PREVENT HAIs Healthcare-Associated Infections

CUSP Guide for Reducing Ventilator-Associated Events in Mechanically Ventilated Patients

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Introduction

Health care organizations around the world are increasingly focused on patient safety and health care quality. While health care providers are committed to improvement efforts, many struggle to create and sustain positive change. The Comprehensive Unit-based Safety Program (CUSP) helps providers achieve the lasting improvements they seek.

You can redesign your care system through technical and adaptive work to improve patient safety and eliminate preventable harm. Technical work focuses on procedural aspects of care that can be explicitly defined, such as the evidence to support a specific intervention or the definition for a ventilator-associated event (VAE). Adaptive work targets the attitudes, values, beliefs, and behaviors of the people who deliver care.

Adaptive work can be discouraging and nebulous. Creating a protocol for elevating the head of the bed is far easier than managing staff's attitudes and values or engaging staff to use the protocol. You may be tempted to focus on technical work and leave complex adaptive problems unaddressed. However, many change efforts fail because adaptive work is neglected. An evidence-based protocol or checklist (technical work) will only impact outcomes if staff understand, value, and prioritize use of the checklist (adaptive work).

The five-step CUSP process brings adaptive work into the change process and helps your team improve your unit's safety culture. By integrating CUSP with technical interventions, your team can achieve real and sustainable improvements in safety.

CUSP Guide In Practice

In 2004, more than 100 intensive care units in Michigan implemented CUSP in their celebrated work to eliminate central line-associated bloodstream infections and VAE. Since their success, thousands of units nationwide have used CUSP to target a wide range of safety problems: patient falls, hospital-acquired infections, and medication administration errors, among others.[1-8] Check out this final report from a national implementation project to reduce bloodstream infections.

CUSP Is Local

CUSP can improve teamwork and safety culture on a large scale. Large-scale change is achieved when multiple teams implement CUSP locally. Patient safety culture improvement at the unit level is crucial. Local norms have a powerful influence on the attitudes and behavior of care providers. Unit culture influences the extent to which providers participate in quality improvement efforts, adhere to evidence-based guidelines, or even speak up when they are concerned about the care of a patient.

How Does CUSP Change Local Culture?

Frontline providers cultivate wisdom by delivering care within their local systems. They encounter patient safety hazards on every shift and develop tactics to safeguard their patients against them. CUSP helps your team improve local safety culture by tapping frontline wisdom. It provides a mechanism to change systems and eliminate safety hazards for all patients. Far too often, frontline staff members perceive that patient safety improvement efforts are done to them instead of done with them. When frontline providers own the improvement process, local safety culture improves.

Respect the local wisdom of frontline providers.

What's in This Guide?

By implementing this guide in your care for intensive care unit (ICU) patients, your team will lead the national effort to reduce complications related to mechanical ventilation and to improve physical, cognitive, and psychological patient outcomes. However, this guide alone is not a prescription for success. While we have developed a model to support your efforts to implement evidence-based practices and improve care for all ICU patients, the authors of this manual do not work in your unit. Only your team understands your obstacles and opportunities for improvement. The materials presented here provide a structure to implement evidence-based practices and improve your patients' outcomes. Ultimately, success requires creative energy, profound persistence, strong leadership, and deliberate teamwork.

CUSP Steps: An Overview

Though CUSP comprises five steps, the program is a continuous process designed to incorporate an evidence-based patient safety infrastructure into your unit. The steps are briefly described below.

Step 1: Educate Staff on the Science of Safety

Introduce your teams to the principles that promote and support patient safety and quality. Help them develop lenses to focus on system factors that can negatively impact care and lead to preventable harm.

Step 2: Identify Defects

Identify patient safety defects in your work area. Your team can identify defects from incident reports, liability claims, or sentinel events. In this step, ask frontline staff how the next patient will be harmed through a short written survey.

Step 3: Partner With a Senior Executive

In this step, you'll partner with a senior hospital executive to develop a shared understanding of local defects, build consensus and plan for how to mitigate those defects, and develop shared accountability for implementing and evaluating the plan.

Step 4: Learn From Defects

Your teams will use a practical and valid tool to learn from defects, answering four basic questions:

1. What happened?
2. Why did it happen?
3. What did you do to reduce risk?
4. How do you know that risks were reduced?

Step 5: Improve Teamwork and Communication

Use tools to improve teamwork and communication in the unit. Teamwork and communication tools include daily goals, and tools from the national TeamSTEPPS® program. TeamSTEPPS is an evidence-based teamwork system to improve communication and teamwork skills among health care professionals.

Who Is Accountable for CUSP?

CUSP is a transdisciplinary process that incorporates the wisdom and unique perspectives of all providers and staff. However, in order to ensure timely completion of project activities, your team will need to choose a team leader. This leader will oversee the implementation of CUSP, and additional team members can help implement each of the steps.

Pre-CUSP Work

Assemble a CUSP Team

The CUSP team transcends discipline silos. Transdisciplinary teams collaborate throughout the entire problem-solving process, instead of developing solutions in isolation and then trying to align them. The CUSP team includes your team leader, a physician champion, a nurse champion, and a respiratory therapist champion. The CUSP team leader and transdisciplinary project champions must be able to dedicate time to this project. While the exact amount of time required will vary, we suggest a minimum of 2–4 hours per week to this program. Additionally, hospital epidemiology and infection control professionals are important CUSP team members, since they will contribute important expert advice and help with data collection for the project. Your CUSP team will be most effective if it includes frontline staff from across the intensive care unit.

The CUSP team leader (or designee) should work with hospital management to connect with a senior executive and secure his or her commitment to the CUSP program. When selecting a senior executive, ensure he or she is available to contribute meaningfully to the team and is approachable. Regardless of whether he or she has experience as a clinician, your senior executive partner should be comfortable having important discussions about difficult and sensitive topics.

In your first CUSP team meeting, discuss how you can make incorporating CUSP in your unit a success. Use the Premortem Tool to help you determine where stumbling blocks and pitfalls are likely to occur. Develop plans to avoid these issues. As you go forward, reassess your work and look at whether new stumbling blocks or pitfalls are on the horizon. As you proceed in your CUSP implementation, watch for potential problems and barriers.

Tools	*How To Use Them*
Premortem Tool	The team imagines the project has failed and brainstorms all of the reasons that could lead to this failure, then develops plans to mitigate these reasons.
Background Quality Improvement Team Information Form	List team member names and contact information in this form. Post the list in a visible location for staff reference.
Assemble the Team (Watch the video)	Reinforce how to build your CUSP team with this 10-minute video.

Our quality improvement department has worked on improvement efforts in our intensive care unit for years. At first, we didn't understand why our hospital leadership had signed us up for this safety program. We thought, "We are already doing this stuff." After reviewing the materials, we began to understand that CUSP would require a different type of quality team that included frontline staff and administrators, and a fundamental restructuring of how our hospital did quality work.

–CUSP Team Physician Champion

Assess Your Culture of Safety (Baseline Assessment)

The ongoing measurement of safety culture using surveys or questionnaires is quickly becoming an industry norm in health care. If your organization has not conducted a safety culture survey, such as the Hospital Survey on Patient Safety (HSOPS), it should be done in your unit at the outset of this project.

Safety culture questionnaires elicit frontline providers' attitudes and perceptions about patient safety topics. Individual providers complete the questionnaire anonymously, and responses can be reported by job category (for example, nurse, physician, or respiratory therapist), by unit, or by hospital. Your team can reassess clinical area safety culture every year or so.

Tools	*How To Use Them*
HSOPS User's Guide	Learn how to plan and administer your survey and make use of the important data you collect.
Culture Check-Up Tool	Use to debrief patient safety culture survey scores and turn data into action.

We measure safety culture across the hospital every year, but when this safety program started, we saw an opportunity to really assess our ICU culture. Even though our staff is tired of taking surveys, we administered HSOPS. This time, we shared survey results and their interpretation with our staff. We told them that we needed their leadership to make things better. Our front line started to realize that they were the center of our quality team.

— Nurse manager, CUSP Team Member

CUSP Steps

Step 1: Science of Safety Training

A "system" is a set of parts interacting to achieve a common goal. All too often we assume that patient harm occurs because of inexperience, lack of supervision, or bad luck, when in fact care is delivered in imperfect systems. Clinical area teams must understand the system in which they work to enable change in their clinical setting.

> Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects…their part is that of adding the final garnish to a lethal brew that has been long in the cooking.
>
> –James Reason, *Human Error*[9]

What the CUSP Team Needs To Do

Have your staff view the Science of Safety video featuring Dr. Peter Pronovost. The CUSP team leader should ensure that all clinicians and staff members watch the Science of Safety presentation within the first month of CUSP implementation. Your CUSP champions can facilitate training for their respective disciplines. Training can be done in large groups, several smaller groups, or individual sessions depending on what is practical for your clinical area.

Tool	*How To Use It*
Science of Safety Video (Watch the video)	This video will help your teams to— • Identify system failures that can impact patient safety • Apply design approaches that can be used to improve patient safety and quality • Integrate CUSP steps into unit processes

> *When we introduced this project to our unit, clinicians were quick to blame each other for our VAE rates. The nurses blamed the doctors; the doctors blamed the nurses and respiratory therapists. We had to teach our staff that infection rates are the result of faulty systems, not bad clinicians. Our VAE rates are not going to budge if all we do is exchange blame. After the Science of Safety training, you could see a few lights go on. Clinicians take care so personally.*
>
> –CUSP Team Nurse Champion

Step 2: Staff Identify Defects

Frontline providers understand patient safety risks in their clinical areas and have great insight into potential solutions to these problems. Your team needs to tap into frontline providers' knowledge and use it to guide your safety improvement efforts. The Staff Safety Assessment helps you access this wisdom by directly asking providers these questions:

- How will the next patient be harmed in your unit?
- What do you think can be done to prevent this harm?
- How will the next patient develop a VAE on your unit?
- What do you think can be done to prevent this VAE?

One of the strongest determinants of safety culture is whether local and hospital leadership respond to staff patient safety concerns. Therefore, it is important to follow up on the defects identified by your staff.

What the CUSP Team Needs To Do

The CUSP team leader (or designee) should hand out a Staff Safety Assessment (SSA) form to all clinical and nonclinical providers in the unit.

Timing and Logistics

We strongly recommend that you administer the SSA Tool following the Science of Safety training session. With their new understanding of the systems of care delivery, staff members are more likely to share constructive feedback.

One person should be assigned the task of handing out and collecting the safety assessment forms. To encourage staff to report safety concerns, it works well to make the tool available at all times, and establish a collection box or envelope in an accessible location where completed forms can be dropped off, anonymously if necessary.

Collective Sensemaking

Group SSA responses by commonly identified defects (such as communication, medication process, equipment failure, supplies, etc.) and summarize findings by defects (e.g., what percent of total responses were related to communication?).

What Comes First?

Prioritize identified defects using the following criteria:

- Likelihood of the defect harming the patient
- Severity of harm the defect causes
- How commonly the defect occurs
- Likelihood that the defect can be prevented in daily work

Tool	How To Use It
Staff Safety Assessment	Gauge perceptions of risks in your unit and tap into team wisdom to proactively identify ways to get your patients off of the ventilator faster.

Our compliance rates for oral care were great. However, when we reviewed our Staff Safety Assessment data, we were surprised that so many staff members were concerned about compliance. Their comments pointed out that surveillance using the electronic health record doesn't work for this particular measure. Through the SSA we discovered that as part of a "chunk" of care activities, the care may not have been completed. As we had already changed to the tear-off kits, the staff was able to see that often not all kits were used at the end of the day. They were concerned that some patients were not receiving the care they should. The staff had brought up this issue of carrying forward tasks previously, and we didn't act on it. It became clear that we should have been listening.

–Quality Improvement Officer, CUSP Team Member

Step 3: Senior Executive Partnership

The partnership between the senior executive and frontline staff is crucial to the CUSP team's success. These partners hold each other accountable for reducing risk to patients. At the unit level, the senior executive stimulates discussions about safety, helps prioritize and solve safety concerns, and helps set goals for the clinical area. At the hospital level, the senior executive may lobby for policy change, promote access to resources, or resolve interdepartmental issues. Additionally, the senior executive is a bridge to the hospital's C-suite (chief executive officer, chief medical officer, chief financial officer, etc.), and helps to share local wisdom with hospital administration and management.

What the CUSP Team Needs To Do

The CUSP team leader (or designee) should schedule monthly safety rounds with the senior executive. He or she should also prepare the senior executive for meaningful participation in safety rounds. If the senior executive does not have a clinical background, offer a tour of your unit. Schedule time with your senior executive to discuss unit-specific information. Include these materials in an information packet:

1. Safety culture survey results
2. The prioritized list of safety issues compiled from the Staff Safety Assessment
3. Pertinent information that the senior executive may not know (for example, staff turnover rate, compliance with process and policy measures, and VAE rate).

Executive Safety Rounds

Executive safety rounds may begin with a senior executive walk-through of the clinical area, led by a frontline clinician. The focus of executive safety rounds, however, is collaboration between the senior executive, the CUSP team, and frontline providers to address safety issues. Your team can solicit collaboration with sit-down discussions open to all staff. Review identified safety issues together. The senior executive can help prioritize your unit's safety concerns. You can use quantitative (i.e., numerically rating risk of harm) or informal (i.e., discussion until there is group consensus) methods to prioritize the greatest risks. Informal methods tend to be less burdensome and can accurately reflect unit level risks.

Tools	*How To Use Them*
CEO and Senior Executive Checklist	That first meeting is very important for engaging your senior executive. You can use this template for suggested activities and talking points.
Safety Issues Worksheet for Senior Executive Partnership	Senior executives can use to note patient safety issues observed during safety rounds.
Engage the Senior Executive (Watch the video)	This 6½-minute video focuses on how engaging a senior executive to partner with a unit will bridge the gap between senior management and frontline providers and will facilitate a system-level perspective on quality and safety challenges that exist at the unit level.

> *Our VAE rates have definitely not been zero. During our CUSP meeting, we discussed the possibility of changing over to the subglottic secretion drainage endotracheal tubes as our next step to reduce our VAE rates. Our executive was concerned about the additional cost per tube and how that would affect the bottom line. We shared the literature regarding the associated cost savings. He was impressed and decided to support us in this endeavor. Next step? Convince the rest of the physicians that the tubes are a good idea and that we need them to help us prevent ventilator-associated pneumonia in our ICU.*
>
> –CUSP Team Leader

Step 4: Learning From Defects

Once defects are identified and prioritized, the CUSP team must learn from them and implement improvement efforts. The Learning From Defects (LFD) Tool helps frontline

providers investigate safety defects. It guides CUSP teams through a structured process to answer four questions:

1. What happened?
2. Why did it happen?
3. What did you do to reduce risk?
4. How do you know that risks were reduced?

What the CUSP Team Needs To Do

Take a defect identified in your clinical area—an incident report, sentinel event, liability claim, or defect identified from the Staff Safety Assessment—and complete the LFD Tool. You may want to start with low-hanging fruit and progress to more difficult problems as you gain experience with the LFD process. After you are comfortable using and explaining the LFD process, you should discuss your LFD projects during executive safety rounds.

Tool	*How To Use It*
Learn From Defects Tool	Use this tool to lead discussions that engage frontline staff in characterizing defects, uncovering system-level causes, and developing plans for improving patient safety and quality. We recommend learning from at least one defect a quarter.

We purchased the subglottic secretion drainage endotracheal tubes and placed them in the ICU, rapid response team cart, the emergency department (ED), and the operating rooms (OR). We worked with the appropriate departmental heads and presented at Grand Rounds to ensure that providers understood the change and the reasons for the change, and to answer any questions. We thought we had covered all our bases. However, patients kept arriving from both the ED and OR with standard tubes. It was time to come up with a solution that worked. We invited representatives, the directors from the departments of surgery and anesthesiology, to our next monthly CUSP meeting. We used the Learning From Defects Tool at that meeting to determine what the issues were and to develop solutions. The surgeons and anesthesiologists felt that the tubes were too big and regardless of that, the expense too high if the patient would be extubated within 24 hours of surgery as planned. Through this process we decided to work with the stakeholders to develop an algorithm to help determine which patients are more likely to need longer term intubation. We have already gone through several iterations of the algorithm, but everyone seems to feel that they have been

heard, and fewer patients are admitted to the unit with normal endotracheal tubes. It wasn't easy to develop the algorithm, and it is still being honed to meet the needs of the different stakeholders, but we are making strides in bringing this important intervention to our patients.

–CUSP Senior Executive

Step 5: Use Tools To Improve

Throughout this document, we've identified tools you can use as you implement these interventions. In this section, some additional practical tools are listed to help your team improve communication and teamwork. You can find them on the AHRQ Web site. Each tool comes with detailed instructions.

What the CUSP Team Needs To Do

Review your safety culture scores and determine which areas need improvement (for example, poor teamwork climate). Collaborate with frontline providers to select a tool that best addresses their concerns.

Tools	*How To Use Them*
Daily Goals Checklist	Improve team communication and role clarity while caring for a patient in the ICU. **When to use?** This tool should be used with every patient. Research shows it can make a big difference when used in a meaningful way.
Conducting a Morning Briefing	Improve team communication regarding clinical area workflow with this tool. **When to use?** When staff believe that ICU workflow and communication are poorly coordinated.
Shadowing Another Professional	Identify and improve communication, collaboration, and teamwork skills between different disciplines. **When to use?** When staff believe that disciplines need to walk a mile in each other's shoes.
Observing Patient Care Rounds	Provides a structured approach for improving teamwork and communication across and between disciplines that might negatively affect staff morale and patient care delivery.

After a few project gains, we realized that we could tap frontline wisdom every morning by implementing the Daily Goals Tool. Now, as each case is discussed during rounds, a plan is developed for that patient's care for that day. The goals can involve everything from ordering a magnetic resonance image to decreasing pain medications to performing a spontaneous awakening trial. Goals are discussed with all staff present and documented. The documentation allows staff not present during rounds to help their patients' progress. We have found that Daily Goals are very effective for the night shift. They essentially have a status check for the morning and directions on how to proceed for the night. We are not just "implementing CUSP." We are building a patient safety infrastructure.

— CUSP Physician Champion

CUSP Is an Ongoing Process, Not an Endpoint

CUSP is an ongoing process and is never truly finished. Prepare frontline providers new to your unit by including a Science of Safety presentation or video in their orientation. Revisit the SSA on a periodic basis (e.g., monthly or quarterly) or make the tool readily available for staff to complete on an ongoing basis.

For More Information

There are many aspects to this intervention program: an adaptive component (pertaining to safety culture, teamwork, and communication) and three technical components:

- Daily Care Processes
- Early Mobility
- Low Tidal Volume Ventilation

This guide addresses the adaptive component. Please refer to the Toolkit To Improve Safety for Mechanically Ventilated Patients technical guides for more information.

You can access more learning materials on the Web site for the Toolkit To Improve Safety for Mechanically Ventilated Patients.

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