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HAZMAT Technician Radiological Incident Response Readiness: Assessing Mental Model Gaps

Understanding how Hazardous Materials (HAZMAT) Technicians think about radiation risk and Radiological Dispersal Device (RDD) incidents provides unique insights into where additional training focus could enhance responder readiness. How people think is captured in a mental model, which is like a map in someone's head that helps them understand how things work and predict what will happen next. It consists of beliefs, knowledge, and assumptions about aspects of the world, such as how to open a door, how a car works, or what will happen to them in a hazardous situation. Using an Expected Mental Model State (EMMS) Diagnostic Matrix, which is a tool designed to elicit responder mental models and compare them against an ideal or expected knowledge state, HAZMAT Technicians from fire departments across the US were assessed for gaps in understanding.

The analysis revealed four pivotal areas of misunderstanding: (1) overestimation of radiation health risks, (2) overreliance on personal protective gear, (3) confusion around radiation measurement units, and (4) limited understanding of radiation characteristics and dispersal mechanics. By using these insights to adapt training to target and improve responders' mental models, we can bolster their readiness for RDD incidents, ensuring a

more effective emergency response. This study serves as a repeatable framework to identify misunderstandings and focus training, ultimately fostering a more competent and prepared HAZMAT response.

Presentation Theme: Enhancing training by analyzing for specific gaps in responders‚Äô understanding of radiation risks and radiological incidents.

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