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The Reluctant Patient

History: In February 2007 Meridian Fire Department's monthly CE for EMS was carbon monoxide poisoning. A PowerPoint presentation was done, followed by a video that explained the potential pitfalls for crews responding to possible CO poisonings because the typical signs and symptoms mimic so many other illnesses. The video discussed the Masimo Rad-57 Pulse CO-Oximeter and its potential benefits. Coincidentally, around the time of this training, the local headlines were ripe with stories from all around Idaho of families and individuals who had been poisoned by carbon monoxide. Some of those stories had fairly bad outcomes. This began the discussion within the department: without very solid evidence, how are we to know if someone has or has not been exposed to carbon monoxide, especially in the face of mild complaints/symptomology?

The regional Masimo representative had given us a list of departments that were currently using the device. We reviewed their protocols and documents from the departments we contacted, and began to put pen to paper. Cost was certainly an issue, which is why we purchased only one device initially. The goal was to become familiar with the unit, place it on an engine, and complete a six month study on its accuracy and effectiveness. An added incentive for us was knowing that we were going to be the first department in Idaho to have a CO-Oximeter. If we successfully implemented a CO protocol and could prove its effectiveness, the opportunity to share our findings with other departments would be very rewarding. Little did we know it would impress us so quickly.

The Call: On June 8th 2007, at approximately 22:30 hrs, engine crews were dispatched to a possible suicide involving carbon monoxide. Responding units included Meridian Police Department, Meridian Fire Dept. (E301- ALS engine company), and an ambulance from Ada County Paramedics. When the crews arrived, they found a deceased woman in the garage of a two-story apartment duplex. The doors in the garage had been sealed with tape and a suicide note was found inside.

While the crews of E301 were inside searching the deceased's apartment for other potential victims, the ambulance crew began interviewing people outside, specifically a neighbor in the adjoining apartment and a representative from the gas company. The neighbor had awoken around 21:45 hrs smelling some kind of gas odor and not feeling very well. He called the local gas company and a representative responded to the man's apartment. His CO monitor read 400 ppm at the front door. The man was evacuated from the apartment, and the readings were continued. Upstairs, where the man had been trying to sleep, the monitor readings were 750 ppm. After ventilating the apartment, the gas company began investigating the source. Upon entering the man's garage, he heard the car running in the adjoining garage. He told responders that when he put his hand on the deceased's garage door, it was "hot." He opened the garage, found a woman lying on the floor and immediately called 911. It was estimated, based on notes found in the garage that the car had run for approximately five to six hours. The neighbor's apartment had filled with CO through the shared attic spaces in the duplex and then through the HVAC system.

The search of the apartment revealed no other victims, so the focus shifted to the neighbor. Upon doing a more thorough exam, the crews found him complaining only of a mild headache. He initially did not want treatment or transport to a hospital. Because of the very high CO levels found in his apartment and a strong index of suspicion, the Rad-57 was used and the first SpCO reading was 24% (25% is considered severe). He again refused transport, based on the fact that he only had a mild headache. Oxygen was administered via non-rebreather mask and a second reading was obtained several minutes later. His CO level was now at 19%. After much convincing, the man agreed to go to the hospital for an evaluation. At the hospital, his CO lab value was 20.1%. He was transferred to a hyperbaric chamber and spent two days there until his levels had subsided.



Photo Lineup from left to right: Paramedic/FF Scott Warren, Driver/EMT Mike Gould, Captain/EMT Tyler Rountree, and Ada County Paramedic Jeremy Schabot

The Meridian Fire Department, overseen by Chief Ron Anderson, is made up of 30 full-time firefighter/EMTs, 12 full-time firefighter/paramedics, 3 Deputy Chiefs, a fire inspector and a volunteer division.

Located just west of Boise, Idaho, Meridian Fire Department has 5 stations covering a 54 square mile territory with an average call volume of 3,800 per year. Most recently, the department was awarded the Association of Idaho Cities "Award of Excellence" for the creation and development of its Fire Medic program. The department has been ALS staffed since 2005.

Outcome: We could not have asked for better results in our first week using the Rad-57. Most responders can identify the obvious; it's the vague, non-specific patients that can get any agency in trouble. In the past, this patient may have signed a refusal and gone back into his residence with no physician follow-up. Now, our exams on these types of vague patients are not solely relying on our level of suspicion but also incorporate a measured reading. In this case, the reading from the CO-Oximeter along with our explanation of concern, convinced a refusing patient to seek the further medical attention that he needed. For our department, the Rad-57 has already paid for itself.