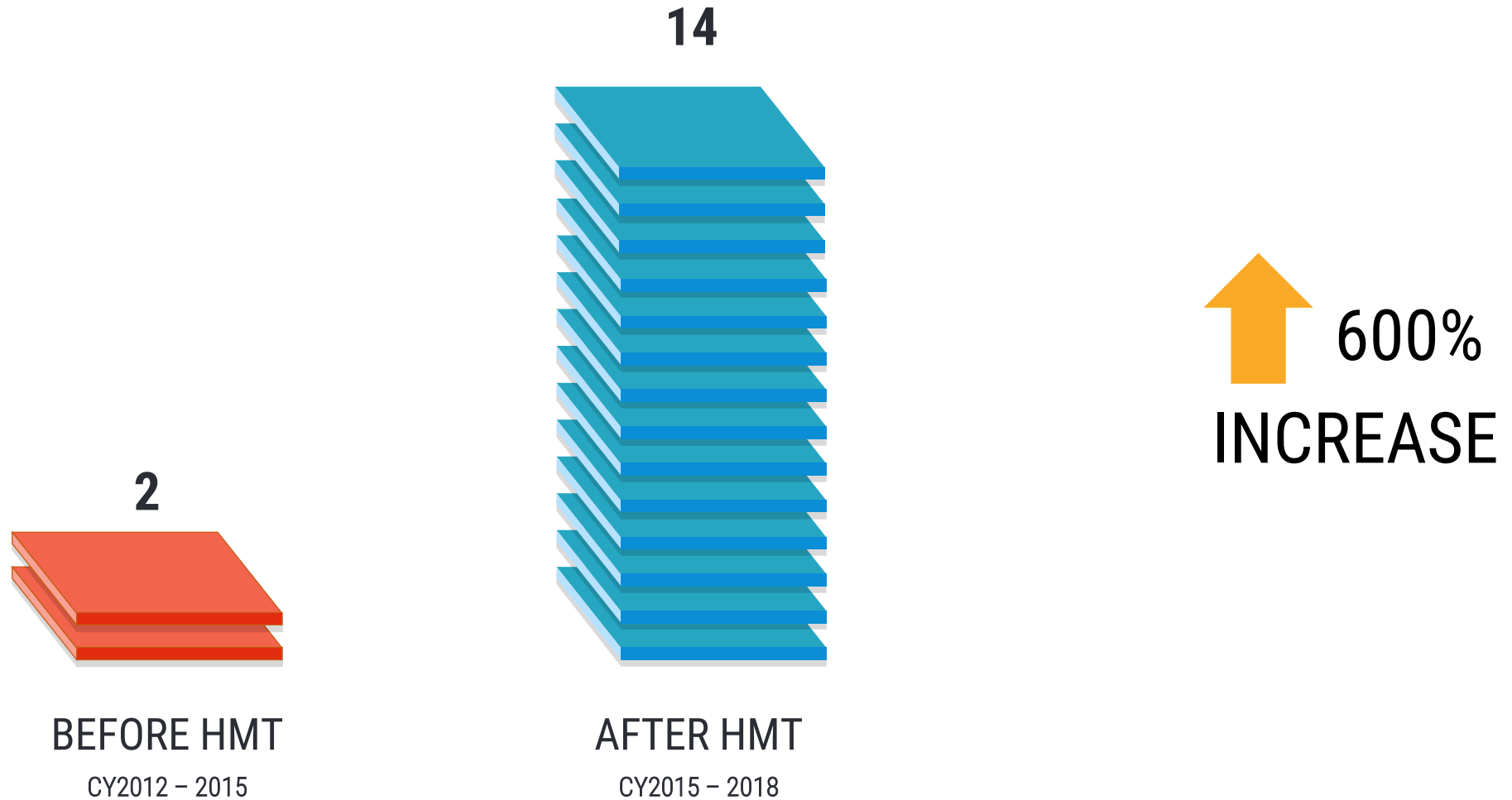
INCREASE

# MAMMOGRAM TESTS ORDERED

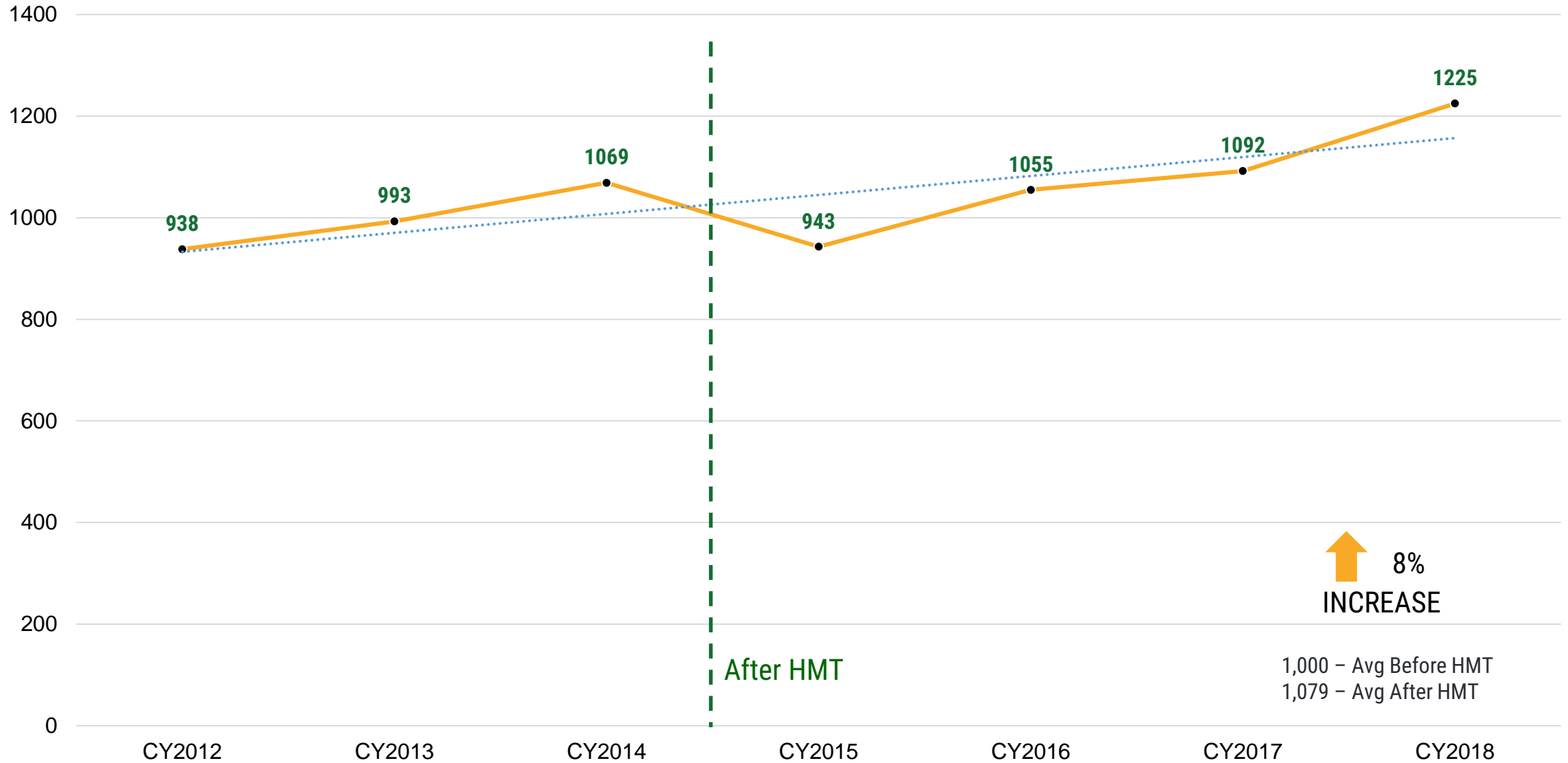




## + CANCER RESULTS MAMMOGRAM TEST



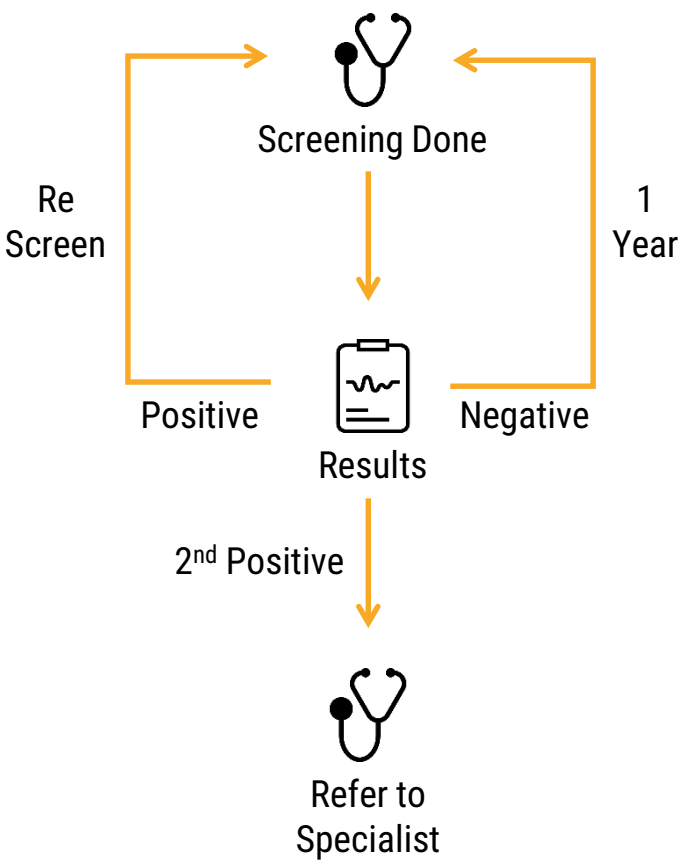
# PAP SMEAR TESTS ORDERED



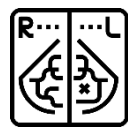
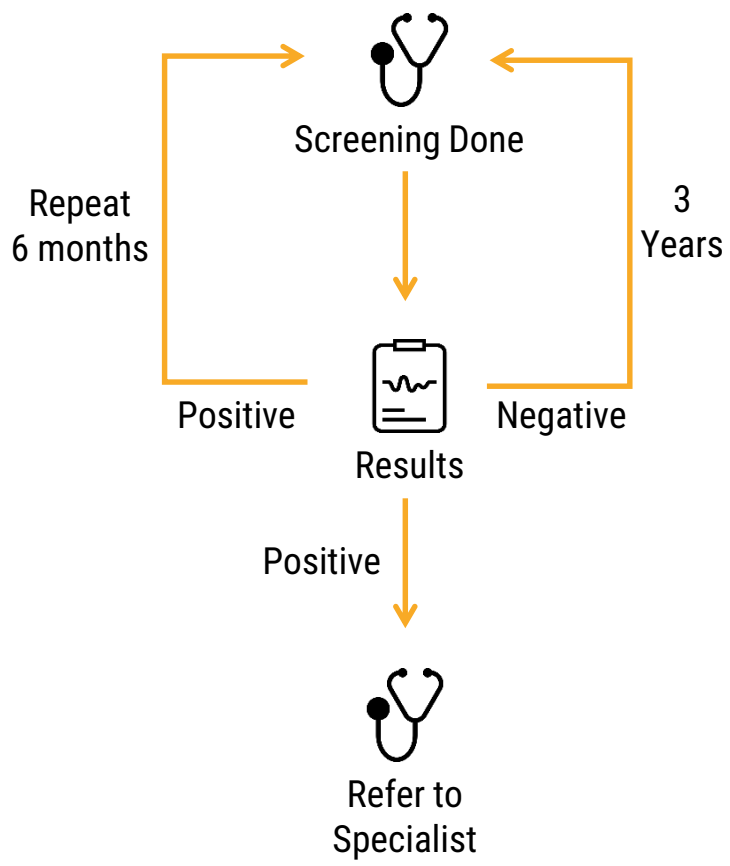
# FOLLOW UP + CANCER RESULTS



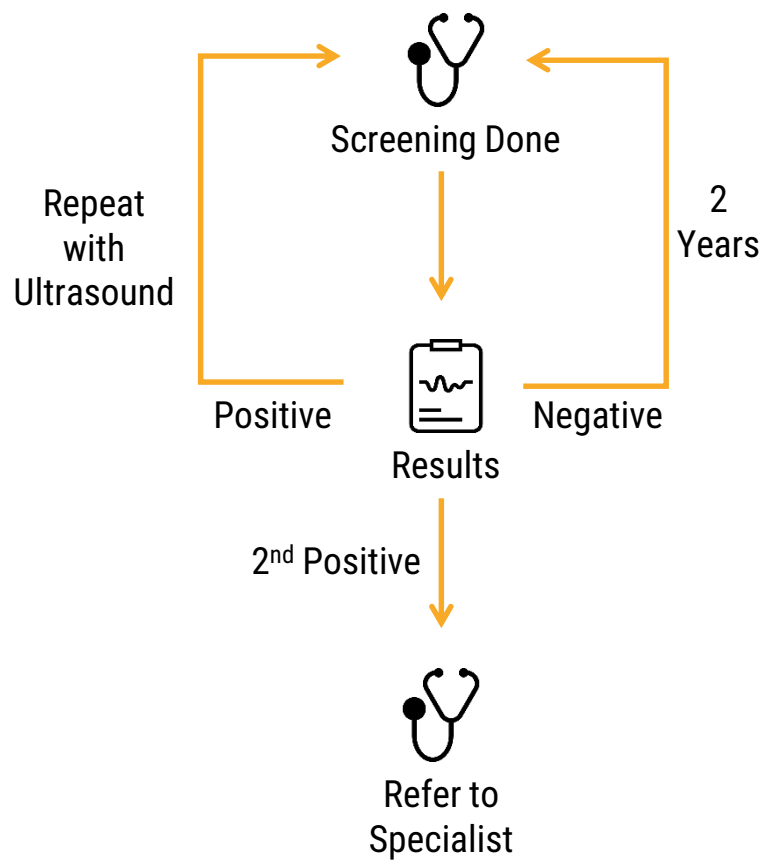
## Fecal Occult Blood



## Pap Smear



## Mammogram



# INTERNATIONAL STANDARDS ALIGNMENT



## World Health Organization

- In order to improve breast cancer outcomes and survival, early detection is critical. There are two early detection strategies for breast cancer: early diagnosis and screening.
- Annual, but not biennial, FOBTs reduce mortality from colorectal cancer after about a ten year period.

## Key Points for Practice (AFP Editors)

- Routine screening with mammography should be initiated at 45 years of age in women at average risk.
- For women 55 years and older, biennial screening is the preferred approach, with the option to screen each year.
- Annual screening mammography should be offered to patients between 40 and 44 years of age.
- Clinical breast examination is not recommended as an approach to screening for breast cancer.

## US Preventive Services Taskforce

- Breast cancer screening recommendations include a mammogram every two years for women from the ages of 50 to 74 years.
- Annual FOB testing from the age of 50 or completing a colonoscopy every 10 years as part of colorectal cancer screening.

## KFSH&RC Standards

- Mammogram Screening done every 2 years for all females between the ages of 45 and 75 years. (Based on evidence, starting age for Breast Cancer Screening should be at 45years as indicated by *local population studies*.)
- Annual screening is done for any female with a family history of Breast cancer
- Referral done if there is a second positive Mammogram and Ultrasound
- FOB Screening done every year for all patients above the age of 50
- FOB Test will be repeated if there is a positive result
- Colonoscopy & Gastroenterology referrals done if there is a second positive FOBT

# LEARNINGS

## SUCCESS

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- Enterprise wide standardization of preventative care towards cancer screening
- Improved alert monitoring to minimize alert fatigue
- Inclusion of clinicians in the build and design decisions optimized the workflow and improved adoption
- Engaging leadership from the start, helped to drive accountability and utilization

## CHALLENGE

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- Change management
- Expansion to other cancer preventive services
- Facility specific workflows while using the same tools



# UTILIZATION OF OUTCOMES IN CLINICAL RESEARCH



## RESEARCH ARTICLE

### Interferon Gamma Release Assay versus Tuberculin Skin Testing among Healthcare Workers of Highly Diverse Origin in a Moderate Tuberculosis Burden Country

Sahar Al Hajj<sup>1\*</sup>, Bright Varghese<sup>1</sup>, Akia Dattjan<sup>1</sup>, Mohammed Shoukr<sup>2</sup>, Ali Alzahrani<sup>3</sup>, Abdallah Akhenizan<sup>4</sup>, Abdulaziz AlSaif<sup>5</sup>, Sahar Althawadi<sup>6</sup>, Grace Fernandez<sup>2</sup>, Abdulrahman Alrajhi<sup>6</sup>

**1** Mycobacteriology Research Section, Department of Infection and Immunity, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, **2** National Biotechnology Centre, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, **3** Gulf Centre for Cancer Control and Prevention, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, **4** Department of Family Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, **5** Department of Pathology and Laboratory Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, **6** Department of Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia

\* [hajj@kfshrc.edu.sa](mailto:hajj@kfshrc.edu.sa)



## OPEN ACCESS

**Citation:** Al Hajj S, Varghese B, Dattjan A, Shoukr M, Alzahrani A, Akhenizan A, et al. (2016) Interferon Gamma Release Assay versus Tuberculin Skin Testing among Healthcare Workers of Highly Diverse Origin in a Moderate Tuberculosis Burden Country. PLoS ONE 11(5): e0154833. doi:10.1371/journal.pone.0154833

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## Abstract

Health care workers (HCWs) are always at risk of tuberculosis (TB) infection. In Saudi Arabia, Interferon Gamma Release Assay (IGRA) has been evaluated as a screening tool for latent TB in high demographic diversity. During February 2015, a study was conducted in a tertiary care center in a population in the capital city-Riyadh. After a 24-hour test, a logistic regression analysis was carried out to identify putative risk factors and the diagnosis according to geographical origin and a detailed history of origin towards the results of TST and QFT were BCG vaccinated, female (67.9%) and male (32.1%).



## OPEN ACCESS

**Citation:** Akhenizan A, Mahmoud A, Hussain A, Gabr A, Alsagheer S, Balal A (2017) The Relationship between 25 (OH) D Levels (Vitamin D) and Bone Mineral Density (BMD) in a Saudi Population in a Community-Based Setting. PLoS ONE 12(1): e0169122. doi:10.1371/journal.pone.0169122

**Editor:** Andrzej T Sliwinski, University of Alabama at Birmingham, UNITED STATES

**Received:** August 14, 2016

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## RESEARCH ARTICLE

### The Relationship between 25 (OH) D Levels (Vitamin D) and Bone Mineral Density (BMD) in a Saudi Population in a Community-Based Setting

Abdullah Akhenizan<sup>1\*</sup>, Ahmed Mahmoud<sup>1</sup>, Aneela Hussain<sup>1</sup>, Alia Gabr<sup>1</sup>, Saud Alsagheer<sup>2</sup>, Abdelmoneim Eldas<sup>3</sup>

**1** Department of Family Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia, **2** Department of Biostatistics, Epidemiology and Scientific Computing, King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia

\* [akhenizan@kfshrc.edu.sa](mailto:akhenizan@kfshrc.edu.sa)

## Abstract

### Background

Vitamin D deficiency has been linked to an increased risk of osteoporosis. Vitamin D deficiency has reached high levels in the Saudi population, but there is conflicting evidence both in the Saudi population, and worldwide, regarding the existence of a correlation between these low vitamin D levels and reduced BMD (bone mineral density), or osteoporosis.

### Objective

The objective of this study was primarily to determine whether there was a correlation between vitamin D deficiency and osteoporosis in the Saudi population. We aimed to investigate whether the high levels of vitamin D deficiency and insufficiency would translate to higher prevalence of osteoporosis, and whether there is a correlation between vitamin D levels and bone mineral density.

### Materials and methods



## Investigating the epidemiology of medication errors in adults in community care settings

### A retrospective cohort study in central Saudi Arabia

Chadeh A. Asiri<sup>1</sup>, B Pharm, MSc, Abdullah HM Alkhenizan, MD, CCFP, Salma M. Al-Khamsi, B Pharm, MHEA, Liz M. Grant, PhD, MA, Aziz Sheikh, MD, MBBE

## ABSTRACT

**أهداف:** التحقق من معدل الانتشار الوصي وعوامل الخطر للأخطاء الدوائية سريرية من ناحية الوصف والمراقبة في إدارة الدواء لدى المرضى البالغين الذين تم معالجتهم في الرعاية المجتمعية.

**الطريقة:** استخدمت هذه الدراسة الارتباطية تأثير رجعي بيانات السجلات الصحية الإلكترونية (HER). تم اختيار عينة عشوائية تضم 2000 شخص بالغ (عمر 18 عامًا) في زيارة عيادات طب الأسرة في مستشفى الملك فيصل التخصصي ومركز الأبحاث، الرياض، المملكة العربية السعودية. استوفت عملية جمع البيانات 3 أشهر (من أول أكتوبر إلى ديسمبر 2017م). قمنا بالتحقق من مدى انتشار وعوامل الخطر المرتبطة بالمرضى المعرضين لخطر الأخطاء الدوائية سريرية. أجريت التحليلات الوصفية ولقدجة التحرف الوصفي باستخدام برنامج الإحصاء STATA (الإصدار 14).

**النتائج:** كشفت دراستنا الارتباطية أن معدل الانتشار الوصي للأخطاء الدوائية على مدى 15 شهرًا هو 8.1% (فاصل ثقة 95% (CI) 6.5-9.7). وعوامل الخطر المرتبطة بالمرضى المعرضين لخطر الأخطاء الدوائية هي: العمر >65 عامًا، الجنس الذكري، الجنسية السعودية للمرضى، واستخدام جنس أو أكثر من الأدوية المتزامنة.

In King Faisal Specialist Hospital and Research Center (KFSC & RC), Riyadh, SA, was selected. Data collection took 3 months (October-December 2017). Descriptive analyses and logistic regression modeling were performed using STATA (version 14) statistical software.

**Results:** The overall period prevalence of medication errors over 15 months was 8.1% (95% confidence interval [CI] 6.5-9.7). Risk factors that significantly predicted overall risk of patients experiencing one or more medication errors were: age >65 years, male gender, Saudi nationality, and polypharmacy (defined as the concurrent use of ≥5 drugs).

**Conclusions:** Clinically were commonly observed prescription and monitoring

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From the Department of Pharmacy, King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia

## Yield of prostate cancer screening at a community based clinic in Saudi Arabia

Abdulaziz A. Almutairi<sup>1</sup>, Abdelmoneim M. Edali<sup>2</sup>, MSc, Shoaib A. Khan, MD, Wale A. Aldithan, MD, Abdullah H. Alkhenizan, MD,

## ABSTRACT

**الأهداف:** تحديد معدل الإصابة ومعدل انتشار المرض في المجتمع السعودي.

**الطريقة:** أجريت دراسة ارتباطية رجعية شملت على 2,160 مرضى أعمارهم 40 سنة فما فوق ممن سبق لهم فحص مستند البروستات (PSA) في عيادات طب الأسرة المرتبطة بمستشفى الملك فيصل التخصصي ومركز الأبحاث بالرياض في الفترة من سبتمبر 2007 إلى ديسمبر 2016م.

**النتائج:** قمنا بتحليل البيانات إحصائياً والتي شملت على 1,521 (70%) سعودي و 639 (30%) غير سعودي. إجمالاً، من بين 108 (5%) ممن خضعوا لعينة البروستات وجدنا معدل انتشار سرطان البروستات بين السعوديين 31 (2%) ومرضين بينما المعدل في غير السعوديين 6 مرضي (0.93%). معدل الإصابة بعد توحيد الأعداد بين السعوديين (ASIR) كان 70 لكل 100,000 رجل. ما يقارب ثلثي السعوديين في الدراسة (71%) كانوا في المراحل الأولى للمرض.

**الخلاصة:** معدل انتشار مرض البروستات في المجتمع السعودي أعلى

**Results:** A total of 2,160 male patients were included in the study. Of these, 1,521 (70%) were Saudi nationals and 639 (30%) were non-Saudi nationals. A total of 108 (5%) patients underwent a prostate biopsy. The biopsy results confirmed that 31 (2%) Saudi patients and 6 (0.93%) non-Saudi patients had prostate adenocarcinoma. The age-standardized incidence rate of prostate cancer in the Saudi male population is 70 per 100,000 males. Nearly two-thirds (71%) of the Saudi patients' prostate cancer was found to be in the early stages.

**Conclusion:** The prevalence of prostate cancer in the Saudi male population is higher than that reported by the Saudi Cancer Registry; however, it is low compared with prevalences in developed countries. The mortality rate is also very low. Prostate-specific antigen screening in Saudi Arabia should not be carried out routinely; instead, it should only be carried out on an individual basis.

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# 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*

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