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# Improving Hand Hygiene Compliance to Reduce CLABSI Rate in Oncology ICU

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University of San Francisco  
CNL Online Program  
Prospectus  
Summary Brief  
Improving Hand Hygiene Compliance to Reduce CLABSI Rate in Oncology ICU  
Lorenzo San Pedro

**Specific Aim:** We aim to reduce the rate of CLABSI occurrence in oncology ICU by 50% by the last quarter of 2015.

**Background:** The Oncology ICU is in a prestigious clinical research facility located in Los Angeles County, CA. It is best known as a non-profit cancer treatment center and has been designated a Comprehensive Cancer Center by the National Cancer Institute (NCI). The facility provides care for patients with expertise in cancer and an array of world-class technologies and services. The patient population range from pediatrics, adults and geriatric patients, usually with co-morbidities, who suffer from serious injury or illness as a result of cancer disease process, treatment side effects, and post-operative medical-surgical procedures. One of the most common types of infection in ICU is central line associated blood stream infection (CLABSI). One successful initiative recently undertaken in the ICU was the improvement effort in the use of CUROS caps on all IV ports. The CUROS cap use in ICU during last quarter of 2014 was dismal at 60% to 65% far below the 90% or above target rate. The CNL student, in a joint effort with ICU unit based council members, developed a project that focused on non-punitive peer review and audits conducted by designated unit champions along with direct observation and use of visual cues posted on IV poles in the patient room. The project achieved a landmark accomplishment as the CUROS cap use gradually improved, met and exceeded the 90% target rate during the first quarter of 2015: January (82%), February (86%), and March (96%).

**Supportive Data:** Various metrics collected by Infectious Disease Department and ICU microsystem audits related to CLABSI occurrence in the unit indicated that thresholds are not being met. Table 1 to Table 6 in Appendix A demonstrates these outcome metrics including CUROS cap use on all lines ports at all times, hand hygiene compliance, NDNQI Nurse – Sensitive Clinical Indicators: #CLABSI/1000 line days, CLABSI Occurrence (ICU) raw numbers, dressing change compliance and HCAHPS Scores Patient Satisfaction. The Fish Bone Analysis Figure 1 in Appendix B indicates in red bold letters details of contributing factors to the CLABSI rates in the ICU including hand hygiene non-compliance, which is the focus of this project.

**Microsystem Status Relative to the project:** The SWOT analysis Figure 1 in Appendix C demonstrates the opportunities, strengths, weaknesses and threats that exist related to the project. The strengths included ICU staff understanding of the importance of hand hygiene for patient safety and the existing hand hygiene audit and research activity. In addition, the strong staff relations in the unit will enable continuation of a multi-disciplinary team that includes the CNL student, preceptor and unit based council members to provide support for the project. The weaknesses include the variation in

hand washing motivation among ICU staff, lack of senior management support, lack of awareness of the views of staff and lack of immediate feedback regarding infection rates in the unit. Opportunities included improved staff morale and patient/family satisfaction, better and effective method of communicating infection control metrics including CLABSI rate to the staff, financial gains for the facility and the patient/family, and potential achievement of Magnet Status recognition. The threats are the competing priority projects in ICU, and the availability of Just In Time (JIT) coaches as many of the UBC members and charges nurse are already undertaking other roles in the unit.

### **Summary of Evidence:**

**Search Strategies:** The references selected in this project of reducing CLABSI occurrence in oncology ICU by improving hand hygiene compliance. Multiple search parameters were used to select publications including publication date from 2010-2014, full text and peer-reviewed, and using terms such as CLABSI, hand hygiene compliance, and hand washing.

**Database Used:** Article searches were done through the University of San Francisco's library resources including EBSCO Host using databases such as CINAHL, MEDLINE and Cochrane Database of Systematic Reviews.

### **Evidence and Best Practices:**

The Agency for Healthcare Research and Quality (2013) asserts in its final report companion guide entitled "Eliminating CLABSI, a national patient safety imperative: Final report companion guide" that implementing a comprehensive unit-based safety program result in infection prevention, aversion of excess cost, changes mortality rate.

Chavali et al (2014) argues that using multimodal technique such as direct observation would improve hand hygiene compliance among all health care staff. It further asserts that continuous training, performance feedback and verbal reminders improve hand hygiene compliance.

Harris et al (2011) assert that active enforcement of hand hygiene policy and using unit champions (consisting of doctors, nurses, and other unit members) would reduce the rate of hospital-acquired infections, reduce in hospital length of stay and lower mortality rate.

Mathai et al (2011) argue that using multimodal techniques such as strong visual message and "my five moments of hand hygiene" would significantly improve hand hygiene compliance among all health care staff.

The Public Health Agency of Canada (2013) asserts that hand hygiene is the most effective way of preventing the transmission of healthcare-associated infection to patients, staff, and visitors in all healthcare settings. Its four-parts hand hygiene guidelines addresses barriers to effective hand hygiene resulting in poor adherence and outlines ways to overcome the barriers. Part A describes the role played by hands in the transmission of microorganism in the healthcare setting. Part B outlines hand hygiene programs and measures for improving adherence to hand hygiene practices. Part C

outlines the selection and dispensing of products for hand hygiene and effective hand hygiene techniques. Part D provides the recommendations for hand hygiene practices to prevent infection.

The Joint Commission Center for Transforming Healthcare (2015) asserts that implementing specific solutions and implementation guides will reduce the causes that keep healthcare workers from washing theirs. For instance, the use of the Targeted Solutions Tool for Hand Hygiene is recommended as the framework to improve hand hygiene compliance and to reduce frequency of health care associated infections.

**Theoretical Direction:** The theory of planned behavior by Icek Ajzen theorizes that the cause of a behavior is intention and that behavioral intention is influenced by key specific variables. Ajzen (n.d.) noted that human behavior is guided by three kinds of considerations namely behavioral beliefs, normative beliefs, and control beliefs. According to this theory, the first predictors of intentions are behavioral attitudes that relates to how a person thinks and feels about a behavior and reflects his expectations and evaluations of the behavior. The second predictor of intention is the subjective norms that relates to the support given by other people. The final predictor of intention is perceived behavior control. It pertains to the extent to which a person feels capable and has confidence in their ability to execute the desired behavior will play a central role in their intentions and actual behavioral outcomes. This can be compared to the perception of the person's ability to overcome barriers and challenges.

**Stakeholders:** Patient and family members of oncology ICU, ICU manager and assistant manager, staff RNs/charge nurses, nursing director, Professional Practice Leader – ICU (PPL-ICU), physicians and nurse practitioners, other members of the interdisciplinary team including respiratory therapist, physical therapist, case managers, dieticians and spiritual team, the oncology medical center, and government agencies such as CMS and The Joint Commission.

**Methods:** A multidisciplinary team approach to improving hand hygiene in the ICU microsystem will be used. The value of engaging ICU team members together is that they are given a stake in the outcome and have a unified mindset to achieve the same goal. The Joint Commission's Targeted Solutions Tool of Hand Hygiene (2015) improvement will be adopted including using Just-in-Time (JIT) coaches and visual cues in key areas of the unit to reduce the causes that keep ICU staff from adherence to hand washing. The coaching focus will be on positive reinforcement and immediate feedback that is expected to elicit the underlying beliefs of the ICU RNs in their desire to perform the hand hygiene compliance. The CNL student will compile and analyze results to be shared with all members of ICU microsystem.

**Steps for implementation:** The Hand Hygiene Compliance project timeline chart Figure 1 in Appendix D indicates the detailed activities in achieving improvement in hand hygiene compliance. The baseline hand hygiene compliance is based on on-going random audits. The CNL student and UBC members will meet to identify the following:

1. Hand hygiene education refresher during staff meeting. This will provide general

- knowledge and document competency.
- 2. Identification of JIT coaches.
- 3. Poster design choices review and selection

The rollout date has been ascertained. A two-hour coach training will be provided and will focus on real-time positive reinforcement and feedback to health care personnel. There will be a general announcement to all staff thru huddles, staff meetings, and intra-company email distribution list regarding the hand hygiene initiative. The selected poster will be displayed in key areas of the unit including outside the patient room. Sample hand hygiene compliance posters to visually reinforce adherence to hand hygiene are shown on Figure 1 to Figure 3 in Appendix E. The coaches will note on the coaching form barriers shared by staff to non-compliance. They will provide feedback obtained during coaching which will be analyzed by the CNL student. The information will be continually shared with staff during huddles and staff meetings and highlight success stories and share teachable moments. The monthly CLABSI occurrence rate will be compared to the initial rate prior to the start of the project to identify progress and areas of opportunities to improve.

**Evaluation Methods:** The baseline start date result will be compared with the result after hand hygiene improvement plans have been tested. The CNL student will synthesize report regarding the feedback data gathered by the Just In Time Coaches from the healthcare staff and will be compared with the hand hygiene compliance rate provided by the Infectious Disease Department. The rate of hand hygiene compliance improvement will then be compared with the improvement in CLABSI per 1000 central line-days. The improvement in hand hygiene is reflected with a corresponding reduction in CLABSI occurrence in ICU. Other metrics including CUROS cap use and dressing change compliance will also be compared to CLABSI occurrence result.

**Business Case:** Agency for Healthcare Research and Quality (2013) conducted a systematic review of the cost of CLABSI, infections avoided, excess costs averted and changes in mortality rate. The project reported the average CLABSI cost was \$70,696 with a range of \$40,412 - \$100,980 to 2012 dollars; over 2,187 – 2,419 CLABSIs were prevented over the course of the project; an estimated 290 – 605 deaths were prevented during the course of the project assuming a 12-25 percent mortality rate; and an estimated \$97,756,628 - \$244,270,620 in excess cost averted during the course of the project.

The CNL is expected to spend approximately 250 hours for the project duration at \$45 dollars per hour (\$11,250). In addition, the following project members are expected to contribute work hours as follows:

Two UBC Members – Coach Training - 2 hours @ \$45 dollars per hour (\$180)  
Two Charge Nurses – Coach Training – 2 hours @ \$55 dollars per hour (\$220)  
Miscellaneous office supplies such as posters, pens, and papers will be added at an approximate cost of \$200 for the project duration.

The project's goal to meet the hand hygiene compliance benchmark coupled with the

previously successful CUROS cap project will decrease CLABSI occurrence. The net financial benefit to ICU microsystem is projected as follows:

CLABSI cost	\$100,980 (based on AHRQ 2013 study)
Less: Project Cost:	\$ 11,850
Net Benefit	<hr/> \$ 89,130

Aside from the financial benefits of this project, it can also potentially impact improvement in patient and family satisfaction (related to reduce length of hospital days and reduce cost of care) and increase in staff satisfaction (sense of pride and ownership that complying with hand hygiene protocol relates to patient safety) and a strong validation of the culture of safety in the ICU microsystem. These results will be reflected on the unit outcome metrics including HCAHPS Scores Patient Satisfaction and Employee Engagement Survey periodically conducted by Gallup in the hospital.

**Results:** The project's timeline that illustrates the tasks are current.

The facility's existing Hand Hygiene Protocol educational module available on the facility's Intranet website has been approved to become part of the annual required education by all staff. It will be done during the staff's work shift and is expected to be completed by the end of May 2015.

The four charge nurses have been identified (two night charge nurses and two day charge nurses) and have started the Just In Time coach training module using The Joint Commission's website.

Poster's have been sent for printing and will be available for posting in high traffic areas of ICU on Monday, May 11, 2015.

**Outcomes:** All activities displayed on the project timeline are on schedule. There is a reasonable expectation that the efforts to improve hand hygiene compliance will reduce CLABSI occurrence rate in oncology ICU and meet the threshold set by the facility's Infectious Disease Department in accordance with CDC guideline. Thus, the project's aim to reduce the number of CLABSI per 1,000 line days and meet the benchmark will be achieved by the end of second quarter of 2015 (end of June, 2015). This trend is expected to continue until the last quarter of 2015. In the meantime, the hand hygiene compliance metric outcome will be monitored on monthly basis starting the end of May 2015.

**Recommendations:** As a CNL, I recommend that other staff members be encouraged to assume the role of Just In Time coaches and provide them with The Joint Commission's coaching tool to ease the burden of workload upon the charge nurses. I will continue to assume an active role in gathering and analyzing data as they come and sharing results with management and the UBC council.

Appendix A  
CUROS Cap Use on All Lines At All Times

Table 1

*CUROS cap use on all lines at all times*

	October 2014	November 2014	December 2014	January 2015	February 2015	March 2015
ICU (10 audits/week)	65%	65%	67%	82%	86%	96%

*Note:* The ICU microsystem target goal is 90% or better compliance.

Hand Hygiene Compliance

Table 2

*Hand hygiene compliance*

	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015
Goal: 90%	86%	85%	89%	87%	84%	85%	89%				

*Note:* The ICU microsystem target goal is 90% or better compliance.

NDNQI Nurse – Sensitive Clinical Indicators: # CLABSI/1000 Line Days

Table 3

*NDNQI nurse – Sensitive clinical indicators: # CLABSI/1000 line days*

	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14
CLABSI/1000 line days	1.25	1.27	Not Avail	2.75	0	1.42	5.05	0.69
Benchmark	0.81	0.95	0.97	0.90	0.83	0.89	0.95	0.60

*Note:* The information is provided monthly by the facility's Infectious Disease Department

Appendix A  
CLABSI Occurrence (ICU) Raw Numbers

Table 4

*CLABSI occurrence (ICU) raw numbers*

	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015
Goal: Zero	2	2	3	1	2	2	7				

*Note:* The information is provided monthly by the facility's Infectious Disease Department

Dressing Change Compliance (Peer to Peer Observation)

Table 5

*Dressing change compliance (peer to peer observation)*

	October, 2014	November, 2014	December, 2014
ICU (5 random peer to peer audits per month) GOAL: 100% threshold)	80%	85%	80%

*Note:* Peer to peer observation conducted by charge nurses and CNL student during the month.

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Scores:  
Patient Satisfaction

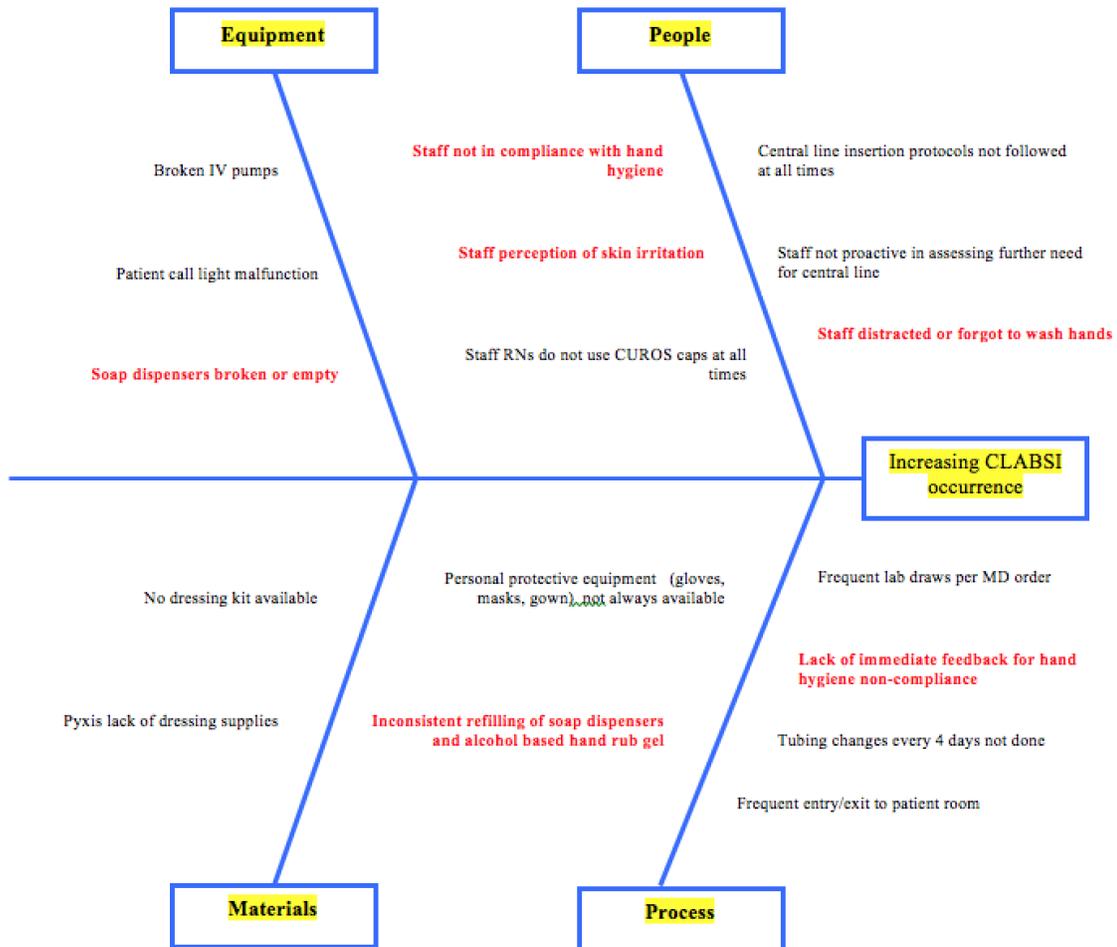
Table 6

*Hospital consumer assessment of healthcare providers and systems (HCAHPS) scores:  
Patient satisfaction*

	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015
Goal: 90% or better	30%	72%	55%	67%	64%	75%	80%				

*Note:* HCAHPS is a patient satisfaction survey required by Centers for Medicare and Medicaid Services (CMS) for all hospitals in the U.S. The survey is for adult inpatients.

## Appendix B Fish Bone Diagram



*Figure 1.* Fishbone diagram. The diagram indicates details of contributing factors to the CLABSI rates in the ICU microsystem including hand hygiene non-compliance, which is the focus of this project.

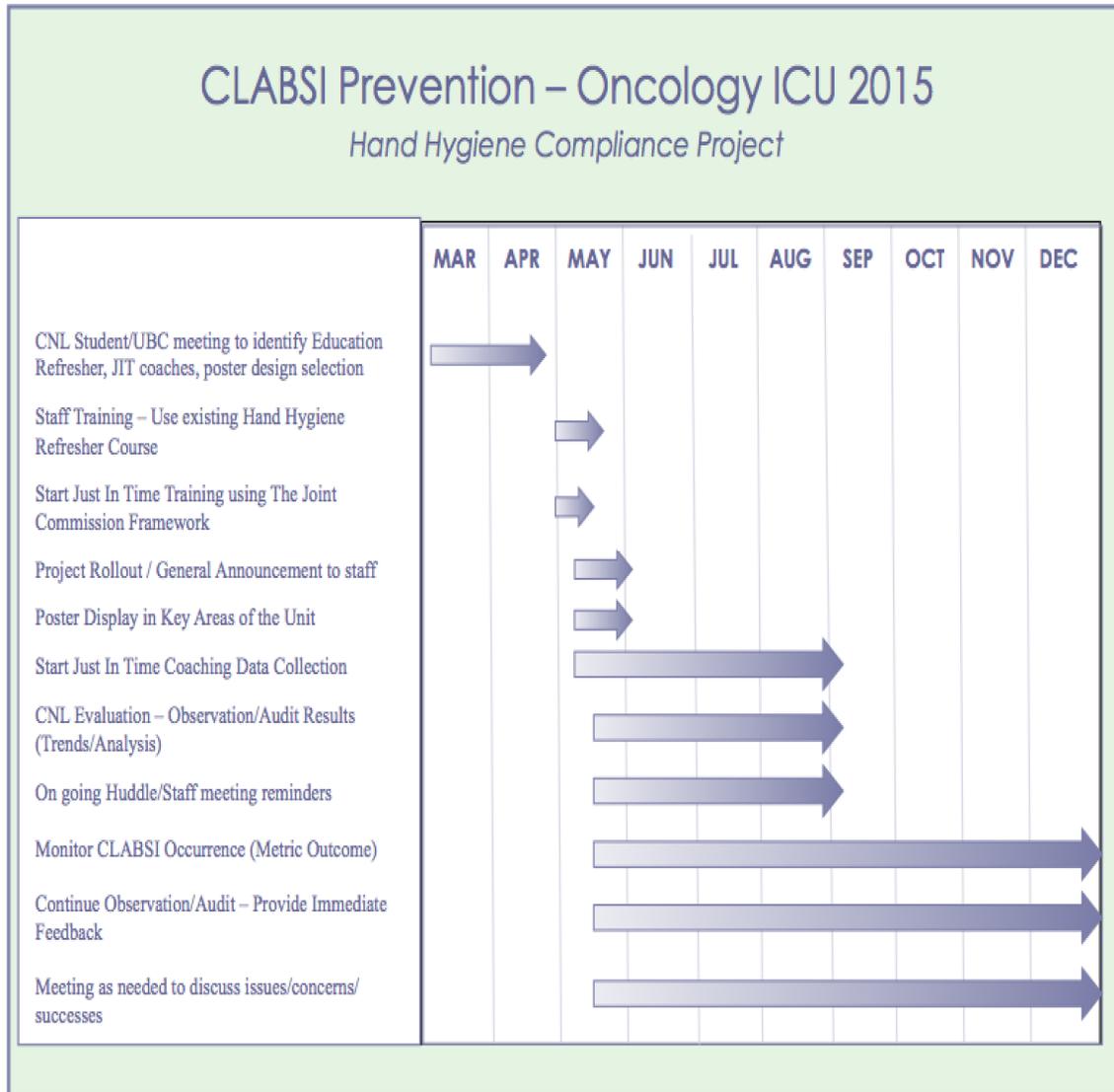
Appendix C  
Strengths, Weaknesses, Opportunities, and Threat (SWOT) Analysis

## SWOT ANALYSIS

	Positives	Negatives
<b>Internal</b> <ul style="list-style-type: none"> <li>• Human Resources</li> <li>• Physical Resources</li> <li>• Financial Resources</li> <li>• Activities and processes</li> <li>• Past experiences</li> </ul>	<b>Strengths</b> <ul style="list-style-type: none"> <li>• RNs understand the importance of hand hygiene</li> <li>• Hand washing station located outside each patient room</li> <li>• Hand washing compliance audit in place</li> <li>• Good teamwork/staff relations</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Staff motivation to hand washing compliance varies</li> <li>• Lack of awareness of the views of staff</li> <li>• Lack of senior allies</li> <li>• Lack of immediate feedback and reinforcement</li> </ul>
<b>External</b> <ul style="list-style-type: none"> <li>• Financial Performance</li> <li>• Funding availability</li> <li>• Legislation and regulatory requirements</li> <li>• Accreditation</li> <li>• Magnet Status application</li> </ul>	<b>Opportunities</b> <ul style="list-style-type: none"> <li>• More support from leadership staff</li> <li>• Infection control metrics available but not explained to staff</li> <li>• Better staff satisfaction/morale</li> <li>• Financial gains</li> <li>• Magnet Status achievement-prestige</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Competing with other priority projects in the unit</li> <li>• Availability of potential coaches</li> </ul>

*Figure 1.* SWOT Analysis. The SWOT matrix is the structured method used to evaluate the strengths, weaknesses, opportunities and threats involved in the hand hygiene compliance project.

Appendix D  
Hand Hygiene Compliance Project Timeline



*Figure 1.* Hand Hygiene Compliance Project Timeline. The project timeline illustrates the project schedule from the start and finish dates of each elements of the project.

Appendix E  
Hand Hygiene Compliance Visual Posters



Figure 1. Sample Visual Poster to be posted in heavy traffic areas of oncology ICU.



# Wash your hands.

*Figure 2.* Sample Visual Poster to be posted in heavy traffic areas of oncology ICU.

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# Your health is in <sup>Clean</sup> YOUR HANDS

*HAND HYGIENE is the most effective way to prevent the spread of infectious diseases including respiratory illnesses such as:*

SARS • INFLUENZA • COLDS • AND OTHERS

## WASH WITH SOAP AND WATER

when hands are visibly soiled.

## WASH WITH SOAP AND WATER OR WITH AN ALCOHOL-BASED HAND RUB OR GEL

when hands are not visibly soiled.

### ALWAYS:

- Wear gloves when contact with blood, mucous membranes, or non-intact skin could occur.
- Remove gloves after caring for a patient. Do **not** wear the same gloves with more than one patient.
- Wash hands after removing gloves.
- Keep natural nail tips less than  $\frac{1}{4}$  inch long; avoid artificial fingernails when caring for patients.

Visit [www.cdc.gov/handhygiene](http://www.cdc.gov/handhygiene) for additional hand hygiene information.



Figure 3. Sample Visual Poster to be posted in heavy traffic areas of oncology ICU.

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