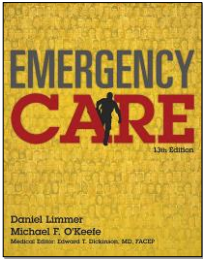


Emergency Care

THIRTEENTH EDITION



CHAPTER 21

Poisoning and Overdose Emergencies

Daniel Limmer
Michael T. O'Keefe
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Poisoning

- A poison is any substance that can harm the body.
- The harm it can cause can result in a medical emergency.

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Poisoning

- Common poisonings
 - Acetaminophen and Aspirin
 - Other Medications
 - Acids and Alkalis
 - Petroleum products
 - Cosmetics
 - Pesticides and Insecticides
 - Plants
 - Food

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Poisoning

- Harm to body based on:
 - Nature of poison,
 - Its concentration,
 - Route of entry,
 - Patient's age, weight, and health
- Damage to skin and tissues from contact
- Suffocation
- Localized or systemic damage to body systems

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Poisoning


- Classified by route
 - Ingested (swallowed)
 - Inhaled (breathed in)
 - Absorbed (through unbroken skin)
 - Injected (inserted through skin)



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Pediatric Note

- EMT's own home and squad building should be "childproofed" against poisoning.
- Community poison prevention program



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Ingested Poisons

- Child
 - Accidentally eat or drink a toxic substance
- Adult
 - Often an accidental or deliberate medication overdose



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Patient Assessment

- What substance was involved?
 - Look for container; check labels.
 - Transport with patient to hospital.
- When did exposure occur?
 - Quick-acting poison requires faster treatment.
 - ER personnel need to know for appropriate testing and treatment.

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Patient Assessment

- How much was ingested?
 - Estimate missing pills by looking at prescription label.
- Over how long a time did the ingestion occur?
 - Treatments may vary.
 - Was medication taken for very first time?
 - Was medication being taken chronically?

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Patient Assessment

- What interventions have been taken?
 - Treatments indicated on label
 - Other home remedies (syrup of ipecac)
- What is patient's estimated weight?
 - Rate of onset of toxic effects is related to weight.

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Patient Assessment

- What effects has patient experienced?
 - Nausea, vomiting, altered mental status, abdominal pain, diarrhea, chemical burns around mouth, and unusual breath odors



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Consider

- Is my scene safe?
- Risk of vomiting or airway compromise?
- Additional resources?
 - ALS
 - Poison Control
 - Medical Direction

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Food Poisoning

- Can be caused by improperly handled or prepared food
- Symptoms
 - Nausea, vomiting, abdominal cramps, diarrhea, and fever
- May occur within hours of ingestion, or a day or two later

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Activated Charcoal

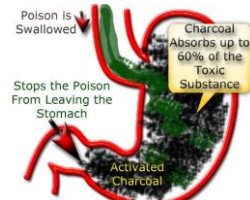
- Works through adsorption, allowing substances to attach to its surface
- *Not an antidote*
 - Prevents or reduces amount of poison absorbed by body
- Names
- Contraindications
- Form
- Dosage



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Activated Charcoal

- Many poisons but not all are absorbed by activated charcoal.
- Medical direction will determine if the use of this substance is appropriate.



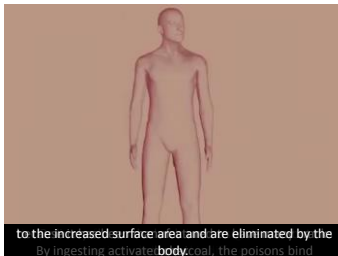
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Activated Charcoal

- Activated charcoal versus syrup of ipecac
 - Traditionally syrup of ipecac was preferred treatment for poisoning.
 - Induces vomiting in most people with one dose
 - However, has potential to make patient aspirate and only removes less than one-third of stomach contents

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Activated Charcoal Use Animation



Click the screenshot to view an animation illustrating the use of activated charcoal.

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Dilution

- Adult patient should drink one to two glasses of water or milk.
- Children should drink one-half to one full glass of water or milk.
- Water may slow absorption, but milk may soothe stomach upset.
- Frequently advised for patients who, as determined by medical direction, do not need transport

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Antidotes

- Thought of as substance that will neutralize the poison or its effects
 - Very few genuine antidotes exist.
- Naloxone directly reverses narcotics' depressant effects on level of consciousness and respiratory drive.

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Ingested Poisons



First Take Standard Precautions. 1. Quickly gather information. **Note:** When a patient has ingested a poison, it provides another reason to avoid mouth-to-mouth contact. Provide ventilations through a pocket face mask or other barrier device.

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Ingested Poisons



2. Call medical direction on the scene or en route to the hospital.

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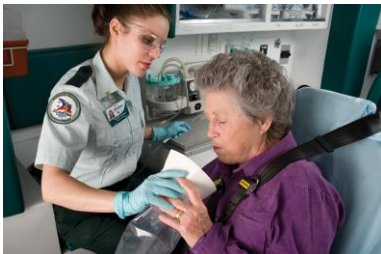
Ingested Poisons



3. If directed, administer activated charcoal. You may wish to administer the medication in an opaque cup that has a lid with a hole for a straw.

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Ingested Poisons



4. Position the patient for vomiting and save all vomitus. Have suction equipment ready.

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Think About It

- Think about your own home. Is it safe for a small child?
- Are there potential poisons within 3 feet of the floor, or behind unlocked doors?
- Are there household cleaners that look like juices and drinks familiar to children?



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Think About It

- Can flavored children's medications be mistaken for candy?
- What sense does a small child typically use to identify things?



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Inhaled Poisons

- Common types
 - Carbon monoxide
 - Ammonia
 - Chlorine gas
 - Agricultural chemicals and pesticides
 - Carbon dioxide



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Inhaled Poisons

- Scene safety
 - Approach scene with caution.
 - Protective clothing and self-contained breathing apparatus may be required.
 - If not trained or equipped, call for additional resources.



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Inhaled Poisons

- Signs and symptoms
 - Difficulty breathing
 - Chest pain
 - Coughing
 - Hoarseness
 - Dizziness
 - Headache, confusion, or altered mental status
 - Seizures

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Patient Assessment

- What substance (exact name)?
- When did exposure occur?
- Over how long did exposure occur?
- What interventions has anyone taken?
 - Did someone remove patient?
 - Did someone ventilate the area?
- What effects is patient experiencing?

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Patient Care

- Move patient from unsafe environment using trained and equipped personnel.
- Detect and treat immediately life-threatening ABC's in primary assessment.
- Perform secondary assessment, obtain vital signs.



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Patient Care

- Administer high-concentration oxygen
- Transport with all containers, bottles, and labels
- Perform reassessment en route

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Carbon Monoxide

- Colorless, odorless, tasteless gas created by combustion
- Can be caused by improper venting of fireplaces, portable heaters, generators
- Common cause of death during winter and power outages



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Carbon Monoxide

- Signs and symptoms of poisoning
 - Headache, especially "a band around head"
 - Dizziness
 - Breathing difficulty
 - Nausea
 - Cyanosis
 - Altered mental status
 - In severe cases, unconsciousness



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Carbon Monoxide

- Treatment
 - Patient may begin to feel shortly after being removed from dangerous environment.
 - Administer 100 percent oxygen.
 - Transport to hospital.
 - Takes time to "wash out" CO from bloodstream



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Smoke Inhalation

- Smoke from burning materials can contain poisonous and toxic substances, including CO, ammonia, chlorine, cyanide.
- Substances can irritate skin and eyes, damage lungs, and progress to respiratory or cardiac arrest.

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Smoke Inhalation

- Signs and symptoms
 - Difficulty breathing
 - Coughing
 - "Smoky" or chemical smell on breath
 - Black (carbon) residue in mouth, nose or sputum
 - Singed nasal or facial hair



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Smoke Inhalation

- Treatment
 - Move patient to safe area.
 - Assess patient.
 - Maintain airway.
 - Provide high-concentration oxygen.
 - Monitor patient closely.
 - Airway burns may lead to swelling of airway.

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"Detergent Suicides"

- Method of suicide started in Japan and becoming more common in the U.S.
- Mix of two easily obtained chemicals to release toxic hydrogen sulfide gas
- Commonly released inside enclosed space such as a car



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"Detergent Suicides"

- Scene safety
 - Exposure to fumes may injure EMS personnel.
 - Warning note may be left on vehicle, but this is not assured.
 - May need to treat first as a hazmat scene

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Absorbed Poisons

- Can be absorbed through skin
- May or may not cause damage to skin
- Patient may require decontamination prior to treatment



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Patient Assessment

- What substance?
- When?
- How much?
- Over how long?
- What interventions has anyone taken?
- What effects is the patient experiencing?

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Patient Care

- Assess for immediate life-threatening problems in primary assessment.
- Perform secondary assessment, obtain vital signs.
- Remove powder by:
 - Brushing off powder
 - Irrigating with clean water for at least 20 minutes and during transport

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Patient Care

- Transport with all containers, bottles, SDSs, and labels from substance.
- Perform reassessment en route.



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Injected Poisons

- Most common are:
 - Illicit drugs injected with a needle
 - Venom of snakes and insects



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Poison Control Centers

- Excellent resource
- Information on poisons, signs and symptoms, and treatments
- Follow local protocol for contact procedures.



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Alcohol and Substance Abuse

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Alcohol and Substance Abuse

- Many patients whose conditions are caused either directly or indirectly by alcohol or substance abuse
- Abuse of alcohol and other drugs crosses all geographic and economic boundaries.

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Alcohol Abuse

- Potent drug affects central nervous system.
- Can be addictive
- Chronic versus emergent
- Treat patients as any others.
- Abuse can lead to or worsen other medical conditions.

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Alcohol Abuse

- Alcohol often consumed with other drugs, which can result in a serious medical emergency.
- Impaired patients can be uncooperative or combative.
- Contact law enforcement if safety concern.

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Alcohol Abuse

- Signs and symptoms
 - Alcohol odor on breath or clothing
 - Swaying or unsteady on feet
 - Slurred, rambling speech
 - Flushed, complaining of being warm
 - Nausea/vomiting
 - Poor coordination
 - Slowed reaction time

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Alcohol Abuse

- Signs and symptoms
 - Blurred vision
 - Confusion
 - Hallucinations, visual or auditory
 - Lack of memory (blackout)
 - Altered mental status

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Alcohol Abuse

- Alcohol withdrawal
 - Abrupt cessation of drinking may cause some alcoholics to suffer from delirium tremens (DTs).
 - Can be serious, resulting in tremors, hallucinations, and seizures

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Alcohol Abuse

- Alcohol withdrawal
 - Signs and symptoms
 - Confusion and restlessness
 - Unusual behavior
 - Hallucinations
 - Gross tremor of hands
 - Profuse sweating
 - Seizures
 - Hypertension
 - Tachycardia

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Patient Assessment

- Many medical conditions mimic alcohol intoxication.
- Intoxicated patients may also have medical problems.
- All patients receive full assessment regardless of suspicion of intoxication.

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Patient Care

- Vomiting common
 - Standard precautions are essential.
- Keep suction ready.
- Stay alert for airway and respiratory problems.
- Be alert for changes in mental status.

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Patient Care

- Monitor vital signs.
- Treat for shock.
- Gather history from patient, bystanders.
- Stay alert for seizures.
- Transport the patient to a medical facility.

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Substance Abuse

- Any chemical substance taken for other than therapeutic (medical) reasons
- Includes uppers, downers, narcotics hallucinogens, and volatile chemicals

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Substance Abuse



These substances are often abused.

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Substance Abuse

- Uppers
 - Stimulants that affect the nervous system
 - Cocaine
 - Amphetamines
 - May be snorted, smoked, or injected

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Substance Abuse

- Uppers
 - Signs and symptoms
 - Excitement, restlessness
 - Increased pulse and breathing rates
 - Sweating
 - Hyperthermia
 - No sleep for a long time, possibly days

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Substance Abuse

- Downers
 - Central nervous system depressants
 - Barbiturates
 - Rohypnol (roofies)
 - GHB (gamma hydroxybutyrate)
 - Signs and symptoms
 - Sluggishness, poor coordination
 - Decreased pulse and respirations

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Substance Abuse

- Narcotics
 - Used to relieve pain or help with sleep
 - Opiates
 - Heroin, codeine, morphine
 - OxyContin (oxycodone)

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Substance Abuse

- Narcotics
 - Signs and symptoms
 - Reduced rate of pulse and rate and depth of breathing
 - Lethargy (being very sleepy)
 - Pinpoint pupils
 - Profuse sweating
 - Coma

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Substance Abuse

- Hallucinogens
 - Create intense state of excitement and distorted perception
 - LSD, PCP, XTC
 - Signs and symptoms
 - Rapid pulse
 - Dilated pupils
 - Flushed face
 - Seeing or hearing things

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Substance Abuse

- Volatile chemicals
 - Produce vapors that are inhaled
 - Initial "rush" can act as central nervous system depressant.



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Substance Abuse

- Volatile chemicals
 - Signs and symptoms
 - Dazed/disoriented
 - May develop a coma
 - Swollen membranes in nose or mouth
 - "Funny numb feeling" or "tingling" inside head
 - Changes in heart rhythm

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Patient Assessment

- May be difficult
 - Patient's level of consciousness
 - Patient may have taken more than one type of drug.
- Patient may be uncooperative or combative.
- Be aware of a possibility of contaminated needles and the presence of chemicals.

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Patient Care

- Airway & Breathing – Control airway, provide oxygen, be prepared to assist ventilations
- Treat for shock.
- Keep them calm and cooperative.
- Perform physical exam.
- Look for evidence of injection sites ("track marks").



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Patient Care

- Transport as soon as possible.
- Consult with medical control according to local protocols.
- Perform reassessment with monitoring vital signs.
- Continue to reassure patient throughout all phases of care.

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Naloxone

- Naloxone is an opioid (narcotic) antagonist that may reverse central nervous system and respiratory depression secondary to an overdose of opioids.
- Naloxone is not effective against respiratory depression due to non-opioid drugs.

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Common Opioids

- | | |
|----------------------------|-------------------------|
| • Heroin | • Morphine |
| • Buprenorphine | • Nalbuphine (Nubain) |
| • Butorphanol (Stadol) | • Oxycodone (Percocet) |
| • Codeine | • Oxymorphone |
| • Fentanyl | • Pentazocine |
| • Hydrocodone (Vicodin) | • Paregoric |
| • Hydromorphone (Dilaudid) | • Propoxyphene (Darvon) |
| • Meperidine (Demerol) | • Methadone |

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Signs and Symptoms of Opioid Toxicity

- Unresponsive or minimally responsive, with a pulse
- Depressed respiratory rate
- Agonal respirations
- Respiratory arrest
- Cyanosis
- Miosis (constricted pupils)



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Scene

- Scene Safety is top priority
- Ensure you have enough resources present
- Remain non-judgmental and non-confrontational
- Attempt to determine what was ingested, inhaled, or injected and when.
- Consider there may have more than one substance used.
- Remember naloxone may have been administered by a bystander prior to your arrival
 - Do not let that stop you from administering more if the patient needs it.

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Naloxone Drug Profile

- Opiate antagonist
- Binds to the opioid receptors and blocks the effects of narcotics
- Respiratory arrest or hypoventilation
- No known contraindications
- Side effects: Nausea/vomiting, restlessness, diaphoresis, tachycardia, hypertension or hypotension, narcotic withdrawal

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Naloxone Supply



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Dosage

- 0.4mg intramuscular auto-injector
- 2-4mg intranasal
- Physician oversight may direct different dosing



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The Right Situation

- "Addicts take opiates and other sedatives specifically to induce a pleasant stupor. If they're lethargic and hard to arouse, but still breathing effectively, it's not an overdose. It's a dose."
- Boston paramedic
- Naloxone is for depressed respirations, not depressed mental status.
- Opiate use alone (without depressed respirations) does not merit the use of naloxone.

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Naloxone Use

- Ensure scene safety and PPE
- Assess level of consciousness and vital signs including oxygen saturation and blood glucose level
- Maintain open airway and provide tactile stimulation
- Assist ventilations
- Ensure appropriate resources are responding (call for ALS!)
- Administer naloxone when indicated
- Initiate transport as soon as possible

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Naloxone Use

- Document the time, dose and route given
- Watch for and assess patients response to treatment
 - Be aware: the patient may become combative
- Document response to treatment
- Frequently reassess your patient as many patients require more than one dose
 - Naloxone does not last as long as most opioids in the body system.
- Every effort should be made to transport the patient to definitive care
 - Law enforcement involvement may be needed to help facilitate this.

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Things to Remember

- Do not get distracted by drug administration
 - Ventilate your patient as needed
- If respirations do not improve after 5 minutes consider what else could be going on
 - The patient may have taken an amount of opioids that is more than the naloxone can counter
 - Maybe it's not an overdose
 - What other conditions have similar signs and symptoms?

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Chapter Review

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Chapter Review

- In a poisoned patient –
 - ABC's
 - Life threatening problems
 - Oxygen
 - Secondary assessment
 - Type and route of poison
 - How much was taken, over how long
 - Interventions and effects

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Chapter Review

- Consult medical direction. As directed, administer activated charcoal, water, or milk for ingested poisons.
- Remove the patient who has inhaled a poison from the environment, and administer high-concentration oxygen. Remove poisons from the skin by brushing off or diluting them.

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Chapter Review

- Transport the patient with all containers, bottles, and labels from the substance.
- Reassess patient en route.
- Carefully document all information about poisoning, interventions, and patient's responses.

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Remember

- Safety is always the first concern when dealing with a poisoning or substance-abuse patient.
- Poisonings are generally classified by route of exposure. Effects vary greatly, depending upon type of poison and method of entrance into body.

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Remember

- EMTs must use thorough assessment, including scene clues, to help identify the nature and severity of poisoning.
- Poison control centers offer a wealth of resources to assist in assessment and treatment of poisoning patient.

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Remember

- Alcohol is a common underlying issue with patients. In some patients, it may be the most significant problem.
- The effects of substance abuse can vary greatly, based on the type of substance. Determining the type of drug ingested can shed light on effects to come.

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Questions to Consider

- What are potential risks to the responder on a poisoning or overdose call?
- What are the routes of entry into the body?
- What are some things EMS can do to prevent poisonings, especially in children?

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Critical Thinking

- A farmer calls 911 because one of his farm hands has tried to clean up spilled pesticide powder with his hands. On arrival, you find that the patient insists he has brushed all the powder off, feels fine, and doesn't need to go to the hospital.

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Critical Thinking

- As he talks, he continues to make brushing motions at his jeans on which you can see the marks of a powdery residue. How do you manage the situation?

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