# In-Station Training

## *TM 25-04 Multiple Unconscious Patients*

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### Purpose

Some incidents turn out to be exactly what you are dispatched to, others do not. It is important to consider the fixed and variable factors available when dispatched, with continual review and revision of situation assessment as additional information becomes available.

### Learning Outcomes

Firefighters and officers perform an effective size-up, select an appropriate strategy, and implement tactics based on the strategic decision-making model.

### Conducting the Drill

This incident involved multiple individuals in cardiac arrest at 99-2 Pulpit Road in Bedford, New Hampshire on Sunday, October 13, 2024, at 16:00 (New Hampshire Union Leader, 2024; Fortier, 2024; & WMUR TV, 2024). Review the map and photos (Figures 1-4) to gain an understanding of the area and building involved.

Figure 1. Map of the Incident Area


*Note:* Adapted from Google. (2024a). [Map, 99-2 Pulpit Road, Bedford, NH]. https://bit.ly/4fwouL7.

Figure 2. Aerial View


*Note:* Adapted from Google. (2024b). [Aerial 99-2 Pulpit Road, Bedford, NH]. https://bit.ly/4iHGmFH.

There are no hydrants in the immediate area of the incident.

Figure 3. Approach


*Note:* Adapted from Google. (2018a). Redfin. (2018). 99-2 Pulpit Rd, Bedford, NH 03110. https://bit.ly/41MgjXB.

Figure 4. Side Alpha

*Note:* Adapted from Google. (2018b). Redfin. (2018). 99-2 Pulpit Rd, Bedford, NH 03110. https://bit.ly/41MgjXB.

The temperature is currently 47° F with no appreciable wind from the north (Weather Underground, 2024). It is Sunday October 13th, and you have been dispatched along with two other engines, a ladder company, two medic units, and command officer at 16:00 to 99-2 Pulpit Road for multiple patients in cardiac arrest. The engines and ladder have four-person staffing[1]. You are the company officer or AIC of the first arriving engine.


Time starts now! Answer the first eight questions within the next 10 minutes. Decide and put your answers in the form of communication you would have with your crew, other companies, and the first arriving command officer. Save discussion for after answering the first eight questions.

1. What critical factors would you consider when dispatched and during response? What conversations would you have with your crew during response?

[1] If your first alarm deployment is different, use your own resource assignment and staffing with the first and second arriving resources typical for your agency (e.g., two engines vs. engine and ladder).

You hear a command officer, two other engines, a ladder company, two advanced life support ambulances, and command officer go enroute. You will arrive from the south on Pulpit Road. The ladder company will arrive from the same direction three minutes after you arrive. The second engine will arrive from the north six minutes after you. The command officer will arrive shortly after the second engine and ladder company. All other units dispatched will arrive after the command officer.

While enroute, dispatch advises that family members checking on their mother and father discovered them unconscious and not breathing. The two patients are in their eighties. Based on multiple patients, dispatch upgraded the standard response for a cardiac arrest with two additional engine companies and a second medic unit.

Figure 5. Conditions on Arrival

*Note:* Adapted from Redfin. (2018). 99-2 Pulpit Rd, Bedford, NH 03110. https://bit.ly/41MgjXB.

2. State your initial radio report (IRR) exactly as you would transmit it to dispatch.

3. What specific actions would you take (as the company officer) immediately upon arrival and exiting the apparatus and what task orders would you give your crew?

Entering the home you do not hear any alarms sounding and you find the occupants' two adult family members in the bedroom performing hands only cardiopulmonary resuscitation (CPR) on male and female patients that appear to be in their eighties. The family members advised that both patients were

in bed and had been moved to the floor to perform CPR. You observe a reddish skin color on both patients, and the family members report that they are dizzy and nauseous.

4. Would you change the action you are taking or modify the assignments given to your crew? If so, what task orders would you provide?

5. State your update report exactly as you would transmit it to dispatch.

6. Ladder 1 arrives and reports that they are Level 1 on Pulpit Rd. State the tactical assignment you would give them exactly as you would transmit it.

7. Engine 2 arrives and reports that they are Level 1 on Pulpit Rd. State the tactical assignment you would give them exactly as you would transmit it.

8. Assuming resuscitation efforts are ongoing, state your conditions, actions, and needs (CAN) report that would you provide to the first arriving command officer as part of command transfer to IC #2.


Reflect on your strategic decision-making and responses to questions one through eight before answering the next three questions. Give some thought to what cues, patterns, or anomalies (differences from conditions that you would anticipate) inform your answers.

9. What was the problem?

10. What was getting in the way of achieving your tactical priorities?

11. Was there anything in this incident that could have hurt or killed you (right now)?

When dispatched to an emergency incident consider pre-priming your decision-making by considering the circumstances that you may encounter.

12. What are the potential causes of two patients in cardiac arrest? What information has been provided by dispatch and what don't you know?

13. Do you routinely monitor to determine the presence and concentration of carbon monoxide when responding on medical emergencies (or specific incidents based on reported symptoms or circumstances)? Why or why not?

14. Did you recognize the potential for carbon monoxide poisoning in this incident? What action did you take to address treatment of the patients (all four of them) and the safety of the personnel responding to this incident?

***Additional Learning:*** Measuring the concentration of carbon monoxide (CO) in parts per million (ppm) is one of the standard functions of typical four-gas atmospheric monitoring instruments that are often carried on fire apparatus. The other standard functions are identifying the presence and concentration of flammable gases in percentage of the lower explosive limit (LEL), oxygen concentration in percent, and presence and concentration of hydrogen sulfide ($H_2S$) in parts per million. The presence of CO and its concentration can also be measured with a single gas monitor. Single gas monitors for CO are often along with the airway or medical kits on apparatus used for emergency medical response.

Review the operation and function of atmospheric monitoring equipment used to detect and measure the concentration of CO in the atmosphere carried on your apparatus. Typically, CO monitors will alarm at 25 ppm (the threshold limit value-time weighted average (TLV-TWA) or 35 ppm permissible exposure limit (PEL)). This is well below the immediately dangerous to life and health (IDLH) concentration of 1200 ppm.

The home in this incident was equipped with CO alarms, but they did not operate. Carbon monoxide alarms operate on a time-weighted principle. They will activate at lower concentrations over a long period of time or at higher concentrations in a shorter period. Carbon monoxide alarms meeting *UL Standard 2034* (2017) will activate at the following time weighted alarm points (alarms may differ but should meet these requirements at a minimum).

Table 1. *UL 2034 Standard for Safety for Single and Multiple Station Carbon Monoxide Alarms*

| Concentration | Alarm Time |
|---|---|
| 400 ppm | Between 4 and 15 Minutes |
| 150 ppm | Between 10 and 50 Minutes |
| 70 ppm | Between 60 and 240 Minutes |

*Note:* Adapted from Underwriters Laboratories. (2017). UL 2034: Standard for safety for single and multiple station carbon monoxide alarms (7th ed.). Northbrook, IL: Author.

If the building is occupied and carbon monoxide is detected above 9 ppm (ASHRAE, 2013), evacuate the occupancy until the hazard has been mitigated. Keep in mind; carbon monoxide concentrations below regulatory action levels (PEL, TLV-TWA) may be hazardous to sensitive populations (older adults, children, and individuals with other medical issues).

For a more detailed understanding of the medical implications of carbon monoxide exposure, read *Carbon Monoxide Toxicity* (Hanley & Patel, 2022) and *Carbon Monoxide Toxicity* (Palmeri & Gupta, 2022). Discuss how carbon monoxide poisoning may be identified during patient assessment (e.g., signs and symptoms including $SpO_2$ and COHb levels).

Watch *CO-Oximetry vs Pulse Oximetry* (Respiratory HQ, 2024) for an explanation of the differences between these concepts and how $SpO_2$ and SpCO are applied in the context of a person with carbon monoxide poisoning. In the field SpCO is measured using a device such as the Masimo Rad-57 (Figure 6).

Figure 6. Maximo Rad057® Pulse CO-Oximeter®

Note: Adapted from Masimo (2024). Rad-57® Pulse CO-Oximeter®. https://bit.ly/3P1HqqD.

## References

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