



CO Exposure – St. Mary's Villa - December 26, 2010



CO Monitoring in LTC Facilities and Hospitals: Expert Group –
October 21, 2013

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Saskatoon Health Region

- Largest health region in SK, serving approx. 318,000 local residents in more than 100 cities, towns, villages, RMs and First Nation communities
- Approx. 30 per cent of the population of SK reside within the Region's geography
- An integrated health delivery agency providing a comprehensive range of services & programs in more than 75 facilities
- 29 long term care facilities with 2,282 beds
- Largest employer in the province with 929 physicians & 13,458 care and service providers



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Background

- SMV is a 101-bed LTC facility located in Humboldt, SK
- OH&S Committee and EP plans in place
- Early morning of Dec 26, 2010 – several residents and staff at SMV LTC facility transferred out of one wing of the Villa after exhibiting symptoms of CO exposure
- 24 residents, 5 employees and 2 visiting family members assessed and treated at local hospital
- 89 year old resident died on Dec 26, 2010
- 94 and 98 year old residents died on Jan 4 and 26, 2011
- CO exposure a contributing factor in each of these deaths



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Building Code

- When SMV was constructed, national building code did not require presence of CO monitors
- Changes to the code in 2010, adopted by Govt of SK in Sept 2011, require installation of detectors in NEW buildings classified as care occupancies or existing buildings undergoing alteration, addition or renovation
- Dec 30, 2010, Building Advisory issued by Building Standards directing all health regions to install CO monitors in appropriate facilities
- Since the Dec 2010 incident, 11 CO detectors have been installed at SMV
- All care facilities within SHR that have patients staying overnight have had CO detectors installed



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No Prior Experience

- Prior to Dec 2010, SHR had NO experience identifying or managing a release of CO in any of its facilities*
- CO exposure occurred due to flue gas from a boiler being circulated throughout the affected wing as a result of a backdraft situation occurring in the boiler room
- Maintenance staff had experienced heat and steam problems with the boiler but issues had resolved with routine checking and attention by maintenance staff
- No documented evidence to suggest a build up of CO gas had occurred prior to this incident

*2 acute care facilities by exhaust fans had existing CO detection and 1 LTC facility



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Other Factors

- Just prior to the exposure, SMV experienced a noro-virus outbreak that was considered over on Dec 23, 2010
- Symptoms of noro-virus include feelings of general unwellness, fever, vomiting & diarrhea
- Staff on site at the Villa on Dec 26 felt that the symptoms they and the residents were experiencing were related to the noro-virus outbreak
- The incident began Christmas Eve/Day with the height of the exposure occurring in the early morning hours of Boxing Day – staff initially attributed their symptoms to being overtired from the general ‘busy-ness’ of the holiday season

Chronology of Events

- Dec 24, 2010 – 2 staff smelled odor of gas
- Dec 25, 2010 – 1 staff went home feeling ill, throughout the night staff and residents on the wing began feeling unwell
- 3:00 a.m. Dec 26, 2010 – Mgr called by nurse in charge and discussed the possibility of an airborne infectious disease such as TB and decision made to don surgical masks as a precaution
- Mgr's husband suggested a gas leak and the Mgr contacted SKEnergy from her home
- Staff began preparing fanout lists for a possible evacuation



Response

- Mgr arrives at Villa and air very humid in one wing – decision made to open windows (cranks had been removed but found quickly) and doors (not fire doors and locked – keys could not be found)
- Atmosphere calm and staff relaxed
- Maintenance staff person arrives 45 minutes after the call had been made to SkEnergy
- Boiler identified as a possible issue was shut down at 3:45 a.m.
- Shortly after 5 a.m. SkEnergy arrives from another town approximately 80 kms away



Evacuation

- SkEnergy CO reading is 25 and 43 ppm within the wing and at the far end of the wing 63 ppm. Further assessment of the building confirmed that one wing had readings.
- By 5:30 a.m., SKEnergy technician advised the manager of the facility to evacuate and that ill staff should seek medical attention
- Shortly after 6:00 a.m., 911 was called and a multi-agency response was triggered including EMS (ambulance) and Fire Dept
- From 7-10 a.m, 14 symptomatic residents transported to local hospital and remaining 24 residents with mild to no symptoms were relocated to another wing and assessed regularly

Transfers to Hospital

- Blood tests on 10 residents who were relocated found carboxyhemoglobin levels and these residents were transported to hospital in the early afternoon
- 14 of 38 residents expressed some form of illness or symptoms
- One resident whose general condition throughout the night was deteriorating was transferred to hospital in the early morning and passed away shortly after arrival to hospital
- One resident was transferred and admitted to hospital the morning of Dec 26 and passed away in hospital on Jan 4, 2011. One resident was transferred to the hospital on Dec 26 and returned to the Villa and passed away on Jan 26, 2011.
- All 3 deaths were referred to the Coroner's office



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Public & Staff

- 1 family member & 1 member of public in resident's room in the wing when exposure occurred
- They report no symptoms and did not seek treatment
- 2 other family members in another resident's room reported feeling very ill. Both attended the hospital and received treatment
- Mgmt reports that all staff potentially exposed to CO were contacted about the need for blood testing, however 2 staff report not being contacted
- 7 of the 8 staff working exhibited varying degrees of symptoms. 6 of the staff were tested and treated
- The emotional and psychological impact of the incident on staff were described to be significant



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Follow up

- Staff filed WCB claims, originally denied and then accepted for PTSD only
- On Jan 4, 2011 SHR's EFAP attended to the Villa to begin counseling sessions and CISD. Group counseling was also provided twice
- Coroner indicates there will be an inquest related to the 3 resident deaths (likely to occur in 2014/15)
- SHR receives 6 contraventions from SK Labour (all have been resolved – training/education, boiler replacement, Code Brown revision)
- Education is conducted annually for all staff re: signs and symptoms of CO by Public Health & EPP as well as when to call 911
- Local laboratory upgrades blood gas analyzer to have carboxyhemoglobin detection capabilities



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CO Reporting, Monitoring & Recording

- Regional policy & procedure developed and co-owned by Enterprise Risk Management & Facilities Management.
- Policy approved in July 2013.
- Mandatory participation is in place for all overnight stay sites, including affiliated agencies within SHR.
- Site responsibilities consist of three basic components:
 - Daily monitoring & recording of all detector readings including “peak level” readings. Elevated readings will be reported and investigated.
 - Retention of monitoring records for a minimum of 12 months.
 - Completing a monthly electronic compliance report and submitting it to the SHR Emergency Planner. By submitting this report, the site Administrator is verifying all required provisions within the program are adhered to.



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Co Reporting, Monitoring & Recording

- Sustained through annual site visits and program audits.
- Manager &/or designate of the facility accompanies representatives from; SHR Facilities Management, the SHR Emergency Planner & ERM Consultant to tour the site.
- The location of each detector is recorded as well as verification that monitoring records are current. General discussion takes place how the site is managing the program, any elevated levels reported and the investigation outcome following these reports.
- Recommendations are made regarding the location of detectors as required.
- Policy includes the escalation procedure to address non-compliance of the program.

Technical and Provincial Follow up

- Original investigation of root cause of CO exposure at SMV was conducted by SHR Facilities Management along with Saskatchewan Government Agencies and HVAC contractors.
- SHR FM research quickly revealed that CSA 6.19 compliant CO monitors would not adequately protect LTC residents from prolonged low level CO exposure.
- The Saskatoon Health Region and the Regina Qu' Appelle Health Region on behalf of all Saskatchewan Health Regions and the Ministry of Health hired Stantec Consulting to prepare a detailed report on Carbon Monoxide causes, exposures and monitoring.



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Technical and Provincial Follow up

- The Stantec report estimated the cost of gas monitoring systems that would meet HealthCare needs would be \$55 million. These systems would not meet the requirements of CSA 6.19 nor would they be compliant with the current National Building Code.
- The Stantec report also made recommendations on Facility Maintenance Operations, assessments of existing facilities for potential problems, as well as new Design and Construction.

SHR Resources

- Lisa Williams, ERM Consultant – Policy Compliance
- Al Krieger, Regional Mgr – Infrastructure Planning – Technical Support
- Dale Gagnon, Property Manager – Facilities Management – Technical Support
- Lori Frank – Director - ERM



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