1 Hour and 50 Minutes

SESSION XXIV

DRUG COMBINATIONS

SESSION XXIV DRUG COMBINATIONS

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

- Explain the prevalence of polydrug use among drug impaired subjects and identify common combinations of drugs abused by those subjects.
- Describe the possible effects that combinations of drugs can produce on the major indicators of drug impairment.
- Define the terms "Null," "Overlapping," "Additive," and "Antagonistic" as they relate to polydrug effects.
- Identify the specific effects that are most likely to be observed in persons under the influence of particular drug combinations.

CONTENT SEGMENTS

A. The Prevalence of Polydrug Use

B. Possible Effects of Drug Combinations

C. Identifying Expected Indicators of Specific Combinations

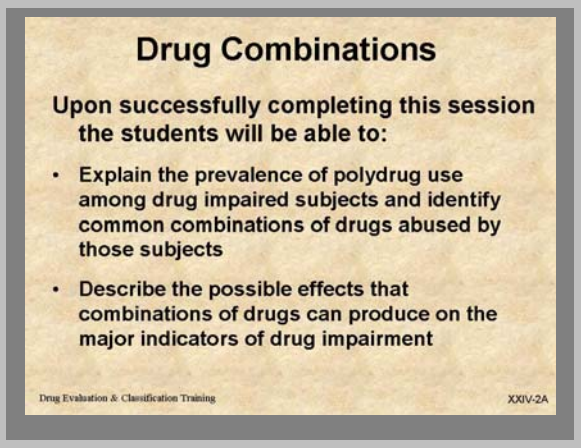
LEARNING ACTIVITIES

- Instructor-Led Presentations
- Interactive Discussions
- Workbook Exercise
- Video Presentations

I. DRUG COMBINATIONS

Session 24-1: Drug Combinations

Session 24-2A: Drug Combinations

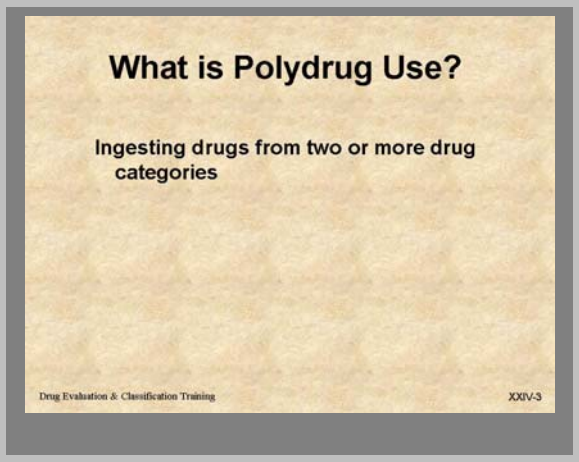


Session 24-2B: Drug Combinations

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

A. The Prevalence of Polydrug Use

Session 24-3: What is Polydrug Use?



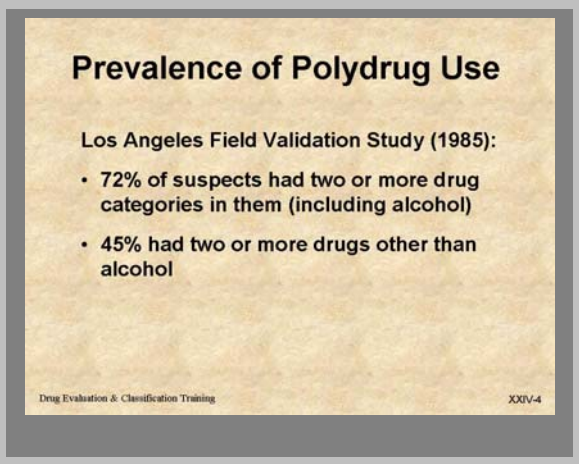
Polydrug

- Polydrug use means ingesting drugs from two or more drug categories.

Prevalence of Polydrug Use

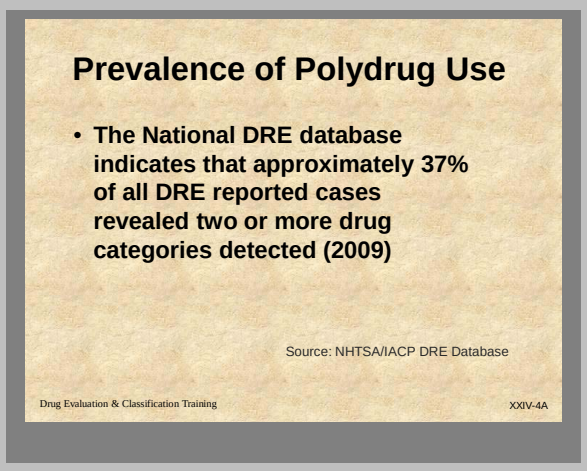
It is actually more common for a DRE to encounter polydrug users than single drug users.

Session 24-4: Prevalence of Polydrug Use



- In the Los Angeles Field Study (1985), 72% of the suspects had two or more drugs in them.
    - Point out that 81 of the 173 suspects (47%) in the Los Angeles Field Study had alcohol in combination with one or more other drugs.
- If we discount alcohol, nearly half (45%) of the Field Study suspects had two or more other drugs in them.

Session 24-4A: Prevalence of Polydrug Use



National DRE

- 2009 data collected from the national DRE tracking database from DREs throughout the U.S. indicates that approximately 37% of all cases with toxicology resulted in two or more drug categories detected.

- Emphasize: Not all states are represented in the database therefore, the 37% may be low. DRE's nationwide are encouraged to enter their evaluations in the national DRE database. Contact your state coordinator.

- Solicit students' comments and questions about the prevalence of polydrug use.

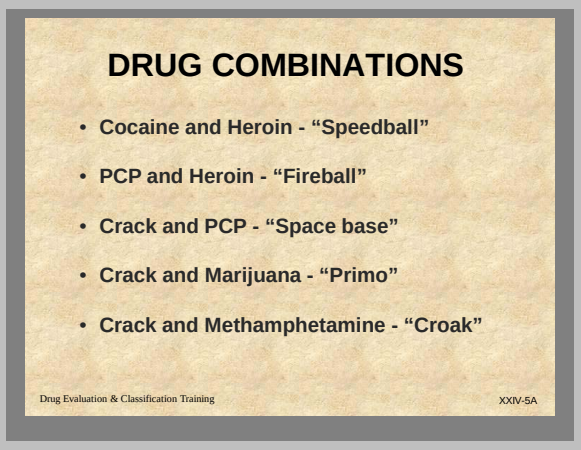
Session 24-5: Common Combinations of Drugs

Common Combinations

- Cocaine and Cannabis.
- Cocaine and Heroin.
- PCP and Cannabis.
- Many of the subjects you examine will be exhibiting the effects of two or more drugs acting together.

B. Possible Effects of Drug Combinations

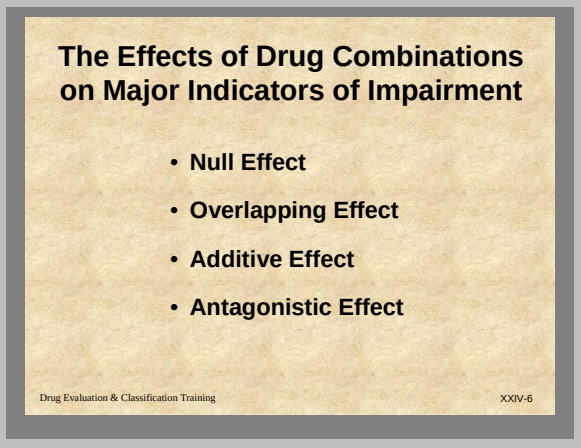
Session 24-5A: Drug Combinations



<u>*Combos*</u>

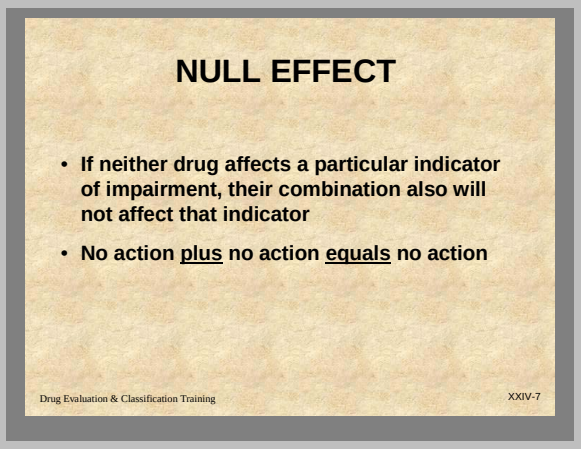
- Let us examine the possible ways in which two or more drug categories might interact.

Session 24-6: The Four Effects



Four Effects

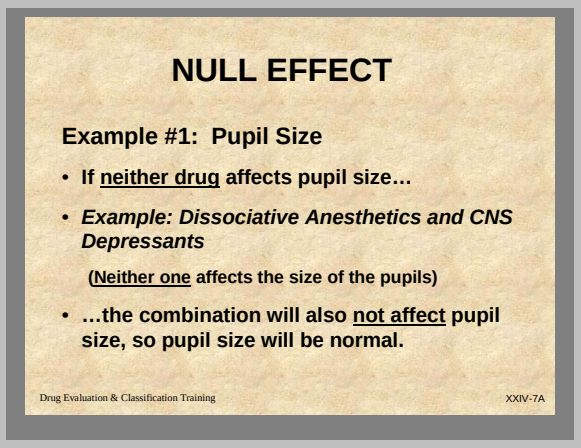
Session 24-7: Null Effect



Null Effect

- The first effect is called the "Null Effect."
  - Clarify: "Null Effect" is the combination of no action plus no action equals no action.

Session 24-7A: Null Effect

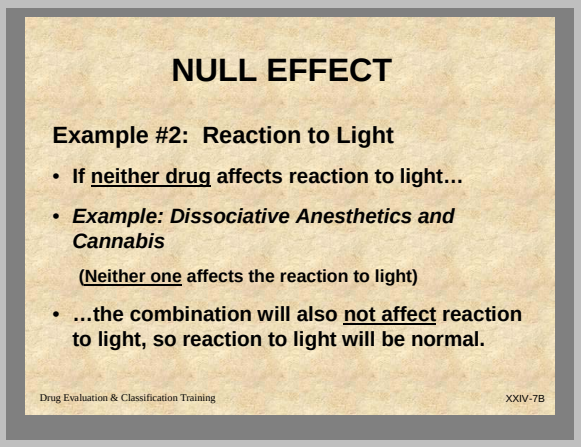


Example #1

- Example #1: neither drug affects pupil size.

- Drug #1 leaves pupil size in the normal range.
- Drug #2 also leaves pupil size normal.
- The combination also will leave pupil size normal.
    - Point out a general principle: if neither drug affects a major indicator, the combination of those two drugs also will not affect that indicator.
- Example #1 is called the Null Effect.
    - Clarification of "Null Effect" – the combination of no action plus no action equals no action.

Session 24-7B: Null Effect

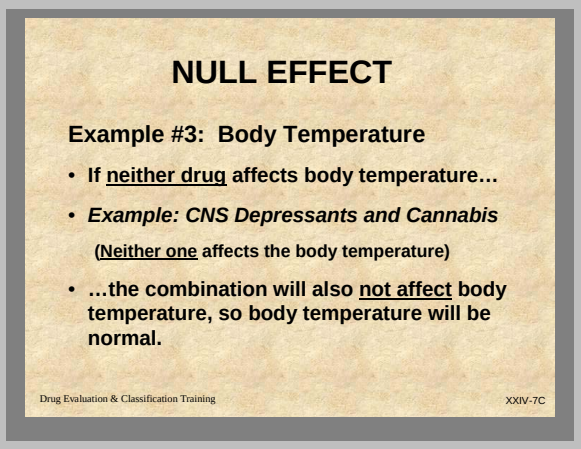


Example #2

Another example of the Null Effect:

- Reaction to Light: neither drug affects reaction to light. Example: a Dissociative Anesthetic and Cannabis.
- Ask students to suggest a specific combination of drugs that will exhibit the Null Effect on Horizontal Gaze Nystagmus.

Session 24-7C: Null Effect



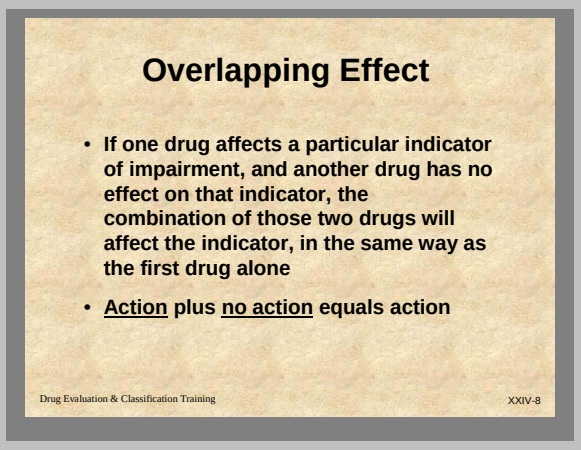
Example #3

Another example of the Null Effect:

- Body Temperature: neither a CNS Depressant nor Cannabis usually affects body temperature; the combination of the two leaves body temperature normal.

- Solicit students' questions about the Null Effect.

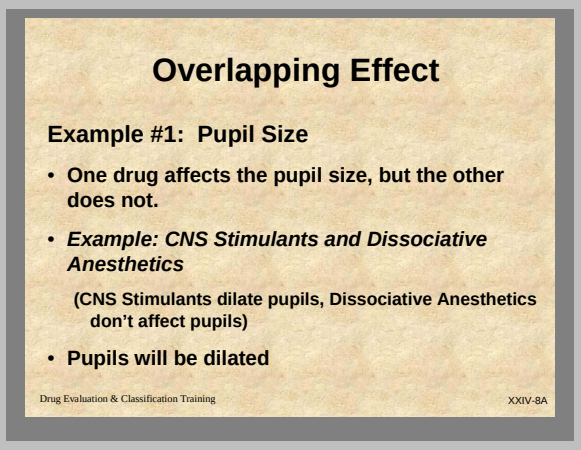
Session 24-8: Overlapping Effect



Overlapping Effect

- The second effect is called the "Overlapping Effect."
- Clarify: "Overlapping Effect" - action plus no action equals action.

Session 24-8A: Overlapping Effect



Example #1

- Example #1: one drug affects pupil size, but the other does not.
- Example: CNS Stimulants and Dissociative Anesthetics. Stimulants dilate pupils, Dissociative Anesthetics do not affect pupil size.
- Therefore, pupils will be dilated

Example #2

- Ask a student to give an example of a specific combination of drugs that will produce an "Overlapping Effect" on Horizontal Gaze Nystagmus.
- HGN: a CNS Depressant will cause HGN, but Cannabis will not cause HGN; a person under the combined influence of a CNS Depressant Cannabis will usually have HGN.

Session 24-8B: Overlapping Effect

Overlapping Effect

Example #2: HGN

- **One drug causes HGN, but the other does not.**
- ***Example: CNS Depressants and Narcotic Analgesics***

  (CNS Depressants cause HGN but Narcotic Analgesics don't)
- **HGN will be present**

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Example #3

Another example of the "Overlapping Effect":

- Lack of Convergence. Dissociative Anesthetics cause Lack of Convergence, Hallucinogens do not.
- Ask a student to give an example of a specific combination of drugs that will produce an "Overlapping Effect" on body temperature.

Session 24-8C: Overlapping Effect

Overlapping Effect

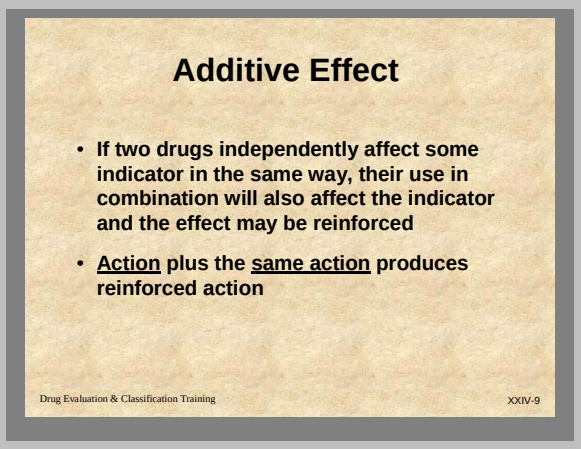
Example #3: Lack of Convergence

- **One drug affects lack of convergence, but the other does not.**
- ***Example: Dissociative Anesthetics and Hallucinogens***

  (Dissociative Anesthetics cause lack of convergence, Hallucinogens don't)
- **Lack of Convergence will be present**

Drug Evaluation & Classification Training XXIV-8C

Session 24-9: Additive Effect



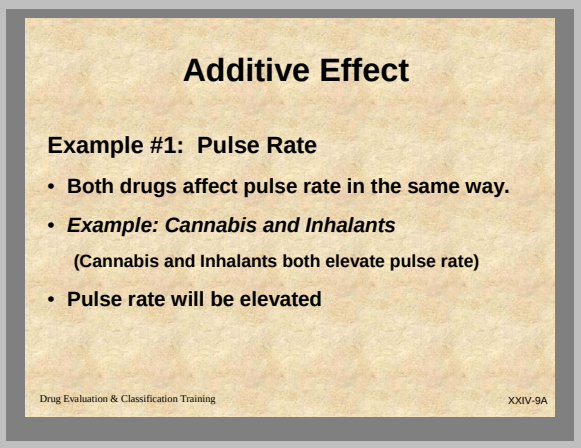
Additive Effect

- The third effect is called the Addictive Effect.
- Clarification of the "Additive Effect" – action plus the same action produces reinforced action.

Example #1

- Pulse Rate. Cannabis and Inhalants both elevate pulse rate. Therefore, pulse rate is elevated.

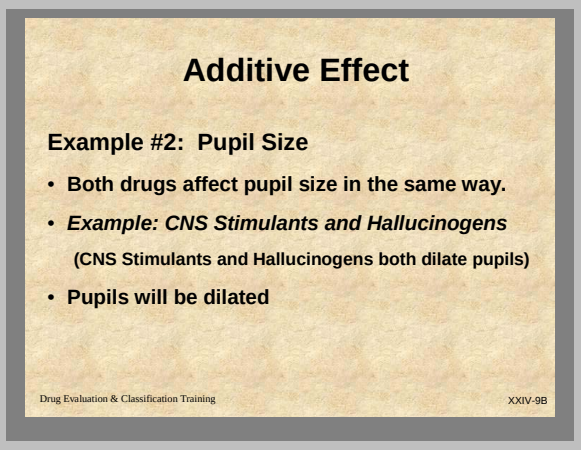
Session 24-9A: Additive Effect



Example #2

- Pupil Size. CNS Stimulants and Hallucinogens both dilate the pupils; therefore, pupils will be dilated.

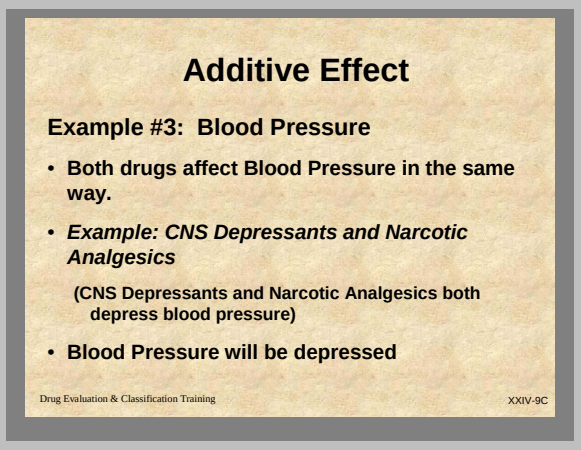
Session 24-9B: Additive Effect



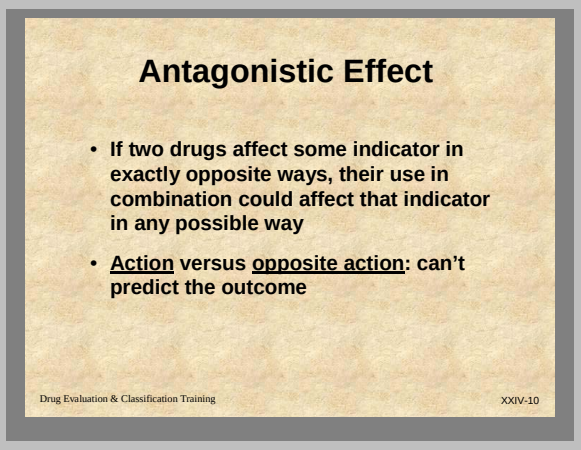
Example #3

- Ask a student to give an example of a drug combination that will produce an additive effect on blood pressure.
- Blood Pressure. CNS Depressants and Narcotic Analgesics both depress blood pressure. Therefore, the blood pressure will be depressed.

Session 24-9C: Additive Effect



Session 24-10: Antagonistic Effect



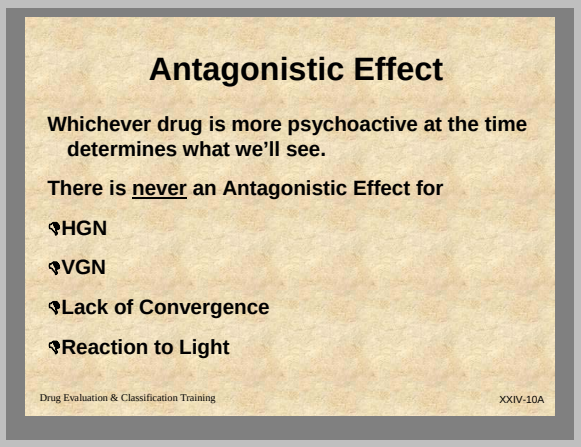
- Clarification of "Antagonistic Effect" – action versus opposite action: can't predict the outcome.

- When two drugs produce an "Antagonistic Effect," they tend to try to cancel each other out. Normally, whichever drug is more psychoactive at the time determines what we'll see.

- There is never an Antagonistic Effect for HGN, VGN, Lack of Convergence and Reaction to Light.

- Point out that a common example is when a person takes a "speedball" (Heroin plus Cocaine), the two drugs try to cancel out their effects on pupil size.

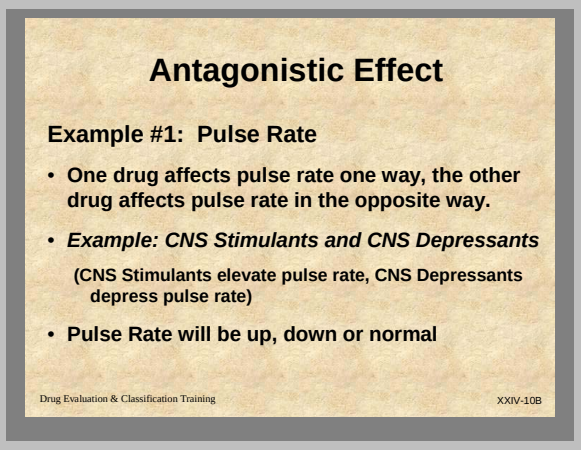
Session 24-10A: Antagonistic Effect



Example #1

- Pulse Rate. CNS Stimulants elevate pulse rate, CNS Depressants depress pulse rate; therefore, pulse rate will be up, down or normal.

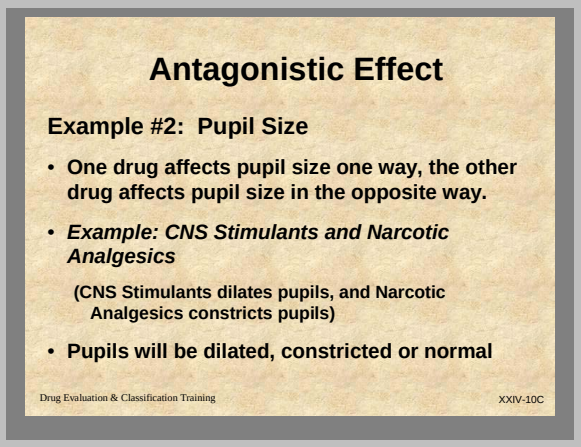
Session 24-10B: Antagonistic Effect



Example #2

- Pupil Size. CNS Stimulants dilate pupils, Narcotic Analgesics constrict pupils. Pupil size will be dilated, constricted or normal.

Session 24-10C: Antagonistic Effect

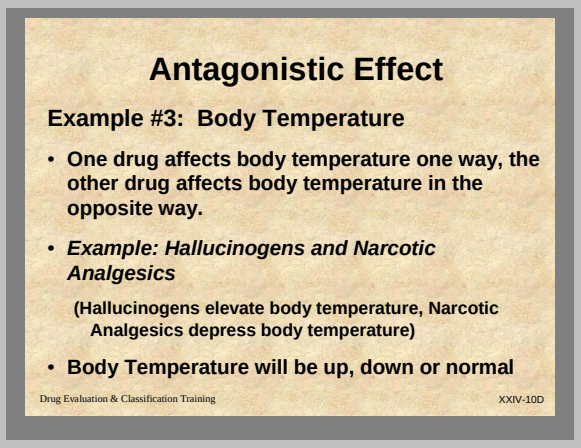


Example #3

- Body Temperature. Hallucinations elevate body temperature, Narcotic Analgesics depress body temperature. Body temperature will be up, down or normal.

- With an "Antagonistic Effect," we just can't predict what we will see.

Session 24-10D: Antagonistic Effect



Summary

When drugs from two or more drug categories are taken together, they tend to produce a combination of Null Effects, Overlapping Effects, Additive Effects and Antagonistic Effects.

Solicit students' questions about the Null, Overlapping, Additive and Antagonistic Effects.

Proceed to the following slides of drug combinations involving the input from the students.

Session 24-11: Cannabis and Stimulant

Cannabis and Stimulant

IMPAIRMENT INDICATOR	CANNABIS	STIMULANT	TYPE OF EFFECT	WHAT WILL WE SEE?
HGN	NONE	NONE	NULL	NONE
VERTICAL GAZE NYSTAGMUS	NONE	NONE	NULL	NONE
LACK OF CONVERGENCE	PRESENT	NONE	OVERLAPPING	PRESENT
PUPIL SIZE	DILATED (6)	DILATED	OVERLAPPING OR ADDITIVE	DILATED
REACTION TO LIGHT	NORMAL	SLOW	OVERLAPPING	SLOW
PULSE RATE	UP	UP	ADDITIVE	UP
BLOOD PRESSURE	UP	UP	ADDITIVE	UP
BODY TEMPERATURE	NORMAL	UP	OVERLAPPING	UP
MUSCLE TONE	NORMAL	RIGID	OVERLAPPING	RIGID

(6) Pupil Size possibly normal.

Drug Evaluation & Classification Training XXIV-11

HGN

Display only the title of XXIV-11 (Cannabis and a Stimulant in Combination): you will reveal this visual one line at a time.

- A specific example: consider a person who is under the influence of a combination of Cannabis and a CNS Stimulant.
- Ask students: “will you see HGN with this particular combination?”

Reveal the first line of the visual.

- Neither Cannabis nor a Stimulant causes HGN.
- Point out that the combination of Cannabis and Stimulant produces a Null Effect on HGN.
- This is a case of no action plus no action equals no action.
- We will not see HGN with this combination.

VGN

- Ask students: “Will we see Vertical Gaze Nystagmus?”

Reveal the second line of the visual.

- Neither Cannabis nor a stimulant causes VGN.
- This is another Null Effect.
- We won't see VGN.

LOC

Reveal the third line of the visual.

- Cannabis causes Lack of Convergence; a CNS Stimulant does not.
- Point out that the combination of Cannabis and Stimulant produces an Overlapping Effect on Lack of Convergence.
- This is a case of action plus no action equals action.
- We will see Lack of Convergence with this combination.

Pupil Size

- Ask students: "What will we see when we examine pupil size?"

Reveal the fourth line of the visual.

- CNS Stimulants dilate pupils; Cannabis either dilates pupils or leaves them alone.
- Point out that the combination of Cannabis and Stimulant produces either an Additive Effect or an Overlapping Effect on pupil size.
- This may be a case of action plus no action equals action.
- Or it may be a case of action plus same action reinforces action.
- In either case, we should see dilated pupils with this combination.

Reaction to Light

- Ask students: "What should we see when we examine the pupils' reaction to light?"

Reveal the fifth line of the visual.

- CNS Stimulants slow the pupils' Reaction to Light; Cannabis usually doesn't affect the pupils' reaction.
- Here we have another Overlapping Effect.
- We should observe a slowed reaction of the pupils.

Pulse Rate

- Ask students: "What should we see when we measure this person's pulse rate?"

Reveal the sixth line of the visual.

- Both Cannabis and CNS Stimulants usually elevate pulse rate.
- This is an Additive Effect.
- We will see a pulse rate higher than normal.

Blood Pressure

- Ask students: "What should we see when we measure this person's blood pressure?"

Reveal the seventh line of the visual.

- Cannabis usually causes blood pressure to be above normal; so does a CNS Stimulant.
- This is another Additive Effect.
- We should see a higher than normal blood pressure.

Body Temperature

- Ask students: "What can we expect to find when we check this person's temperature?"

Reveal the eighth line of the visual.

- Cannabis usually does not affect body temperature. But CNS Stimulants usually elevate temperature.
- Point out that Cannabis in combination with CNS Stimulant produces an Overlapping Effect on body temperature.
- This is another case of action plus no action equals action.
- We can expect to see an elevated temperature with this combination.

Muscle Tone

- Cannabis usually does not affect muscle tone. CNS Stimulants cause muscle tone to be rigid.
- Point out that this particular combination produces no Antagonistic Effects.
- This is another case of action plus no action equals action.
- We can expect to see rigid muscle tone with this combination.

Session 24-12: Dissociative Anesthetic and Narcotic Analgesic

Dissociative Anesthetic and Narcotic Analgesic

IMPAIRMENT INDICATOR	DISSOCIATIVE ANESTHETIC	NARCOTIC ANALGESIC	TYPE OF EFFECT	WHAT WILL WE SEE?
HGN	PRESENT	NONE	OVERLAPPING	PRESENT
VERTICAL GAZE NYSTAGMUS	PRESENT	NONE	OVERLAPPING	PRESENT
LACK OF CONVERGENCE	PRESENT	NONE	OVERLAPPING	PRESENT
PUPIL SIZE	NORMAL	CONSTRICTED	OVERLAPPING	CONSTRICTED
REACTION TO LIGHT	NORMAL	LITTLE OR NONE VISIBLE	OVERLAPPING	LITTLE OR NONE VISIBLE
PULSE RATE	UP	DOWN	ANTAGONISTIC	UP, DOWN OR NORMAL
BLOOD PRESSURE	UP	DOWN	ANTAGONISTIC	UP, DOWN OR NORMAL
BODY TEMPERATURE	UP	DOWN	ANTAGONISTIC	UP, DOWN OR NORMAL
MUSCLE TONE	RIGID	FLACCID	ANTAGONISTIC	NORMAL, RIGID OR FLACCID

Drug Evaluation & Classification Training XXIV-12

Dissociative Anesthetics and Narcotic Analgesics

Display only the title on XXIV-12 (Dissociative Anesthetic and Narcotic Analgesic).

- Another specific example: consider a person under the influence of a combination of a Dissociative Anesthetic and a Narcotic Analgesic.

HGN

- Ask students: "What will we see when we examine this person for HGN?"

Reveal the first line of the visual.

- A Dissociative Anesthetic causes HGN, Narcotic Analgesics do not.
- This is an Overlapping Effect.
- We can expect to see HGN with this suspect.

VGN

Reveal the second line of the visual.

- A Dissociative Anesthetic should cause Vertical Gaze Nystagmus, especially at high doses. A Narcotic Analgesic will not cause Vertical Gaze Nystagmus.
- This is another Overlapping Effect.
- We may see Vertical Gaze Nystagmus in this subject.

LOC

Reveal the third line of the visual.

- Ask students: "Can we expect to see a Lack of Convergence?"
- A Dissociative Anesthetic causes Lack of Convergence; Narcotic Analgesics do not.
- Another Overlapping Effect.
- We can expect to see Lack of Convergence.

Pupil Size

- Ask students: "What are we likely to see when we check the size of this subject's pupils?"

Reveal the fourth line of the visual.

- A Dissociative Anesthetic doesn't affect pupil size, but a Narcotic Analgesic constricts pupils.
- This is another Overlapping Effect.
- We can expect to see constricted pupils with this subject.

Reaction to Light

- Ask students: "What are we likely to observe when we check the reaction of this subject's pupils to light?"

Reveal the fifth line of the visual.

- A Dissociative Anesthetic doesn't affect pupil's Reaction to Light; but a Narcotic Analgesic usually produces "little to no" reaction to light.
- Point out that the combination of Dissociative Anesthetics and a Narcotic Analgesic produces Overlapping Effects on all major eye indicators of drug impairment.
- This, too, is an Overlapping Effect.
- We can expect "little or no" reaction in this subject's pupils.

Pulse Rate

- Ask students: "What can we expect to find when we check this subject's pulse rate?

Reveal the sixth line of the visual.

- A Dissociative Anesthetic usually causes pulse rate to be above normal; a Narcotic Analgesic usually produces a below normal pulse rate.
- This is our first Antagonistic Effect.
- We cannot predict what this subject's pulse rate will be.

- The pulse rate could be above normal, or below normal, or within the normal range.
- This subject's pulse rate will depend on many factors, including:
  - How much of each drug was taken.
  - How and when each drug was taken.
  - How tolerant the subject is of each drug.

Blood Pressure

- Ask students: "What are we likely to find when we check this subject's blood pressure?"

Reveal the seventh line of the visual.

- A Dissociative Anesthetic usually elevates blood pressure; a Narcotic Analgesic usually lowers blood pressure.
- This is another Antagonistic Effect.
- We can't predict what the blood pressure will be.
- It could be above normal, below normal, or within the normal range.

Temperature

- Ask students: "What are we likely to find when we check this subject's temperature?"

Reveal the eighth line of the visual.

- A Dissociative Anesthetic usually elevates temperature; a Narcotic Analgesic usually lowers it.
- This, too, is an Antagonistic Effect.
- The temperature could be above normal, or below normal or within the normal range.
- Point out that the combination of a Dissociative Anesthetic and Narcotic Analgesics produce Antagonistic Effects on all three vital signs.

Muscle Tone

- A Dissociative Anesthetic usually causes rigid muscle tone, a Narcotic Analgesic usually causes flaccid muscle tone.
- This could be an Overlapping or Antagonistic Effect.
- Muscle tone could be normal, rigid, or flaccid.

Solicit students' comments and questions about the combination of a Dissociative Anesthetic and a Narcotic Analgesic.

Session 24-13: Cannabis, CNS Stimulants and Hallucinogens

Cannabis, CNS Stimulants and Hallucinogens

IMPAIRMENT INDICATOR	CANNABIS	STIMULANT	HALLUCINOGEN	TYPE OF EFFECT	WHAT WILL WE SEE?
HGN	NONE	NONE	NONE	NULL	NONE
VERTICAL GAZE NYSTAGMUS	NONE	NONE	NONE	NULL	NONE
LACK OF CONVERGENCE	PRESENT	NONE	NONE	OVERLAPPING	PRESENT
PUPIL SIZE	DILATED (6)	DILATED	DILATED	ADDITIVE/ OVERLAPPING (6)	DILATED
REACTION TO LIGHT	NORMAL	SLOW	NORMAL (3)	OVERLAPPING/ ADDITIVE (3)	SLOW
PULSE RATE	UP	UP	UP	ADDITIVE	UP
BLOOD PRESSURE	UP	UP	UP	ADDITIVE	UP
BODY TEMPERATURE	NORMAL	UP	UP	ADDITIVE/ OVERLAPPING	UP
MUSCLE TONE	NORMAL	RIGID	RIGID	OVERLAPPING	RIGID

Drug Evaluation & Classification Training (3) Certain psychedelic amphetamines may cause slowing. (6) Pupil Size possibly normal. XXIV-13I

Cannabis, Stimulant and Hallucinogens

- Another specific example: consider a person under the influence of Cannabis, a CNS Stimulant and a Hallucinogen.

HGN

Reveal the first line of the visual.

- None of the three categories causes HGN, this is an example of the Null Effect.

VGN

Reveal the second line of the visual.

- None of the three drug categories cause Vertical Gaze Nystagmus, another example of the Null Effect.

LOC

Reveal the third line of the visual.

- Cannabis causes a Lack of Convergence while CNS Stimulants and Hallucinogens do not.
- This is an example of an Overlapping Effect and Lack of Convergence will be present.

Pupil Size

Reveal the fourth line of the visual.

- Cannabis usually dilates pupils, CNS Stimulants and Hallucinogens also dilate the pupils.
- This is an example of an Additive or Overlapping Effect.
- Ask students: What effect will take place and the result.
    - The pupils will be dilated.

Reaction to Light

Reveal the fifth line of the visual.

- Cannabis does not effect the Reaction to Light. CNS Stimulants will slow down the reaction. Most Hallucinogens, with some exceptions, will cause a normal Reaction to Light.
- This is an example of either an Overlapping or Additive Effect.
- Ask students: What effect would take place and the result.
    - We could probably see a slow Reaction to Light.

Pulse Rate

Reveal the sixth line of the visual.

- Cannabis will normally elevate the pulse rate as will CNS Stimulants and Hallucinogens.
- This is an example of an Additive Effect.
- Ask students: What effect would take place and the result.
    - The result would be an elevated pulse rate.

Blood Pressure

Reveal the seventh line of the visual.

- All three drug categories will elevate blood pressure.
- This is an example of an Additive Effect.
- Ask students: What effect would take place and the result.
    - Blood pressure would be elevated with this combination.

Body Temperature

Reveal the eighth line of the visual.

- Cannabis usually causes a normal body temperature. CNS Stimulants and Hallucinogens elevate body temperature.
- This would be an example of an Additive or Overlapping Effect.
- Ask students: What effect would take place and the result.
    - The body temperature would be elevated with this combination.

Muscle Tone

Reveal the ninth line of the visual.

- Cannabis causes a normal muscle tone, while CNS Stimulants and Hallucinogens will cause rigid muscle tone.

- This would be an example of an Additive or an Overlapping Effect.

- Ask students: What effect would take place and the effect.

    - The muscle tone would be rigid with this combination.

C. Identifying Expected Indicators of Specific Combinations

Direct the students' attention to the Cumulative Drug Symptomatology Matrix, found in Section XXIV of their Student's Manual. A copy also appears at the end of these lesson plans, for your reference.

Drug Symptomatology Matrix

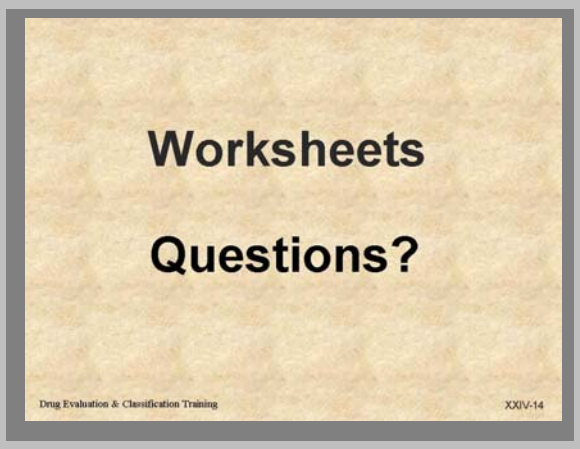
The Matrix outlines the expected results of the drug influence evaluation for each category.

We will refer to the Matrix to help us interpret what we are likely to see when we examine drug combinations.

- Remind students that we "never say never" and we "always avoid saying always" when it comes to signs and symptoms of drugs. The Matrix summarizes what we usually see but doesn't guarantee we will always see exactly that, or every indicator.

Show the video of subjects under the influence of specific drug combinations. Point out the Null, Overlapping, Additive and Antagonistic Effects exhibited by the subjects.

Session 24-14: Worksheets and Questions



Worksheet Exercises

- Assign the students to work in three member teams. Direct the students' attention to the three worksheets in their Student's Manual.
- Instruct the teams that they have only 15 minutes to fill out all three worksheets (5 minutes per worksheet).
    - Worksheet #1: Dissociative Anesthetic and a Hallucinogen.
    - Worksheet #2: Cannabis and CNS Depressant.
    - Worksheet #3: CNS Depressant and CNS Stimulant.
- Solicit students' questions about this assignment.
- Tell the teams to start working. Terminate their work after 15 minutes.

Discussion of Worksheets

- For each worksheet, select a team to lead the discussion. Critique and correct the students' analyses of the drug combinations, as appropriate.
- Solicit students' comments and questions about drug combinations.

INDICATORS CONSISTENT WITH DRUG CATEGORIES

	CNS DEPRESSANTS	CNS STIMULANTS	HALLUCINOGENS	DISSOCIATIVE ANESTHETICS	NARCOTIC ANALGESICS	INHALANTS	CANNABIS
HGN	PRESENT	NONE	NONE	PRESENT	NONE	PRESENT	NONE
VGN	PRESENT (HIGH DOSE)	NONE	NONE	PRESENT	NONE	PRESENT (HIGH DOSE)	NONE
LACK OF CONVERGENCE	PRESENT	NONE	NONE	PRESENT	NONE	PRESENT	PRESENT
PUPIL SIZE	NORMAL (1)	DILATED	DILATED	NORMAL	CONSTRICTED	NORMAL (4)	DILATED (6)
REACTION TO LIGHT	SLOW	SLOW	NORMAL (3)	NORMAL	LITTLE OR NONE VISIBLE	SLOW	NORMAL
PULSE RATE	DOWN (2)	UP	UP	UP	DOWN	UP	UP
BLOOD PRESSURE	DOWN	UP	UP	UP	DOWN	UP/DOWN (5)	UP
BODY TEMPERATURE	NORMAL	UP	UP	UP	DOWN	UP/DOWN/NORMAL	NORMAL
MUSCLE TONE	FLACCID	RIGID	RIGID	RIGID	FLACCID	NORMAL OR FLACCID	NORMAL

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

(1) Soma, Quaaludes and possibly some anti-depressants usually dilate pupils.
(2) Quaaludes, ETOH and possibly some anti-depressants may elevate.
(3) Certain psychedelic amphetamines may cause slowing.
(4) Normal, but may be dilated.
(5) Down with anesthetic gases, up with volatile solvents and aerosols.
(6) Pupil size possibly normal.

MAJOR INDICATORS	CNS DEPRESSANTS	CNS STIMULANTS	HALLUCINOGENS	DISSOCIATIVE ANESTHETICS	NARCOTIC ANALGESICS	INHALANTS	CANNABIS
GENERAL INDICATORS	Disoriented Droopy eyes (Ptosis) Drowsiness Drunk-like behavior Gait ataxia Slow, sluggish reactions Thick, slurred speech Uncoordinated *NOTE: With Methaqualone, pulse will be elevated and body tremors will be evident. Alcohol and Quaaludes elevate pulse. Soma and Quaaludes dilate pupils.	Anxiety Body tremors Dry mouth Euphoria Exaggerated reflexes Excited Eyelid tremors Grinding teeth (Bruxism) Increased alertness Insomnia Irritability Redness to nasal area Restlessness Runny nose Talkative	Body tremors Dazed appearance Difficulty w/speech Disoriented Flashbacks Hallucinations Memory loss Nausea Paranoia Perspiring Poor perception of time and distance Synesthesia Uncoordinated NOTE: With LSD, piloerection may be observed (goose bumps, hair standing on end).	Blank stare Confused Chemical odor Cyclic behavior Difficulty w/speech Disoriented Early HGN Onset Hallucinations Incomplete verbal responses Increased pain threshold "Moon Walking" Muscle rigidity Non communicative Perspiring Possibly violent Sensory distortions Slow, slurred speech Warm to touch	Constricted pupils Depressed reflexes Drowsiness Droopy eyelids (Ptosis) Dry mouth Euphoria Facial itching Nausea "On the Nod" Puncture marks Slow, low, raspy speech Slowed breathing NOTE: Tolerant users exhibit relatively little psychomotor impairment.	Bloodshot, watery eyes Confusion Disoriented Flushed face Intense headaches Lack of muscle control Non-communicative Odor of substance Possible nausea Residue of substance Slow, thick, slurred speech **NOTE: Anesthetic gases cause below normal blood pressure; volatile solvents and aerosols cause above normal blood pressure.	Body tremors Disoriented Debris in mouth Eyelid tremors Impaired perception of time & distance Increased appetite Marked reddening of conjunctiva Odor of Marijuana Possible paranoia Relaxed inhibitions
DURATION OF EFFECTS	Barbiturates: 1-16 hours Tranquilizers: 4-8 hours Methaqualone: 4-8 hours	Cocaine: 5-90 minutes Amphetamines: 4-8 hours Meth: 12 hours	Duration varies widely from one hallucinogen to another. LSD: 4-6 hours Psilocybin: 2-3 hours	PCP Onset: 1-5 minutes Peak Effects: 15-30 minutes Exhibits effects up to 4-6 hours DXM: Onset 15-30 min. Effects 3-6 hours	Heroin: 4-6 hours Methadone: Up to 24 hours Others: Vary	6-8 hours for most volatile solvents Anesthetic gases and aerosols – very short duration	2-3 hours – exhibit effects (Impairment may last up to 24 hours, without awareness effects.)
USUAL METHODS OF ADMINISTRATION	Oral Injected (occasionally)	Insufflation (snorting) Smoked Injected Oral	Oral Insufflation Smoked Injected Transdermal	Smoked (PCP) Oral Insufflation (PCP) Injected (PCP) Eye drops	Injected Oral Smoked Insufflation	Insufflation (Historically, have been taken orally.)	Smoked Oral
OVERDOSE SIGNS	Shallow breathing Cold, clammy skin Pupils dilated Rapid, weak pulse Coma	Agitation Increased body temperature Hallucinations Convulsions	Long intense "trip"	Long intense "trip"	Slow, shallow breathing Clammy skin Coma Convulsions	Coma	Fatigue Paranoia

D. Specific Examples of Drug Combinations: An Exercise for the Student

On the final five pages of this session, you will find examples of specific drug combinations. The expected results for the first two of these combinations (Cannabis and Stimulants, and Dissociative Anesthetic and Narcotic Analgesic) have been worked out for you. Study those examples, then complete the work sheets for the three remaining combinations.

CANNABIS AND CNS STIMULANT
IN COMBINATION

IMPAIRMENT INDICATOR	EFFECT DUE TO CANNABIS	EFFECT DUE TO CNS STIMULANT	TYPE OF COMBINED EFFECT	WHAT WILL WE SEE
VERTICAL GAZE NYSTAGMUS	NONE	NONE	NULL	NONE
LACK OF CONV.	PRESENT	NONE	OVERLAPPING	PRESENT
PUPIL SIZE	DILATED OR NORMAL	DILATED	OVERLAPPING OR ADDITIVE	DILATED
REACTION TO LIGHT	NORMAL	SLOW	OVERLAPPING	SLOW
PULSE RATE	UP	UP	ADDITIVE	UP
BLOOD PRESSURE	UP	UP	ADDITIVE	UP
BODY TEMP	NORMAL	UP	OVERLAPPING	UP
MUSCLE TONE	NORMAL	RIGID	OVERLAPPING	RIGID

DISSOCIATIVE ANESTHETIC AND NARCOTIC ANALGESIC
IN COMBINATION

IMPAIRMENT INDICATOR	EFFECT DUE TO PHENCYCLIDINE	EFFECT DUE TO HEROIN	TYPE OF COMBINED EFFECT	WHAT WILL WE SEE
HORIZONTAL GAZE NYSTAGMUS	PRESENT	NONE	OVERLAPPING	PRESENT
VERTICAL GAZE NYSTAGMUS	PRESENT	NONE	OVERLAPPING	PRESENT
LACK OF CONV.	PRESENT	NONE	OVERLAPPING	PRESENT
PUPIL SIZE	NORMAL	CONSTRICTED	OVERLAPPING	CONSTRICTED
REACTION TO LIGHT	NORMAL	LITTLE OR NONE VISIBLE	OVERLAPPING	LITTLE OR NONE VISIBLE
PULSE RATE	UP	DOWN	ANTAGONISTIC	DOWN/ NORMAL/UP
BLOOD PRESSURE	UP	DOWN	ANTAGONISTIC	DOWN/ NORMAL/UP
BODY TEMP	UP	DOWN	ANTAGONISTIC	DOWN/ NORMAL/UP
MUSCLE TONE	RIGID	FLACCID	ANTAGONISTIC	RIGID/ FLACCID/ NORMAL

WORKSHEET #1
KETAMINE AND LSD

IMPAIRMENT INDICATOR	EFFECT DUE TO DISSOCIATIVE ANESTHETICS	EFFECT DUE TO HALLUCINOGEN (Hall)	TYPE OF COMBINED EFFECT*	WHAT WILL WE SEE
HORIZONTAL GAZE NYSTAGMUS				
VERTICAL GAZE NYSTAGMUS				
LACK OF CONV.				
PUPIL SIZE				
REACTION TO LIGHT				
PULSE RATE				
BLOOD PRESSURE				
BODY TEMP				
MUSCLE TONE				

*Null; Overlapping; Additive; or, Antagonistic

WORKSHEET #2
CANNABIS AND CNS DEPRESSANT

IMPAIRMENT INDICATOR	EFFECT DUE TO CANNABIS	EFFECT DUE TO DEPRESSANT	TYPE OF COMBINED EFFECT*	WHAT WILL WE SEE
HORIZONTAL GAZE NYSTAGMUS				
VERTICAL GAZE NYSTAGMUS				
LACK OF CONV.				
PUPIL SIZE				
REACTION TO LIGHT				
PULSE RATE				
BLOOD PRESSURE				
BODY TEMP				
MUSCLE TONE				

*Null; Overlapping; Additive; or, Antagonistic

WORKSHEET #3
CNS STIMULANT AND CNS DEPRESSANT

IMPAIRMENT INDICATOR	EFFECT DUE TO CNS STIMULANT	EFFECT DUE TO DEPRESSANT	TYPE OF COMBINED EFFECT*	WHAT WILL WE SEE
HORIZONTAL GAZE NYSTAGMUS				
VERTICAL GAZE NYSTAGMUS				
LACK OF CONV.				
PUPIL SIZE				
REACTION TO LIGHT				
PULSE RATE				
BLOOD PRESSURE				
BODY TEMP				
MUSCLE TONE				

*Null; Overlapping; Additive; or, Antagonistic