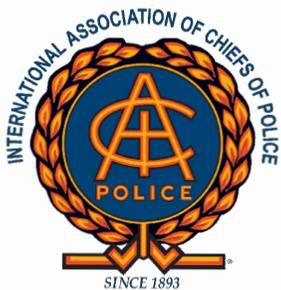


Participant Manual

Drug Evaluation and Classification (Preliminary School)

Revised: 10/2015



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Drug Recognition Expert Course Preliminary School
Participant Manual
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2015 Curriculum

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Preface

The Drug Recognition Expert course is a series of three training phases that, collectively, prepare police officers and other qualified persons to serve as drug recognition experts (DRE). Throughout this manual, the terms “drug recognition expert” and “DRE” are used to designate an individual who is specially trained and has continued training to conduct examinations of drug-impaired drivers. This training, developed as part of the Drug Evaluation and Classification Program (DECP) under the auspices and direction of the National Highway Traffic Safety Administration (NHTSA) and the International Association of Chiefs of Police (IACP) has experienced remarkable success since its inception in the 1980s.

As in any educational training program, an instruction manual is considered a “living document” that is subject to updates and changes based on advances in technology and science. A thorough review is made of information by the DECP Technical Advisory Panel (TAP) of the Highway Safety Committee of the IACP with contributions from many sources in health care science, toxicology, jurisprudence, and law enforcement. Based on this information, any appropriate revisions and modifications in background theory, facts, examination and decision making methods are made to improve the quality of the instruction as well as the standardization of guidelines for the implementation of the Drug Recognition Expert Training Curriculum. The reorganized manuals are then prepared and disseminated, both domestically and internationally, to the DECP state coordinators.

Changes will take effect 90 days after approval by the TAP, unless otherwise specified or when so designated by a state coordinator.

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

35 Minutes

Session 1

**Introduction:
Preliminary Training for
Drug Evaluation and
Classification Program**



Preliminary Training for Drug Evaluation and Classification Program

1-1

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Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program Administrative Matters

Housekeeping

- Paperwork
- Mandatory attendance
- Breaks
- Facility
- Interruptions
 - All electronic devices off





Preliminary Training for Drug Evaluation and Classification Program 1-2

Welcoming Remarks

Faculty Introductions

Paperwork

Attendance

Attendance is mandatory at all sessions of this school.

Breaks

Facility

Interruptions

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Course Learning Objectives

- Define the word “drug”
- Name the seven categories of drugs
- Identify the twelve components, or steps, used in the DRE drug influence evaluation
- Administer and interpret the psychophysical (or “divided attention”) tests used by DREs during the drug influence evaluation




Preliminary Training for Drug Evaluation and Classification Program 1-5

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Course Learning Objectives

- List the vital signs utilized in the DRE examinations
- Check and measure a subject’s vital signs
- List major signs and symptoms of impairment for each drug category
- Conduct eye examinations that are part of the drug influence evaluation
- Describe the history and physiology of alcohol as a drug




Preliminary Training for Drug Evaluation and Classification Program 1-6

Learning Objectives of the Preliminary Training

- Define “Drug” and name the seven categories.
- Name the seven categories of drugs.
- Identify the twelve components or steps in the DRE drug influence examination.
- Administer and interpret the psychophysical (or “divided attention”) tests used by DRE’s during the drug influence evaluation.
- List the vital signs utilized in the DRE examinations
- Check and measure a subject’s vital signs.
- List the major signs and symptoms of each drug category.
- Conduct the eye examinations that are part of the drug influence evaluation.
- Describe the history and physiology of alcohol as a drug.

Key Points of Emphasis

This two-day school is only the first of three stages in your training as DREs.

Next will come the seven-day formal DRE school.

After that will come several weeks of supervised on-the-job training known as the “Certification Phase.”

Preview of the remainder of the Pre-School

Certification Progress Logs

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Session Learning Objectives

- State the goal and objectives of the course
- Define the term “drug” as it is used in the course
- Name the seven categories of drugs and give at least one example of each category




Preliminary Training for Drug Evaluation and Classification Program 1-7

Upon successfully completing this session the participant will be able to:

- State the goal and objectives of the course.
- Define the term “drug” as it is used in the course.
- Name the seven categories of drugs and give at least one example of each category.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. Welcoming Remarks and Objectives Instructor-Led Presentations
- B. Definition and Categories of Drugs

A. Definition and Categories of Drugs

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

What is a “Drug”?

Working definition of “Drug”:

“Any substance that, when taken into the human body, can impair the ability of the person to operate a vehicle safely.”



Preliminary Training for Drug Evaluation and Classification Program 1-10

A Simple, Enforcement-Oriented Definition of Drugs

“any substance that, when taken into the human body, can impair the ability of the person to operate a vehicle safely.”

Working definition derived from the 1985 California Vehicle Code.

This definition includes some substances that physicians don't usually think of as drugs.

Within this simple, enforcement-oriented definition, there are seven categories of drugs.

Each category consists of substances that impair a person’s ability to drive.

The categories differ from one another in terms of how they impair driving ability and in terms of the kinds of impairment they cause.

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Central Nervous System Depressants

- Alcohol
- Barbiturates
- Valium
- Chloral Hydrate



Preliminary Training for Drug Evaluation and Classification Program 1-12

Central Nervous System Depressants

The category of CNS Depressants includes some of the most commonly abused drugs.

Alcohol – the most familiar drug of all – is abused by an estimated 40-50 million Americans.

- Slightly more than half of Americans age 12 or older reported being current drinkers of alcohol in 2014 (52.7% of the population). This translates to an estimated 139 million people. *Source: Behavioral Health Trends in the United States: Results from the 2014 National Survey on Drug Use and Health (NSDUH, September 2015)*
- Depressant drugs consistently rank among the most widely used and abused drugs in the U.S. and Canada. Over the past decade, an estimated 60 million prescriptions were processed for minor tranquilizers in U.S. pharmacies. *Source: Downers: A New Look at Depressant Drugs*

Depressants slow down the operation of the central nervous system (i.e., the brain, brain stem and spinal cord).

- Cause the user to react more slowly.
- Cause the user to process information more slowly.
- Relieve anxiety and tension.
- Induce sedation, drowsiness and sleep.
- In high enough doses, CNS Depressants will produce general anesthesia, i.e. depress the brain's ability to sense pain, and in very high doses, they can induce coma and death.

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Central Nervous System Stimulants

- Cocaine
- Amphetamines
- Methamphetamine



Preliminary Training for Drug Evaluation and Classification Program 1-13

Central Nervous System Stimulants

CNS Stimulants are a widely abused category of drugs.

- In 2014, an estimated 1.6 million people aged 12 or older in the U.S were current non-medical users of stimulants including 569,000 people who were current methamphetamine users. *Source: National Survey on Drug Use and Health (NSDUH), September 2015.*
- In 2014, there were 1.5 million cocaine users aged 12 or older in the U.S. *Source: NSDUH Report, September 2015.*

CNS Stimulants speed up the operation of the central nervous system, and of the various bodily functions controlled by the central nervous system.

- Cause the user to become hyperactive, extremely talkative.
 - A grinding of the teeth, referred to as bruxism, may be noticed.
 - Speech may become rapid and repetitive.
 - Heart rate increases.
 - Blood pressure increases.
 - Body temperature rises, user may become excessively sweaty.
 - Induce emotional excitement, restlessness, irritability.
 - Can induce cardiac arrhythmia (unstable beating of the heart), cardiac seizures and death.
-
-
-

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Hallucinogens

- LSD
- Peyote
- Ecstasy









Preliminary Training for Drug Evaluation and Classification Program 1-14

Hallucinogens

Hallucinogens are also widely abused. In recent years an increase in the abuse of LSD, Ecstasy (MDMA), and many new Hallucinogens has been reported. In 2014 an estimated 1.2 million people aged 12 and over were current users of hallucinogens. *Source: USDUH, September 2015*

- It is estimated that approximately one million Americans abuse Hallucinogens.
- Hallucinogens may create Hallucinations. That is, they may create apparent perceptions of things not truly present.
- Hallucinogens may also create very distorted perceptions, so that the user sees, hears and smells things in a way quite different from how they really look, sound and smell.

Instead, Hallucinogens cause the nervous system to send strange or false signals to the brain.

- Induce a temporary condition very much like psychosis or insanity.
- Can create a “mixing” of sensory modes, for example, the user “hears colors,” “sees music,” “tastes sounds,” etc., referred to as “Synesthesia.”



PCP is a synthetic drug, i.e., it does not occur naturally but must be produced in a laboratory-like setting.

PCP is similar to CNS Depressants in that it depresses brain wave activity.

- Slows down thought.
- Slows reaction time.
- Slows verbal responses.

But PCP is similar to CNS Stimulants in that it activates the parts of the brain that control emotions, the heart and the other autonomic systems.

- Heart rate increases.
- Blood pressure increases.
- Adrenalin production increases.
- Body temperature rises.
- Muscles become rigid.

And PCP is similar to Hallucinogens in that it distorts or “scrambles” signals received by the brain.

- Sight, hearing, taste, smell and touch may all be distorted.
- User’s perception of time and space may be distorted.
- User may become paranoid, feel isolated and depressed.
- User may develop a strong fear of and pre-occupation with death.
- User may become unpredictably violent.

PCP analogs include Ketamine, Ketalar, Ketajet, and Ketaset.

Dextromethorphan (DXM) is an ingredient found in numerous over-the-counter cough and cold remedies.

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Narcotic Analgesics

- Heroin
- Morphine
- Codeine








Preliminary Training for Drug Evaluation and Classification Program 1-17

Narcotic Analgesics

There are two subcategories of Narcotic Analgesics:

- Opiates are derivatives of Opium.
- Synthetics are produced chemically in the laboratory. They are not in any way derived from Opium but produce similar effects.

The word “Analgesic” means pain reliever. All of the drugs in this category reduce the person’s reaction to pain.

- According to the 2014 NSDUH report, there are approximately 435,000 current users of heroin.
- Heroin is highly addictive.

In addition to reducing pain, they produce euphoria, drowsiness, apathy, lessened physical activity and sometimes impaired vision.

Persons under the influence of Narcotic Analgesics often pass into a semi-conscious type of sleep or near sleep.

- Persons “on the nod” may be awakened easily.
- They often are sufficiently alert to respond to questions effectively.

Higher doses of Narcotic Analgesics can induce coma, respiratory failure and death.

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Inhalants

- Paint
- Various glues
- Nitrous Oxide

Preliminary Training for Drug Evaluation and Classification Program

NHTSA
1-18

Inhalants

Inhalants are fumes of certain substances that produce mind altering results.

In 2014, approximately 546,000 people aged 12 and older were current users of inhalants.

Source: USDUH, September 2015

There are three subcategories of Inhalants:

- Volatile solvents (e.g., gasoline, glue, oil-based paint, cleaning fluids, paint remover, etc.)
- Aerosols (i.e., the propellant gases in spray cans, e.g., hair sprays, insecticides, etc.)
- Anesthetic Gases (e.g., nitrous oxide, ether, amyl nitrite, butyl nitrate, etc.)

Different Inhalants produce different effects.

- Many produce effects similar to those of CNS Depressants.
- A few produce Stimulant-like effects.
- Some produce hallucinogenic effects.

The Inhalant abuser's attitude and demeanor can vary from being inattentive, stuporous and passive to irritable, violent and dangerous.

The abuser's speech will often be slow, thick and slurred.

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Frequency of Drug Use

- According to the NSDUH 2014 survey, approximately 22.2 million Americans aged 12 or older had used marijuana at least once in the month prior to being surveyed.
- In 2014, an estimated 27.0 million Americans aged 12 or older were current illicit drug users.




Preliminary Training for Drug Evaluation and Classification Program 1-20

Session 1 - Introduction: Preliminary Training for Drug Evaluation and Classification Program

Frequency of Drug Use

- In 2014 approximately 6.5 million people aged 12 years or older used psychotherapeutic drugs non-medically (NSDUH, 2015).




Preliminary Training for Drug Evaluation and Classification Program 1-21

Frequency of Drug Use

- According to the 2014 National Survey on Drug Use and Health, approximately 22.2 million Americans aged 12 or older used marijuana at least once in the month prior to being surveyed.
- In 2014, an estimated 27.0 million Americans aged 12 or older were current illicit drug users. *Source: National Survey on Drug Use and Health (NSDUH, September 2015).*
- In 2013, approximately 6.5 million people aged 12 years or older used psychotherapeutic drugs non-medically.

Source: National Survey on Drug Use and Health (NSDUH, September 2015).

- The exact number of prescription drug users in the U.S. is unknown. However in 2012, a record 4 billion drug prescriptions were written in the U.S.

Source: Medical News Today, September 18, 2012.

- Among those aged 50 to 59, the rate of past month illicit drug use increased from 90,000 in 2002 to more than 3 million in 2012. This trend may partially reflect the aging into this age group of the “Baby Boomer” generation, whose lifetime rate of illicit drug use is higher than those of older cohorts.

Source: National Institutes of Health.

- In 2013, 9.9 million persons aged 12 or older reported driving under the influence of illicit drugs during the past year. This corresponds to 3.8 percent of the population aged 12 or older.

Source: National Survey on Drug Use and Health (NSDUH, 2014).

Frequency of Polydrug Use

- The term “polydrug” use refers to ingesting drugs from two or more drug categories.
- Though drug evaluation subjects may be under the influence of any one of the mentioned categories of drugs, it is not uncommon to find individuals who have taken several combinations of drugs.
- Data being collected through the national DRE Database indicates that approximately 1/3 of all toxicology results indicate two or more drug categories.



Polydrug Use

- The term “polydrug” use refers to ingesting drugs from two or more drug categories.
- Though drug evaluation subjects may be under the influence of any one of the mentioned categories of drugs, it is not uncommon to find individuals who have taken combinations of several drugs.
- Data being collected through the national DRE Database indicates that approximately 1/3 of all toxicology results indicate two or more drug categories.
- Most controlled prescription drug abusers are polydrug abusers. One study reported that approximately 75% of persons who abuse alcohol also abuse illicit drugs. *Source: “Under the Counter: The Diversion and Abuse of Controlled Prescription Drugs in the U.S.,” National Center on Addiction and Substance Abuse, July 2005.*

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DRUG EVALUATION AND CLASSIFICATION PROGRAM

GLOSSARY OF TERMS

ACCOMMODATION REFLEX

The adjustment of the eyes for viewing at various distances. Meaning the pupils will automatically constrict as objects move closer and dilate as objects move further away.

ADDICTION

Habitual, psychological, and physiological dependence on a substance beyond one's voluntary control.

ADDITIVE EFFECT

One mechanism of polydrug interaction. For a particular indicator of impairment, two drugs produce an additive effect if they both affect the indicator in the same way. For example, cocaine elevates pulse rate and PCP also elevates pulse rate. The combination of cocaine and PCP produces an additive effect on pulse rate.

AFFERENT NERVES

See: "Sensory Nerves."

ALKALOID

A chemical that is found in, and can be physically extracted from, some substance. For example, morphine is a natural alkaloid of opium. It does not require a chemical reaction to produce morphine from opium.

ANALGESIC

A drug that relieves or allays pain.

ANALOG (of a drug)

An analog of a drug is a chemical that is very similar to the drug, both in terms of molecular structure and in terms of psychoactive effects. For example, the drug Ketamine is an analog of PCP.

ANESTHETIC

A drug that produces a general or local insensibility to pain and other sensation.

ANTAGONISTIC EFFECT

One mechanism of polydrug interaction. For a particular indicator of impairment, two drugs produce an antagonistic effect if they affect the indicator in opposite ways. For example, heroin constricts pupils while cocaine dilates pupils. The combination of heroin and cocaine produces an antagonistic effect on pupil size. Depending on how much of each drug was taken, and on when they were taken, the suspect's pupils could be constricted, or dilated, or within the DRE Average range of pupil size.

ARRHYTHMIA

An abnormal heart rhythm.

ARTERY

The strong, elastic blood vessels that carry blood away the heart.

AUTONOMIC NERVE

A motor nerve that carries messages to the muscles and organs that we do not consciously control. There are two kinds of autonomic nerves, the sympathetic nerves and parasympathetic nerves.

AXON

The part of a neuron (nerve cell) that sends out a neurotransmitter.

BAC

(Blood Alcohol Concentration) - The percentage of alcohol in a person's blood.

BrAC

(Breath Alcohol Concentration) - The percentage of alcohol in a person's blood as measured by a breath testing device.

BLOOD PRESSURE

The force exerted by blood on the walls of the arteries. Blood pressure changes continuously, as the heart cycles between contraction and expansion.

BRADYCARDIA

Abnormally slow heart rate.

BRADYPNEA

Abnormally slow rate of breathing.

BRUXISM

Grinding the teeth. This behavior is often seen in person who are under the influence of cocaine or other CNS Stimulants.

CANNABIS

This is the drug category that includes marijuana. Marijuana comes primarily from the leaves of certain species of Cannabis plants that grow readily all over the temperate zones of the earth. Hashish is another drug in this category, and consists of the compressed leaves from female Cannabis plants. The active ingredient in both Marijuana and Hashish is a chemical called delta-9 tetrahydrocannabinol, usually abbreviated THC.

CARBOXY THC

A metabolite of THC (tetrahydrocannabinol).

CHEYNE-STOKES RESPIRATION

Abnormal pattern of breathing. Marked by breathlessness and deep, fast breathing.

CNS (Central Nervous System)

A system within the body consisting of the brain, the brain stem, and the spinal cord.

CNS DEPRESSANTS

One of the seven drug categories. CNS Depressants include alcohol, barbiturates, anti-anxiety tranquilizers, and numerous other drugs.

CNS STIMULANTS

One of the seven drug categories. CNS Stimulants include Cocaine, the Amphetamines, Ritalin, Desoxyn, and numerous other drugs.

CONJUNCTIVITIS

An inflammation of the mucous membrane that lines the inner surface of the eyelids caused by infection, allergy, or outside factors. May be bacterial or viral. Persons suffering from conjunctivitis may show symptoms in one eye only. This condition is commonly referred to as "pink eye", a condition that could be mistaken for the bloodshot eyes produced by alcohol or Cannabis.

CONVERGENCE

The "crossing" of the eyes that occurs when a person is able to focus on a stimulus as it is pushed slowly toward the bridge of their nose. (See, also, "Lack of Convergence".)

CRACK/ROCK

Cocaine base, appears as a hard chunk form resembling pebbles or small rocks. It produces a very intense, but relatively short duration "high".

CURRICULUM VITAE

A written summary of a person's education, training, experience, noteworthy achievements and other relevant information about a particular topic.

CYCLIC BEHAVIOR

A manifestation of impairment due to certain drugs, in which the suspect alternates between periods (or cycles) of intense agitation and relative calm. Cyclic behavior, for example, sometimes will be observed in persons under the influence of PCP.

DELIRIUM

A brief state characterized by incoherent excitement, confused speech, restlessness, and possible hallucinations.

DENDRITE

The part of a neuron (nerve cell) that receives a neurotransmitter.

DIACETYL MORPHINE

The chemical name for Heroin.

DIASTOLIC

The lowest value of blood pressure. The blood pressure reaches its diastolic value when the heart is fully expanded, or relaxed (Diastole).

DIPLOPIA

Double vision.

DISSOCIATIVE ANESTHETICS

One of the seven drug categories. Includes drugs that inhibits pain by cutting off or disassociating the brain's perception of pain. PCP and its analogs are considered Dissociative Anesthetics.

DIVIDED ATTENTION

Concentrating on more than one thing at a time. The four psychophysical tests used by DREs require the suspect to divide their attention.

DOWNSIDE EFFECT

An effect that may occur when the body reacts to the presence of a drug by producing hormones or neurotransmitters to counteract the effects of the drug consumed.

DRUG

Any substance that, when taken into the human body, can impair the ability of the person to operate a vehicle safely.

DYSARTHIA

Slurred speech. Difficult, poorly articulated speech.

DYSPNEA

Shortness of breath.

DYSMETRIA

An abnormal condition that prevents the affected person from properly estimating distances linked to muscular movements.

DYSPHORIA

A disorder of mood. Feelings of depression and anguish.

EFFERENT NERVES

See: "Motor Nerves".

ENDOCRINE SYSTEM

The network of glands that do not have ducts and other structures. They secrete hormones into the blood stream to affect a number of functions in the body.

EXPERT WITNESS

A person skilled in some art, trade, science or profession, having knowledge of matters not within the knowledge of persons of average education, learning and experience, who may assist a jury in arriving at a verdict by expressing an opinion on a state of facts shown by the evidence and based upon his or her special knowledge. (NOTE: Only the court can determine whether a witness is qualified to testify as an expert.)

FLASHBACK

A vivid recollection of a portion of a hallucinogenic experience. Essentially, it is a very intense daydream. There are three types: (1) emotional -- feelings of panic, fear, etc.; (2) somatic -- altered body sensations, tremors, dizziness, etc.; and (3) perceptual -- distortions of vision, hearing, smell, etc.

GAIT ATAXIA

An unsteady, staggering gait (walk) in which walking is uncoordinated and appears to be "not ordered."

GARRULITY

Chatter, rambling or pointless speech. Talkative.

GENERAL INDICATOR

Behavior or observations of the subject that are observed and not specifically tested for. (Observational and Behavioral Indicators)

HALLUCINATION

A sensory experience of something that does not exist outside the mind, e.g., seeing, hearing, smelling, or feeling something that isn't really there. Also, having a distorted sensory perception, so that things appear differently than they are.

HALLUCINOGENS

One of the seven drug categories. Hallucinogens include LSD, MDMA, Peyote, Psilocybin, and numerous other drugs.

HASHISH

A form of cannabis made from the dried and pressed resin of a marijuana plant.

HASH OIL

Sometimes referred to as "marijuana oil" it is a highly concentrated syrup-like oil extracted from marijuana. It is normally produced by soaking marijuana in a container of solvent, such as acetone or alcohol for several hours and after the solvent has evaporated, a thick syrup-like oil is produced with a high THC content.

HEROIN

A powerful and widely-abused narcotic analgesic that is chemically derived from morphine. The chemical, or generic name of heroin is "diacetyl morphine".

HOMEOSTASIS

The dynamic balance, or steady state, involving levels of salts, water, sugars, and other materials in the body's fluids.

HORIZONTAL GAZE NYSTAGMUS (HGN)

Involuntary jerking of the eyes occurring as the eyes gaze to the side.

HORMONES

Chemicals produced by the body's endocrine system that are carried through the blood stream to the target organ. They exert great influence on the growth and development of the individual, and that aid in the regulation of numerous body processes.

HYDROXY THC

A metabolite of THC (tetrahydrocannabinol).

HYPERFLEXIA

Exaggerated or over extended motions.

HYPERGLYCEMIA

Excess sugar in the blood.

HYPERPNEA

A deep, rapid or labored breathing.

HYPERPYREXIA

Extremely high body temperature.

HYPERREFLEXIA

A neurological condition marked by increased reflex reactions.

HYPERTENSION

Abnormally high blood pressure. Do not confuse this with hypotension.

HYPOGLYCEMIA

An abnormal decrease of blood sugar levels.

HYPOPNEA

Shallow or slow breathing.

HYPOTENSION

Abnormally low blood pressure. Do not confuse this with hypertension.

HYPOTHERMIA

Decreased body temperature.

ICE

A crystalline form of methamphetamine that produces a very intense and fairly long-lasting "high".

INHALANTS

One of the seven drug categories. The inhalants include volatile solvents (such as glue and gasoline), aerosols (such as hair spray and insecticides) and anesthetic gases (such as nitrous oxide).

INSUFFLATION

See "snorting".

INTEGUMENTARY SYSTEM

The skin and accessory structures, hair and nails. Functions include protection, maintenance of body temperature, excretion of waste, and sensory perceptions.

INTRAOCULAR

"Within the eyeball".

KOROTKOFF SOUNDS

A series of distinct sounds produced by blood passing through an artery, as the external pressure on the artery drops from the systolic value to the diastolic value.

LACK OF CONVERGENCE

The inability of a person's eyes to converge, or "cross" as the person attempts to focus on a stimulus as it is pushed slowly toward the bridge of his or her nose.

MAJOR INDICATORS

Physiological signs that are specifically assessed and are, for the most part, involuntary reflecting the status of the central nervous system (CNS) homeostasis (Physiological Indicators).

MARIJUANA

Common term for the Cannabis Sativa plant. Usually refers to the dried leaves of the plant. This is the most common form of the cannabis category.

MARINOL

A drug containing a synthetic form of THC (tetrahydrocannabinol). Marinol belongs to the cannabis category of drugs, but marinol is not produced from any species of cannabis plant.

MEDICAL IMPAIRMENT

An opinion made by a DRE based on the evaluation that the state of a suspected impaired driver is more likely related to a medical impairment that has affected the subject's ability to operate a vehicle safely.

METABOLISM

The sum of all chemical processes that take place in the body as they relate to the movements of nutrients in the blood after digestion, resulting in growth, energy, release of wastes, and other body functions. The process by which the body, using oxygen, enzymes and other internal chemicals, breaks down ingested substances such as food and drugs so they may be consumed and eliminated. Metabolism takes place in two phases. The first step is the constructive phase (anabolism) where smaller molecules are converted to larger molecules. The second steps is the destructive phase (catabolism) where large molecules are broken down into smaller molecules.

METABOLITE

A chemical product, formed by the reaction of a drug with oxygen and/or other substances in the body.

MIOSIS

Abnormally small (constricted) pupils.

MOTOR NERVES

Nerves that carry messages away from the brain, to be body's muscles, tissues, and organs. Motor nerves are also known as efferent nerves.

MUSCULAR HYPERTONICITY

Rigid muscle tone.

MYDRIASIS

Abnormally large (dilated) pupils.

NARCOTIC ANALGESICS

One of the seven drug categories. Narcotic analgesics include opium, the natural alkaloids of opium (such as morphine, codeine and thebaine), the derivatives of opium (such as heroin, dilaudid, oxycodone and percodan), and the synthetic narcotics.

NERVE

A cord-like fiber that carries messages either to or from the brain. For drug evaluation and classification purposes, a nerve can be pictured as a series of "wire-like" segments, with small spaces or gaps between the segments.

NEURON

A nerve cell. The basic functional unit of a nerve. It contains a nucleus within a cell body with one or more axons and dendrites.

NEUROTRANSMITTER

Chemicals that pass from the axon of one nerve cell to the dendrite of the next cell, and that carry messages across the gap between the two nerve cells.

NULL EFFECT

One mechanism of polydrug interaction. For a particular indicator of impairment, two drugs produce a null effect if neither of them affects that indicator. For example, PCP does not affect pupil size, and alcohol does not affect pupil size. The combination of PCP and alcohol produces a null effect on pupil size.

NYSTAGMUS

An involuntary jerking of the eyes.

"ON THE NOD"

A semi-conscious state of deep relaxation. Typically induced by impairment due to Heroin or other narcotic analgesics. The suspect's eyelids droop, and chin rests on the chest. Suspect may appear to be asleep, but can be easily aroused and will respond to questions.

OVERLAPPING EFFECT

One mechanism of polydrug interaction. For a particular indicator of impairment, two drugs produce an overlapping effect if one of them affects the indicator but the other doesn't. For example, cocaine dilates pupils while alcohol doesn't affect pupil size. The combination of cocaine and alcohol produces an overlapping effect on pupil size: the combination will cause the pupils to dilate.

PALLOR

An abnormal paleness or lack of color in the skin.

PARANOIA

Mental disorder characterized by delusions and the projection of personal conflicts that are ascribed to the supposed hostility of others.

PARAPHERNALIA

Drug paraphernalia are the various kinds of tools and other equipment used to store, transport or ingest a drug. Hypodermic needles, small pipes, bent spoons, etc., are examples of drug paraphernalia. The singular form of the word is "paraphernalium". For example, one hypodermic needle would be called a "drug paraphernalium".

PARASYMPATHETIC NERVE

An autonomic nerve that commands the body to relax and to carry out tranquil activities. The brain uses parasympathetic nerves to send "at ease" commands to the muscles, tissues, and organs.

PARASYMPATHOMIMETIC DRUGS

Drugs that mimic neurotransmitter associated with the parasympathetic nerves. These drugs artificially cause the transmission of messages that produce lower blood pressure, drowsiness, etc.

PDR (Physician's Desk Reference)

A basic reference source for drug recognition experts. The PDR provides detailed information on the physical appearance and psychoactive effects of licitly-manufactured drugs.

PHENCYCLIDINE

A contraction of PHENYL CYCLOHEXYL PIPERIDINE, or PCP. Formerly used as a surgical anesthetic, however, it has no current legitimate medical use in humans.

PHENYL CYCLOHEXYL PIPERIDINE (PCP)

Often called "phencyclidine" or "PCP", it is a specific drug belonging to the Dissociative Anesthetics category.

PHYSIOLOGY

Physiology is the branch of biology dealing with the functions and activities of life or living matter and the physical and chemical phenomena involved.

PILOERECTION

Literally, "hair standing up", or goose bumps. This condition of the skin is often observed in persons who are under the influence of LSD.

POLYDRUG USE

Ingesting drugs from two or more drug categories.

PSYCHEDELIC

A mental state characterized by a profound sense of intensified or altered sensory perception sometimes accompanied by hallucinations.

PSYCHOPHYSICAL TESTS

Methods of investigating the mental (psycho-) and physical characteristics of a person suspected of alcohol or drug impairment. Most psychophysical tests employ the concept of divided attention to assess a suspect's impairment.

PSYCHOTOGENIC

Literally, "creating psychosis" or "giving birth to insanity". A drug is considered to be psychotogenic if persons who are under the influence of the drug become insane, and remain so after the drug wears off.

PSYCHOTOMIMETIC

Literally, "mimicking psychosis" or "impersonating insanity". A drug is considered to be psychotomimetic if persons who are under the influence of the drug look and act insane while they are under the influence.

PTOSIS

Droopy eyelids.

PULSE

The expansion and contraction of the walls of an artery, generated by the pumping action of blood.

PULSE RATE

The number of expansions of an artery per minute.

PUPILLARY LIGHT REFLEX

The pupils of the eyes will constrict and dilate depending on changes in lighting.

PUPILLARY UNREST

The continuous, irregular change in the size of the pupils that may be observed under room or steady light conditions.

REBOUND DILATION

A period of pupillary constriction followed by a period of pupillary dilation where the pupil steadily increases in size and does not return to its original constricted size.

RESTING NYSTAGMUS

Jerking of the eyes as they look straight ahead.

SCLERA

A dense white fibrous membrane that, with the cornea, forms the external covering of the eyeball (i.e., the white part of the eye).

SENSORY NERVES

Nerves that carry messages to the brain, from the various parts of the body, including notably the sense organs (eyes, ears, etc.). Sensory nerves are also known as afferent nerves.

SINSEMILLA

The unpollinated female cannabis plant, with a relatively high concentration of THC.

SFST

Standardized Field Sobriety Testing. There are three SFSTs, namely Horizontal Gaze Nystagmus (HGN), Walk and Turn, and One Leg Stand. Based on a series of controlled laboratory studies, scientifically validated clues of impairment have been identified for each of these three tests. They are the only Standardized Field Sobriety Tests for which validated clues have been identified.

SNORTING

One method of ingesting certain drugs. Snorting requires that the drug be in powdered form. The user rapidly draws the drug up into the nostril, usually via a paper or glass tube. Snorting is also known as insufflation.

SPHYGMOMANOMETER

A medical device used to measure blood pressure. It consists of an arm or leg cuff with an air bag attached to a tube and a bulb for pumping air into the bag, and a gauge for showing the amount of air pressure being pressed against the artery.

STETHOSCOPE

A medical instrument used, for drug evaluation and classification purposes, to listen to the sounds produced by blood passing through an artery.

SYMPATHETIC NERVE

An autonomic nerve that commands the body to react in response to excitement, stress, fear, etc. The brain uses sympathetic nerves to send "wake up calls" and "fire alarms" to the muscles, tissues and organs.

SYMPATHOMIMETIC DRUGS

Drugs that mimic the neurotransmitter associated with the sympathetic nerves. These drugs artificially cause the transmission of messages that produce elevated blood pressure, dilated pupils, etc.

SYNAPSE (or Synaptic Gap)

The gap or space between two neurons (nerve cells).

SYNESTHESIA

A sensory perception disorder, in which an input via one sense is perceived by the brain as an input via another sense. An example of this would be a person "hearing" a phone ring and "seeing" the sound as a flash of light. Synesthesia sometimes occurs with persons under the influence of hallucinogens.

SYSTOLIC

The highest value of blood pressure. The blood pressure reaches its systolic value when the heart is fully contracted (systole), and blood is sent surging into the arteries.

TACHYCARDIA

Abnormally rapid heart rate.

TACHYPNEA

Abnormally rapid rate of breathing.

THC (Tetrahydrocannabinol)

The principal psychoactive ingredient in drugs belonging to the cannabis category.

TOLERANCE

An adjustment of the drug user's body and brain to the repeated presence of a drug. As tolerance develops, the user will experience diminishing psychoactive effects from the same dose of the drug. As a result, the user typically will steadily increase the dose he or she takes, in an effort to achieve the same psychoactive effect.

TRACKS

Scar tissue usually produced by repeated injection of drugs, via hypodermic needle, along a segment of a vein.

VERTICAL GAZE NYSTAGMUS

An involuntary jerking of the eyes (up-and-down) which occurs as the eyes are held at maximum elevation. The jerking should be distinct and sustained.

VOIR DIRE

A French expression literally meaning "to see, to say." Loosely, this would be rendered in English as "To seek the truth," or "to call it as you see it." In a law or court context, one application of voir dire is to question a witness to assess his or her qualifications to be considered an expert in some matter pending before the court.

VOLUNTARY NERVE

A motor nerve that carries messages to a muscle that we consciously control.

WITHDRAWAL

This occurs in someone who is physically addicted to a drug when he or she is deprived of the drug. If the craving is sufficiently intense, the person may become extremely agitated, and even physically ill.

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 2 - Overview of the Drug Evaluation and Classification Procedures

60 Minutes

Session 2

Overview of the Drug Evaluation and Classification Procedures



Preliminary Training for Drug Evaluation and Classification Program

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Learning Objectives

- Identify the 12 components of the DRE drug influence evaluation
- Discuss the purposes of each component



Upon successfully completing this session the participant will be able to:

- Identify the 12 components of the DRE drug influence evaluation.
- Discuss the purposes of each component.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

A. Components of the Process Instructor-Led Presentations

B. Video/DVD Demonstrations Video/DVD Presentations

Components of the Process

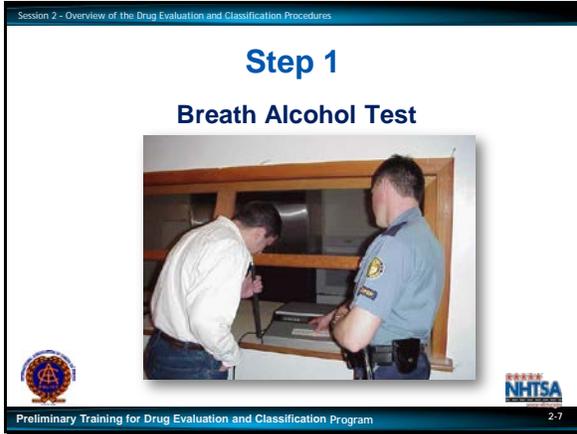
- **Autonomic responses of the body**
- **Standardization of evaluation**



Some of the observable signs and symptoms relate to automatic responses of the subject's body to the specific drugs that are present.

All of these reliable indicators are examined and carefully considered before a judgment is made concerning what categories of drugs are affecting the subject. The process is standardized in that it is administered the same way, to every subject, by every drug recognition expert.

- Standardization helps to ensure that no mistakes are made.
- No steps of the process are left out.
- No extraneous or unreliable "indicators" are included.
- Standardization helps to promote professionalism among drug recognition experts.
- Standardization helps to secure acceptance in court



Breath Alcohol Test

Breath Alcohol Test to determine Blood Alcohol Concentration (BAC).

- The purpose of the breath test is to determine whether the specific drug, alcohol, may be contributing to the impairment observable in the subject.
- Obtaining an accurate measurement of BAC enables the DRE to assess whether alcohol may be the sole cause of the observable impairment, or whether it is likely that some other drug or drugs, or other complicating factors are contributing to the impairment.

Interview of the Arresting Officer

- In most cases, the subjects you will examine will not be people that you arrested.
- The arresting officer may have seen or heard things that would be valuable indicators of the kinds of drugs the subject has ingested.
- The arresting officer, in searching the subject, may have uncovered drug related paraphernalia, or even drugs themselves.
- The arresting officer also may be able to alert you to important information about the subject's behavior that could be very valuable for your own safety.

Step 6

Examination of Vital Signs

Pulse and Time

1. _____ bpm / _____
2. _____ bpm / _____
3. _____ bpm / _____



Blood Pressure Temp

____ / ____ mmHg _____ °



Examination of Vital Signs

Many categories of drugs affect the operation of the heart and other major organs of the body. These effects show up during examination of the subject's vital signs.

- The vital signs that are reliable indicators of drug influence include blood pressure, pulse, and temperature.
- Blood pressure is measured with two medical instruments; a stethoscope and a sphygmomanometer.

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 3 - Psychophysical Tests

90 Minutes

Session 3

Psychophysical Tests



Preliminary Training for Drug Evaluation and Classification Program

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Session 3 - Psychophysical Tests

Modified Romberg Balance Test Diagram

Modified Romberg Balance

Approx. Approx.

Internal Clock:
_____ Estimated as 30 sec.

NHISA

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Session 3 - Psychophysical Tests

30 Seconds

- Internal timing estimate
- Some drugs tend to speed up or slow down the subject's internal clock

NHISA

Preliminary Training for Drug Evaluation and Classification Program 3-4

- Four divided attention psychophysical tests are administered in the DRE evaluation – Modified Romberg Balance, Walk and Turn, One Leg Stand and Finger to Nose.
- The Walk and Turn and One Leg Stand as well as HGN have been scientifically validated by conducting controlled research to demonstrate their reliability. The Modified Romberg Balance and Finger to Nose have not been subjected to that sort of scrutiny, however, if properly administered and recorded they are very credible evidence of impairment.

A. Modified Romberg Balance

The Modified Romberg Balance is the first divided attention test that is administered during the drug influence evaluation.

- The test requires the subject to stand with the feet together and the head tilted back slightly and with the eyes closed.
- The test also requires that the subject attempt to estimate 30 seconds; the subject must be instructed to open the eyes and tilt the head forward and say “stop” when they think thirty seconds has elapsed.

Session 3 - Psychophysical Tests

Instruction Stage

1. Instruct the subject to stand straight with feet together and arms down at their sides
2. Tell the subject to remain in that position until you have finished giving the instructions
3. Emphasize that he or she must not start the test until you say, "begin"
4. Ask the subject if he or she understands the instructions so far



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Session 3 - Psychophysical Tests

Instruction Stage

5. Tell the subject, "When I tell you to begin, tilt your head back slightly and close your eyes"
6. Estimate the passage of 30 seconds
7. Tell the subject, "When you think 30 seconds has gone by, bring your head forward, open your eyes, and say "Stop"
8. Ask the subject if he/she understands



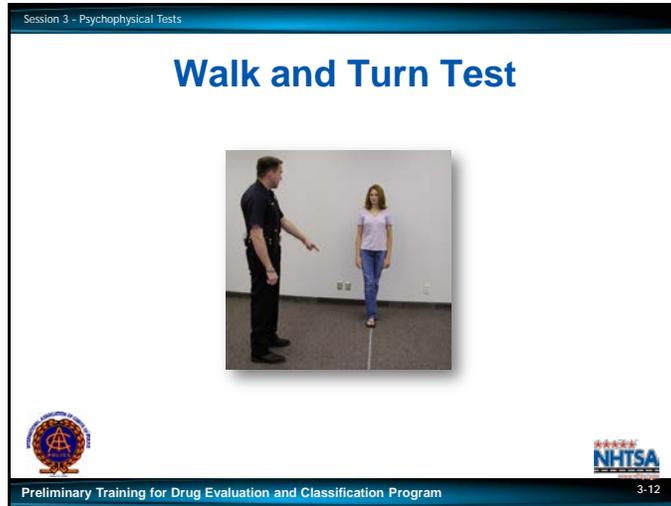
Preliminary Training for Drug Evaluation and Classification Program 5-7

Administrative Procedures

Instruction Stage

Administrative Procedures and Instructions

- Tell the subject to stand straight with their feet together and their arms down at their sides.
- Tell the subject to maintain that position while you give the instructions. Emphasize that he or she must not start the test until told to start.
- Ask the subject if he or she understands so far.
- **Make sure to obtain a verbal response from the subject.**
- Tell the subject when you instruct them to begin the test, they must tilt their head back slightly and close their eyes.
- Tell the subject that when you say "Start", they must keep their head tilted back with their eyes closed until they think that 30 seconds have gone by. DO NOT tell the subject to "count to thirty seconds" or to use any other specific procedure to keep track of time. But on the other hand, DO NOT tell the subject that they are not allowed to count to thirty seconds. SIMPLY SAY, "keep your head tilted back with your eyes closed until you think that thirty seconds have gone by".
- Tell the subject that, when they think the 30 seconds have gone by, they must bring their head forward, open their eyes, and say "Stop".
- Ask the subject if he or she understands.



B. Walk and Turn

Walk and Turn is the second divided attention test administered during the drug influence evaluation.

The test is administered the same way that we have used it for Standardized Field Sobriety Testing purposes.

- Monitor the practice and offer coaching and constructive criticism, as appropriate.
- Review of Walk and Turn administrative procedures.

The test has two stages: the instructions stage and the walking stage.

- During the instructions stage the subject must stand heel-to-toe, with the right foot ahead of the left foot with the heel of the right foot against the toe of the left foot, and keeping the arms at the sides.
 - Demonstrate the stance that the subject must maintain during the instructions stage. If the subject fails to maintain the starting position during your instructions, discontinue the instructions and direct the subject back to the starting position before continuing.
 - The subject is told to not start walking until told to do so.
 - The subject must be told to take nine heel-to-toe steps on the line, to turn around keeping the front or lead foot on the line and to turn by taking a series of small steps with the other foot, and to return nine heel-to-toe steps down the line.
-
-
-
-
-

Walk and Turn Test Diagram

Walk and Turn Test

Describe Turn

Cannot keep balance	_____	
Starts too soon	_____	
Stops Walking	1st Nine	2nd Nine
Misses Heel-Toe		
Steps Off Line		
Raises Arms		
Actual Steps Taken		

Cannot Do Test (explain)

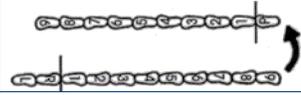


- The subject must be told to keep their arms at the sides at all times.
- The subject must be told to watch his or her feet while walking.
- The subject must be told to count the steps out loud.
- The subject must be told not to stop walking until the test is completed.
- The subject should be asked if he/she understands the instructions.
- Once the subject acknowledges his/her understanding of the instructions, instruct the subject to begin the test.
- If the subject stops or fails to count out loud or watch his/her feet, remind him/her to perform these tasks. This interruption will not affect the validity of the test and is essential for evaluating divided attention.

Session 3 - Psychophysical Tests

Walk and Turn Recording Results

Walk and Turn Test



Describe Turn

Cannot keep balance _____

Starts too soon _____

	1st Nine	2nd Nine
Stops Walking		
Misses Heel-Toe		
Steps Off Line		
Raises Arms		
Actual Steps Taken		

Cannot Do Test (explain)




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Recording Results of the Walk and Turn Test

- We record the very same clues on this test that we use for Standardized Field Sobriety Testing purposes.

Instruction stage clues:

- Cannot maintain balance while listening to instructions (feet break away from the heel-to-toe stance). Draw a slash mark at an angle in the direction the subject stepped out of the instruction position.
- Starts too soon (i.e., subject starts walking before told to do so).

Session 3 - Psychophysical Tests

Documenting the Walk and Turn Test

Walk and Turn Test

Describe Turn _____

Cannot keep balance _____

Starts too soon _____

	1st Nine	2nd Nine
Stops Walking	✓	
Misses Heel-Toe	✓	
Steps Off Line	✓	
Raises Arms		
Actual Steps Taken	8	

Cannot Do Test (explain) _____

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Walking stage clues:

- Stops while walking
- Does not touch heel-to-toe (distance ½")
- Steps off the line
- Uses arms to balance (distance 6")
- Improper turn
- Incorrect number of steps

Session 3 - Psychophysical Tests

One Leg Stand Test Diagram Recording Results

One Leg Stand:

L	<input type="checkbox"/>	R	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Sways while balancing	
	<input type="checkbox"/>		<input type="checkbox"/>	Uses arms to balance	
	<input type="checkbox"/>		<input type="checkbox"/>	Hopping	
	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Puts foot down	

Type of Footwear
Tennis shoes

Preliminary Training for Drug Evaluation and Classification Program
3-19

Recording Results of the One Leg Stand

For drug evaluation purposes, we use the same clues on the One Leg Stand that we use for Standardized Field Sobriety Testing.

The One Leg Stand clues:

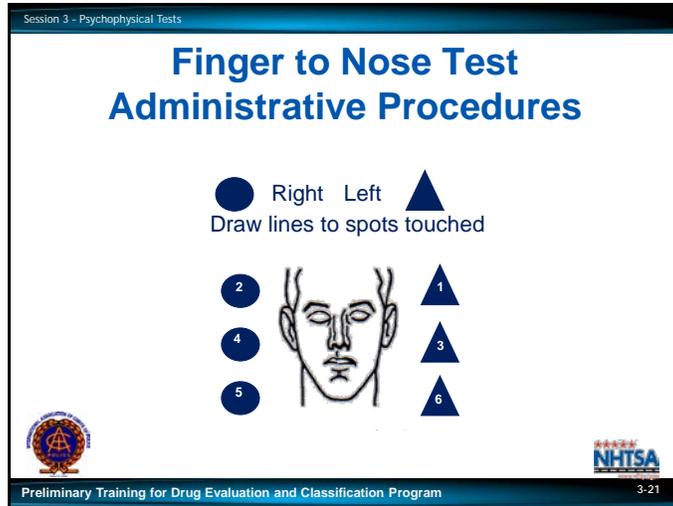
- Sways while balancing
- Uses arms to balance
- Hopping
- Puts foot down

Indicate above the feet the number they were counting when they put their foot down.

Check marks should be made to indicate the number of times the subject swayed, used arms for balance, hopped or put their foot down.

The subject's actual count during the 30 seconds should be documented in the top area of the box above the foot on which the subject was standing.

DREs should also be observant for the presence of other indicators, such as body tremors and improper counting during this test.



D. Finger to Nose

The Finger to Nose is the final divided attention test used in the drug influence evaluation.

Finger to Nose differs from the other three tests in that the examiner must continue to give instructions to the subject throughout the test.

Administrative Procedures for Finger to Nose

- The subject must be told that he/she will be given a series of commands, i.e., “left, right, etc.” to indicate which fingertip is to be brought to the tip of the nose.
- The subject must be told to stand with feet together, arms down at the sides, facing the examiner.
- The examiner should demonstrate the stance.
- The subject must be told to close his/her hands, rotate the palms forward and then to extend the index fingers from the closed hands.
- The examiner must tell subject that they will be asked to touch the tip of the index finger to the tip of the nose.
- The examiner must demonstrate to the subject how they are expected to touch the fingertip to the nose. (Without actually touching the nose.)

Session 3 - Psychophysical Tests

Finger to Nose Test Recording Results

Right Left
 Draw lines to spots touched

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Recording Results of the Finger to Nose Test

- The results of Finger to Nose test are recorded by drawing a “map” showing where the fingertips landed on each attempt.
- A line should be drawn to the appropriate circle or triangle to indicate where the subject touched their nose.
- Suggestion: If the DRE draws the line from the place where the subject touches to the appropriate circle or triangle, it enables them to draw a straighter line.

Hands-on Practice

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Participant Manual

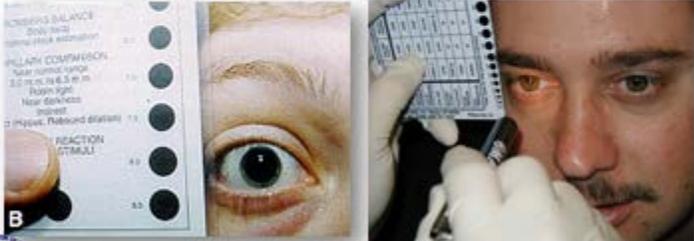
Drug Evaluation and Classification (Preliminary School)

Session 4 - Eye Examinations

90 Minutes

Session 4

The Eye Examinations



B



Preliminary Training for Drug Evaluation and Classification Program

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Learning Objectives

- Administer tests of Horizontal Gaze Nystagmus, Vertical Gaze Nystagmus and Lack of Convergence
- Estimate pupil size
- Relate the expected results of the eye examinations to the seven categories of drugs

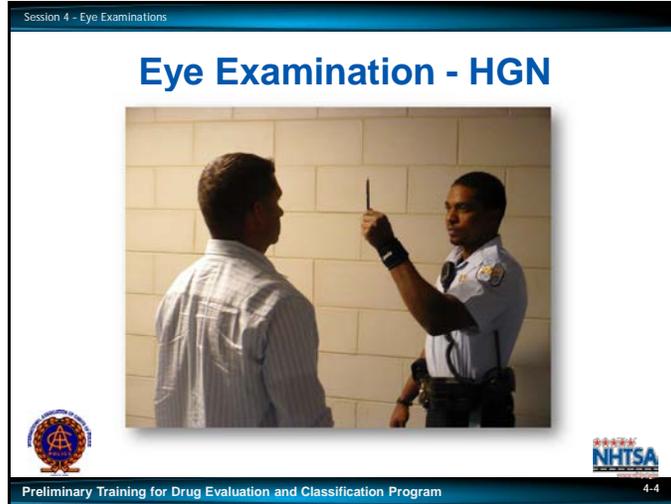


Upon successfully completing this session the participant will be able to:

- Administer tests of Horizontal Gaze Nystagmus, Vertical Gaze Nystagmus and Lack of Convergence.
- Estimate pupil size.
- Relate the expected results of the eye examinations to the seven categories of drugs.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. Purposes of the Eye Examinations..... Instructor-Led Presentations
- B. Procedures and Clues Instructor-Led Demonstrations
- C. Demonstrations Hands-on Practice
- D. Relationship of Drug Categories to the Eye Examinations



Horizontal Gaze Nystagmus (HGN)

The tests of Horizontal Gaze Nystagmus (HGN) and Vertical Gaze Nystagmus (VGN) provide important indicators of the drug categories that may or may not be present.

- Prior to the administration of the HGN, the subject's eyes should be checked for equal pupil size, resting nystagmus and equal tracking.
 - The check for equal pupil size is simply done by visibly checking to see if both pupils are equal in size. Both pupils should be of equal size and there should not be any noticeable difference in size.
 - The check for equal tracking is done by moving the stimulus smoothly across the subject's entire field of vision checking to see if the eyes track together or if one lags behind.
 - If the subject's pupils are noticeably unequal in size or if resting nystagmus is present or if the eyes do not track together, there may be a chance of a medical condition or pathological disorder.
 - This part of the examination may require more than one check to ensure that a medical condition or pathological disorder does not exist.
 - If HGN is observed, it is likely that the subject may have taken a CNS Depressant, Dissociative Anesthetic, an Inhalant, or a combination of those.
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Session 4 - Eye Examinations

Three Clues of Horizontal Gaze Nystagmus

- Lack of Smooth Pursuit
- Distinct and Sustained Nystagmus at Maximum Deviation
- Angle of Onset



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B. Procedures and Clues

Three Clues of Horizontal Gaze Nystagmus

Prior to the administration of the HGN test, the subject’s eyeglasses should be removed, and the eyes are checked separately for equal pupil size, resting nystagmus and equal tracking. **(If subject wears contacts, especially colored contacts because some colored contacts may affect the ability to compare and estimate pupil size.)**

As pointed out earlier, if the eyes do not track together, or if the pupils are noticeably unequal in size, the chance of a medical disorder or injuries causing the nystagmus may be present. Prior to the administration, resting nystagmus may also be observed at this time.

Horizontal Gaze Nystagmus test consists of three separate checks, administered independently to each eye.

Lack of Smooth Pursuit

The first check is for “lack of smooth pursuit.”

- Position the stimulus approximately 12 to 15 inches from of the subject’s nose.
- Hold the tip of the stimulus slightly above the subject’s eye level.

Session 4 - Eye Examinations

Eye Examination - Angle of Onset

BAC = 50 - Angle of Onset




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Session 4 - Eye Examinations

Eye Examination - Angle of Onset

Angle of Onset = 35 degrees
BAC = 50 - Angle of Onset
= 50 - 35
= 15




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Angle of Onset

The consistency of onset angle and BAC can be compared using the following formula:

- Explanation: $BAC = 100 \times \text{blood alcohol}$ (e.g., if blood alcohol is 0.10, $BAC = 10$).
- Example: If onset angle is 35 degrees, then $BAC = 50 - 35 = 15$.
- The corresponding blood alcohol concentration would be approximately 0.15.
- Keep in mind that this formula is only a statistical approximation. It is not an exact relationship for all subjects at all times.
- The only purpose of comparing BAC and the angle of onset is to obtain a gross indication of the possible presence of another Depressant, Inhalant, or Dissociative Anesthetic.
- A DRE is expected to be able to estimate the angle of onset of nystagmus to the nearest 5 degree increment, over the range from 30 to 45 degrees.
- If the subject's eyes begin to jerk before they have moved to the 30 degree mark, you will not attempt to estimate the angle precisely, but will record that they exhibit "immediate onset."
- From 30 degrees on out, you will record a numeric estimate of onset.

Session 4 - Eye Examinations

Vertical Gaze Nystagmus



Click on Picture for Video Example of Vertical Gaze Nystagmus



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Vertical Gaze Nystagmus

- Position the stimulus horizontally, approximately 12 to 15 inches in front of the subject's nose.
- Point out to the subject that he or she will have to keep their head steady and try to keep their eyes focused on the stimulus as it moves upward.
- Raise the stimulus until the subject's eyes are elevated as far as possible.
- Watch closely for evidence of up-and-down jerking.

Participant Practice

Participants' initial practice of the Vertical Gaze Nystagmus test.

Session 4 - Eye Examinations

LOC Testing Procedure

- Begin by moving the stimulus in a circle in front of the subject's face
- Observe the eyes to verify that the subject is tracking the stimulus
- Slowly move the stimulus in toward the bridge of the nose



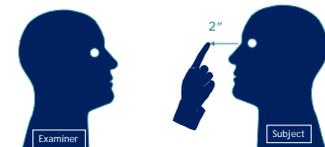
Examiner Subject

NHTSA

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Session 4 - Eye Examinations

Normal convergence is a distance approximately two inches (2") from the bridge of the nose



Examiner Subject

NHTSA

Preliminary Training for Drug Evaluation and Classification Program 4-20

- Position the stimulus approximately 12 to 15 inches in front of the subject's nose in the same position we use for the HGN test.
- Inform the subject that you are going to move the stimulus around in a circle in front of his or her face and to follow the stimulus with his or her eyes only.
- Inform the subject that you will move the tip of the stimulus in toward the bridge of his or her nose.
- Start to move the object slowly in a circle.
- Verify the subject is tracking the stimulus.
- Stop moving in a circular manner with the stimulus above eye level.
- Slowly move the stimulus down to within approximately two inches of the bridge of the nose.
- Carefully observe the subject's eyes to determine whether both eyes converge on the stimulus.
- It is recommended that the DRE repeat the check for LOC conducting the check at least two times.
- If the eyes converge (cross) when the stimulus is approximately two inches from the bridge of the nose, the Lack of Convergence is "not present"
- Lack of convergence is present if the subject's eyes do not come together and cross as they track and stay aligned on the stimulus
- In a non-impaired subject, the eyes should come together (converge) and remain converged for one second.
- If the eyes do not converge or remain converged on the stimulus for one second, then Lack of Convergence is present.

Drug Categories That Cause LOC

The following drug categories usually will cause Lack of Convergence:

- CNS Depressants
- Inhalants
- Dissociative Anesthetics
- Cannabis

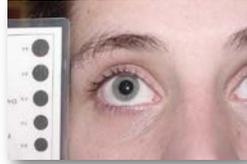


Drug categories which usually cause lack of convergence include:

- CNS Depressants
- Inhalants
- Dissociative Anesthetics
- Cannabis

Estimating Pupil Size

DRE average range of pupil size in room light is
2.5 to 5.0 mm



- 8.5 or larger _____
- 8.0 _____
- 7.5 _____
- 7.0 _____
- 6.5 _____
- 6.0 _____
- 5.5 _____
- 5.0 _____
- 4.5 _____
- 4.0 _____
- 3.5 _____
- 3.0 _____
- 2.5 or smaller _____

Estimation of Pupil Size

- Pupils are examined in Room Light prior to darkening the room
- The final two pupil size estimations are made with the use of a penlight in a near totally darkened room
- Prior to estimating the pupil sizes, we darken the room and wait approximately 90 seconds to allow both the subject's eyes and our own to adapt to the dark



Estimation of Pupil Size under Room Light

- Pupils are examined in Room Light prior to darkening the room.

Estimation of Pupil Size under Near Total Darkness and Direct Light

The final two pupil size estimations are made with the use of a penlight in a near totally darkened room.

- Prior to estimating the pupil sizes, we darken the room and wait approximately 90 seconds to allow both the subject's eyes and our own to adapt to the dark.
- For the estimation under near total darkness, completely cover the tip of the penlight with your finger or thumb, so that only a reddish glow and no white light emerges.
- Bring the glowing red tip up toward the subject's left eye until you can distinguish the pupil from the colored portion of the eye (iris).
- Position the pupillometer alongside the pupil (left eye first) and locate the circle or semi-circle that is closest in size to the pupil.
- Repeat the procedure for the subject's right eye.

Session 4 - Eye Examinations

Recent Research for DRE Average Values

Mean or Average:

- The average value of a given set of findings

Average Range: (1.5 Standard Deviation)

- The range of data in which 88% or greater of the findings are included




Preliminary Training for Drug Evaluation and Classification Program 4-29

Session 4 - Eye Examinations

Updated Values – Where did they come from specifically related to DRE?



An evaluation of pupil size standards used by police officers for detecting drug impairment

Jack E. Richman, O.D., Kathleen Gullen, M.S.N., AGNP, Donald Decker,* and Stephen C. Mullaney, B.S., M.S.*

*The New England College of Optometry, Boston, Massachusetts; †University of South Florida, Tampa, Florida; ‡The Massachusetts College of Podiatric Medicine, Boston, Massachusetts; §The Massachusetts State Police, Salem, Massachusetts





Preliminary Training for Drug Evaluation and Classification Program 4-30

Basic Concepts Relative to Interpreting Pupil Sizes

It is important to understand a few basic concepts relative to interpreting pupil sizes. Understanding these concepts will allow DRE's to better understand the relationship of pupil size to impairment.

Mean values and average ranges: scientifically validated studies were conducted to determine normative values for pupil size in non-impaired persons. These studies show what one would expect a person to exhibit when their pupil sizes are checked under different lighting conditions. Sometimes average means "in the middle" or sum of all numbers divided by the number in a particular group. What we use for interpretation purposes are "average ranges" of pupil sizes.

- As a DRE, you will be making your decision of impairment based on clinical, psychophysical, and behavioral indicators. This includes using pupil sizes as one of the factors in determining that impairment.
- With many people, even under very bright light, the pupils won't constrict much below a diameter of 2.0 mm, and even under near total dark conditions, the pupils usually only dilate to a diameter of not more than 8.5 mm.
- Studies have indicated there are significant differences between the average pupil size in these three conditions. (*Source: See next page*)
- Consequently, the use of three distinct pupil sizes range for each of the different testing conditions may be more useful to determine impairment versus non-impairment.

Source: "An Evaluation of Pupil Size Standards Used By Police Officers for Detecting Drug Impairment" Journal of American Optometric Association (JAOA), March 2004, Richman, McAndrew, Decker & Mullaney.

Session 4 - Eye Examinations

Reaction to Light

Assessment of how quickly the pupil constricts to its smallest size during the check of pupil size under direct light



Preliminary Training for Drug Evaluation and Classification Program 4-34

Reaction to Light

Assessment of how quickly the pupil constricts to its smallest size during the check of pupil size under direct light when the uncovered light is brought from the side of the subject's face and the light beam is moved directly into the subject's eye.

- As you bring the beam of light directly into the subject's eye, note how the pupil reacts.
- Under ordinary conditions, the pupil should react very quickly, and constrict noticeably when the light beam strikes the eye.
- Under the influence of certain categories of drugs, the pupil's reaction may be slow, or there may be no visible reaction at all.

For DRE purposes, we consider the pupil's reaction to be slow if it takes more than one second to reach its smallest size.

- Hold the direct light on the subject's eye for approximately 15 seconds to assess pupil reaction.
- Caution should be used by the officer so as not to move the light beam or allow the bulb to change in light intensity.
- When you have completed this process for the left eye, repeat it for the right eye.

Participants' initial practice in assessing the pupil's reaction to light.

Session 4 - Eye Examinations

Relationship of Drug Categories to the Eye Examinations

	CNS Depressants	CNS Stimulants	Hallucinogens	Dissociative Anesthetics	Narcotic Analgesics	Inhalants	Cannabis
HGN	Present	None	None	Present	None	Present	None
VGN	Present	None	None	Present	None	Present	None
Lack of Convergence	Present	None	None	Present	None	Present	Present
Pupil Size	Normal (1)	Dilated	Dilated	Normal	Constricted	Normal (4)	Dilated (6)
Reaction to Light	Slow	Slow	Normal(5)	Normal	Little or None Visible	Slow	Normal

FOOTNOTE: These indicators are those most consistent with the category, keep in mind that there may be variations due to individual reaction, dose taken and drug interactions.

(1) Some, Quaaludes and possibly some anti-depressants usually dilate pupils.
(3) Certain psychedelic amphetamines may cause slowing.
(4) Normal, but may be dilated.
(6) Pupil size possibly normal.




Preliminary Training for Drug Evaluation and Classification Program 4-41

D. Relationship of Drug Categories to the Eye Examinations

Optional: Draw the matrix at the end of this session on the dry erase board or flip-chart at the outset of this segment.

Three of the seven drug categories normally will cause Horizontal Gaze Nystagmus.

- CNS Depressants, Inhalants and Dissociative Anesthetics normally will cause HGN.
- The other four categories normally will not cause HGN.
- Any drug that will cause HGN also will cause Vertical Gaze Nystagmus, if a high enough dose of the drug is taken.
- Depressants, Inhalants and Dissociative Anesthetics can all cause Vertical Gaze Nystagmus at higher doses for that individual.
- But if a drug will not cause HGN, then it will not cause Vertical Gaze Nystagmus.

All drugs that cause nystagmus also will cause the eyes to be unable to converge.

- Therefore, Depressants, Inhalants and Dissociative Anesthetics, including PCP and its analogs, usually will cause Lack of Convergence.
- Interestingly, there is one category of drug that does not cause nystagmus but that does usually cause Lack of Convergence.
- Cannabis usually does cause Lack of Convergence, even though it does not cause nystagmus.

- The other three categories do not cause a Lack of Convergence.

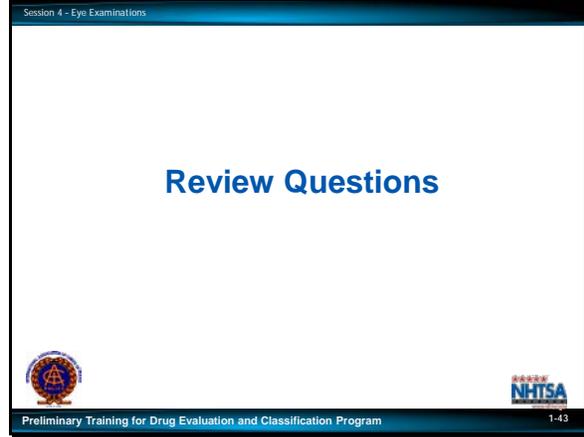
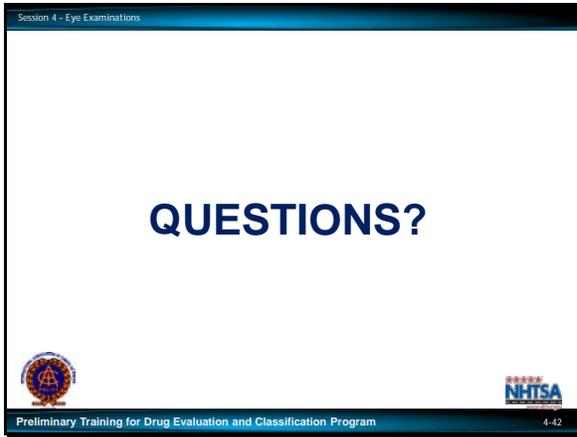
An interesting and important fact is that the drugs that cause nystagmus usually don't affect pupil size, and the drugs that don't cause nystagmus usually do affect pupil size.

- CNS Stimulants and Hallucinogens usually cause the pupils to become larger or "dilated."
- Cannabis may cause the pupils to dilate.
- Narcotic Analgesics usually cause the pupils to become smaller or "constricted."
- Dissociative Anesthetics and most Inhalants tend to leave pupil size in the average ranges.

CNS Depressants also usually leave the pupils near the average range.

- However, there are some exceptions, i.e., depressant drugs that usually dilate the pupils.

Soma, Quaaludes and some anti-depressants usually dilate pupils.



The checks of horizontal gaze nystagmus, lack of convergence, pupil size, and reaction to light provide useful indicators of the possible presence of many drug categories.

REVIEW QUESTIONS

1. Name the three clues of impairment associated with Horizontal Gaze Nystagmus.

2. Complete this formula: BAC = 50 - ????

3. Which categories of drugs will not cause Vertical Gaze Nystagmus?

4. Which categories of drugs usually will cause Lack of Convergence?

5. Name the three lighting conditions under which a DRE makes pupil size estimations.

6. What is the average range of pupil size for room light?

7. Which categories of drugs will usually slow down the reaction of the pupils to light?

Understanding the Terms “Normal” vs. “Average” in the DRE Opinion and Decision Making Process

Dr. Jack E. Rickman, O.D., New England College of Optometry (Retired), Don Decker, Massachusetts DRE State Coordinator, Charles Hayes, International Association of Chiefs of Police – DRE Regional Operations Coordinator.

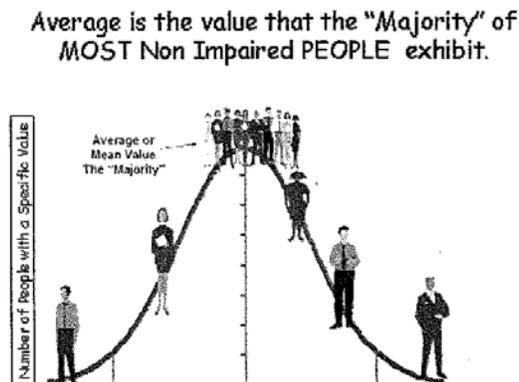
The Drug Evaluation and Classification (DEC) training program and the Drug Recognition Expert (DRE) examination process utilizes a standardized and systematic process assessing a variety of physical indicators to identify drug-impaired drivers. (“Drug Evaluation and Classification Program 7-Day School Training manual, 2013”). These indicators are also referred to as signs and symptoms and are based on accepted information within the medical and health care community (“Drug Effects on Psychomotor Performance” Randall C Baselt, Ph.D., Biomedical Publications).

During a DRE drug influence evaluation the DRE uses controlled and standardized methods to assess a person’s pulse, blood pressure, body temperature, pupil size, reaction to light and psychomotor functions. The DRE also evaluates the suspect’s visual tracking, smooth pursuit and Horizontal and Vertical Gaze Nystagmus (HGN and VGN).

A DRE is trained to reach a conclusion (opinion) of the person’s condition based on the interpretation of all these signs and indicators as well as the facts of the situation in its entirety. An opinion is not based simply on one or two elements of the evaluation, but on the totality of the information gained during the investigation.

Many of the DRE evaluation results involve the concept of “normal” or average values or average ranges therefore it is important that the DRE understand the concept of physical indicators of impairment and how they relate to their opinion making process.

Average values or ranges are based on the values for the majority of healthy non-impaired people. Average within the DRE process is the number that represents the value that the majority of non-impaired people would exhibit or have in a specific test. (Refer to graph below)



For example, the “average” or “mean value” for pupil size in near total darkness is 6.5 mm. This means that when all the sizes were measured in a large number of pupils in healthy non-impaired adults, the majority of the people had a pupil size approximately 6.5 mm. (“An Evaluation of the Pupil Size Standards Used By Police Officers for Detecting Drug Impairment” by Richman, McAndrew, Decker, and Mullaney, *Optometry, March 2004*)

In scientific and clinical information, the terms “mean”, “average” or “average range” are commonly used. Average range typically means a range of values or results that are “close to” average, but can be plus (above) or minus (below) from the “average” value for the majority of healthy non-impaired people.

Average then is a quantity that represents the middle or typical value that the majority of healthy non-impaired people would exhibit in a specific test, i.e., pupil size, pulse rate, body temperatures. The average or mean value is the total of a group of numbers divided by the total number of values in the group typically using a standard deviation. For example, a group of non-impaired males and females would be given a specific test, e.g., pupil size estimation in near total darkness, and the results were determined for the averages in order to create the reference range for that group. Though the average pupil size was approximately 6.5 mm, the average range for the majority of non-impaired subjects was 5 mm to 8.5 mm. (Richman, et al).

In the DEC Program, the use of the terms “normal”, “average”, “average ranges” or “DRE average range” are often used interchangeably. There are situations where a DRE uses the term “normal” when referring to a non-impaired result for a particular function or test. But since the DRE does not know what “normal” is for the individual being tested, a better and more accurate descriptor would be with the “DRE average ranges” which relate to values for healthy non-impaired persons for that particular function of test. If a DRE deems that a result is “normal” or within the “normal ranges” it does not mean the person is normal from a medical standpoint. A DRE does not make a medical diagnosis which is beyond the scope and purpose of the DRE evaluation.

Summary:

From the DRE perspective the closer the test finding is to the average value for the majority of non-impaired people, the more likely the person is not exhibiting impairment in that particular function or test.

The further from the test finding to the average value for the majority of non-impaired people and the edge of the “average range for the majority of non-impaired people”, the more likely the person is exhibiting impairment in the particular function or test.

The further the finding outside the average range for the majority of non-impaired people the greater the likelihood that the person is exhibiting impairment in the particular function or test.

CEH

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 5 - Alcohol Workshop

120 Minutes

Session 5

Alcohol Workshop



Preliminary Training for Drug Evaluation and Classification Program

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Learning Objectives

- Administer the psychophysical tests and the eye examinations to persons who have consumed varying amounts of alcohol
- Document the results of these tests and examinations
- Accurately assess the extent of a person's alcohol impairment based on the tests and examinations

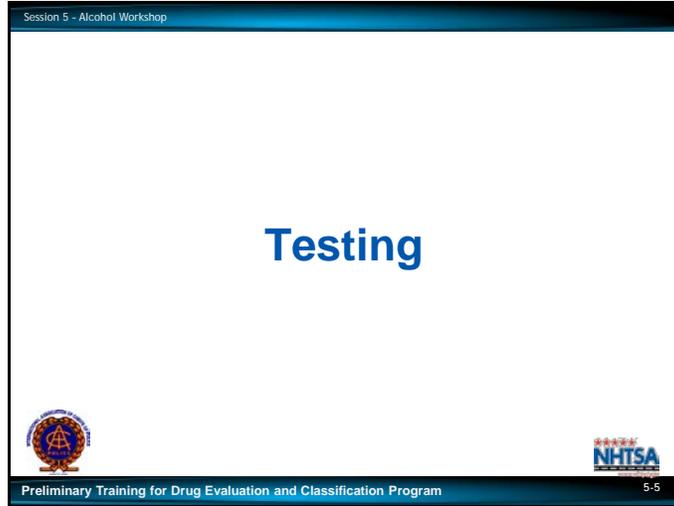


Upon successfully completing this session the participant will be able to:

- Administer the psychophysical tests and the eye examinations to persons who have consumed varying amounts of alcohol.
- Document the results of these tests and examinations.
- Accurately assess the extent of a person's alcohol impairment based on the tests and examinations.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. Assignments and Procedures..... Hands-on Practice
- B. Testing.....Participant-Led Presentations
- C. Feedback and Discussion
- D. Alcohol Workshop Checklist



B. Testing

C. Feedback and Discussion

D. Alcohol Workshop SFST Proficiency Checklist

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Participant Guide

Drug Evaluation and Classification (Preliminary School)

Session 6 - Examinations of Vital Signs

180 Minutes

Session 6

Examinations of Vital Signs



Preliminary Training for Drug Evaluation and Classification Program

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Session 6 - Examinations of Vital Signs

Vital Signs

- Pulse rate
- Blood pressure
- Temperature

Different types of drugs affect these vital signs in different ways



Preliminary Training for Drug Evaluation and Classification Program 6-3

A. Purposes of the Examinations

The vital signs that are relevant to the drug influence evaluation process include:

- Pulse rate
- Blood pressure
- Temperature

Different types of drugs affect these vital signs in different ways.

Certain drugs tend to “speed up” the body and elevate these vital signs.

Clarification:

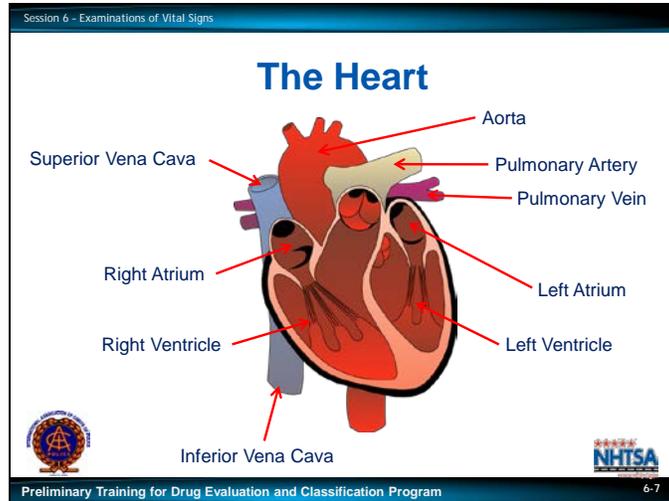
- Pulse may quicken
- Blood pressure may rise
- Temperature may rise

Other drugs tend to “slow down” the body and lower these vital signs.

Clarification:

- Pulse may slow
- Blood pressure may drop
- Temperature may fall

Systematic examination of the vital signs gives us much useful information concerning the possible presence or absence of various categories of drugs.



The heart is the pump and has two sides:

Consists of the left atrium and ventricle. The upper chamber (atrium) receives blood from the great veins, the lower chamber discharges blood into the great arteries.

Left side pumps blood through the aorta and the arteries to the tissues.

Blood, after passing through the tissues, returns via the veins to the right side.

Right side pumps blood through the pulmonary artery to the lungs and returns it to the left side of the heart again via the four pulmonary veins.

Consists of the right atrium and ventricle.

NOTE: The pulmonary artery is the only artery that carries de-oxygenated blood; all other arteries carry blood that has received fresh oxygen from the lungs. Likewise, the pulmonary vein is the only vein that carries blood rich in oxygen; all other veins carry blood depleted of oxygen back to the heart.

The normal heart continues to beat regularly and continuously, with a rest interval never longer than a fraction of a second.

Pulse rate is the number of pulsations per minute.

For DRE purposes, the average range for the pulse rate is 60-90 pulsation beats per minute.

Session 6 - Examinations of Vital Signs

Definitions Concerning "Pulse"

- **Pulse**
The expansion and contraction of an artery generated by the pumping action of the heart
- **Pulse Rate**
The number of pulsations in an artery per minute
- **Artery**
A strong, elastic blood vessel that carries blood from the heart to the body tissues
- **Vein**
A blood vessel that carries blood back to the heart from the body tissues



Preliminary Training for Drug Evaluation and Classification Program 6-9

B. Procedures and Cues

Measurement of Pulse Rate

- Pulse is the expansion and contraction of the walls of an artery generated by the pumping action of the blood.
- Pulse rate is the number of pulsations in an artery per minute.
- An artery is a strong, elastic blood vessel that carries blood away from the heart.
- A vein is a blood vessel that carries blood back to the heart from the body tissues.
- When the heart contracts, it squeezes blood out of its chambers into the arteries.
- The surging blood causes the arteries to expand.

By placing your fingers on the skin next to an artery and pressing down, you can feel the artery expand as the blood surges through.

By keeping your fingers on the artery and counting the number of pulses that occur in one minute, you will measure the pulse rate.

Pulse is easy to measure, once you locate an artery close to the surface of the skin.

Definitions Concerning “Blood Pressure”

- **Blood Pressure**
The force that the circulating blood exerts on the walls of the arteries
- **Systolic Pressure**
The maximum blood pressure, reached as the heart contracts
- **Diastolic Pressure**
The minimum pressure, reached when the heart is fully expanded



Measurement of Blood Pressure

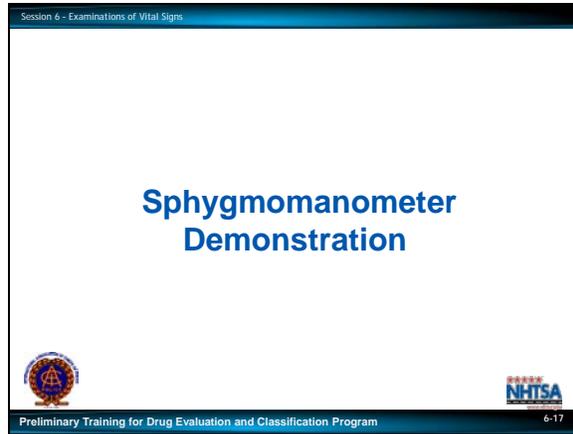
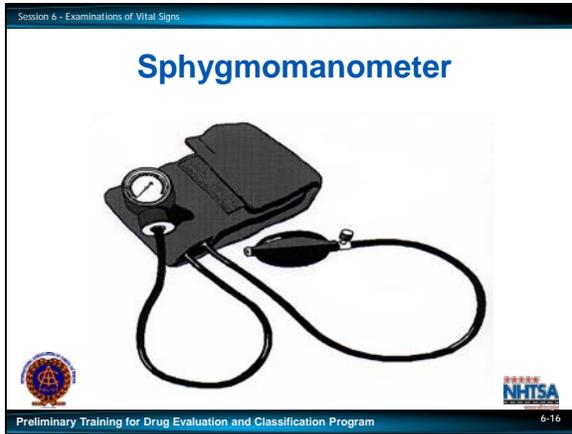
Blood pressure is the force that the circulating blood exerts on the walls of the arteries.

- Blood pressure changes constantly as the heart cycles between contraction and expansion.
- Blood pressure reaches its maximum as the heart contracts and sends the blood surging through the arteries. This is called the systolic pressure.
- Blood pressure reaches its minimum when the heart is fully expanded. This is called the diastolic pressure.
- It is always necessary to measure and record both the systolic and diastolic blood pressure.

Memory aid:

Systolic: “S” for “Superior”

Diastolic: “D” for “Down”



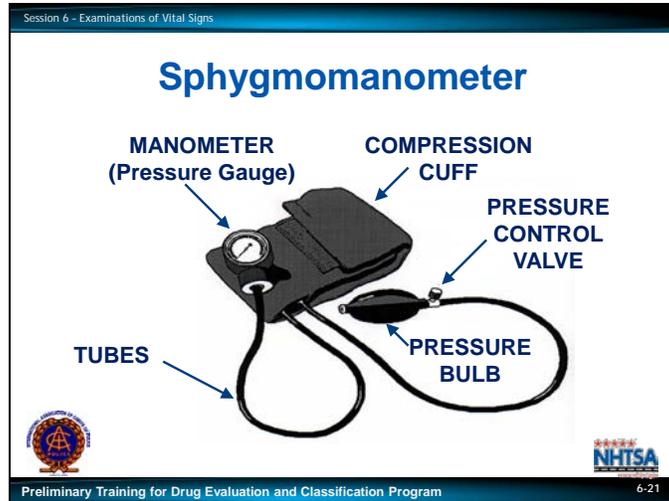
The device used for measuring blood pressure is called a sphygmomanometer.

The sphygmomanometer has a special cuff that can be wrapped around the subject's arm and inflated with air pressure.

- As the pressure in the cuff increases, the cuff squeezes tightly on the arm.
- When the pressure gets high enough, it will squeeze the artery completely shut.
- Blood will cease flowing through the brachial artery. Since the brachial artery "feeds" the radial artery, blood will also cease flowing through the radial artery.

If we slowly release the air in the cuff, the pressure on the arm and on the artery will start to drop.

- Eventually, the pressure will drop enough so that blood will once again start to flow through the artery.
 - Blood will start flowing in the artery once the pressure inside the artery equals the pressure outside the artery.
 - The two pressures will become equal when the air pressure in the cuff drops down to the systolic pressure.
 - Point out that the blood would spurt through the artery each time the heart contracted, but would cease flowing when the heart expanded.
 - When that happens, blood will spurt through the artery each time the heart contracts.
 - Once the air pressure in the cuff drops down to the diastolic level, the blood will flow continuously through the artery.
-
-
-
-



Familiarization with the Sphygmomanometer

The compression cuff contains an inflatable rubber bladder.

A tube connects the bladder to the manometer, or pressure gauge.

- Another tube connects the bladder to the pressure bulb, which can be squeezed to inflate the bladder.
- The pressure control valve permits inflation of the bladder and regulates the rate at which the bladder is deflated.
- To inflate the bladder, the pressure control valve must be twisted all the way to the right.
- When the valve is twisted all the way to the right, air can be pumped into the bladder, but no air can escape from the bladder.
- To deflate the bladder, twist the valve to the left.
- The more the valve is twisted to the left, the faster the bladder will deflate.

Drug Categories and Vital Signs

- All seven categories of drugs ordinarily will affect pulse rate and blood pressure
- Some categories usually will lower pulse and blood pressure



E. Relationship of Drug Categories to the Vital Signs Examinations

- All seven categories of drugs ordinarily will affect pulse rate and blood pressure.
- Some categories usually will lower pulse and blood pressure.
- CNS Depressants and Narcotic Analgesics usually lower pulse and BP.
- Quaaludes, ETOH and possibly some anti-depressants may cause the pulse to increase.

The other five categories all tend to elevate pulse rate.

- Most of the drug categories that elevate pulse rate also elevate blood pressure.
- CNS Stimulants, Hallucinogens, Dissociative Anesthetics and Cannabis all usually cause blood pressure to rise.
- The vast majority of Inhalants, namely, the volatile solvents and the aerosols, also elevate blood pressure.
- But the remaining small group of Inhalants, the anesthetic gases, actually lowers the blood pressure.

- So for Inhalants, the effect on blood pressure will be up or down.

Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 7 - Overview of Signs and Symptoms

75 Minutes

Session 7

Overview of Signs and Symptoms



Preliminary Training for Drug Evaluation and Classification Program

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Learning Objectives

- Give examples of specific drugs belonging to the seven drug categories
- Describe the major signs and symptoms of impairment associated with each category



Upon successfully completing this session the participant will be able to:

- Give examples of specific drugs belonging to the seven drug categories.
- Describe the major signs and symptoms of impairment associated with each category.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. CNS DepressantsInteractive Discussions
- B. CNS Stimulants
- C. Hallucinogens
- D. Dissociative Anesthetics
- E. Narcotic Analgesics
- F. Inhalants
- G. Cannabis
- H. Wrap-Up

Session 7 - Overview of Signs and Symptoms

Inhalants

- HGN ?
- VGN ?
- LOC ?






Preliminary Training for Drug Evaluation and Classification Program 7-19

F. Inhalants

The category of Inhalants includes a wide variety of gases and fumes that have mind-altering effects.

- Not all Inhalants affect their users in exactly the same way.
- There is probably less consistency in the signs and symptoms of Inhalants than there is with any other category.
- When we talk of the signs and symptoms of Inhalants, we often must qualify our statements.
- For example, we may say that a particular effect will be observed “for most Inhalants.”

Indicators of Inhalant Influence Found in Eye Exams

With most Inhalants, HGN usually will be present.

With most Inhalants, Vertical Gaze Nystagmus may be present, especially with large doses.

Under the influence of Inhalants, Lack of Convergence usually will be present.

Drug Matrix

INDICATOR	CNS Dep.	CNS Stim.	Halluc.	Dissoc. Anesthet.	Narc. Analges.	Inhalants	Cannabis
HGN							
VGN							
LoC							
Pupil Size							
Reaction to Light							
Pulse Rate							
Blood Pressure							
Body Temp.							
Muscle Tone							

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 8 - Alcohol as a Drug

90 Minutes

Session 8

Alcohol as a Drug



Preliminary Training for Drug Evaluation and Classification Program

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Session 8 - Alcohol as a Drug

Learning Objectives

- Describe a brief history of alcohol
- Identify common types of alcohol
- Describe the physiological processes of absorption, distribution and elimination of alcohol in the human body
- Describe dose response relationships that impact alcohol's impairing effects




Preliminary Training for Drug Evaluation and Classification Program 8-2

Upon successfully completing this session the participant will be able to:

- Describe a brief history of alcohol.
- Identify common types of alcohols.
- Describe the physiological processes of absorption, distribution and elimination of alcohol in the human body.
- Describe dose response relationships that impact alcohol's impairing effects.

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. Brief Overview of Alcohol Instructor-Led Presentations
- B. Physiological Processes..... Oral Quiz
- C. Symptomatology of Alcohol
- D. Dose-Response Relationships
- E. Questions for Review
 - Alcohol is a drug. In fact, alcohol is the most commonly abused drug.
 - As DREs, the participants will often encounter persons who are under the combined influence of alcohol and some other drug.

Session 8 - Alcohol as a Drug

Alcohol

A family of closely-related chemicals whose molecules are made up of hydrogen, carbon, and oxygen.

Preliminary Training for Drug Evaluation and Classification Program 8-3

Session 8 - Alcohol as a Drug

Some Types of Alcohol

METHYL ALCOHOL
(Methanol)

ETHYL ALCOHOL
(Ethanol)

ISOPROPYL ALCOHOL
(Isopropanol)

Preliminary Training for Drug Evaluation and Classification Program 8-4

A. A Brief Overview of Alcohol

The word “alcohol” refers to a number of distinct but similar chemicals.

- Each of the chemicals that is called an “alcohol” is composed of the three elements: hydrogen, carbon, and oxygen.
- Each of the “alcohols” is a drug within the scope of our definition.
- But only one can be tolerated by the human body in substantial quantities.

Common Alcohols

Three of the more commonly known “alcohols” are Methyl, Ethyl, and Isopropyl.

- Methyl Alcohol, also known as Methanol, or “wood alcohol.”
- Ethyl Alcohol, also known as Ethanol, or “beverage alcohol.”
- Isopropyl Alcohol, also known as Isopropanol, or “rubbing alcohol.”

Ethanol Alcohol

Ethanol is the kind of alcohol on which we will focus, because it is the only type intended for human consumption.

- Ethanol is the active ingredient in beer, wine, whiskey, and other alcoholic beverages intended for drinking.
- Like all “alcohols,” ethanol is composed of hydrogen, carbon and oxygen.
- Chemists use a number of different symbols to represent ethanol.

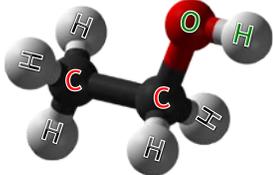
Session 8 - Alcohol as a Drug

Ethanol

Ethyl Alcohol
(Intended for human consumption)

Chemical Symbols:

- ETOH
- C_2H_5OH



Preliminary Training for Drug Evaluation and Classification Program 8-5

Session 8 - Alcohol as a Drug

Production of Ethanol

- **FERMENTATION**
Yeast combines with sugars from fruit or grains in a chemical reaction that results in ETOH
- **DISTILLATION**
Fermented beverage is boiled at a controlled temperature to extract and concentrate the ethanol fumes

Preliminary Training for Drug Evaluation and Classification Program 8-6

- For our purposes, we will use the symbol “ETOH.”
- The “ET” represents “ethyl” and the “OH” represents an oxygen atom and hydrogen atom, bonded together in what the chemists refer to as the “hydroxy radical.” All alcohols have a hydroxy radical in their molecules.

Ethanol has been around for a long time. People drank it long before they learned to write.

Ethanol is a naturally occurring drug. That is, it is produced through a process called fermentation.

In fermentation, spores of yeast, carried by the wind, come in contact with fruit or grain that has fallen to the ground.

Sugars in the fruit or grain chemically react with yeast, and produce ethanol.

Humans almost certainly first encountered ethanol that had been produced accidentally in this fashion.

Of course, today we don't sit around waiting for the wind to bring yeast to fallen fruit.

Most fermentation takes place on purpose, under controlled conditions.

Through the process of fermentation, we can produce a beverage that has, at most, about 14% ethanol.

When the ethanol concentration reaches 14%, the yeast die, so fermentation stops.

If we want to have higher concentration ethanol beverages, we have to use another step in the production.

Distillation is the process used to produce a higher concentration of ethanol.



B. Physiological Processes

Alcohol is the most abused drug in the United States.

Ethanol is a Central Nervous System Depressant.

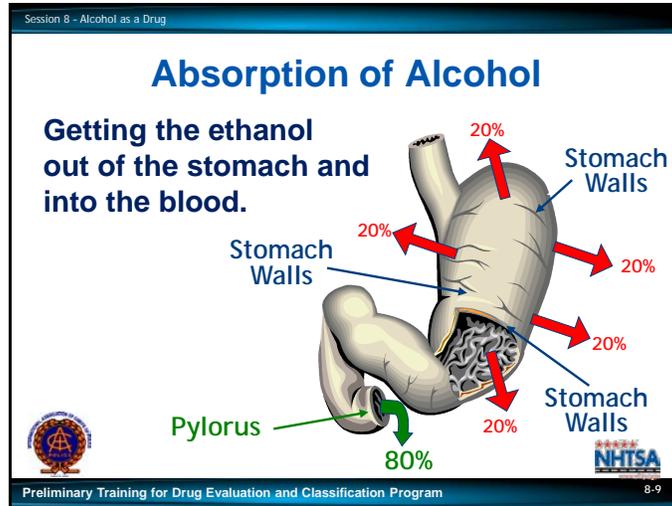
- It doesn't impair until it gets into the brain.
- It can't get into the brain until it first gets into the blood.
- It can't get into the blood until it first gets into the body.

This concept is true with all drugs that impair.

There are a number of ways in which alcohol can get into the body.

- It can be injected into a vein via hypodermic needle.
- It can be inhaled, i.e., alcohol fumes can be brought into the lungs, and some molecules will pass into the blood.
- It could also be inserted as an enema and ingested by quickly passing from the large intestine into the blood.

But the vast majority of times that alcohol gets into the body, it gets there via drinking.

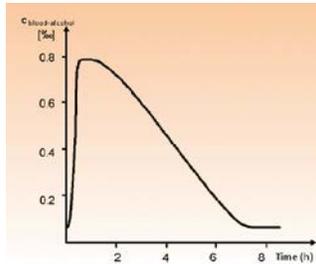


Once the alcohol is in the stomach, it will take two routes to get into the blood.

- One interesting thing about alcohol is that it is able to pass directly through the stomach walls.
- Under normal conditions, about 20% of the alcohol a person drinks gets into the blood by diffusing through the walls of the stomach.
- But most of the alcohol usually passes through the base of the stomach into the small intestine, from which it passes quickly into the blood.
- Another interesting thing about alcohol is that it does not have to be digested before it can move from the stomach to the small intestine.
- When a person eats food, the food must remain for a time in the stomach.
- Acids and enzymes in the stomach must begin to break down the food to prepare it to pass to the lower portion of the gastrointestinal track.
- While the initial digestive process is underway, a muscle at the base of the stomach will constrict, and shut off the passage to the small intestine.
- Note the muscle called the pylorus, or pyloric valve.
- Since alcohol doesn't have to be digested, the pylorus does not constrict when alcohol enters the stomach.
- If we drink on an empty stomach, the pylorus stays wide open.
- The alcohol will pass immediately through the base of the stomach, into the small intestine, and quickly move into the bloodstream.
- Food will cause the pylorus to constrict.
- While the pylorus is closed, nothing will move from the stomach to the small intestine.

Metabolism in the Liver

- Due to metabolism, the average person's BAC drops by about 0.015 per hour



The speed with which the liver burns alcohol varies from person to person, and will change from time to time for any particular person.

- BUT ON THE AVERAGE: Due to metabolism, a person's BAC will drop by about 0.015 per hour. For the average male, a BAC of 0.015 is equal to the alcohol content of about two-thirds of a "standard drink". i.e., about two-thirds of a can of beer, or about two-thirds of a glass of wine, or two-thirds of a shot of whiskey.
- For the average woman, a BAC of 0.015 is equal to the alcohol content of only one-half of a "standard drink." So the average male can "burn up" about two-thirds of a drink in an hour. But the average female can only burn up about one-half of a drink in an hour.
- In other words: suppose a person gulps down a can of beer, or a glass of wine, or a shot of whiskey; if the person is an average man, it will take him about an hour and one-half to burn up that alcohol; if the person is a woman, it will take her about two hours.
- We can't speed it up.
- Drinking coffee won't help.
- A cold shower won't help.
- Exercise won't help.
- Our livers take their own sweet time burning the alcohol.

Alcohol Symptomatology

	ALCOHOL
HGN	Present
VGN	Present (High Doses)
LACK CONV	Present
PUPIL SIZE	Normal
RCTN LIGHT	Slow
PULSE RATE	Down ²
BLOOD PRESS	Down
TEMP	Normal
MUSCLE TONE	Flaccid



² May be elevated.

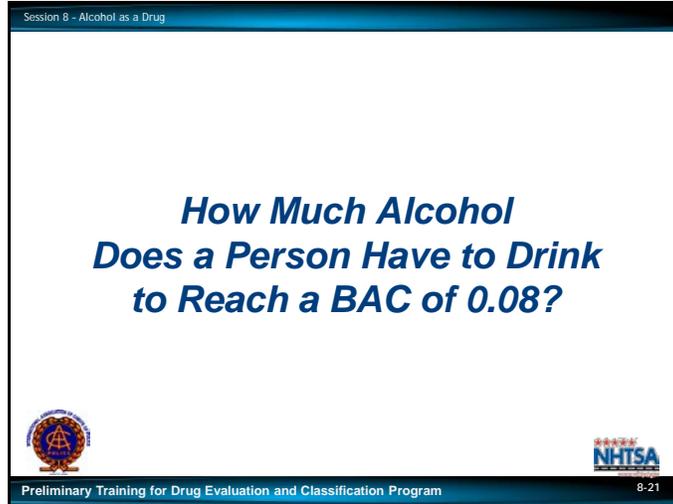


C. Symptomatology of Alcohol

- ETOH may elevate the pulse rate in lower BAC levels.

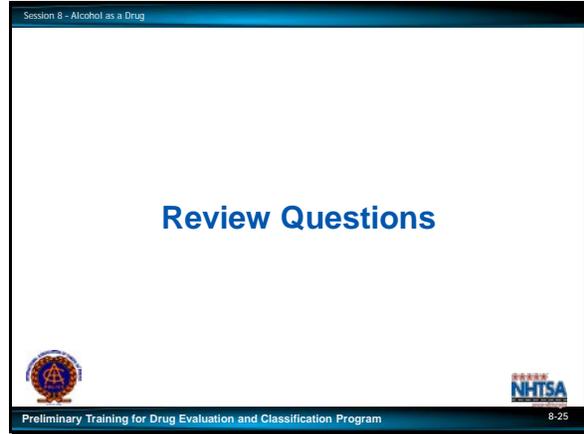
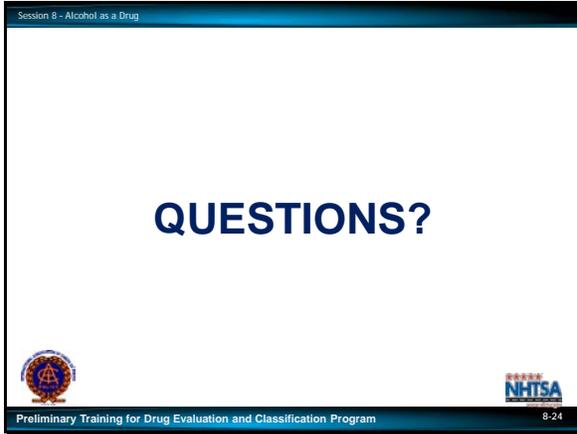
Indicators of Alcohol Influence Found in Eye Exams

- HGN will be present.
- Vertical Gaze Nystagmus may be present, especially with high doses (for that individual) of alcohol.
- Under the influence of alcohol, Lack of Convergence frequently will be present.
- Alcohol does not affect pupil size; therefore, alcohol usually leaves the pupils in the DRE average ranges.
- Alcohol will cause pupillary reaction to light to be sluggish.
- Indicators of Alcohol Influence Found in Checks of Vital Signs
- Pulse rate will usually be down. However, ETOH is one of the exceptions and some subjects have been found to have elevated pulse rates at lower BACs.
- Blood pressure response to alcohol will normally be down.
- *Alcohol usually leaves body temperature near the average range.*
- Alcohol usually causes flaccid muscle tone.



How much alcohol does a person have to drink to reach a BAC of 0.08?

- Take an average male weighing 175 pounds and in reasonably good physical shape.
- Assume he does his drinking on an empty stomach.
- He would have to gulp down about 4 to 5 cans of beer, or 4 to 5 glasses of wine, or five shots of whiskey in a fairly short period of time to reach 0.08 BAC.
- In terms of pure ethanol, that would amount to just about two and one-half fluid ounces, or about two shot glasses.
- If these two shot glasses were filled with pure ethanol, we would have just enough of the drug to bring an average man to a BAC of approximately 0.10.
- In one respect, it certainly doesn't take much ethanol to impair; just two full shot glasses will more than do the trick for a full-sized man.
- BUT COMPARED TO OTHER DRUGS, it takes an enormous quantity of ethanol to cause impairment.
- In order to compare ethanol to other drugs, we have to review some more units of weight.



E. Questions for Review

1. What is the chemical abbreviation for beverage alcohol?

2. What is the name of the chemical process by which beverage alcohol is produced naturally?

3. True or False: "Blood alcohol concentration is the number of grams of alcohol in every 100 milliliters of blood."

4. True or False: Pound-for-pound, the average woman contains more water than does the average man.

5. What do we mean by the "proof" of an alcoholic beverage?

6. Every chemical that is an "alcohol" contains what three elements?

7. True or False: Most of the alcohol that a person drinks is absorbed into the blood via the small intestine.

8. What is the name of the muscle that controls the passage from the stomach to the lower gastrointestinal tract?

9. True or False: Alcohol can pass directly through the stomach walls and enter the bloodstream.

10. Suppose a man and a woman who both weigh 160 pounds arrived at a party and started to drink at the same time. And suppose that, two hours later, they both have a BAC of 0.10. How did this occur?

11. In which organ of the body does most of the metabolism of the alcohol take place?

12. What is the name of the enzyme that aids the metabolism of alcohol?

13. Once a person reaches his or her peak BAC, it will drop at a rate of about _____ per hour.

14. True or False: If a person has a blood alcohol concentration of 0.10, then there are one million nanograms of alcohol in every milliliter of his or her blood.

15. True or False: It takes about thirty minutes for the average 175 pound man to “burn off” the alcohol in one 12-ounce can of beer.

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 9 - Preparing for the DRE School

30 Minutes

Session 9

Preparing for the DRE School



Preliminary Training for Drug Evaluation and Classification Program

9-1

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Participant Manual

Drug Evaluation and Classification (Preliminary School)

Session 10 - Conclusion of the Preliminary Training

45 Minutes

Session 10

Conclusion of the
Preliminary Training



Preliminary Training for Drug Evaluation and Classification Program

10-1

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Session 10 - Conclusion of the Preliminary Training

Learning Objectives

- **Demonstrate knowledge of the concepts covered during the training**
- **Offer anonymous comments and criticisms concerning the school**



Preliminary Training for Drug Evaluation and Classification Program 10-2

Upon successfully completing this session the participant will be able to:

- Demonstrate his or her knowledge of the concepts covered during the DRE Pre-School.
- Offer anonymous comments and criticisms concerning the school

CONTENT SEGMENTS..... LEARNING ACTIVITIES

- A. Post-Test and Critique..... Written Examinations
- B. Certificates and Dismissal
- C. Session Wrap-up

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Course Location _____ Date _____

Preliminary Training for Drug Evaluation and Classification
Student's Critique Form

A. Course Objectives

Please indicate whether you feel that you personally achieved the following course objectives.

	Yes	No	Not Sure
Can you define the term "drug" and name the seven drug categories?			
Can you identify the twelve major components of the drug recognition process?			
Can you administer and interpret the psychophysical tests used in a drug evaluation?			
Can you conduct the eye examinations used in the evaluations?			
Can you check the vital signs used in the evaluation?			
Can you list the major signs and symptoms associated with each drug category?			
Can you describe the history and physiology of alcohol as a drug?			

B. Course Activities

Please rate how helpful each workshop session was for you personally. Also, please rate the quality of instruction (subject knowledge, instructional techniques and learning activities). Use a scale from 1 to 5 where: 5=Excellent, 4=Very Good, 3=Good, 2=Fair, 1=Poor.

	Session/Activity	Quality
Overview of Drug Evaluation and Classification Procedures		
The Psychophysical Tests		
The Eye Examinations		
Alcohol Workshop		
Examination of Vital Signs		
Overview of Signs and Symptoms		
Alcohol as a Drug		
Preparing for the DRE School		

C. Course Design

Please indicate your own personal feeling about the accuracy of each statement.

	Agree	Disagree	Not Sure
1. I wish we had more practice with drinking volunteers.			
2. There was too much "bull throwing" in this course.			
3. I now have a much better idea as to what the drug recognition process is all about.			
4. The course was at least one-half day too long.			
5. I got a great deal of practical, useful information from this course.			
6. I'm still pretty confused as to what the drug recognition process is all about.			
7. I think I could do a pretty good job conducting a drug evaluation right now, without additional training.			
8. This course should have been at least one-half day longer.			
9. We spent too much time with the volunteer drinkers session.			
10. Some of the practice sessions in this course were dragged out a bit too much.			
11. I don't think that our instructors were as well prepared as they should have been.			
12. This course was a good review, but it really didn't teach me anything new.			
13. I am very glad that I attended this course.			
14. The instructors seemed to be more interested in practicing their teaching skills than in seeing to it that we learned what we were supposed to learn.			
15. I would have to say that this course was not quite as good as I expected it to be.			

D. Suggestions for Deletion and Additions

If you absolutely had to cut four hours out of this course, what would you delete or shorten?

If you could add four hours to this course, how would you spend the extra time?

E. Ratings of the Course and the Instructors

On a scale from 1 (=very poor) to 5 (=excellent), please give your opinion of the course as a whole.

The course as a whole: _____

On a scale from 1 (=very poor) to 5 (=excellent), please give your opinion of each instructor.

Instructor	Rating

F. Final Comments/Suggestions

Please offer any final comments that you wish to make.
