

## Keys to a Successful Lean Quality Project

- Employee engagement
- Small tests of change
- Good data
- GEMBA – improvement team needs to see the problem
- Make the problem visible to staff/physicians
- Communication – daily huddles
- Clear goals and expectations – report cards / dashboards
- Emphasis on “Kaizen” with continuous improvement
- Follow-up with persistence and vigilance



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## Lean & Clean – Preventing HAI

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LEADING THE QUEST

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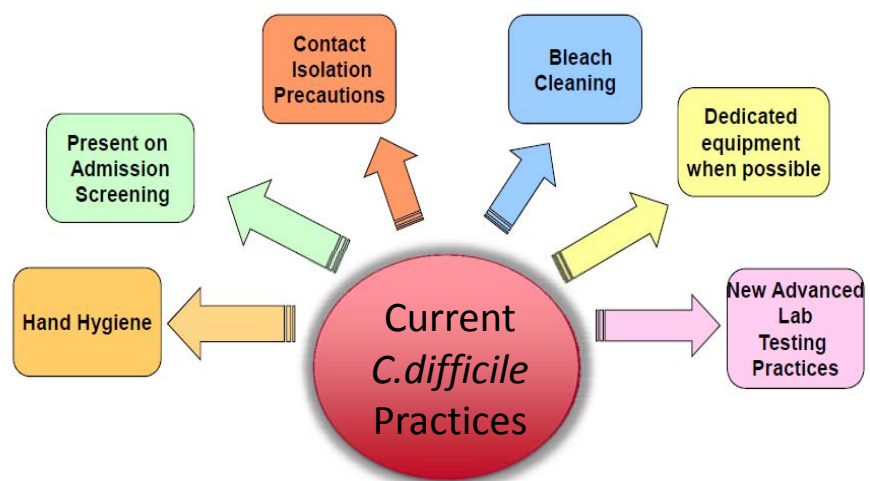
## Agenda

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- ❖ Baseline
- ❖ Gap Analysis: Wastes identified
- ❖ Quick Wins
- ❖ Jewels
- ❖ Tough Issues
- ❖ Current *C.difficile* Infection Rates

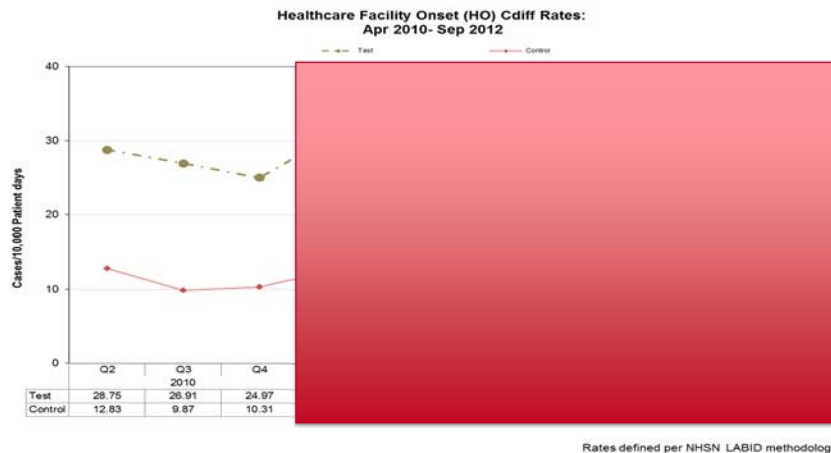
## Baseline: *C. difficile* Transmission Control Protocol

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## C. difficile Infection Rates

Baseline data demonstrated rates of 25 – 30 cases per 10,000 Patient Days

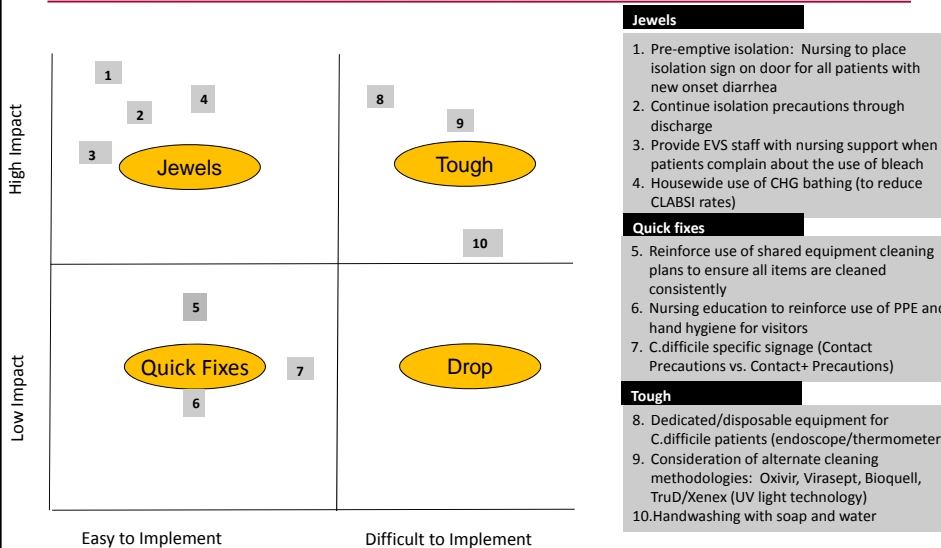


% reviewed cases	Successes identified	% reviewed cases	Gaps identified
<b>Early detection and isolation of C.difficile patients</b>			
<b>100 %</b>	Diarrhea present on admission documented on POA form and patient isolated on admission	<b>100%</b>	Diarrhea after admission had no order for isolation or notes in the chart stating that patient was isolated
<b>100%</b>	Contact precautions signs in place on patient room doors for C. difficile patients	<b>17%</b>	Contact precautions signs not remaining on patient room doors at discharge to indicate terminal bleach cleaning for EVS staff
<b>Effectiveness of daily, discharge and shared equipment cleaning</b>			
<b>29%</b>	2 out of 7observed/interviewed EVS associates use a combination of Virex and Clorox for isolation rooms (compliance with Clorox wipes is low because it's a new requirement starting 10/01/2010)	<b>71%</b>	EVS staff using non-bleach solution Virex for daily (routine) clean in isolation rooms
<b>100%</b>	3 out of 3 observed/interviewed EVS associates use Clorox for discharge clean in isolation rooms	<b>100%</b>	Staff not enforcing use of PPE with visitors of C. difficile patients. 100% of visitors are not wearing gowns/gloves
<b>100%</b>	Use of Sani wipes for shared equipment	<b>0%</b>	Efficacy of Sani wipes for C.difficile associated shared equipment
		<b>TBD</b>	Central issues process for cleaning shared equipment not well understood
<b>Compliance with PPE, Hand Hygiene</b>			
<b>78%</b>	Healthcare workers donning PPE (gloves and gowns) when in contact with C. difficile patients (opportunity exists in educating on the right way of wearing gowns)	<b>22%</b>	Healthcare workers do not use either gloves or gowns upon entry into an isolation room
<b>89%</b>	Healthcare workers clean hands with alcohol sanitizer before entering an isolation room (Soap and water not in use)	<b>11%</b>	Healthcare workers do not clean their hands with alcohol sanitizer or soap/water immediately before entering an isolation room
<b>88%</b>	Healthcare workers clean hands with alcohol sanitizer immediately after exiting an isolation room (Soap and water not in use)	<b>12%</b>	Healthcare workers do not clean their hands with alcohol sanitizer or soap/water immediately after exiting an isolation room

### C.difficile project timeline: 2010 - 2011

Activity	Date	Goal	Results
Project Charter development	Aug -2010	Define project goal, scope, metric, schedule, participants	Project Charter developed and adopted by the team and HAI leadership
<b>Literature review:</b> -best practices in HAI control - current CDC guidelines - initial contacts with other hospitals	Sept-Oct' 2010	Determine best national practices to reduce transmission of nosocomial <i>C. difficile</i>	Best practices in hand hygiene, isolation precautions, cleaning and disinfection of rooms and equipment have been identified
<b>Gap analysis:</b> CSMC c .diff isolation policies vs. actual compliance. Direct observations and data/process analysis of: - POA vs. new onset c. diff - Preemptive isolation ; Documentation of isolation status - Lab results turnaround times - Hand hygiene, PPE - Daily/terminal clean; Shared equipment cleaning and storage - Central Issues process	Nov-Dec'2010	Obtain a thorough understanding of current practices to reduce <i>C. difficile</i> transmission	The team has gained an in-depth understanding of the gaps in the compliance with the current practices, test of change opportunities have been defined, approved and scheduled for implementation
<b>I. Test of Change:</b>	Jan -2011		
<b>II. Test of Change:</b>	Feb -2011		
<b>III. Test of Change:</b>	Mar -2011		

### Priority Ranking of Potential Interventions



- Jewels**
- 1. Pre-emptive isolation: Nursing to place isolation sign on door for all patients with new onset diarrhea
- 2. Continue isolation precautions through discharge
- 3. Provide EVS staff with nursing support when patients complain about the use of bleach
- 4. Housewide use of CHG bathing (to reduce CLABSI rates)
- Quick fixes**
- 5. Reinforce use of shared equipment cleaning plans to ensure all items are cleaned consistently
- 6. Nursing education to reinforce use of PPE and hand hygiene for visitors
- 7. C.difficile specific signage (Contact Precautions vs. Contact+ Precautions)
- Tough**
- 8. Dedicated/disposable equipment for *C. difficile* patients (endoscope/thermometer)
- 9. Consideration of alternate cleaning methodologies: Oxivir, Virasept, Bioquell, TruD/Xenex (UV light technology)
- 10. Handwashing with soap and water

## Quick Fixes

## Interventions: Shared Equipment Cleaning Plan

**The Evidence:**

As healthcare workers, we are constantly faced with contaminated environmental items. Do not pass the bacteria on to your patients or your family members.

**The Fact:**

YOU can make a difference!

**What can you do?**

- Wash your hands
- Clean the items on the list to the right
- Do your part to reduce hospital acquired infections

Responsible Department	Clean Daily with Sani-Wipe or Virex	Clean Before Use with Sani-Wipe
Cardiology		EKG, Echo
Dialysis		Portable Dialysis
EVS	Privacy Curtains (virex spray), Patient Room Door Knobs, Supply Cabinet Door Knobs, Med Room Door Knobs, RN Station Counters, RN Station Phones, Quad Phones, Quad Keyboards & Mice, Purell Dispensers, Nurse-Server Cabinets, Bedrails, Linen Cabinets, Recycle Bins, Visitor chairs in patient rooms, IV poles & pumps (discharge), Medication carts (outside)	
Nursing	NCT / CP: Charts, Addressograph, RN Station Keyboards & Mice, Crash Carts (weekly)	RNs: Pulse Oximeters, <b>Wheelchairs, Cardiac Chairs</b> , Walkers, Blood Glucose Meters, Portable Monitors during patient transport
Pharmacy	Medication Carts (inside, weekly)	
Procedure Center		Ultrasound
Radiology		Gurneys, Portable Xray, etc.
Respiratory		Percussor, Portable Bronch
Self Clean	PDA, Cell Phone, Pager, Pen, Pencil	Stethoscope

## C.difficile specific signage

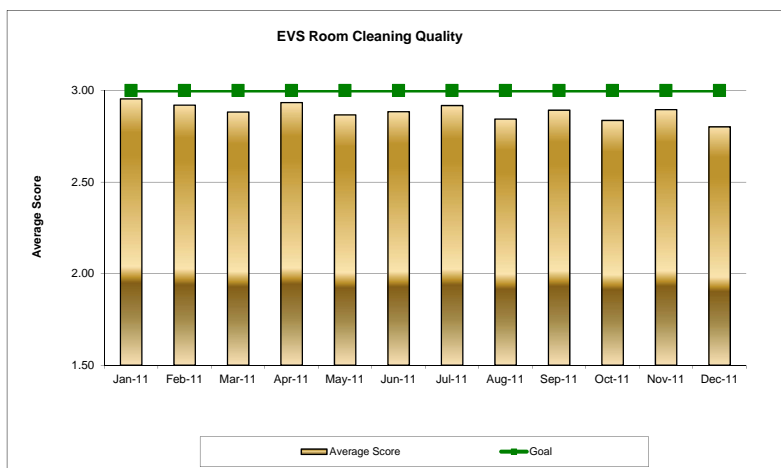
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❖Picture of our signage

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## Jewels

## EVS Room Cleaning – Evaluating effectiveness using Glogerm



## Interventions: SPORE Bundle

### Eliminate C difficile SPORES

Sanitize shared equipment with bleach wipes between use

Patient hygiene to remove spores:

Daily bathing

Patients should don clean gown & wash hands before leaving the room

Orders contact isolation and consider C diff testing for all patients with new diarrhea

Remain on contact isolation *until discharge* (for patients with confirmed C diff)

Everyone (including visitors) must follow hand hygiene and contact isolation policies

### Central Issues – Surveillance results

Swab #	Equipment	Result	Comment
1	Kangaroo pump	Coag negative staph, Bacillus species not anthracis	
2	SCD (compression stockings)	Coag negative staph, Bacillus species not anthracis	
3	IV pumps	Bacillus species not anthracis	
4	K-pad (Gaymar T-pump)	Coag negative staph	
5	PCA pump	Vancomycin resistant enterococcus, Bacillus species	Pieces of old scotch tape still on machine

**Observations**

- Central Issues saturates cloth in Virex solution and wipes equipment.
- Use of brushes and putty knife covered in Virex cloth for detailed cleaning
- Potential gap: Insufficient saturation for equipment to stay wet for 2-3 minutes

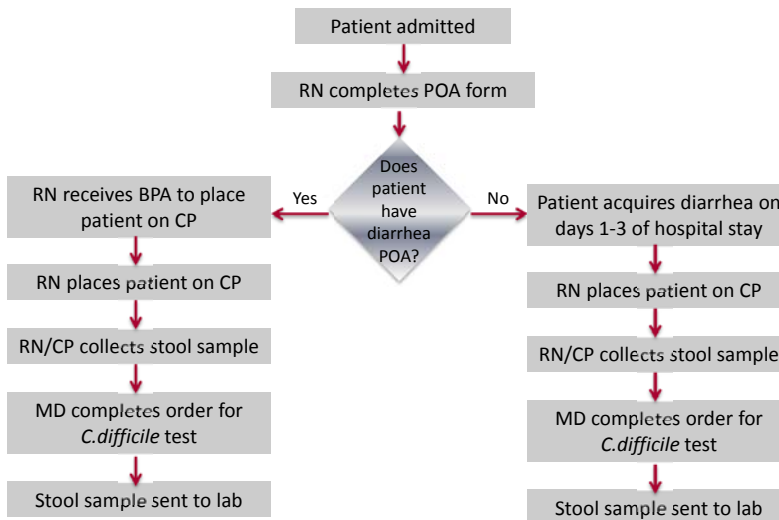
**Barriers faced by Central Issues:**

- Difficulty obtaining dirty equipment from nursing

**Recommendations:**

- Require Central Issues to use bleach wipes to clean shared equipment
- Bag contaminated equipment which travels from room to room
- Evaluate shared equipment demand to address turnaround times

### Process Map for *C.difficile* specimen collection





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# The Tough Issues


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## Test of Change - Hand Hygiene with Soap and Water

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**Goal:** To assess the feasibility of maintaining the same or better level of hand hygiene if washing with soap and water were to be required upon exit


**Method:** Display signs on the patient door and alcohol sanitizer dispenser prompting HCWs/visitors to wash hands with soap and water upon exit only

**Location:** 7 Saperstein (MICU/RICU)

**Results:**

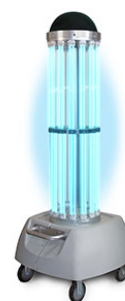
	4 weeks average					
	MD (n=10)	RN (n=18)	EVS (n=4)	RT (n=5)	CP (n=4)	Visitor (n=10)
Entry (Alcohol)	25%	74%	33%	50%	100%	7%
Entry (Soap and Water)	0%	0%	0%	0%	0%	0%
Exit (Alcohol)	25%	37%	33%	0%	0%	23%
Exit (Soap and Water)	42%	63%	17%	88%	100%	34%
Gowns and Gloves	92%	100%	83%	100%	100%	77%

**Recommendation:** Microbiology add verbiage to positive *C.difficile* test results to encourage use of soap and water when caring for these patients.


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## TruD® - Rapid Room Sterilizer

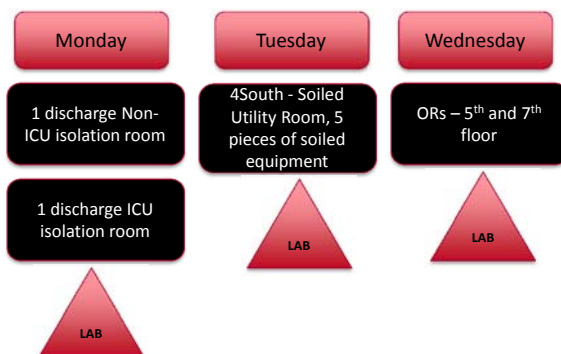
- Germicidal dose of UV energy to all surfaces of a room, including hard-to-clean, shadowed and often overlooked high-touch surfaces such as electronic key boards, remotes, and computers.
- Most contaminated areas can be serviced in 20 to 30 minutes with rooms ready to occupy and use immediately.
- Eliminates the risk of an improperly cleaned/contaminated room due to human error.



## TruD® Testing and Pilot Design

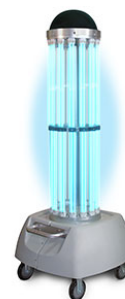
### **PARAMETERS:**

1. Conduct testing on specific rooms throughout the week.
2. Microbiology - 50 cultures to process per week.
3. Determine use of swabs, sponges or Rodac plates.
4. The test may be repeated the following week



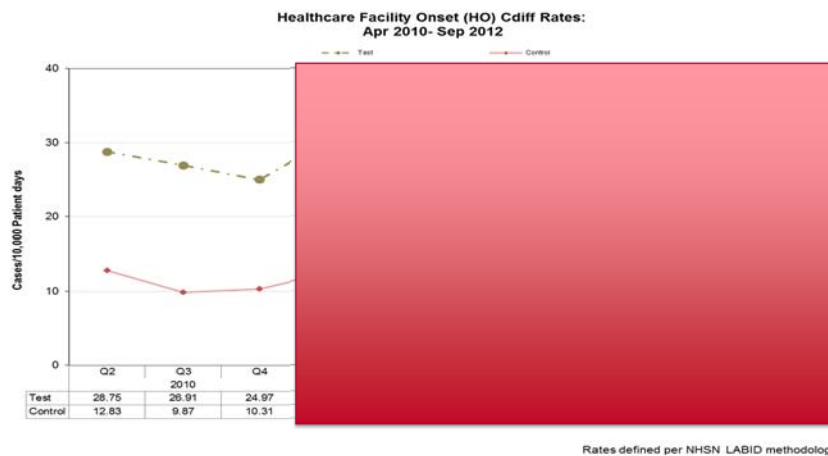
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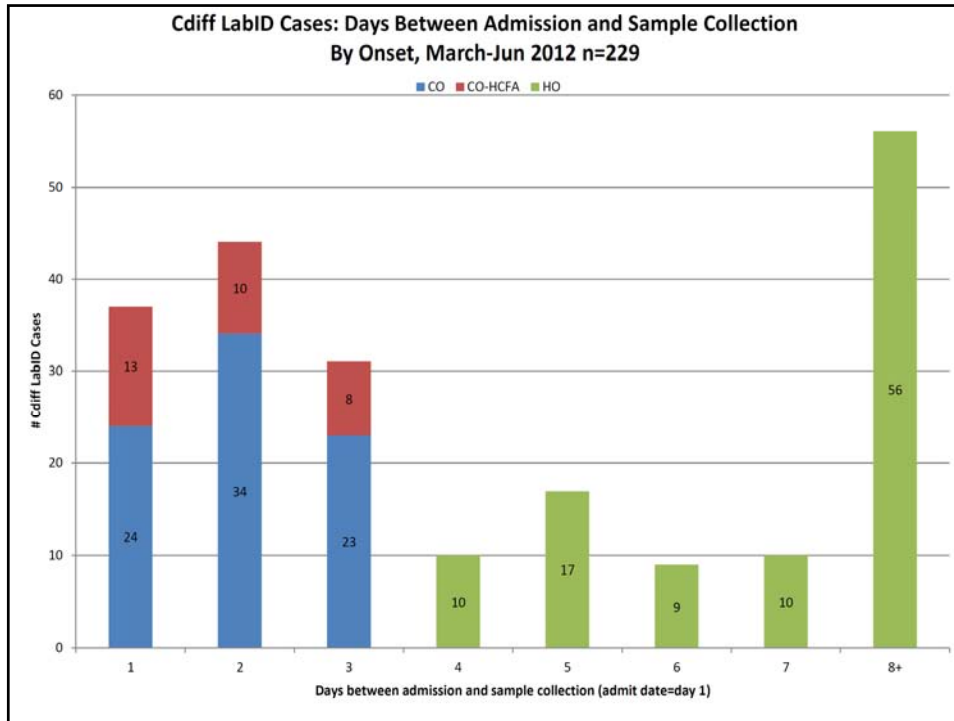
### Results



## *C. difficile* Infection Rates

Improvement efforts have reduced rate to under 20 cases per 10,000 Patient Days





### C. difficile Team: Project Activities

Activity	Timeline	Goal	Results
<b>Project Charter development</b>	Aug -2010	Define project goal, scope, metric, schedule, participants	Project Charter developed, adopted by the C. diff team and approved by the HAI leadership <b>Challenges:</b> no easy way to measure - C. difficile transmission - C. difficile bioburden
<b>Best practices in HAI control</b> - review of published literature - current CDC guidelines - regular contacts established with Johns Hopkins, Cleveland Clinic, UCSD	Sept-Oct' 2010	Determine best national practices to reduce transmission of nosocomial C. difficile	Best practices in hand hygiene, isolation precautions, cleaning and disinfection of patient rooms and equipment have been identified <b>Findings:</b> Although CSMC is largely in line with best practices of HAI control, opportunities exist in the area of testing new disinfection technologies and soiled equipment handling
<b>Gap analysis:</b> CSMC HAI policies pertaining to C. diff vs. actual compliance. Methodology: Direct observations and data/process analysis of the following: - Diarrhea POA vs. new onset (documentation in pt charts) - Preemptive isolation by nursing - Documentation of isolation status in pt charts - Lab results turnaround times - Hand hygiene, PPE compliance - Daily/terminal clean: methods and disinfectants used - Shared equipment cleaning and storage -Central Issues process	Nov-Jan 2010	Obtain a thorough understanding of the current practices used to reduce nosocomial C. difficile transmission	The team has gained an in-depth knowledge of the breakages in the current processes, test of change opportunities have been identified, approved and scheduled for implementation <b>Findings: Opportunities exist to improve:</b> • timely documentation of the isolation status • hand hygiene and PPE compliance (particularly among MDs, CPs, visitors) • standardization of daily and discharge clean processes • disinfection of the shared equipment

### C. difficile Team: Project Activities

Activity	Timeline	Goal	Results																																																	
<b>I. Test of Change:</b> Timely documentation of the isolation status in CS-Link for C. diff patients	Jan -2011	To ensure that isolation is ordered and documented in CS-Link for patients with confirmed or pending C. diff <b>within the same shift time frame</b>	<b>Findings:</b> 61% (11/18) of c. diff patients had an isolation order documented within the same shift at TOC completion. <b>Barrier to higher compliance:</b> Process to document isolation status in CS-Link involves 9 different steps and corresponding screens <b>Recommendation:</b> Once process for documentation has been streamlined, nurses house-wide should be documenting isolation status in CS-Link																																																	
<b>II. Test of Change:</b> Maintain Contact Precautions until C. difficile patient's discharge	Jan -2011	Recent studies show that the patient continues to shed c diff spores even after diarrhea resolves	<b>Findings:</b> This approach is feasible to be implemented house-wide <b>Current Status:</b> Isolation through discharge is now implemented on 4South <b>Pending:</b> Assessment of compliance																																																	
<b>III. Test of Change:</b> Hand Hygiene using SOAP and WATER upon exit from C. difficile patient rooms	Feb -2011	Assess feasibility (Hand hygiene compliance)	<b>Findings:</b> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="6">4 weeks average</th> </tr> <tr> <th></th> <th>MD (n=10)</th> <th>RN (n=18)</th> <th>EVS (n=4)</th> <th>RT (n=5)</th> <th>CP (n=4)</th> <th>Visitor (n=10)</th> </tr> </thead> <tbody> <tr style="background-color: yellow;"> <td>Entry (Alcohol)</td> <td>25%</td> <td>74%</td> <td>33%</td> <td>50%</td> <td>100%</td> <td>7%</td> </tr> <tr> <td>Entry (Soap and Water)</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr style="background-color: yellow;"> <td>Exit (Alcohol)</td> <td>25%</td> <td>37%</td> <td>33%</td> <td>0%</td> <td>0%</td> <td>23%</td> </tr> <tr> <td>Exit (Soap and Water)</td> <td>42%</td> <td>63%</td> <td>17%</td> <td>88%</td> <td>100%</td> <td>34%</td> </tr> <tr style="background-color: yellow;"> <td>Gowns and Gloves</td> <td>92%</td> <td>100%</td> <td>83%</td> <td>100%</td> <td>100%</td> <td>77%</td> </tr> </tbody> </table>		4 weeks average							MD (n=10)	RN (n=18)	EVS (n=4)	RT (n=5)	CP (n=4)	Visitor (n=10)	Entry (Alcohol)	25%	74%	33%	50%	100%	7%	Entry (Soap and Water)	0%	0%	0%	0%	0%	0%	Exit (Alcohol)	25%	37%	33%	0%	0%	23%	Exit (Soap and Water)	42%	63%	17%	88%	100%	34%	Gowns and Gloves	92%	100%	83%	100%	100%	77%
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Environmental sampling in search for C. difficile (or its surrogate VRE)	Feb-2011	To collect culture swabs on shared equipment in: 2 c. diff iso rooms 2 non- C. diff iso rooms 2 non-iso rooms	<b>Findings:</b> <ul style="list-style-type: none"> <li>• MDRO identified in Isolation rooms (C diff or non C diff)</li> <li>• VRE recovery on multiple surfaces in VRE positive patient room</li> <li>• Contamination with gut flora in C diff positive rooms</li> <li>• Large% of equipment has Bacillus species (spore producer)</li> </ul> <b>Conclusions:</b> <ul style="list-style-type: none"> <li>• Findings support the test planned for distinguishing clean and dirty items from isolation rooms</li> <li>• Findings do not reflect efficacy of cleaning (these were randomly collected items in use in rooms)</li> </ul>																																																	

