Building and Sustaining a Biohazard Accident Investigation Program in the Microbiology Laboratory

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WHAT IS AN ACCIDENT?

A lab accident related to a biohazard event can be classified as...

- A near-miss
- An exposure
- Neither

EXAMPLES OF A NEAR - MISS

- Recapping a needle
- Spill in a running, functioning BSC
- Dropping a tube of MTB culture, no respirator

EXAMPLES OF AN EXPOSURE

- Any percutaneous inoculation
- Culturing of certain pathogens on the open bench
- Specific deviations of protocol

ALL ACCIDENTS SHOULD BE INVESTIGATED

- To determine the magnitude
- To identify trends
- Must be blame-free and non-punitive

INVESTIGATIONS HELP TO...

- Prevent illness
- Save lives
- Save money
- Demonstrate commitment to health and safety
- Promote positive workplace morale
- Improve management

STAGES OF AN INVESTIGATION

GATHER INFORMATION

- who, what, when, where?
- injuries?
- eyewitness accounts
- guidance documents
- vaccination records
- floorplans, pictures

WAS IT A NEAR-MISS, EXPOSURE OR NEITHER?

Analyze all information

Ensure medical surveillance, prophylaxis etc as needed

DETERMINE ROOT CAUSE

Identify underlying reason

Keep asking why?

Think pulling out the roots of weeds
vs
cutting the weeds

Was lack of PPE or emergency equipment a contributing factor?

WHY?

PPE incorrectly specified, lack of PPE, improper use, did not function as intended

WHY?

Employee did not follow safety procedure

WHY?

Employee was in a hurry to finish and safety procedures slowed down work

WHY in a hurry?

IMPLEMENT CORRECTIVE ACTIONS

- Final step of investigation
- Should entail program level improvements
- Should be supported by senior management
- Sometimes take time to implement
- Some might be general, across-the-board improvements

SAMPLE GLOBAL CORRECTIVE ACTIONS

- Strengthening/ developing a written comprehensive safety & health management program
- Revising safety policies to clearly establish responsibility and accountability
- Revising purchasing and/or contracting policies to include safety considerations
- Changing the safety inspection to include staff along with management

SCENARIOS

1. At the end of the work day an employee placed a glass slant that was growing an active culture of the plague bacterium Yersinia pestis into a test tube rack and into an autoclave for sterilization along with other biohazard waste bags. The cap of the slant was left tight. The autoclave cycle was allowed to run overnight.

The next morning the same employee noticed that the autoclave had failed it's run. The employee proceeds to open the autoclave. When the steam clears he notices that the slant has exploded and there is agar and culture on the walls of the autoclave. Concerned he brings this to my attention.

Is more information needed?

Is it a near-miss, exposure, or neither?

What might be the root cause(s)?

What might be some corrective actions?

2. An employee who is up to date on his rabies vaccination, with high post-vaccine titer, was manipulating a brain specimen with a scalpel when he is cut. The specimen turns out to be positive for rabies virus.

Is more information needed?

Is it a near-miss, exposure, or neither?

What might be the root cause(s)?

What might be some corrective actions?

"Human error is not the conclusion of an investigation, it is the starting point."
- Sidney Dekker (2006)

RESOURCES

1. American National Standards Institute (ANSI) Z10 - 2012 Occupational Health and Safety Management Systems.
2. National Safety Council (NSC) Safety and Health Online.
3. OSHA Incident Investigations; https://www.osha.gov/dte/IncInvGuide4Empl_Dec2015.pdf
4. How to conduct an accident investigation; https://www.shrm.org/resourcesandtools/tools-and-samples/how-to-guides/pages/conductanaccidentinvestigation.aspx
5. The 7 steps of a thorough accident investigation; https://safetymanagementgroup.com/the-seven-steps-of-a-thorough-accident-investigation/