Sensemaking and Learn From Defects for Perinatal Safety

SAY: The Sensemaking and Learn From Defects module of the Safety Program for Perinatal Care will help you identify recurring defects in your system and apply Comprehensive Unit-based Safety Program, or CUSP. Sensemaking tools to help reduce the risk of future harm to your patients.	***Slide 1***
SAY: In this module, we will— • Introduce sensemaking tools to identify defects or safety issues on labor and delivery, or L&D, units, • Discuss the relationship between CUSP and sensemaking, • Show how to apply CUSP and sensemaking tools, and • Discuss how to share findings.	***Slide 2***
SAY: Some of the tools that will help CUSP teams identify and learn from defects include— • The Staff Safety Assessment, which provides L&D unit teams a structured approach to assessing the patient safety culture on the L&D unit. • The Safety Issues Worksheet, for senior executive partnership, which offers L&D unit teams an organized method for identifying, characterizing, and bringing safety issues to the attention of the senior executive partnership to address.	***Slide 3***

- The Learn From Defects Form, which provides a standardized means to assess where defects occur and to develop an action plan to correct them.

A number of Sensemaking tools are also available.

Sensemaking tools supply a systematic approach to event reporting.

Sensemaking can be applied to the analysis of individual events or specific systems. Sensemaking tools include—

- Discovery Form
- Root Cause Analysis
- Failure Mode and Effects Analysis
- Probabilistic Risk Assessment
- Causal Tree Worksheet

SAY:

CUSP and Sensemaking employ similar defect identification and solving skills.

Defects identification

CUSP asks L&D unit staff to work through a defect and ask—

- What happened?
- Why did it happen?
- What will you do to reduce risk?
- How will you know that you actually succeeded?

By engaging in this learning process, providers can uncover contributing system-level failures that influenced the defect.

Sensemaking calls for staff to work through the failure, identifying the latent and active contributors to it.

Active failures are also called human error. Active failures are categorized in three main types: skill-based, rule-based, and knowledge-based.

- Skill-based failures happen when a

Slide 4

The Relationship Between CUSP and Sensemaking[1,2,3]

Concept	CUSP	Sensemaking
Defect or failure identification	Defects	1. Human/active failure 2. Latent/system conditions
Ways to identify defects or failure	- Staff Safety Assessment - Status of Safety Issues Worksheet	- Discovery Form - Root Cause Analysis - Failure Mode and Effects Analysis - Probabilistic Risk Assessment
Tools to examine defects or failures	Learn From Defects Form	Causal Tree Worksheet
Coding defects or failures	Learn From Defects Form	Eindhoven Model

AHRQ Safety Program for Perinatal Care

Sensemaking & Learn From Defects 4

person fails in the performance of a routine task that normally requires little conscious effort.

- A rule-based failure occurs when a person does not carry out a procedure or protocol correctly or chooses the wrong procedure or rule.
- A knowledge-based failure happens when a person is unable to apply existing knowledge to new situations.

Latent conditions result from the delayed consequences of technical and organizational actions and decisions. These conditions are the mistakes that occur without human error. Latent conditions are sorted into two categories: technical failures and organizational failures.

- Technical failures are problems with physical items, such as equipment and software.
- Organizational failures occur when decisional elements, such as culture, procedures, and leadership decisions challenge safety.

Tools to identify defects or failures

When identifying defects or failures, CUSP uses the Staff Safety Assessment and the Safety Issues Worksheet for Senior Executive Partnership.

To accomplish the same work, Sensemaking uses the Discovery Form, the Root Cause Analysis, the Failure Mode and Effects Analysis, and the Probabilistic Risk Assessment.

To examine defects or failures, CUSP uses the Learn From Defects Form, and Sensemaking uses the Causal Tree Worksheet.

To code defects or failures, CUSP uses the Learn From Defects Form, and Sensemaking uses the Eindhoven Model.

By addressing these areas through the use of

both CUSP and Sensemaking ideas, skills, and tools, teams will be able to analyze defects on their L&D units and design effective interventions to fit their needs.	
SAY: When collaborating with frontline staff to identify defects on the L&D unit, the CUSP team should apply tools to identify defects, define them, and identify their sources.	***Slide 5*** **Identify Defects Overview** • Define defects • Identify sources of defects • Apply CUSP tools to identify defects AHRQ Safety Program for Perinatal Care
SAY: Sensemaking, in the context of patient safety, is used to describe a deliberate process of reflection on failures or near misses. Sensemaking is a way for a L&D unit to learn from and prevent mistakes. Sensemaking has five attributes: First, Sensemaking involves a conversation among team members. When engaging in Sensemaking, teams retrospectively assign meaning to ambiguous events or data. This act provides them an opportunity to collaborate to carry out a sustainable intervention on their L&D unit. Second, Sensemaking reduces the ambiguity of the event or issue by providing teams the tools and resources needed to make sense of a failure that occurred on their L&D unit. By doing this, teams are able to assign meaning to the system breakdowns that occur on their L&D unit. Third, Sensemaking engages the experiences of team members. Sensemaking calls for the involved L&D unit members to share their experiences as firsthand experts on the contributors to the failure. The intent of sharing is to have only the individuals involved in the	***Slide 6*** **Sensemaking Overview[4]** • A conversation among members of an organization involved in an event/issue • The purpose is to reduce the ambiguity about the event/issue—literally to make sense of it • Each person brings their experience of that event/issue to the discussion • The conversation is the mechanism that combines that knowledge into a new, more understandable form for the members • Members develop a similar representation in their minds that allows for action that can be implemented and understood by all who participated in the conversation AHRQ Safety Program for Perinatal Care

event, rather than their representatives or other staff, provide their interpretation of the events.

Fourth, Sensemaking employs conversation to create new knowledge. Sensemaking calls for teams to collaboratively seek a solution to the failure identified on their L&D unit. The conversation builds an understanding of how one part of the system interacts with other parts that safeguard or produce gaps in the system.

Fifth, team members develop a shared understanding of the failure and develop an action plan to address the failure. Sensemaking calls for team members to develop a representation similar to the failure and use it to develop and implement an action plan for their L&D unit. Staff must recognize that any element of the plan that takes action to prevent failures will affect other elements of the representation, sometimes with poor outcomes. By involving multiple parts of the representation in the Sensemaking conversation, the changes designed in one area can be safeguarded in another, increasing the effectiveness of interventions.

SAY:

When identifying defects that affect patient care, team members who know how a defect will affect patient safety can help the team prevent the defect as well as a sentinel event. In doing this, team members understand the relationship between defects and production pressures—leaving hazards unnoticed until a sentinel event occurs.

Examples of defects that affect patient safety and interventions put in place to alleviate them include—

- Medication lookalikes: Staff were educated about medication similarities and the physical separation of drugs, and staff sent a letter to a drug manufacturer to request different labeling.
- Missing equipment on a cart: Staff

Slide 7

Examples of Defects or Failures That Affect Patient Safety

Defect	Intervention
Medication look-alike	Education conducted, medications physically separated, and letter sent to manufacturer
Missing equipment on cart	Checklist developed for stocking cart
Failure to respond rapidly and appropriately to clinical emergencies	Staff simulation training, use of checklists to guide response

AHRQ Safety Program for Perinatal Care

Sensemaking & Learn From Defects   7

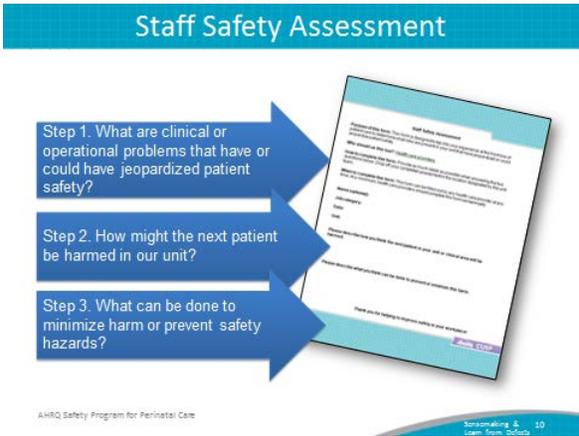|	
developed a checklist to assign responsibility for stocking supplies on the cart. • Failure to recognize clinical emergencies and intervene rapidly and appropriately: Staff participated in simulation training that included information about the availability of checklists to guide response.	
SAY: When combating defects on the L&D unit, it is important for staff to understand where and how breakdowns in safety occur. The Swiss cheese model portrays how defects permeate the L&D unit-level systems and contribute to patient harm. The cheese itself represents the L&D unit-level systems, and the holes symbolize the opportunities for defects to permeate established systems and cause patient harm. As shown on the previous slide, defects can be found everywhere on the L&D unit. Bearing this in mind, unit staff members are responsible for being aware of their patients and the environment to prevent defects from permeating their systems and contributing to patient harm.	***Slide 8*** Reason's Swiss Cheese Model[5] Excerpted from the "Swiss Cheese" Model – James Reason, 1990. Reason J. Human Error. Cambridge: University Press; 1990. AHRQ Safety Program for Perinatal Care
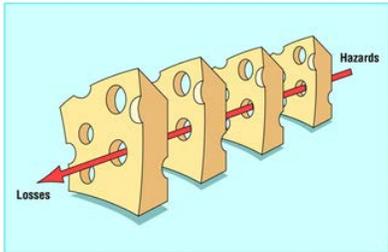
SAY:	*Slide 9*
The following tools can be used to help engage unit staff in identifying and learning defects.	

SAY:	*Slide 10*
The CUSP Staff Safety Assessment is an effective and proactive tool for identifying defects. It helps teams ask three simple questions about the issue of patient safety on their unit: 1. What clinical or operational problems have or could have endangered patient safety? 2. How might the next patient be harmed in our unit? 3. What can be done to minimize harm or prevent safety hazards? The Staff Safety Assessment is designed for all health care staff to use. Staff should provide as much detail as possible when completing the assessment, especially the second question. The objective of this form is to access the knowledge at the frontlines of patient care to determine what risks are present that have jeopardized or could jeopardize patient safety on the L&D unit. Frontline staff members are the eyes and ears of patient safety. Data they provide can be used to prepare a list of improvement opportunities that has face validity and creates a focus for your Safety Program For Perinatal Care activities. Use the Staff Safety Assessment results to— • Report defects to staff and the senior	

executive, • Prioritize defects by the potential level of risk to one or more patients, • Select one defect to address with the support of the senior executive, and • Develop a plan for the selected defect. Additionally, CUSP teams should— • Identify at least one defect each quarter, and • Ensure identification of defects is an ongoing process.	
SAY: Using the following exercise, you can practice this process of safety assessment by completing the following: • List all defects that have the potential to cause harm on your L&D unit, • Discuss the three greatest risks, and • Rank these risk factors. Further guidance to complete this exercise can be found using the CUSP Learn From Defects form.	***Slide 11*** **Exercise** Please complete the following: • List all defects that have the potential to cause harm • Discuss the three greatest risks • Rank these factors AHRQ Safety Program for Perinatal Care
SAY: The goal of using the Safety Issues Worksheet for Senior Executive Partnership is to: • Engage the senior executive in addressing the safety issues; • Identify safety issues, potential solutions, and resources during safety rounds; and • Keep project leaders apprised of the information on this form.	***Slide 12*** **Use the Safety Issues Worksheet for Senior Executive Partnership** Step 1. Engage the senior executive in addressing the safety issues identified on the form. Step 2. Use the form during safety rounds to identify safety issues, identify potential solutions, and identify resources. Step 3. Keep the project leader apprised of the information on this form. AHRQ Safety Program for Perinatal Care
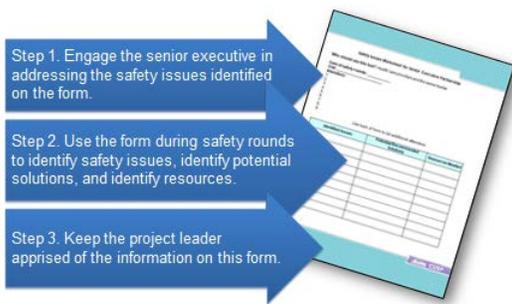
SAY:

In addition to CUSP tools, Sensemaking tools such as root cause analysis will help providers understand the consequences of a failure and avert future harm for patients. Here is an example of a root cause analysis causal tree template. Each tree will look different because it will be based on the failure that took place within the unit and the information gathered through the Sensemaking process.

A causal tree can be built in many ways. In this example, we will start with the discovery event and work backward through time, asking a series of "why's" to reach the root causes of the event. When you can no longer answer "why," you have reached a root cause, and you do not proceed further with that branch of the tree.

On this worksheet, you see both a failure and a recovery side. The recovery side is completed when the event is a near miss, that is, something that happened to stop the event from reaching the patient.

The recovery side of the tree usually resembles a "mini tree." It is seldom more than three boxes. Sometimes only one box represents the recovery step that took place.

The last step in building a causal tree is to assign causal codes.

The bottom of each branch of the causal tree represents the root causes. Root causes are assigned, coded, and entered into hexagons at the bottom of each branch.

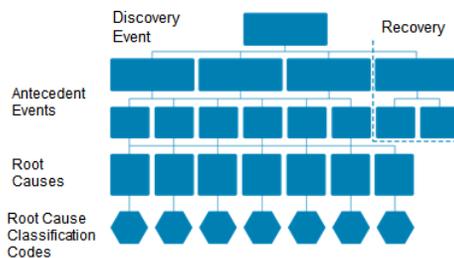The consequent, or discovery, event is located at the top of the causal tree. It is imperative to define the consequent event correctly because the rest of the tree will flow from it.

The consequent event is described in terms of the event's consequences:

- Harm that did happen
- Harm that did not happen—No-harm event
- Event did not reach the patient—Near-

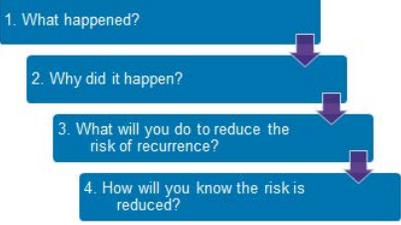***Slide 13***

Root Cause Analysis: Causal Tree Worksheet[6]

miss event We then ask why this consequence occurred. An antecedent describes the preceding event, condition, or cause. Antecedent events are those actions and decisions that led up to the consequent event. Remember to consider both active failures and latent conditions. There is no absolutely correct method of building a causal tree. The tree is an interpretation of the event. Additional information discovered during investigation may cause the tree to grow. And different tree compositions for the same event could possibly yield the same root causes.	
SAY: Learning from defects often reveals that systems contribute to the underlying causes of the defects. Every system is perfectly designed to achieve the results it obtains. Learning from defects can also be called second-order problem solving. Health care providers have become very adept at first-order problem solving, which is recovery problem solving. This problem solving method approaches a defect by reacting to an issue, finding its solution, and moving on. While this is commendable and necessary, it is also vital to learn from the defect and then apply second-order problem solving—in which the underlying causes and processes are examined—to correct the factors contributing to the event.	***Slide 14*** **Learning From Defects Overview** • Health care providers are adept at reacting to an event and finding a solution • Providers must also correct the factors that contribute to an event AHRQ Safety Program for Perinatal Care Sensemaking & 14 Learn From Defects

Sensemaking and Learn From Defects for Perinatal Safety

SAY: Think of an unexpected situation that you recently encountered. • When did you know it was not what you expected? • What were the clues? • What sense did you make of it?	***Slide 15*** **Exercise** Think of an unexpected situation that you recently encountered • When did you know it was not what you expected? • What were the clues? • What sense did you make of it? AHRQ Safety Program for Perinatal Care

SAY:
 	
When learning from defects, the following questions should be used to guide the assessment and understanding of the event.
 	
1. What happened?
 	
   • Step 1. Reconstruct the timeline to understand what happened.
   • Step 2. Put yourself in the place of those involved and in the middle of the event as it was unfolding.
   • Step 3. Try to understand the thinking and reasoning behind their actions and decisions.
   • Step 4. Try to view the world as they did when the event occurred.
 	
2. Why did it happen?
 	
   • Step 1. Visualize the factors that led to the event.
   • Step 2. Identify the contributing factors.
   • Step 3. Prioritize the contributing factors.
 	
3. What will you do to reduce the risk of recurrence?
 	
   • Step 1. Develop interventions for two to five of the most important factors.
	Slide 16
	
	Learning From Defects: Four Questions
	
	1. What happened?
	
	2. Why did it happen?
	
	3. What will you do to reduce the risk of recurrence?
	
	4. How will you know the risk is reduced?
	
	AHRQ Safety Program for Perinatal Care

- Step 2. Rate the interventions. - Step 3. Select the highest-rated interventions. - Step 4. Develop an action plan for implementation. 4. How will you know the risk is reduced? - Question 1. Did you create a policy or procedure (rate strong or weak)? - Question 2. Do staff members know about the policy or procedure? - Question 3. Are staff members using the procedure as intended? - Question 4. Do staff members believe risks were reduced?	

SAY:
 	
One Sensemaking model is the Eindhoven Model, which is based on earlier work in chemical plants. In this model, 20 separate event cause types are given in four categories: technical, organizational, human, and other.
 	
Remember that all events involve multiple causes, usually of more than one type. If the analysis of an event lists only one type, then it is likely the analysis is incomplete. The Eindhoven Model allows for the coding of multiple causes and will help teams identify more than one cause of a failure.
 	
The subcategories of technical causes are—   - Design, such as equipment design and, often, interface design;   - Construction, such as incorrectly assembled devices;   - Materials, such as a faulty seal on a pump; and   - External causes outside the unit, such as the loss of an electrical supply.   Subcategories of organizational causes include—   - Transfer of knowledge, such as a gap
	Slide 17
	
	Causal Coding: Eindhoven Model[6]
	
	• 20 separate event cause types in four categories
	  – Technical
	  – Organizational
	  – Human
	  – Other
	• Aim for three to seven root cause codes for each event, a mixture of active and latent
	• All events involve multiple causes
	
	AHRQ Safety Program for Perinatal Care Sensemaking & Learn From Defects 17

in new staff training;

- Protocols, such as a procedure that is impractical to apply in an emergency situation;
- Management priorities, such as inadequate staffing levels;
- Culture, such as a failure because of inappropriate deference to physicians; and
- External causes, such as a confusing regulation enforced by an outside agency.

As noted earlier, there are 20 codes that are divided into the categories of technical, organizational, human, and other. When the Eindhoven Model of analysis is completed, there should be three to seven root causes for each incident, and they should be a combination of active and latent factors.

This sequence of analysis is very important. Many times in health care, the focus starts with human factors to blame on the participants and may sometimes look at the technical factors.

The Eindhoven Model of analysis ensures the most crucial and fixable factors are addressed first, followed by human factors. Some of the codes for the factors are—

- TC: Technical, construction,
- TM: Technical, materials,
- TD: Technical, design,
- OEX: Organizational, external,
- OK: Organizational, knowledge transfer,
- OM: Organizational, management,
- HEX: Human, external, and
- HRV: Human, rule-based, verification.

SAY: After working through the Sensemaking and Learn From Defects processes, teams will be able to summarize and share their findings with their colleagues and senior management. • Create a one-page summary answering the four Learn From Defects questions; • Share the summary within your organization; • Engage staff in face-to-face conversations to provide opportunities to learn from defects; and • Share de-identified information with other teams.	*Slide 18* **Summarize and Share Findings** • Create a one-page summary answering the four Learning From Defects questions • Share the summary within your organization – Engage staff in face-to-face conversations to provide opportunities to learn from defects • Share de-identified information with others in your state collaborative (pending institutional approval) AHRQ Safety Program for Perinatal Care
SAY: To facilitate communication about what the team learned by identifying defects through Sensemaking, the CUSP team should— • Review data each month, • Review data with the senior executive each month, and • Present findings to hospital colleagues as needed, including leadership, frontline staff, and the hospital board.	**Slide 19** **Communicating the Learning** • Meeting to review data—monthly • Meeting with executive partner—monthly or more often • Executive review of data—monthly • Presentations to hospital colleagues as needed, including leadership, frontline staff, and hospital board AHRQ Safety Program for Perinatal Care
SAY: In summary— • Sensemaking and Learning From Defects share several common themes. • Defects are clinical or operational events that you do not want to happen again. • CUSP and Sensemaking tools help teams identify defects and identify ways to prevent them from occurring in the future.	*Slide 20* **Summary: Sensemaking and Learn From Defects** • Sensemaking and Learn From Defects share several common themes • Defects or failures are clinical or operational events that you do not want to happen again • CUSP and Sensemaking tools help teams identify defects and identify ways to deter them from occurring in the future AHRQ Safety Program for Perinatal Care

	Slide 21
	References 1. Battles JB, Kaplan HS, Van der Schaaf TW, et al. The attributes of medical event-reporting systems: Experience with a prototype medical event-reporting system for transfusion medicine. Arch Pathol Lab Med. 1998 March;122:231-238. PMID: 9823860. 2. Battles JB, Dixon NM, Borotkanics RJ, et al. Sensemaking of patient safety risks and hazards. Hlth Svcs Res. 2006;41(Aug 4 Pt 2.):1555-1575. PMID: 16898979. 3. Sensemaking. Patient safety analysis training. *[Columbia University's Digital Knowledge Ventures is no longer in operation.]* AHRQ Safety Program for Perinatal Care — Sensemaking & Learn From Defects 21
	Slide 22
	References 4. Sensemaking. Patient safety analysis training. *[Columbia University's Digital Knowledge Ventures is no longer in operation.]* 5. Pronovost PJ, Wu AW, and Sexton JB. Acute Decompensation after Removing a Central Line: Practical Approaches to Increasing Safety in the Intensive Care Unit. Ann Intern Med. 2004 June;140(12):1025-1033. PMID: 15197020. 6. Sensemaking. Patient safety analysis training. *[Columbia University's Digital Knowledge Ventures is no longer in operation.]* AHRQ Safety Program for Perinatal Care — Sensemaking & Learn From Defects 22
	Slide 23
	Disclaimers Every effort was made to ensure the accuracy and completeness of this resource. However, the U.S. Department of Health and Human Services makes no warranties regarding errors or omissions and assumes no responsibility or liability for loss or damage resulting from the use of information contained within. The U.S. Department of Health and Human Services cannot endorse, or appear to endorse derivate or excerpted materials, and it cannot be held liable for the content or use of adapted resources. Any adaptations of this resource must include a disclaimer to this effect. Reference to any specific commercial products, process, service, manufacturer, company, or trademark does not constitute endorsement or recommendation by the U.S. Government, HHS, or AHRQ of the linked Web resources or the information, products, or services contained therein. The Agency does not exercise any control over the content on these sites. AHRQ Safety Program for Perinatal Care — Sensemaking & Learn From Defects 23