To learn more about using this tool refer to Section 7 in the Safe Patient Handling and Mobility: A Toolkit for Program Development 2025 at: https://www.nvha.net/safe-patient-handling-and-mobility-toolkit/

Tips for Root Cause Analysis of WMSDs

For the purposes of this document a root cause analysis (RCA) is a structured process that is used to identify all contributing factors related to patient handling incidents, or near miss by examining what happened, why it happened and what can be done to prevent it from happening again.

The aim of effective incident investigation and RCA is to identify work system failures that led to an incident, instead of placing blame on employees. Incident investigations related to occupational incidents and injuries should be carried out with the same level of rigor and seriousness as RCA that is conducted for patient-related incidents, adverse events or near miss.

Work-related musculoskeletal disorders (WMSDS) associated with patient handling are often caused by prolonged or cumulative exposure to one or more physical risk factors that a caregiver may be exposed to when performing various patient handling and other non-patient handling work tasks.

Therefore, when determining the root cause and prevention of future WMSDs it may be necessary to conduct an ergonomics analysis of the task performed when the incident occurred and other work tasks to quantify and mitigate other contributing risk factors. For example, a nursing aide might strain their back while boosting a dependent patient in bed. However, they are also exposed to risk factors for back injury from manually transferring patients and handling heavy bags of dirty linen multiple times throughout each shift and on a daily basis.

Additionally, psychosocial, organizational and individual risk factors may contribute to a WMSD and should be considered when conducting an injury investigation and developing solutions to mitigate risk and prevent employee reinjury.

Refer to Section 1 for more information about risk factors for WMSDS.

Root Cause Analysis Tools (OSHA, 2016)

Below is a list of tools that may be used to conduct a root cause analysis. *Also refer to the References and Resources provided with this tool. Refer to Sections 3 and 10 for information about ergonomics analysis tools.*

The tools are not meant to be used exclusively. Ideally, a combination of tools will be used.

- Brainstorming using the '5-Whys' approach
- Checklists
- Logic/Event Trees
- Timelines
- Sequence Diagrams
- Structured Causal Factor Determination Tools e.g., "Fishbone Tool"(Ishikawa/Cause-and-Effect)

For simpler incidents, brainstorming and checklists may be sufficient to identify root causes. For more complicated incidents, logic/event trees should also be considered. Timelines, sequence diagrams, and structured causal factor identification are often used to support the logic/event tree tool.

Regardless of the combination of tools chosen, these tools should be used to answer the following questions:

- What happened? (including who was involved, when and where did it happen, and the consequences)
- How did it happen?
- Why did it happen?
- What needs to be corrected?

The severity of the actual or potential harm and the likelihood of recurrence can be evaluated to determine level of risk and assist in prioritizing potential solutions.

Overall Steps That Can Be Used to Conduct an RCA (CMS, n.d.)

1. Identify the event to be investigated and gather preliminary information such as employee incident and supervisor reports.
2. Determine who will be involved in the investigation e.g., SPHM program coordinator, other employee safety/ergonomics staff, the unit/dept. manager, the employees(s) involved in the incident and other stakeholders with personal knowledge of the processes and systems involved in the event to be investigated.
3. Describe what happened - collect and organize the facts surrounding the event to understand what happened.
4. Identify the contributing factors - the situations, circumstances or conditions that increased the likelihood of the event are identified.
5. Identify the root causes - a thorough analysis of contributing factors leads to identification of the underlying process and system issues (root causes) of the event.
6. Design and implement changes to eliminate the root causes - the team determines how best to change processes and systems to reduce the likelihood of another similar event. Identify immediate/urgent/quick fix solutions and long-term solutions.
7. Evaluate the success of solutions.

Involving employees in the root cause investigative process, for example using safely huddles, and sharing the results of those investigations, will also go a long way toward preventing future similar incidents (OSHA, 2016).

Patient Handling Incidents - Examples of Contributing Factors

The following are examples of contributing factors that may lead to a patient handling incident. Once contributing factors have been identified then the next question should be “Why” did they occur. The question “Why” may need to be asked a few times to find the true cause of the issue.

SPHM Equipment	Physical Workspace	Work Practices	Patient	Caregiver
• Not available on unit/dept. e.g.no SPHM program • Not easily accessible/ insufficient supply • Not appropriate for patient SPHM needs • Not working/ damaged/maintained • Not user-friendly for intuitive and safe use	• Lack of sufficient workspace to move floor-based equipment e.g., through doorways/in rooms • Poor clearance under beds, around chairs etc • Lack of vertical clearance when using overhead/floor-based lifts • Poor lighting • Uneven, sloping and/or slippery floor surfaces • Medical equipment/devices that hinder easy access to patient when using a lift e.g., full bed trapeze systems, beds with safety canopies	• Poor ergonomics work practices e.g., bed is not raised to allow caregivers to use neutral working postures when repositioning a patient in bed • SPHM equipment should have been used but was not • SPHM equipment was used incorrectly • SPHM patient mobility assessment/ screen/check was not conducted before patient handling task to determine if and what SPHM equipment should be used	• Refusal to use SPHM technology • Unexpected or predictable combative behavior • Emergent situation e.g., code/patient seizure and SPHM equipment cannot be used • Urgency to use the bathroom or address other physiological need	• Fatigue • High workload • Perception and beliefs about SPHM • Knowledge, skills and abilities to perform task safely • Awareness of hazards

Example of underlying system-related issues that may contribute to the factors above:

- Education and training (all stakeholders) – lack of; not effective/relevant; not current; skills not practiced or maintained
- Policy and procedures - lack of or ineffective; non enforcement
- SPHM technology availability, suitability, management & maintenance /Physical design/layout of the workspace
- Communications and information – lack of, inaccurate, not meaningful/user friendly; not salient]
- Work organization & staffing – understaffing; high caregiver to patient ratios; insufficient breaks; frequent overtime etc.
- Safety culture – supervisor & peer support for worker and patient safety; bullying; support of SPHM program activities; defined and communicated roles and responsibilities related to SPHM; lack of support/resources for SPHM equipment/program etc.

References & Resources

Centers for Medicare & Medicaid Services (n.d.). Guidance for Performing Root Cause Analysis (RCA) with Performance Improvement Projects (PIPs) https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/guidanceforrca.pdf

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