

000001

DRUGS THAT IMPAIR DRIVING

PARTICIPANT'S MANUAL

HS 178B R2/06

SESSION I

INTRODUCTION, OVERVIEW & DRUGS IN SOCIETY

SESSION I INTRODUCTION, OVERVIEW & DRUGS IN SOCIETY

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

- o State the goals and objectives of the course
- o Define the term "drug" in the context of DWI enforcement.
- o Name the seven categories of drugs.
- o Describe the observable signs generally associated with the seven drug categories.
- o Describe medical conditions and other situations that can produce similar signs.

Content Segments

Learning Activities

- | | |
|--|--------------------------------|
| A. Overview | o Instructor-Led Presentations |
| B. Objectives | o Instructor-Led Presentations |
| C. Definition of a "Drug" | o Instructor-Led Presentations |
| D. Overview of the seven drug categories | o Instructor-Led Presentations |

A. Overview

This session is to improve your ability to recognize suspects who may be medically impaired or under the influence of drugs other than alcohol.

Alcohol remains the most frequently abused drug. It is not uncommon for impaired drivers under the influence of alcohol to also be under the influence of other drugs at the same time.

It is likely that experienced police officers have encountered suspects who were under the influence of drugs other than alcohol. Depending upon the specific types of drugs the suspect has taken, some may appear similar to persons who are under the influence of alcohol. Other suspects will look and behave differently from the alcohol-impaired driver.

It is important that you be able to recognize suspects that may be under the influence of other drugs, so that you will know when to summon assistance from physicians, trained Drug Recognition Experts (DRE's) or other appropriate persons.

B. Goals and Objectives

1. Goal:

- a. To identify and apprehend individuals who are impaired by drugs.

2. Objectives:

- a. To recognize impairment associated with drug use.
- b. To define "drug" as it relates to highway safety.
- c. To identify the **seven drug categories** and recognize the major observable indicators.
- d. To successfully document the impaired driving arrest.

This session **will not** accomplish nor qualify you to perform the functions of a Drug Recognition Expert (DRE). Officers become certified DRE's only upon completion of a very challenging program that includes nine days of classroom training and many weeks of closely supervised on-the-job training.

C. Definition of a "drug"

The word "drug" means many things to many people. The word is used in a number of different ways, by different people, to convey some very different ideas.

For example, the corner druggist and the U.S. Drug Enforcement Administration (DEA) are both concerned with "drugs", but they don't have exactly the same thing in mind when they use the word "drug". The druggist and DEA agent do not have the same perspective as the DWI enforcement officer.

For our purpose, a drug is:

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

This definition excludes some substances that physicians consider to be drugs. This definition also includes some substances that physicians do not usually consider as a drug. Examples are airplane glue and paint.

Drugs are organized into seven categories based on the physiological effects that the drugs produce.

The seven drug categories:

Central Nervous System (CNS) Depressants
Central Nervous System (CNS) Stimulants
Hallucinogens
Dissociative Anesthetics
Narcotic Analgesics
Inhalants
Cannabis

No one knows precisely how many people operate motor vehicles while under the influence of drugs, or how many crashes, deaths and injuries these people cause. But even the most conservative estimates suggest that America's drug-impaired drivers kill thousands of people each year, and seriously injure tens of thousands of others. There are numerous studies that illustrate these facts. They include:

- Maryland (1986) - 32 percent of crash-injured drivers had evidence of marijuana in their blood.

- University of Tennessee (1988) - 40 percent of crash-involved drivers treated at the University's Trauma Center had drugs other alcohol in their urine.
- NHTSA (Terhune, Ippolito, Hendricks et al., 1992) - 1,882 operators involved in fatal crashes in three states were tested for alcohol and 43 other drugs. Alcohol was the most prevalent drug detected in 51.5 percent of the crashes, while other drugs were involved in 17.8 percent of the crashes.
- Washington State (Schwilke, et al. 2006) - the results of tests of blood and/or urine from 370 fatally injured drivers revealed that marijuana was the most encountered drug (12 percent), followed by benzodiazepines (5.1 percent), cocaine (4.8 percent) and amphetamines (4.8 percent).

How about people who drive under the influence of alcohol and other drugs that are not involved in crashes? A 2002 survey (National Survey on Drug Use and Health) revealed that one in seven Americans aged 12 years or older (14.2 percent or 33.5 million people) admitted driving under the influence of alcohol at least once in the past year. The same survey also revealed that in 2003, an estimated 19.5 million Americans, or 8.2 percent of the population aged 12 years or older, were current illicit drug users, and that marijuana was the most commonly used illicit drug, with a rate of 6.2 percent (14.6 million) in 2003.

Monitoring the Future, a national survey of high school students conducted in 2003 by the University of Michigan and the White House anti-drug czar's office concluded that one in six high school seniors had admitted to having driven while they were high on drugs.

In 2003, an estimated 11 million people reported driving under the influence of an illicit drug during the past year. As many as 18 percent of 21 year-olds reported having driven under the influence of drugs at least once during the past year. (NSDUH Report: Drugged Driving, 2003 Update)

SESSION II

SEVEN DRUG CATEGORIES AND
MAJOR INDICATORS OF IMPAIRMENT

SESSION II SEVEN DRUG CATEGORIES AND MAJOR INDICATORS OF
 I IMPAIRMENT

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

- o Overview the major indicators of impairment
- o Name examples of the drugs in each of the seven categories
- o Identify the indicators of impairment associated with each drug category
- o Describe medical clues that mimic drug impairment

CONTENT SEGMENTS

- A. Major Indicators of Impairment
- B. Drug Categories

LEARNING ACTIVITIES

- o Instructor-Led Presentation
- o Instructor-Led Presentation

THE SEVEN DRUG CATEGORIES AND MAJOR INDICATORS OF IMPAIRMENT

A. Major indicators of impairment.

All drugs affect the body in a predictable fashion with different categories affecting the body differently.

As you conduct your investigation, you will see signs and symptoms that indicate the suspect is under the influence of drugs other than alcohol. The documentation of your observations will be crucial to convincing court testimony. At the end of Session II, a sample Field Note Sheet is included to assist you in documenting your observations.

DIVIDED ATTENTION PSYCHOPHYSICAL TESTS

During the examination you will collect the evidence that will establish whether the suspect, at that moment, is impaired and cannot operate a vehicle safely. It is common knowledge to judges, juries and police officers that safe driving demands that operators of vehicles are able to attend properly to many things at the same time. We have to be able to steer and control the accelerator and look for other traffic and identify stop signs and signal lights, and on and on.

This means that we have to be able to divide our attention among all of the individual tasks that constitute driving a vehicle. One thing all drugs have in common is that they impair a person's ability to divide their attention. Drugs simply make it very difficult for people to handle several tasks at the same time. People who are impaired by drugs won't be able to perform these tests very well, and the mental and physical mistakes they make will go a long way toward convincing the judge and/or jury that the suspect was in fact impaired.

You should always use the SFST test battery as you were previously instructed. When drug impairment is suspected the Romberg Balance test is an additional test that can be used to evaluate the suspect. All these tests are **STANDARDIZED**, in their administration, documentation and interpretation. This means we always give exactly the same instructions to the suspect when we use these tests; we always record the suspects' performance in a prescribed manner; and always look for a specific set of clues to determine to what extent the suspect is impaired.

The Three Standardized Tests Are:

Horizontal Gaze Nystagmus (HGN)
Walk and Turn
One Leg Stand

In the event drug impairment is suspected the **Romberg Balance** test should be administered to evaluate the suspect's internal clock.

The tests are in the sequence in which they should be administered.

Three of the tests, namely the Horizontal Gaze Nystagmus (HGN), Walk and Turn and the One Leg Stand, have been scientifically validated. That means the tests were subjected to controlled research, involving hundreds of volunteer drinkers, in which it was demonstrated that they could reliably discriminate between impaired and unimpaired subjects. That same research program demonstrated the scientific validity of horizontal gaze nystagmus for identifying alcohol impairment. The other test, Romberg Balance, has not been subjected to the same scientific scrutiny causing it not to be validated. Saying a test is not validated is not the same as saying the test is invalid. Properly administered and recorded the Romberg Balance produces very important and credible evidence of a suspects' impairment.

HORIZONTAL GAZE NYSTAGMUS (HGN)

This is the first of the three standardized field sobriety tests that you will administer to the suspect. Nystagmus is the involuntary jerking of the eyes. HGN is a very reliable field sobriety test by itself (77%). The test requires the suspect to follow a stimulus that is moved in front of the suspect's face.

Administrative Procedures

- o Have the suspect remove their glasses if they are wearing them.
- o Tell the suspect to put their feet together and place their hands at their sides.
- o Tell the suspect to keep their head still during the test.
- o Tell the suspect to look at the specific stimulus.
- o Tell the suspect to follow the movement of the stimulus with their eyes only.

- o Tell the suspect to continue looking at the stimulus until they are told that the test is over.
- o Position the stimulus approximately 12 to 15 inches in front of the suspects nose, and slightly above eye level to commence the test.
- o Check for equal tracking of the eyes.
- o Check for equal pupil size and check for resting nystagmus.
- o Check the eyes for lack of smooth pursuit. Always starting with the suspect's left eye.
- o Check the eyes for distinct and sustained nystagmus at maximum deviation. Start with the left eye.
- o Check the eyes for the onset of nystagmus prior to 45 degrees. Start with the left eye.
- o Total the clues.
- o Check for Vertical Nystagmus.

DOCUMENTING THE TEST

Three validated clues of impairment have been established for the Horizontal Gaze Nystagmus test.

- o Lack of smooth pursuit
- o Distinct and sustained nystagmus at maximum deviation
- o Onset of nystagmus prior to 45 degrees

A minimum of four clues are needed to determine if the suspect's B.A.C. level is above 0.10 percent.

WALK AND TURN

This test should already be very familiar to you from your previous training. The test requires the suspect to stand in a heel-to-toe position with arms at the sides while a series of instructions are given. Then, the suspect must take nine heel-to-toe steps along a line, turn in a prescribed manner, and take another nine heel-to-toe steps along the line. All of this must be done while counting the steps out-loud and keeping the arms at the sides. The suspect should not stop walking until the test is completed.

Administrative Procedures

- o Tell the suspect to place their left foot on the line.
- o Tell the suspect to place the right foot on the line, in front of the left foot, with the heel of the right foot against the toe of the left foot.
DEMONSTRATE the heel-to-toe stance.
- o Tell the suspect to put their arms down against their sides, and to keep them there throughout the entire test.
- o Tell the suspect that they are to maintain this position while you give the instructions. **EMPHASIZE** that the suspect must not start walking until you say to "begin".
- o Ask the suspect if they understand.

NOTE: If at any time while you are giving the rest of the instructions the suspect should break away from the heel-to-toe stance, stop giving instructions until they resume the stance.

- o Tell the suspect that, when you say to "begin", they must take nine heel-to-toe steps, turn around, and take nine heel-to-toe steps back.
- o Tell the suspect that every time they take a step, the heel must be placed against the toe of the other foot. **DEMONSTRATE** several heel-to-toe steps.
- o Tell the suspect that, when the ninth step has been taken, they must leave the front foot on the line, and turn around using a series of small steps with the other foot. **DEMONSTRATE** a proper turn.
- o Remind the suspect that, after turning, they must take another nine heel-to-toe steps up the line.
- o Tell the suspect to watch their feet at all times, count the steps out loud, and keep the arms down at the sides.
- o Tell the suspect that, once they start walking, not to stop walking until the test has been completed.
- o Ask the suspect if they understand.
- o Tell the suspect to "begin".

DOCUMENTING THE TEST

Eight validated clues of impairment have been identified for the Walk and Turn test. Two clues apply while the suspect is standing heel-to-toe and listening to the instructions:

- o Cannot keep balance (i.e., suspect breaks away from the heel-to-toe stance)
- o Starts too soon (i.e., suspect starts walking before you say "begin")

At the top of the checklist portion of the Walk and Turn segment of the standardized note guide, you will record the number of times these two clues were observed while you were giving the instructions. For example, if the suspect breaks away from the heel-to-toe stance twice, put two check marks in the "Cannot keep balance" block.

The other **six** validated clues apply during the walking stage of the test. They are:

- o Stops walking
- o Misses heel-to-toe
- o Steps off the line
- o Raises the arms while walking
- o Takes the wrong number of steps
- o Turns improperly

In the checklist area, you will record the first five of those, separately for the first nine steps and the second nine steps. Below the checklist area, you will describe how the suspect turned. If they turned in the appropriate fashion, simply write "proper" in that space. If the suspect "staggered to the left" or executed an "about face" turn, write that description in the space.

If the suspect was unable to begin or complete the test, explain why. Usually, this will be due either to a physical infirmity that precludes the test entirely (e.g., "suspect has an artificial left leg") or to your decision to stop the test (e.g., "suspect is in danger of being injured due to the lack of balance"). Whatever the case might be, some reason must be documented for a test that wasn't given or completed.

ONE LEG STAND

This test requires the suspect to stand on one leg. The other leg is to be extended in front of the suspect in a stiff-leg manner, with the foot held approximately six inches above and parallel with the ground. The suspect is to stare at the elevated foot, and count out loud, in this fashion: "one thousand and one, one thousand and two, one thousand and three, ..." and so on until told to stop. You will time the test and terminate it at the end of 30 seconds.

Administrative Procedures

- o Tell the suspect to stand with their feet together and the arms down at the sides.
- o Tell the suspect to maintain that position while you give the instructions; emphasize that they should not try to perform the test until you say to "begin".
- o Ask the suspect if they understand.
- o Tell the suspect that, when you say to "begin", they must raise either leg in a stiff-leg manner, and hold the foot approximately six inches off the ground, with the toe pointed forward so that the foot is parallel with the ground.
- o **DEMONSTRATE** the proper one-legged stance.
- o Tell the suspect that they must keep the arms at the sides and must keep looking directly at the elevated foot, while counting in the following fashion: "one thousand and one, one thousand and two, one thousand and three", and so on until told to stop.
- o Ask the suspect if they understand.
- o Tell the suspect to "begin".

NOTE: It is important that this test last for thirty seconds. You must keep track of the time. If the suspect counts slowly, you will tell him or her to stop when thirty actual seconds have gone by, even if, for example, the suspect has only counted to "one thousand and twenty". On the other hand, if the suspect is counting rapidly, tell them to keep counting until you say to stop.

Indicate/record the suspects actual internal clock time and direct the suspect to continue counting until the actual thirty seconds is consumed then stop that portion of the test. The suspect shall, perform the counting as well as being timed by the evaluator.

DOCUMENTING THE TEST

Four validated clues of impairment have been identified for the One Leg Stand:

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

You will place check marks in or near the small boxes to indicate how many times you observed each of the clue. You should further indicate at which point the clues were observed, i.e., 0-10 seconds, 11-20 seconds or 21-30 seconds.

You must pay attention to the suspects general appearance and behavior while they perform this test. Take note of any body tremors or muscle tension that may be apparent. Listen for any unusual or "interesting" sounds or statements the suspect might make while the test is in progress. Make sure that any such information is documented on a SFST Field Note Sheet or in your narrative report.

ROMBERG BALANCE

This test requires the suspect to stand with both feet together, the head tilted slightly back, the eyes closed and estimate the passage of thirty seconds. When the suspect believes that the thirty seconds have passed, they are to tilt the head forward, open their eyes and say "stop".

Administrative Procedures

- o Tell the suspect to stand with the feet together and the arms down at the sides.
- o Tell the suspect to maintain that position while you give the instructions. Emphasize that they must not start the test until you say "begin".
- o Ask the suspect if they understand so far.
- o Tell the suspect that, when you tell them to, they must tilt their head back slightly and close their eyes. **DEMONSTRATE** how the head should be tilted back, but **DO NOT CLOSE YOUR EYES** while demonstrating.
- o Tell the suspect that when you say "start", they must keep their head tilted back with the eyes closed until they think that thirty seconds have gone by. **DO NOT** tell the suspect to "count to thirty seconds" or to use any other specific procedure to keep track of time.

But on the other hand, DO NOT tell the suspect that they are not allowed to count to thirty seconds. SIMPLY SAY, "keep your head tilted back with your eyes closed until you think that thirty seconds have gone by".

- o Tell the suspect that, when they think the thirty seconds have gone by, to bring their head forward, open their eyes, and say "stop".
- o Ask the suspect if they understand.
- o Look at your watch and pick a convenient time to start the test.
- o Tell the suspect to tilt their head back and close their eyes.
- o Tell the suspect to begin and start timing.
- o Keep track of the time while the suspect performs the test.
- o When the suspect opens their eyes, ask them "how much time was that?" and document their response.
- o If ninety seconds elapse before the suspect opens their eyes, stop the test.

Look and listen for the following:

- o suspect unable to stand still or steady with the feet together
- o body tremors
- o eyelid tremors
- o muscle tone (either more rigid or more flaccid than normal)
- o any statements or unusual sounds made by the suspect when performing the test

E. Documenting the Test

Record the estimated number of inches of sway exhibited by the suspect. You should estimate the approximate extent of swaying for both front to back and side to side.

To indicate impairment of the suspects' "internal clock", record the actual number of seconds the suspect stood with the eyes closed.

Document any of the above, or any other noteworthy observations and explain as necessary in the narrative section of your report.

OBSERVATIONS

SUSPECT'S BREATH

- Odor of alcohol
- Chemical odor
- Cannabis odor

OBSERVATION OF FACE

- Normal
- Flushed
- Pale
- Other (describe)

GENERAL APPEARANCE

- Clean
- Orderly
- Disarranged
- Bloody
- Vomit
- Urine

EYES

- Normal
- Watery
- Bloodshot
- Pink/Red

ATTITUDE

- Anxious
- Restless
- Agitated
- Excited
- Combative
- Disinterested
- Uninhibited
- Disoriented
- Drowsy
- Confused
- Hallucinating
- Loss of Memory
- Cyclic mood swings
- Polite
- Antagonistic
- Stuporous
- Cooperative/indifferent
- Laughing
- Insulting
- Argumentative
- Fumbling

SPEECH

- Talkative
- Thick, slurred
- Incoherent
- Rapid
- Slow
- Non-communicative
- Repetitive

PHYSICAL ACTIONS

- Facial itching
- Dry mouth
- Nodding
- Droopy eyelids
- Low, raspy voice
- Body tremors
- Muscle tone - rigid
- Muscle tone - flaccid
- Muscle tone - normal
- Grinding of teeth

OTHER

- Nasal redness
- Runny nose
- Track marks
- Perspiring
- Warm to touch
- Intense headaches
- Residue of paint on person
- Debris
- Pills
- Vials
- Syringes
- Drug paraphernalia

SESSION III

EYE EXAMINATIONS:
DETECTING SIGNS OF DRUG INFLUENCE

SESSION III: EYE EXAMINATIONS: DETECTING SIGNS OF DRUG INFLUENCE

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

- o Overview the major eye indicators of impairment

CONTENT SEGMENTS

- A. Detecting Signs of Drug Influence

LEARNING ACTIVITIES

- o Instructor-Led Presentation

A. Detecting Signs of Drug Influence

A suspect's eyes often disclose some very important, indicators of drug influence or medical impairment. Four eye examinations are especially helpful:

- o Tracking Ability
- o Pupil Size
- o Horizontal Gaze Nystagmus
- o Vertical Nystagmus

Tracking ability refers to the ability of the eyes to track together when the subject attempts to follow an object moving side-to-side. The test for tracking ability is conducted in the same fashion as the check for "lack of smooth pursuit" in the horizontal gaze nystagmus test. If the two eyes do not track together, i.e., if one moves smoothly but the other moves only slightly, or in a very jerky fashion, or not at all, the possibility of a medical condition or injury exists.

Pupil size is an important indicator of certain categories of drugs. Of course, the size of a person's pupils changes naturally, in response to changing light conditions. Usually, the diameter of the pupils constricts in bright light, and dilates in dark conditions.

If the two pupils are noticeably different in size, the suspect may have a glass eye, or be suffering from an injury or medical condition. This condition may be pre-existing, or a medical emergency requiring immediate medical treatment or may be an old injury and not a medical emergency.

Subjects under the influence of CNS stimulants or hallucinogens usually have dilated pupils. Cannabis usually causes a dilation of the pupils, but not necessarily in all cases. Most CNS depressants, Dissociative Anesthetics, and inhalants usually do not affect pupil size. Subjects under the influence of narcotic analgesics usually have constricted pupils. It is not necessary that a precise estimate of pupil size be obtained. It is enough to estimate whether the pupils are of equal size, and whether they look noticeably small, about normal, or noticeably large.

Horizontal Gaze Nystagmus usually occurs with subjects under the influence of three categories of drugs:

- o CNS depressants (including alcohol)
- o Dissociative Anesthetics
- o Inhalants

When PCP is involved, the onset of jerking usually occurs almost immediately, i.e., very soon after the eyes start to move to the side.

Vertical Nystagmus is another easy-to-administer test. Position the stimulus horizontally, approximately 12 to 15 inches in front of the subject's nose. Instruct the subject to hold the head steady and follow the object with the eyes only. Then, slowly and steadily move the stimulus upward until the eyes are elevated as far as possible and hold in that position for approximately four (4) seconds. If the eyes can be observed to jerk noticeably, vertical nystagmus is present.

Vertical nystagmus usually occurs with Dissociative Anesthetics, and may occur with relatively high doses, for that individual, of CNS depressants or inhalants.

SESSION IV
METHODS OF INGESTION/INJECTION

SESSION IV: METHODS OF INGESTION AND INJECTION

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

- o Describe the common methods of ingesting drugs.

CONTENT SEGMENTS

LEARNING ACTIVITIES

- A. Methods of Ingestion and Injection
 - o Instructor-Led Presentation

A. Methods Of Ingestion/Injection

If the means of ingestion can be determined, it can be a significant clue as to the involved drug category.

Different drugs are taken into the body in various ways. Drugs may be ingested orally. Some Depressants, Stimulants, Dissociative Anesthetics, and Narcotic Analgesics are commonly taken in a pill or capsule. Some other drugs such as Hallucinogens can be eaten in their naturally occurring form.

Ingestion through the nasal area or insufflation is a very common method of ingesting some Stimulants and Narcotic Analgesics. This method of ingestion may cause marked reddening in the nasal area, or even traces of the ingested substance in the nose.

Another common method of ingestion is for the user to inhale the drug or fumes from the drug. Gasoline, paint and anesthetic gases are usually ingested by inhaling. When we think of drug use by hypodermic needle, we usually think primarily of Narcotics, and especially Heroin. Many people inject other drugs. Cocaine and Methamphetamine, for example, are often "shot", and hypodermic injection of certain Depressants, Phencyclidine and LSD, is not unheard of.

You should be extremely careful when dealing with suspected drug users. **PROTECTIVE RUBBER GLOVES SHOULD ALWAYS** be worn to reduce the possibility of contracting contagious diseases such as **AIDS** and **HEPATITIS**. These suspects may also be carrying used, non-sterile syringes or needles on their person.

SESSION V
MUSCLE TONE

SESSION V: MUSCLE TONE

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

- o Describe how various drug categories affect muscle tone.

CONTENT SEGMENTS

- A. Muscle Tone

LEARNING ACTIVITIES

- o Instructor-Led Presentations

A. MUSCLE TONE

The effect of some drugs on the user may be observed in their muscle tone. Muscle tone may be normal, rigid, or flaccid.

Dissociative Anesthetics, Stimulants and Hallucinogens, primarily cause a rigid, tense or stiff feeling in the muscles. Some drugs, i.e., Depressants and Narcotics, often will cause the muscles to be very flaccid or loose and relaxed. Subjects with rigid muscle tone may appear very stiff and exhibit very jerky movements. Flaccid muscle tone will usually be evidenced by loose, relaxed movements. Evidence of muscle tone may become apparent when the suspect attempts to perform the divided attention tests.

SESSION VI
DRUG CATEGORIES AND THEIR OBSERVABLE EFFECTS

SESSION VI: DRUG CATEGORIES AND THEIR OBSERVABLE EFFECTS

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

- o Identify the indicators of impairment associated with each category.
- o Describe the expected results of roadside observations/indicators of impairment.
- o Describe the general indicators that may be present for each drug category.

CONTENT SEGMENTS

- A. CNS Depressants
- B. CNS Stimulants
- C. Hallucinogens
- D. Dissociative Anesthetics
- E. Narcotic Analgesics
- F. Inhalants
- G. Cannabis
- H. Drug Combinations
- I. Medically Impaired Person

LEARNING ACTIVITIES

- o Instructor-Led Presentations

A. CNS DEPRESSANTS

Action

CNS depressants slow down the operations of the brain. They depress the heartbeat, blood pressure, and many other processes controlled by the brain.

Examples

- o Alcohol
- o Barbiturates
- o Anti-Anxiety Tranquilizers (e.g., Valium, Librium, Xanax, Prozac, and Thorazine)
- o GHB (Gama Hydroxy Butarate)
- o Rohypnol
- o Many Others

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical

- o Divided attention impairment
- o Poor coordination and balance
- o Slowed internal clock

Eye Indicators

- o Horizontal Gaze Nystagmus usually present.
- o Vertical Nystagmus will be present (with high doses for that individual).
- o Pupil size usually normal
- o Eye lids may be droopy and eyes watery.

Methods of Ingestion

- o Orally
- o Injected

General Indicators

- o "Drunken" behavior
- o Sluggish
- o Drowsy
- o Flaccid muscles
- o Thick, slurred speech

Other Conditions That May Cause Similar Symptoms

- o Extreme fatigue
- o Head injury
- o Hypotension (lowering of the blood pressure)
- o Severe depression
- o Inner ear disorders
- o Diabetic reaction

B. CNS STIMULANTS

Action

CNS stimulants accelerate the heart-rate and elevate the blood pressure, and "speed up" or over-stimulate many other processes of the body. Subjects under the influence of CNS stimulants tend to be hyperactive, nervous, talkative, and unable to sit still. They are usually unable to concentrate, or think clearly for any length of time.

Examples

- o Cocaine
- o "Crack"
- o Amphetamine
- o Methamphetamine

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Divided attention impairment
- o Starts test too soon
- o Accelerated internal clock
- o Completes test too quickly
- o Rapid and jerky movements

Eye Indicators

- o Nystagmus will usually not be present
- o Pupils usually will be dilated

Methods of Ingestion

- o Smoked
- o Snorted
- o Injected
- o Orally

General Indicators

- o Restlessness
- o Talkative
- o Excitation
- o Euphoria
- o Exaggerated reflexes
- o Grinding Teeth
- o Redness to nasal area
- o Runny nose
- o Body Tremors
- o Loss of appetite

Other Conditions That May Cause Similar Symptoms

- o Hyperactivity
- o Nervousness
- o Stress
- o Fear
- o Hypertension

C. HALLUCINOGENS

Action

Hallucinogens may cause hallucinations, i.e., they cause the user to perceive things differently than they actually are.

Examples

- o LSD
- o Peyote
- o Psilocybin
- o MDMA (Ecstasy)

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Uncoordinated
- o Severe divided attention impairment
- o Poor perception of time and distance
- o Poor balance
- o Distorted internal clock

Eye Indicators

- o Vertical or Horizontal Nystagmus usually not present
- o Pupils will be dilated

Methods of Ingestion

- o Orally
- o Smoked
- o Transdermal absorption (absorbed through the skin)
- o Injected
- o Snorted

General Indicators

- o Hallucinations
- o Dazed appearance
- o Body tremors
- o Perspiring
- o Piloerection (LSD)
- o Disorientation
- o Paranoia
- o Difficulty in speech
- o Nausea

Other Conditions That May Cause Similar Symptoms

- o Mental illness
- o High fever

D. DISSOCIATIVE ANESTHETICS

Action

Dissociative Anesthetics may produce impairments and other observable effects on the human mind and body much like the effects produced by depressants, stimulants and hallucinogens. Dissociative Anesthetics also induces a state of sedation, immobility, amnesia and marked analgesia.

Examples

- o Phencyclidine
- o Dextromethorphan (DXM)
- o Ketalar (analog of PCP)
- o Ketaset (analog of PCP)
- o Ketamine (analog of PCP)

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Divided attention impairment
- o May take abnormally high and slow steps as though they were attempting to step over obstacles
- o Slowed internal clock

Eye Indicators

- o Horizontal Gaze Nystagmus will be present, generally with a very early angle of onset.
- o Vertical Nystagmus generally will be present.
- o Pupil size is usually normal.
- o Suspect may have a blank stare.

Methods of Ingestion

- o Smoked
- o Inhaled or snorted
- o Orally (in capsule or tablet form)
- o Injected
- o Transdermal absorption (directly absorbed through the skin)

General Indicators

- o Slow, slurred speech
- o Disorientation
- o Loss of memory
- o Agitation, Excitement
- o Blank stare
- o Cyclic behavior
- o Rigid muscle tone
- o Warm to touch
- o Perspiring
- o Chemical odor (PCP)

Other Conditions That May Cause Similar Symptoms

- o Mental disorder

E. NARCOTIC ANALGESICS

Action

Narcotic analgesics relieves pain, induces euphoria, and changes mood.

Examples

- o Opium
- o Codeine
- o Heroin
- o Demerol
- o Darvon
- o Morphine
- o Dilaudid
- o Methadone
- o Oxycontin

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Divided attention impairment
- o Poor coordination and balance
- o Slowed internal clock

Eye Indicators

- o Horizontal Gaze Nystagmus will not be present
- o Vertical Nystagmus will not be present
- o Pupil size will be constricted
- o Eyelids will be droopy

Methods of Ingestion

- o Injected
- o Smoked
- o Snorted
- o Orally
- o Suppositories

General Indicators

- o Slowed reflexes
- o Slow, low and raspy speech
- o Muscle tone - flaccid

F. INHALANTSAction

Inhalants include a wide variety of breathable chemicals that produce mind-altering results.

Examples

- o Toluene
- o Plastic cement
- o Paint
- o Gasoline
- o Thinners
- o Hair sprays
- o Deodorants
- o Anesthetic gases

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Divided attention impairment
- o Poor coordination and balance

Eye Indicators

- o Horizontal Gaze Nystagmus will be present
- o Vertical Nystagmus may be present, especially if a high dose, for that individual, of inhalant has been taken
- o Pupils normal or dilated depending on substance used

Methods of Ingestion

- o Inhaling
- o Some are ingested directly from the source

General Indicators

- o Dizziness and numbness
- o Floating sensation
- o Distorted perceptions of time and distance
- o Intense headaches
- o Nausea

G. CANNABIS

Action

Cannabis appears to interfere with a person's ability or willingness to pay attention. People under the influence of Cannabis usually do not divide their attention very well. When driving, they may attend to certain parts of the driving tasks but ignore others. For example, they may continue to steer the car but ignore stop signs, traffic lights, etc.

Examples

- o Marijuana
- o Hashish
- o Hashish oil
- o Marinol

Expected Results of Roadside Observations/Indicators of Impairment

Psychophysical Indicators

- o Divided attention impaired
- o Poor coordination and balance
- o Slowed internal clock

Eye Indicators

- o Horizontal Gaze Nystagmus will not be present
- o Vertical Nystagmus will not be present
- o Pupils will be dilated or normal

Methods of Ingestion

- o Smoking
- o Orally (hash oil and hashish)

General Indicators

- o Diminished inhibitions
- o Impair perception of time and distance
- o Eyelid and body tremors
- o Impaired attention
- o Redness of eyes
- o Residue in mouth

H. DRUG COMBINATIONS (Polydrug) Use

Experience across the country suggests that polydrug use, the simultaneous consumption of two or more categories of drugs is very common among drug users.

The Los Angeles Field Validation Study found that 72% of the suspects were found to have two or more drugs in their system.

New York City found that during Drug Certification Training 67% of the suspects tested were polydrug users.

Alcohol routinely shows up in combination with virtually all drug categories.

Suspects are often encountered who have consumed alcohol with two or more drugs.

Cannabis is a popular mixer and frequently shows up in combination with cocaine, PCP with other drugs.

Common Combinations

- o Cocaine and Cannabis
- o Cocaine and Heroin
- o PCP and Cannabis

Possible Effects

The nature and use of drug combinations (polydrug) may result in a wide range of effects.

DEALING WITH SUSPECTED DRUG INFLUENCE OR MEDICAL IMPAIRMENT

Students should become familiar with their agency's policies and procedures for handling drug or medically impaired subjects.

INDICATORS CONSISTENT WITH DRUG CATEGORIES

	DEPRESSANT	STIMULANTS	HALLUCINOGEN	DISSOCIATIVE ANESTHETICS	NARCOTIC	INHALANT	CANNABIS
HGN	PRESENT	NONE	NONE	PRESENT	NONE	PRESENT	NONE
VERTICAL NYSTAGMUS	PRESENT (HIGH DOSE)*	NONE	NONE	PRESENT	NONE	PRESENT (HIGH DOSE)*	NONE
PUPIL SIZE	NORMAL(1)	DILATED	DILATED	NORMAL	CONSTRICTED	NORMAL(2)	DILATED(3)

* high dose for that particular individual

FOOTNOTE:

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

1. SOMA, Quaaludes usually dilate pupils.
2. Normal but may be dilated.
3. Pupil size possibly normal.

MAJOR INDICATORS	CNS DEPRESSANTS	CNS STIMULANTS	HALLUCINOGENS	DISSOCIATIVE ANESTHETICS	NARCOTIC ANALGESICS	INHALANTS	CANNABIS
GENERAL INDICATORS	Uncoordinated Disoriented Sluggish Thick, slurred speech Drunk-like behavior Gait ataxia Drowsiness Droopy eyes Fumbling *NOTE: With Methaqualone, pulse will be elevated and body tremors will be evident. Alcohol and Quaaludes elevate pulse. Soma and Quaaludes dilate pupils.	Restlessness Body tremors Excited Euphoric Talkative Exaggerated reflexes Anxiety Grinding teeth (bruxism) Redness to nasal area Runny nose Loss of appetite Insomnia Increased alertness Dry mouth Irritability	Dazed appearance Body tremors Synesthesia Hallucinations Paranoia Uncoordinated Nausea Disoriented Difficulty in speech Perspiring Poor perception of time & distance Memory loss Disorientation Flashbacks NOTE: With LSD, pilorection may be observed (goose bumps, hair standing on end)	Perspiring Warm to the touch Blank stare Very early angle of HGN onset Difficulty in speech Incomplete verbal responses Repetitive speech Increased pain threshold Cyclic behavior Confused agitated Hallucinations Possibly violent & combative Chemical odor "Moon walking"	Droopy eyelids ("ptosis") "On the nod" Drowsiness Depressed reflexes Low, raspy, slow speech Dry mouth Facial itching Euphoria Fresh puncture marks Nausea Track marks NOTE: Tolerant users exhibit relatively little psychomotor impairment.	Residue of substance around nose & mouth Odor of substance Possible nausea Slurred speech Disorientation Confusion Bloodshot, watery eyes Lack of muscle control Flushed face Non-communicative Intense headaches **NOTE: Anesthetic gases cause below normal blood pressure; volatile solvents and aerosols cause above normal blood pressure.	Marked reddening of conjunctiva Odor of marijuana Marijuana debris in mouth Body tremors Eyelid tremors Relaxed inhibitions Increased appetite Impaired perception of time & distance Disorientation Possible paranoia

SCENARIO I

While checking an interstate rest area, you notice a vehicle parked, engine running, with the driver apparently sleeping. After awakening the driver, who claims she was not sleeping, you notice that her actions are very slow and lethargic. There is no odor of alcoholic beverage on this person's breath and she states she has not been drinking. As you administer the standardized field sobriety tests, you observe that there is no Horizontal Gaze Nystagmus and no Vertical Nystagmus. You also observe that her pupils are extremely small and the eyelids are droopy. As the driver is performing the walk and turn and one leg stand tests, her movements are slow. Administration of the Romberg test disclosed that the subject has a slow internal clock.

SCENARIO II

On a Saturday evening following a concert, you stop a vehicle for weaving down the street. During the initial conversation with the subject you notice that he is talking very rapidly, has extremely large pupils and is paranoid. The subject states that he was trying to avoid the large snails that were on the road. There is no odor of an alcoholic beverage on this person's breath. As you administer the standardized field sobriety tests, you observe that there is no Horizontal Gaze Nystagmus and no Vertical Nystagmus. As the driver is performing the walk and turn and one leg stand, his movements are fast, then slow, then fast again; and was having difficulty dividing attention. Administration of the Romberg test discloses that the subject has a fast internal clock and goosebumps. After the Romberg test the subject stated that he was confused by the loud noise coming from the Police Officer's raincoat.

SCENARIO III

It is August, you arrive on the scene of a serious traffic crash. You notice that the driver is wearing a long sleeve shirt and different smelling smoke escapes from the vehicle. He is not able to stay awake but is able to answer your questions. The sleeve of his shirt slides up and you notice red marks on his arms. He has no Horizontal Gaze Nystagmus and no Vertical Nystagmus. As the driver is performing the walk and turn and one leg stand tests, his movements are slow and deliberate. Administration of the Romberg test disclosed that the subject has a slow internal clock. His eyes are reddish and pupils appear to normal.

SCENARIO IV

On a Saturday evening following a concert, you stop a vehicle for speeding (70 in a 35). During the initial conversation with the subject you notice that she is talking very rapidly, has extremely large pupils and is anxious. There is no odor of an alcoholic beverage on this person's breath. As you administer the standardized field sobriety tests, you observe that there is no Horizontal Gaze Nystagmus and no Vertical Nystagmus. As the driver is performing the walk and turn and one leg stand, her movements are fast. Administration of the Romberg test discloses that the subject has a fast internal clock and muscle tremors.

SCENARIO V

You receive a call to back-up a fellow officer who has stopped a vehicle and is now wrestling with the operator. Upon arrival, you observe that the subject is naked (the temperature is thirty degrees). He appears to be somewhat cooperative but non-communicative. There is no odor of alcoholic beverage on this person's breath. As you administer the standardized field sobriety tests, you observe that there is Horizontal Gaze Nystagmus with immediate onset and Vertical Nystagmus. As the driver is performing the walk and turn and one leg stand tests, his movements are slow and rigid. He was having difficulty dividing attention. Administration of the Romberg test discloses that the subject has a slow internal clock. His skin is warm to the touch.

SCENARIO VI

You have responded to a one car property damage crash. In your initial conversation with the operator you observe him to be drowsy. There is no odor of alcoholic beverage on this person's breath. As you administer the standardized field sobriety tests, you observe that there is Horizontal Gaze Nystagmus and Vertical Nystagmus. As the driver is performing the walk and turn and one leg stand, his movements are slow and his muscle tone appears flaccid. Administration of the Romberg test discloses that the subject has a slow internal clock. The subject's pupils appeared normal in size.

SCENARIO VII

You receive a call to assist a local officer and he explains that he stopped the vehicle for obvious driving impairment. The driver displayed numerous clues and indicators of impairment during the SFSTs. However, he did not demonstrate any clues in Horizontal Gaze Nystagmus or Vertical Nystagmus. Larger than normal pupils and noticeable fluttering eyelids during the Romberg were detected. His internal clock was slowed to 60 seconds. The whites of his eyes appear reddish. He seems totally unconcerned with the thought of possibly being arrested.

SCENARIO VIII

You stop a vehicle for running a red light. As you observe the driver, he is slow to respond, perspiring, and is easily agitated. As the subject is performing the walk and turn and one leg stand, you observe that the subject is very rigid and is having a difficult time dividing attention. He has Horizontal Gaze Nystagmus and Vertical Nystagmus. His eyes are reddish and pupils are larger than normal. Administration of the Romberg test disclosed that the subject has a distorted internal clock.

SESSION VII
PROGRAM CONCLUSION

SESSION VII WRITTEN EXAMINATION AND PROGRAM CONCLUSION

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

- o Complete a written examination with a passing grade.
- o Provide comments and suggestions to improve the course.

CONTENT SEGMENTS

- A. Post Test and Critique
- B. Certificates and Dismissal

LEARNING ACTIVITIES

- o Written Participant Exam

TOPICS FOR STUDY

Test your knowledge of the subject matter covered in this module by trying to answer the following questions. Answers are given on the next page.

1. What is a "drug" as the term is used in this course?
2. What are the seven major categories of drugs?
3. What kind (category) of drug is alcohol? What about cocaine? What about heroin?
4. Name the four eye examinations that provide important indicators of drug influence or medical impairment.
5. What category of drug is PCP? What about marijuana? What about Valium?
6. What category (or categories) of drug usually causes (or cause) the pupils to constrict?
7. What category (or categories) of drug causes (or cause) the pupils to dilate?
8. What categories of drugs usually will not induce horizontal gaze nystagmus?
9. What kind (category) of drug is methamphetamine? What about LSD? What about Peyote?
10. What does the term "polydrug use" mean?

Answers To Review Questions

1. For purposes 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. The seven categories are:
 - Central Nervous System Depressants
 - Central Nervous System Stimulants
 - Narcotic Analgesics
 - Cannabis
 - Hallucinogens
 - Dissociative Anesthetics
 - Inhalants
3. Alcohol is a CNS depressant. Cocaine is a CNS stimulant. Heroin is a narcotic analgesic.
4. The four key eye examinations include:
 - Tracking Ability
 - Horizontal Gaze Nystagmus
 - Pupil Size
 - Vertical Nystagmus
5. PCP is a Dissociative Anesthetic; that category consists of PCP and its various analogs. Marijuana is Cannabis. Valium is a CNS depressant.
6. Narcotic Analgesics usually cause the pupils to constrict.
7. CNS stimulants and Hallucinogens usually cause the pupils to dilate. Cannabis causes dilation of the pupils but may be normal.
8. CNS stimulants, Hallucinogens, Narcotic Analgesics and Cannabis do not induce horizontal gaze nystagmus.
9. Methamphetamine is a CNS stimulant. LSD and peyote are Hallucinogens.
10. "Polydrug use" is the practice of using two or more categories of drugs at the same time, i.e., combining drugs.

APPENDIX I

HORIZONTAL GAZE NYSTAGMUS (HGN)

This is the first of the three standardized field sobriety tests that you will administer to the suspect. Nystagmus is the involuntary jerking of the eyes. HGN is a very reliable field sobriety test by itself (77%). The test requires the suspect to follow a stimulus that is moved in front of the suspect's face.

Administrative Procedures

- o Have the suspect remove their glasses if they are wearing them.
- o Tell the suspect to put their feet together and place their hands at their sides.
- o Tell the suspect to keep their head still during the test.
- o Tell the suspect to look at the stimulus.
- o Tell the suspect to follow the movement of the stimulus with their eyes only.
- o Tell the suspect to continue looking at the stimulus until they are told that the test is over.
- o Position the stimulus approximately 12 to 15 inches from the nose in and slightly above eye level to commence the test.
- o Check for equal tracking of the eyes.
- o Check for equal pupil size and resting nystagmus.
- o Check the eyes for lack of smooth pursuit. Always starting with the suspect's left eye.
- o Check the eyes for distinct and sustained nystagmus at maximum deviation. Start with the left eye.
- o Check the eyes for the onset of nystagmus prior to 45 degrees. Start with the left eye.
- o Total the clues.
- o Check for Vertical Nystagmus.

DOCUMENTING THE TEST

Three validated clues of impairment have been established for the Horizontal Gaze Nystagmus test.

- o Lack of smooth pursuit
- o Distinct nystagmus at maximum deviation
- o Onset of nystagmus prior to 45 degrees

A minimum of four clues are needed to determine if the suspect's B.A.C. level is above 0.10 percent.

WALK AND TURN

This test should already be very familiar to you from your previous training. The test requires the suspect to stand in a heel-to-toe fashion with arms at the sides while a series of instructions are given. Then, the suspect must take nine heel-to-toe steps along a line, turn in a prescribed manner, and take another nine heel-to-toe steps along the line. All of this must be done while counting the steps out-loud and keeping the arms at the sides. The suspect should not stop walking until the test is completed.

Administrative Procedures

- o Tell the suspect to place their left foot on the line.
- o Tell the suspect to place the right foot on the line, in front of the left foot, with the heel of the right foot against the toe of the left foot. **DEMONSTRATE** the heel-to-toe stance.
- o Tell the suspect to put their arms down against their sides, and to keep them there throughout the entire test.
- o Tell the suspect that they are to maintain this position while you give the instructions. **EMPHASIZE** that the suspect must not start walking until you say to "begin".
- o Ask the suspect if they understand.

NOTE: If at any time while you are giving the rest of the instructions the suspect should break away from the heel-to-toe stance, stop giving instructions until he or she resumes the stance.

- o Tell the suspect that, when you say to "begin", they must take nine heel-to-toe steps down the line, turn around, and take nine heel-to-toe steps up the line.

- o Tell the suspect that every time they take a step, the heel must be placed against the toe of the other foot. **DEMONSTRATE** several heel-to-toe steps.
- o Tell the suspect that, when the ninth step has been taken, they must leave the front foot on the line, and turn around using a series of small steps with the other foot. **DEMONSTRATE** a proper turn.
- o Remind the suspect that, after turning, they must take another nine heel-to-toe steps up the line.
- o Tell the suspect that they must watch their feet at all times, must count the steps out loud, and must keep the arms down at the sides.
- o Tell the suspect that, once they start walking, not to stop walking until the test has been completed.
- o Ask the suspect if they understand.
- o Tell the suspect to "begin".

NOTE: If the suspect fails to either look at their feet or count their steps out loud, remind the suspect to do so and note the occurrence on the evaluation form. These tasks are part of the validated clues and must be performed to properly evaluate divided attention.

DOCUMENTING THE TEST

Eight validated clues of impairment have been identified for the Walk and Turn test. Two clues apply while the suspect is standing heel-to-toe and listening to the instructions:

- o Can not keep balance (i.e., suspect breaks away from the heel-to-toe stance)
- o Starts too soon (i.e., suspect starts walking before you say "begin")

At the top of the checklist portion of the Walk and Turn segment of the standardized note guide, you will record the number of times these two clues were observed while you were giving the instructions. For example, if the suspect breaks away from the heel-to-toe stance twice, put two check marks in the "Cannot keep balance" block.

The other **six** validated clues apply during the walking stage of the test. They are:

- o Stops walking
- o Misses heel-to-toe
- o Steps off the line

- o Raises the arms while walking
- o Takes the wrong number of steps
- o Turns improperly

In the checklist area, you will record the first five of those, separately for the first nine steps and the second nine steps. Below the checklist area, you will describe how the suspect turned. If he or she turned in the appropriate fashion, simply write "proper" in that space.

If the suspect "staggered to the left" or executed an "about face" turn, write that description in the space.

If the suspect was unable to begin or complete the test, explain why. Usually, this will be due either to a physical infirmity that precludes the test entirely (e.g., "suspect has an artificial left leg") or to your decision to stop the test (e.g., "suspect is in danger of being injured due to the lack of balance"). Whatever the case might be, some reason must be documented for a test that wasn't given or completed.

ONE LEG STAND

This test requires the suspect to stand on one leg. The other leg is to be extended in front of the suspect in a stiff-leg manner, with the foot held approximately six inches above and parallel with the ground. The suspect is to stare at the elevated foot, and count out loud until told to stop, in this fashion: "one thousand and one, one thousand and two, one thousand and three, ...".

Administrative Procedures

- o Tell the suspect to stand with the feet together and the arms down at the sides.
- o Tell the suspect to maintain that position while you give the instructions; emphasize that they should not try to perform the test until you say to "begin".
- o Ask the suspect if they understand.
- o Tell the suspect that, when you say to "begin", they must raise their leg in a stiff-leg manner, and hold the foot approximately six inches off the ground, with the toe pointed forward so that the foot is parallel with the ground.
- o **DEMONSTRATE** the proper one-legged stance.
- o Tell the suspect that they must keep the arms at the sides and must keep looking directly at the elevated foot, while counting in the following fashion: "one thousand and one, one thousand and two, one thousand and three", and so on until told to stop.

- o Ask the suspect if he or she understands.
- o Tell the suspect to "begin".

NOTE: It is important that this test last for thirty seconds. You must keep track of the time. If the suspect counts slowly, you will tell him or her to stop when thirty actual seconds have gone by, even if, for example, the suspect has only counted to "one thousand and twenty". Indicate/record the suspects actual internal clock time.

DOCUMENTING THE TEST

Four validated clues of impairment have been identified for the One Leg Stand:

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

You will place check marks in or near the small boxes to indicate how many times you observed each of the clue.

You must pay attention to the suspects general appearance and behavior while he or she is performing this test. Take note of any body tremors or muscle tension that may be apparent. Listen for any unusual or "interesting" sounds or statements the suspect might make while the test is in progress. Make sure that any such information is documented on a SFST Field Note Sheet or in your narrative report.

ROMBERG BALANCE

This test requires the suspect to stand with both feet together, the head tilted slightly back, the eyes closed and estimate the passage of thirty seconds. When the suspect believes that the thirty seconds have passed, he or she is to tilt the head forward, open the eyes and say "stop".

Administrative Procedures

- o Tell the suspect to stand with the feet together and the arms down at the sides.
- o Tell the suspect to maintain that position while you give the instructions. Emphasize that they must not start the test until you say "begin".
- o Ask the suspect if they understand so far.
- o Tell the suspect that, when you tell them to, they must tilt their head back slightly and close their eyes. **DEMONSTRATE** how the head should be tilted back, but **DO NOT CLOSE YOUR EYES** while demonstrating.

- o Tell the suspect that when you say "start", they must keep their head tilted back with the eyes closed until they think that thirty seconds have gone by. DO NOT tell the suspect to "count to thirty seconds" or to use any other specific procedure to keep track of time. But on the other hand, DO NOT tell the suspect that they are not allowed to count to thirty seconds. SIMPLY SAY, "keep your head tilted back with your eyes closed until you think that thirty seconds have gone by".
- o Tell the suspect that, when they think the thirty seconds have gone by, they must bring the head forward, open the eyes, and say "stop".
- o Ask the suspect if they understand.
- o Glance at your watch and pick a convenient time to start the test.
- o Tell the suspect to tilt their head back and close their eyes.
- o Tell the suspect to begin.
- o Keep track of the time while the suspect performs the test.
- o When the suspect opens their eyes, ask them "how much time was that?"
- o If ninety seconds elapse before the suspect opens their eyes, stop the test.

Look and listen for the following:

- o suspect unable to stand still or steady with the feet together
- o body tremors
- o eyelid tremors
- o muscle tone (either more rigid or more flaccid than normal)
- o any statements or unusual sounds made by the suspect when performing the test

DOCUMENTING THE TEST

Record the estimated number of inches of sway exhibited by the suspect. You should estimate the approximate extent of swaying for both front to back and side to side.

To indicate impairment of the suspects' "internal clock", record the actual number of seconds the suspect stood with the eyes closed.

Document any of the above, or any other noteworthy observations and explain as necessary in the narrative section of your report.

APPENDIX II

SUGGESTED ADDITIONAL REFERENCES AND RESOURCES

ABC'S OF THE HUMAN BODY. The Reader's Digest Association, INC., Pleasantville, New York, 1987.

THE BRAIN. Richard Restak, M.D., Bantam Books, Toronto, 1984.

CHOCOLATE TO MORPHINE: UNDERSTANDING MIND-ACTIVE DRUGS. Andrew Weil, M.D. and Winifred Rosen, Houghton Mifflin Company, Boston, 1983.

COCAINE: THE MYSTIQUE AND THE REALITY. Joel L. Phillips and Ronald D. Wynne, Ph.D., Avon Books, New York, 1980.

COMPLETE GUIDE TO PRESCRIPTION & NON-PRESCRIPTION DRUGS. H. Winter Griffith, M.D. HP Books, Inc., Tucson, AZ, 1985.

COMPLETE GUIDE TO SYMPTOMS, ILLNESS & SURGERY. H. Winter Griffith, M.D. HP Books, Los Angeles, 1985.

DESIGNER DRUGS. M.M Kirsch. CompCare Publications, Minneapolis, 1986.

DRUGS AND LAW FOR THE STREET COP. Gary J. Miller, Miller Publications, Gilroy, CA 1986.

DRUGS AND SOCIETY. Weldon L. Witters PH.D & Peter J. Ventucelli Ph.D. Jones & Bartlett Publishers, Boston, 1988.

HEROIN USE: LEGAL AND MEDICAL ASPECTS. Paul R. Edholm, Jr., Richard P. Neidorf. Heroin Information Publications, Beverly Hills, CA, 1978.

LICIT AND ILLICIT DRUGS: THE CONSUMER UNION REPORT. Edward M. Brecher. Little, Brown, and company, Boston, 1972.

THE LITTLE BLACK PILL BOOK. Bantam Books, Toronto, 1985.

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MEDICAL DICTIONARY FOR THE NON PROFESSIONAL. Charles F. Chapman. Barron's Educational Series, Woodbury, New York.

THE PHYSICIAN'S GUIDE TO PSYCHOACTIVE DRUGS. Richard Seymour, M.A. and David Smith, M.D. The Haworth Press, New York, 1987.

PLANTS OF THE GODS: ORIGINS OF HALLUCINOGENIC USE. Richard Evans Schultes & Albert Hogmann, Alfred van der Marck Editions, New York, 1979.

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PSYCHIATRIC DICTIONARY Leland E. Hinsie, M.D. & Robert J. Campbell, M.D. Oxford University Press, New York, 1970.

SIGNS AND SYMPTOMS HANDBOOK. Clinical Director Barbara McVan, R.N. Springhouse Corporation, Springhouse, PA 1986.

STEAL THIS URINE TEST: FIGHTING DRUG HYSTERIA IN AMERICA. Abbie Hoffman, Penguin Books, New York, 1987.

THE SUBSTANCE ABUSE PROBLEMS. VOLUMES ONE AND TWO. Sidney Cohen, M.D. The Haworth Press, New York, 1985.

USE AND ABUSE OF AMPHETAMINE AND ITS SUBSTITUTES. Research Issue 25. National Institute on Drug Abuse, Rockville, Maryland, 1980.

SOURCES OF DRUG INFORMATION

1. National Institute of Drug Abuse
5600 Fishers Lane
Rockville, Maryland 20857

Ask for: Research *26-Guide to Drug Abuse Terminology
 Research *27-Guide to Drug Use Research Literature

2. Vista Hill Foundation
Drug Abuse/Alcoholism Newsletter
3420 Camino del Rio North, Suite 100
San Diego, California 92108

This is a newsletter which is published ten times a year and mailed about once a month. Topics deal with alcohol and drugs.

3. National Clearinghouse for Drug Abuse Info (NCDAI)
P.O. Box 416
Kensington, Maryland 20795

The above sources will furnish, free of charge information on drugs. Simply write to them requesting the information with a return address. Information will be mailed in about six to eight weeks.

APPENDIX III

**OVERVIEW OF STANDARDIZED FIELD SOBRIETY TESTING
RESEARCH AND DEVELOPMENT
DWI DETECTION AND STANDARDIZED FIELD SOBRIETY TESTING**

1. First Phase: The Developmental ResearchA. What were the research objectives?

- o To evaluate currently used physical coordination test to determine their relationship to intoxication and driving impairment.
- o To develop more sensitive tests that would provide more reliable evidence of impairment.
- o To standardize the tests and observation.

B. Who conducted the research?

Southern California Research Institute (SCRI)

The final report:

Burns, Marcelline and Moskowitz, Herbert Psychophysical Tests for DWI:
June, 1977 NHTSA Report Number DOT HS-802 424 (available for National
Technical Information Service, Springfield, Virginia 22161)

C. Who were the test subjects?

There were 238 volunteers, of whom 168 were males and 70 females. They were paid \$3.00 per hour, and they each participated in one testing session.

The volunteers were interviewed by SCRI staff, and on the basis of the interview they were classified as either light, moderate or heavy drinkers. They were randomly assigned to "target BAC" levels appropriate to their classifications. The following shows the distribution of BACs achieved by volunteers:

	<u>Light Drinkers</u>	<u>Moderate Drinkers</u>	<u>Heavy Drinkers</u>	<u>Totals</u>
No Alcohol (0.00%)	26	27	26	79
Approximately 0.05%	36	16	3	55
Approximately 0.075%	--	6	7	13
Approximately 0.10%	--	37	13	50
Approximately 0.15%	--	--	41	41

D. Who tested the subjects?

Ten police officers, representing four agencies in the vicinity of Los Angeles, did all of the testing. Each officer examined an average of 23-24 volunteers. While the officer was conducting the examinations, a member of the SCRI staff observed the examinations.

NOTE: Neither the volunteer, the officer, nor the observer knew the volunteer's BAC. Separate members of the SCRI staff handled the dosing and breath testing of volunteers.

E. What tests were administered?

Each volunteer was subjected to six tests:

- o One Leg Stand
- o Finger-to-Nose
- o Finger Count
- o Walk-and-turn
- o Tracing (a paper-and-pencil exercise)
- o Nystagmus (called "alcohol gaze nystagmus" in the final report)

Each officer was given one day's training in the administration and scoring of these tests prior to conducting the experiment. NOTE: Only two of the ten officers had any prior experience with nystagmus.

F. In general, how were the tests "scored"?

Each of the six tests were "scored" on a scale from 0 to 10; for the nystagmus test, each eye was "scored" independently, so that a subject's total nystagmus "score" could range from 0 to 20.

The higher the "score," the more impaired the subject appeared to be.

Whenever a volunteer was tested, the officer administering the test and the SCRI researcher observing the test independently scored the subject's performance.

G. What were the nystagmus administration and "scoring" procedures?

The volunteer was seated, with his or her chin in a chin rest, and faced a small light bulb mounted on a swing arm that could be moved to precise angles on either side.

The volunteer was instructed to cover the left eye and follow the movement of the light bulb with the right eye. The officer slowly moved the swing arm to the 30-degree mark, and left it there for several seconds, while observing the volunteer's eye for jerking. "Points" were scored as follows:

no jerking	0 point
minimal jerking	2 points
moderate jerking	3 points
distinct, easily observed jerking	5 points

Next, the officer slowly moved the swing arm to the 40-degree mark and left it there to observe the eye once again. The same scoring system was used. Then, the score for the right eye was determined by adding the scores at the 30-degree and 40-degree marks. For example, if the eye showed minimal jerking at 30- degrees (2 points) but moderate jerking at 40-degrees (3 points), the score for the eye would be 5 points.

Finally, the volunteer was instructed to uncover the left eye and cover the right eye, and the entire procedure was repeated to determine the left eye's "score." NOTE: The scores for the two eyes often were different, by a point or two.

H. What were the administration and "scoring" procedures for walk-and-turn?

The volunteer was told to stand facing the examiner (not in a heel-to-toe posture) and to "watch what I do so you will be able to do it the same way. I want you to put one foot here on the line, and then take exactly nine steps along the line, touching your heel to your toe each step."

(The examiner then demonstrated the heel-to-toe step.)

"Then, turn and take 9 steps back along the line, touching heel-toe. (NOTE: Apparently the examiner did not demonstrate the turn.) Do you understand? Come here to the line and begin."

The officer and observer independently "scored" the volunteer's performance, using the following scheme:

no problem	0 point
falls, won't attempt test, or discontinues test	10 points
slow or minor problem in performing test	1-1 points (examiner's judgment)

Or, the examiner could assign 1 or 2 points for each of the following cues (up to a maximum of 10 points, total, for the test):

- o loses balance while walking
- o loses balance while turning
- o cannot stay on line
- o extreme use of arms and/or body to maintain balance
- o does not touch heel-toe
- o incorrect number of steps
- o stops to steady self
- o requires repeat of demonstration

I. What were the administration and "scoring" procedures for One-Leg-Stand?

The volunteer was told to "watch what I do but don't begin until I tell you. Stand with your feet together, arms at your side, and hold one leg straight forward, like this."

(At this point, the examiner demonstrated the one-legged stance, holding his or her foot 8-12 inches off the floor.

"Do you understand? Ready? Being. Don't put your foot down until I tell you to."

NOTE: The subject was not required to count aloud for 30 seconds. Instead, the examiner simply terminated the test after 30 seconds.

The officer and the observer independently "scored" the volunteer's performance, using the following scheme:

no problem	0 point
slightly unsteady	2 points
moderately unsteady	4 points
extremely unsteady	6 points

And, 1 point was added for each of the following, if observed:

- o required a repeat of the instructions
- o put the foot down
- o used arms for balance

If the volunteer fell, or made no attempt to perform the test, or discontinued the test, he or she was "scored" 10 points.

J. What did the researchers learn?

The researchers analyzed their data and found that, using the scores for all six tests, they could correctly classify a volunteer's BAC as being either above or below 0.10% about 83 percent of the time.

Further, the researchers found that this same level of reliability could be achieved just by considering the scores on nystagmus, walk and turn, and one leg stand. In other words, those three tests constituted an 83% reliable battery for distinguishing BACs of 0.10% or more from BACs below 0.10%. What about the 17% of volunteers whose BACs were misclassified? How did the researchers account for them?

First, half of the volunteers who were misclassified had BACs between 0.08% and 0.12%, a "borderline" range in which it can be very hard to distinguish among slight differences in impairment. Secondly, almost all of the remaining misclassified volunteers were either light drinkers with BACs of at least 0.05% (who may well have appeared and been very impaired at that level), or heavy drinkers with BACs below 0.15% (whose experience with alcohol may have helped them mask the signs of impairment).

K. What was the overall conclusion?

The three-test battery made up of nystagmus, walk and turn, and one leg stand clearly appeared to offer a very reliable field sobriety testing procedure. But these tests were not yet standardized in their final form. That standardization was achieved in the next phase of research.

2. The Second Phase: Initial Validation Research

A. What were the research objectives?

- o To complete the development and validation of the sobriety test battery.
- o To assess in the field the battery's feasibility, and its effectiveness for estimating BAC and facilitating identification of persons with BACs above 0.10%.

B. Who conducted the research?

Southern California Research Institute (SCR).

The final report:

Tharp, V., Burns, M. and Moskowitz, H. Development and Field Test of Psychophysical Tests for DWI Arrest, March 1981. NHTSA Report Number DOT HS-805 864 (available from NTIS, Springfield, Virginia 22161).

C. Who were the test subjects?

During the first (laboratory) portion of this research effort, the test subjects were 296 volunteers, of whom 202 were males and 94 females. In the second (field) portion, the "subjects" were 3,128 drivers stopped by participating police officers (or traffic law violations and either routine causes. Of these, the officers at least initially suspected 396 might be under the influence of alcohol or other drugs; 215 ultimately were arrested for DWI.

The 296 laboratory subjects each participated in at least one testing session. And, 145 of them returned for a second session, for a total of 441 subject-days of testing. The following table shows the distribution of these subjects by drinker classification and "target BAC;" the numbers in parenthesis refer to the subjects who returned for a second session.

	Light <u>Drinkers</u>	Moderate <u>Drinkers</u>	Heavy <u>Drinkers</u>	<u>Totals</u>
No Alcohol (0.00%)	30(18)	32(16)	35(16)	97(50)
Approximately 0.05%	33(15)	33(16)	36(17)	102(48)
Approximately 0.11%	--	30(15)	34(14)	64(20)
Approximately 0.15%	--	--	33(18)	33(18)

D. Who tested the subjects?

For the laboratory portion of the study, ten police officers from three agencies in the metropolitan Los Angeles area did the testing. Each officer examined an average of 44 subjects (including returnees). While the officer conducted the examinations, a member of the SCRI staff observed. Neither the volunteer, the officer, nor the observer knew the volunteer's BAC.

For the field portion of the study, participating officers were drawn from four stations of the Los Angeles County Sheriff's Office. They included a group called the "experimentals" (who received training in the SFSTs), and a group of "controls" (who were not trained until the final stage of the study). Both groups were instructed to complete data forms for all of their traffic stops during the study period: in addition, SCRI researchers periodically rode with every officer to monitor their performance.

E. What tests were administered?

In both the laboratory and field portion of the study, participating officers (except the "controls") administered Horizontal Gaze Nystagmus, Walk and Turn, and One Leg Stand. Some of the officers had some prior experience with these tests, but all received one half day's training in test administration and scoring.

In addition to recording subjects' performance on the SFSTs, the officers attempted to estimate each subject's BAC.

F. How did the officers do in their estimation of subjects' BAC?

In both the laboratory and field portion of the study, the average absolute value in the difference between officers' estimates and subjects' actual BACs (as measured on a breath testing instrument) was 0.03%. The error in the officers' estimates appeared to be random, i.e., their estimates were high about half the time and low about half the time. It should be observed that a laboratory study provides a relatively "easy" context in which to estimate BACs. All participants know (or quickly learn that the research team will not expose the subjects to very elevated levels (e.g., 0.20% or more), and since the study design is based on fairly precise "target BACs" the subjects tend to "cluster" in the BACs they actually achieve. In other words, it would not be too difficult to make a fairly good educated guess of a subject's BAC if the officer has a reasonable amount of experience in DWI enforcement. Despite the favorable context, the officers' estimates were off by more than 0.03% about half the time.

In the study's field portion, the researchers concluded that most of the officers' estimates of subjects' BACs were invalid. Apparently, most of the participating officers filled out their data forms at the end of their shift, when they already knew the BACs of most arrestees.

G. What were the nystagmus administration and "scoring" procedures?

In the laboratory portion, two kinds of nystagmus measurements were made on each subject. First, the officer examined the subject to: estimate the angle of onset; check for lack of smooth pursuit; and, check for distinct jerking at maximum lateral deviation. These checks were performed in both eyes. Second, the subject was seated at the light bulb/swing arm device used in the previous study, and a measurement of the angle of onset was obtained for each eye. In their previous research, and in their review of studies conducted by other researchers, the SCRI staff found evidence that "a strong correlation exists between the BAC and the angle of onset..." They found that the mathematical expressions of the correlation are slightly different for the left and right eyes, but in either eye an angle of 41 degrees would correspond to a BAC of about 0.10%. They wanted to learn whether officers could estimate onset angles with reasonable precision, and whether the estimate can accurately distinguish subjects above 0.10% from those below that level.

The SCRI researchers did not report the actual data that would compare the officers' onset angle estimates with the swing arm device measurements of onset angle. Instead, they furnished a list of Pearson Product Moment Correlation Coefficients, for each officer and observer, that express how each officer's estimates "track" with the device measurements. A bit of explanation is needed in order to understand these coefficients.

In general terms, a correlation coefficient expresses the "closeness" of two sets of data. If a change in the value of one item is always associated with a systematic change in the value of the other item, then we can say that the two items are closely correlated. For example, in the summer months, there is probably a pretty close correlation between the highest daytime temperature and the number of people visiting beaches: the higher the temperature (i.e., the hotter it gets), the more people you'll find at beaches (trying to cool down). But if a change in one variable has nothing to do with changes in the other item, then we say that the two items are uncorrelated.

For example, the number of people visiting beaches in America on any given day probably has nothing to do with the number of loaves of bread sold in Russia on that same day. Some days, lots of bread will get sold in Russian, and lots of Americans will go swimming. But other days, just as many Russians will buy bread, but quite a different number of Americans will be at the beach. The two items just aren't related. Another common situation occurs when two items are related, but the relationship is not exact. For example, the number of runs a baseball team scores in a game in general probably is related to the number of hits the team makes in the game: in other words, the more hits you get, the more likely you are to score runs.

But this relationship is far from perfect: it is quite possible to get very few hits and still score lots of runs, if the other team makes lots of errors or gives up lots of walks. Runs and hits in a game probably are correlated, but the correlation may be weak.

The correlation coefficient gives an indication of the strength or weakness in the relationship between two items. The highest absolute value that the correlation coefficient can have is 1.00, and that occurs when the two items are perfectly correlated. That would mean that, if you know the value of one item you could exactly predict the value of the other item. The lowest absolute value of the correlation coefficient is 0. That occurs when the two items have absolutely nothing in common, i.e., when knowledge of the value of one is of no help at all in predicting the value of the other.

It is important to understand that two items could have a very high correlation without having equal values. Consider the comparison between an officer's onset angle estimations and the device-measured angles. If an officer consistently underestimated the device's angle by 10 degrees, we would not think that the officer was very accurate. That is, if the officer said "35" when the device indicated "45," and said "40" when it indicated "50," and so on, we would consider those to be bad estimates. But the correlation between the officer's estimates and the device's would be perfect, and the correlation coefficient would be 1.00, simply because the relationship between the two variables would be perfectly predictable.

In reporting only the correlation coefficients for the officers' estimates the SCRI researchers are not describing the officers' accuracy, but only are indicating whether there is some systematic relationship between the measured angles and each officer's estimates of them.

With all that preamble now accomplished, the correlation coefficients for the ten officers' angle estimates ranged from a low of 0.234 to a high of 0.719. Most of these correlations (at least) probably are statistically significant (although the report does not state that), but in practical terms the correlations would be considered weak to moderate. This can be quantified: when the correlation coefficient is squared (i.e., multiplied by itself), the resulting number expresses the percentage of variability in one item that can be related to variability in the other item. In loose terms, it tells us how useful one item is in predicting the value of the other. For example, suppose the correlation coefficient for two items were 0.500. The square of that would be 0.250. That would mean that 25 percent of the variability in one item could be related to the variability of the other, or that one item would be about 25 percent useful in predicting the other.

The best of the ten officers had a correlation coefficient for angle estimations of 0.719. The square of that is .517. That officer's estimates are about 50% useful in predicting the "true" onset angle. The worst estimating officer had a coefficient of 0.234, which means that his or her estimates are about 5% useful. The average correlation coefficient for the ten officers was 0.475, indicating an average utility of a bit less than 23 percent.

Of course, the ability of officers to estimate onset angle is only part of the story. We also have to consider how well the "true" onset angle can predict BAC. The SCRI researchers report two different correlation coefficients for onset versus BAC, one for the left eye (absolute value of 0.780) and one for the right (absolute value of 0.740). If the higher value is accepted, then the device-measured onset angle is about 60% useful in predicting BAC.

These are not encouraging words for anyone who would claim the ability to use horizontal gaze nystagmus to "predict" BAC. The so-called "true" onset angle is only about 60% useful in predicting BAC. The average officer's estimates are less than 25% useful in predicting onset angle, and even this says nothing about any systematic inaccuracy that may exist in the officer's estimates. At best, one can expect only a 25% chance of reaching something that has a 60% chance of being useful, or overall a 15% chance of getting to anything at all. Given this, it is not surprising that these officer's were off in their estimates of subjects' BACs by an average of 0.03%, despite the favorable estimation conditions of a controlled drinking experiment.

In both the laboratory and field portions of this study, officers were instructed to record the following nystagmus data, for each eye:

- o Whether onset occurred within 45 degrees, with at least 10% of the white of the eye showing;
- o The estimated angle of onset;
- o Whether the eye was unable to follow smoothly;
- o Whether the nystagmus at maximum deviation was absent minimal, moderate or heavy.

One "point" was "scored" for each eye if onset occurred within 45 degrees; if the eye was unable to follow smoothly; and if the nystagmus at maximum deviation was moderate or heavy.

H. What were the administration and "scoring" procedures for Walk and Turn?

Based on a review of previous research, the SCRI staff decided to modify the Walk and Turn test to incorporate a divided attention feature. Thus, the subject was instructed at the outset to "assume a heel-to-toe position on the line with your arms at your sides." The officer gave no further instructions until the subject assumed the proper stance. Then, the rest of the instructions were issued, in the same manner that they were given during the previous phase of research.

Walk and Turn "scoring" procedures also were modified, and they were slightly different for the laboratory versus field portions of this study. In the laboratory tests, officers and observers were told to "score" one "point" for each of the following behaviors.

- o cannot keep balance while listening to instructions
- o starts before instructions are finished
- o keeps balance but does not remember instructions
- o stops while walking to steady self
- o does not touch heel-to-toe while walking
- o loses balance while walking (i.e., steps off line)
- o uses arms for balance
- o loses balance while turning
- o incorrect number of steps

If the laboratory subject was "unable to do the test," the officers and observers were instructed to "score" ten points."

For the field portion of the study, the item marked above with an asterisk ("keeps balance but does not remember instruction") was dropped, and nine "points" were given for being unable to perform the test. Thus, by the time the field study began, administration and "scoring" procedures for Walk and Turn had evolved to essentially their present state.

I. What were the administration and "scoring" procedures for One Leg Stand?

SCRI researchers decided to add a divided attention feature to this test as well. The subject now was to be instructed to count aloud, "One thousand and one, one thousand and two....one thousand and thirty." Also, the instructions were modified to call for raising the foot about six inches off the ground, rather than the 8-12 inches specified during the previous research phase.

One Leg Stand "scoring" differed slightly from the laboratory to the field portions of this study. Laboratory subjects were assessed one "point" for each of the following behaviors:

- o Swaying while balancing
- o Uses arms to balance
- o Slightly unsteady
- o Quite unsteady
- o Starts before instructions are finished
- o Puts foot down.

If a laboratory subject was unable to do the test or discontinued the test, he or she was to be assessed seven "points."

By the beginning of the field study, SCRI researchers had dropped the two items marked with asterisks, and were assessing five "points" for being unable to perform. Thus, One Leg Stand had evolved very nearly to its present state. Subsequently, NHTSA staff recognized that the scoring factor "quite unsteady" was subjective; based on a re-analysis of the SCRI data, that factor was changed to "hops."

J. What did the researchers learn?

1. The Laboratory Phase

Results of the laboratory study demonstrated that the battery of three tests could be used reliably to distinguish subjects with BACs of 0.10% or more from those with lower BACs. Collectively, the ten officers and two observers were correct in classifying subjects' BACs (above or below 0.10%) about 82% of the time. Subsequent to publication of the SCRI report, NHTSA re-analyzed the laboratory test data and found that the nystagmus test, by itself, could have produced 77% accurate classifications. Similarly, Walk and Turn was capable of 68% unaided accuracy, and One Leg Stand of 65%. NHTSA also found that it would be possible to combine the results of nystagmus and Walk and Turn in a "decision matrix," and achieve 80% accuracy.

2. The Field Phase

SCRI reported a number of problems that plagued the field study, chief among which was a lack of consistency by participating officers in submitting data forms. SCRI concluded that the field test data would not support in-depth statistical analysis, but nevertheless disclosed some favorable trends:

- o after training on the test battery, officers tended to make more DWI arrests; and,

- o trained officers were more accurate in identifying suspects whose BACs are above 0.10%.

The overall conclusion of this study was that the test battery works well. But it remained necessary to conduct a rigorous field test.

3. The Third Phase: Large Scale Field Validation

a. What were the research objectives?

- o To develop standardized, practical and effective procedures for police officers to use in reaching arrest/no arrest decisions;
- o To secure data to determine if the tests will discriminate as well in the field as in the laboratory.

In support of the first of the objectives, the NHTSA research staff began by re-analyzing the SCRI data with a view toward systematizing the administrative and "scoring" procedures for the three tests. The intent was to ensure that the tests would be quick and easy to use; that they could each be used independently of one another, i.e., if the officer elected to use only one or two of the tests; and, that they would maximize the detection of drivers at BACs of 0.10% or more while minimizing the continued investigation of persons below that level.

b. Who conducted the research?

The National Highway Traffic Safety Administration (NHTSA)

The final report:

Anderson, T., Schweitz, R., and Snyder, M. Field Evaluation of a Behavioral Test Battery for DWI September 1983, NHTSA Report Number DOT HS-806 475 (available from NTIS, Springfield, Virginia 22161).

c. Who were the test subjects?

There were 1,506 drivers stopped for suspicion of DWI during a three-month period during late 1982/early 1983. Of these, approximately 80% were examined using all three tests.

d. Who tested the subjects?

Police officers representing four large agencies in the eastern portion of the country did the testing. All participating officers completed a one day training session prior to the beginning of the study. The training included practice in administering the tests to volunteer drinkers.

e. What tests were administered?

The officers used the three tests that make-up the Standardized Field Sobriety Testing battery. As previously noted, not all subjects were exposed to all three tests, primarily because circumstances of the stop location and/or the subject sometimes precluded use of one or two of the tests. But 89% of subjects were examined using the nystagmus test, 84% on Walk and Turn and 82% on One Leg Stand.

f. What were the test administrative and "scoring" procedures?

The procedures followed in using and interpreting the tests were essentially those spelled out in the current NHTSA training program DWI Detection and Standardized Field Sobriety Testing (1987 Update). The tests are "standardized" in the sense that:

- o they are always administered in the same way;
- o the officer administering the tests always looks for a specific set of clues on each test; and,
- o the officer always assesses a subject's performance relative to a specific criterion for each test.

g. What are the "standardized" elements of the Horizontal Gaze Nystagmus test?

(1) Standardized Administrative Procedures

- o Hold the stimulus approximately 12-15 inches in front of the subject's face.
- o Keep the tip of the stimulus slightly above the subject's eyes.
- o Always move the stimulus smoothly.
- o Always check for all three clues in both eyes.

NOTE: It does not matter whether you check for the three clues in one eye and then check the other eye, or check the first clue in both eyes, then the second clue in both eyes, etc. Either approach is acceptable as long as you always examine all clues in both eyes.

- o Check the clues in this sequence: lack of smooth pursuit; distinct jerking at maximum deviation; onset within 45 degrees.
- o Always check for each clue at least twice in each eye.

(2) Standardized Clues

- o Lack of smooth pursuit.
- o Distinct jerking at maximum deviation.
- o Onset of jerking within 45 degrees.

No other "clues" are recognized by NHTSA as valid indicators of horizontal gaze nystagmus. In particular, NHTSA does not support the allegation that onset angle can reliably be used to estimate BAC, and considers any such estimation to be misuse of the horizontal gaze nystagmus test.

(3) Standardized Criterion

The maximum number of clues of horizontal gaze nystagmus that a subject can exhibit is six. That would occur when all three clues are observed in both eyes. If a subject exhibits four or more clues that should be considered evidence that he or she is under the influence.

h. What are the "standardized" elements of Walk and Turn?

(1) Standardized Administrative Procedures

- o Always begin by having the subject assume the heel-toe stance.
- o Verify that the subject understand that the stance is to be maintained while the instructions are given.
- o If the subject breaks away from the stance as the instructions are given, cease giving instructions until the stance is resumed.
- o Demonstrate several heel-toe steps.
- o Demonstrate the turn.

- o Tell the subject to keep the arms at the sides, to watch the feet, to count the steps aloud, and not to stop walking until the test is completed.
- o Ask the subject whether he or she understands; if not, re-explain whatever the subject does not understand.
- o Tell the subject to begin.
- o If the subject staggers or stops, allow him or her to resume from the point of interruption: do not require the subject to start over from the beginning.

(2) Standardized Clues

- o Loses balance during the instructions (i.e., breaks away from the heel-toe stance).
- o Starts walking too soon.
- o Stops while walking.
- o Misses heel-to-toe while walking (i.e., misses by at least one-half inch).
- o Raises arms from side while walking (by six inches or more).
- o Steps off the line.
- o Turns improperly.
- o Takes the wrong number of steps.

These eight are the only validated clues of Walk and Turn. However, officers may see or hear other noteworthy evidence while the subject is performing this test, and officers should include any such observations in their reports.

Officers should note in their reports how many times each of the eight clues appears. However, for purposes of applying the standardized criterion (discussed below), a clue should be "counted" only once, even if it appears more than once.

If the subject cannot perform or complete the test, (it should be considered that he or she has exhibited nine clues. One situation that would warrant this is if the subject steps off the line three or more times.

(3) Standardized Criterion

If a subject exhibits at least two clues on Walk and Turn, it should be considered evidence that he or she is under the influence.

i. What are the "standardized" elements of One-Leg Stand?

(1) Standardized Administration Procedures

- o Tell the subject to stand with heels together, and arms at sides.
- o Tell the subject not to start the test until you say to do so.
- o Ask the subject whether he or she understands.
- o Tell the subject he or she will have to stand on one foot, with the other foot about six inches off the ground.
- o Demonstrate the stance.
- o Tell the subject to count from 1 to 30, by thousands.
- o Demonstrate the count, for several seconds.
- o Ask the subject whether he or she understands: if not, re-explain whatever is not understood.
- o Tell the subject to begin.
- o If the subject stops or puts the foot down, allow him or her to resume at the point of interruption; do not require the count to begin again at "one thousand and one."

(2) Standardized Clues

- o Sways
- o Puts foot down
- o Hops
- o Raises arms from side (six inches or more)

These are the only four validated clues of One Leg Stand. However, officers may see or hear other noteworthy evidence while this test is being performed, and should include any such evidence in their reports.

If the subject cannot perform or complete the test, it should be considered that he or she has exhibited five clues. One event that would warrant this is if the subject puts the foot down three or more times.

(3) Standardized Criterion

If the subject exhibits two or more clues on One Leg Stand, it should be considered evidence that he or she is under the influence. As with Walk and Turn, clues should be counted only once in applying this criterion.

j. What did the researchers learn?

The three standardized tests were found to be highly reliable in identifying subjects whose BACs were 0.10% or more. Considered individually, the nystagmus test was the most accurate of the three: among subjects who exhibited four or more clues, 82% had BACs of 0.10% or higher; but the other two tests were nearly as accurate (80% for Walk and Turn, 78% for One Leg Stand). When the nystagmus and Walk and Turn results were jointly interpreted using the decision table, they proved capable of correctly classifying 83% of subjects.

The importance of this large scale (field validation study deserves to be emphasized. It was the first significant assessment of the "workability" of the standardized tests under actual enforcement conditions, and it was the first time that completely objective clues and scoring criteria had been defined for the tests. The results of the study unmistakably validated the SFSTs.

But it is also necessary to emphasize one final and major point: this validation applies only when the tests are administered in the prescribed, standardized fashion; and only when the standardized clues are used to assess the subject's performance; and, only when the standardized criteria are employed to interpret that performance. If any of the standardized elements of the tests is changed, their validity will be threatened.

 Course Location

Date

DRUGS THAT IMPAIR DRIVING Participant's Critique

A. Workshop Objectives

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

	<u>Yes</u>	<u>No</u>	<u>Not Sure</u>
1. Define the term "drug" in the context of DWI Enforcement.	_____	_____	_____
2. Name the seven categories of drugs.	_____	_____	_____
3. Describe the observable signs generally associated with the seven drug categories.	_____	_____	_____
4. Improve your ability to recognize and interpret evidence of DWI/Drug violations.	_____	_____	_____
5. Enable you to administer and interpret validated psychophysical tests to DWI/Drug suspects.	_____	_____	_____
6. Describe medical conditions and other situations that can produce similar signs.	_____	_____	_____

B. Workshop Sessions and Quality of Instruction

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

	Session/Activity	Quality
Legal Issues	_____	_____
Overview of Major Indicators of Impairment	_____	_____
Romberg Balance Test Procedures	_____	_____
Eye Examinations	_____	_____
Signs of Injection and Ingestion	_____	_____
Drug categories and their observable effects	_____	_____

C. Course Design

Please circle the appropriate word to indicate your agreement or disagreement with each of the following statements:

1. The program contains some information that is not needed and that should be deleted.

Agree Disagree Not Sure

2. There are some important topics missing from the programs that should be added.

Agree Disagree Not Sure

3. The program is too short.

Agree Disagree Not Sure

4. I feel this program has improved my own ability to enforce DWI/ Drug laws.

Agree Disagree Not Sure

5. The instructors did a good job.

Agree Disagree Not Sure

6. I am very glad I attended the program.

Agree Disagree Not Sure

7. The program is too long.

Agree Disagree Not Sure

8. The instructors should have been better prepared.

Agree Disagree Not Sure

9. I feel fully qualified to use the eye exam test now.

Agree Disagree Not Sure

10. I feel fully qualified to use the Romberg Balance test now.

Agree Disagree Not Sure

11. I already knew most of this information.

Agree Disagree Not Sure

12. This "Drug that Impair Driving" Session definitely will improve my ability to identify drug impaired drivers.

Agree Disagree Not Sure

13. This training will assist me in identifying and arresting the drug impaired driver.

Agree Disagree Not Sure

D. If you absolutely had to delete one session or topic from this course, what would it be?

E. If you could add one new topic or session to this course, what would it be?

F. Overall Course Rating

Please rate the overall quality of the seminar on a scale from 1 to 5 where: 5=Excellent, 4=Very Good, 3=Good, 2=Fair, 1=Poor.

Overall course Rating: _____

G. Quality of Instruction

Please rate each instructor on a scale from 1 to 5 where: 5=Excellent, 4=Very Good, 3=Good, 2=Fair, 1=Poor.

Instructor Rating

Instructor Rating

Instructor Rating

Instructor Rating

H. Please provide any final comments or suggestions that you feel are appropriate.
