

CASE STUDY

EMS > Case #209

Exhaust Gas Sickens Mother and Three Children

Masimo® Rad-57™ Pulse CO-Oximeter™ alerts paramedics to an unsuspected source of poisoning

Location Farmington Fire Department, Farmington, NM
Clinician Reporting Jay Balfour, Battalion Chief
Patient Event Faulty car exhaust sickens family

> The Situation

Farmington firefighters responded to a call of a sick patient at a Safeway Supermarket. They arrived to find the 14-year-old female, who had passed out at the checkout counter, alert with no obvious symptoms. The Masimo Rad-57 sensor was initially placed on the patient's finger to check her oxygen saturation (SpO₂) level, but firefighters were surprised when the device started alarming. The patient's carboxyhemoglobin (SpCO®) blood level measured 15%. Finding that she suffered carbon monoxide (CO) poisoning, the patient was placed on high flow oxygen (O₂) and her SpCO level dropped to 13% within two minutes.



> The Problem

A check of the Safeway revealed no signs of a carbon monoxide leak. Although all signs pointed to CO poisoning, the recent warm weather made heating units—a common culprit—seem an unlikely cause. Paramedics arriving from the county ambulance service also expressed surprise at the high SpCO measurement, so they tested the mother and her 17-year-old daughter—both were also in the store with patient—only to find that they too had elevated SpCO levels of 8 to 9%. With the store ruled out as the source of the poisoning, the family vehicle, which was just purchased the prior week, was evaluated.

After starting up the vehicle, a mini-air gas CO detector alarmed within 10 to 15 seconds and quickly rose to 40 PPM with the windows of the van all rolled down. An exhaust leak was found to be the source of the carbon monoxide poisoning. The mother and two daughters were transported by ambulance to the ER while another fire engine was dispatched to the family's home to check out the five other children: an infant, 3-year-old, 9-year-old, 12-year-old, and 18-year-old. The 3-year-old male, who was asleep on the couch, did not wake to verbal commands. Although firefighters were able to awaken him, he was very lethargic. After placing the Rad-57 sensor on his finger, the device immediately alarmed with an SpCO of 13%. He was also placed on high flow O₂ and transported to the same ER as his mother and sisters. The 3-year-old was the only other family member who had recently been in the van. In fact, the mother, along with the 14-year-old and 17-year-old, had spent an hour driving around in the van and running errands the previous night, which explained their elevated SpCO levels. None of the other children had elevated SpCO levels or obvious symptoms and a thorough check of the house revealed no CO leaks.

> The Masimo Difference

Firefighters and paramedics initially had no reason to suspect CO poisoning as the cause of the 14-year-old's symptoms. Without the elevated SpCO measurements from the Rad-57, we would not have tested the van and confirmed the source of the CO poisoning. The Rad-57's SpCO measurements sent up a red flag that helped a family of eight to escape a potential deadly outcome.

“Those SpCO measurements from the Masimo Rad-57 forced us to investigate further and find the source of the CO poisoning—allowing us to turn a potentially tragic outcome into a success story for this family.”
— Jay Balfour, Battalion Chief