BOX. Strategies for health-care providers to reduce chronic kidney failure

- **Control diabetes**
  - — Among persons with diabetes, those with glycated hemoglobin (HbA1c) levels of <7% are less likely to have chronic kidney failure (*1*).
  - — Only 37% of adults with diabetes have HbA1c levels of <7% (*2*).
- **Control blood pressure**
  - — Among persons with hypertension, the risk for chronic kidney failure is lower for those who control their blood pressure (*1*).
  - — Only one third of persons with hypertension have their blood pressure under control (*3*).
- **Monitor kidney function**
  - — For persons at high risk for kidney disease, blood and urine screening for elevated creatinine and proteinuria are recommended for determining the risk for most types of chronic kidney disease (*4*).
  - — Persons with elevated creatinine levels can reduce their chances of having chronic kidney failure by being treated with an angiotensin-converting enzyme (ACE) inhibitor (*5*,*6*).
  - — Only 32% of Georgia Medicare beneficiaries with diabetes and a serum creatinine level of >1.5 mg/dL receive an ACE inhibitor at hospital discharge (*7*).

References

1. Phillips CA, Molitch ME. The relationship between glucose control and the development and progression of diabetic nephropathy. Curr Diab Rep 2002;2:523–9.
2. Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. JAMA 2004;291:335–42.
3. Hajjar I, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1988–2000. JAMA 2003;290:199–206.
4. Collins AJ, Kasiske B, Herzog C, et al. Excerpts from the United States Renal Data System 2003 annual data report: atlas of end-stage renal disease in the United States. Am J Kidney Dis 2003;42 (6 Suppl 5):S1–S226.
5. Garg J, Bakris GL. Angiotensin converting enzyme inhibitors or angiotensin receptor blockers in nephropathy from type 2 diabetes. Curr Hypertens Rep 2002;4:185–90.
6. Konzem SL, Devore VS, Bauer DW. Controlling hypertension in patients with diabetes. Am Fam Physician 2002;66:1209–14.
7. McClellan WM, Knight DF, Karp H, Brown WW. Early detection and treatment of renal disease in hospitalized diabetic and hypertensive patients: important differences between practice and published guidelines. Am J Kidney Dis 1997;29:368–75.

toms, and the importance of early detection and treatment also are effective strategies for reducing the prevalence of chronic kidney failure.

References

1. Arias E, Anderson RN, Kung HC, Murphy SL, Kochanek KD. Deaths: final data for 2001. Natl Vital Stat Rep 2003;52(3):1–115.
2. Coresh J, Astor BC, Greene T, Eknoyan G, Levey AS. Prevalence of chronic kidney disease and decreased kidney function in the adult US population: Third National Health and Nutrition Examination Survey. Am J Kidney Dis 2003;41:1–12.
3. Collins AJ, Kasiske B, Herzog C, et al. Excerpts from the United States Renal Data System 2003 annual data report: atlas of end-stage renal disease in the United States. Am J Kidney Dis 2003;42 (6 Suppl 5):S1–S226.
4. US Renal Data System. Researcher's guide to the USRDS database. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2003.
5. US Renal Data System. Chapter eleven: economic costs of ESRD in USRDS 2003 annual data report: atlas of end-stage renal disease in the United States. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2003:161–72.
6. Hajjar I, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1988–2000. JAMA 2003; 290:199–206.
7. Mokdad AH, Ford ES, Bowman BA, et al. Prevalence of obesity, diabetes, and obesity-related risk factors, 2001. JAMA 2003;289:76–9.

Carbon Monoxide Releases and Poisonings Attributed to Underground Utility Cable Fires — New York, January 2000–June 2004

Carbon monoxide (CO) is a potentially deadly gas that is odorless, colorless, tasteless, and nonirritating. Each year, CO poisoning causes approximately 500 unintentional deaths in the United States (*1*). CO is generated during the incomplete combustion of carbon-based fuels such as oil, natural gas, kerosene, coal, charcoal, gasoline, and wood (*1*,*2*). Common sources of CO poisonings include furnaces, generators, and nonelectric space heaters. Another potential cause of CO poisonings is the unintentional burning of underground utility cables. The oxygen-poor environment below ground promotes incomplete combustion and the production of CO. The New York State Department of Health (NYSDOH) documented 234 events during January 2000–June 2004* in which CO releases resulted from underground utility cable fires (also known as CO burnout events). This report describes these events, summarizes data on reported CO burnouts, and discusses associated injuries†. The findings underscore the need for preventive actions, such as installation of CO detectors in central locations in homes

* Data for 2003–2004 are preliminary.
† Includes symptoms and other adverse health effects.

and businesses. In homes, CO detectors should be installed outside of each separate sleeping area (*3*).

In 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) created the Hazardous Substances Emergency Events Surveillance (HSEES) system. This active, multistate[§] health department surveillance system tracks acute morbidity and mortality from releases of nonpetroleum hazardous substances during emergency events[¶] (*4*). The only HSEES data available on CO burnout events are those reported by NYSDOH during the surveillance period of January 2000–June 2004. The HSEES system does not have a variable to identify CO burnout events; to capture these releases, the system was first queried by identifying all CO events and then by conducting a word search on these events with such terms as "burnout(s)" and "manhole fire(s)." The following case reports describe actual HSEES events that are representative of typical CO burnouts that occurred in New York.

Case Reports

Kings County (Brooklyn). In December 2003, an underground cable burnout caused CO to seep into a block of two-family homes. No one was injured; however, at least 20 residents were evacuated overnight as utility workers turned off the electricity. After the electricity was turned off, approximately 65 firefighters from 12 fire companies extinguished the fire. The street was excavated and blowers were installed to disperse the CO.

Queens County (Flushing). In March 2003, an underground cable burnout released CO into the basement of a nursing home. The utility company reported a reading of 300 parts per million (ppm) CO; the recommended indoor air level for CO is <10 ppm for any 8-hour period and <25 ppm for any 1-hour period (*5*). Immediate response and venting by the utility company eliminated any need to evacuate nursing home residents.

Kings County (Brooklyn). In February 2003, a total of 25 children and staff were evacuated from a private school after an underground cable burnout caused elevated CO levels. The fire department measured 115 ppm CO. An emergency crew from the utility company vented the building and allowed evacuees to return after 1 hour.

Bronx County (Bronx). In January 2001, an underground cable burnout caused CO to seep into a laundromat. Four customers were exposed to CO and experienced gastrointestinal symptoms (e.g., nausea and vomiting). All four were treated at a hospital; two were admitted. A hazardous materials crew responded, and the building was evacuated.

Bronx County (Bronx). In May 2000, CO from an underground cable burnout entered the basement of a medical center through conduits and the ventilation intake. CO levels in the basement were 1,300 ppm. An unknown number of building occupants were evacuated. The utility company used blowers to vent the basement. The evacuation lasted 3 hours.

Surveillance Data

During January 2000–June 2004, NYSDOH reported 234 CO burnout events. All occurred in the New York City (NYC) metropolitan area in the following counties: Queens County (73 [31%]), New York County (72 [31%]), Kings County (59 [25%]), Bronx County (29 [12%]), and Richmond County (one [<1%]). The majority of these events (214 [91%]) occurred in commercial or residential areas. More than half (130 [56%]) occurred during November–February.

Twelve of the burnout events resulted in injury to 37 persons, of whom 28 (76%) were members of the general public, five (13%) were firefighters, and four (11%) were of unknown affiliation. The injuries most frequently sustained included dizziness and other central nervous system symptoms and gastrointestinal irritation. Twenty-eight persons (76%) were treated at a hospital; of these, two (7%) were admitted, and 26 (93%) were treated and released. In addition, seven (19%) of the 37 injured persons were treated on the scene; for two (5%) persons, disposition was unknown. No fatalities were reported.

Of the 234 events, 220 (94%) were known to have involved ordered evacuations in which at least 3,855 persons were evacuated (range: one to 810 persons). The average length of these ordered evacuations was 1.7 hours (range: <1–12 hours).

Reported by: *RE Wilburn, MPH, WL Welles, PhD, New York State Dept of Health. DK Horton, MSPH, Z Berkowitz, MSc, WE Kaye, PhD, Div of Health Studies, Agency for Toxic Substances and Disease Registry.*

Editorial Note: CO exposure from indoor sources has long been recognized as a public health hazard; however, the events described in this report illustrate a source that is much less reported — fires in underground utility lines. Underground fires typically begin when the rubber coating of utility cables crack and split because of normal wear and tear, freezing and thawing, and excavation. As the cable insulation is breached, water (i.e., rain or runoff) and road salt from de-icing cause electrical shorts and underground fires. The burning cable and insulation creates noxious emissions containing CO. The CO gas released travels along conduits under streets and

[§] During the period reported, 15 state health departments participated in HSEES: Alabama, Colorado, Iowa, Louisiana, New Jersey, New York, Minnesota, Mississippi, Missouri, North Carolina, Oregon, Texas, Utah, Washington, and Wisconsin.

[¶] An HSEES event is defined as one involving the release or threatened release of a hazardous substance that requires (or would have required) removal, clean-up, or neutralization according to federal, state, or local law (*4*). A hazardous substance (e.g., CO) is one that can reasonably be expected to cause an adverse health effect.

ultimately migrates into residential, commercial, and industrial settings. Smoke and CO also can be emitted from utility portals (i.e., "manholes") and drawn into nearby buildings through ventilation systems. As more lines are buried, CO burnouts might increase in frequency.

Approximately half of these CO burnout events occurred during the snow season. Anecdotal information recorded in the HSEES system suggests that these events often occur when road salt is applied for de-icing after large snow or ice storms. Before several of the CO burnout events in December 2003, approximately 105,000 tons of salt were spread on NYC streets after a snowstorm. The utility company reported that rock salt penetrated into underground electrical cables, leading to fires and CO releases several days later.

Because burning rubber and insulation materials release noxious odors that are highly noticeable, the percentage of CO burnout events with victims probably is lower than that of other traditional CO events with victims. Traditional CO events, particularly those associated with gas appliances, tend to take longer to identify because CO itself has no odor. Although few injuries resulted from the CO burnout events described in this report, thousands of persons were evacuated.

Common symptoms of CO poisoning include headache, dizziness, weakness, nausea, vomiting, loss of muscle control, shortness of breath, chest tightness and pain, visual changes, sleepiness, fluttering of the heart, and confusion. At higher CO levels, loss of consciousness and death can occur (*1,2,5*).

The findings in this report are subject to at least three limitations. First, ATSDR began collecting data on CO burnout events in January 2000; CO events before 2000 were not captured. Second, a major utility company in NYC voluntarily reported these CO burnout events; however, reporting of these events is not required. Finally, discussions with staff of the NYC Department of Health and Mental Hygiene indicated that not all events were captured by the project. Therefore, the true number of CO burnout events in NYC was likely underreported.

Certain actions can decrease or prevent exposure from CO burnout events. The public should be aware that emissions from underground utility fires might contain CO, which can migrate into living and working spaces. CO detectors, which sound an alarm in the presence of elevated CO, are effective at preventing fatalities from CO poisoning (*3*). CO detectors should be installed in central locations in homes and businesses. In homes, CO detectors should be installed outside of each separate sleeping area (*3*). Proper sealing of existing conduits at building interfaces can reduce smoke and CO entry into interior spaces. In addition, sealing utility chases can prevent smoke migration throughout the building. Finally, preventive maintenance of underground utility lines can reduce the frequency of these events.

References

1. CDC. Carbon monoxide poisoning: what's the problem? Atlanta, GA: US Department of Health and Human Services, CDC; 2004. Available at http://www.cdc.gov/nceh/airpollution/carbonmonoxide/cofaq.htm.
2. New York State Department of Health. Hazard alert: carbon monoxide. Troy, NY: Bureau of Toxic Substance Assessment; 2001. Available at http://www.health.state.ny.us/nysdoh/indoor/co.htm.
3. National Fire Protection Agency. NFPA fact sheets: carbon monoxide poisoning. Available at http://www.nfpa.org/Research/NFPAFactSheets/CO/co.asp.
4. Agency for Toxic Substances and Disease Registry. Hazardous Substances Emergency Events Surveillance system biennial report, 1999–2000. Atlanta, GA: US Department of Health and Human Services, ATSDR; 2001. Available at http://www.atsdr.cdc.gov/HS/HSEES.
5. World Health Organization. WHO air quality guidelines. Copenhagen, Denmark: WHO Regional Publications; 2000. European series no. 91. Available at http://www.euro.who.int/document/aiq/5_5carbon monoxide.pdf.

West Nile Virus Activity — United States, September 29–October 5, 2004

During September 29–October 5, a total of 81 cases of human West Nile virus (WNV) illness were reported from 18 states (Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Iowa, Kansas, Kentucky, Minnesota, Missouri, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, and Virginia).

During 2004, a total of 40 states have reported 1,865 cases of human WNV illness to CDC through ArboNET (Table and Figure). Of these, 583 (31%) cases were reported in California, 370 (20%) in Arizona, and 225 (12%) in Colorado. A total of 1,071 (58%) of the 1,833 cases for which such data were available occurred in males; the median age of patients was 51 years (range: 1 month–99 years). Illness onset ranged from April 23 to September 23; a total of 59 cases were fatal.

A total of 177 presumptive West Nile viremic blood donors (PVDs) have been reported to ArboNET in 2004. Of these, 70 (40%) were reported in California; 37 (21%) in Arizona; 15 in Texas; 12 in New Mexico; five each in Colorado, Louisiana, and Nevada; four each in Georgia and Oklahoma; three each in Florida and South Dakota; two each in Minnesota, Missouri, and Wisconsin; and one each in Delaware, Iowa, Michigan, Nebraska, New Jersey, North Dakota, Oregon, and Pennsylvania. Of the 177 PVDs, three persons aged 35, 69, and 77 years subsequently had neuroinvasive illness, and 36 persons (median age: 53 years; range: 17–73 years) subsequently had West Nile fever.

In addition, during 2004, a total of 4,706 dead corvids and 1,138 other dead birds with WNV infection have been