"9-1-1, where is your emergency?"
"I need an ambulance right away. I think my 16-year-old daughter has taken some pills."

This exchange between a caller and the emergency medical dispatcher (EMD) is not uncommon. Therefore, EMDs need a basic understanding of overdoses and poisoning emergencies so they can appropriately handle such requests for assistance.

Overdose can be defined as too great a dose of a therapeutic agent or as a lethal or toxic amount of a drug. A substance that through its chemical action usually kills, injures or impairs an organism, or inhibits the activity of another substance or the course of a reaction or process is defined as a *poison*.

Overdose/poisoning calls typically fall into one of two categories: intentional overdose and accidental ingestion.

Drugs can affect the entire body. The effects of a drug overdose may be a heightened level of the drug's therapeutic effects. Side effects may become more apparent or noticeable as well. Large amounts of some medications may cause only minimal effects; whereas, smaller amounts of other medications can cause severe effects and possibly death. A single dose of many medications can be lethal for a young child. And some overdoses can worsen a chronic illness, thereby causing a person to experience chest pains or have an asthma attack.

POISONING OVERVIEW

A poison can be introduced into the body by four means: ingestion (or swallowing), inhalation (or breathing it in), absorption (by contact through the skin) or injection (typically introduced by needle or syringe, bites or stings). Approximately 80% of all poisoning is by ingestion.

Poisons that are ingested include liquids, contaminated foods, alcohol, medication, household cleaners, garden items, plants and, in the majority of cases, drugs—over the counter, prescription and illicit.

Inhaled poisons include fumes from household products, such as glue, paint and cleaners, illegal drug manufacture and pesticides; and such gases as carbon monoxide (e.g., by-products of car exhaust, a malfunctioning furnace and smoke), carbon dioxide (e.g., released by sewers and other sources) and chlorine (e.g., emanating from a pool).

Absorbed poisons enter the body through the skin. A person may report touching or coming into contact with poisonous plants, fertilizers or pesticides. Corrosive substances, as well as acids, alkalis and some petroleum products, will damage the skin and are very destructive.

Injected poisons enter the body through bites or stings of insects, spiders, ticks, marine life, snakes and other animals, or medications or drugs injected with a hypodermic needle.

OVERDOSE OVERVIEW

Overdoses of drugs or chemicals can be either accidental or intentional. Overdoses occur when a person takes more than the prescribed or recommended dose. However, some people may be more sensitive to certain medications, and taking the high end of the therapeutic range could be toxic for them. An *overdose*, as defined for dispatch, is a purposeful and intentional ingestion. The patient also has a motive for their action. An accidental ingestion is described as an unplanned or unintentional intake.

Drugs are generally classified as prescription drugs, nonprescription drugs or illicit drugs. Prescription drugs require a physician's authority to purchase them. Common examples are Valium, morphine and Vicodin. Non-prescription drugs can be purchased over the counter without prescriptions. They include medications for headache, cough elixirs and mild medications that can be purchased at any type of store. Common examples are Tylenol, Advil and Vicks cough syrup. Many medications that once were available only by prescription are now available over the counter.

Illicit drugs are imported, grown or manufactured illegally. All illicit drugs are dangerous by definition and usually imply a degree of dependence and, in some cases, addiction. Common examples are heroin, cocaine, amphetamines, LSD, marijuana and methamphetamines. Drugs used to get high, or illicit drugs, may be taken in overdose amounts when the person's metabolism cannot detoxify the substance fast enough to avoid the side effects.

ACCIDENTAL OR UNINTENTIONAL OVERDOSES

According to the U.S. Centers for Disease Control and Prevention (CDC), the mortality rate due to unintentional drug overdose (not including alcohol) has risen steadily since the early 1970s. Over the past 10 years, the mortality rate has reached historic highs. Mortality is currently four to five times higher than during the "black tar" heroin epidemic in the mid-1970s and more than twice what it was during the peak years of crack cocaine use in the early 1990s. The number of drug overdose deaths does not yet exceed the number of motor vehicle crash deaths, but more people in the 45- to 54-year-old age group now die of drug overdoses than from traffic crashes.

Accidental overdoses frequently occur when a young child or an adult with impaired mental abilities swallows a medication that has been left within their reach. Elderly people or anyone taking multiple medications can mistakenly ingest an incorrect medication or take the wrong dose. But recent studies by the CDC indicate that the vast majority of unintentional drug overdose deaths are not the result of toddlers getting into medicines or the elderly mixing up their pills. Rather, all available evidence suggests that accidental overdose deaths are related to the increasing use of prescription drugs, especially opioid (i.e., possessing some properties characteristic of opiate narcotics but not derived from opium) painkillers, among people during the working years of life. Other evidence suggests that most of these deaths involve the misuse and abuse of prescription drugs.

Accidental drug overdose may be the result of misuse of prescription or commonly used medications, such as pain

relievers or cold remedies. Signs and symptoms differ by drug taken. Some drugs commonly involved in overdoses are:

Acetaminophen (generic for Tylenol): Overdose of acetaminophen causes liver damage with symptoms that include loss of appetite, fatigue, nausea and vomiting, pale skin and sweating. As the symptoms progress, abdominal pain and tenderness, swelling of the liver and abnormal blood test for liver enzymes indicate liver failure. In the later stages of liver failure, the patient becomes jaundiced, exhibiting yellowing of the skin and whites of the eyes.

Anticholinergic drugs: Drugs that block the neurotransmitter acetylcholine in the central and peripheral nervous systems include atropine, antihistamines and antipsychotic agents. Overdose of these drugs cause the skin and moist tissues (mouth and nose) to become dry and flushed. Other symptoms include dilated pupils, inability to urinate and mental disturbances. Severe toxicity can result in seizures, abnormal heart rhythms, extremely elevated blood pressure and unconsciousness.

Antidepressant drugs: Used to treat or prevent depression, this class of drugs includes amitriptyline, desipramine and nortriptyline. Overdoses of these drugs can cause irregular heart rate, vomiting, low blood pressure, confusion and seizures.

Cocaine and crack cocaine: Cocaine overdoses can cause seizures, high blood pressure, increased heart rate, paranoia and other changes in behavior. Heart attack and stroke are serious risks within three days after a cocaine overdose.

Depressants: This class of drugs, which includes tranquilizers, anti-anxiety drugs and sleeping pills, causes sleepiness, slowed or slurred speech, difficulty walking or standing, blurred vision, impaired ability to think, disorientation and mood changes. Signs and symptoms from overdose include slowed breathing, very low blood pressure, stupor, unconsciousness, shock and death.

Digoxin: Overdose from digoxin, a drug used to regulate the heart, can cause irregular heart rate, nausea, loss of appetite and blurred vision.

Narcotics or opiates: Overdoses of such drugs as heroin, morphine and codeine cause sleepiness, low blood pressure, slowed heart rate and slowed breathing. Pinpoint pupils are also common in opiate overdose. However, if other drugs are taken at the same time as an opiate, the pinpoint pupil effect may be counteracted. A serious risk of opiate overdose is that the patient will stop breathing.

Salicylates: Found in aspirin and some creams or ointments used for muscle and joint pain, and creams for psoriasis (a skin condition), salicylates cause symptoms that initially include gastrointestinal irritation, fever and vomiting with blood. Metabolic acidosis and respiratory alkalosis, conditions in which the body's acid/base balance malfunctions, can occur. Symptoms from salicylate overdose include rapid heart rate and fast breathing. Nervous system symptoms include confusion, hallucinations, tiredness and ringing in the ears. An increased tendency to bleed is also common. Serious complications include acute renal failure, unconsciousness and heart failure. Acute salicylate poisoning can lead to death.

More people age 45–54 years old now die of drug overdoses than from traffic crashes.

RECEIVING THE CALL

If you receive a call reporting a possible overdose or poisoning, it's important to immediately determine whether it is intentional or accidental. The procedure on how to handle the call, as well as the questions to ask, may vary by the type of call. Refer to your local policies and procedures, as well as your local EMD guidecards.

If the caller is the patient, consider the possibility that you're dealing with a suicide attempt. You may need to alter your approach and change some questions. It's also important to remember that the substance that has been ingested may affect the patient's level of consciousness. Thus, you may not have a lot of time to ask questions.

For the purpose of this example, the scene is safe and the caller can answer questions and assist the patient as requested by the EMD. Upon completion of the All-Callers Interrogation and determining Overdose/Poisoning as the chief complaint, Vital Points Questions may include:

- Is the patient acting normally? What is different?
- Is the patient violent?
- Do you have any idea what the patient took?
- If the patient took a medication, was it by prescription?
- What medication(s) did the patient take? How much?
- If it wasn't medication, what substance did the patient take?
- Has the patient used street or nonprescription drugs? With alcohol?
- If cocaine or crack was taken, is the patient complaining of any pain? Is so, where?

If possible, have the caller locate the container and read the label to you. To prevent any confusion caused by mispronunciation, have the caller spell the drug name for you. Many drugs are spelled and pronounced similarly but their effects can be completely different. It may be difficult to determine how much the patient ingested. Again, you may have to refer to the container and its label. When was the prescription filled? How many doses were in the container? How many are left? Use this information and the date filled to calculate the amount that may have been taken.

Scene safety is also imperative during questioning, especially if the call is perceived to be a suicide attempt. Someone willing to take their own life may be willing to take someone else's as well. A suicide attempt is universally understood to be

a criminal act, and, due to the potential danger to EMS units, law enforcement should be dispatched to all overdose calls. EMS units should also be encouraged to stage until law enforcement has secured the scene. The safety of the caller should also be ensured. If the caller feels they are in danger, instruct the individual to leave the area.

Once EMS and law enforcement have both been dispatched to the scene, continue with the call and give pre-arrival instructions to the caller. Your pre-arrival instructions may include:

- Monitor and maintain the airway, especially if the patient is nauseated or vomiting or the level of consciousness is decreased. Do not place a pillow under the patient's head.
- Keep the patient in a position of comfort. Calm and reassure the patient. Keep the patient warm.
- Get the container of the substance taken and have it ready for EMS personnel.
- Don't force the patient to drink coffee or place them in the shower.
- Give nothing by mouth, including Ipecac, unless advised to do so by Poison Control (if consulted per agency policy and procedures).
- Protect the patient from further injury from themselves, if safe to do so.
- If the phone call is completed prior to responders' arrival on scene, advise the caller to call back immediately if the patient's condition changes or worsens.

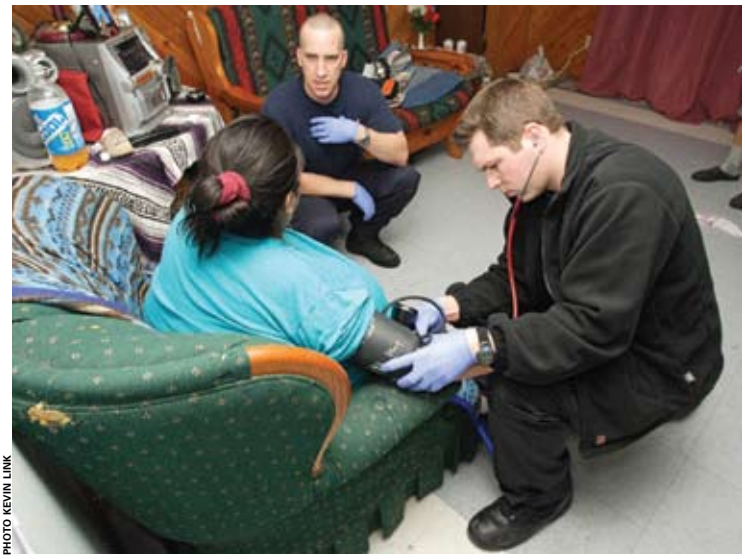

PHOTO KEVIN LINK

Law enforcement should be dispatched to all overdose calls to secure the scene and ensure the safety of EMS providers.

EMERGENCY CARE

Upon arrival at a hospital, treatment of a drug overdose patient will be dictated by the specific drug taken. The information passed on by EMS personnel to the emergency staff, such as the amount taken, the time taken and underlying medical problems, will be very helpful.

At the hospital:

Blood tests can be used to detect changes in body chemistry that may give clues to what drugs were taken. Blood can also be screened for various drugs in the system. If the drug was unknown, once it is identified, blood tests can be used to monitor how fast the drug is being cleared out of the body.

Urine tests can also be used to screen for some drugs and to detect changes in the body's chemistry. Blood and urine tests may also show if there is damage to the liver or kidneys as a result of the overdose.

The patient's airway is assessed to make sure the trachea is not blocked. If needed, a tube can be inserted through the patient's mouth and into the trachea (intubation) to help the patient breath.

The patient's heart rate, blood pressure, temperature and other physical signs are assessed as well.

Elimination of the drug that has not yet been absorbed is attempted. Vomiting may be induced.

Gastric lavage (pumping of the stomach) may be attempted to remove unabsorbed drugs from the stomach. For this procedure, a flexible tube is inserted through the nose, down the throat and into the stomach. A solution of salt water is injected into the tube, and the contents of the stomach are then suctioned out through the tube.

Activated charcoal may be given to help bind drugs and keep them in the stomach and intestines. This reduces the amount absorbed into the blood. The drug bound to the charcoal is then expelled in the patient's bowel movement. Often, a laxative is given with activated charcoal so the person has a quicker bowel movement.

Medication to stimulate urination or defecation may be given to try to flush the excess drug out of the body faster.

Intravenous (IV) fluids may be given. Increasing fluids can help flush the drug out of the system and reestablish balance of fluids and minerals in the body. The acid/base balance of the body (pH) may need to be corrected by the administration of electrolytes (e.g., sodium, potassium and bicarbonate) through the IV. Any additional drugs can be quickly administered through the IV as well.

Hemodialysis may have to be used to filter drugs out of the blood. With this procedure, blood is circulated out of the body, pumped through a dialysis machine and reintroduced into the body. If the kidneys are damaged due to the overdose, hemodialysis may have to be used temporarily or even long term.

For certain overdoses, other medications may need to be given to serve as an antidote and reverse the effects of, or prevent even more harm from, the drug that was initially taken.

An agitated or violent patient may need physical restraint and sometimes sedating medications until the effects of the drugs wear off. Restraining a patient can be disturbing for the patient and for family members to witness. However, it's important to remember that medical personnel are trying to protect the person they're treating, as well as themselves.

A psychiatric evaluation may be recommended if the drug overdose was taken intentionally.

PATIENT OUTCOME

A person who overdoses may recover completely and without lasting physical

disability. However, there can be serious consequences. Some drug overdoses can cause the failure of major organs, such as the kidneys or liver, or failure of whole systems, such as the respiratory or circulatory system. Patients who survive a drug overdose may need kidney dialysis, a kidney or liver transplant, or ongoing care due to heart failure, stroke or unconsciousness. Death can occur in almost any drug overdose, especially if treatment is not started immediately.

PREVENTION

To prevent accidental overdoses, medications, even over-the-counter pain relievers and vitamins need to be kept in a safe, secure place. To protect children from an accidental drug overdose, all medications should be stored in containers with child-resistant caps. All drugs should be kept out of sight and out of reach of children, preferably in a locked cabinet. People with certain mental illnesses need the help of family and friends to assist with medication therapy and to lend social support. Drug abusers also need this same support to stay clean and safe. Make sure elderly people understand how to take their medication and can differentiate one medication from another. It may be safest to provide some sort of supervision for the elderly person taking medication.

Prescription medications should be used according to directions and only by the person whose name is on the label. Threats of suicide need to be taken seriously and appropriate help sought for people with depression or other mental illness that may lead to suicide. ||PSC||

RESOURCES

- APCO Institute: Emergency Medical Dispatch Guidecards: www.apcointl.com/institute/index.htm
- APCO Institute: Emergency Medical Dispatcher Manual, Version 5.2: www.apcointl.com/institute/index.htm
- Web MD: www.webmd.com
- U.S. Department of Transportation, National Highway Traffic Safety Administration, EMT-Basic: National Standard Curriculum
- Medline Plus Medical Dictionary: www.nlm.nih.gov/medlineplus/mplusdictionary.html
- eMedicineHealth: www.emedicainehealth.com
- U.S. Department of Health & Human Services: www.hhs.gov
- Drug Overdose: www.drug-overdose.com
- Health A to Z: www.healthatoz.com

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CDE #24280: OVERDOSE & ACCIDENTAL POISONING

1. ***Fill in the blank:*** **[_____] can be defined as too great a dose of a therapeutic agent or a lethal or toxic amount of a drug.**

2. ***Fill in the blank:*** **A substance that through its chemical action usually kills, injures or impairs an organism, or that inhibits the activity of another substance or the course of a reaction or process is defined as a [_____].**

3. **A poison can be introduced into the body by:**
   a. ingestion.
   b. inhalation.
   c. absorption.
   d. injection.
   e. all of the above.

4. **Approximately 80% of all poisoning is by mouth.**
   a. True
   b. False

5. **An *overdose*, as defined for dispatch, is a purposeful and intentional ingestion.**
   a. True
   b. False

6. ***Fill in the blank:*** **Drugs are generally classified as prescription drugs, nonprescription drugs and [_____].**

7. **Prescription drugs do not require a physician's authority to purchase them.**
   a. True
   b. False

8. **A suicide attempt is universally understood to be a criminal act, and, due to the potential danger to EMS units, law enforcement should be dispatched to all overdose calls.**
   a. True
   b. False

9. ***Fill in the blank:*** **Gastric lavage or [_____] may be attempted to remove unabsorbed drugs from the stomach.**

10. ***Fill in the blank:*** **[_____] may be given to help bind drugs and keep them in the stomach and intestines.**

Using the CDE Articles for Credit

APCO Institute Continuing Dispatch Education

1. Study the CDE article in this issue.
2. Answer the test questions using this form. Photocopies are acceptable, but don't enlarge them.
3. Fill out the appropriate information section(s), and submit the form to:

   APCO Institute
   351 N. Williamson Blvd.
   Daytona Beach, FL 32114

   Questions? Call us at 888/APCO-9-1-1.

ORDERING INFORMATION:

If you are **APCO certified** and will be using the CDE tests for recertification, complete this section and return the form when you send in your request for recertification. **Do not send in the tests every month.** There is no cost for APCO-certified personnel to use the CDE article program.

APCO Instructor Certificate # _____

Expiration Date: _____

APCO EMD Basic Certificate # _____

Expiration Date: _____

If you are **not APCO certified** and would like to use the CDE tests for other certifications, fill out this section and send in the completed form with payment of $15 for each test. You will receive an APCO certificate in the mail to verify test completion. (APCO instructors and EMD students please use section above also.)

Name: _____

Title: _____ Organization: _____

Address: _____

Phone: _____ Fax: _____

E-mail: _____

I am certified by: ❑ MPC ❑ PowerPhone ❑ Other

If other, specify: _____

❑ My check is enclosed, payable to APCO Institute for $15.
❑ Use the attached purchase order for payment.