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# Quality Improvement Overview and Application to a Physician Hand Hygiene Project

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# Objectives/Goals



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- **Today**
  - Gain a basic understanding of Quality Improvement
  - Apply Quality Improvement principles/tools to a Hand Hygiene Improvement Project
    - Complete a Project Charter
    - Identify project measures you will use to collect your data
- **Our Next Meeting**
  - Analyze the data you have collected
  - Identify improvement interventions



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# Quality Improvement Methodology

# Improvement Models



## DMAIC

Phase	Goal
<b>Define</b>	<ul style="list-style-type: none"><li>• Project purpose and scope</li><li>• Measures for data collection</li></ul>
<b>Measure</b>	<ul style="list-style-type: none"><li>• Gather data</li></ul>
<b>Analyze</b>	<ul style="list-style-type: none"><li>• Identify root causes</li></ul>
<b>Improve</b>	<ul style="list-style-type: none"><li>• Identify improvement strategies to mitigate root causes</li></ul>
<b>Control</b>	<ul style="list-style-type: none"><li>• Monitor new system/process</li></ul>

## PDSA



# Our Project Approach



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## Today – January 2018

### Define & Measure

- Provide background information to “Define” the problem
- Complete our Project Charter
- Clearly “Define” Outcome and Process Measures
  - What
  - How
  - Who
- Collect reliable data to guide your future improvement strategies

## February 2018

### Analyze & Improve

- Identify gaps between actual and goal performance
- Determine causes of those gaps
- Devise potential solutions based on data
  - Identify solutions that are easiest to implement
  - Test Hypothetical solutions
  - Implement actual improvements



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# Define Phase

# LUMC Project Charter



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- Project Purpose
- Measures
- Scope
- Schedule
- Team, Financial, Executive Sponsor Approval

# Define Phase: Project Charter



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## ■ Purpose

- What is the problem?
- How big is the problem?
- What is the impact of the problem?

## ■ Aim Statement

- Includes goal/targets for project
- Specific to patient population
- Time Specific
- Measurable

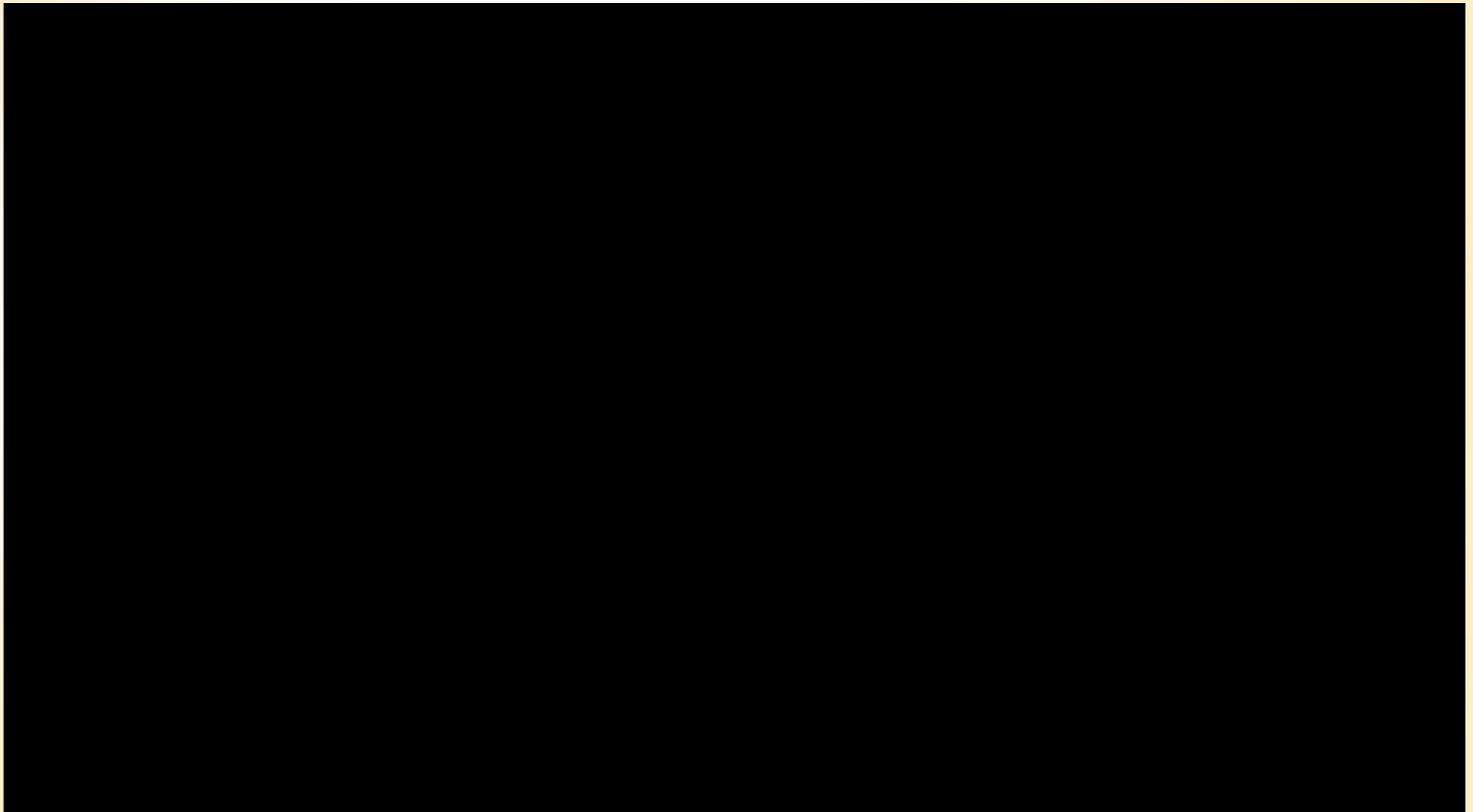


**S**pecific  
**M**easurable  
**A**greed Upon  
**R**ealistic  
**T**ime-based

# Introduction to Hand Hygiene



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# History of Hand Hygiene



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- Ignaz Semmelweis is considered the father of hand hygiene
- Semmelweis was the first to discover the effects of proper hand hygiene on mortality rates between two maternity wards

# Consequences of Poor Hand Hygiene



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- Approximately 70% of healthcare workers and 50% of surgical teams do not routinely practice hand hygiene
- A single gram of human feces (the weight of a paper clip) can contain one trillion germs
- Failure to wash hands can result in hospital acquired conditions, longer lengths of stay, and increased cost

# Consequences of Poor Hand Hygiene



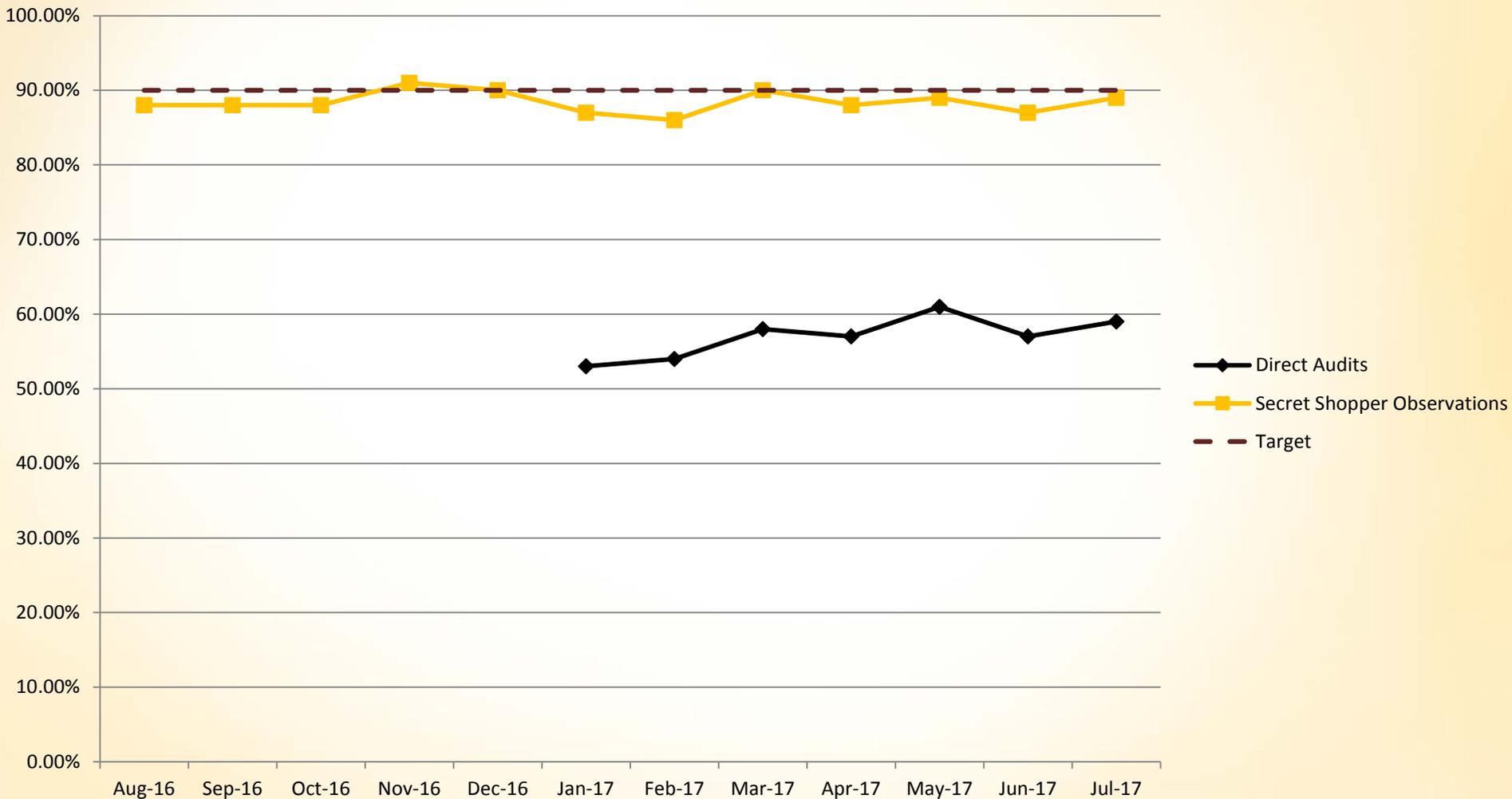
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- The CDC estimates that 1.7 million patients in the US will contract an infection while receiving care. 722,000 infections will occur in a hospital setting.
- Healthcare associated infections (HAIs) are associated with 99,000 deaths per year
- HAIs represent an estimated \$30 billion in added healthcare costs per year

# Current LUMC Hand Hygiene Performance



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# Current LUMC Infection Rates



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## Loyola University Medical Center HAI Data (January 2016-December 2016)

Hospital Acquired Infection	Number of Infections
Catheter Associated Urinary Tract Infections (CAUTIs)	32
Central Line Associated Bloodstream Infections (CLABSIs)	28
Clostridium Difficile (C.diff)	184
Methicillin Resistant Staph Aureus (MRSA) Bacteremia Infections	14
Class I Procedure Surgical Site Infections (SSIs)	71
Class II Procedure Surgical Site Infections (SSIs)	87

# Current LUMC Infection Rates



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- The CDC estimates that 70% of HAI's are avoidable

## Loyola University Medical Center HAI Data (January 2016-December 2016)

Hospital Acquired Infection	Number of Infections	70% Reduction
Catheter Associated Urinary Tract Infections (CAUTIs)	32	10
Central Line Associated Bloodstream Infections (CLABSIs)	28	9
Clostridium Difficile (C.diff)	184	55
Methicillin Resistant Staph Aureus (MRSA) Bacteremia Infections	14	4
Class I Procedure Surgical Site Infections (SSIs)	71	21
Class II Procedure Surgical Site Infections (SSIs)	87	26

# World Health Organization (WHO) Guidelines



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- **Patient Safety**
- ***First Global Patient Safety Challenge:  
Clean Care is Safer Care***
- **Hand Hygiene: Why, How & When**

World Health Organization (WHO) 2009. *Clean care is safer care. Tools and resources*. Retrieved 5/12/17 from <http://www.who.int/gpsc/5may/tools/en/>

# WHO HH Guidelines



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## Why?

- “Thousands of people die every day around the world from infections acquired while receiving health care”
- “Hands are the main pathways of germ transmission during health care”
- “Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent health care-associated infections”

World health Organization (WHO) 2009. *Clean care is safer care. Tools and resources*. Retrieved 5/12/17 from <http://www.who.int/gpsc/5may/tools/en/>

# WHO HH Guidelines



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## How?

- “Clean your hands by **rubbing them with an alcohol-based formulation**, as the preferred mean for routine hygienic hand antisepsis if hands are not visibly soiled. It is faster, more effective, and better tolerated by your hands than washing with soap and water”
- “**Wash your hands with soap and water** when hands are visibly dirty or visibly soiled with blood or other body fluids or after using the toilet”
- “If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of *Clostridium difficile*, hand washing with soap and water is the preferred means”

World health Organization (WHO) 2009. *Clean care is safer care. Tools and resources*. Retrieved 5/12/17 from <http://www.who.int/gpsc/5may/tools/en/>

# Project Charter Group Activity



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- Fill in the project **Purpose** and **Aim** statement on your project charter
  - Purpose
    - What is the problem?
    - How big is the problem?
    - What is the impact of the problem?
  - Aim Statement
    - Includes goal/targets for project
    - Specific to patient population
    - Time Specific
    - Measurable

# Define Phase: Project Charter Measures



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- Project Charter Measures
  - Outcome Measures
  - Process Measures

# Define Phase: Project Charter



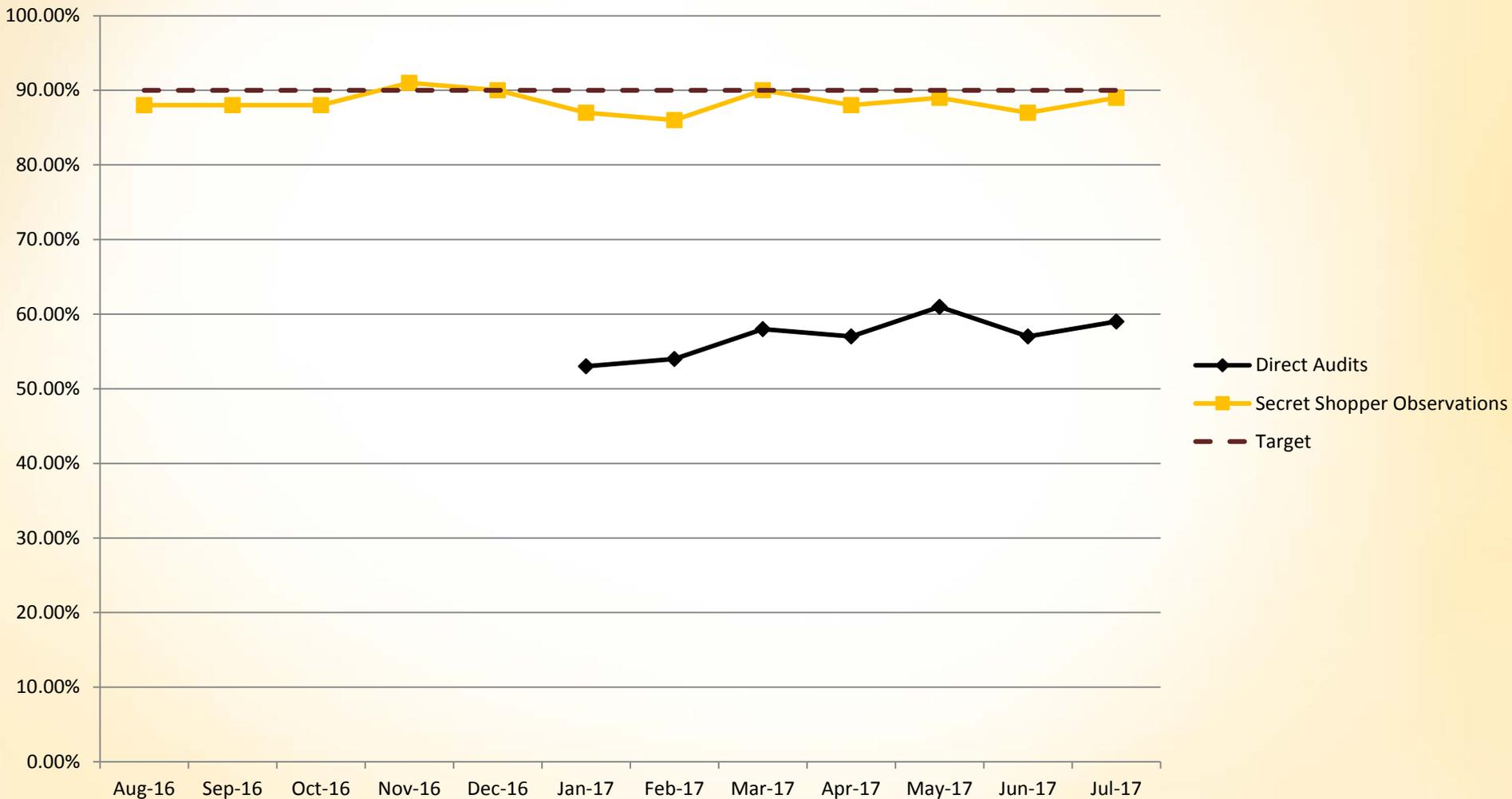
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- Project Charter Measures
  - Outcome Measures
    - High Level Measures that need improvement
      - Readmission Rates
      - Mortality
      - Infections

# Current LUMC Hand Hygiene Performance



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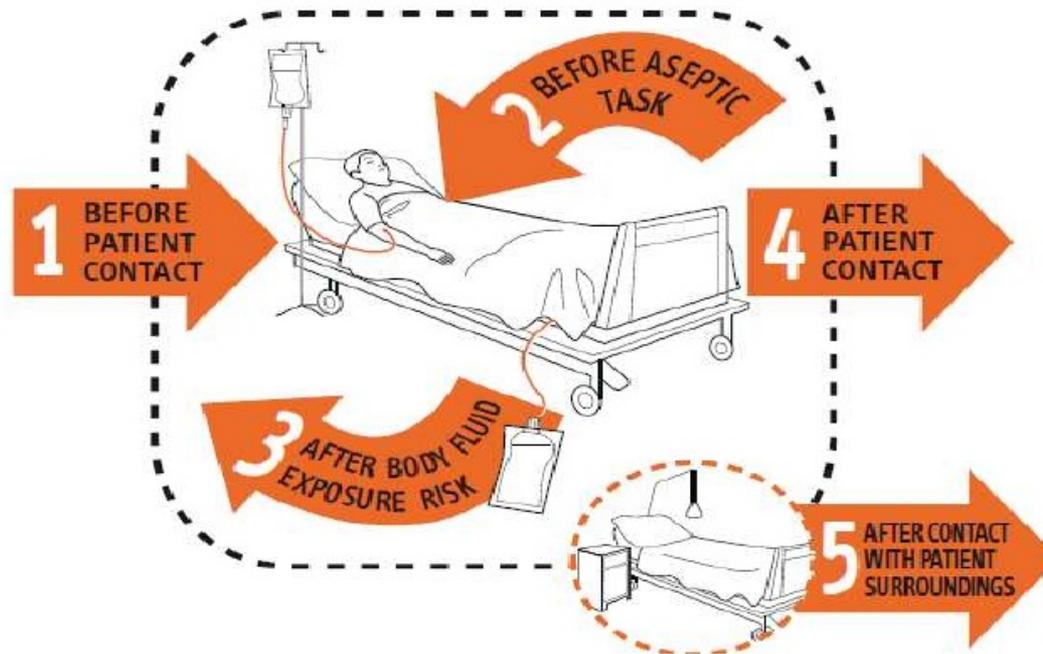
# WHO HH Guidelines



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## When?

### Your 5 moments for HAND HYGIENE



'Based on the 'My 5 moments for Hand Hygiene' URL: <http://www.who.int/gpsc/5may/background/5moments/en/index.html>  
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# WHO 5 Moments



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<b>1 BEFORE PATIENT CONTACT</b>	<b>WHEN?</b> Clean your hands before touching a patient when approaching him or her <b>WHY?</b> To protect the patient against harmful germs carried on your hands
<b>2 BEFORE AN ASEPTIC TASK</b>	<b>WHEN?</b> Clean your hands immediately before any aseptic task <b>WHY?</b> To protect the patient against harmful germs, including the patient's own germs, entering his or her body
<b>3 AFTER BODY FLUID EXPOSURE RISK</b>	<b>WHEN?</b> Clean your hands immediately after an exposure risk to body fluids (and after glove removal) <b>WHY?</b> To protect yourself and the health-care environment from harmful patient germs
<b>4 AFTER PATIENT CONTACT</b>	<b>WHEN?</b> Clean your hands after touching a patient and his or her immediate surroundings when leaving <b>WHY?</b> To protect yourself and the health-care environment from harmful patient germs
<b>5 AFTER CONTACT WITH PATIENT SURROUNDINGS</b>	<b>WHEN?</b> Clean your hands after touching any object or furniture in the patient's immediate surroundings, when leaving - even without touching the patient <b>WHY?</b> To protect yourself and the health-care environment from harmful patient germs

'Based on the 'My 5 moments for Hand Hygiene' URL: <http://www.who.int/gpsc/5may/background/5moments/en/index.html>  
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# Outcome Measure



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- Percent of time physicians are compliant with WHO hand hygiene guidelines while inside a patient room
- Numerator: Number of times where a WHO hand hygiene moment was performed
- Denominator: Total opportunities to perform a WHO hand hygiene moment

# Define Phase: Project Charter



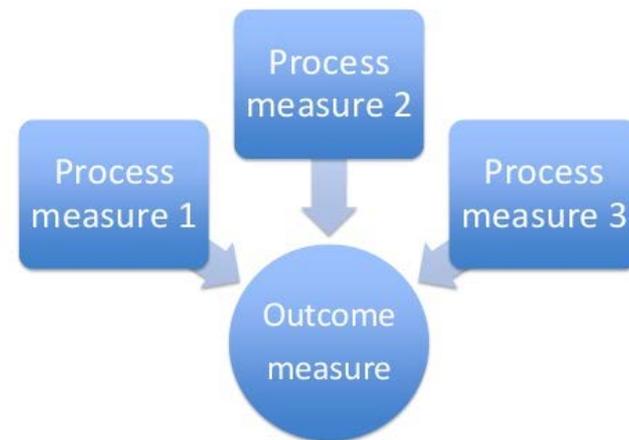
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## ■ Project Charter Measures

### ■ Process Measures

- Specific steps in a process that lead to a positive or negative outcome
- Assess the activities carried out by healthcare professionals
- Must create operational definitions

### Measurement coherence



# Define Phase: Project Charter



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## ■ Process Measures:

- Number of objects touched before WHO hand hygiene moment
- Each individual WHO hand hygiene moment
  - **WHO Hand Hygiene Moment #1**
    - Numerator: Number of times hands were washed before patient contact
    - Denominator: Total number of opportunities to wash hands before patient contact

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# Define Phase: Project Charter



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- **Scope of Project**
  - What are the boundaries of the project?
  - What is the start and stop point?
  - Is the scope manageable?
- **Examples of scoping to consider:**
  - Age
  - Inpatient/Outpatient
  - ICU vs Non-ICU
  - Admission through ED vs. Direct Admit

# Summary: Define



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- Reviewed the critical role hand hygiene plays in patient safety in preventing HAI
- Reviewed LUMC's current data on HAI and hand hygiene
- Completed our Project Charter:
  - Purpose, Aim and Scope
- Identified Outcome and Process Measures (key metrics)

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# Measure Phase

# Measure Phase: Data Collection Plan



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- We have identified our Outcome and Process Measures
- A good data collection plan helps ensure data will be useful
- Establish baselines
- Develop operational definitions

# Operational Definitions



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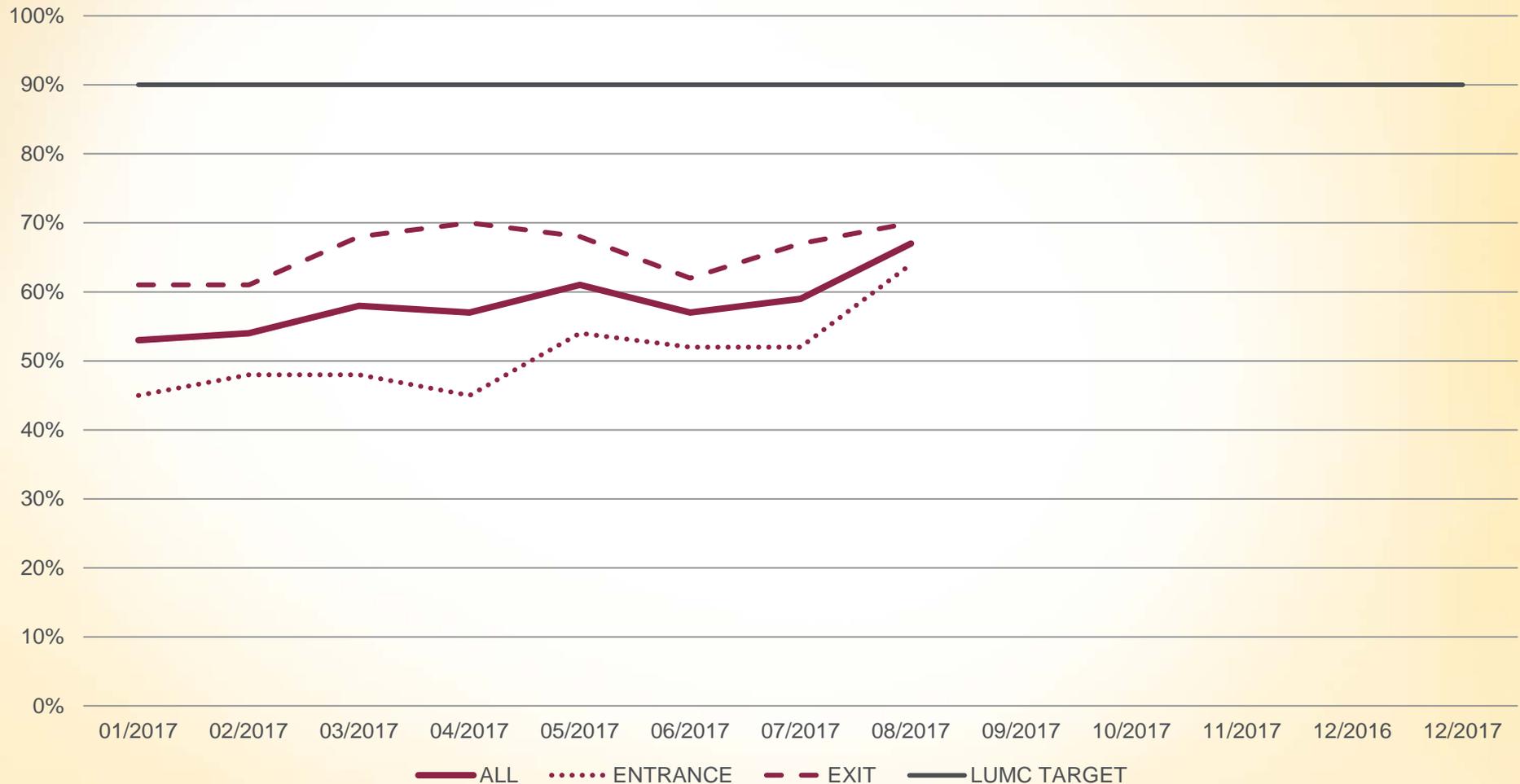
- A clear, concise detailed definition of a measure
- When collecting data, it is essential that everyone participating has the same understanding and collects data in the same way.

# Operation Definition Example



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## Hospital Wide Overall Observation Hand Hygiene Compliance



# Operational Definition Example



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- **LUMC Hand Hygiene Policy (IC-009)**
  - HH must be performed upon entry and exit of a patient room, even if patient care is not anticipated and/or if gloves are used
  - HH with soap and water is required when contaminated with proteinaceous or if the patient is suspected of having or has *Clostridium difficile*.
- **Antiseptic hand gel or soap and water required**
  - Upon entry and exit of patient room
  - Before ALL patient care or patient contact
  - Before donning sterile gloves
  - Before donning non-sterile gloves
  - After contact with inanimate objects in the immediate vicinity of the patient (i.e., medical equipment)
  - After removing gloves
  - When moving from one body site to another while providing care
  - When touching one's own face, hair or other body surfaces

INFECTION CONTROL-Hand Hygiene Policy IC-009 available on [loyola.wired](http://loyola.wired)

# Operational Definitions



Process Measure	Operational Definition
Percent of time hands are washed before patient contact (WHO Moment #1)	<ul style="list-style-type: none"><li>• Compliance will be counted if the physician washes their hands with either gel or soap and water before coming in contact with any part of the patient.</li><li>• Hand hygiene performed on entrance to the room can be counted as compliant if the physician does not touch any objects before coming in contact with the patient.</li><li>• If the patient is on isolation precautions, the provider should wash their hands before putting on gloves. The gloves should not make contact with other surfaces before coming in contact with the patient.</li></ul>
Percent of time hands are washed before an aseptic task (WHO Moment #2)	<ul style="list-style-type: none"><li>• Compliance will be counted in the physician washed their hands with either gel or soap and water before performing an aseptic task.</li><li>• Aseptic tasks are any tasks where sterile technique is necessary including but not limited to the insertion or removal of central lines, insertion or removal of catheters, and giving an injection.</li><li>• If gloves are used during the aseptic task, the provider should wash their hands before putting on gloves.</li></ul>

# Operational Definitions



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Process Measure	Operational Definition
Percent of time hands are washed after body fluid exposure risk (WHO Moment #3)	<ul style="list-style-type: none"><li>• Compliance will be counted if the provider washes their hands with either gel or soap and water before coming in contact with any body fluid from the patient.</li><li>• If the provider is wearing gloves and is exposed to body fluid, in order to be compliant, the provider must remove the gloves and wash their hands with gel or soap and water before putting on a new pair of gloves.</li></ul>
Percent of time hands are washed after patient contact (WHO Moment #4)	<ul style="list-style-type: none"><li>• Compliance will be counted if the provider washed their hands with either gel or soap and water after coming in contact with any part of the patient.</li><li>• Hand hygiene upon exiting the room may be counted as compliant if the provider does not touch any objects or the patient before exiting the room.</li><li>• If the patient is on Contact Plus precautions, the provider must use soap and water after patient contact in order to remain compliant.</li><li>• If the provider is wearing gloves, hand hygiene must be performed once the gloves are removed.</li></ul>

# Operational Definition



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Process Measures	Operational Definition
Percent of time hands are washed after contact with patient surroundings (WHO Moment # 5)	<ul style="list-style-type: none"><li>• Compliance will be counted if the provider washes their hands with either gel or soap and water after contact with any object inside the patient's room.</li><li>• Hand hygiene upon exiting the room may be counted as compliant if the provider does not touch any objects or the patient before exiting the room.</li><li>• If the patient is on Contact Plus precautions, the provider must use soap and water after patient contact in order to remain compliant.</li></ul>

# Audits



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- Each group will be responsible for collecting data on one assigned WHO Moment.
- Audit tools specific to your assigned data will be emailed to your lead to distribute to the group.
- Each Medical Student will be responsible for completing 50 audits between now and January 1<sup>st</sup> 2018.
- Only focus on one physician for each audit.



# Collecting the Best Sample



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Our Data will Guide our Improvement Strategies

- Gather data throughout your workday/workweek
- Pre identify your collect data strategy and follow it. (i.e., every third patient round on Mon, Wed, Fri).
- Document your findings as soon as possible. Do not rely on your memory at the end of the day
- Be objective
- Do not guess

# Let's Practice



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- Collect data using your audit tool independently for the following scenarios
- As a group review a correctly completed audit tool for the scenario
- Discuss/compare any discrepancies
- Identify any needed clarifications in our operational definitions

# Scenario # 1



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## You Observe:

The Resident gels his hand as he enters the room of a patient on the medical surgical unit

While he is talking to the patient, he places his hand on the side rail of the bed. After he has answered the patient's questions, he proceeds with auscultating her heart and lung sounds. He checks the patient's lower extremities for edema and then covers her with the sheet

He explains the tests he plans to order

As he exits the room he gels his hands

# Scenario #2:



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## You Observe:

The Attending physician gels his hands as he enters the room

As he approaches the patient, he notices fresh blood on the sheet. He dons gloves to examine the patient's abdominal surgical dressing which is saturated with blood. He removes the dressing and discards in the waste basket. He then removes his gloves and discards in the waste basket

He returns to the bedside to finish his physical exam and answers the patient's questions

He gels his hands as he exits the room

# Scenario #3:



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## You Observe:

The physician gel her hands upon entering the room of a patient. She explains to the patient that she will be removing her central line

She positions the patient and then opens the needed supplies onto the bedside table. She then applies gloves to remove the dressing and stabilizing device. She discards the dressing and stabilizing device and then removes her gloves and discards

She carefully applies sterile gloves and proceeds with removing the line. She applies antiseptic ointment and an occlusive dressing

She cleans up her work area, then removes her gloves and washes her hands with soap and water



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# Recap and Quality Improvement Project Expectations

# Recap



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- Gained and applied basic knowledge of QI Methodology and DMAIC
- Developed a project charter and identified project measures
- Developed a data audit tool and operational definitions

# QI Project Expectations



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- Each Med Student will complete 50 Audits over the next 11 weeks
- 4.5 Audits per week
- Submit your audits to your group lead via email by the 1<sup>st</sup> of the month
- Group lead will email the audit data to Cindy Koehn ([cynthia.koehn@luhs](mailto:cynthia.koehn@luhs)) each month no later than the 15<sup>th</sup>
- Final Deadline for data submission is January 15th

# Next Steps: February



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- For the next session:
  - Learn the improve and control aspects of DMAIC
  - Summarize and analyze collected data
  - Complete a root causes analysis
  - Make recommendations for interventions to the Hand Hygiene Steering Committee



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# Questions?



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