i360HYGIENE LIMITED

Addressing Healthcare Associated Infections

February 2016

Healthcare Associated Infections Are A Major Global Problem

NICE National Institute for Health and Care Excellence

"..300,000 people get an infection while being cared for within the NHS in England each year and one in 16 people being treated on the NHS picks up an infection.."

CDC Centers for Disease Control and Prevention

Approximately **1.7 million** HAIs occur in U.S. hospitals each year, resulting in **99,000 deaths** and an estimated **$20 billion** in healthcare costs

Substantially due to healthcare workers **NOT** washing their hands

i360Hygiene is focused on **reducing Healthcare Associated Infections** by ensuring that healthcare workers wash their hands

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Hospitals Worldwide are Under Pressure to Fix Hand Hygiene

USA

- **2016**, 758 out of 3,308 hospitals subject to the HAC Reduction Program were subject to a payment reduction of $364 million, financial cost of $480,000 per hospital.
- **2015**, Medicare and Medicaid will not pay hospitals for HCAI's, financial burden on hospital

UK

- **2016,** *"..if people visiting a restaurant had a 6.4% chance of contracting an infection, that restaurant would not be able to continue to operate, so why are we tolerating such levels of HAIs in our hospitals?...."*

Ireland

- **2015**, HIQA audits are costing HSE millions to respond to poor hand hygiene results

Saudi Arabia

- **2015**, with MERS endemic, radical measure implemented to address poor hand hygiene performance from salary deductions, to suspension, and escalating to jail for repeat offenders.

Current Interventions Have Limited Long Term Effect

Electronic Hand Hygiene Monitoring Proven Sustainable Reductions in HCAI's

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Why Now?

- Halyard review
  - 11 clinical studies focused on Electronic Hand Hygiene Monitoring

i360Hygiene System ROI of Less than One Year

Analogy

- Seat Belts
  - Education / Encouragement
    - "Clunk Click Every Trip"
    - "Belt Up"
  - Mandatory wearing seat belts
    - 1970 Australia (Victoria)
  - Install in-car monitoring system
    - 99% compliance !

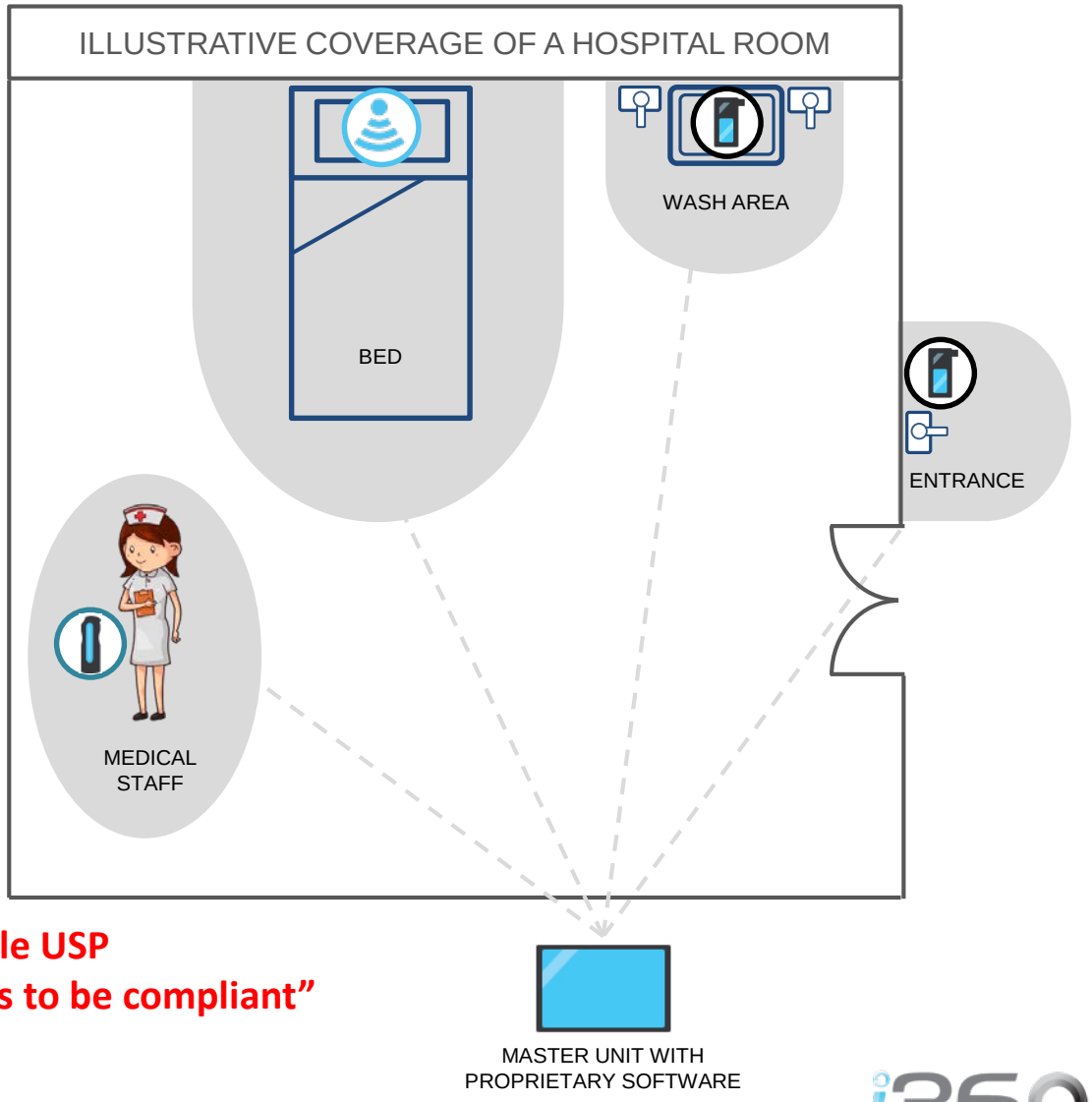
- Hand Hygiene
  - Education / Encouragement
    - WHO hand hygiene day
    - "Hands Up"
  - Hand Washing compliance audits
    - Mandatory reporting
    - "gold standard"
  - *Install in-hospital monitoring system*
    - *+90% compliance!*

i360Hygiene's Solution Reduces Healthcare Associated Infections

i360genie **records**

Hand Hygiene **events**
Hand Hygiene **opportunities**

Customised to your protocols



i360 Hygiene has a simple USP
"make it easy for healthcare workers to be compliant"

Why i360Hygiene?

- Best featured product available.

General Dispensing Unit	Personal Dispensing Unit	Master Display Unit
Real Time Feedback	WHO 5 Moments	Real Time Monitoring

i360Hygiene – Making it Easy

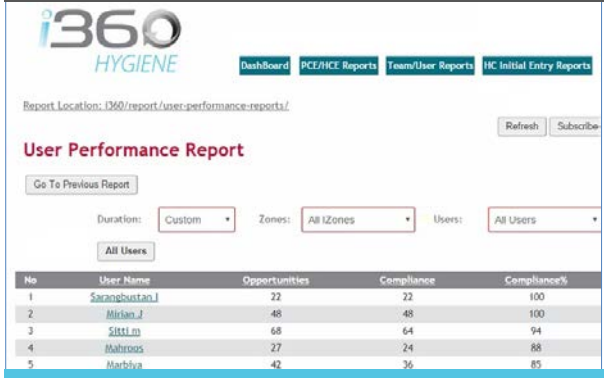
Why i360Hygiene?

- Comprehensive, consolidated reporting
- Access level aligned to reporting

Dashboard

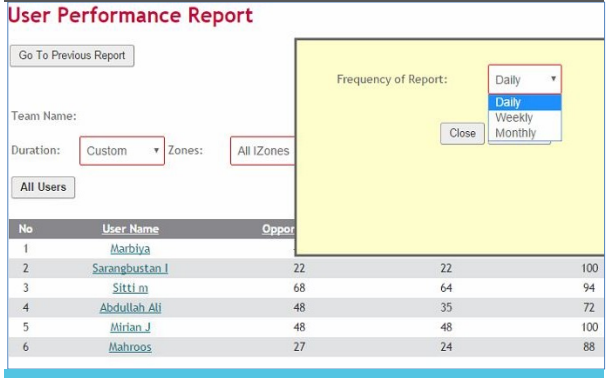
Real Time Status

Reports



Team and Location Reporting

Subscription



Email Reporting

i360Hygiene – Making it Easy

Why i360Hygiene?

- **Whitfield Clinic – Ireland** : Testimonial on line on our website
  - http://i360hygiene.com/testimonials
- **Al Moosa Hospital – Saudi Arabia** : Here now to give their perspective
  - Bassel Salim Molaeb, Infection Control Director

Testimonial on line

Whitfield Clinic
Ireland

Here today

Al Moosa Hospital
Saudi Arabia

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Almoosa Specialist Hospital

Al-Moosa Specialist Hospital Experience with Automated Hand Hygiene Monitoring System (i360Hygiene) in a 20-bed Intensive Care Unit

- Bassel Molaeb, MPH, CIC
- Infection Control Director
- Al-Moosa Specialist Hospital
- Saudi Arabia

- February 23, 2016

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Hand Hygiene

Your Complete Solution

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Outline

- Why to focus on Hand Hygiene?
- Why was i360Hygine installed in Al-Moosa Specialist Hospital ICU?
- The Journey with i360
- A 10-Month Monitoring Period Results
- Challenges with i360
- Sustaining Hand Hygiene Compliance
- Lessons Learned from ASH Experience with i360

Why to focus on Hand Hygiene?

Why to focus on Hand Hygiene?

- **"Hand hygiene is the primary measure to reduce infections"**

World Health Organization Guidelines on Hand Hygiene in Health Care

- **"Of every 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire at least one health care-associated infection**

World Health Organization Healthcare-associated infections Fact Sheet

- **"Hand hygiene is the most important intervention for preventing HAIs"**

The Joint Commission

- **"Hand hygiene has long been considered one of the most important infection control measures for preventing HAIs"**

Institute for Healthcare Improvement (IHI)

Why to focus on Hand Hygiene?

- **Estimates of Healthcare-Associated Infections Occurring in Acute Care Hospitals in the United States**

Major Site of Infection	Estimated No.
Pneumonia	157,500
Gastrointestinal Illness	123,100
Urinary Tract Infections	93,300
Primary Bloodstream Infections	71,900
Surgical site infections from any inpatient surgery	157,500
Other types of infections	118,500
Estimated total number of infections in hospitals	**721,800**

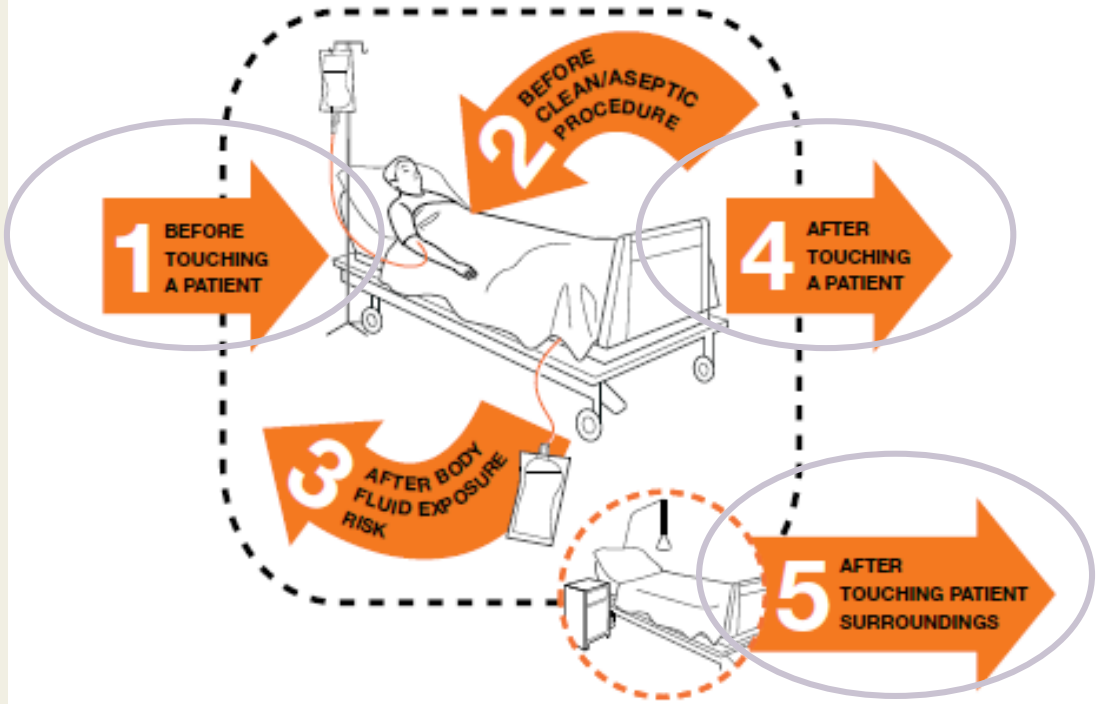
Source: CDC HAI Prevalence Survey. Magill SS, Edwards JR, Bamberg W, et al. Multistate Point-Prevalence Survey of Health Care–Associated Infections. N Engl J Med 2014;370:1198-208.

Why to focus on Hand Hygiene?

- Up to 40% of HAIs are attributable to poor hand hygiene
- Healthcare workers are not compliant to proper hand hygiene procedures 50% of the time
- Studies show that:
  - Total cost of hand hygiene promotion corresponded to less than 1% of the costs associated with nosocomial infections
  - Cost-benefit exists for HH promotion: every 1USD spent on hand hygiene promotion could result in a 23.7USD benefit

Source: Evidence of hand hygiene to reduce transmission and infections by multidrug resistant organisms in health-care settings: www.who.int/gpsc/5may/MDRO_literature-review.pdf

My 5 Moments for Hand Hygiene



80% of Total

World Health Organization

How to Improve Hand Hygiene Compliance?

- Busy staff have very little spare time in which to perform HH

Normal ward	**Up to 20 washes per hour**
Intensive care ward	**Up to 40 washes per hour**

Source: Pittet D, Mourouga P, Perneger TV: Compliance with handwashing in a teaching hospital. Infection Control Program. Ann Intern Med 1999, 130(2):126-130

How to Improve Hand Hygiene Compliance?

Bundles were associated with improved hand hygiene compliance:

- **Education**
- **Reminders**
- **Feedback**
- **Administrative support**
- **Access to HH products**

Source:*Searching for an Optimal Hand Hygiene Bundle: A Meta-analysis. Clin Infect Dis. (2013) doi: 10.1093/cid/cit670 First published online: October 8, 2013*

Why was i360Hygine installed in Al-Moosa Specialist Hospital ICU?

- ASH is a 200-bed tertiary-care hospital Located in Al-Ahsa Eastern Province in SA
- JCI Accreditation
- CBAHI Accreditation
- Planetree Designation

In February 2015, a new 20-bed Medical/Surgical ICU was inaugurated

Why was i360Hygine installed in ASH ICU?

- Hand Hygiene was selected as a key performance indicator to be monitored
- Package payment for ICU patients by Third-party payers
  - Decrease HAI burden in ICU
- Continuous problem with Direct HH observation:
  - HH was monitored through manual audits and observations
  - Observers couldn't monitor all hand hygiene opportunities and all personnel all the time
  - Compliance tend to increase when people know that an observer was watching them and tend to decrease when the observer was not present
  - Manual Observation was time-consuming
  - Compliance in observed areas usually increased during manual audits but for limited times

The Journey with i360

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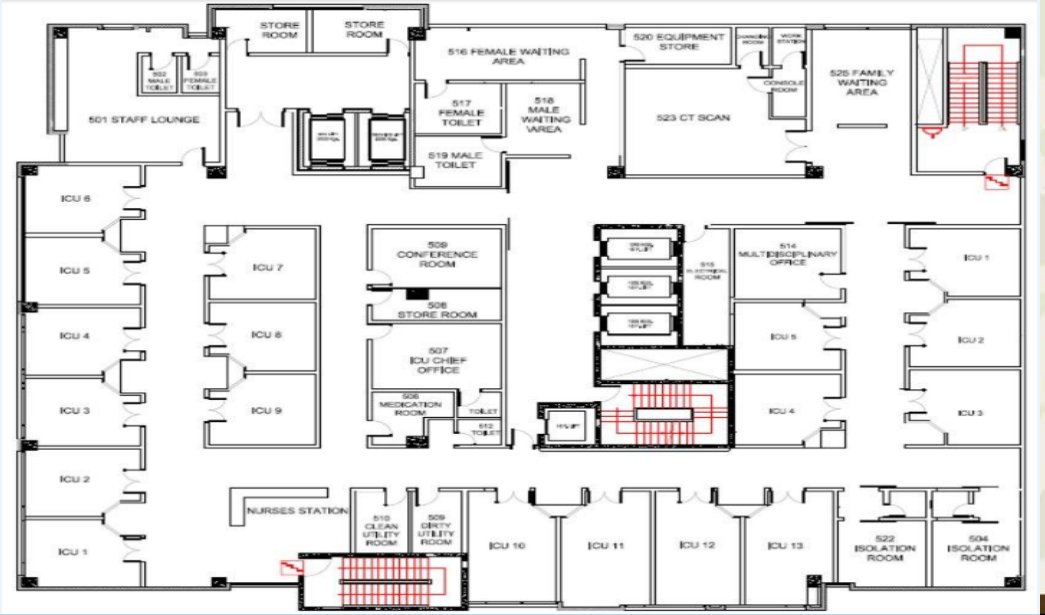
The Journey with i360

- Leadership decision was to install an Automated electronic hand hygiene compliance monitoring system:
  - Monitor all hand hygiene opportunities 24/7 all-year-round
  - Provide detailed reports and analysis in real-time ready to Infection Control Team, Leadership and Team leaders
  - Initiative to decrease HAI
- In March 2015, i360Hygiene technology was installed in 20 - ICU rooms with 40 Gel dispensers & 20 Soap dispensers



The Journey with i360

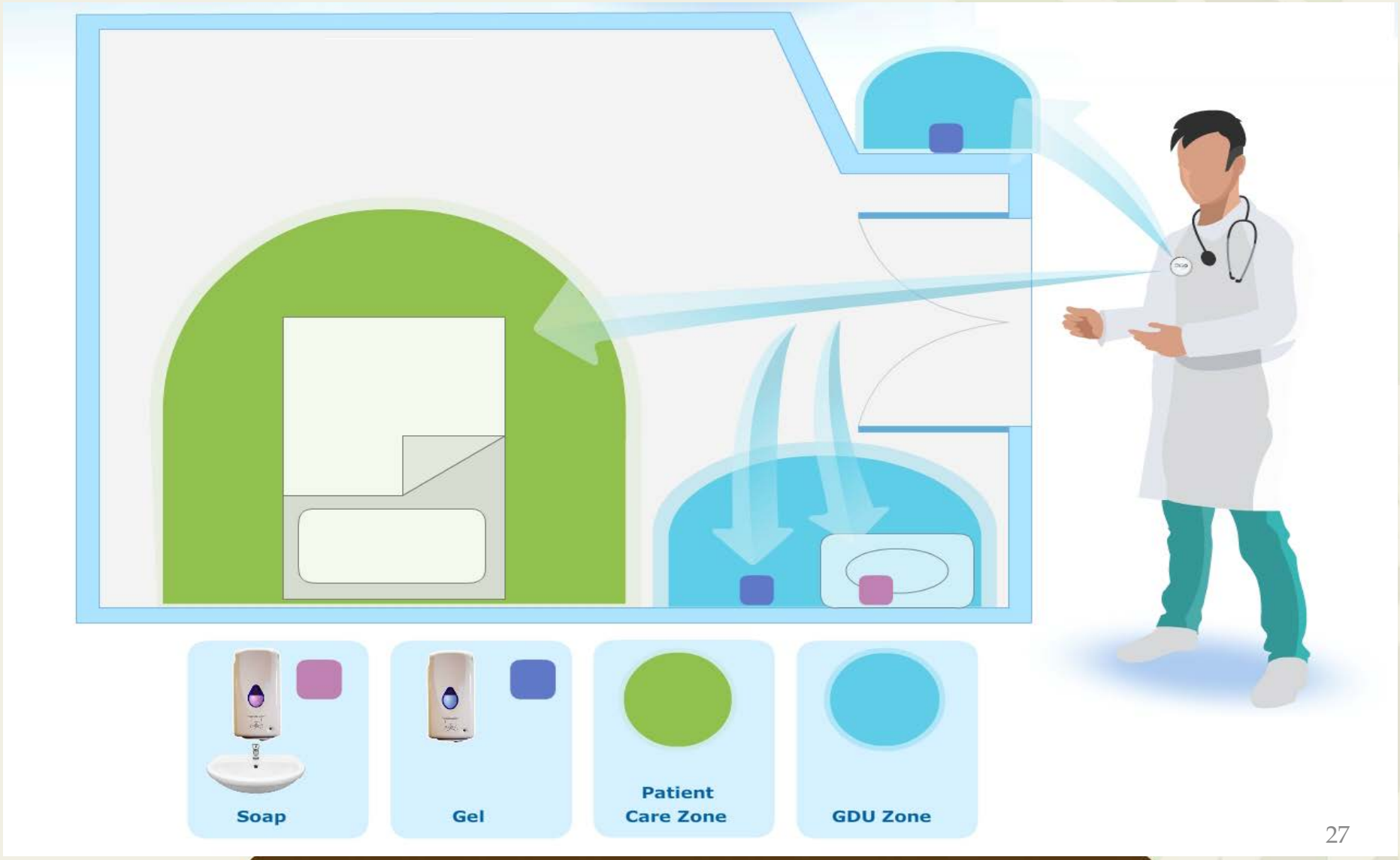
March 2015
Installation of i360 Technology

April 2015
Phase I monitoring
Compliance Threshold 40%

October 2015
Phase II monitoring
Compliance Threshold 70%

- i360 technology included:
  - A personal device
  - Location Zone Unit
  - General Dispensing Unit

How the System Works



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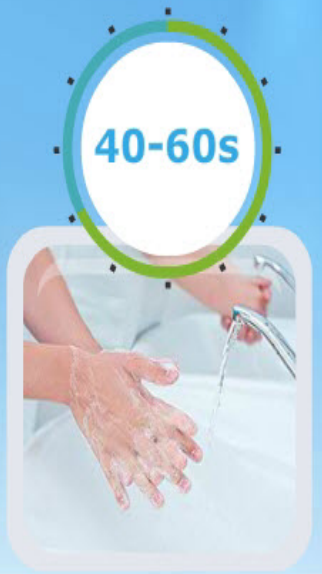
How to be Compliant

Please stay at the gel dispense for 3 seconds to register for a compliant hand wash.



Please stay at the sink for 40 seconds register for a compliant hand wash with soap and water.

How to be Compliant

150s

Patient Care Zone (Inside Room)
The system will register you at the patient zone after you have been there for more than 10 seconds. You can leave the patient zone and return within 1 minute to remain in the patient zone

10s

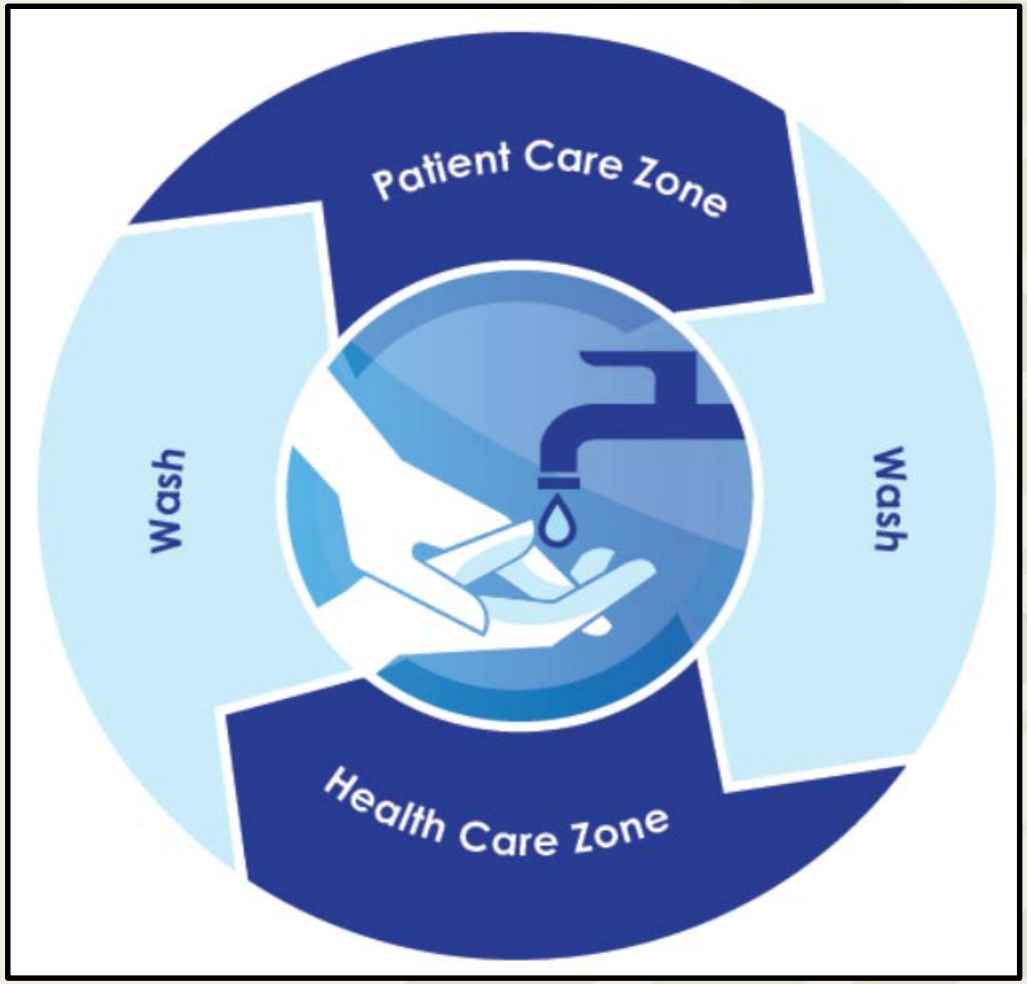
Wash IN Process
Wash your hands prior to entering the patient zone. This can be done outside or inside the room. You have 150 seconds to enter the patient care zone after washing to ensure you have a compliant Wash In.

Wash OUT Process
After leaving the Patient Care Zone, wash your hand using either the soap and water or gel dispenser inside the room or outside the room within 120 seconds.

120s

How to be Compliant

Compliance Process



Personal Feedback

- All users get real time feedback on their hand hygiene performance

Real-Time Compliance Reporting

- Online, real-time reports accessible 24/7

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Detailed View

Teams	Opportunities	Compliance	Compliance%	Compliance Threshold	Status
Physicians	1874	1415	75	70	
Housekeeping	3386	2953	87	70	
Physiotherapist	572	449	78	70	
RT Team	3712	2505	67	70	
i360 Team	32	28	87	70	
Nurse Team	36154	26682	73	70	
X-Ray	577	360	62	70	
HaemoDialysis	631	333	52	70	

Detailed View

No	User Name	Opportunities	Compliance	Compliance%
1	Sarah	10	10	100
2	Hazel	381	351	92
3	Anitha	119	109	91
4	Shermaine	401	359	89
5	Mohammed	271	234	86
6	Santosh	55	47	85
7	Amado u	349	297	85
8	Roqayah AS	127	107	84
9	Tifanny	418	340	81
10	Aiza	419	341	81
11	Dana	747	612	81
12	Roy	238	193	81
13	Janepple	354	284	80
14	Rima	298	237	79
15	Joseph	497	393	79

Responsibilities and Follow up

- i360 Team level:
  - Monitoring system effectiveness
  - Technical Support (Whatsapp communication, Skype meetings, local representative on-site support)
  - Responding to troubleshooting
  - On-site training
  - Reporting

- Infection Control level:
  - Daily, weekly & monthly reporting
  - Collaboration with i360 team and ICU teams and leaders
  - Continuous training
  - Feedback to team leaders
  - Identifying system troubleshooting

Responsibilities and Follow up

- Unit / User level:
  - Adherence to system requirements
  - Training
  - Proper use of personal device and positioning in zones
- Team Leaders level:
  - Engagement in training and staff adherence to HH
  - Follow up on staff compliance
- Senior Management level:
  - Support
  - Monitoring
  - Recognition of HH Champion (monetary prizes)

Feedback and Analysis

- Weekly reports are sent from i360 team to IC team and team leaders

Message | Nurse Team.pdf (147 KB) | Abed.pdf (120 KB) | Wesam.pdf (135 KB) | Ebtisam.pdf (125 KB) | Annamma.pdf (116 KB) | Helen.pdf (137 KB) | Elien.pdf (177 KB) | Andrea.pdf (122 KB)
Vivid.pdf (315 KB) | Leigh.pdf (159 KB) | Loraine.pdf (160 KB)

Dear Ms. Sarah,

Please see attached your teams hand hygiene metrics for ICU A for the past week. Your team achieved compliance this week.
Please see details attached for those that have not achieved compliance. I would like to schedule time with Vivid during my next visit for system training. The other staff should be encouraged to follow hand hygiene protocol.

The CARE engineer will visit Almoosa this week so please let me know if you have anything that needs attention.

Kind Regards,

Patrick

i360 HYGIENE

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Feedback and Analysis

Team Name	Opportunities	Compliance	Compliance%
Housekeeping	179	176	98%
Physiotherapist	33	29	88%
X-Ray	32	28	88%
RT Team	323	260	80%
Physicians	192	153	80%
Nurse Team	2259	1715	76%
HaemoDialysis	11	8	73%
ALL TEAMS	3029	2369	78%

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PLANE TREE

Feedback and Analysis

Name	Compliant	Location	Date	PCEWDur	PCELiquid	PCECode	HCEWDur	HCELiquid	HCECode
Dr. Basel	No	Room_04	13/02/2016 11:25:41	7.71 sec	Gel	Compliant	3.72 sec	Gel	Wash Interval,159.69 sec
Dr. Basel	No	Room_02	13/02/2016 10:43:23	8.29 sec	Gel	Compliant	15.29 sec	Gel	Wash Interval,130.82 sec
Dr. Basel	Yes	Room_01	13/02/2016 10:16:33	9.7 sec	Gel	Compliant	58.25 sec	Gel	Compliant
Dr. Basel	Yes	Room_06	13/02/2016 09:07:07	12.02 sec	Gel	Compliant	7.64 sec	Gel	Compliant
Dr. Basel	Yes	Room_05	13/02/2016 09:01:05	9.58 sec	Gel	Compliant	7.24 sec	Gel	Compliant
Dr. Basel	Yes	Room_09	12/2/2016 17:33	7.61 sec	Gel	Compliant	7.03 sec	Gel	Compliant
Dr. Basel	No	Room_04	12/2/2016 9:43	8.91 sec	Gel	Compliant	18.39 sec	Gel	Wash Interval,104.45 min
Dr. Basel	No	Room_05	12/2/2016 9:27	8.65 sec	Gel	Compliant	35.82 sec	Gel	Wash Interval,357.68 sec
Dr. Basel	Yes	Room_07	12/2/2016 9:08	10.75 sec	Gel	Compliant	7.58 sec	Gel	Compliant
Dr. Basel	No	Room_02	12/2/2016 8:58	8.16 sec	Gel	Compliant	10.75 sec	Gel	Wash Interval,463.75 sec
Dr. Basel	Yes	Room_01	12/2/2016 8:20	7.82 sec	Gel	Compliant	96.93 sec	Gel	Compliant
Dr. Basel	No	Room_02	11/2/2016 13:59	12.13 sec	Gel	Compliant	13.63 sec	Gel	Wash Interval,599.26 sec
Dr. Basel	Yes	Room_03	11/2/2016 13:40	9.59 sec	Gel	Compliant	10.78 sec	Gel	Compliant
Dr. Basel	Yes	Room_04	11/2/2016 13:18	10.15 sec	Gel	Compliant	13.65 sec	Gel	Compliant
Dr. Basel	Yes	Room_07	11/2/2016 13:08	8.68 sec	Gel	Compliant	97.73 sec	Gel	Compliant
Dr. Basel	Yes	Room_07	11/2/2016 13:07	9.82 sec	Gel	Compliant	97.73 sec	Gel	Compliant
Dr. Basel	Yes	Room_05	11/2/2016 12:37	10.09 sec	Gel	Compliant	7.58 sec	Gel	Compliant
Dr. Basel	Yes	Room_06	11/2/2016 12:03	10.18 sec	Gel	Compliant	10.19 sec	Gel	Compliant
Dr. Basel	Yes	Room_01	11/2/2016 11:16	7.85 sec	Gel	Compliant	8.33 sec	Gel	Compliant
Dr. Basel	Yes	Room_07	11/2/2016 10:47	9.48 sec	Gel	Compliant	18.88 sec	Gel	Compliant
Dr. Basel	No	Room_07	11/2/2016 10:35	8.98 sec	Gel	Compliant	9.48 sec	Gel	Wash Interval,493.71 sec
Dr. Basel	Yes	Room_10	9/2/2016 16:57	8.13 sec	Gel	Compliant	13.94 sec	Gel	Compliant
Dr. Basel	Yes	Room_02	9/2/2016 11:38	10.35 sec	Gel	Compliant	13.55 sec	Gel	Compliant
Dr. Basel	Yes	Room_07	9/2/2016 11:00	8.53 sec	Gel	Compliant	21.94 sec	Gel	Compliant
Dr. Basel	Yes	Room_06	9/2/2016 10:49	9.01 sec	Gel	Compliant	7.57 sec	Gel	Compliant
Dr. Basel	Yes	Room_05	9/2/2016 10:15	10.47 sec	Gel	Compliant	10.7 sec	Gel	Compliant
Dr. Basel	No	Room_04	9/2/2016 9:51	8.64 sec	Gel	Compliant	76.2 sec	Gel	Wash Interval,853.53 sec
Dr. Basel	No	Room_09	9/2/2016 8:46	7.84 sec	Gel	Compliant	22.1 sec	Gel	Wash Interval,639.38 sec
Dr. Basel	No	Room_10	8/2/2016 13:38	10.85 sec	Gel	Compliant	15.79 sec	Gel	Wash Interval,200.5 sec
Dr. Basel	No	Room_10	8/2/2016 13:22	51.41 sec	Gel	Wash Interval,16.68 min	10.85 sec	Gel	Compliant
Dr. Basel	No	Room_10	8/2/2016 13:21	51.41 sec	Gel	Wash Interval,950.36 sec	10.85 sec	Gel	Wash Interval,925.83 sec
Dr. Basel	No	Room_10	8/2/2016 13:20	51.41 sec	Gel	No Handwash	10.85 sec	Gel	Wash Interval,972.57 sec

Feedback and Analysis

- All users get real time feedback on their hand hygiene performance
- Teams Heads have access to reports
- Weekly support from i360
- Weekly alerts from infection control team
- One-to-one counseling for low compliant staff
- Educational sessions from IC on HH compliance and i360use
- Training videos for HH and system use (in process)

HH Champions Recognition

- Creating peer pressure on team members
- Challenging staff to follow i360 and perform proper HH and attain high compliance

During Annual Celebration in January 2016:

- The Top 3 HH Champions for ICU were recognized and received monetary prizes:
  - Mr. Christopher Gumarao Buban: **96.8%** (House Keeping Staff)
  - Ms. Mirian Salahudeen: **94.8%** (Respiratory Technician)
  - Dr. Basel Ismaeil: **94.2%** (ICU Doctor)

HAND
HYGIENE
CHAMPIONS

HAND
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CHAMPIONS

HAND
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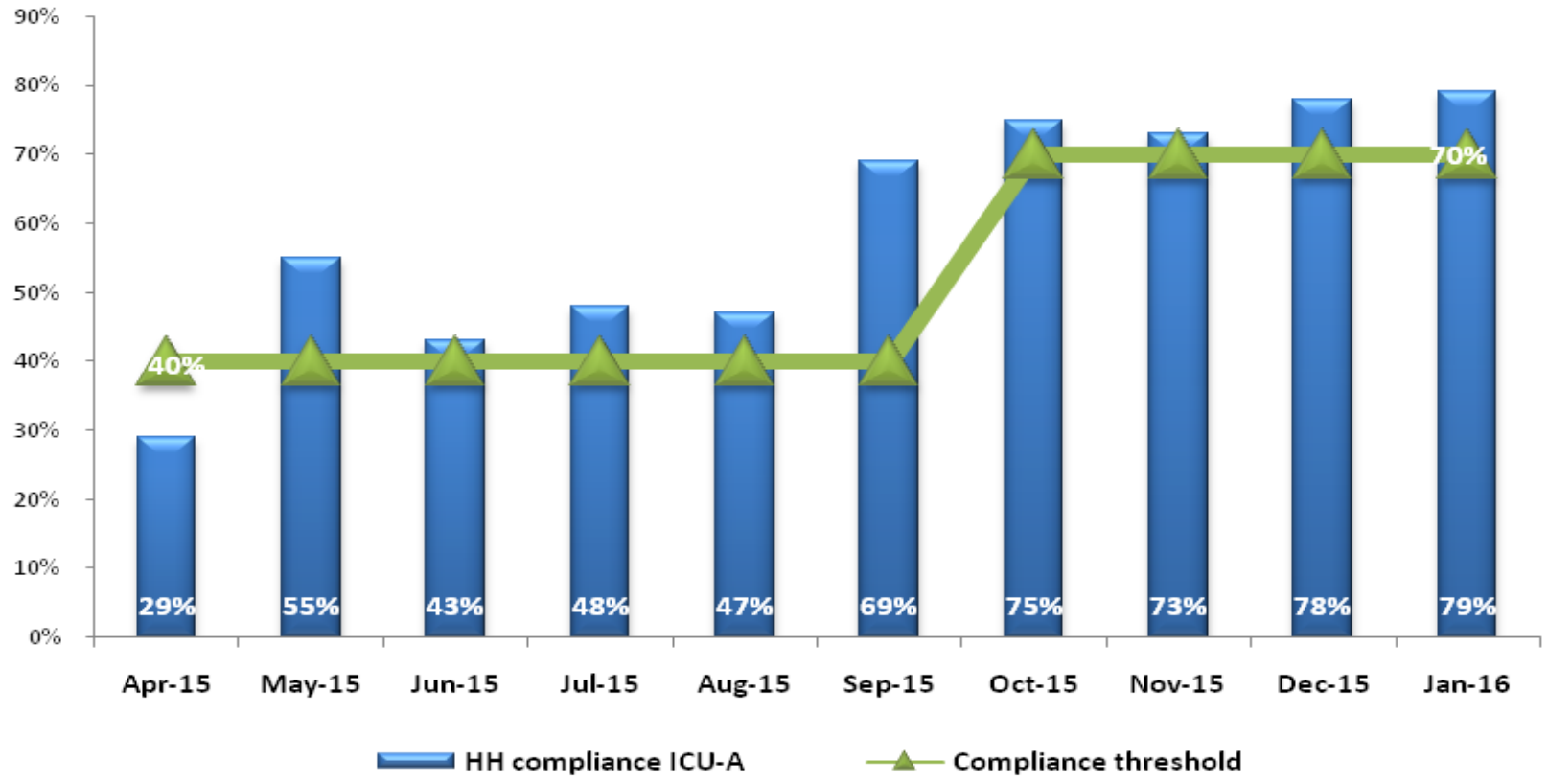
CHAMPIONS

A 10-Month Monitoring Period Results

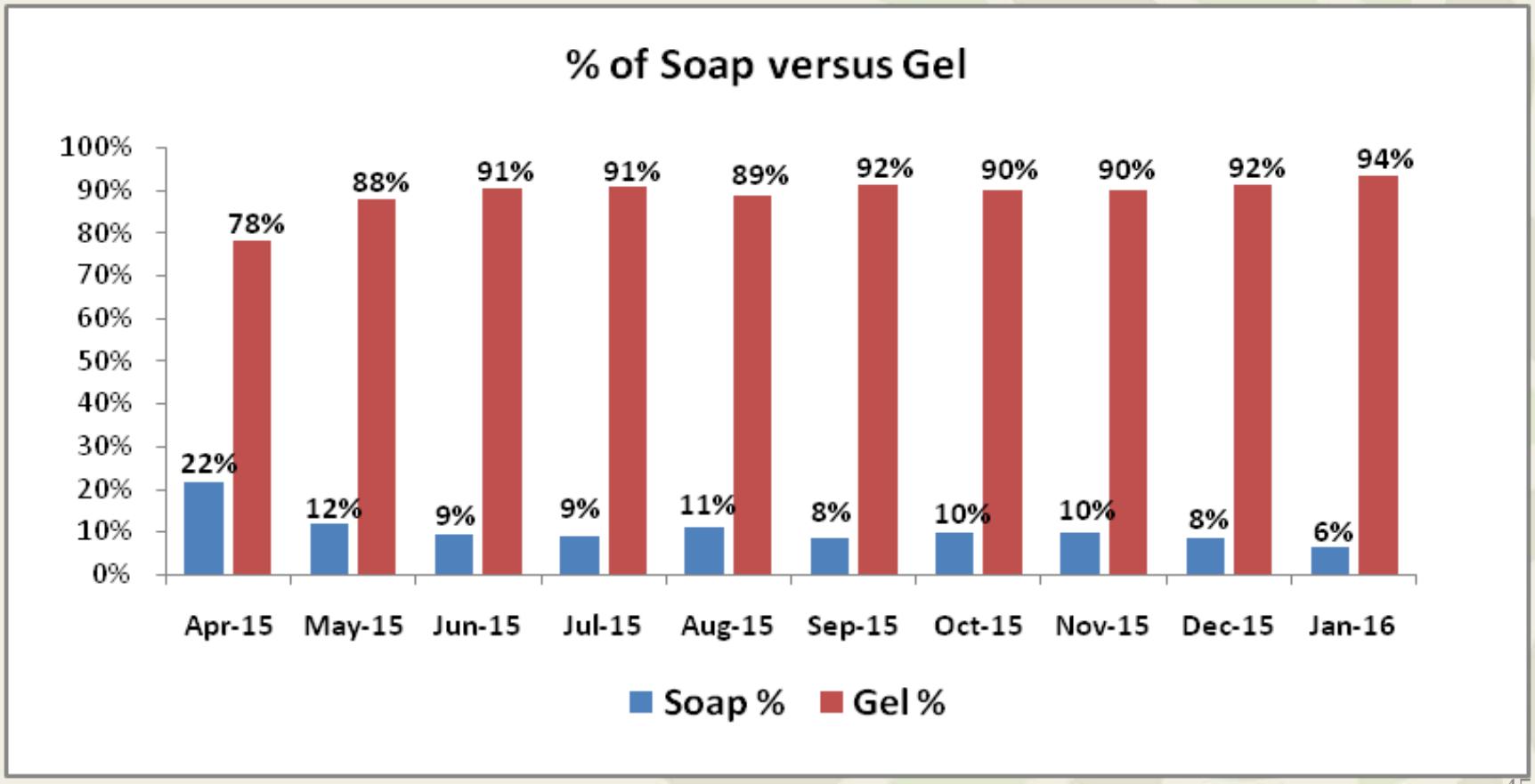
A 10-Month Monitoring Period Results

HH compliance increased by 172% ($p < 0.05$)



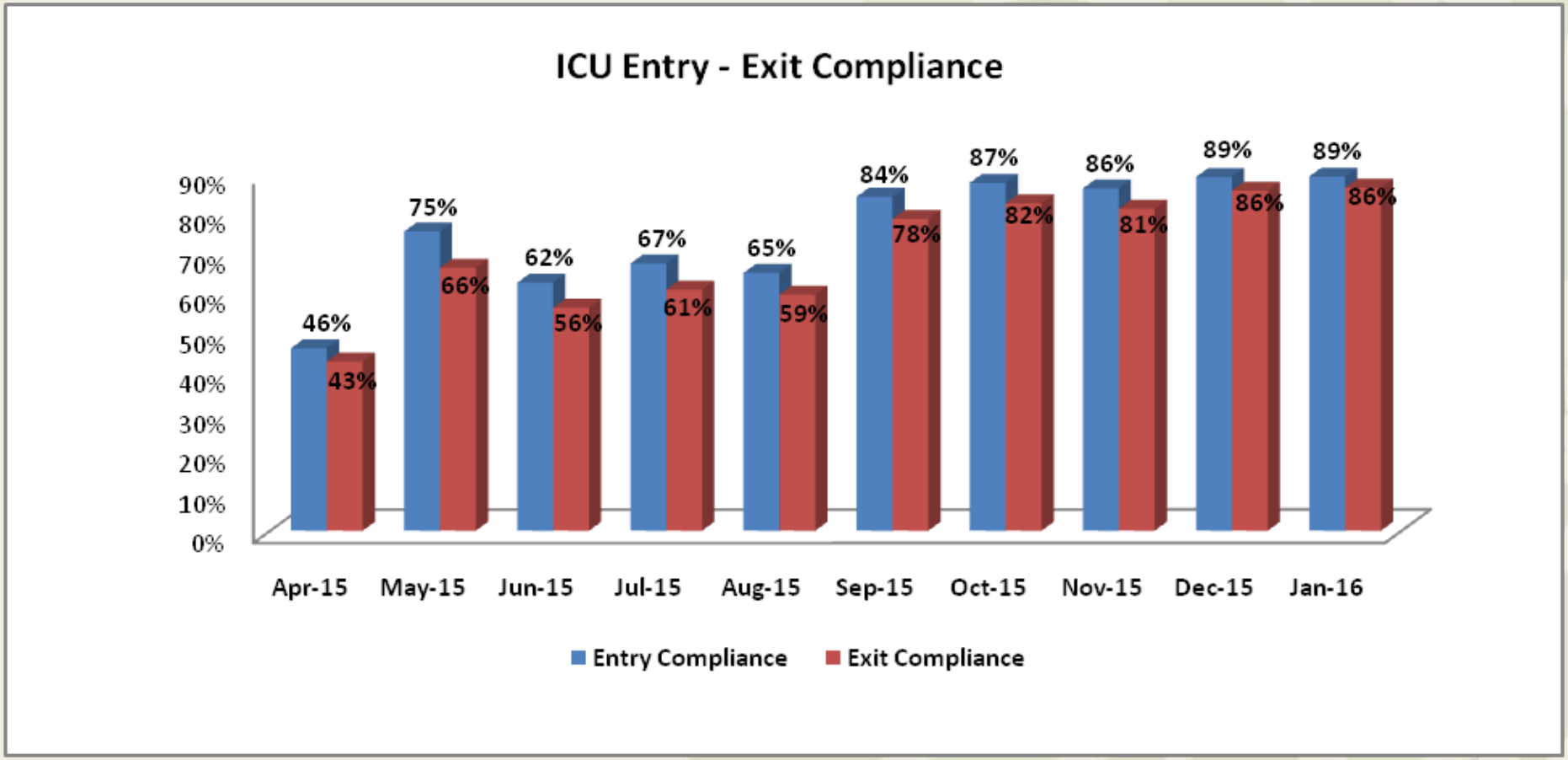
A 10-MONTH MONITORING PERIOD RESULTS

- The use of gel increased by 20%

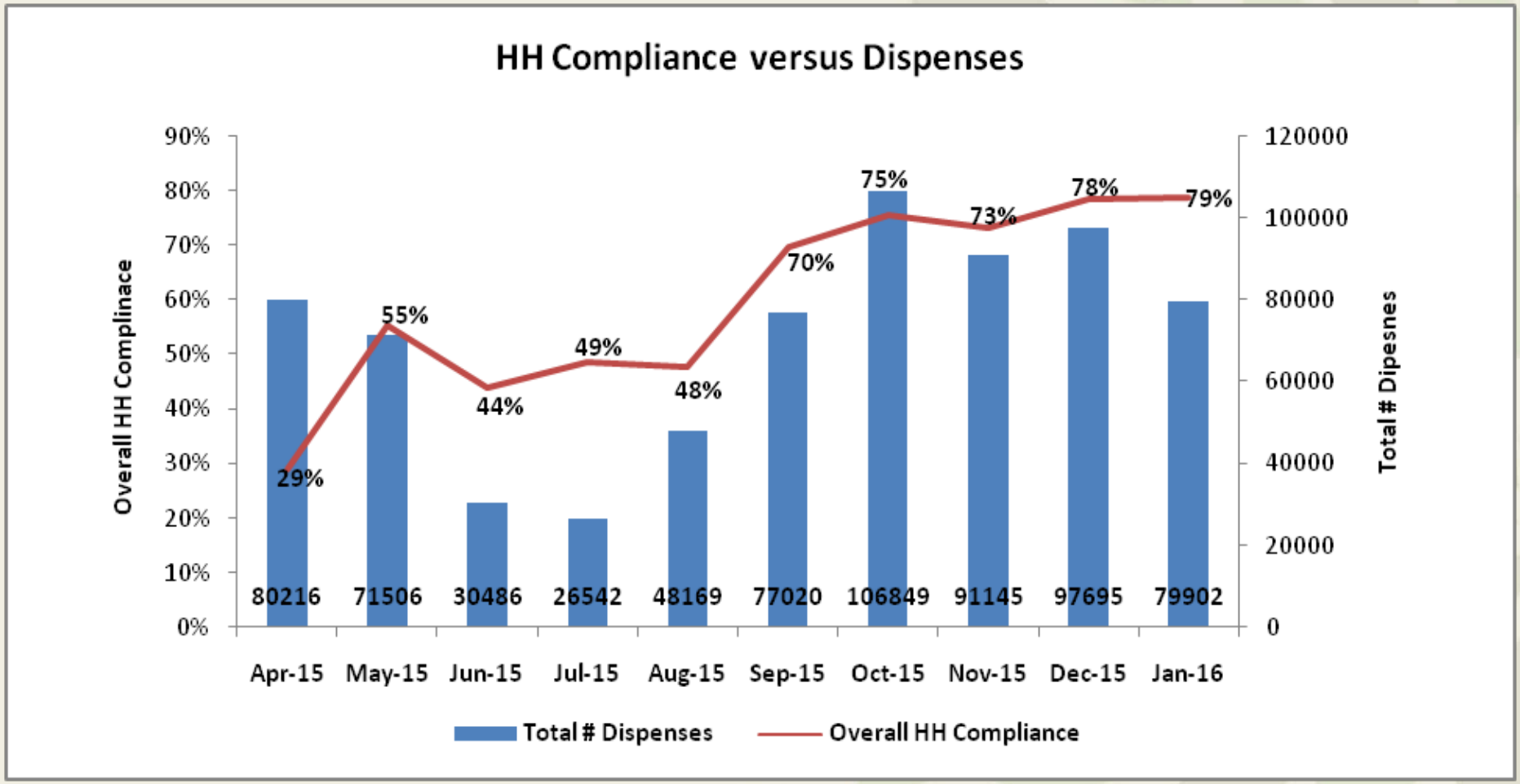


A 10-MONTH MONITORING PERIOD RESULTS

HH compliance upon entry /exit increased by 94% and 103% respectively



A 10-MONTH MONITORING PERIOD RESULTS



Challenges with i360

Challenges with i360

Technology (Hardware/Software) issues:

- Hospital server shutdown causing system collapse on a holiday period
- Power supply to GDUs (under the sink)
- System calibration
- Sensor batteries dislodging and cover contamination causing failure in detection
- Management of troubleshooting on weekends and holidays
- System delay & performance details not appearing requiring software update
- Personal device: Shock protection

ICU environment issues / physical setting:

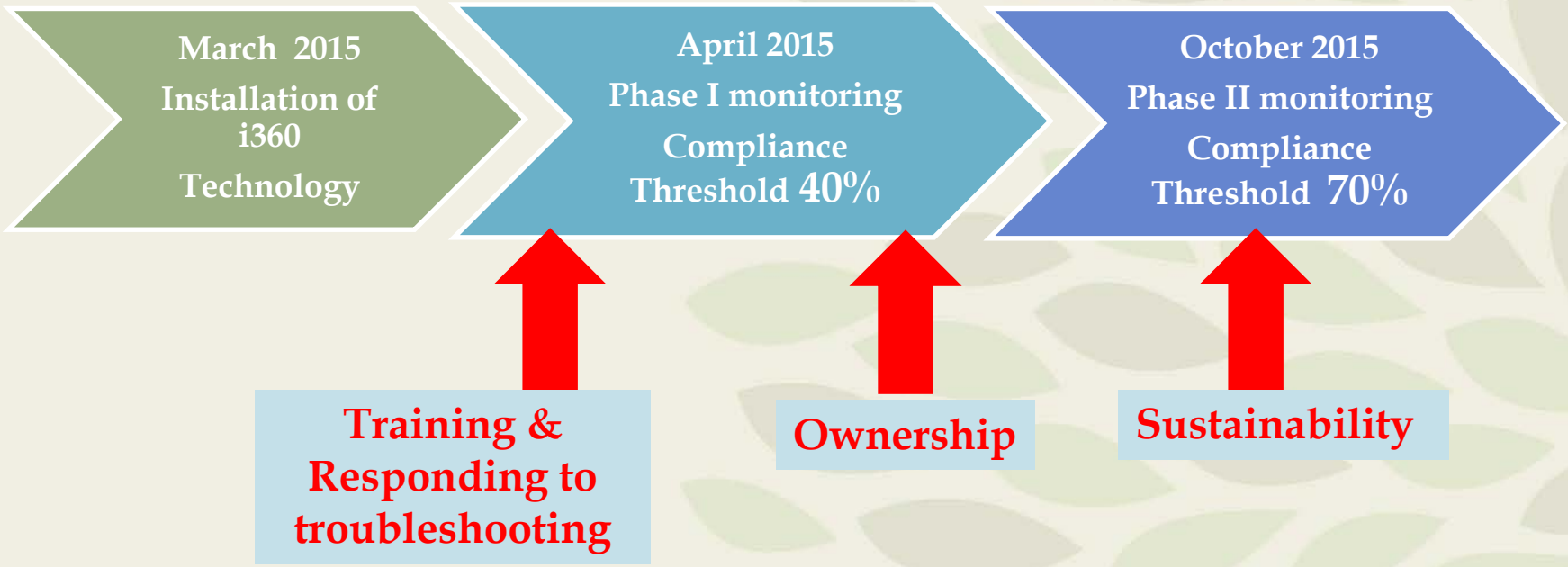
- Adapting to technology requirements in a busy ICU environment:
  - Selecting wash-in/wash-out timings
  - Calibrating zones (patient specific zone & dispensing zones)

Challenges with i360

Staff issues:

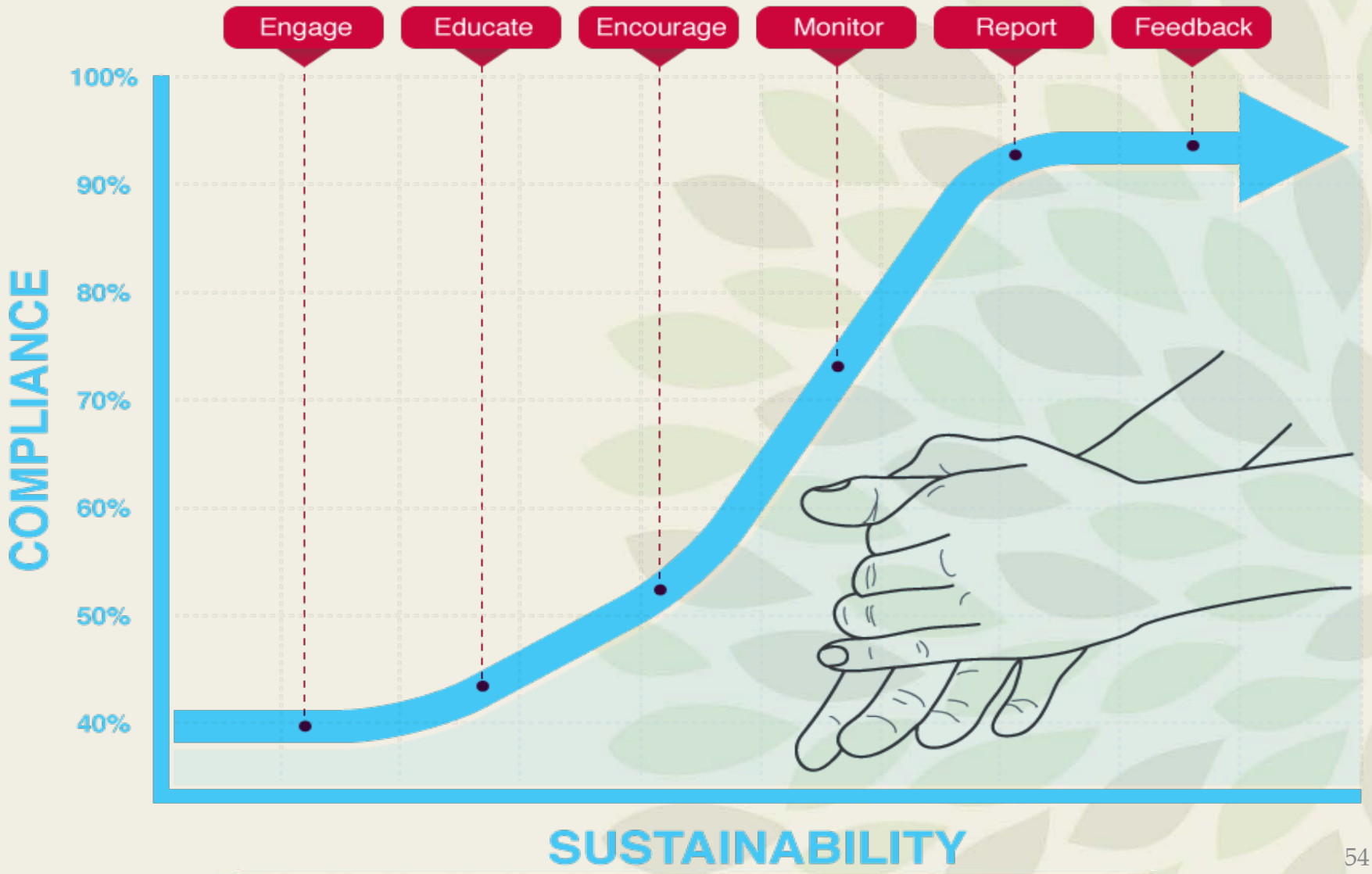
- Staff resistance to change
- Staff Turnover requiring new trainings
- Wearing of i360 personal device
- Staff understanding of the system functions (respecting timings and zones)
- Understanding of complex tasks performed by ICU staff and adapting i360 ex: extended procedures, patient care requirements, X-ray staff practices, movement in patient room,…
- Staff compliance with system and violating HH

Challenges with i360



Sustaining HH Compliance

Sustaining HH Compliance



Lessons Learned from ASH Experience with i360

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Almoosa Specialist Hospital

Lessons Learned from ASH Experience with i360

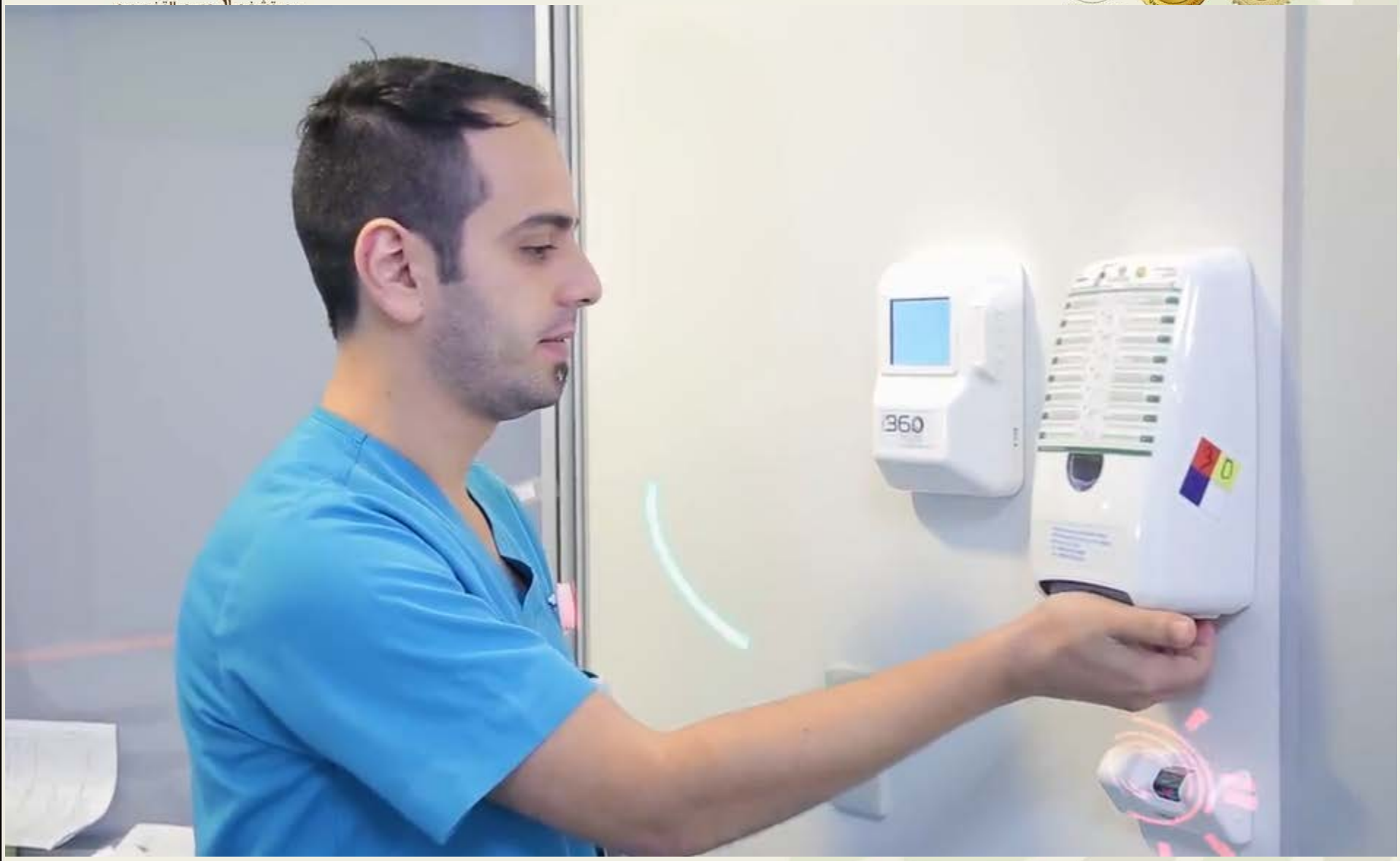
For successful intervention, a Multi-modal Approach is required:

- Partnership (i360, local company, IC team)
- Ownership (IC team, teams)
- Leadership Engagement
- Training
- Feedback and Analysis
- HH Culture
- Monitor staff behavior (HH driven vs. i360 driven)

Al-Moosa feedback:

- This technology improves HH compliance
- Longer study period is needed to reflect the decrease in HAIs and cost savings
- Bundles approach should be applied to decrease HAI
- All components are eventually contributing to a safer patient care environment in ICU

Pictures from ICU


360

- Hand Hygiene Champions meeting to discuss i360 Hygiene results and action plans
- 24/7 observation provides valuable metrics to healthcare providers to drive hand hygiene compliance and reduce HAIs

Thank you

مستشفى الموسى التخصصي
Almoosa Specialist Hospital
لنزرع الأمل ..

Why i360Hygiene?

- We make it easy to be compliant
- Proven sustainable compliance
- Customised to your protocols
- Long term partnership

"make it easy"

Whitfield Clinic
Ireland

"sustainable compliance"

Al Moosa Hospital
Saudi Arabia

i360Hygiene

Please contact us for presentation, webex, demo, pilot

- Live demo: **Stand 04**
- Website: **http://i360hygiene.com/**
- Contact e-mail: **info@i360hygiene.com**

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