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<th>Document Description</th>
<th>Page(s) Withheld</th>
<th>Exemption</th>
<th>Comments</th>
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<tr>
<td>Drug Recognition Expert Pre-School Instructor Manual, HS 172A R1/07, January 2007</td>
<td>221-231</td>
<td>Exam information Test questions - Employment and Licensing - RCW 42.56.250(1)</td>
<td>Test questions, scoring keys, and other examination data used to administer a license, employment, or academic examination are exempt from production.</td>
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<td>Drug Recognition Expert 7-Day Instructor Manual, HS 172A R1/07, January 2007</td>
<td>232-245</td>
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<td>Drug Recognition Expert Pre-School Instructor Manual, HS 172A R1/07, January 2007</td>
<td>246-249</td>
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<td>Drug Recognition Expert 7-Day Instructor Manual, HS 172A R1/07, January 2007</td>
<td>250-252</td>
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<td>Drug Recognition Expert Pre-School Instructor Manual, HS 172A R1/07, January 2007</td>
<td>253-257</td>
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<td>258-260</td>
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PRELIMINARY TRAINING
FOR DRUG EVALUATION AND CLASSIFICATION

ADMINISTRATOR'S GUIDE
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2. Instructor Qualifications
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A. Purpose of This Document

This Administrator's Guide provides an introduction to and an overview of the two-day course entitled "Preliminary Training for Drug Evaluation and Classification Program". This course is the first in a series of three training programs that, collectively, prepare police officers and other qualified persons to serve as Drug Recognition Experts (DREs). In some law enforcement agencies, these officers are known as Drug Recognition Technicians. The International Association of Chiefs of Police (IACP) have adopted "DRE" as the generic title for the persons who carry out this program.

A person who satisfactorily completes this Preliminary Training program is eligible for advancement to the second stage of DRE training, i.e., the seven-day classroom program in Drug Evaluation and Classification. The seven-day course commonly is called the "DRE School", to distinguish it from this two-day preliminary course (known as the "Pre-School"). Upon successful completion of the seven-day DRE School, the officer graduates to the final, or Certification Phase, of his or her training. The Certification Phase is conducted on-the-job: under the supervision of duly-authorized instructors, the DRE trainee conducts evaluations of persons actually under arrest on suspicion of drug impairment. The instructors evaluate the trainee's skill in conducting drug recognition examinations, and also evaluate his or her judgment in forming opinions as to the category or combination of categories of drugs causing the impairment evident in the suspects. And, the trainee's opinions are compared with the results of toxicological examinations, when they are available.

This Administrator's Guide is intended to facilitate planning and implementation of the Preliminary Training Program. The Guide overviews the two-day course of instruction and also overviews the documents that make up the curriculum package.

B. Overview of the Course

1. For Whom Is The Training Intended?

   This course is designed for people who have been selected to serve as DREs. No one is permitted to enroll in the Pre-School unless he or she intend to proceed through the sub-sequent stages of training, and ultimately achieve certification as a DRE. The emphasis here should be kept on the concept of actual service as DREs. The skills that a DRE applies can be kept sharp only if they are frequently used.
There is no point in offering this training to someone who will not routinely and regularly evaluate drug-impaired suspects, since that person would quickly lose whatever competence he or she gained through the training. The DRE's job is not like riding a bicycle: one can and will forget how to do it properly unless he or she does it frequently. Agencies interested in this training should take special note that it is not desirable to send full-time instructors to this course, with the intent of having those instructors come home and teach others. Unless provisions are made to have those instructors actually work as DREs, their ability to serve competently as teachers of other DREs will vanish rapidly. It is far preferable to select trainees who will subsequently serve primarily as DRE practitioners, and who can be called upon part-time to serve as trainers.

Anyone selected as a DRE trainee must be fully competent with the Standardized Field Sobriety Tests (SFSTs), i.e., Horizontal Gaze Nystagmus, Walk and Turn, and One Leg Stand. No one can progress to the seven-day DRE School until he or she demonstrates proficiency with the three SFSTs.

2. What Is The Goal Of This Training?

The goal of this two-day Pre-School is succinct:

To prepare the student to participate successfully in his or her formal classroom training in the drug recognition process, i.e., the seven-day DRE School.

3. What Will The Students Get Out Of The Training?

As a result of successfully completing this Pre-School, the students will be better able to:

(1) Define the term "drug" and name the seven categories.

(2) Identify the twelve major components of the drug recognition process.

(3) Administer and interpret the psychophysical tests used in the process.

(4) Conduct the eye examinations used in the process.

(5) Check the vital signs that are relevant to the process.

(6) List the major signs and symptoms associated with each drug category.
(7) Describe the history and physiology of alcohol as a drug.

These are a subset of the competencies expected of DRE trainees by the completion of the seven-day DRE School; the Pre-School gives them a "head start" toward achieving those skills.

4. What Subject Matter Does The Course Cover?

The Pre-School covers concepts and skills that are fundamental to the DRE's job.

- A traffic safety-oriented definition of what constitutes a "drug" (i.e., Any substance which when taken into the human body can impair the ability of the person to operate a vehicle safely.

- Enumeration of seven distinct categories of drugs; the drug recognition process allows the DRE to identify which category or combination of categories is causing the impairment evident in a subject

- Demonstrations of and practice with four divided attention psychophysical tests that are used to assess impairment during a drug evaluation.

- Demonstration of and practice with the three eye examinations that provide cues of the possible presence of various drug categories.

- Demonstrations of and practice with checks of certain vital signs that point to the possible presence of various drug categories.

- A review of the major observable signs that distinguish the categories from each other.

5. What Activities Take Place During The Training?

Although a certain minimal amount of formal lectures are required, the course consists primarily of hands-on practice. Students repeatedly drill in the divided attention tests, the eye examinations and in performing checks of the vital signs. A controlled drinking exercise (involving volunteers who are not members of the class) provides an opportunity to practice assessing impairment on the divided attention tests.
6. How Long Does The Training Take?

The training encompasses approximately 13 and \( \frac{1}{2} \) hours of actual instruction. With breaks, this occupies two full training days.

C. Overview of the Curriculum Package

1. Instructor's Lesson Plans

The Instructor's Lesson Plans are a complete and detailed outline of what is to be taught in the Pre-School (i.e. the subject matter) and also of how it is to be taught (i.e., the instructional methods). The lesson plans are organized into modules. Each module corresponds to one of the course's ten sessions.

Each module consists of a cover page; an outline page; the lesson plans themselves; and copies of any visuals referenced in the lesson plans.

The cover page presents the session's title and the total time required to conduct the session.

The outline page presents the training objectives for the session, i.e. exactly what the student will be able to do as a result of successfully completing the session. The outline page also lists the major content segments of the session, as well as the principal instructional activities that take place during the session.

The lesson plans themselves are arrayed in a standard two-column format. The left-side column contains the outline of "content", or the subject matter to be taught. The right-side column outlines the "instructional notes", or how the content is to be taught.

The Instructor's Lesson Plans serve, first, to prepare the instructor to teach the course. He or she should review the entire set of plans, for all ten sessions, to become familiar with the content and learning activities and develop a clear understanding of how the course fits together. The instructor is expected to become thoroughly familiar with each lesson plan segment that he or she is assigned to teach; to prepare acetate copies of the visuals; to assemble all "props" and materials needed to deliver the lesson; and, to augment the instructional notes, as necessary and appropriate, to ensure that his or her own style and experience are applied to teaching the lesson.
Subsequently, the Instructor's Lesson Plans serve as an in-class reference document for the instructor, to help him or her maintain the sequence and pace of training.

It is worth emphasizing that the lesson plans are not speeches. Although the outlines of content and instructional notes are fairly detailed, those outlines are not to be read verbatim to the students. This training is intended to be a dynamic and highly interactive learning experience. It must not be permitted to degenerate into a series of mere lectures.

2. Visual Aids

Four kinds of audio-visual aids are employed in the Pre-School:

- wallcharts
- Dry erase board/flip-chart presentations
- visuals, i.e. PowerPoint slides
- video/DVD

The wallcharts are permanently displayed items. They consist of sketches with brief captions, intended to depict major themes and segments of the course. The wallcharts should be positioned high on the far left and right sides of the classroom's front wall where they will be visible without occupying the center of attention.

The dry erase board/flip-chart presentations are outlined in the "instructional notes" column of the lesson plans, and are self-explanatory.

The visuals are simple graphic and/or narrative displays that emphasize key points and support the instructor's presentations. In the "instructional notes", these are referred to as "visuals". Paper copies of all "visuals" are found at the end of each module.

The video/DVD is a portrayal of major components of the drug influence evaluation. This same video is used in the 7-day DRE School.
D. General Administrative Requirements

1. Facility Requirements

   The Pre-School requires a classroom with ample table/desk space for each student; an audio visual projector and screen; a video/DVD player and one or more monitors easily visible to all students; and, a dry-erase board and/or flip-chart. The classroom must have sufficient open space to permit instructors to give full and unimpeded demonstrations of the divided attention tests; the eye examinations; and the checks of vital signs. And, the arrangement of the classroom must permit the students to have full view of these demonstrations.

   Adequate space must be available to permit the students to practice the various tests and checks that the instructors demonstrate. The practice space may be a room separate from the classroom; a gymnasium often serves quite well for the practice segments.

   The Alcohol Workshop also requires a separate room where the volunteers can do their drinking. Breath testing instruments and operators must be available to monitor the volunteers' BACs.

2. Instructor Qualifications

   All faculty for the Pre-School must be duly certified DREs. The principal instructor, at least, must have completed DRE Instructor Training.

3. Class Size Considerations

   This course is a highly participative learning experience. A significant amount of hands-on practice requiring close supervision and coaching takes place. Because of the nature of this training, the recommended maximum class size is 25 students. A more nearly ideal range would be 15 to 20.

4. Requirements For The Controlled Drinking Practice Sessions

   Both the DRE Pre-School and DRE seven-day course require an alcohol workshop and the use of volunteer drinkers. The participation of volunteers who will consume carefully measured quantities of alcohol and submit to examinations administered by the students. Without these volunteers, students have no opportunity to practice administering the tests under reasonably realistic circumstances, or to practice interpreting test results. Drinking volunteers, then, are an essential resource for this training. But
they can be a difficult, even unpleasant, resource with which to work. Careful steps must be taken to insure that the volunteers contribute to a worthwhile learning experience, and suffer no harm themselves nor cause any harm to others.

The following criteria define who can be considered as drinking volunteers.

- They cannot be members of the class.
- They must be at least 21 years old.
- They cannot have any history of alcoholism.
- They cannot be known to suffer from any medical condition that may be exacerbated by alcohol (such as hypertension or diabetes).
- They cannot be taking any medication (prescription or otherwise) that might interact with alcohol.
- They must be in good physical health, and have no impairments of vision or limbs that might affect their performance of the Standardized Field Sobriety Tests.
- They must be under 60 years of age, and less than 50 pounds overweight (conditions for which the standardized divided attention tests have not been validated).

Every volunteer drinker participating in the alcohol workshop must read and sign the "Statement of Informed Consent" before receiving any alcohol. The Course Administrator or a designated DRE Instructor will obtain the individual signatures from each of the volunteer drinkers prior to commencing the alcohol workshop.

Transportation must be provided for the volunteers to and from the training session. Under no circumstances may a volunteer be permitted to drive from the training session, regardless of his or her blood alcohol concentration at the time of departure. Volunteers should be released only into the custody of responsible, sober persons.
The practice sessions require a minimum of one drinking volunteer for every five students. A more desirable ratio is one volunteer for every three students. Thus, for a class of 25 students, at least 5 volunteers, and preferably 8 or 9 must participate in each session.

The effectiveness of the volunteers, as training resources, very much depends on their blood alcohol concentrations. If a volunteer's BAC is too low (i.e., below 0.06), he or she generally will provide a poor simulation of a typical DWI subject. If the BAC is too high (i.e., above 0.15), the volunteer's state of inebriation usually will be evident without standardized sobriety testing, and the learning experience will not contribute as effectively as possible to sharpening the students' detection skills.

Ideally, approximately half of the volunteers at any session should achieve peak BACs between 0.12 and 0.14 and the other half between 0.06 and 0.08. But this is very difficult to control. It is always preferable to err, if necessary, on the low side: it is better to fail to get volunteers as "high" as desired, rather than to get them too "high".

Volunteers should be instructed to refrain from eating two hours prior to their arrival at the training facility. Food in their stomachs may dramatically affect the absorption of alcohol into their bloodstreams, and significantly impede your ability to control the peak BACs they achieve.

Volunteers should be brought to the training facility two hours before the practice session is scheduled to begin. Each volunteer should be breath tested immediately upon arrival to verify that his or her BAC is zero.

The table on the next page indicates the ounces of 80-proof distilled alcoholic beverage that volunteers should consume, in relation to their weight and the "target" peak BAC, during a three (3) hour interval to reach a target BAC of 0.12-0.14 percent.
GUIDELINES FOR ACHIEVING TARGET BAC'S
DURING A THREE (3) HOUR INTERVAL

Ounces of 80-Proof Alcoholic Beverage to Reach a B.A.C. of 0.12.

<table>
<thead>
<tr>
<th>Weight (Pounds)</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>5</td>
<td>4</td>
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<tr>
<td>120</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>130</td>
<td>6</td>
<td>5</td>
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<td>140</td>
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<td>150</td>
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<td>160</td>
<td>8</td>
<td>6</td>
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<td>170</td>
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<td>180</td>
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<td>190</td>
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<td>200</td>
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<td>210</td>
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<td>220</td>
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<td>230</td>
<td>11</td>
<td>9</td>
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<tr>
<td>240</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>250</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

It is recommended that volunteers consume half of the total allocated amount of alcoholic beverage during the first hour following their arrival at the testing facility. They should refrain from drinking or smoking prior to any breath test.

NOTE: A volunteer may cease drinking at any time.

NOTE: No weapons should be present in the vicinity of any drinking volunteer.

Volunteers must be kept under constant supervision from the time of their arrival at the training facility. At least one instructor's aide must be present for every four volunteers. The aids must monitor the volunteers, serve their drinks, make sure that they comply with the schedule, and in general keep them under close observation.

NOTE: For a more complete description of Alcohol Workshop procedures, refer to the latest edition of the Student-Instructor's Manual for the DRE Instructor Training School, and specifically Unit Nine, "Planning and Managing an Alcohol Workshop".
International Association of Chiefs of Police

Drug Evaluation and Classification Program

Drug Influence Evaluation Checklist

_______ 1. Breath alcohol test

_______ 2. Interview of arresting officer
    (Note: Gloves must be worn from this point on.)

_______ 3. Preliminary examination and first pulse

_______ 4. Eye examinations

_______ 5. Divided attention tests:
    ________ Romberg balance
    ________ Walk and turn
    ________ One leg stand
    ________ Finger to nose

_______ 6. Vital signs and second pulse

_______ 7. Dark room examinations and ingestion examination

_______ 8. Check for muscle tone

_______ 9. Check for injection sites and third pulse

_______ 10. Interrogation, statements, and other observations

_______ 11. Opinion of evaluator

_______ 12. Toxicological examination
Table of Contents

Session I  Introduction and Overview

Session II  Overview of Drug Evaluation and Classification Procedures

Session III  The Psychophysical Tests

Session IV  The Eye Examinations

Session V  Alcohol Workshop

Session VI  Examinations of Vital Signs

Session VII  Overview of Signs and Symptoms

Session VIII  Alcohol as a Drug

Session IX  Preparing for the DRE School

Session X  Conclusion of the Preliminary Training
SESSION I

INTRODUCTION AND OVERVIEW
SESSION I  INTRODUCTION AND OVERVIEW

Upon successfully completing this session the student 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  o Instructor-Led Presentations

B. Definition and Categories of Drugs
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>INTRODUCTION AND OVERVIEW</strong></td>
<td>Display Session Title</td>
</tr>
<tr>
<td></td>
<td>35 Minutes</td>
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<td></td>
<td>10 Minutes</td>
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<tr>
<td></td>
<td><strong>A. Welcoming Remarks and Objectives</strong></td>
<td>Instructors' names and students' names on tent cards.</td>
</tr>
<tr>
<td></td>
<td>I-I (Title)</td>
<td></td>
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<tr>
<td></td>
<td>1. Welcome to the Preliminary Training for the Drug Evaluation and Classification Program.</td>
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<td></td>
<td>2. Instructor introductions.</td>
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</tr>
<tr>
<td></td>
<td>a. Principal instructor(s).</td>
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<td></td>
<td>b. Apprentice instructors.</td>
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<td></td>
<td>I-2 (Goal)</td>
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<td></td>
<td>3. Preliminary training goal:</td>
<td>Inform the students of when and where their formal, seven-day DRE School will take place.</td>
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<td></td>
<td>To prepare the students to participate successfully in the 7-day Drug Recognition Expert school.</td>
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<td></td>
<td>a. This two-day Preliminary School won't make you DREs.</td>
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<td></td>
<td>b. But it will make it easier for you to pass the 7-day DRE School and successfully complete your certification training.</td>
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<td>I-3 (First 3 Objectives)</td>
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<td>4. Objectives of the Preliminary Training:</td>
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<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
<td></td>
<td>a. Define &quot;Drug&quot; and name the seven categories.</td>
<td>Solicit students' questions about the goal and objectives.</td>
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<td>b. Identify the twelve components or steps in the DEC drug influence examination.</td>
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<td>I-3B (Last 4 Objectives)</td>
<td>c. Administer and interpret the Psychophysical Tests used by DRE's during the drug influence evaluation</td>
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<td>d. Check and measure a subject's vital signs.</td>
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<td></td>
<td>e. List the major signs and symptoms of each drug category.</td>
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<td>f. Conduct the eye examinations that are part of the drug influence evaluation.</td>
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<td>g. Describe the history and physiology of alcohol as a drug.</td>
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<td>5. Key point of emphasis:</td>
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<td></td>
<td>This two-day school is only the first of three stages in your training as DREs.</td>
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<td></td>
<td>a. Next will come the seven-day formal DRE school.</td>
<td>Solicit students' questions about the three stages of training.</td>
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<td></td>
<td>b. After that will come at least several weeks of supervised on-the-job training known as the &quot;Certification Phase&quot;.</td>
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<td>6. Preview of the remainder of the Pre-School.</td>
<td>Briefly outline the upcoming sessions of the school. Refer to</td>
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<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<td>7. Certification Progress Logs.</td>
<td>the wallcharts.</td>
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<tr>
<td></td>
<td><strong>B. Definition and Categories of Drugs</strong></td>
<td>Instruct students to open their manuals and remove the Certification Progress Log. Have students fill out the first line of the log, then collect it.</td>
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<tr>
<td></td>
<td>25 Minutes</td>
<td><strong>Pose</strong> this question. Solicit responses from several students</td>
</tr>
<tr>
<td></td>
<td>a. Alternative definitions, drawn from several sources.</td>
<td>Ask students: &quot;Would you agree that all drugs are medicines or ingredients of medicines?&quot; Ask students to name some substances they consider to be &quot;drugs&quot; that have no medicinal value.</td>
</tr>
<tr>
<td></td>
<td>o &quot;A substance used as a medicine or in making medicines.&quot;</td>
<td>Source: <em>Webster's.</em> Ask students if they agree that all drugs are narcotics.</td>
</tr>
<tr>
<td></td>
<td>o &quot;A narcotic substance or preparation.&quot;</td>
<td>Source: <em>Random House College</em></td>
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<tr>
<td></td>
<td>o &quot;A chemical substance administered to a</td>
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<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<td>person or animal to prevent or cure disease or otherwise to enhance physical or mental welfare.</td>
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<tr>
<td>&quot;A substance taken by mouth, injected or applied locally to treat a disorder. (i.e., to ease pain)&quot;</td>
<td>Point out that this definition seems to exclude any drug that is harmful or does not enhance welfare.</td>
<td></td>
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<tr>
<td>A chemical substance introduced into the body to cause pleasure or a sense of changed awareness, as in the non-medical use of Lysergic Acid Diethylamide (LSD).</td>
<td>Source: Random House</td>
<td></td>
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<tr>
<td>&quot;Any substance, natural or artificial that by chemical nature alters the structure or function of a living organism.&quot;</td>
<td>Ask students if they agree that all drugs are habit-forming. Ask if, from an enforcement perspective, they can think of any habit-forming substances they would not ordinarily consider to be a drug.</td>
<td></td>
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<tr>
<td>&quot;Any substance that, in small amounts, produces changes in the body, mind or both.&quot;</td>
<td>Source: Medical Dictionary For The Non-professional, Barows Educational Series, Inc., Woodbury, NY. 1984</td>
<td></td>
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<tr>
<td></td>
<td>Source: LAPD</td>
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</table>
2. A simple, enforcement-oriented definition of drugs.
   - "Any substance, which, when taken into the human body, can impair the ability of the person to operate a vehicle safely."

3. Within this simple, enforcement-oriented definition, there are seven categories of drugs.
   a. Each category consists of substances that impair a person's ability to drive.
   b. The categories differ from one another in terms of how they impair driving ability and in terms of the kinds of impairment they cause.
   c. Because the categories produce different types of impairment, they generate different signs and symptoms.

   Point out that this definition excludes many substances that ordinarily would be considered "drugs" by physicians, chemists, etc.
   Emphasize that, as traffic law enforcement officers, the students' concern has to remain focused on substances that impair.

   Note: Emphasize that the DEC Program drug categories differ from those of the American Medical Association and the Drug Enforcement Administration because they categorize drugs on the basis of their chemical structures, while we categorize drugs on the basis of the kinds of impairment they produce.
### Aids Lesson Plan

<table>
<thead>
<tr>
<th>d. With training and practice, you will be able to recognize the different signs of drug influence and determine which category is causing the impairment you observe in a suspect.</th>
</tr>
</thead>
</table>

#### Instructor Notes

- **Ask** students: "What are the seven categories of drugs?"
- **Write** the names of the categories on the dry erase board or flip-chart as they are mentioned by the students.
- Since the drug categories may be new to the students you may need to assist them in correctly identifying each category.

### I-5

**4. Central Nervous System Depressants.**

- **a.** The category of CNS Depressants includes some of the most commonly abused drugs.
  - **o** Alcohol - - the most familiar drug of all - - is abused by an estimated 40-50 million Americans.
  - **o** It’s estimated that 119 million Americans aged 12 or older reported being current drinkers of alcohol in 2002 (51.0 percent of the population)
  - **o** In 2002, more than three million prescriptions were filled for over 500,000 different drugs in the

_HS 172A R1/07_  
_I-8_
<table>
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<th>Lesson Plan</th>
<th>Instructor Notes</th>
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<tbody>
<tr>
<td>It is also estimated that in 2003 there were 6.3 million Americans age 12 or older using prescription drugs non-medically.</td>
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<tr>
<td>b. Depressants slow down the operation of the central nervous system (i.e., the brain, brain stem and spinal cord).</td>
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<tr>
<td>cause the user to react more slowly.</td>
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<tr>
<td>cause the user to process information more slowly.</td>
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<tr>
<td>relieve anxiety and tension.</td>
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<tr>
<td>induce sedation, drowsiness and sleep.</td>
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<td>in high enough doses, CNS depressants will produce general anesthesia.</td>
<td>i.e. depress the brain’s ability to sense pain.</td>
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<td>in very high doses, induce coma and death.</td>
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<td>5. Central Nervous System Stimulants</td>
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<tr>
<td>a. CNS Stimulants are a widely abused category of drugs.</td>
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<td>Aids</td>
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<td>Instructor Notes</td>
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<tr>
<td>o</td>
<td>In 2000, there were an estimated 2.7 million chronic cocaine users and 3 million occasional cocaine users in the U.S.</td>
<td>Source: Office of National Drug Control Policy (ONDCP) Cocaine Fact Sheet</td>
</tr>
<tr>
<td>o</td>
<td>The use and abuse of Methamphetamine continues to rise and has quickly become one of the major drugs of abuse.</td>
<td>Note: Instructors may wish to include statistics regarding the use of methamphetamine in their respective State.</td>
</tr>
<tr>
<td>o</td>
<td>Several million appear to use amphetamines.</td>
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<tr>
<td>b.</td>
<td>CNS Stimulants speed up the operation of the central nervous system, and of the various bodily functions controlled by the central nervous system.</td>
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<tr>
<td>o</td>
<td>cause the user to become hyperactive, extremely talkative.</td>
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<tr>
<td>o</td>
<td>speech may become rapid and repetitive.</td>
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<tr>
<td>o</td>
<td>heart rate increases.</td>
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<tr>
<td>o</td>
<td>blood pressure increases.</td>
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<tr>
<td>o</td>
<td>body temperature rises, user may become excessively sweaty.</td>
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<tr>
<td>o</td>
<td>induce emotional excitement, restlessness, irritability.</td>
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<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
<td>I-7  (Hallucinogens)</td>
<td>o can induce cardiac arrhythmia (unstable beating of the heart), cardiac seizures and death.</td>
<td>Remind students of well-known athletes and others who have died because of cocaine abuse.</td>
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<td></td>
<td>6. Hallucinogens</td>
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<tr>
<td></td>
<td>a. Hallucinogens are also widely abused. In recent years an increase in the abuse of both LSD and Ecstasy (MDMA) has been reported.</td>
<td>Point out that LSD and Peyote are only two examples of hallucinogens.</td>
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<td></td>
<td>b. It is estimated that approximately one million Americans abuse hallucinogens.</td>
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<td></td>
<td>c. Hallucinogens may create hallucinations. That is, they may create apparent perceptions of things not truly present.</td>
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<td></td>
<td>d. 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.</td>
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<td></td>
<td>e. Instead, hallucinogens cause the nervous system to send strange or false signals to the brain.</td>
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<tr>
<td></td>
<td>o produce sights, sounds and odors that aren't real.</td>
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<td></td>
<td>o induce a temporary condition very much like psychosis or insanity.</td>
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</table>
### Aids

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<th>Lesson Plan</th>
<th>Instructor Notes</th>
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</table>
| o can create a "mixing" of sensory modes, for example the user "hears colors", "sees music", "tastes sounds", etc., referred to as "Synesthesia."
| Point out that, with all of these false and distorted perceptions, the person under the influence of hallucinogens would be a very unsafe driver. |

#### 7. Dissociative Anesthetics

<table>
<thead>
<tr>
<th>a. This category includes drugs such as PCP it’s analogs and Dextromethorphan (DXM) These drugs generally inhibit pain by cutting off or “dissociating” the brain’s perception of the pain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point out that this category used to be Phencyclidine (PCP) but was changed in 2005.</td>
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<table>
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<tr>
<th>b. PCP is considered to be by the medical community an hallucinogen. However, because of the symptomatology it presents; it is included in this category.</th>
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<tr>
<td>Point out that the definition of Dissociative Anesthetic is contained in the Glossary of Terms in the DRE Pre-School Student Manual.</td>
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<thead>
<tr>
<th>c. PCP is a synthetic drug, i.e., it does not occur naturally but must be produced in a laboratory-like setting.</th>
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<tbody>
<tr>
<td>Point out that people under the influence of a Dissociative Anesthetic may exhibit a combination of the signs associated with hallucinogens, CNS stimulants and depressants.</td>
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</table>

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<thead>
<tr>
<th>d. PCP is similar to CNS depressants in that it depresses brain wave activity.</th>
</tr>
</thead>
</table>

| o slows down thought |
| o slows reaction time |
| o slows verbal responses |
e. 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

f. 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

g. PCP analogs include Ketamine, Ketalar, Ketajet, and Ketaset.
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<th>Instructor Notes</th>
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<td></td>
<td>h. Dextromethorphan (DXM), is an ingredient found in numerous over-the-counter cough and cold remedies.</td>
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<td></td>
<td>8. Narcotic Analgesics</td>
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<td></td>
<td>a. There are two subcategories of Narcotic Analgesics</td>
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<td></td>
<td>o Opiates are derivatives of opium</td>
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<td></td>
<td>o Synthetics are produced chemically in the laboratory. They are not in any way derived from Opium but produce similar effects</td>
<td>Point out that heroin, morphine and codeine are natural derivatives of opium.</td>
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<td></td>
<td>b. The word &quot;Analgesic&quot; means pain-killer. All of the drugs in this category reduce the person’s reaction to pain.</td>
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<td></td>
<td>c. Heroin is the most commonly abused of the Narcotic Analgesics. It is estimated that approximately 2.5 million people have used heroin (lifetime).</td>
<td>Source: National Institute of Drug Abuse (NIDA), 2003</td>
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<tr>
<td></td>
<td>d. Heroin is highly addictive, and very expensive.</td>
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<td>o Many addicts support their habit by stealing property and converting it to cash.</td>
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</table>
### Aids Lesson Plan

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<thead>
<tr>
<th></th>
<th>e. In addition to reducing pain, they produce euphoria, drowsiness, apathy, lessened physical activity and sometimes impaired vision.</th>
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<tbody>
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<td></td>
<td>f. Persons under the influence of Narcotic Analgesics often pass into a semi-conscious type of sleep or near-sleep.</td>
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<td></td>
<td>o persons &quot;on the nod&quot; may be awakened easily.</td>
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<tr>
<td></td>
<td>o they often are sufficiently alert to respond to questions effectively.</td>
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<tr>
<td></td>
<td>g. Higher doses of Narcotic Analgesics can induce coma, respiratory failure and death.</td>
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</tbody>
</table>

### Instructor Notes

Point out that this condition is often called being "on the nod".

#### 9. Inhalants

<table>
<thead>
<tr>
<th></th>
<th>a. Inhalants are fumes of certain substances that produce mind-altering results.</th>
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<tbody>
<tr>
<td></td>
<td>b. There are three subcategories of inhalants:</td>
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<tr>
<td></td>
<td>o Volatile Solvents (e.g., gasoline, glue, oil-based paint, cleaning fluids, paint remover, etc.)</td>
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<td></td>
<td>o Aerosols (i.e., the propellant gases in spray cans, e.g., hair sprays, insecticides, etc.)</td>
</tr>
<tr>
<td></td>
<td>o Anesthetic Gases (e.g., nitrous oxide, ether, amyl nitrite, butyl nitrite, etc.)</td>
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</tbody>
</table>
c. Different inhalants produce different effects.
   
   o many produce effects similar to those of CNS depressants.
   
   o a few produce stimulant like effects.
   
   o some produce hallucinogenic effects.

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

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

10. Cannabis

   a. The category "Cannabis" includes the various forms and products of the Cannabis Sativa plant.

   b. The active ingredient in Cannabis is the substance known as "Delta-9 Tetrahydrocannabinol", or "THC".

   c. Apart from alcohol, marijuana is one of the most commonly abused drugs in this country.

   Write "Cannabis Sativa" on the dry erase board or flip-chart.

   Write "Δ-9 THC" on the dry erase board or flip-chart.
### Aids Lesson Plan

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<tr>
<td>d.</td>
<td>Marijuana continues to be the most used illegal drug in the U.S.: nearly 69 million Americans over the age of 12 have used marijuana at least once. It is also estimated that there were 14.6 million users of marijuana in 2002.</td>
<td>Source: NIDA and Marijuana Addiction Facts.</td>
</tr>
<tr>
<td>e.</td>
<td>Cannabis appears to interfere with the attention process. Drivers under the influence of marijuana often do not pay attention to their driving.</td>
<td>Point out that divided attention Standardized Field Sobriety Tests usually disclose the best evidence of cannabis impairment.</td>
</tr>
<tr>
<td>f.</td>
<td>Cannabis also produces a distortion of the user’s perception of time, an increased heart rate (often over 100 beats per minute) and a reddening of the eyes.</td>
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<tr>
<td>g.</td>
<td>Marijuana is the most frequently reported drug in emergency department visits related to drug abuse in youth age 12 to 19.</td>
<td>Source: The Drug Abuse Warning Network (DAWN) Report, August 2003.</td>
</tr>
</tbody>
</table>

### 11. Frequency of Drug Use

I-12

(Frequency of Drug Use)

|   |   |
|   |   |
| o | In 2003, 51 percent of persons age 12 or older (119 million) were current alcohol drinkers. | Source: National Survey on Drug Use and Health (NSDUH), 2003 |
| o | The exact number of prescription drug users in the U.S. is unknown. However, in 2003, the National Association of Chain Drug Stores (NACDS) reported that 3.14 billion scripts for prescription drugs were | Source: National Survey on Drug Use and Health (NSDUH), 2003 |

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<table>
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<tr>
<td>written in the U.S.</td>
<td></td>
<td>Source: National Survey on Drug Use and Health (NSDUH), 2003</td>
</tr>
<tr>
<td>o It is estimated that in 2003 there were 6.3 million Americans age 12 and older using prescription drugs non-medically.</td>
<td></td>
<td>Source: National Association of Chain Drug Stores (NACDS), 2003</td>
</tr>
<tr>
<td>o 51% of students have tried an illicit drug by the time they finish high school</td>
<td></td>
<td>Source: “Driving Under the Influence Among Adult Drivers”, SAMHSA, 2005.</td>
</tr>
<tr>
<td>o 16.6% of drivers age 21 and older (30.7 million persons) admitted driving under the influence of alcohol or illicit drugs during the past year.</td>
<td></td>
<td>Source: 2004 National Survey on Drug Use and Health (NSDUH).</td>
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<td>o Approximately 2.4 million Americans began abusing prescription drugs within the past year. The average age of new users was 23.3 years.</td>
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<td>12. Polydrug Use</td>
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<tr>
<td>a. 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.</td>
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<td>Point out that the Pacific Institute of Research and Evaluation (PIRE) maintains the national DRE data reporting system for the DEC Program and that DRE’s will be encouraged to enter evaluation data into the website.</td>
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<tr>
<td>Data being collected through the national DRE Database indicates that approximately 25% of all toxicology results indicate two or more drug categories.</td>
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<tr>
<td>Aids</td>
<td>Lesson Plans</td>
<td>Instructor</td>
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<tr>
<td></td>
<td>b. The term &quot;polydrug&quot; use refers to instances where the subject has ingested drugs from two or more drug categories.</td>
<td>Point out that the drugs do not have to be actually ingested at exactly the same time.</td>
</tr>
<tr>
<td></td>
<td>c. Most controlled prescription drug abusers are poly-drug abusers. One study reported that approximately 75 percent of persons who abuse alcohol also abuse illicit drugs.</td>
<td>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</td>
</tr>
</tbody>
</table>
REVIEW QUESTIONS

Test your knowledge of the subject matter covered in this session by trying to answer the following questions.

1. What is a "drug" as the term is used in this course?

   For the purpose of this training, a “drug” is any substance which when taken into the human body, can impair the ability of the person to operate a vehicle safely”.

2. What are the seven major categories of drugs?

   CNS Depressants, CNS Stimulants, Hallucinogens, Dissociative Anesthetics, Narcotic Analgesics, Inhalants and Cannabis.

3. What kind (category) of drug is alcohol? What about Cocaine? What about Heroin?

   Alcohol is a CNS Depressant. Cocaine is a CNS Stimulant. Heroin is a Narcotic Analgesic.

4. How would you respond to someone who suggests that the "drug problem" basically occurs only in a few metropolitan areas, and doesn't apply to their community?

   There might be some rare communities in this country that are free from the “drug problem”, but they would be rare indeed. A conservative estimate suggests that about 40-50 million Americans regularly use drugs other than alcohol. However, the exact number is not known.

5. What category of drug is PCP classified? What about Marijuana? What about Valium?

   PCP belongs to the Dissociative Anesthetics category. Marijuana is Cannabis and Valium is a CNS Depressant.

6. What category of drug is Methamphetamine? What about LSD? What about Peyote?

   Methamphetamine is a CNS Stimulant. LSD and Peyote are Hallucinogens.
7. What does the term "polydrug use" mean?

“Polydrug use” is the practice of ingesting drugs from two or more drug categories, i.e., combining drugs.
# Drug Evaluation and Classification Certification Progress Log

**Please Print or Type**

<table>
<thead>
<tr>
<th>Item or Step</th>
<th>Date Completed</th>
<th>Location</th>
<th>Authorized Signature</th>
<th>IACP DRE #</th>
<th>Agency</th>
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</thead>
<tbody>
<tr>
<td>DRE Pre-School</td>
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<td>SEST Proficiency</td>
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<td>DRE School</td>
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<td>DRE School Final Exam</td>
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<td>Evaluation #12*</td>
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<td>Certification Knowledge Exam</td>
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<td>Completed Minimum Number of Evaluations**</td>
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<td>Identified the Minimum Number of Drug Categories</td>
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<td>Rolling Log Reviewed</td>
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<td>Toxicology Consistent**</td>
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**Recommendations for Certification (Standard 1.15)**

We certify that this student satisfactorily met the IACP International Standards for the Drug Evaluation and Classification Program and is recommended for certification (Standard 1.15—TWO INSTRUCTORS WHO WITNESSED EVALUATIONS MUST SIGN).

I recommend this student for certification.
(Agency Coordinator—if applicable)

I hereby certify this student and request IACP credentialing.
(State Coordinator—required)

**Candidate’s Name Entered into Tracking System?**

Yes  No

*Please use the reverse side to record additional evaluations if necessary.
**Please see reverse side for the exact language of these standards.
**Standard 1.9** Upon completion of the field certification phase of training, the candidate must demonstrate the ability to correctly conduct a complete drug influence evaluation and appropriately document and interpret the results. The candidate must also be able to document the findings of the evaluation.

**Standard 1.10** To be considered for certification as a drug recognition expert, the candidate must satisfactorily complete a minimum of twelve (12) drug influence evaluations, during which the candidate must encounter and identify subjects under the influence of at least three of the drug categories as described in the DRE training.

Of the evaluations required for certification, the candidate shall administer a minimum of six evaluations. The candidate may observe the remaining evaluations. For each evaluation, either administered or observed, the candidate shall independently record the observations and the results of the evaluation, and shall identify the category (ies) of the drugs affecting the subject.

All evaluations, either administered or observed, and documented for certification purposes, shall be supervised by at least one certified DRE instructor.

**Standard 1.11** Prior to completing the certification phase of training, the candidate DRE must demonstrate the ability to draw correct conclusions consistent with observed physiological signs and symptoms. In addition, the conclusions must be supported by the findings of a forensic toxicology laboratory. No candidate DRE shall be certified as a drug recognition expert unless blood, urine, or other appropriate biological samples are obtained and submitted from at least nine (9) subjects whom the candidate DRE has examined for certification purposes. These may include subjects for whom the candidate DRE served as the examination recorder or observer as well as those subjects directly evaluated by the candidate DRE. Further, the candidate DRE cannot be certified unless the opinion concerning the drug category or categories affecting the subject is supported by the forensic toxicological analysis seventy-five percent (75%) of the time or in at least seven (7) of the nine (9) samples submitted for certification purposes. For purposes of this standard, a candidate DRE’s opinion is supported if the toxicological analysis discloses the presence of at least one drug category named by the candidate DRE. In the event that the candidate DRE has concluded that three or more categories of drugs are involved, at least two categories must be supported by toxicology results.

Additional comments
DRUG EVALUATION AND CLASSIFICATION PROGRAM

GLOSSARY OF TERMS

ACCOMODATION REFLEX
The adjustment of the eyes at various distances. Meaning the pupils will automatically constrict as objects move closer.

ADDICTION
The 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 when they were taken, the suspect's pupils could be constricted, dilated or within the normal range of size.

ARRHYTHMIA
An abnormal heart rhythm.

ARTERY
The strong, elastic blood vessel that carries blood away from the heart.

ATAXIA
A blocked ability to coordinate movements. A staggering walk and poor balance may be caused by damage to the brain or spinal cord. This can be the result of trauma, birth defect, infection, tumor or drug use.

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; pulse rate below the normal range.

BRADYPNEA
Abnormally slow rate of breathing.
BRUXISM
Grinding the teeth. This behavior is often seen in persons who are under the influence of cocaine or other CNS stimulants.

CANNABIS
1. One of the seven drug categories. Cannabis includes marijuana, hashish, hash oil and marinol.

2. Several species of plants from which marijuana and related products are made (e.g. Cannabis Sativa and Cannabis Indicia).

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, preludin 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 and 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 his or her nose. (See also "Lack of Convergence".)

CRACK/ROCK
Cocaine base, appears as a hard solid 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 information about a particular topic.

CYCLIC BEHAVIOR
A manifestation of impairment due to certain drugs, in which the subject 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 ANESTHETIC
One of the seven drug categories. Includes drugs that inhibit pain by cutting off or "disassociating" the brain's perception of pain. PCP and it's analogs are considered dissociative anesthetics.

DIVIDED ATTENTION
Concentrating on more than one task at a time. The four psychophysical tests used by DREs require the subject to divide 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, which when taken into the human body, can impair the ability of the person to operate a vehicle safely.
DYSPNEA
Shortness of breath.

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

DYSPHORIA
A mood disorder. 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, he/she 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 an 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.

GARRULITY
Chatter, rambling or pointless speech. Talkative.

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 THC content usually 10% to 12%.

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

HIPpus
A rhythmic pulsating of the pupils of the eyes, as they dilate and constrict within fixed limits.

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.

**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.

**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 it is not produced from any species of cannabis plant.

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 step 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 constricted pupils.

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

MYDRIASIS  
Abnormally 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, percodan and hycodan), and the synthetic narcotics (such as demerol and numorphan).

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 semiconscious state of deep relaxation. Typically induced by impairment due to heroin or other narcotic analgesic. The subject's eyelids droop and chin rests on the chest. Subject 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 neurotransmitters 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 for humans.

PHENYL CYCLOHEXYL PIPERIDINE (PCP)
Often called "phencyclidine" or “PCP", it is a specific drug belonging to the Dissociative Anesthetics category.

PHYSIOLOGY
The study of living organisms and the changes that occur during activity.

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 subject’s impairment.

PSYCHOTOGENETIC
Literally "creating psychosis" or "giving birth to insanity". A drug is considered to be psychotogenetic 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 relaxation of the walls of an artery, caused by the surging flow of blood.

PULSE RATE
The number of expansions of an artery per minute.

REBOUND DILATION
A period of constriction followed by dilation with a change equal to or greater than 2 mm.

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, having 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 alcohol 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 powder 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 in order 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; pulse rate above the normal range.

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 the 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.
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 as an expert in a 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.
SESSION II
OVERVIEW OF DRUG EVALUATION AND CLASSIFICATION PROCEDURES
SESSION II   OVERVIEW OF DRUG EVALUATION AND CLASSIFICATION PROCEDURES

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

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

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<td>OVERVIEW OF DRUG EVALUATION AND CLASSIFICATION PROCEDURES</td>
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<td>II-1 (Title)</td>
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<td><img src="image2.png" alt="Projector" /></td>
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<td><img src="image3.png" alt="Projector" /></td>
<td>A. Components of the Process</td>
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<td><img src="image4.png" alt="Projector" /></td>
<td>35 Minutes</td>
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<td></td>
<td>1. The Drug Evaluation and Classification process is a standardized and systematic method of examining a subject to determine:</td>
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<td>a. Whether the subject is under the influence of a drug or combination of drugs.</td>
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<td>b. If the impairment is resulting from an injury, illness, or drug related.</td>
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<td>c. The category (or categories) of drugs that is (or are) the likely cause of the subject's impairment.</td>
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</table>
2. The process is **systematic** in that it is based on a careful assessment of a variety of observable signs and symptoms that are known to be reliable indicators of drug impairment.

   a. Some of these observable signs and symptoms relate to the subject's **appearance**.

   b. Some of the signs and symptoms relate to the subject's **behavior**.

   c. Some relate to the subject's performance of carefully administered **psychophysical tests**.

   - Drugs impair the subject's ability to control his or her mind and body.
   - Psychophysical tests can disclose that the subject's ability to control mind and body is impaired.
   - The specific manner in which the subject performs the psychophysical tests may indicate the type of impairment from which the subject is suffering. In turn, this may indicate the category or categories of drugs causing the impairment.

Instructor Notes:

- Write on dry erase board or flip-chart: "A SYSTEMATIC PROCESS".
- Write "appearance" on dry erase board or flip-chart.
- Write "behavior" on dry erase board or flip-chart.
- Write "psychophysical testing" on dry erase board or flip-chart.
- Ask students: "What does 'psychophysical' mean?"
- Point out that "psychophysical" relates to the subject's mind (psyche) and body (physique).
### Lesson Plan

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<td></td>
<td>d. Some of the observable signs and symptoms relate to <strong>automatic responses of the subject's body to the specific drugs that are present.</strong></td>
<td>Write &quot;automatic responses of the body&quot; on the dry erase board or flip-chart.</td>
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<td>e. <strong>All</strong> of these reliable indicators are examined and carefully considered before a judgment is made concerning what categories of drugs are affecting the subject.</td>
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<td>II-3 (Standard-ized and Systematic)</td>
<td>3. The process is <strong>standardized</strong> in that it is administered the same way, to every subject, by every drug recognition expert.</td>
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</table>
|      | a. Standardization helps to ensure that no mistakes are made. | **Ask** students: "Why is it so important to perform the drug evaluation and classification examination in exactly the same way, every time?"
|      | o No examinations are left out. | **Probe** to draw out all major reasons for standardization. |
|      | o No extraneous or unreliable "indicators" are included. | |
|      | b. Standardization helps to promote professionalism among drug recognition experts. | |
|      | c. Standardization helps to secure acceptance in court. | |
| II-4 (12-Steps) | 4. The Drug Evaluation and Classification process has **twelve** components or steps. | |

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<td></td>
<td>a. Breath Alcohol Test to determine Blood Alcohol Concentration (BAC).</td>
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<td></td>
<td>o The purpose of the breath test is to determine whether the specific drug, alcohol, may be contributing to the impairment observable in the subject.</td>
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<td></td>
<td>o 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.</td>
<td>Remind students that many subjects who are under the influence of drugs other than alcohol also have alcohol in their bodies.</td>
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<td>b. Interview of the Arresting Officer.</td>
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<td>o In most cases, the subjects you will examine will not be people that you arrested.</td>
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<td>o The arresting officer may have seen or heard things that would be valuable indicators of the kinds of drugs the subject has ingested.</td>
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<td></td>
<td>o The arresting officer, in</td>
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Aids | Lesson Plan | Instructor Notes
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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.

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<th>c. Preliminary Examination</th>
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<td>- The preliminary examination is your first opportunity to observe the subject closely and directly.</td>
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<td>Point out that the preliminary examination begins the &quot;hands on&quot; with the subject. Use of protective gloves is imperative.</td>
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<td>- A major purpose of the preliminary examination is to determine if the subject may be suffering from an injury or some other medical condition not necessarily related to drugs.</td>
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<td>Analogy: The preliminary examination is a &quot;fork in the road.&quot; It can help you decide whether to continue with the drug examination, or to pursue a possible medical complication, or to proceed with a DWI (alcohol) case.</td>
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<td>- Another major purpose of the preliminary examination is to begin systematically assessing the subject's appearance, behavior and automatic bodily responses for signs of drug-induced impairment.</td>
<td></td>
<td>Emphasize that the term &quot;preliminary&quot; does not imply &quot;unimportant&quot;. Very valuable evidence often comes to light during the preliminary examination.</td>
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<td>- The preliminary examination consists of a series of questions</td>
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<td>Emphasize that courts generally accept these questions as not being in</td>
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<td>II-8 (Eye Examinations)</td>
<td>dealing with possible injuries or medical problems; observations of the subject's face, speech and breath; initial checks of the subject's eyes; and, an initial examination of the subject's pulse.</td>
<td>conflict with the subject’s Miranda rights. However, the students must comply with their own departments' policies as to whether they should advise subjects of their Miranda rights before asking these questions.</td>
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<td>o The initial examination of the eyes may reveal signs of injury or illness. A difference in pupil size of greater that 0.5 mm may indicate an injury or existing medical condition.</td>
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|  | d. Examinations of the Eyes. | Ask students: "What do we look for, in a subject's eyes, to determine if he or she may be under the influence of alcohol?"
<p>|  | o Certain drugs produce very easily observable effects on the eyes. | Probe, as necessary, to draw out the response &quot;nystagmus&quot;. |
|  | - One of the most dramatic of these effects is nystagmus, which means an involuntary jerking of the eyes. | |
|  | - Persons under the influence of alcohol usually will exhibit Horizontal Gaze Nystagmus, which is an involuntary jerking of the eyes as the eyes turn toward the side. | |
|  | - Alcohol is not the only drug that causes nystagmus. | |</p>
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<tr>
<td>II-9  (Divided Attention Tests)</td>
<td>- Horizontal Gaze Nystagmus is not the only observable effect on the eyes that will be produced by various drugs.</td>
<td>Point out that the examinations of the eyes will be covered in much greater depth subsequently.</td>
</tr>
<tr>
<td></td>
<td>e. Divided Attention Psycho-physical tests.</td>
<td>Ask students: &quot;What does 'divided attention' mean?&quot;</td>
</tr>
<tr>
<td></td>
<td>o All drugs that impair driving ability will also impair the subject's ability to perform certain carefully-designed divided attention tests.</td>
<td>Probe, as necessary, to draw out responses indicating the concept of &quot;concentrating on more than one thing or task at a time&quot;.</td>
</tr>
<tr>
<td></td>
<td>o These tests are familiar to you in the context of examining alcohol-impaired subjects.</td>
<td>Point out that students will have opportunities to practice administering these tests subsequently in the course.</td>
</tr>
<tr>
<td></td>
<td>o The same tests are very valuable for disclosing evidence of impairment due to drugs other than alcohol.</td>
<td></td>
</tr>
<tr>
<td>f. Examination of Vital Signs.</td>
<td></td>
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<tr>
<td></td>
<td>o Many categories of drugs affect the operation of the heart, lungs and other major organs of the body.</td>
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<tr>
<td></td>
<td>o These effects show up during examination of the subject's vital signs.</td>
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<tr>
<td></td>
<td>o The vital signs that are reliable indicators of drug influence include</td>
<td></td>
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<tr>
<td>II-10 (Vital Signs Exams)</td>
<td></td>
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</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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</tr>
<tr>
<td>II-11 (Dark Room Exams)</td>
<td>blood pressure, pulse, and temperature.</td>
<td>students will have ample opportunity to practice measuring vital signs.</td>
</tr>
</tbody>
</table>

**g. Dark Room Examinations**

- Many categories of drugs affect how the pupils of the eyes will appear, and how they respond to light.

- Certain kinds of drugs will cause the pupils to widen dramatically, or dilate.

- Some other drugs cause the pupils to narrow, or constrict tightly.

- By systematically changing the amount of light entering the subject's eyes, we can observe the pupils' appearance and reaction under controlled conditions.

- We carry out these examinations in a dark room, using a penlight to control the amount of illumination entering the subject's eyes.

- We use a device called a pupillometer to estimate the size of the subject's pupils.

  Exhibit a penlight.

  Exhibit a pupillometer. Point out that the pupillometer has a series of circles or semi-circles of various sizes. By lining up the circles or semi-circles alongside the subject's pupil, the pupil's size can be...
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>determined.</td>
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<tr>
<td></td>
<td>Select a student to step forward and demonstrate the measurement of the student's pupils.</td>
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<tr>
<td></td>
<td>Shine the penlight directly into the student's eye, and again demonstrate the measurement of the pupils.</td>
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<tr>
<td></td>
<td>Demonstrate that the two eyes &quot;work together&quot;; i.e., shine the penlight into one eye, and demonstrate that the pupil of the other eye also contracts.</td>
<td></td>
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<tr>
<td></td>
<td>Demonstrate the examination of the student's nasal area and oral cavity.</td>
<td></td>
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<tr>
<td></td>
<td>Excuse the student and thank him or her for participating.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point out that students will have several opportunities to practice conducting dark room examinations subsequently in the course.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other examinations are also conducted in the darkroom, using the penlight: i.e., examination of the nasal area and mouth for signs of drug use and for concealed contraband.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstrate the examination of the student's nasal area and oral cavity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excuse the student and thank him or her for participating.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point out that students will have several opportunities to practice conducting dark room examinations subsequently in the course.</td>
<td></td>
</tr>
</tbody>
</table>

**II-12**  
(Muscle Tone)

**h. Examination of Muscle Tone.**

- Certain categories of drugs can cause the user's muscles to become markedly tense, and rigid.
- Evidence of muscle tone may come to light when the subject attempts to perform the divided attention test.
- Evidence of muscle tone

Point out that examination for
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>II-13 (Exam for Injection Sites)</td>
<td>can also be observed when taking the subject’s pulse and blood pressure.</td>
<td>muscle tone will be covered in greater depth subsequently in the course.</td>
</tr>
<tr>
<td></td>
<td>i. Examination for Injection Sites.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Certain drugs are commonly injected by their users, via hypodermic needles.</td>
<td>Ask students: “What drug is most often associated with injection via hypodermic needle?”</td>
</tr>
<tr>
<td></td>
<td>o Heroin is probably most commonly associated with injection, but several other types of drugs also are injected by many users.</td>
<td></td>
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<tr>
<td></td>
<td>o Uncovering injection sites on a subject provides powerful evidence that he or she may be under the influence of specific types of drugs.</td>
<td></td>
</tr>
<tr>
<td>II-14 (Statements Observations)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>j. Suspect's statements and other observations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o At this point in the examination, the trained DRE should have reasonable grounds to believe that the subject is under the influence of a drug or drugs.</td>
<td>Point out that though the interview of the subject is the formal process of soliciting information about the subjects drug usage, any voluntary statements previously made during the evaluation should be</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
<td></td>
<td>o The DRE should proceed to interview the subject to confirm his or her suspicion/opinions concerning the drug or drugs involved.</td>
<td>Emphasize that any such interview can proceed only in conformance with formal admonition and strict observance of the subject’s Constitutional rights.</td>
</tr>
<tr>
<td></td>
<td>o The DRE must carefully record the subject’s statements, and any other observations that may constitute relevant evidence of drug-induced impairment.</td>
<td>Point out that the appropriate procedures for interviewing subjects vary with the probable category or categories of drugs involved.</td>
</tr>
</tbody>
</table>

**II-15**

**Opinion of the Evaluator**

o Based on all of the evidence and observations gleaned from the preceding ten steps, the DRE must reach an informed conclusion as to:

- whether the subject is under the influence of a drug or drugs
- if so, the probable category or categories of drugs causing the impairment

o The DRE must record a narrative summary of the facts forming the basis for his or her
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>II-16 (Tox Exam)</td>
<td>conclusions.</td>
<td>Solicit students' comments and questions concerning this preview of the Drug Evaluation and Classification procedures.</td>
</tr>
</tbody>
</table>
| II-17 (Drug Influence Evaluation Checklist) | 1. Toxicological Examination  
o The toxicological examination is a chemical test or tests designed to obtain scientific, admissible evidence to substantiate the DRE's conclusions.  
o Departmental policy and procedures must be carefully and completely followed in requesting, obtaining and handling the chemical sample. | Instruct students to turn to the Drug Influence Evaluation Checklist in Section II of their Student Manual. |
| 25 Minutes | m. Review of Drug Influence Checklist |  |

**B. Video Demonstrations**

Show the video of excerpts from the Drug Recognition Demonstration.

(NOTE: This is the 25-minute video segment that is shown in Session V of the 7-day DRE School.)

Solicit students’ questions about the video demonstrations.
International Association of Chiefs of Police

Drug Evaluation and Classification Program

Drug Influence Report Checklist

1. Breath Alcohol Test
2. Interview of Arresting Officer
   (Note: Gloves must be worn from this point on.)
3. Preliminary Examination and First Pulse
4. Eye Examinations
5. Divided Attention Tests:
   a. Romberg Balance
   b. Walk and Turn
   c. One Leg Stand
   d. Finger to Nose
6. Vital Signs and Second Pulse
7. Dark Room Examinations and Ingestion Examination
8. Check for Muscle Tone
9. Check for Injection Sites and Third Pulse
10. Interrogation, Statements, and Other Observations
11. Opinion of Evaluator
12. Toxicological Examination
REVIEW QUESTIONS

1. Study the drug influence evaluation checklist that appears on the preceding page, then put it aside, and list the twelve components of the drug influence evaluation in the sequence in which they are performed.


2. Name the four divided attention psychophysical tests used to assess a subject's impairment.

1. Romberg Test  2. Walk and Turn  3. One Leg Stand  4. Finger to Nose

3. When is the first measurement of a subject's pulse rate taken?

Preliminary Examination

4. Name the two medical instruments that are needed to measure a subject's blood pressure.

Sphygmomanometer and stethoscope

5. What is the name of the device used to estimate the size of the subject's pupils?

Pupillometer

6. Which categories of drugs usually cause nystagmus? Which usually cause Lack of Convergence?

CNS Depressants, Inhalants, Dissociative Anesthetics
CNS Depressants, Inhalants, Dissociative Anesthetics, Cannabis

7. Which categories usually elevate the pulse rate? Which usually lower the pulse rate?

CNS Stimulants, Hallucinogens, Dissociative Anesthetics, Inhalants, Cannabis, CNS Depressants, Narcotic Analgesics
Session II - Overview of the Drug Evaluation and Classification Procedures

Objectives

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

The Drug Influence Evaluation
A Standardized and Systematic Process

Step 1
Breath Alcohol Test

Step 2
Interview of the Arresting Officer
Step 9
Examination for Injection Sites

RIGHT ARM

LEFT ARM

ATTACH PHOTOS OF FRESH PUNCTURE MARKS

Step 10
Suspect's Statements and Other Observations

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the suspect report having used drugs?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Time (HH:MM)</td>
<td>Date (MM/DD/YYYY)</td>
</tr>
<tr>
<td>Real Start Time</td>
<td>Total Committed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence Received</th>
<th>Medical</th>
<th>Deposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td></td>
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<tr>
<td>Deposition</td>
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</table>

Step 11
Opinion of the Evaluator

Step 12
Toxicological Examination

Drug Influence Report Checklist

1. Breath alcohol test
2. Interview of arresting officer (note: Options must be chosen from this point on)
3. Preliminary examination and blood test
4. Eye examination
5. Blood-alcohol testing
6. Fingerprinting
7. DNA analysis
8. Blood test
9. Blood test
10. Blood test
11. Blood test
12. Blood test

Questions?
SESSION III

THE PSYCHOPHYSICAL TESTS
SESSION III       THE PSYCHOPHYSICAL TESTS

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

- Administer the four divided attention tests used in the drug influence evaluation process.
- Document the subject's performance of those tests.

CONTENT SEGMENTS                  LEARNING ACTIVITIES
A. Romberg Balance                o Instructor-Led Presentations
B. Walk and Turn                  o Student-Led Demonstrations
C. One Leg Stand                  o Hands-on Practice
D. Finger to Nose
THE PSYCHOPHYSICAL TESTS

Four divided attention psychological tests are administered in the DRE evaluation - 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 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. Romberg Balance

1. The Romberg Balance is the first divided attention test that is administered during the drug evaluation.
   a. The test requires the subject to stand with the feet together and the head titled back slightly and with the eyes closed.
   b. The test also requires that the subject attempt to estimate the passage of thirty 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.

II-3 (Romberg Test)

Display Session Title

Point out that throughout the evaluation process the evaluator must be cognizant of officer safety issues. Officer survival procedures should be observed as appropriate during the administration of the DRE drug influence evaluation.

Write "Romberg Balance" on dry erase board or flip-chart.

Demonstrate the stance required of the subject.

Emphasize that the DRE must not instruct the subject as to how they are supposed to estimate the passage of 30 seconds.
### Aids Lesson Plan

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td><strong>c.</strong></td>
<td>The DRE must record how much time actually elapsed from the start of the test until the subject opened the eyes.</td>
</tr>
<tr>
<td><strong>d.</strong></td>
<td>If the subject continues to keep the eyes closed for 90 seconds, the DRE should stop the test and record the fact that it was terminated at 90 seconds.</td>
</tr>
</tbody>
</table>

### Instructor Notes

Point out that some drugs tend to "speed up" the subject's internal clock, so that the subject may open the eyes after only 10 or 15 seconds have gone by. Other drugs may "slow down" the internal clock, so that the subject keeps the eyes closed for 60 or more seconds. And, sometimes the drugs confuse the subject to the point where they won't remember to open the eyes until instructed to do so by the DRE.

Two instructors should demonstrate the administrative procedures for Romberg Balance. One instructor will play the role of the DRE, the other the "suspect".

Ask the subject if he/she understands the instructions thus far. 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.

Point out that the DRE should not close their eyes while demonstrating this test for safety reasons. Emphasize this to the students.

---

### Administrative procedures and instructions. Verbal instructions should be given as follows:

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>a.</strong></td>
<td>“Stand with your feet together, arms at your sides”.</td>
</tr>
<tr>
<td><strong>b.</strong></td>
<td>“Watch me and listen while I give you the instructions for this test; don’t start doing the test until I tell you to start”.”Do you understand?”</td>
</tr>
<tr>
<td><strong>c.</strong></td>
<td>“When I tell you to start, I want you to tilt your head back slightly (demonstrate) and close your eyes.”</td>
</tr>
<tr>
<td><strong>d.</strong></td>
<td>“Once you have closed your eyes I want you to remain in that position until you think that 30 seconds have gone by”.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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<tr>
<td></td>
<td>e. “As soon as you think 30 seconds have passed by, open your eyes and tilt your head forward and say ‘stop’”. “Do you understand the instructions?”</td>
</tr>
<tr>
<td></td>
<td>f. When the subject opens their eyes ask them &quot;How much time was that?&quot;.</td>
</tr>
<tr>
<td></td>
<td>3. Instructor-led demonstrations.</td>
</tr>
<tr>
<td></td>
<td>a. Instructor-to-instructor demonstrations.</td>
</tr>
<tr>
<td></td>
<td>b. Instructor-to-student demonstration.</td>
</tr>
<tr>
<td></td>
<td>4. Student-led demonstrations.</td>
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</table>
### 5. Recording results of the Romberg Balance test.

- The major items that need to be recorded for the Romberg Balance test are:
  - The amount that the subject sways
  - The actual amount of time that the subject keeps the eyes closed.

- To record swaying, the DRE must estimate how many inches the subject sways, either front-to-back or left-to-right, or both.

- To record the subject's time estimate, simply write the number of seconds that the subject kept his or her eyes closed.

### 6. Hands-on practice.

- Instruct students to turn to the "Romberg Test Diagram" in their Student Manuals (the same diagram that appears on Visual III-3).

- Example: if the subject sways approximately two inches toward the left and approximately two inches toward the right, the DRE should write the number "2" on each side of the "stick figure" that shows left-to-right movement.

- Solicit students' questions.

---

Have the second student administer the test to the first, and offer appropriate constructive criticism.

Thank the students for their participation and solicit questions.

Assign students to work in pairs.

Instruct teammates to practice administering the Romberg Balance test to each other.

Monitor the practice and offer coaching and constructive criticism, as appropriate.
### B. Walk and Turn

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

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

3. Review of Walk and Turn administrative procedures.
   a. The test has two stages: the instructions stage and the walking stage.
   b. During the instructions stage the subject must stand heel-to-toe, with the right foot ahead of the left foot, and keeping the arms at the sides.
   c. The subject must be told to take nine heel-to-toe steps up the line, to turn, and to return nine heel-to-toe steps down the line.
   d. You must demonstrate several heel-to-toe steps, and you must demonstrate the turn.
   e. The subject must be told to watch his or her feet while walking, and to count the steps out loud.

---

**Instructor Notes**

- Write "Walk and Turn" on the dry erase board or flip-chart.
- It is suggested a visible line be placed on the floor for use during the demonstration.
- 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.
- Demonstrate how the steps are taken and demonstrate the turn. Emphasis that the DRE should not turn his/her back to the subject for safety reasons.
- 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 effect the validity of
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>f. The subject must be told to keep their arms at the sides at all times.</td>
<td></td>
<td>The test and is essential for evaluating divided attention.</td>
</tr>
<tr>
<td>g. The subject must be told not to stop walking until the test is completed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Demonstrations of Walk and Turn.</td>
<td>Select a student to serve as the &quot;suspect&quot;.</td>
<td></td>
</tr>
<tr>
<td>a. Instructor-to-student demonstration.</td>
<td>Instructor should administer a complete Walk and Turn test.</td>
<td></td>
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<tr>
<td></td>
<td>Thank the student for his or her participation and solicit questions about test administrative procedures.</td>
<td></td>
</tr>
<tr>
<td>b. Student-to-student demonstration.</td>
<td>Select two students to conduct a demonstration.</td>
<td></td>
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<tr>
<td></td>
<td>Have one student administer a complete Walk and Turn test to the other.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Offer appropriate comments and constructive criticism about the test administration.</td>
<td></td>
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<tr>
<td></td>
<td>Thank the students for their participation and solicit questions.</td>
<td></td>
</tr>
<tr>
<td>5. Recording results of the Walk and Turn test.</td>
<td>Instruct students to turn to the &quot;Walk and Turn Test Diagram&quot; in their Student Manuals (the same diagram that appears on Visual III-4).</td>
<td></td>
</tr>
<tr>
<td>a. We record the very same clues on this test that we use for Standardized Field Sobriety Testing purposes.</td>
<td>Ask students: &quot;What are the two clues that we might observe during the instructions stage of the Walk and Turn test?&quot;</td>
<td></td>
</tr>
</tbody>
</table>
b. Instructions stage clues:
   o Failure to maintain balance (feet break away from the heel-to-toe stance)
   o Starting to walk too soon.

c. Walking stage clues:
   o Stops walking
   o Misses Heel-To-Toe
   o Steps off line
   o Raises arms
   o Wrong number of steps
   o Turns improperly

Ask students: "What are the six clues that we might observe during the walking stage?"

d. During the walking stage clues will be marked in the following manner:
   o On the lines indicate the number of times the clue occurred. Draw a slash mark at an angle in the direction the step was taken.

e. During the walking stage clues will be marked in the following manner:
   o Indicate by a check the number of times the subject stops, misses heel to toe, steps off line, or raises arms.
   o Record the actual number of steps taken.
   o If the subject stops walking a slash mark

The “S” indicates “stopped”
should cross between the feet and labeled with an “S”.

- If the subject steps off the line, indicate with a half of a slash mark at an angle in the direction the step was taken.

- If the subject misses heel to toe, indicate with a slash mark between the feet and label with an “M”.


Assign students to work in pairs. Instruct teammates to take turns administering the Walk and Turn test to each other.

Note: It is not necessary that the teammate playing the role of the “suspect” actually carry out the walking stage of the test.

The idea is to take turns practicing the proper way to give instructions for the test.

Monitor the practice and offer coaching and constructive criticism, as appropriate.

C. One Leg Stand

1. One Leg Stand is the third divided attention test administered during the drug influence evaluation.

Write "One Leg Stand" on the dry erase board or flip-chart.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. For drug evaluation purposes, One Leg Stand is given twice to the subject.</td>
<td>Write &quot;given twice&quot; on dry erase board or flip-chart.</td>
</tr>
<tr>
<td></td>
<td>a. First, the subject is required to perform the One Leg Stand while standing on the left foot.</td>
<td>Note: The One Leg Stand is administered twice to test both the left and right legs to assist the DRE in making comparisons and identify potential medical conditions that may be present.</td>
</tr>
<tr>
<td></td>
<td>b. Next, they are required to perform the test while standing on the right foot.</td>
<td>Two instructors should be used for this demonstration, one as the &quot;suspect&quot; and the other as the examiner.</td>
</tr>
<tr>
<td></td>
<td>3. Otherwise, One Leg Stand is used in the same fashion as in Standardized Field Sobriety Testing.</td>
<td>Demonstrate the stance that the “suspect” is required to maintain.</td>
</tr>
<tr>
<td></td>
<td>4. Review of One Leg Stand administrative procedures.</td>
<td>The examiner must demonstrate the one-leg stance.</td>
</tr>
<tr>
<td></td>
<td>a. The test has two stages, the instructions stage and the balance and counting stage.</td>
<td>Emphasize that the subject must maintain the foot elevation throughout the test.</td>
</tr>
<tr>
<td></td>
<td>b. During the instructions stage the subject must stand with the feet together, arms at the side, facing the examiner.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. The subject must be told that they will have to stand on the left foot, and raise the right foot approximately 6 inches off the ground, with the right leg held straight and the raised foot parallel to the ground.</td>
<td>If the subject lowers his/her foot, he/she should be instructed to raise it.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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</tr>
<tr>
<td>d.</td>
<td>The subject must be told that they must look at the elevated foot during the test.</td>
<td>Emphasize that the examiner should not look at his or her own foot while giving the instructions; for safety reasons, the examiner must keep the eyes on the subject at all times.</td>
</tr>
<tr>
<td>e.</td>
<td>The subject must be told that they will have to count out loud in the following manner: &quot;one thousand-and one, one thousand-and two, one thousand-and-three&quot; and so on until told to stop.</td>
<td>After giving the instructions, the examiner should ask the &quot;suspect&quot; if they understand.</td>
</tr>
<tr>
<td>f.</td>
<td>After the subject has completed the test on the left foot, they must be told to repeat the test on the right foot.</td>
<td>Solicit students' questions about the administrative procedures for One Leg Stand.</td>
</tr>
</tbody>
</table>

**5. Recording results of the One Leg Stand.**

Point out that the validation of the One Leg Stand was based on a thirty-second time period. Therefore, the DRE must keep track of the actual time the subject stands on each foot. When thirty seconds have passed, stop the test.

Point out that the DRE should explain the instructions again prior to having the “suspect” perform the test on the right foot.

Instruct students to turn to the "One Leg Stand Test Diagram" in their Student Manuals (the same diagram that appears on Visual III-5).
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<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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<tr>
<td>a. For drug evaluation purposes, we use the same clues on the One Leg Stand that we use for Standardized Field Sobriety Testing.</td>
<td>Ask students: &quot;What are the four clues of the One Leg Stand test?&quot;</td>
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<td>b. The One Leg Stand clues:</td>
<td>Solicit questions about documenting the results of the One Leg Stand.</td>
<td></td>
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<tr>
<td>o Sways while balancing</td>
<td></td>
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<tr>
<td>o Uses arms to balance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Hopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Puts foot down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Indicate above the feet the number they were counting when they put their foot down.</td>
<td></td>
<td></td>
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<tr>
<td>d. Check marks should be made to indicate the number of times the subject swayed, used arms for balance, hopped or put their foot down.</td>
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<td></td>
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<tr>
<td>e. The subjects 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.</td>
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<td></td>
<td>Instruct teammates to take turns administering the One Leg Stand to each other.</td>
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<tr>
<td></td>
<td>Note: It is not necessary that the student serving as the “suspect” actually stand on one foot for thirty seconds. The idea is to practice giving the instructions for the test.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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### D. Finger to Nose.

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

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

3. Administrative procedures for Finger to Nose.
   
   a. The subject must be told to stand with feet together, arms down at the sides, facing the examiner.

   b. 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.

   c. The examiner must tell subject that they will be asked to touch the tip of the index finger to the tip of the nose.

   d. The examiner must demonstrate to the subject how they are expected to touch the fingertip to the nose.

   - Write "Finger to Nose" on dry erase board or flip-chart.

   - Two instructors should serve in this demonstration, one as the examiner and the other as "suspect".

   - The examiner should demonstrate the stance.

   - Demonstrate the proper extension of the index fingers.

   - Demonstrate the movement of the fingertip to the nose by standing at an angle to the "suspect" so that he/she can see the proper method for touching the nose.

Monitor the practice and offer appropriate coaching and constructive criticism.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.</td>
<td>The “suspect” must be told that he/she will be given a series of commands, i.e., &quot;left, right, etc.&quot; to indicate which fingertip is to be brought to the tip of the nose.</td>
<td>Demonstrate: &quot;When I say 'right', touch the tip of your right index finger to the tip of your nose.&quot;</td>
</tr>
<tr>
<td>f.</td>
<td>The examiner must tell the subject that they are expected to return the arm to the side immediately after touching the fingertip to the nose.</td>
<td>Note: the subject's head should be tilted back in the same fashion as in the Romberg Balance test.</td>
</tr>
<tr>
<td>g.</td>
<td>The “suspect” must be told to tilt the head back slightly and to close the eyes, and keep them closed until the examiner says to open them.</td>
<td>The examiner should demonstrate the stance with head tilted back, arms at the sides with index fingers extended. Remind the students that they should not close their eyes during the instructions for safety reasons.</td>
</tr>
<tr>
<td>h.</td>
<td>The test is always given in the following sequence of commands:</td>
<td>Write the sequence on dry erase board or flip-chart.</td>
</tr>
<tr>
<td></td>
<td>o left</td>
<td>Solicit students' questions concerning administrative procedures for Finger to Nose.</td>
</tr>
<tr>
<td></td>
<td>o right</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o left</td>
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<tr>
<td></td>
<td>o right</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o left</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Instructor-led demonstrations.</td>
<td>One instructor should give a complete demonstration of Finger to Nose, using another instructor as the &quot;suspect&quot;.</td>
</tr>
<tr>
<td>a.</td>
<td>Instructor-to-instructor demonstration.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>b. Instructor-to-student demonstration.</td>
<td>Select a student to serve as the &quot;suspect&quot; and administer a complete Finger to Nose test to that student. Thank the student for his/her participation and solicit questions about the demonstrations.</td>
<td></td>
</tr>
<tr>
<td>5. Student-led demonstrations.</td>
<td>Select two students and have them take turns administering Finger to Nose to each other. Offer appropriate comments and constructive criticisms about the students' administration of the test. Thank the students for their participation and solicit questions from the class.</td>
<td></td>
</tr>
<tr>
<td>6. Recording results of the Finger to Nose test.</td>
<td>Instruct students to turn to the &quot;Finger to Nose Test Diagram&quot; in their Student Manuals (the same diagram that appears on Visual III-4).</td>
<td></td>
</tr>
<tr>
<td>a. The results of Finger to Nose test are recorded by drawing a &quot;map&quot; showing where the fingertips landed on each attempt.</td>
<td>Suggestion: If the DRE draws the line from the place where the subject touches to the appropriate triangle it enables them to draw a straighter line. Solicit questions about recording the results of Finger to Nose.</td>
<td></td>
</tr>
<tr>
<td>b. A line should be drawn to the appropriate triangle to indicate where the subject touched their nose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
<td></td>
<td></td>
<td>Instruct teammates to take turns administering Finger to Nose to each other.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: It is not necessary for the teammate who is the “suspect” to carry out the test completely.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor the practice and offer appropriate coaching and constructive criticism.</td>
</tr>
</tbody>
</table>
REVIEW QUESTIONS

1. List the four divided attention test in the sequence in which they are administered in the drug influence evaluation.
   
   1. Romberg   2. Walk and Turn   3. One Leg Stand   4. Finger to Nose

2. On which foot must the subject stand the first time he or she performs the One Leg Stand?
   
   Left

3. How much time must the subject estimate during the Romberg Balance?
   
   30 seconds

4. List all of the scientifically validated clues of impairment for Walk and Turn.
   

5. List all of the scientifically validated clues of impairment for Finger to Nose.
   
   None

6. What sequence of finger commands must you give for the Finger to Nose?
   
   Left, Right, Left, Right, Right, Left

7. List all of the scientifically validated clues of impairment for Romberg Balance.
   
   None

8. List all of the scientifically validated clues of impairment for One Leg Stand.
   
Session III - Psychophysical Tests

Objectives

- Administer the four divided attention tests used in the drug influence evaluation process
- Document the subject's performance of those tests

Romberg Balance Test Diagram

Walk and Turn Test Diagram

One Leg Stand Test Diagram

Finger to Nose Test Diagram
Questions?
SESSION IV

THE EYE EXAMINATIONS

Ninety Minutes
SESSION IV  THE EYE EXAMINATIONS

Upon successfully completing this session the student 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           o Instructor-Led Presentations
B. Procedures and Clues                       o Instructor-Led Demonstrations
C. Demonstrations                            o Hands-on Practice
D. Relationship of Drug Categories to the Eye Examinations
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>![90 Minutes]</td>
<td><strong>THE EYE EXAMINATIONS</strong></td>
<td>Display Session Title</td>
</tr>
<tr>
<td>![IV-1 (Title)]</td>
<td></td>
<td>Briefly review the content, objectives and activities of this session.</td>
</tr>
<tr>
<td>![15 Minutes]</td>
<td><strong>A. Purposes of the Eye Examinations</strong></td>
<td></td>
</tr>
<tr>
<td>![IV-3 (Eye Exams)]</td>
<td>1. The principal purpose of all of the eye examinations is to obtain articulable facts indicating the presence or absence of specific categories of drugs.</td>
<td></td>
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<tr>
<td></td>
<td>a. Certain drug categories usually cause the eyes to react in specific ways.</td>
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<tr>
<td></td>
<td>b. Other drug categories usually do not cause those reactions.</td>
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</tbody>
</table>
2. 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.

a. If HGN is observed, it is likely that the subject may have taken a CNS Depressant, Dissociative Anesthetics, an Inhalant, or a combination of those.

b. If VGN is observed, the implication may be that the subject took Dissociative Anesthetics, or fairly large doses of depressants or inhalants (for that individual).

c. By comparing the subject’s blood alcohol concentration with the angle of onset of HGN, it may be possible to determine that alcohol is or is not the sole cause of the observed nystagmus.

Point out that it is very unlikely that a subject would exhibit Vertical Gaze Nystagmus without also exhibiting HGN.

Clarification: If the angle of onset is significantly inconsistent with the BAC, the implication may be that the subject has also taken a Dissociative Anesthetics or an Inhalant, or some CNS Depressant other than alcohol, or that the subject may have a medical condition.

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

\[ \text{BAC} = 50 - A \]

Write the formula on the dry erase board or flip-chart.

Explanation:
BAC = 100 x blood alcohol (e.g., if blood alcohol is 0.10, BAC = 10)

A = onset angle (in degrees)

Example: If onset angle is 35

degrees, then
BAC = 50 - 35 = 15.

The corresponding blood alcohol concentration would be approximately 0.15.

Emphasize this point: The formula can easily be "off" by 0.05 or more, even though the subject has consumed no drug other than alcohol.

Emphasize that many other facts will also be considered that will help to determine whether Depressants, Inhalants or Dissociative Anesthetics may be present.

e. Keep in mind that this formula is only a statistical approximation. It is not an exact relationship for all subjects at all times.

f. The only purpose of comparing BAC and the angle of onset is to obtain a gross indication of the possible presence of another Depressant, Inhalants, or Dissociative Anesthetics.

g. 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 they exhibit "immediate onset".

- From 30 degrees on out, you will record a numeric estimate of onset.

3. The check for Lack of Convergence can provide another clue as to the possible presence of
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Depressants, Inhalants, or Dissociative Anesthetics.</strong></td>
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<tr>
<td></td>
<td>4. Lack of Convergence is also an indicator of the possible presence of Cannabis.</td>
<td><strong>Point out</strong> that a DRE might begin to suspect the presence of cannabis if Lack of Convergence was observed but no HGN was observed.</td>
</tr>
<tr>
<td></td>
<td>5. The checks of pupil size and reaction to light provide useful indicators of the possible presence of many drug categories.</td>
<td><strong>Point out</strong> that in addition to signs of drug use, checks of the pupil size and reaction to light may reveal signs of injury or existing medical conditions.</td>
</tr>
<tr>
<td></td>
<td>a. Depressants, CNS Stimulants, Inhalants and Narcotic Analgesics will usually cause the pupils to react very slowly or not at all to light.</td>
<td><strong>Solicit students' comments and questions concerning the purposes of the eye examinations.</strong></td>
</tr>
<tr>
<td></td>
<td>b. CNS Stimulants and Hallucinogens usually will cause the pupils to dilate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Narcotic Analgesics will usually cause the pupils to constrict.</td>
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<td></td>
<td><strong>B. Procedures and Clues</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Prior to the administration of the HGN test, the eyes are checked for equal pupil size, equal tracking and resting nystagmus.</td>
<td><strong>NOTE</strong>: 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. Resting Nystagmus may also be observed at this time.</td>
</tr>
</tbody>
</table>
### Aids

#### IV-4 (HGN Clues)

<table>
<thead>
<tr>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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<tbody>
<tr>
<td>2. Horizontal Gaze Nystagmus test consists of three separate checks, administered independently to each eye.</td>
<td>Remind the students that the HGN test is done exactly the same as in the SFST training and that the DRE start with the “suspects” left eye first.</td>
</tr>
</tbody>
</table>

#### IV-4A (Lack of Smooth Pursuit)

<table>
<thead>
<tr>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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</thead>
<tbody>
<tr>
<td>a. The first check is for &quot;lack of smooth pursuit&quot;.</td>
<td>Select a student, and demonstrate the first check of HGN on that student.</td>
</tr>
<tr>
<td>o Position the stimulus approximately 12 to 15 inches in front of subject's nose.</td>
<td>Point out that this procedure insures that the eyes will be open wide and easy to observe.</td>
</tr>
<tr>
<td>o Hold the tip of the stimulus slightly above the subject's eye level.</td>
<td></td>
</tr>
<tr>
<td>o Instruct the subject to hold the head still and follow the stimulus with the eyes only.</td>
<td></td>
</tr>
<tr>
<td>o Move the stimulus smoothly, all the way to the subject's left, then all the way to the right, then back again all the way to the left, then once again all the way back to the right.</td>
<td>Point out that we begin by checking the subject’s left eye, then we immediately check the right eye. And, we make at least two complete passes in front of both eyes.</td>
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<tr>
<td></td>
<td>Demonstrate two complete passes in front of the eyes, using the student-volunteer as your test subject.</td>
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<td></td>
<td>Emphasize: For standardization, we always begin by checking the left eye.</td>
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<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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</table>

b. While the eye is moving, examine it for evidence of a lack of smooth pursuit. |

c. Students' initial practice of the check for lack of smooth pursuit.
d. The second check is for "distinct and sustained nystagmus at maximum deviation".

- Again position the stimulus as before.
- Move the stimulus all the way to the subject's left side and hold it there so that the subject's eye is turned as far to the side as possible.
- Hold the eye at that position for a minimum of 4 seconds, to check carefully for any jerking that may be present.
- Then, move the stimulus all the way to the subject's right side, and hold it there for a minimum of 4 seconds.
- Repeat the procedure.

e. With this cue, the examiner looks for distinct and sustained jerking.

- A slight or barely visible tremor is not sufficient to consider this cue present.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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<tbody>
<tr>
<td></td>
<td>o A definite, strong jerking must be seen.</td>
<td>Point out that for HGN to be considered present, a distinct and sustained jerking must be present for a minimum of four seconds.</td>
</tr>
<tr>
<td></td>
<td>f. Students' initial practice of the check for distinct and sustained nystagmus at maximum deviation.</td>
<td>Excuse the student-volunteer and thank him/her for participating.</td>
</tr>
<tr>
<td></td>
<td>g. The final check is for the &quot;angle of onset&quot;. The formula is BAC = 50 - A.</td>
<td>Instruct students to work in pairs, taking turns checking each other's eyes for distinct and sustained nystagmus at maximum deviation. Monitor, coach and critique the students' practice. Allow this practice to continue for only about 2 minutes.</td>
</tr>
<tr>
<td></td>
<td>o Position the stimulus as before.</td>
<td>Select a student and demonstrate the third check of HGN on that student.</td>
</tr>
<tr>
<td></td>
<td>o Slowly move the stimulus to the subject's left side, carefully watching the eye for the first sign of jerking.</td>
<td></td>
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<tr>
<td></td>
<td>o When you think that you see the eye jerk, stop moving the stimulus and hold it perfectly still.</td>
<td>Point out: if the eye is not jerking, resume moving the stimulus slowly to the side, again observing for the first</td>
</tr>
</tbody>
</table>
Aids | Lesson Plan | Instructor Notes
---|---|---
o | Once you have established that you have located the point of onset, estimate the angle. | sign of jerking.
| | | Exhibit a template if available.
o | Then, repeat this procedure on the subject’s right eye. | Point out that angle estimation simply requires practice.
| | | Point out that the template will be used during practice. Excuse the student-volunteer and thank him or her for participating.
h. | Students’ initial practice of angle of onset estimation. | Instruct students to work in pairs, taking turns estimating angles of each other’s eyes.
| | | Instruct students that they are to try to draw their partners’ eyes to 3 different angles: 30, 35, 40 degrees.
| | | Students will check their accuracy using the template.
| | | Monitor, coach and critique the students’ practice.
| | | Allow this practice to continue for only about 3 minutes.

**INSTRUCTOR PLEASE NOTE:** In their previous training in HGN, some students may have been taught to look for all 3 clues in one eye, and then to check the other eye for all 3 clues. There is nothing wrong with that procedure, from either a scientific or legal perspective. As DREs however, we expect...
them to switch from eye to eye as they "work through" the three clues. There are two reasons for this:

(1) Standardization: we want all DREs to work in the same way; the "left eye/right eye" switching procedure is simply the standard approach that we have adopted.

(2) Medical Complications: DREs must always be alert to the possibility of a medical complication, such as a stroke, brain tumor or other injury to the brain. These kinds of injuries often will cause the two eyes to behave quite differently from one another. For example, the left eye might jerk noticeably while the right eye tracks smoothly. By always immediately comparing the performances of the two eyes, the DRE might more quickly spot the possibility of a medical complication.

NOTE: NHTSA modified its SFST training courses to conform to this "left/right" procedure in 1989.

Select a student and demonstrate the Vertical Gaze Nystagmus test on the student.

2. The Vertical Gaze Nystagmus test is a very simple test.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>Position the stimulus <strong>horizontally, approximately</strong> 12 to 15 inches in front of the subject's nose.</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>Instruct the subject to hold the head still and follow a specific point on the stimulus with the eyes only.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Raise the stimulus until the subject's eyes are elevated as far as possible.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>Watch closely for evidence of jerking.</td>
<td><strong>Point out</strong> that the examiner should keep the subject's eyes elevated for approx. 4 seconds to verify that the jerking is present and continues during the full four seconds. <strong>Point out</strong> that we do not attempt to estimate an angle of onset for Vertical Gaze Nystagmus: We simply record whether a visible up-and-down jerking is present or not present.</td>
</tr>
<tr>
<td>e.</td>
<td>Students' initial practice of the Vertical Gaze Nystagmus test.</td>
<td><strong>Instruct</strong> students to work in pairs, taking turns administering the Vertical Gaze Nystagmus test to each other. <strong>Monitor</strong>, coach and critique the students' practice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allow this practice to continue for only about 2 minutes.</td>
</tr>
</tbody>
</table>
### Lesson Plan

<table>
<thead>
<tr>
<th>Aids</th>
<th>3. The test for <strong>Lack of Convergence</strong> determines whether the subject is able to cross his or her eyes.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>a. 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.</td>
</tr>
<tr>
<td></td>
<td>b. Inform the subject that you are going to move the stimulus around in a circle in front of his/her face and to follow the stimulus with his/her eyes only.</td>
</tr>
<tr>
<td></td>
<td>c. Inform the subject that you will move the tip of the stimulus in toward the bridge of his or her nose.</td>
</tr>
<tr>
<td></td>
<td>d. Point out to the subject that he or she will have to keep their head steady and try to cross the eyes in order to keep the eyes focused on the stimulus as it moves in toward the nose.</td>
</tr>
<tr>
<td></td>
<td>e. Start to move the object slowly in a circle.</td>
</tr>
<tr>
<td></td>
<td>f. Verify the subject is tracking the stimulus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Select a student and demonstrate the test for Lack of Convergence on that student.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point out in simplest terms. Lack of Convergence means an inability to cross the eyes.</td>
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<tr>
<td></td>
<td>Point out that the stimulus can be moved either clockwise or counterclockwise.</td>
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<tr>
<td></td>
<td>Emphasize that it is important for the subject to be aware of what will happen so that he or she will not flinch or become frightened when you move the stimulus toward his or her face.</td>
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<tr>
<td></td>
<td>Point out that you will not actually touch the subject’s nose.</td>
</tr>
<tr>
<td></td>
<td>Point out that this initial circular motion helps to verify that the subject has focused on the stimulus and is able to track it.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>g.</td>
<td>Move the stimulus 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.</td>
</tr>
<tr>
<td>h.</td>
<td>In a normal non-impaired subject, the eyes should come together (converge) and remain converged for one second.</td>
</tr>
<tr>
<td>i.</td>
<td>If the eyes do not converge or remain converged on the stimulus for one second, then Lack of Convergence is present.</td>
</tr>
<tr>
<td>j.</td>
<td>Students' initial practice of the test for Lack of Convergence.</td>
</tr>
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<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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</tr>
<tr>
<td></td>
<td>k. Drug categories which usually cause lack of convergence include:</td>
</tr>
<tr>
<td></td>
<td>IV-9 (Drugs Causing LOC)</td>
</tr>
<tr>
<td></td>
<td>IV-10 (Estimating Pupil Size)</td>
</tr>
<tr>
<td></td>
<td>• CNS Depressants</td>
</tr>
<tr>
<td></td>
<td>• Inhalants</td>
</tr>
<tr>
<td></td>
<td>• Dissociative Anesthetics</td>
</tr>
<tr>
<td></td>
<td>• Cannabis</td>
</tr>
<tr>
<td></td>
<td>4. Estimation of pupil size.</td>
</tr>
<tr>
<td></td>
<td>a. We use a device called a pupillometer to estimate the size of the subject’s pupil.</td>
</tr>
<tr>
<td></td>
<td>b. The DRE pupillometer has a series of circles or semi-circles, with diameters ranging from 1.0 mm to 10.5 mm, in half-millimeter increments.</td>
</tr>
<tr>
<td></td>
<td>c. The pupillometer is held alongside the subject’s eye, and moved up and down until the circle or semi-circle closest in size to the pupil is located.</td>
</tr>
<tr>
<td></td>
<td>d. The pupil size estimations are recorded as the numeric value that corresponds to the diameter of the circle or semi-circle closest in size to the subject’s pupil in each</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>lighting condition.</td>
</tr>
<tr>
<td>e.</td>
<td>Students' initial practice of pupil size estimation.</td>
</tr>
<tr>
<td></td>
<td>Instruct students to work in pairs, taking turns estimating each other's pupils.</td>
</tr>
<tr>
<td></td>
<td>Tell the students to record on paper the pupil sizes of their partners.</td>
</tr>
<tr>
<td></td>
<td>Tabulate the pupil size estimates made by the students, on the flip-chart using the following sizes:</td>
</tr>
<tr>
<td></td>
<td>8.5 or larger _________</td>
</tr>
<tr>
<td></td>
<td>8.0 _________</td>
</tr>
<tr>
<td></td>
<td>7.5 _________</td>
</tr>
<tr>
<td></td>
<td>7.0 _________</td>
</tr>
<tr>
<td></td>
<td>6.5 _________</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. We estimate pupil size under three (3) different lighting conditions:</td>
</tr>
<tr>
<td></td>
<td>• Room Light</td>
</tr>
<tr>
<td></td>
<td>• Near Total Darkness</td>
</tr>
<tr>
<td></td>
<td>• Direct Light</td>
</tr>
<tr>
<td></td>
<td>Different testing conditions create different demands on the autonomic nervous system, including the pupil.</td>
</tr>
<tr>
<td></td>
<td>g. Examining the pupils in three different lighting conditions is similar to examining other clinical indicators, i.e., pulse or blood pressure in different conditions.</td>
</tr>
<tr>
<td></td>
<td>1. Estimation of pupil size under Room Light</td>
</tr>
<tr>
<td></td>
<td>a. Pupils are examined in Room Light prior to darkening the room.</td>
</tr>
<tr>
<td></td>
<td>2. Estimation of pupil size under Near Total Darkness and Direct Light.</td>
</tr>
</tbody>
</table>

| 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 | 2.5 or smaller |

Point out that the "normal" range of pupil size in room light is 2.5 to 5.0 mm.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>The final two pupil size estimations are made with the use of a penlight in a near totally darkened room.</td>
<td>Demonstrate this.</td>
</tr>
<tr>
<td>b.</td>
<td>Prior to estimating the pupil sizes, we darken the room and wait 90 seconds to allow the subject's eyes and our own to adapt to the dark.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>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 emerges.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>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).</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>Position the pupillometer alongside the pupil (left eye first) and locate the circle or semi-circle that is closest in size to the pupil.</td>
<td>Select a student to participate in demonstrations of darkroom pupil measurements.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>f. Repeat the procedure for the subject’s right eye.</td>
<td><strong>Demonstrate this.</strong></td>
</tr>
<tr>
<td></td>
<td>g. For the estimation under <strong>direct light</strong> bring the light from the side of the subject's face, then completely uncover the tip of the penlight shining the beam into the subject's eye. Hold it there for 15 seconds.</td>
<td>Emphasize that the penlight should be positioned so that the beam just &quot;fits&quot; or approximately fills the eye socket.</td>
</tr>
<tr>
<td></td>
<td>h. Bring the pupillometer up alongside the left eye, and find the circle or semi-circle that is closest in size to the pupil.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. Repeat the procedure for the right eye.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>5. Normal sizes for the pupil.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Since we estimate pupil size under three different lighting conditions; Room Light, Near Total Darkness, and Direct Light, the range of pupil sizes will vary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>6. Basic Concepts Relative to Interpreting Pupil Sizes.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. It is important to understand a few basic concepts relative to interpreting pupil sizes.</td>
<td></td>
</tr>
</tbody>
</table>

**IV-13**
(Research Values)

**HS 172A R1/07**

**IV-20**
Understanding these concepts will allow DRE’s to better understand the relationship of pupil size to impairment.

b. 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.

Point out that when all of the study subjects were tested, the majority (approximately 88%) of the “normal” non-impaired people fell within the “average ranges.”

c. 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.

d. With many people, even under very bright light, the pupils won’t constrict much below a
diameter of 2.5 mm, and even under near total dark conditions, the pupils usually only dilate to a diameter of not more than 8.5 mm.

**e.** Studies have indicated there are significant differences between the average pupil size in these three conditions. Consequently, the use of three distinct pupil size ranges for each of the different testing conditions may be more useful to determine impairment vs. non-impairment.

1. **Room Light** is approximately 4.0 mm with an average range of normal sizes ranging from 2.5 to 5.0 mm.

2. **Near Total Darkness** is approximately 6.5 mm with an average range of normal pupil sizes ranging from 5.0 to 8.5 mm.

3. **Direct Light** is approximately 3.0 mm with an average range of normal pupil sizes ranging from 2.0 to 4.5 mm.

Point out: That although there are several studies that indicate these pupill sizes are “for the majority of normal, non-impaired people”, there is one study in particular that specifies the average size and ranges:

<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>d.</td>
<td>Many drugs, however, will affect the dilation or constriction of the pupils and many cause the pupil size to go outside these normal ranges.</td>
<td>Point out that specific drug categories and their relationship to pupil sizes will be covered later.</td>
</tr>
<tr>
<td>6.</td>
<td>The check of the pupil's reaction to light takes place at the same time as the test of pupil size under direct light.</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Observe the subject's pupil size as the penlight is aimed at the side of the subject's face.</td>
<td>Demonstrate this using a participant-volunteer.</td>
</tr>
<tr>
<td>b.</td>
<td>As you bring the beam of light directly into the subject's eye, note how the pupil reacts.</td>
<td>Demonstrate this.</td>
</tr>
<tr>
<td>c.</td>
<td>Under ordinary conditions, the pupil should react very quickly, and constrict noticeably when the light beam strikes the eye.</td>
<td>Point out that pupillary reaction to light should occur within one second.</td>
</tr>
<tr>
<td>d.</td>
<td>Under the influence of certain categories of drugs, the pupil's reaction may be very sluggish, or there may be no constriction at all.</td>
<td>Excuse the student-volunteer and thank him/her for participating.</td>
</tr>
<tr>
<td>e.</td>
<td>Students' initial practice in measuring the pupil's reaction to light.</td>
<td>Instruct the students to work in pairs, taking turns shining the light into each other's eye and observing the pupil's reaction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remind students to position the penlight so that the beam exactly &quot;fits&quot; the eye socket when the beam is brought directly into the eye.</td>
</tr>
</tbody>
</table>
C. Demonstrations

1. Demonstrate equal tracking and equal pupil size.

2. Demonstration of Horizontal Gaze Nystagmus.
   a. Check for lack of smooth pursuit.
   b. Check for distinct and sustained nystagmus at maximum deviation.
   c. Estimation of the angle of onset.


Monitor, coach and critique the students' practice.

Allow the practice to continue for only about 2 minutes.

Solicit students' comments and questions concerning the eye examinations.

Select two students to come before the class.

Instruct one student to demonstrate the administration of HGN to the other student.

Coach and critique the student-administrator's performance.

Make sure that the student-administrator checks both eyes.

When the participant-administrator has completed the HGN test, instruct the student-administrator to draw the student-subject's eye to an angle of 35 degrees. Check the accuracy of this estimate, using the template.

Excuse the two students and thank them for participating.

Select two other students to come before the class.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Demonstration of pupil size estimation and test for reaction to light.</td>
<td>Instruct one student to check the other for Vertical Gaze Nystagmus.</td>
<td>Coach and critique the student-administrator's performance.</td>
</tr>
<tr>
<td>a. Pupil size estimation under room light.</td>
<td>Coach and critique the student-administrator's performance.</td>
<td>Excuse the two students and thank them for participating.</td>
</tr>
<tr>
<td>b. Darkroom estimations of pupil size.</td>
<td>Select two other students to come before the class.</td>
<td></td>
</tr>
<tr>
<td>o near total darkness</td>
<td>Instruct one student to estimate the other's pupils under room light.</td>
<td></td>
</tr>
<tr>
<td>o direct light</td>
<td>Coach and critique the student-administrator's performance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instruct the second student to demonstrate how to perform the dark room estimations of pupil size.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coach and critique the student-administrator's performance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point out that assessment of the pupil's reaction to light takes place in conjunction with the direct-light estimation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excuse the two students and thank them for participating.</td>
<td></td>
</tr>
</tbody>
</table>
### IV-18
(Normal Ranges Recap)

**Room Light:** 4.0 mm with an average range of 2.5 - 5.0 mm.

**Near Total Darkness:** 6.5 mm with an average range of 5.0 - 8.5 mm.

**Direct Light:** 3.0 mm with an average range of 2.0 - 4.5 mm.

### D. Relationship of Drug Categories to the Eye Examinations

1. Three of the seven drug categories normally will cause Horizontal Gaze Nystagmus.
   
a. CNS Depressants, Inhalants and Dissociative Anesthetics normally will cause HGN.
   
b. The other four categories normally will not cause HGN.

2. Any drug that will cause HGN also will cause Vertical Gaze Nystagmus, if a high enough dose of the drug is taken.

<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV-18</td>
<td>c. To review, the normal ranges for non-impaired people are:</td>
<td>Solicit students' comments and questions concerning the demonstrations of the eye examinations and the pupil size ranges.</td>
</tr>
<tr>
<td></td>
<td>Room Light: 4.0 mm with an average range of 2.5 - 5.0 mm.</td>
<td>Note: Draw the Matrix at the end of this session on the dry erase board or flip-chart at the outset of this segment.</td>
</tr>
<tr>
<td></td>
<td>Near Total Darkness: 6.5 mm with an average range of 5.0 - 8.5 mm.</td>
<td>Ask the students which drug categories normally induce HGN.</td>
</tr>
<tr>
<td></td>
<td>Direct Light: 3.0 mm with an average range of 2.0 - 4.5 mm.</td>
<td>Along the &quot;HGN&quot; line on the matrix, write &quot;PRESENT&quot; under the columns for Depressants, Dissociative Anesthetics and &quot;YES&quot; for Inhalants.</td>
</tr>
<tr>
<td>10 Minutes</td>
<td>1. Three of the seven drug categories normally will cause Horizontal Gaze Nystagmus.</td>
<td>Write &quot;NONE&quot; on the &quot;HGN&quot; line under the other columns.</td>
</tr>
<tr>
<td></td>
<td>a. CNS Depressants, Inhalants and Dissociative Anesthetics normally will cause HGN.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. The other four categories normally will not cause HGN.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>a. So, Depressants, Inhalants and Dissociative Anesthetics, can all cause Vertical Gaze Nystagmus at higher doses for that individual.</td>
<td>Along the &quot;VERT NYST&quot; line, write &quot;PRESENT&quot; under the columns for those three categories.</td>
<td>Write &quot;NONE&quot; for &quot;VERT NYST&quot; under the other four columns.</td>
</tr>
<tr>
<td>b. But if a drug will not cause HGN, then it also will not cause Vertical Gaze Nystagmus.</td>
<td>Write &quot;PRESENT&quot; along the &quot;LACK CONV&quot; line under the columns for those three categories.</td>
<td>Ask students which category that is.</td>
</tr>
<tr>
<td>3. All drugs that cause nystagmus also will cause the eyes to be unable to converge.</td>
<td>Write &quot;PRESENT&quot; along the &quot;LACK CONV&quot; line under &quot;CANNABIS&quot;.</td>
<td>Write &quot;NONE&quot; along the line under the remaining three columns.</td>
</tr>
<tr>
<td>a. Therefore, Depressants, Inhalants and Dissociative Anesthetics, including PCP and its analogs, usually will cause Lack of Convergence.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Interestingly, there is one category of drug that does not cause nystagmus but that does usually cause Lack of Convergence.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Cannabis usually does cause lack of convergence, even though it does not cause nystagmus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. The other three categories do not cause a Lack of Convergence.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>a. CNS Stimulants and Hallucinogens usually cause the pupils to become larger or &quot;dilated&quot;.</td>
<td>Write &quot;DILATED&quot; along the &quot;PUPIL SIZE&quot; line under the columns for CNS Stimulants and Hallucinogens.</td>
<td></td>
</tr>
<tr>
<td>b. Cannabis may cause the pupils to dilate.</td>
<td>Write &quot;DILATED&quot; under the &quot;CANNABIS&quot; column; however, explain they may also be NORMAL. (Exception #6)</td>
<td></td>
</tr>
<tr>
<td>c. Narcotic Analgesics usually cause the pupils to become smaller or &quot;constricted&quot;.</td>
<td>Write &quot;CONSTRICTED&quot; under the &quot;NARCOTICS&quot; column.</td>
<td></td>
</tr>
<tr>
<td>d. Dissociative Anesthetics and most Inhalants tend to leave pupil size in the normal ranges.</td>
<td>Write &quot;NORMAL&quot; under the columns for Dissociative Anesthetics and Inhalants. BUT POINT OUT THAT SOME INHALANTS WILL CAUSE PUPIL DILATION. (Exception #4)</td>
<td></td>
</tr>
<tr>
<td>e. CNS Depressants also usually leave the pupils near normal.</td>
<td>Write &quot;NORMAL&quot; under the &quot;DEPRESSANT&quot; column.</td>
<td></td>
</tr>
<tr>
<td>f. However, there are some exceptions, i.e., depressant drugs that usually dilate the pupils.</td>
<td>Ask students which depressants causes pupil dilation.</td>
<td></td>
</tr>
<tr>
<td>g. Methaqualone, or &quot;Quaaludes&quot; and Soma usually cause pupil dilation.</td>
<td>Put a (1) next to the &quot;NORMAL&quot; in the &quot;DEPRESSANT&quot; column, and explain that this exception #1; Soma and Quaaludes usually dilate pupils. Solicit students' questions and comments.</td>
<td></td>
</tr>
</tbody>
</table>

5. Generally, the pupillary reaction to light is either slowed by the effect of the drug or the pupil reacts normally. The most
significant exception is the effect caused by Narcotic Analgesics. Though there is always some reaction to light, in live subjects, the constricted pupil caused by narcotics makes it difficult to perceive a change in the pupil size.

<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. CNS Depressants and CNS Stimulants usually cause a slowed reaction to light.</td>
<td>Write &quot;SLOW&quot; under the columns for CNS Stimulants and Depressants.</td>
<td></td>
</tr>
<tr>
<td>b. With Hallucinogens, Dissociative Anesthetics and Cannabis the pupillary reaction to light is usually normal.</td>
<td>Write &quot;NORMAL&quot; under the columns for Hallucinogens, Dissociative Anesthetics and Cannabis.</td>
<td></td>
</tr>
<tr>
<td>c. Due to the constricted nature of the pupils when under the influence of Narcotic Analgesics, it is difficult to perceive a reaction to light. As a result we list reaction to light for Narcotic Analgesics as “little or none visible”.</td>
<td>Point out that certain psychedelic amphetamines cause slowing of the pupils; Exception #3.</td>
<td></td>
</tr>
<tr>
<td>d. Inhalants may cause a slowed reaction or the pupils may react normally depending on the substance used.</td>
<td>Write &quot;SLOW&quot; in the column for inhalants and explain that this is only a general rule.</td>
<td></td>
</tr>
<tr>
<td>DEPRESS</td>
<td>STIMULS</td>
<td>HALLUCS</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>HGN</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>VGN</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>LACK</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>CONV.</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>PUPIL SIZE</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>RCTN. LIGHT</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>
REVIEW QUESTIONS

1. Name the three clues of impairment associated with Horizontal Gaze Nystagmus.
   
   1. Lack of smooth pursuit   2. Distinct and sustained nystagmus at maximum deviation   3. Onset of nystagmus prior to 45 degrees

2. Complete this formula:
   
   \[ \text{BAC} = 50 - \text{Angle of onset} \]

3. Which categories of drugs will not cause Vertical Gaze Nystagmus?
   
   CNS Stimulants, Hallucinogens, Narcotic Analgesics, Cannabis

4. Which categories of drugs usually will cause Lack of Convergence?
   
   CNS Depressants, Inhalants, Dissociative Anesthetics, Cannabis

5. Name the three lighting conditions under which a DRE makes pupil size estimations.
   
   Room light, Near total darkness, Direct light

6. What is the normal range of pupil size for room light?
   
   2.5-5.0 mm

7. Which categories of drugs will usually slow down the reaction of the pupils to light?
   
   CNS Depressants, CNS Stimulants, Inhalants
Session IV - The Eye Examinations

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 various categories of drugs

The Eye Examinations

Three Clues of Horizontal Gaze Nystagmus
- Lack of Smooth Pursuit
- Distinct and Sustained Nystagmus at Maximum Deviation
- Angle of Onset

Vertical Gaze Nystagmus

Lack of Convergence
**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.

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

- 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.

**Drug Categories That Induce LOC**

The following drug categories usually will induce Lack of Convergence:

- CNS Depressants
- Inhalants
- Dissociative Anesthetics
- Cannabis

**Estimating Pupil Size**

**THREE TESTING CONDITIONS FOR PUPIL SIZE ESTIMATIONS**

- Room Light
- Near Total Darkness
- Direct Light

**These THREE TESTING CONDITIONS create Different Demands on the Autonomic Nervous System including the Pupil**

We ALSO know that ... There are THREE CONDITIONS For Other Clinical Indicators
Recent Research for Normal 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

**Room Light**

<table>
<thead>
<tr>
<th>Pupil Size (mm)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 mm</td>
<td>0.05%</td>
</tr>
<tr>
<td>0.5 mm</td>
<td>0.43%</td>
</tr>
<tr>
<td>1.0 mm</td>
<td>1.12%</td>
</tr>
<tr>
<td>1.5 mm</td>
<td>1.79%</td>
</tr>
<tr>
<td>2.0 mm</td>
<td>0.88%</td>
</tr>
<tr>
<td>2.5 mm</td>
<td>3.35%</td>
</tr>
<tr>
<td>3.0 mm</td>
<td>4.22%</td>
</tr>
<tr>
<td>3.5 mm</td>
<td>5.32%</td>
</tr>
<tr>
<td>4.0 mm</td>
<td>5.80%</td>
</tr>
<tr>
<td>4.5 mm</td>
<td>5.90%</td>
</tr>
<tr>
<td>5.0 mm</td>
<td>6.68%</td>
</tr>
</tbody>
</table>

Room Light is approximately 4.0 mm, with an average range of normal pupil sizes ranging from 2.5 to 5.0 mm.

88% of normal fall within the range of 2.5 to 6.0 mm. In fact, the percentage that falls within 2.5 to 4.5 mm is more than half (81%) of the people.

**Near Total Darkness**

<table>
<thead>
<tr>
<th>Pupil Size (mm)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm</td>
<td>6.55%</td>
</tr>
<tr>
<td>1.0 mm</td>
<td>6.22%</td>
</tr>
<tr>
<td>1.5 mm</td>
<td>4.85%</td>
</tr>
<tr>
<td>2.0 mm</td>
<td>4.92%</td>
</tr>
<tr>
<td>2.5 mm</td>
<td>5.83%</td>
</tr>
<tr>
<td>3.0 mm</td>
<td>5.81%</td>
</tr>
<tr>
<td>3.5 mm</td>
<td>5.05%</td>
</tr>
<tr>
<td>4.0 mm</td>
<td>4.47%</td>
</tr>
<tr>
<td>4.5 mm</td>
<td>3.79%</td>
</tr>
<tr>
<td>5.0 mm</td>
<td>3.80%</td>
</tr>
<tr>
<td>5.5 mm</td>
<td>2.08%</td>
</tr>
<tr>
<td>6.0 mm</td>
<td>0.89%</td>
</tr>
</tbody>
</table>

Near Total Darkness is approximately 6.5 mm with an average range of normal pupil sizes ranging from 5.0 to 8.5 mm.

About 88% of normal fall within the range of 5.0 to 8.5 mm. In fact, the percentage that falls within 6.0 to 7.5 mm is over 73 percent of the people.

**Direct Light**

<table>
<thead>
<tr>
<th>Pupil Size (mm)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm</td>
<td>2%</td>
</tr>
<tr>
<td>1.0 mm</td>
<td>3%</td>
</tr>
<tr>
<td>1.5 mm</td>
<td>3%</td>
</tr>
</tbody>
</table>

Direct Light is approximately 3.0 mm with an average range of normal pupil sizes ranging from 2.0 to 4.5 mm.

80% of normal fall within the range of 2.0 to 4.5 mm. In fact, the percentage that falls within 3.0 to 4.0 mm is almost 69 percent of the people.

**Normal Pupil Size Ranges Recap**

- **Room Light:** 4.0 mm with average range of 2.5 – 5.0 mm
- **Near Total Darkness:** 6.5 mm with average range of 5.0 – 8.5 mm
- **Direct Light:** 3.0 mm with average range of 2.0 – 4.5 mm
Questions?
SESSION V

ALCOHOL WORKSHOP

Two Hours
SESSION V  ALCOHOL WORKSHOP

Upon successfully completing this session the student 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

A. Assignments and Procedures

B. Testing

C. Feedback and Discussion

D. Alcohol Workshop Checklist

LEARNING ACTIVITIES

- Hands-on Practice
- Student-led Presentations
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ALCOHOL WORKSHOP</strong></td>
<td>Display Session Title</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discuss the objectives of the Alcohol Workshop.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INSTRUCTOR NOTE: The main emphasis of the alcohol workshop is to evaluate the student’s proficiency in the administration of SFSTs.</td>
</tr>
<tr>
<td>V-1</td>
<td>(Title)</td>
<td>Group the participants into teams. The number of students in each team is determined by dividing the total number of students by the total number of volunteer drinkers. Example: if there are 23 students and 7 volunteer drinkers, form five teams of three members and two teams of four members.</td>
</tr>
<tr>
<td></td>
<td>(Objectives)</td>
<td>(NOTE: All volunteer drinkers must read and sign the &quot;Statement of Informed Consent&quot; form prior to receiving any alcohol.)</td>
</tr>
</tbody>
</table>

### A. Assignments and Procedures

1. **Team assignments.**
   a. One member will be an examiner and will complete all portions of the exam.
   b. One member will be the recorder and document the findings of the examination on the evaluation form.
   c. All others in the group will observe/coach.
   d. Each team member will conduct at least one complete examination.

120 Minutes

V-2

15 Minutes
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Explanation of testing procedures.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Each team will conduct the following sequence of tests and examinations on each volunteer:</td>
<td>Write the sequence of tests and examinations on dry erase board or flip-chart.</td>
</tr>
<tr>
<td></td>
<td>o HGN (record angle of onset in each eye)</td>
<td>Emphasize that the team will administer each test only once to each volunteer, e.g., only one member of a team will administer the HGN test to a particular volunteer.</td>
</tr>
<tr>
<td></td>
<td>o Vertical Gaze Nystagmus</td>
<td>Emphasize that the tests and examinations are to be given in the order listed for all volunteers.</td>
</tr>
<tr>
<td></td>
<td>o Lack of Convergence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Romberg Balance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Walk and Turn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o One Leg Stand (standing on left leg)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o One Leg Stand (standing on right leg)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Finger to Nose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Teams will record the results of each test and examination.</td>
<td>Solicit questions about the testing procedures.</td>
</tr>
<tr>
<td></td>
<td>c. Upon completing the test and examinations, the team members will record their best estimate as to the volunteer's BAC.</td>
<td>Hand out test recording forms to the teams if available.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>B. Testing</td>
<td>Monitor the testing to ensure compliance with the procedures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Always allow a team to complete the full sequence of tests and examinations before sending the volunteer to another team.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer coaching and constructive criticism as appropriate.</td>
</tr>
<tr>
<td></td>
<td>C. Feedback and Discussion</td>
<td>Transcribe on the board the matrix found at the end of this session to be completed during the discussion phase of the workshop.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For each volunteer, select one team to report in detail on each test and examination administered to that volunteer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call upon students to report their best estimates as to that volunteer's BAC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inform the students of the results of that volunteer's breath tests.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue this process until all volunteers have been reported upon.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solicit students' questions and comments.</td>
</tr>
<tr>
<td>Drinker’s Name</td>
<td>Below .05</td>
<td>.05 - .09</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Session V - Alcohol Workshop

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

Testing Procedures
- Horizontal Gaze Nystagmus (record onset angle in each eye)
- Vertical Gaze Nystagmus
- Lack of Convergence
- Romberg Balance
- Walk and Turn
- One Leg Stand (on left foot)
- One Leg Stand (on right foot)
- Finger to Nose
SESSION VI

EXAMINATIONS OF VITAL SIGNS
SESSION VI  EXAMINATIONS OF VITAL SIGNS

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

- Define basic terms relevant to pulse rate and blood pressure measurements.
- Measure pulse rate.
- Measure blood pressure.
- Relate the expected results of vital signs examinations to the various categories of drugs.

CONTENT SEGMENTS

A. Purposes of the Examinations
B. Procedures and Cues
C. Demonstrations
D. Normal Ranges of Vital Signs
E. Relationship of Drug Categories to the Vital Signs Examinations
F. Practice

LEARNING ACTIVITIES

- Instructor-Led Presentations
- Instructor-Led Demonstrations
- Hands-on Practice
AIDS Lesson Plan

180 Minutes

VI-1 (Title)

VI-2 (Objectives)

EXAMINATIONS OF VITAL SIGNS

Display Session Title

5 Minutes

A. Purposes of the Examinations

1. The vital signs that are relevant to the drug evaluation and classification process include:
   a. Pulse rate
   b. Blood pressure
   c. Temperature

2. Different types of drugs affect these vital signs in different ways.
   a. Certain drugs tend to "speed up" the body and elevate these vital signs.
   b. Other drugs tend to "slow down" the body and lower these vital signs.

Briefly review the content, objectives and activities of this session.

Point out these vital signs on the wallchart.

Clarification

o pulse may quicken
o blood pressure may rise
o temperature may rise

Clarification

o pulse may slow
o blood pressure may drop
### 3. Systematic examination of the vital signs gives us much useful information concerning the possible presence or absence of various categories of drugs.

Point out that for purposes of standardization, the pulse and blood pressure readings will be obtained using the left arm if at all possible.

### B. Procedures and Cues

#### 1. Measurement of pulse rate.

a. **Pulse** is the expansion and relaxation of an artery generated by the pumping action of the heart.

Point out that pulse rate is equal to the number of contractions of the heart per minute.

b. **Pulse rate** is the number of pulsations in an artery per minute.

c. An **artery** is a strong, elastic blood vessel that carries blood away from the heart.

d. A **vein** is a blood vessel that carries blood back to the heart.

e. When the heart contracts, it squeezes blood out of its chambers into the arteries.

**Emphasize:** The "surge" can be felt as the blood is squeezed from the heart through an
<table>
<thead>
<tr>
<th>Aids</th>
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</tr>
</thead>
<tbody>
<tr>
<td>feel the artery expand as the blood surges through.</td>
<td>artery. The pulse cannot be felt in a vein.</td>
<td>Demonstrating this, by holding your fingers on your own radial artery.</td>
</tr>
<tr>
<td>h. By keeping your fingers on the artery and counting the number of pulses that occur in one minute, you will measure the pulse rate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Pulse is easy to measure, once you locate an artery close to the surface of the skin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. One convenient pulse point involves the radial artery.</td>
<td>Point to the radial artery pulse point on your own wrist.</td>
<td></td>
</tr>
<tr>
<td>o The radial artery can be located in or near the natural crease of the wrist, on the side of the wrist next to the thumb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Hold your left hand out, with the palm down.</td>
<td>Demonstrate this.</td>
<td></td>
</tr>
<tr>
<td>o Place the tips of your right hand's index finger and middle finger into the crease of your left wrist, and exert a slight pressure.</td>
<td>Demonstrate this.</td>
<td></td>
</tr>
<tr>
<td>o Allow your left hand to curl downward.</td>
<td>Demonstrate this.</td>
<td></td>
</tr>
<tr>
<td>o You should be able to feel the pulse in your radial artery.</td>
<td>Ask students whether they can feel their pulses. Coach any students who have difficulty in locating the pulse.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>
| VI-5 (Brachial Artery) | k. Another pulse point involves the brachial artery.  
   o The brachial artery can be located in the crook of the arm, halfway between the center of the arm and the side of the arm closest to the body.  
   o Hold your left hand out, with the palm up.  
   o Place the tips of your right hand's index and middle fingers into the crook of your left arm, close to the body, and exert a slight pressure.  
   o You should be able to feel the pulse in your brachial artery. | Point to the brachial artery pulse point in your own arm.  
   Instruct students to roll up their sleeves, if necessary, to expose their brachial artery pulse points.  
   Demonstrate this.  
   Demonstrate this.  
   Ask students whether they can feel their pulses. Coach any students who have difficulty locating the pulse. |
| VI-6 (Carotid Artery) | l. Another pulse point involves the carotid artery.  
   o The carotid artery can be located in the neck, on either side of the Adam’s apple.  
   o Place the tips of your right hand's index and middle fingers alongside the right side of your “Adam's Apple”. | Point out the carotid artery pulse point on your own neck.  
   Demonstrate this. |
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>o You should be able to feel the pulse in your carotid artery.</td>
<td>Ask students whether they can feel their pulses. Coach any students who have difficulty locating the pulse.</td>
<td></td>
</tr>
<tr>
<td>m. Basic Do's and Don'ts of measuring pulse.</td>
<td>Point out that there is an artery located in the thumb. If you apply pressure with the thumb, you may be actually measuring your own pulse instead of the subject’s.</td>
<td></td>
</tr>
<tr>
<td>o Don't use your thumb to apply pressure while measuring a subject's pulse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o If you use the carotid artery pulse point, don't apply pressure to both sides of the Adam's Apple: this can cut off the supply of blood to the brain.</td>
<td>Point out that pulse rate is always expressed as &quot;beats per minute&quot;. If you count the beats during an interval of 30 seconds, you must double the result to obtain the pulse rate. The pulse reading should not be an odd number.</td>
<td></td>
</tr>
<tr>
<td>o When measuring the pulse rate, use 30 seconds as the standard time interval.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Students' initial practice at measuring pulse rate.</td>
<td>Instruct students to work in pairs, taking turns measuring each other's pulse.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tell students to record on paper their partner's pulse rates.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitor, coach and critique the students' practice.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
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<td>------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Allow the practice to continue for only about 5 minutes.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Print</strong> the following lists on the dry erase board or flip-chart:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 or less 76-78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>52-54 80-82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>56-58 84-86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60-62 88-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>64-66 92-94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68-70 96-98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>72-74 100 or more</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Tabulate</strong> the numbers of students whose pulse rates were in each of the listed intervals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Point out</strong> that the &quot;normal range&quot; of pulse rate is 60-90 beats per minute.</td>
</tr>
</tbody>
</table>

2. **Measurement of blood pressure.**

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

   b. Blood pressure changes constantly as the heart contracts and relaxes.

   c. Blood pressure reaches its maximum as the heart contracts and sends the blood surging through the arteries. This is called the **systolic** pressure.
d. Blood pressure reaches its minimum when the heart is fully expanded. This is called the diastolic pressure.

e. It is always necessary to measure and record both the systolic and diastolic blood pressure.

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

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

h. As the pressure in the cuff increases, the cuff squeezes tightly on the arm.

i. When the pressure gets high enough, it will squeeze the artery completely shut.

j. Blood will cease flowing through the brachial artery. And, since the brachial artery "feeds" the radial

Remind students that "systolic" is the higher number, "diastolic" the lower number.

Memory aid:
Systolic: "S" for "Superior"
Diastolic: "D" for "Down"

Write "SPHYGMOMANOMETER" on the dry erase board or flip-chart.

Exhibit a sphygmomanometer.

Select a student to come before the class. Have the student sit in a chair facing the class, and roll up a sleeve (if necessary) to expose the left bicep.

Wrap the cuff around the student-volunteer's arm and inflate it.

Ask the student-volunteer whether they can feel the pressure of the cuff.

Ask students: "What artery is located in the crook of the arm?" (Point to that location on the student-volunteer's arm).

Release the pressure in the cuff on the student-volunteer's arm.
artery, blood will also cease flowing through the radial artery.

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

l. Eventually, the pressure will drop enough so that blood will once again start to flow through the artery.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| o | Blood will start flowing in the artery once the pressure **inside** the artery equals the pressure **outside** the artery. | Ask students: "How far must the pressure in the cuff drop before the blood can start to squeeze through the artery?"

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>o</td>
<td>The two pressures will become equal when the air pressure in the cuff drops down to the systolic pressure.</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| o | When that happens, blood will spurt through the artery each time the heart contracts. | Ask students: "What would happen if we allowed the pressure in the cuff to drop down to the systolic level, and held the air pressure at that level?"

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Point out that the blood would spurt through the artery each time the heart contracted, but would cease flowing when the heart expanded.</td>
</tr>
</tbody>
</table>
### Lesson Plan

<table>
<thead>
<tr>
<th>Procedures for Measuring Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Apply enough air pressure to the cuff to cut off the flow of blood through the artery. (Approximately 180 mmHg)</td>
</tr>
<tr>
<td>o Slowly release the air pressure until the blood just begins to spurt through the artery: that level will be the systolic pressure.</td>
</tr>
<tr>
<td>o Continue to release the air pressure until the blood flows continuously through the artery: that level will be the diastolic pressure.</td>
</tr>
</tbody>
</table>

### Instructor Notes

- **Ask students:** "How far down must the air pressure in the cuff drop before the blood will flow through the artery continuously?"

- **Demonstrate,** using the student-volunteer (apply pressure to the cuff). As DREs we usually inflate the cuff until the manometer shows a reading of approximately 180 mmHg.

- Slowly release the pressure in the cuff.

- **Emphasize** that the pressure should drop at approximately 2 mmHg per second. (5 sec for each 10 mm drop)

- **Ask students:**

  1. "How can we tell when the blood starts to spurt through the artery?"
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(2) &quot;How can we tell when the blood is flowing continuously through the artery?&quot;</td>
</tr>
<tr>
<td></td>
<td>n. We can listen to the spurting blood, using a stethoscope.</td>
<td>Exhibit a stethoscope.</td>
</tr>
<tr>
<td></td>
<td>o Apply the stethoscope to the skin directly above the artery.</td>
<td>Demonstrate, using the student-volunteer.</td>
</tr>
<tr>
<td></td>
<td>o Apply pressure to the cuff, enough to cut off the flow of blood.</td>
<td>Inflate the cuff on the student-volunteer's arm.</td>
</tr>
<tr>
<td></td>
<td>o When no blood is flowing through the artery, we hear nothing through the stethoscope.</td>
<td>Release the air in the cuff.</td>
</tr>
<tr>
<td></td>
<td>o Slowly release the air from the cuff, letting the pressure start to drop.</td>
<td>NOTE: This begins as a clear, tapping sound.</td>
</tr>
<tr>
<td></td>
<td>o When we drop to the systolic pressure, we start to hear a spurting sound.</td>
<td>NOTE: The sounds take on a swishing quality, and become fainter.</td>
</tr>
<tr>
<td></td>
<td>o As we continue to allow the air pressure to drop, the surges of blood become steadily longer.</td>
<td>Excuse the student-volunteer and thank him or her for participating.</td>
</tr>
<tr>
<td></td>
<td>o When we drop to the diastolic pressure, the blood flows steadily and all sounds cease.</td>
<td>Named after Dr. Nikolai Korotkoff, a Russian physician who introduced the method of</td>
</tr>
<tr>
<td></td>
<td>o The sounds that we listen to are called Korotkoff Sounds.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>They are divided into five (5) phases.</td>
<td>determining blood pressure in 1905.</td>
</tr>
<tr>
<td></td>
<td>o Phase 1 - the first appearance of clear, tapping sounds that gradually increase in intensity.</td>
<td>Point out that the beginning of Phase 1 corresponds to the systolic pressure.</td>
</tr>
<tr>
<td></td>
<td>o Phase 2 - the sounds change to a murmur and take on a swishing quality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Phase 3 - the sounds develop a loud, knocking quality (not quite as clear as the Phase 1 sounds).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Phase 4 - the sounds suddenly become muffled and again have a faint swishing quality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Phase 5 - the sounds cease.</td>
<td>Point out that the beginning of Phase 5 corresponds to the diastolic pressure.</td>
</tr>
<tr>
<td>VI-10</td>
<td>Familiarization with the sphygmomanometer.</td>
<td>Hand out stethoscopes and sphygmomanometers (one per each student is desirable. At a minimum, there should be one for every four students).</td>
</tr>
<tr>
<td></td>
<td>p.</td>
<td>Point out the components of the sphygmomanometer on Visual VI-10.</td>
</tr>
<tr>
<td></td>
<td>o The compression cuff contains an inflatable rubber bladder.</td>
<td>Clarification: The manometer displays the air pressure inside the bladder.</td>
</tr>
<tr>
<td></td>
<td>o A tube connects the bladder to the manometer, or pressure gauge.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>o Another tube connects the bladder to the pressure bulb, which can be squeezed to inflate the bladder.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o The pressure control valve permits inflation of the bladder and regulates the rate at which the bladder is deflated.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- To <strong>inflate</strong> the bladder, the pressure control valve must be twisted all the way to the right.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- When the valve is twisted all the way to the right, air can be pumped <strong>into</strong> the bladder, but no air can escape <strong>from</strong> the bladder.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- To <strong>deflate</strong> the bladder, twist the valve to the left.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The more the valve is twisted to the left, the faster the bladder will deflate.</td>
<td><strong>Demonstrate this.</strong></td>
</tr>
<tr>
<td></td>
<td>q. Details of blood pressure measurement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Position the cuff on the bicep so that the tubes extend down the middle of the arm.</td>
<td><strong>Select a student to serve as a blood pressure subject.</strong> <strong>Demonstrate the procedures using the student.</strong></td>
</tr>
</tbody>
</table>

**VI-11**
(Details of BP)
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>o</td>
<td>Wrap the cuff snugly around the bicep.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Clip the manometer (pressure gauge) on the subject's sleeve, so that it is readily viewable.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Twist the pressure control valve all the way to the right.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Put the stethoscope earpieces in your ears.</td>
<td><strong>Make sure</strong> the earpieces are turned forward, i.e., toward the nose.</td>
</tr>
<tr>
<td>o</td>
<td>Place the diaphragm or bell of the stethoscope over the brachial artery.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Rapidly inflate the bladder to approximately 180 mmHg.</td>
<td><strong>Emphasize</strong> the need to release the pressure slowly. If the pressure drops too fast, the needle will sweep down the gauge too quickly to be read accurately. The pressure should be released at a speed that takes one second for the needle to move a single gradation (i.e., 2 millimeters of mercury) on the gauge.</td>
</tr>
<tr>
<td>o</td>
<td>Twist the pressure control valve slightly to the left to release the pressure slowly.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Keep your eyes on the gauge and listen for the Korotkoff sounds.</td>
<td><strong>Point out</strong> that the needle on the pressure gauge generally will &quot;bounce&quot; slightly when blood starts to spurt through the artery.</td>
</tr>
<tr>
<td>o</td>
<td>Excuse the student and thank him or her for participating.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>Solicit students' questions</td>
<td></td>
</tr>
</tbody>
</table>
concerning these procedures.

Point out that "normal" values of blood pressure are:
- Systolic 120 - 140
- Diastolic 70 - 90

Note, however, that "normal" people can have significantly different blood pressures: there is wide variation in human blood pressure.

r. Do's and Don'ts of blood pressure measurement:

- If you inflate the bladder and then need to repeat the measurement, wait at least three minutes to allow the subject’s artery to return to normal.

- Hold the bell of the stethoscope with your fingers; don't slide it under the cuff: that will distort the measurement.

s. Students initial practice at measuring blood pressure.

Point out that if difficulty is encountered in hearing the Korotkoff sounds, try having the subject raise his/her arm and clench the fist to allow blood flow back to the heart.

If at least one sphygmomanometer and stethoscope are available for every two students, instruct students to practice in pairs. Otherwise, assign students to practice in teams of 3 or 4 members.

VI-12
(Measuring Temp)


a. Temperature is measured orally using a thermometer.

Exhibit this.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Point out</strong> that the &quot;normal&quot; range for body temperature taken orally is 98.6 degrees +/- 1 degree.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Solicit students' comments and questions concerning this overview of procedures and cues.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Point out</strong> that hot and cold liquids immediately prior to the temperature examination may effect the result.</td>
</tr>
<tr>
<td></td>
<td>b. Make sure that a fresh disposable mouthpiece is used each time.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Ensure that the subject does not take any hot or cold liquids by mouth prior to taking the temperature.</td>
<td></td>
</tr>
</tbody>
</table>

**C. Demonstrations**

**15 Minutes**

1. Pulse rate measurement demonstrations.

   a. Radial artery pulse point.  

   **Instruct** the first student to measure the second's pulse using the radial artery pulse point.  **(Simultaneously,** the instructor should measure the subject's pulse using a carotid artery pulse point).

   **Excuse the two students and thank them for participating.**

   b. Carotid artery pulse point.  

   **Instruct** the second student to measure the first's pulse using the carotid artery pulse point.  **(Simultaneously,** the instructor should measure the subject's pulse using a radial artery pulse point).

2. Blood pressure measurement demonstrations.

   **Select** two other students to come before the class.
D. Normal Ranges of Vital Signs

1. Normal human vital signs vary between individuals. However, the DEC program has identified a set of “normal” ranges for each of the three vital sign examinations used in the drug influence evaluation process. The ranges used in the DEC program are normally a bit wider than those used by the medical profession. DEC normal ranges:

   a. Pulse rate: 60 to 90 beats per minute
   
   b. Blood Pressure:
      Systolic: 120 - 140 mmHg
      Diastolic: 70 - 90 mmHg
   
   c. Body Temperature: 98.6 degrees, plus or minus 1 degree.

Remind students that the “normal” ranges identified for the DEC program have been established through years of research and with medical input. However, normal ranges may vary from individual to individual and are normally a little wider than those used by the medical profession.

E. Relationship of Drug Categories to the Vital Signs Examinations.

Note: Draw the Matrix (at the end of this session) on the dry erase board or flip-chart at the outset of this session.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All seven categories of drugs ordinarily will affect pulse rate and blood pressure.</td>
<td></td>
<td>Ask the students which categories will lower pulse rate and blood pressure.</td>
</tr>
<tr>
<td>2. Some categories usually will lower pulse and blood pressure.</td>
<td>a. CNS Depressants and Narcotic Analgesics usually lower pulse and BP.</td>
<td>Write &quot;DOWN&quot; on the pulse and blood pressure lines under the columns for Depressants and Narcotics.</td>
</tr>
<tr>
<td>3. The other five categories all tend to elevate pulse rate.</td>
<td></td>
<td>Point out that ETOH and Quaaludes may cause the pulse to increase.</td>
</tr>
<tr>
<td>4. Most of the drug categories that elevate pulse rate also elevate blood pressure.</td>
<td>a. CNS Stimulants, Hallucinogens, Dissociative Anesthetics and Cannabis all usually cause blood pressure to rise.</td>
<td>Write &quot;UP&quot; on the pulse line under the five remaining columns.</td>
</tr>
<tr>
<td></td>
<td>b. The vast majority of Inhalants -- namely, the volatile solvents and the aerosols -- also elevate blood pressure.</td>
<td>Write &quot;UP&quot; on the blood pressure line for those four categories.</td>
</tr>
<tr>
<td></td>
<td>c. But the remaining small group of Inhalants -- the anesthetic gases -- actually lower the blood pressure.</td>
<td>Remind students that the anesthetic gases include such things as nitrous oxide, amyl nitrite and ether.</td>
</tr>
<tr>
<td></td>
<td>d. So for Inhalants, the effect on blood pressure will be up or down.</td>
<td>Write up/down with the footnote - down with anesthetic gases, up with volatile solvents and aerosols on the blood.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>5.</td>
<td>Three of the categories usually will cause the body temperature to rise.</td>
<td>pressure line under the Inhalants column. Ask students which categories usually cause an elevation in body temperature. Write &quot;UP&quot; on the &quot;TEMP&quot; line under the Dissociative Anesthetics column.</td>
</tr>
<tr>
<td>a.</td>
<td>The drug PCP and its analogs from the Dissociative Anesthetics category usually increases body temperature; PCP users have been known to remove their clothing to cool down.</td>
<td>Write &quot;UP&quot; on the &quot;TEMP&quot; line for CNS Stimulants and Hallucinogens.</td>
</tr>
<tr>
<td>b.</td>
<td>CNS Stimulants and Hallucinogens also will usually increase body temperature.</td>
<td>Write &quot;up/down/or normal&quot; on the &quot;TEMP&quot; line for Inhalants.</td>
</tr>
<tr>
<td>6.</td>
<td>The effect of Inhalants on body temperature depends on the specific substance that is inhaled.</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Some inhalants may cause temperature to increase or be down.</td>
<td>Ask students which category usually lowers temperature. Write &quot;DOWN&quot; on the &quot;TEMP&quot; line for Narcotics.</td>
</tr>
<tr>
<td>b.</td>
<td>But other inhalants may leave the temperature near normal.</td>
<td>Write &quot;NORMAL&quot; on the &quot;TEMP&quot; line for Depressants and Cannabis. Solicit students' questions and comments.</td>
</tr>
<tr>
<td>7.</td>
<td>One category usually causes body temperature to be lowered.</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Narcotic Analgesics usually lower body temperature.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>The remaining two categories usually do not affect temperature.</td>
<td></td>
</tr>
</tbody>
</table>
### F. Practice

1. Assignments and procedures.
   a. Team assignments.

   b. Explanation of practice procedures:
      - Teammates will take turns measuring each other's pulse rate and blood pressure.
      - Each student will write down every measurement he or she makes and the time at which the measurement was made.
      - Whichever member of the team is not engaged in taking the measurement or in serving as the "suspect" will act as a coach and offer appropriate constructive criticism to his or her teammate.
      - Practice will continue until each student has taken at least three complete pulse and blood pressure measurements on both teammates.

   2. Testing (students testing students).

   Solicit questions about the practice procedures.

   Monitor the practice to ensure compliance with the procedures.
   Offer coaching and constructive criticism as appropriate.

---

Group the students into teams of three (3) members each. Each team must have at least one blood pressure kit.
<table>
<thead>
<tr>
<th>DEPRESS</th>
<th>STIMULS</th>
<th>HALLUCS</th>
<th>D/A</th>
<th>NARCOTS</th>
<th>INHALS</th>
<th>CANNABIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PULSE</td>
<td>______</td>
<td>______</td>
<td>___</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>BLOOD</td>
<td>______</td>
<td>______</td>
<td>___</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>PRESS</td>
<td>______</td>
<td>______</td>
<td>___</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>TEMP</td>
<td>______</td>
<td>______</td>
<td>___</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
</tbody>
</table>
REVIEW QUESTIONS

1. Where is the radial artery pulse point?
   
   Crease of the wrist

2. Why should you never attempt to feel a subject's pulse with your thumb?
   
   You can mistakenly measure your own pulse

3. Does an artery carry blood to the heart or from the heart?
   
   Away from the heart

4. What does the symbol "Hg" represent?
   
   Mercury (Hydrargyrum)

5. What is diastolic pressure?
   
   The pressure when the heart relaxes

6. When do the Korotkoff Sounds begin?
   
   At the systolic level when the blood begins to spurt through the brachial artery

7. Name and describe the major components of a sphygmomanometer.
   
   Compression Cuff, Pressure bulb, Manometer, Pressure control valve, Tubes

8. Which of the seven categories of drugs generally will cause pulse rate to be elevated?
   
   CNS Stimulants, Hallucinogens, Dissociative Anesthetics, Inhalants, Cannabis

9. What is the normal range of body temperature?
   
   98.6 +/- 1 degree
10. For how long must a DRE count the beats to obtain a measurement of pulse rate?

30 seconds

11. What is the normal range of pulse rate?

60-90 bpm

12. Which categories of drugs usually lower body temperature?

Narcotic Analgesics

13. What is the normal range for the higher value of blood pressure? What is the normal range for the lower value?

120-140/70-90
Session VI - Examinations of Vital Signs

Objectives
- Define basic terms relevant to pulse rate and blood pressure measurements
- Measure pulse rate
- Measure blood pressure
- Relate the expected results of vital signs examinations to the various categories of drugs

Definitions Concerning “Pulse”
- PULSE
  The expansion and relaxation 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.

Radial Artery
Radial Artery Pulse Point

Brachial Artery
Brachial Artery Pulse Point

Carotid Artery
Carotid Artery Pulse Point
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.

The Basics of Blood Pressure Measurement

- Apply enough air pressure to cut off the flow of blood through the artery.
- Slowly release the air, about 2 mmHg per second, until the blood just begins to spurt through the artery: THAT WILL BE THE SYSTOLIC PRESSURE.
- Continue to release the air until the blood flows continuously: THAT WILL BE THE DIASTOLIC PRESSURE.

Korotkoff Sounds

- Phase 1 begins (SYSTOLIC)
  CLEAR, TAPPING SOUNDS

- Phase 2 begins
  SOUNDS CHANGE TO MURMUR, TAKE ON A “SWISHING” QUALITY

- Phase 3 begins
  SOUNDS DEVELOP A LOUD, KNOCKING QUALITY

- Phase 4 begins
  SOUNDS BECOME MUFFLED, “SWISHING”

- Phase 5 begins (DIASTOLIC)
  THE SOUNDS CEASE

Sphygmomanometer

- MANOMETER
  (Pressure Gauge)

- COMPRESSION
  CUFF

- PRESSURE
  CONTROL
  VALVE

- PRESSURE
  BULB

Details of Blood Pressure Measurement

1. Position cuff on bicep so that tubes extend down middle of arm
2. Wrap cuff snugly around bicep
3. Clip manometer to the subject’s sleeve or in a location to easily see the gauge
4. Twist pressure control valve all the way to the right
5. Put stethoscope earpieces in your ears
6. Apply the stethoscope to the brachial artery pulse point
7. Rapidly inflate bladder to a level high enough to squeeze the artery shut. (Normally 100)
8. Twist the pressure control valve slightly to the left (pressure should drop at 2 mmHg per second)
9. Keep your eyes on the gauge and listen for the Korotkoff sounds

Measuring Body Temperature

- Oral thermometer recommended
- Always use protective disposable mouthpiece
- Position thermometer under the subject’s tongue
- Have subject refrain from talking when measuring temperature
- Refrain from letting subject drink hot or cold fluids immediately prior to measuring temperature
Normal Ranges of Vital Signs
DRE “Normal Ranges”

- **Pulse Rate:**
  60 to 90 beats per minute

- **Blood Pressure:**
  Systolic – 120 to 140 mmHg
  Diastolic – 70 to 90 mmHg

- **Body Temperature:**
  98.6 degrees Fahrenheit plus or minus one degree
SESSION VII

OVERVIEW OF SIGNS AND SYMPTOMS
SESSION VII  OVERVIEW OF SIGNS AND SYMPTOMS

Upon successfully completing this session the student 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

<table>
<thead>
<tr>
<th>CONTENT SEGMENTS</th>
<th>LEARNING ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CNS Depressants</td>
<td>o  Interactive Discussions</td>
</tr>
<tr>
<td>B. CNS Stimulants</td>
<td></td>
</tr>
<tr>
<td>C. Hallucinogens</td>
<td></td>
</tr>
<tr>
<td>D. Dissociative Anesthetics</td>
<td></td>
</tr>
<tr>
<td>E. Narcotic Analgesics</td>
<td></td>
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<tr>
<td>F. Inhalants</td>
<td></td>
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<tr>
<td>G. Cannabis</td>
<td></td>
</tr>
<tr>
<td>H. Wrap-Up</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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<td>------</td>
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</tr>
<tr>
<td>75 Minutes</td>
<td><strong>OVERVIEW OF SIGNS AND SYMPTOMS</strong></td>
</tr>
<tr>
<td>VII-1 (Title)</td>
<td></td>
</tr>
<tr>
<td>VII-2 (Objectives)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Sign: An observable or detectable indicator of drug influence. (i.e., dilated pupils, vital signs)</td>
</tr>
<tr>
<td></td>
<td>2. Symptom: A subjective indicator of drug influence that is reported by the drug-impaired subject. (i.e., &quot;I feel nauseous.&quot;)</td>
</tr>
<tr>
<td>10 Minutes</td>
<td><strong>A. CNS Depressants</strong></td>
</tr>
<tr>
<td></td>
<td>1. Central Nervous System Depressants is a category that includes many different drugs.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
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<tr>
<td>------</td>
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</tr>
<tr>
<td>2. Indicators of CNS Depressant influence found in eye exams.</td>
<td>Ask students: &quot;Do depress-ants cause Horizontal Gaze Nystagmus?&quot;</td>
</tr>
</tbody>
</table>
| a. HGN usually will be present. | Write "Present" on the "HGN" line for Depressants. | Ask: "Do Depressants cause Vertical Gaze Nystagmus?"
| b. Vertical Gaze Nystagmus may be present, especially with high doses (for that individual) of Depressants. | Write "Present" on the "VERT NYST" line for Depressants. Denote in parentheses above "(High Doses)". | Ask: "Do Depressants cause the eyes to be unable to converge?"
| c. Under the influence of Depressants, Lack of Convergence usually will be present. | Write "Present" on the "LACK CONV" line for Depressants. | Ask: "How do Depressants affect pupil size?"
| d. Depressants usually do not affect pupil size; therefore, Depressants usually leave the pupils near normal in size. | Write "Normal" on the "PUPIL SIZE" line for Depressants. | Ask: "What are the Depressants that affect pupil size?"
<p>| o But some specific Depressant drugs do affect pupil size. | | Put a (1) next to &quot;Normal&quot; and write &quot;Common exceptions: Soma and Quaaludes &quot; below the matrix. |
| o Methaqualone (Quaaludes) and Soma usually cause the pupils to dilate. | | Write &quot;Slow&quot; on the &quot;RCTN-LIGHT&quot; line for Depressants. |
| e. Depressants generally will cause pupillary reaction to light to be sluggish. | | |</p>
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Indicators of CNS Depressant influence found in checks of the vital signs.</td>
<td>Ask: &quot;How do Depressants affect pulse rate?&quot;</td>
<td>Write &quot;Down&quot; on the &quot;PULSE&quot; line for Depressants.</td>
</tr>
<tr>
<td>a. Depressants usually lower pulse rate.</td>
<td>Ask: &quot;What are the Depressants that may elevate pulse rate?&quot;</td>
<td>Put a (2) next to &quot;Down&quot; and write &quot;Quaaludes and ETOH may elevate&quot; below the matrix.</td>
</tr>
<tr>
<td>o But some specific Depressant drugs may elevate the pulse.</td>
<td></td>
<td>Ask: &quot;How do Depressants affect blood pressure?&quot;</td>
</tr>
<tr>
<td>o Methaqualone (Quaaludes) and alcohol may cause an elevation in pulse rate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Depressants usually lower blood pressure.</td>
<td>Ask: &quot;How do Depressants affect body temperature?&quot;</td>
<td>Write &quot;Normal&quot; on the &quot;TEMP&quot; line for Depressants.</td>
</tr>
<tr>
<td>c. Depressants usually leave temperature near normal.</td>
<td>Solicit students' questions about CNS Depressants.</td>
<td></td>
</tr>
</tbody>
</table>

### B. CNS Stimulants

#### 10 Minutes

1. The category called Central Nervous System Stimulants includes many drugs.

2. Indicators of CNS Stimulant influence found in eye exams.

   a. HGN will not be present.

Ask students to name some examples of CNS Stimulants. Make sure the examples include cocaine and some amphetamines.

Ask students: "Do CNS Stimulants cause Horizontal Gaze Nystagmus?"

Write "None" on the "HGN" line for CNS Stimulants.
### Aids Lesson Plan

<table>
<thead>
<tr>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask: &quot;Do CNS Stimulants cause Vertical Gaze Nystagmus?&quot;</td>
</tr>
<tr>
<td>b. Vertical Gaze Nystagmus will not be present.</td>
</tr>
<tr>
<td>Write &quot;None&quot; on the &quot;VERT NYST&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>Ask: &quot;Do CNS Stimulants cause the eyes to be unable to converge?&quot;</td>
</tr>
<tr>
<td>c. Under the influence of CNS Stimulants, the eyes should still be able to converge; therefore, lack of convergence will not be present.</td>
</tr>
<tr>
<td>Write &quot;None&quot; on the &quot;LACK CONV&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>Ask: &quot;How do CNS Stimulants affect pupil size?&quot;</td>
</tr>
<tr>
<td>d. CNS Stimulants usually cause the pupils to dilate.</td>
</tr>
<tr>
<td>Write &quot;Dilated&quot; on the &quot;PUPIL SIZE&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>e. We have seen that CNS Depressants effect pupillary reaction; similarly, CNS Stimulants may cause a slowing in the pupillary reaction to light.</td>
</tr>
<tr>
<td>Write &quot;Slow&quot; on the &quot;RCTN-LIGHT&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>3. Indicators of CNS Stimulant influence found in checks of vital signs.</td>
</tr>
<tr>
<td>a. CNS Stimulants usually increase pulse rate.</td>
</tr>
<tr>
<td>Write &quot;Up&quot; on the &quot;PULSE&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>Ask: &quot;How do CNS Stimulants affect blood pressure?&quot;</td>
</tr>
<tr>
<td>b. CNS Stimulants usually increase blood pressure.</td>
</tr>
<tr>
<td>Write &quot;Up&quot; on the &quot;BLOOD PRESS&quot; line for CNS Stimulants.</td>
</tr>
<tr>
<td>Aids</td>
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<tr>
<td>------</td>
</tr>
</tbody>
</table>
|      |             | Ask: "How do CNS Stimulants affect body temperature?"
|      |             | Write "Up" on the "TEMP" line for CNS Stimulants. |
|      |             | Point out that, as shown on the matrix, the signs of Stimulant influence are almost exactly opposite to the signs of Depressant influence. |
|      |             | Solicit students' questions about CNS Stimulants. |
|     | c. CNS Stimulants usually elevate body temperature. |     |
|     | d. Though not directly related to the vital signs, the evaluator may find the subjects muscle tone to be rigid with possible body tremors. A grinding of the teeth, referred to as "bruxism", may also be noticed. |     |
| C.  | Hallucinogens | Ask students to name some hallucinogenic drugs. Make sure the examples include some natural Hallucinogens as well as some synthetics. |
| 10 Minutes | 1. Hallucinogens include some naturally occurring substances as well as some synthetic drugs. | Ask students: "Do Hallucinogens cause Horizontal Gaze Nystagmus?"
| | 2. Indicators of Hallucinogen influence found in eye exams. | Write "None" on the "HGN" line for Hallucinogens. |
| | a. HGN will not be present. | Ask: "Do Hallucinogens cause Vertical Gaze Nystagmus?"
| | b. Vertical Gaze Nystagmus will not be present. | Write "None" on the "VERT NYST" line for Hallucinogens. |
| | | Ask: "Do Hallucinogens cause the eyes to be unable to converge?" |
c. Under the influence of Hallucinogens, the eyes should still be able to converge; therefore, lack of convergence will not be present.

Write "None" on the "LACK CONV" line for Hallucinogens.

Ask: "How do Hallucinogens affect pupil size?"

d. Hallucinogens usually cause the pupils to dilate.

Write "Dilated" on the "PUPIL SIZE" line for Hallucinogens.

e. Normally Hallucinogens do not effect pupillary reaction to light.

Write "Normal" on the "RCTN-LIGHT" line for Hallucinogens.

Put a (3) next to "Normal", and write psychedelic amphetamines cause slowing.

o However, psychedelic amphetamines will cause a slowing in the pupillary reaction.

3. Indicators of Hallucinogen influence found in checks of vital signs.

a. Hallucinogens usually increase pulse rate.

Write "Up" on the "PULSE" line for Hallucinogens.

Ask: "How do Hallucinogens affect pulse rate?"

b. Hallucinogens usually increase blood pressure.

Write "Up" on the "BLOOD PRESS" line for Hallucinogens.

Ask: "How do Hallucinogens affect blood pressure?"

c. Hallucinogens usually elevate body temperature.

Write "Up" on the "TEMP" line for Hallucinogens.

Point out that, as shown on the matrix, the major signs of Hallucinogen influence are identical to the major signs of Stimulant influence.
If we only had these major signs to go by, it would be impossible to distinguish between someone under the influence of CNS Stimulants from someone under the influence of Hallucinogens.

Point out that, in their seven-day DRE School, the students will learn of more subtle indicators that help to distinguish Hallucinogen influence from Stimulant influence. But emphasize that it is often difficult to distinguish between these two categories.

Solicit students' questions about Hallucinogens.

D. Dissociative Anesthetics

10 Minutes

1. The category called Dissociative Anesthetics consists of the drug PCP, its various analogs and Dextromethorphan.

   a. An 'analog' of PCP is a drug that is a 'chemical first cousin' of PCP; that is, it is a drug that has a slightly different molecular structure from that of PCP, but produces the same effects as PCP.

   b. One of the most popular analogs of PCP is the drug called Ketamine.

Ask students: "What does 'analog' mean in this context?"

Write "Ketamine: An analog of PCP" on the dry erase board or flip-chart.
c. Ketamine is a legally-manufactured (but controlled) drug that is used as an anesthetic in some surgical applications.

d. Some other analogs of PCP include Ketalar, Ketaset and Ketajet.

e. Dextromethorphan is a drug found in numerous over-the-counter substances.

2. Indicators of the Dissociative Anesthetic drug PCP and its analogs influence found in eye exams.

   a. HGN usually will be present, and often with a very early onset with the drug PCP.

   b. Vertical Gaze Nystagmus usually will be present.

   INSTRUCTOR NOTE: Both HGN and VGN were noted in various DRE evaluations conducted on persons impaired by DXM. Research has also confirmed HGN in persons impaired by DXM.

Point out that Dextromethorphan, also known as DXM is a widely abused substance and is easy to obtain.

Ask students: "Do Dissociative Anesthetics cause Horizontal Gaze Nystagmus?"

Write "Present" on the "HGN" line for Dissociative Anesthetics.

INSTRUCTOR NOTE: Both HGN and VGN were noted in various DRE evaluations conducted on persons impaired by DXM. Research has also confirmed HGN in persons impaired by DXM.

Ask: "Do Dissociative Anesthetics cause Vertical Gaze Nystagmus?"

Write "Present" on the "VGN" line for Dissociative Anesthetics.

Ask: "Do Dissociative Anesthetics cause the eyes to be unable to converge?"
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<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| c.   | Lack of Convergence usually will be present. | Write "Present" on the "LACK CONV" line for Dissociative Anesthetics. Ask: "How does Dissociative Anesthetics affect pupil size?"
| d.   | Dissociative Anesthetics do not normally affect pupil size; therefore, a person under the influence of a Dissociative Anesthetic, such as PCP usually will have pupils that are near normal in size. | Write "Normal" on the "PUPIL SIZE" line for Dissociative Anesthetics. INSTRUCTOR NOTE: Actual DRE evaluations conducted on persons impaired by DXM resulted in pupils in the normal ranges. |
| e.   | Dissociative Anesthetics normally will not effect pupillary reaction to light. | Write "Normal" on the "RCTN-LIGHT" line for this category. |

3. Indicators of Dissociative Anesthetic influence found in checks of vital signs.

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<thead>
<tr>
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</thead>
</table>
| a. | Dissociative Anesthetics usually increases pulse rate. | Write "Up" on the "PULSE" line for this category. Ask: "How do Dissociative Anesthetics affect pulse rate?"
| b. | Dissociative Anesthetics usually elevates blood pressure. | Write "Up" on the "BLOOD PRESS" line for this category. Ask: "How do Dissociative Anesthetics affect blood pressure?"
| c. | PCP and its analogs usually elevate body temperature. Dextromethorphan may or | Write "Up" on the "TEMP" line for this category. |
may not rise temperature.

<table>
<thead>
<tr>
<th>Aids</th>
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<th>Instructor Notes</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Point out that PCP tends to produce the eye indicators associated with Depressants, and the <strong>vital sign</strong> indicators associated with CNS Stimulants or Hallucinogens.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solicit students' questions about Dissociative Anesthetics.</td>
</tr>
</tbody>
</table>

### E. Narcotic Analgesics

10 Minutes

1. Narcotic Analgesics include some natural derivatives of opium as well as some synthetic drugs.

2. Indicators of Narcotic Analgesic influence found in eye exams.

   a. HGN will not be present. Write "None" on the "HGN" line for Narcotics.
   
   b. Vertical Gaze Nystagmus will not be present. Write "None" on the "VGN" line for Narcotics.
   
   c. Under the influence of Narcotics, the eyes should still be able to converge; therefore, **Lack of Convergence** usually is **not** present. Write "None" on the "LACK CONV" line for Narcotics.

   Ask students: "Do Narcotics cause Horizontal Gaze Nystagmus?"

   Ask: "Do Narcotics cause Vertical Gaze Nystagmus?"

   Ask: "Do Narcotics cause the eyes to be unable to converge?"

   Ask: "How do Narcotics affect pupil size?"
### Aids Lesson Plan

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<tbody>
<tr>
<td>d.</td>
<td>Narcotic Analgesics usually cause a very noticeable constriction of the pupils.</td>
<td>Write &quot;Constricted&quot; on the &quot;PUPIL SIZE&quot; line for Narcotics.</td>
</tr>
<tr>
<td>e.</td>
<td>Though there is always some reaction to light, the constricted pupils caused by Narcotic Analgesics make it nearly impossible to perceive a change in pupil size. However, when observed it will generally be little or none visible.</td>
<td>Write &quot;Little or None Visible&quot; on the &quot;RCTN-LIGHT&quot; line for Narcotics.</td>
</tr>
</tbody>
</table>

3. Indicators of Narcotic Analgesic influence found in checks of vital signs.

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<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
</table>
| a. | Narcotics usually lower pulse rate. | Ask: "How do Narcotics affect pulse rate?"
Write "Down" on the "PULSE" line for Narcotics. |
| b. | Narcotics usually lower blood pressure. | Ask: "How do Narcotics affect blood pressure?"
Write "Down" on the "BLOOD PRESS" line for Narcotics. |
| c. | Narcotics usually lower body temperature. | Ask: "How do Narcotics affect body temperature?"
Write "Down" on the "TEMP" line for Narcotics. |

Point out that Narcotics and Depressants tend to produce similar indicators in the vital signs, but very different indicators in the eyes.

Solicit students' questions about Narcotic Analgesics.
### F. Inhalants

1. The category of Inhalants includes a wide variety of gases and fumes that have the power to intoxicate.

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

3. Indicators of Inhalant influence found in eye exams.
   
   a. With **most** Inhalants, HGN usually will be present.
   
   b. With most Inhalants, Vertical Gaze Nystagmus may be present, especially with large doses.

---

**Instructor Notes**

- Ask students to name some commonly abused Inhalants.
- Ask students: "Do Inhalants cause HGN"
- Write "Present" on the "HGN" line for Inhalants.
- Ask: "Do Inhalants cause Vertical Gaze Nystagmus?"
- Write "Present" on the "VGN" line for Inhalants. Denote in parentheses above "(High Doses)".
<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Ask: &quot;Do Inhalants cause the eyes to be unable to converge?&quot;</td>
</tr>
<tr>
<td></td>
<td>c. Under the influence of Inhalants, Lack of Convergence usually will be present.</td>
<td>Write &quot;Present&quot; on the &quot;LACK CONV&quot; line for Inhalants.</td>
</tr>
<tr>
<td></td>
<td>d. The effect of Inhalants on pupil size depends on the particular substance inhaled.</td>
<td>Ask: &quot;How do Inhalants affect pupil size?&quot;</td>
</tr>
<tr>
<td></td>
<td>o Most Inhalants usually leave the pupils near normal in size.</td>
<td>Write &quot;Normal&quot; on the &quot;PUPIL SIZE&quot; line for Inhalants.</td>
</tr>
<tr>
<td></td>
<td>o Some Inhalants may cause pupil dilation.</td>
<td>Put a (4) next to &quot;Normal&quot;, and write &quot;Normal, may be dilated.&quot; below the matrix.</td>
</tr>
<tr>
<td></td>
<td>e. Depending on the substance used, Inhalants may cause a slowed reaction to light or the pupils may react normally. However, the most frequently observed effect will be a sluggish reaction to light.</td>
<td>Write &quot;Slow&quot; on the &quot;RCTN-LIGHT&quot; line for Inhalants.</td>
</tr>
<tr>
<td></td>
<td>4. Indicators of Inhalant influence found in checks of vital signs.</td>
<td>Ask: &quot;How do Inhalants affect pulse rate?&quot;</td>
</tr>
<tr>
<td></td>
<td>a. Inhalants usually elevate pulse rate.</td>
<td>Write &quot;Up&quot; on the &quot;PULSE&quot; line for Inhalants.</td>
</tr>
<tr>
<td></td>
<td>b. Most Inhalants usually elevate blood pressure, but some lower blood pressure.</td>
<td>Ask: &quot;How do Inhalants affect blood pressure?&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write &quot;Up/Down&quot; on the &quot;BLOOD PRESS&quot; line for Inhalants. Put a (5) Next to</td>
</tr>
</tbody>
</table>
### Aids Lesson Plan

<table>
<thead>
<tr>
<th>Instructor Notes</th>
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</thead>
<tbody>
<tr>
<td>&quot;Up/Down&quot; and write down with &quot;Anesthetic Gases and &quot;UP&quot; with &quot;Volatile Solvents and Aerosols&quot;. Ask: &quot;How do Inhalants affect body temperature?&quot;</td>
</tr>
<tr>
<td>Write &quot;Up/Down/or Normal&quot; on the &quot;TEMP&quot; line for Inhalants. Solicit students' questions about Inhalants.</td>
</tr>
<tr>
<td>The effects of Inhalants on temperature depend on the particular substance inhaled.</td>
</tr>
<tr>
<td>&quot;Up/Down&quot; and write down with &quot;Anesthetic Gases and &quot;UP&quot; with &quot;Volatile Solvents and Aerosols&quot;. Ask: &quot;How do Inhalants affect body temperature?&quot;</td>
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<tr>
<td>Write &quot;Up/Down/or Normal&quot; on the &quot;TEMP&quot; line for Inhalants. Solicit students' questions about Inhalants.</td>
</tr>
<tr>
<td>&quot;Up/Down&quot; and write down with &quot;Anesthetic Gases and &quot;UP&quot; with &quot;Volatile Solvents and Aerosols&quot;. Ask: &quot;How do Inhalants affect body temperature?&quot;</td>
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<td>Write &quot;Up/Down/or Normal&quot; on the &quot;TEMP&quot; line for Inhalants. Solicit students' questions about Inhalants.</td>
</tr>
<tr>
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</tr>
<tr>
<td>Write &quot;Up/Down/or Normal&quot; on the &quot;TEMP&quot; line for Inhalants. Solicit students' questions about Inhalants.</td>
</tr>
</tbody>
</table>

### G. Cannabis

**10 Minutes**

1. Indicators of Cannabis influence found in eye exams.
   - Ask students: "Does Cannabis cause Horizontal Gaze Nystagmus?"
   - Write "None" on the "HGN" line for Cannabis.
   - Ask: "Does Cannabis cause Vertical Gaze Nystagmus?"
   - Vertical Gaze Nystagmus will not be present. Write "None" on the "VERT NYST" line for Cannabis.
   - Ask: "Does Cannabis cause the eyes to be unable to converge?"
   - Under the influence of Cannabis, Lack of Convergence will be present. Write "Present" on the "LACK CONV" line for Cannabis.
   - Point out that Cannabis is the only category that causes Lack of Convergence but does not cause nystagmus.
   - Ask: "How does Cannabis affect pupil size?"
d. Under the influence of Cannabis, the pupils may be dilated or possibly normal in size.

Write "Dilated" on the "PUPIL SIZE" line for Cannabis.
Put a (6) next to "Dilated", and write "Possibly normal".

Write "Normal" on the "RCTN-LIGHT" line for Cannabis.

2. Indicators of Cannabis influence found in checks of vital signs.

   a. Cannabis usually elevates pulse rate.

   Ask: "How does Cannabis affect pulse rate?"

   Write "Up" on the "PULSE" line for Cannabis.

   Ask: "How does Cannabis affect blood pressure?"

   b. Cannabis usually elevates blood pressure.

   Write "Up" on the "BLOOD PRESS" line for Cannabis.

   Ask: "How does Cannabis affect body temperature?"

   c. Cannabis usually leaves temperature near normal.

   Write "Normal" on the "TEMP" line for Cannabis.

   Solicit students questions about Cannabis.

H. Wrap-Up

5 Minutes

Point out that the matrix summarizes the major signs of drug influence that are examined by DREs. But emphasize there are other signs that a DRE considers in reaching a determination as to the category or combination of drugs affecting a particular subject.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>These additional signs will be covered in depth during the seven-day DRE School. Solicit students' questions.</td>
</tr>
<tr>
<td></td>
<td>DEPRESS</td>
<td>STIMULS</td>
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<td>---------</td>
</tr>
<tr>
<td>HGN</td>
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<td>______</td>
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<tr>
<td>VGN</td>
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<td>______</td>
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<tr>
<td>LACK CONV</td>
<td>______</td>
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<tr>
<td>PUPIL SIZE</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>RCTN-LIGHT</td>
<td>______</td>
<td>______</td>
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<tr>
<td>PULSE RATE</td>
<td>______</td>
<td>______</td>
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<tr>
<td>BLOOD PRESS</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>TEMP</td>
<td>______</td>
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</table>
Session VII - Overview of Signs and Symptoms

Objectives

- Give examples of specific drugs belonging to the seven drug categories.
- Describe the major signs and symptoms of impairment associated with each category.
SESSION VIII
ALCOHOL AS A DRUG
SESSION VIII ALCOHOL AS A DRUG

Upon successfully completing, this session the student will be able to:

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

CONTENT SEGMENTS

A. A Brief Overview of Alcohol
B. Physiological Processes
C. Dose-Response Relationships
D. Questions for Review

LEARNING ACTIVITIES

- Instructor-led Presentations
- Oral Quiz
<table>
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<th>Aids</th>
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<tr>
<td></td>
<td>ALCOHOL AS A DRUG</td>
<td>Display Session Title</td>
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<tr>
<td></td>
<td>90 Minutes</td>
<td>Briefly review the objectives, content and learning activities of this session.</td>
</tr>
</tbody>
</table>
| VIII-1 | (Title) | **POSE** this question to the class: "This is a course on drug impairment recognition; why do we have a session on alcohol?"
| VIII-2 | (Objectives) | **GUIDE** the students' responses to bring out these and other appropriate points:

1. Alcohol is a drug, and in fact is the most commonly abused drug.

2. As DREs, the students will often encounter persons who are under the combined influence of alcohol and some other drug.

3. **Point out:** By understanding the basic fundamental concepts of how alcohol effects the body, students will gain a better understanding of the concept of how drugs effect the body.
Aids Lesson Plan Instructor Notes

25 Minutes

A. A Brief Overview of Alcohol

1. The word "alcohol" refers to a number of distinct but similar chemicals.

   a. Each of the chemicals that is called an "alcohol" is composed of the three elements: hydrogen, carbon, and oxygen.

   b. Each of the "alcohols" is a drug within the scope of our definition.

   c. But only one can be tolerated by the human body in substantial quantities.

   Clarification: All of the "alcohols" are chemicals that impair driving ability.

   Clarification: Most "alcohols" are highly toxic, and will cause blindness or death if consumed in significant quantities. Only one is intended for human consumption.

   ASK STUDENTS: What are the names of some of the chemicals that are "alcohols"?

2. Three of the more commonly-known "alcohols" are Methyl, Ethyl and Isopropyl.

   a. Methyl Alcohol, also known as Methanol, or "wood alcohol".

   b. Ethyl Alcohol, also known as Ethanol, or "beverage alcohol".

   EMPHASIZE: Ethanol is the only kind of alcohol that humans can tolerate in significant quantities.
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<tbody>
<tr>
<td>c.</td>
<td>Isopropyl Alcohol, also known as Isopropanol, or &quot;rubbing alcohol&quot;.</td>
<td>Instructi, for your information: The &quot;ET&quot; represents &quot;ethyl&quot;, and the &quot;OH&quot; represents an oxygen atom and hydrogen atom, bonded together in what the chemists refer to as the &quot;hydroxy radical&quot;. All alcohols have an hydroxy radical in their molecules. Selectively reveal the first part only.</td>
</tr>
<tr>
<td>3.</td>
<td>Ethanol is the kind of alcohol on which we will focus, because it is the only type intended for human consumption.</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Ethanol is the active ingredient in beer, wine whiskey and other alcoholic beverages intended for drinking.</td>
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<tr>
<td>b.</td>
<td>Like all &quot;alcohols&quot;, ethanol is composed of hydrogen, carbon and oxygen.</td>
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</tr>
<tr>
<td>c.</td>
<td>Chemists use a number of different symbols to represent ethanol.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>We will stick with the symbol &quot;ETOH&quot;.</td>
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<tr>
<td>4.</td>
<td>Ethanol has been around for a long time. People drank it long before they learned to write.</td>
<td></td>
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<tr>
<td>5.</td>
<td>Ethanol is a naturally occurring drug. That is, it is produced through a process called fermentation.</td>
<td></td>
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</tbody>
</table>
a. In fermentation, spores of yeast, carried by the wind, come in contact with fruit or grain that has fallen to the ground.

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

6. 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.

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

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

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

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

   a. In distillation, a fermented beverage is heated to the point where the ethanol begins to boil.

   POINT OUT that ethanol starts to boil at a lower temperature than does water.

POINT OUT that humans almost certainly first encountered ethanol that had been produced accidentally in this fashion.

ASK STUDENTS: "Why can't fermentation produce a higher ethanol concentration than 14%?"

Reveal the lower part of visual.
<table>
<thead>
<tr>
<th>Aids</th>
<th>Lesson Plan</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>b.</td>
<td>The ethanol vapor is collected and allowed to cool until it turns back into a liquid.</td>
<td>ASK STUDENTS to name some &quot;distilled spirits&quot; (e.g., whiskey; vodka; gin; rum; etc.)</td>
</tr>
<tr>
<td>c.</td>
<td>By repeating the process of heating the liquid and collecting and cooling the vapors, higher and higher concentrations of ethanol can be produced.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>Ethanol beverages that are produced by distillation are called distilled spirits.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Over the centuries in which people have produced ethanol, some standard sized servings of different beverages have evolved.</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Beer is usually served in 12-ounce cans or bottles. Since beer averages an ethanol concentration of four percent, a can or bottle contains a bit less than one-half ounce of pure ethanol.</td>
<td>Reveal only the &quot;beer&quot; part.</td>
</tr>
<tr>
<td>b.</td>
<td>Wine typically is served in a four-ounce glass. At an ethanol concentration of 12 percent, the glass of wine also has just a bit less than one-half ounce of pure ethanol.</td>
<td>Reveal the &quot;wine&quot; part of visual.</td>
</tr>
<tr>
<td>c.</td>
<td>Whiskey and other distilled spirits are dispensed in a &quot;shot&quot; glass, which usually contains one and one-quarter ounces of liquid.</td>
<td>Reveal the &quot;whiskey&quot; part of visual.</td>
</tr>
</tbody>
</table>
d. Since whiskey usually has an ethanol concentration of 40%, a "shot" of whiskey has exactly one-half ounce of pure ethanol.

SOLICIT students comments and questions on this overview of alcohol.

Point out: This concept is true with all drugs that impair.

Point out that a person would have to inhale concentrated alcohol fumes.
brought into the lungs, and some molecules will pass into the blood.

c. It could also be inserted as an enema and ingested by quickly passing from the large intestine into the blood.

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

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

a. One interesting thing about alcohol is that it is able to pass directly through the stomach walls.

b. Under normal conditions, about 20% of the alcohol a person drinks gets into the blood by diffusing through the walls of the stomach.

c. 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.

alcohol fumes for a prolonged period of time in order to develop a significant blood alcohol concentration.
5. 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.

a. When a person eats food,
the food must remain for a
time in the stomach.
b. 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.
c. 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.
d. That muscle is called the
pylorus, or pyloric valve.

6. Since alcohol doesn't have to be
digested, the pylorus does not
constrict when alcohol enters
the stomach.

a. If we drink on an empty
stomach, the pylorus stays
wide open.
b. The alcohol will pass
immediately through the
base of the stomach, into the
small intestine, and quickly
move into the bloodstream.

POINT to the pylorus on the visual.
<table>
<thead>
<tr>
<th>Aids</th>
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</tr>
</thead>
<tbody>
<tr>
<td>VIII-9D</td>
<td>7. But what will happen if there is food in the stomach when the person drinks alcohol?</td>
<td>POSE this question to the class.</td>
</tr>
<tr>
<td></td>
<td>a. Food will cause the pylorus to constrict.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. While the pylorus is closed, nothing will move from the stomach to the small intestine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Any alcohol that is in the stomach will be &quot;trapped&quot; there, along with the food.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. The alcohol will not get into the blood as quickly, and the blood alcohol concentration will not get as high, as if the drinking had been done on an empty stomach.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. While the alcohol is trapped in the stomach, the acids and enzymes will start to react with it and break it down.</td>
<td>SOLICIT students' comments and questions about the absorption of alcohol into the blood.</td>
</tr>
<tr>
<td></td>
<td>f. By the time the pylorus opens, some of the alcohol will have been chemically changed, so there will be less available to get into the blood.</td>
<td>Reveal top part only.</td>
</tr>
<tr>
<td>VIII-10A (Distribution)</td>
<td>9. Once the alcohol gets into the blood, the blood will carry it to the various tissues and organs of the body.</td>
<td></td>
</tr>
</tbody>
</table>
VIII-10B
(Basic Principle)

a. Alcohol is attracted to water. The blood will deposit the alcohol in all the parts of the body where water is found.

b. Parts of the body that have a lot of water will receive a lot of alcohol.

c. Parts of the body that have only a little water will receive little alcohol.

10. Which parts of the body have a lot of water?
   a. The brain
   b. The liver
   c. Muscle tissue
   d. The kidney

POSE this question, and solicit responses from students. Then, display the first part of visual.

VIII-11
(Which Parts ..)

11. Which parts contain very little water?
   a. Bones
   b. Fatty tissue

POSE this question and solicit responses from students. Then, display the second part of visual.

VIII-11A

12. The muscle tissue will receive a relatively high proportion of the alcohol that a person drinks.

POINT to "muscle tissue" on visual.

VIII-11B

13. The fatty tissue will receive very little of the alcohol.

POINT to "fatty tissue" on visual.
14. Here is an interesting and significant difference between men and women: pound-for-pound, the average male has much more water in his body than the average female.

   a. The female body has more fatty tissue than does the male body.
   b. Pound-for-pound, the average female has more fat and less muscle than does the average male.
   c. Since fatty tissue has very little water, the average female, pound-for-pound, has less water than the average male.
   d. This means that the average woman has fewer places in her body in which to deposit the alcohol she drinks.

15. The woman's blood alcohol concentration will be higher than the man's, because she has less water in which to distribute the alcohol.

16. As soon as alcohol gets into the body, the body begins working to get rid of it.
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<tbody>
<tr>
<td>VIII-12A</td>
<td>a. Some alcohol is simply expelled directly from the body, i.e., on the breath, in the sweat, in urine, etc.</td>
<td>Reveal the middle part of visual.</td>
</tr>
<tr>
<td>(Direct ...)</td>
<td>b. Relatively little of the alcohol we drink is directly expelled from the body.</td>
<td>Clarification: Only about 2-10% of the alcohol we consume is directly excreted in the breath, urine, etc.</td>
</tr>
<tr>
<td></td>
<td>c. The body eliminates most of the alcohol by chemically breaking it down.</td>
<td>ASK STUDENTS: What organ in the body is primarily responsible for chemically breaking the alcohol down?</td>
</tr>
<tr>
<td>VIII-12B</td>
<td>d. The liver is primarily responsible for breaking down, or metabolizing, the alcohol.</td>
<td>Clarification: Some metabolism of alcohol also takes place in other parts of the body, including the brain. But the liver does the vast majority of the job.</td>
</tr>
<tr>
<td></td>
<td>17. Metabolism of alcohol actually consists of a slow, controlled burning of the alcohol.</td>
<td>Reveal the first &quot;bullet&quot; of visual.</td>
</tr>
<tr>
<td>VIII-13A</td>
<td>(Metabolism)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. In the burning process, the alcohol combines with oxygen.</td>
<td>Reveal the second &quot;bullet&quot;.</td>
</tr>
<tr>
<td></td>
<td>b. The liver has an enzyme called alcohol dehydrogenase, which helps to speed up the reaction of oxygen with the alcohol.</td>
<td>Clarification: The enzyme does not react with the alcohol itself, but simply makes it easier for the oxygen to react with the alcohol. The technical term for something that helps a chemical reaction while not</td>
</tr>
</tbody>
</table>
itself taking part in the reaction is a catalyst.

Alcohol dehydrogenase is a catalyst for the metabolism of alcohol.

Reveal the third "bullet".

VIII-13C

c. The reaction of alcohol with oxygen ultimately produces carbon dioxide and water, which can be directly expelled from the body.

Reveal the final "bullet".

VIII-13D

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

Reveal the final "bullet".

e. BUT ON THE AVERAGE: Due to metabolism, a person's BAC will drop by about 0.015 per hour.

POSE this problem to the class:

Suppose a person reaches a peak BAC of 0.15. How long will it take for his or her body to eliminate all of the alcohol?

Answer: ten hours 

[0.15-(X hours)(0.015/hour) X = 10]

18. For the average male, a BAC of 0.015 is equal to the alcohol content of about two-thirds of a "standard drink".

a. i.e., about two-thirds of a can of beer.

HS 172A R1/07

VIII-15
b. Or about two-thirds of a glass of wine, or two-thirds of a shot of whiskey.

19. For the average woman, a BAC of 0.015 is equal to the alcohol content of only one-half of a "standard drink".

a. So the average male can "burn up" about two-thirds of a drink in an hour.

b. But the average female can only burn up about one-half of a drink in an hour.

c. 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.

20. How can we speed up the metabolism of alcohol?

a. We can't speed it up.

b. Drinking coffee won't help.

c. A cold shower won't help.

d. Exercise won't help.

21. Our livers take their own sweet time burning the alcohol.
### C. Symptomatology of Alcohol

**ALCOHOL**

- **HGN** > present
- **VGN** > (high dose) present
- **LACK CONV** > present
- **PUPIL SIZE** > normal
- **RCTN-LIGHT** > slow
- **PULSE RATE** > down
- **BLOOD PRESS** > down
- **TEMP** > normal

1. Indicators of Alcohol influence found in Eye Exams.
   a. HGN will be present.
   b. Vertical Gaze Nystagmus may be present, especially with high doses (for that individual) of alcohol.

**Instructor Notes**

Note: Prior to the start of this session, draw the following chart on the dry erase board or flip-chart.

Point out that ETOH may elevate the pulse rate in lower BAC levels.

Ask students: "What category of drugs is alcohol most closely associated?"

Write "Present" on the "HGN" line.

Ask: "Does Alcohol cause Vertical Gaze Nystagmus?"

Write "Present" on the "VGN" line. Denote in parentheses "(High Doses)".
### Aids Lesson Plan

#### Instructor Notes

**Ask: “Does alcohol cause the eyes to be unable to converge?”**

Write "Present" on the "LACK CONV" line.

**Ask: “How do Depressants affect pupil size?”**

Write "Normal" on the "PUPIL SIZE" line.

**Write "Slow" on the "RCTN-LIGHT" line.**

2. Indicators of alcohol influence found in checks of vital signs.

**Ask: “How does alcohol affect pulse rate?”**

Write "Down" on the "PULSE" line. Refer to matrix exception for pulse.

**Ask: “How does Alcohol affect blood pressure?”**

Write "Down" on the "BLOOD PRESS" line.

**Ask: “How does alcohol affect body temperature?”**

Write "Normal" on the "TEMP" line.

Solicit students' questions about the signs and symptoms of alcohol.

---

### Aids

**c. Under the influence of alcohol, Lack of Convergence frequently will be present.**

**d. Alcohol does not affect pupil size; therefore, alcohol usually leaves the pupils normal in size.**

**e. Alcohol will cause pupillary reaction to light to be sluggish.**

### Lesson Plan

**a. Pulse rate will normally be down. However, some subjects have been found to have elevated pulse rates at lower BACs.**

**b. Blood pressure response to alcohol will normally be down.**

**c. Alcohol usually leaves temperature near normal.**
### D. Dose-Response Relationships

#### 20 Minutes

1. **What does "Blood Alcohol Concentration" mean?**
   
   (Reveal only the question at the top)

2. **VIII-14A** (BAC)
   
   a. Blood alcohol concentration means the number of grams of pure ethanol that are found in every 100 milliliters of a person's blood.

   (Reveal the middle part of visual)

   b. A gram is a measure of weight; it takes almost 500 grams to make a pound.

   Instructor, for your information: It actually takes 454 grams to make a pound.

   c. A milliliter is a measure of volume. It takes about 500 milliliters to make a pint.

   Example: A 12-ounce can of beer has about 350 milliliters.

   d. The so-called "illegal limit" of BAC is 0.08 in all states.

   (Reveal the bottom part of visual)

   e. If a person has a BAC of 0.08, it means there is 0.08 grams (g) of ethanol in every 100 milliliters (ml) of his/her blood.

   Point out that in 2005, all 50 states have adopted 0.08 BAC.

   Point out that BAC results are reported in a variety of units. Two common variations are milligrams/milliliters and percent. There are 1000 milligrams (mg) in one gram; therefore, 0.08 grams equals 80 milligrams (mg) and a BAC of 0.08 would be reported as 80 mg of ethanol/100 ml of blood.
<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>How much alcohol does a person have to drink to reach a BAC of 0.08?</td>
<td>Percent means parts of 100. Pose this question to the class.</td>
</tr>
<tr>
<td></td>
<td>a. Take an average male weighing 175 pounds and in reasonably good physical shape.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Assume he does his drinking on an empty stomach.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. He would have to gulp down about 4 or 5 cans of beer, or 4 or 5 glasses of wine, or five shots of whiskey in a fairly short period of time to reach 0.08 BAC.</td>
<td>Display two standard-sized shot glasses, filled with water.</td>
</tr>
<tr>
<td></td>
<td>d. In terms of pure ethanol, that would amount to just about two and one-half fluid ounces, or about two shot glasses.</td>
<td>Hold up the two shot glasses while posing the next question.</td>
</tr>
<tr>
<td></td>
<td>e. 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.</td>
<td>Solicit students’ responses to the question.</td>
</tr>
<tr>
<td></td>
<td>f. So answer this: Does it take a lot of ethanol to impair a person, or only a little?</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>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.</td>
<td>Hold up the glasses again.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
</tr>
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<td>------</td>
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<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>4. BUT COMPARED TO OTHER DRUGS, it takes an enormous quantity of ethanol to cause impairment.</td>
<td>Reveal only the first &quot;bullet&quot;.</td>
</tr>
<tr>
<td>VIII-15A</td>
<td>5. In order to compare ethanol to other drugs, we have to review some more units of weight.</td>
<td>Now reveal the second &quot;bullet&quot;.</td>
</tr>
<tr>
<td>(Grams...)</td>
<td>a. We're already familiar with the gram. It weighs only about one five-hundredth of a pound.</td>
<td>Instructor, for your information: The prefix &quot;milli&quot; derives from the latin word mille, meaning one thousand.</td>
</tr>
<tr>
<td>VIII-15B</td>
<td>b. The milligram is much lighter still; it takes one thousand milligrams to make a gram.</td>
<td>Now reveal the third &quot;bullet&quot;.</td>
</tr>
<tr>
<td></td>
<td>c. That means it takes nearly five hundred thousand milligrams to make a pound.</td>
<td>Clarification: 100 is one-tenth of 1,000.</td>
</tr>
<tr>
<td>VIII-15C</td>
<td>d. If one gram is equal to one thousand milligrams, then one-tenth of a gram is equal to one hundred milligrams.</td>
<td>Now reveal the remainder of visual.</td>
</tr>
<tr>
<td></td>
<td>e. So a person with a BAC of 0.10 has 100 milligrams of ethanol in every 100 milliliters of his or her blood.</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
<td>------</td>
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</tr>
<tr>
<td>VIII-16A (More on ...)</td>
<td>f. That is exactly the same as saying there is one milligram of ethanol in every one milliliter of blood.</td>
<td>Reveal only the first &quot;bullet&quot;.</td>
</tr>
<tr>
<td></td>
<td>6. Here is a new term: the nanogram.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. It takes a million nanograms to make a milligram.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. That means it takes one billion nanograms to make a gram.</td>
<td>Now reveal the parenthetic sentence on visual.</td>
</tr>
<tr>
<td>VIII-16B</td>
<td>c. And that means that it takes almost five hundred billion nanograms to make a single pound.</td>
<td>Now reveal the second &quot;bullet&quot; on visual.</td>
</tr>
<tr>
<td>VIII-16C</td>
<td>d. So if a person's BAC is 0.10, he or she has one million nanograms of pure ethanol in every milliliter of blood.</td>
<td>Now reveal the question at the bottom of visual.</td>
</tr>
<tr>
<td>VIII-16D</td>
<td>7. What kinds of concentrations of other drugs does it take to produce impairment?</td>
<td>Don't solicit responses to this question; it is purely rhetorical.</td>
</tr>
<tr>
<td>VIII-17A (Drug ...)</td>
<td>8. IT IS MOST IMPORTANT to understand that we cannot state exact correspondences between alcohol concentrations and other drug concentrations.</td>
<td>Reveal only the &quot;alcohol&quot; segment of the visual.</td>
</tr>
<tr>
<td>Aids</td>
<td>Lesson Plan</td>
<td>Instructor Notes</td>
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<tr>
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</tr>
<tr>
<td></td>
<td>a. For example, we can say that someone with a blood alcohol concentration between 0.05 and 0.10 will exhibit significant impairment, because there is a large body of scientific research that backs up that statement.</td>
<td>POINT to the alcohol line on visual.</td>
</tr>
<tr>
<td></td>
<td>b. So we can say that research shows that significant impairment will be found, with alcohol, at concentrations of 500,000 to one million nanograms per milliliter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. But we can't say exactly how much cocaine, or THC, or morphine or any other drug it would take to produce exactly the same impairment that we would find at 0.10 BAC.</td>
<td>EXAMPLE: Unlike alcohol, some other drugs (such as THC and PCP) readily deposit in fatty tissue, and may continue to cause impairment even after they have cleared from the blood.</td>
</tr>
<tr>
<td></td>
<td>d. In part, this is because we do not have extensive scientific research for most other drugs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. But also it is because many other drugs do not impair in the same way that alcohol impairs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Nevertheless, based on the available research, it is possible to make some general statements about drug concentrations that can safely be said to induce significant</td>
<td></td>
</tr>
</tbody>
</table>
8. Driving impairment.

   a. First example: Amphetamines

   b. Researchers agree that if we had two shot glasses full of pure amphetamine, we'd have enough to impair as many as ten thousand people.

   c. Second example: Cannabis

   d. Available evidence suggests that if these two little glasses were full of pure THC, we'd have enough drug to impair as many as twenty thousand people.

   e. Many researchers believe that significant impairment results from very low LSD concentrations.

   f. If these two glasses contained pure LSD, we could impair up to one million people.

10. What does all this mean?

   a. First, it means that, compared to alcohol, most other drugs are very powerful: A little goes a very long way.

   b. Second, it means that laboratories may be stretched to

   Example: A person who is "only" carrying one fluid ounce of LSD (hold up one shot glass) would be capable of impairing "only" the entire population of, say, Wyoming.
the limits of their technologic capabilities when we send them samples and request certain drug analyses.

c. All analytic techniques have detection thresholds, i.e., minimum concentrations of drugs that must be present if a scientific confirmation of the presence of the drug is to be obtained.

d. If the concentration of the drug is less than the detection threshold, the laboratory simply will not be able to confirm that the drug is present.

e. The problem is that some people will be significantly impaired at drug concentrations that are below the lab's detection threshold.

f. What this means is that a DRE sometimes examines a subject, concludes correctly that he or she is under the influence of a certain drug category, perhaps even obtains an admission from the subject that he has taken a drug, gets a toxicological sample and sends it off to the lab, only to have the lab report back that “No drugs were found”.

11. When this happens to you -- and it will -- it is important that you don't let yourself become discouraged.
<table>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>As a DRE, all you are expected to do is the best that you can do, given the tools available.</td>
<td>SOLICIT students' comments and questions about dose-response relationships involving alcohol and other drugs.</td>
</tr>
<tr>
<td>b.</td>
<td>You will never become perfect in your diagnosis of drug impairment.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>There will be times when you will &quot;miss&quot; the fact that a subject is impaired.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>And there may times when you will conclude that a subject is under the influence of a drug when, in fact, he or she isn't.</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>We rely on the laboratory to corroborate our opinions, to help make sure that an innocent person is not punished because of an honest mistake in judgment on our part.</td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>The problem is that the laboratory isn't perfect either: The toxicologists won't always be able to corroborate your opinion, even though your opinion is accurate.</td>
<td></td>
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</tbody>
</table>
### Aids Lesson Plan Instructor Notes

<table>
<thead>
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</tr>
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<tbody>
<tr>
<td></td>
<td><strong>E. Questions for Review</strong></td>
<td>Direct students to turn to the review questions, at the end of Section VIII of their Student Manual.</td>
</tr>
<tr>
<td></td>
<td>Refer to the Question and Answer Key on the following pages.</td>
<td>POSE each question to the class, and solicit responses. Make sure all students understand the correct answers.</td>
</tr>
<tr>
<td>10 Minutes</td>
<td>SOLICIT students' comments and questions about &quot;Alcohol as a Drug&quot;.</td>
<td></td>
</tr>
</tbody>
</table>
REVIEW QUESTIONS

1. Name three different chemicals that are alcohols. Which of these is beverage alcohol, intended for human consumption? What is the chemical symbol for beverage alcohol?

   **Answers:** Methyl, Ethyl and Isopropyl (or Methanol, Ethanol and Isopropanol or Wood Alcohol, Beverage Alcohol and Rubbing Alcohol). Ethanol is the beverage intended for human consumption. The four letter chemical symbol for alcohol is ETOH.

2. What is the name of the chemical process by which beverage alcohol is produced naturally? What is the name of the process used to produce high-concentration beverage alcohol?

   **Answers:** Fermentation. Distillation.

3. Multiple Choice: "Blood alcohol concentration is the number of _______ of alcohol in every 100 milliliters of blood."

   A. grams
   B. milligrams
   C. nanograms

   **Answer:** Correct answer is A, “grams”

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

   **Answer:** False. The average woman actually has a good deal less water, pound for pound, than the average man. She has about 55% water, he is about 68% water.

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

   **Answer:** “Proof” means twice the ethanol percentage of the beverage. For example, 80 proof vodka is 40% ethanol.

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

   **Answer:** The three elements common to all alcohols are carbon, hydrogen and oxygen.
7. True or False: Most of the alcohol that a person drinks is absorbed into the blood via the small intestine.

Answer: The statement is true. Under normal conditions, about 80% of the ethanol in the stomach will pass through the pyloric value into the small intestine, from which it will quickly move into the bloodstream.

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

Answer: The muscle is called the pylorus, or pyloric valve.

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

Answer: The statement is true. Usually, about 20% of the ethanol a person drinks diffuses through the stomach walls to enter the blood.

10. Multiple Choice: 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. Chances are ....

A. he had more to drink than she did.
B. they drank just about the same amount of alcohol.
C. he had less to drink than she did.

Answer: “A”, more to drink.

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

Answer: The liver is where most metabolism takes place.

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

Answer: Alcohol dehydrogenase is the enzyme that serves as a catalyst for alcohol’s metabolism in the liver.

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

A. 0.025    B. 0.015    C. 0.010
Answer: “B”, 0.015 percent. (But remember, this is an average value, with wide variations among individuals).

14. Multiple Choice: If a person has a blood alcohol concentration of 0.10, then there are _______ nanograms of alcohol in every milliliter of his or her blood.

   A. one million
   B. one hundred thousand
   C. ten thousand
   D. one thousand
   E. one hundred

   Answer: “A”, one million

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.

   Answer: The statement is false. The average 175 pound man will need more like ninety minutes to metabolize the alcohol.
Session VIII – Alcohol As A Drug

Objectives

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

Alcohol

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

Some Types of Alcohol

- METHYL ALCOHOL (Methanol)
- ETHYL ALCOHOL (Ethanol)
- ISOPROPYL ALCOHOL (Isopropanol)

Ethanol

Ethyl Alcohol
(Intended for human consumption)

Chemical Symbols

ETOH
C₂H₅OH

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
Standard-Sized Drinks
- CAN OF BEER
  12 ounces of fluid @ 4% alcohol equals 0.48 ounces of pure alcohol
- GLASS OF WINE
  4 ounces of fluid @ 12% alcohol equals 0.48 ounces of pure alcohol
- SHOT OF WHISKEY (89-Proof)
  1 and 1/4 ounces @ 49% alcohol equals 0.50 ounces of pure alcohol

Alcohol is a CNS Depressant
Alcohol is the most abused drug in the United States

Absorption of Alcohol
Getting the ethanol out of the stomach and into the blood

Distribution of Alcohol
Getting the ethanol into the body's tissues and organs
Basic Principle:
Ethanol goes wherever it finds water

Which parts of the body have lots of water?
The BRAIN  The LIVER  MUSCLE Tissue

Which parts don’t?
Bones  FATTY Tissue

The average male is 68 percent water
The average female is only 55 percent water

Elimination of Alcohol
Getting the ethanol out of the body:
Direct Excretion:
Breath, sweat, tears, urine, etc.
Metabolism:
Primarily in the liver
Metabolism in the Liver

- The liver burns the ethanol (i.e., causes a chemical reaction of ethanol with oxygen)
- The process is aided by an enzyme called alcohol dehydrogenase
- The ultimate products of the chemical reaction are carbon dioxide and water
- Due to metabolism, the average person’s BAC drops by about 0.015 per hour

Blood Alcohol Concentration

What does it mean?

BAC is the number of grams of alcohol found in 100 milliliters of the person’s blood.

Example

If a person has a BAC of .08, it means there is 0.08 grams of ethanol in every 100 milliliters (ml) of his or her blood.

Grams, Milligrams and Nanograms

- A “gram” is pretty light (it takes almost 500 grams to make one pound)
- One gram is equal to one thousand milligrams.
- One-tenth of a gram therefore is equal to one hundred milligrams.

So if a person has a BAC of .10, he or she has 100 milligrams of alcohol in every 100 milliliters of blood. That is the same as one milligram in every milliliter.

More on Grams and Nanograms

- One milligram is equal to one million nanograms. (A nanogram is very light: it takes almost 500 billion of them to make a pound.)
- A person whose BAC is 0.10 has one million nanograms of alcohol in every milliliter of blood.

How does alcohol compare with other drugs?

Questions?
SESSION IX
PREPARING FOR THE DRE SCHOOL
SESSION IX    PREPARING FOR THE DRE SCHOOL

Upon successfully completing this session the student will be informed of the logistical and other arrangements necessary for their participation in the seven day DRE School.
SESSION IX GUIDE

Review the following points with the students:

a. Dates of the seven-day school

b. Location of the school

c. Dress code

d. Materials that the students should bring to the school

e. Transportation arrangement (if applicable)

f. Lodging arrangements (if applicable)

g. Recreational facilities and opportunities (if appropriate)

Tell the students to open their manuals to Session IX. Point out that a detailed description of "Things you will need at the DRE School" is presented there. Also point out that some very important suggestions of "things to do prior to the DRE School" are given there. Emphasize that the students will be expected to be fully prepared when they come to the school. This is also a good time for the students to begin preparation of their professional Curriculum Vitae (C.V.). A worksheet for the C.V. is provided on the following page and is located in Session IX of the DRE student manual.
DRE CURRICULUM VITAE (C.V.) WORKSHEET

Formal Education

High School

College

Specialized College / Vocational Courses

Formal Professional Training

Academy

Specialized Police Training

Other Specialized / Professional Training

Relevant Experience

Job Experience (Law Enforcement)

Other Job-related Experiences

Drug Enforcement / Evaluation Experience

Court Qualifications

Outside Readings - (relative to the DEC program)
Session IX – Preparing for the DRE School

Objectives

Upon successfully completing this session the student will be informed of the logistic and other arrangements necessary for their participation in the seven-day DRE school.

Seven-Day DRE School

- Dates
- Location
- Dress Code
- Material Needed
- Transportation
- Lodging
- Other
SESSION X

CONCLUSION OF THE PRELIMINARY TRAINING
SESSION X   CONCLUSION OF THE PRELIMINARY TRAINING

Upon successfully completing this session the student will have:

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

CONTENT SEGMENTS

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<tr>
<th>LEARNING ACTIVITIES</th>
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<td>B. Certificates and Dismissal</td>
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Session X – Conclusion of the Preliminary Training

Objectives

- Demonstrate knowledge of the concepts covered during the training
- Offer anonymous comments and criticisms concerning the school
Session V
Alcohol Workshop

Session VI
Examinations of Vital Signs

Session VII
Overview of Signs and Symptoms

Session VIII
Alcohol As A Drug

Session IX
Preparing for the DRE School
A. Course Objectives

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

<table>
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<tr>
<th>Objective</th>
<th>Yes</th>
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<tr>
<td>Can you define the term “drug” and name the seven drug categories?</td>
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<td>Can you identify the twelve major components of the drug recognition process?</td>
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<td>Can you administer and interpret the psychophysical tests used in a drug evaluation?</td>
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<td>Can you conduct the eye examinations used in the evaluations?</td>
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<td>Can you check the vital signs used in the evaluation?</td>
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<tr>
<td>Can you list the major signs and symptoms associated with each drug category?</td>
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<tr>
<td>Can you describe the history and physiology of alcohol as a drug?</td>
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</table>

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.

<table>
<thead>
<tr>
<th>Session/Activity</th>
<th>Quality</th>
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<tbody>
<tr>
<td>Overview of Drug Evaluation and Classification Procedures</td>
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<td>The Psychophysical Tests</td>
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<td>The Eye Examinations</td>
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**C. Course Design**

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

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

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F. Final Comments and Suggestions

Please offer any final comments that you wish to make.

________________________________________________________________________

________________________________________________________________________

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________________________________________________________________________

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