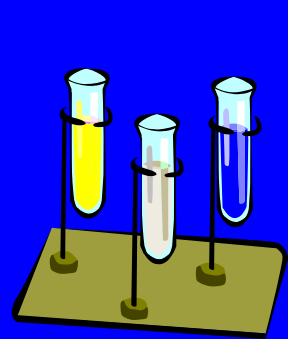


Fundamentals of Drug Testing

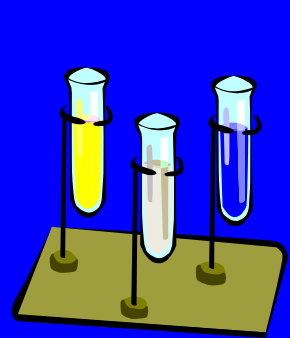
H. Westley Clark, MD, JD, MPH
Director

Center for Substance Abuse Treatment
Substance Abuse and Mental Health Services
Administration
US Department of Health and Human Services



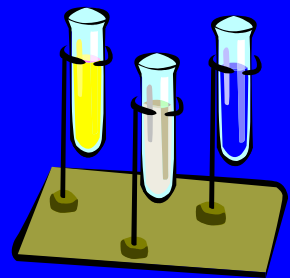
Acknowledgments

- This presentation was adapted from the work of the following:
 - Steven Kipnis of New York's OASAS
 - www.oasas.state.ny.us/admed/documents/drugscreen.pdf
 - SAMHSA's Division of Workplace Programs



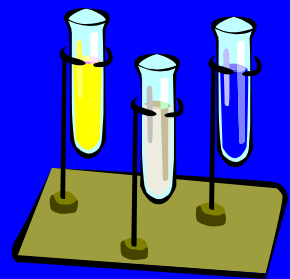
Types of Clinical Drug Testing

- Admission
- Periodic/Non-Random
- Random
- Observed
- Non-Observed



Therapeutic Value of Drug Testing

- A Significant and Necessary Part of the Treatment Process
- Offers the Clinician an opportunity to provide immediate feedback to the Patient
- Provides **the Basis for Therapeutic Intervention** where indicated
- A Validation of Sobriety
 - Linked to an evolving Recovery Process

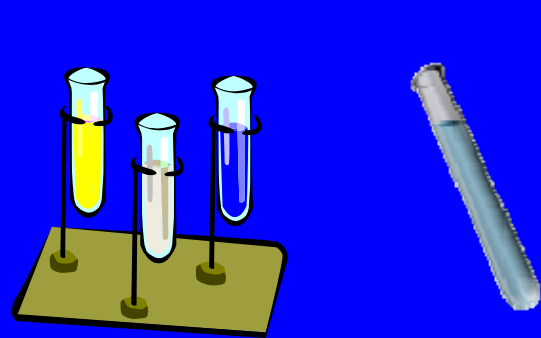


Steven Kipnis et al, New York OASAS



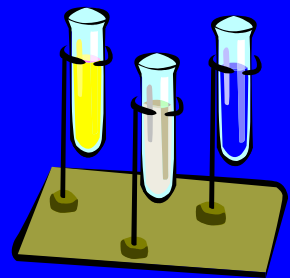
Types of Testing

- Test Kits/Point of Collection
- Instrument Based Testing
 - Program Executed Testing
 - Laboratory Executed Testing



Types of Workplace Drug Testing

- Applicant Testing
- Accident/Unsafe Practice Testing
- Reasonable Suspicion Testing
- Follow-up to Treatment Testing
- Random Testing
- Voluntary Testing

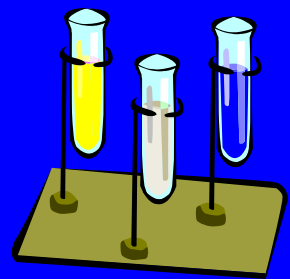


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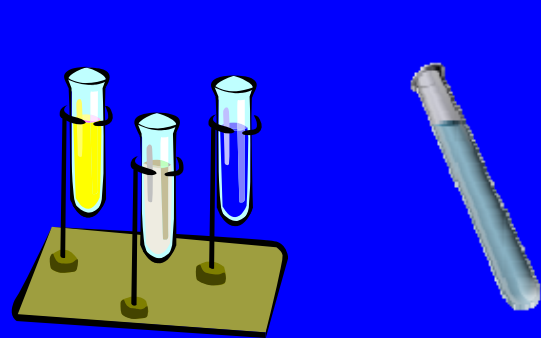
Pre-Testing Issues

- Why is the Testing being done?
- For whom is the Testing being done?
- Will the Results be used in a Forensic Situation
 - Is an approved lab being used?
 - Will there be Chain of Custody Requirements?
 - Is there a need to retain a permanent copy?
- Do you have a current Medication History for the Patient?



Behavioral Indications for Drug Testing

- Change in Participation in Treatment Program
- Increased Reported Problems at Work
- Increased Conflicts with Probation/Parole Officers
- Increased Problems with Children or Spouse
- Volatile Affect
- Increase in Irritability or Anger
- Changes in Thought Processes



Collection of Specimens for Workplace

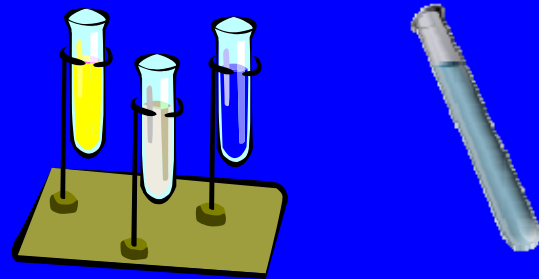


Courier
→



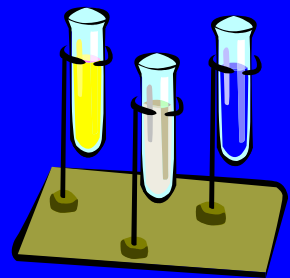
- Right to Privacy
- Chain of Custody
 - Integrity, Security, and Identification
- Temperature Recording
- Tamper-Evident Bottle Seal

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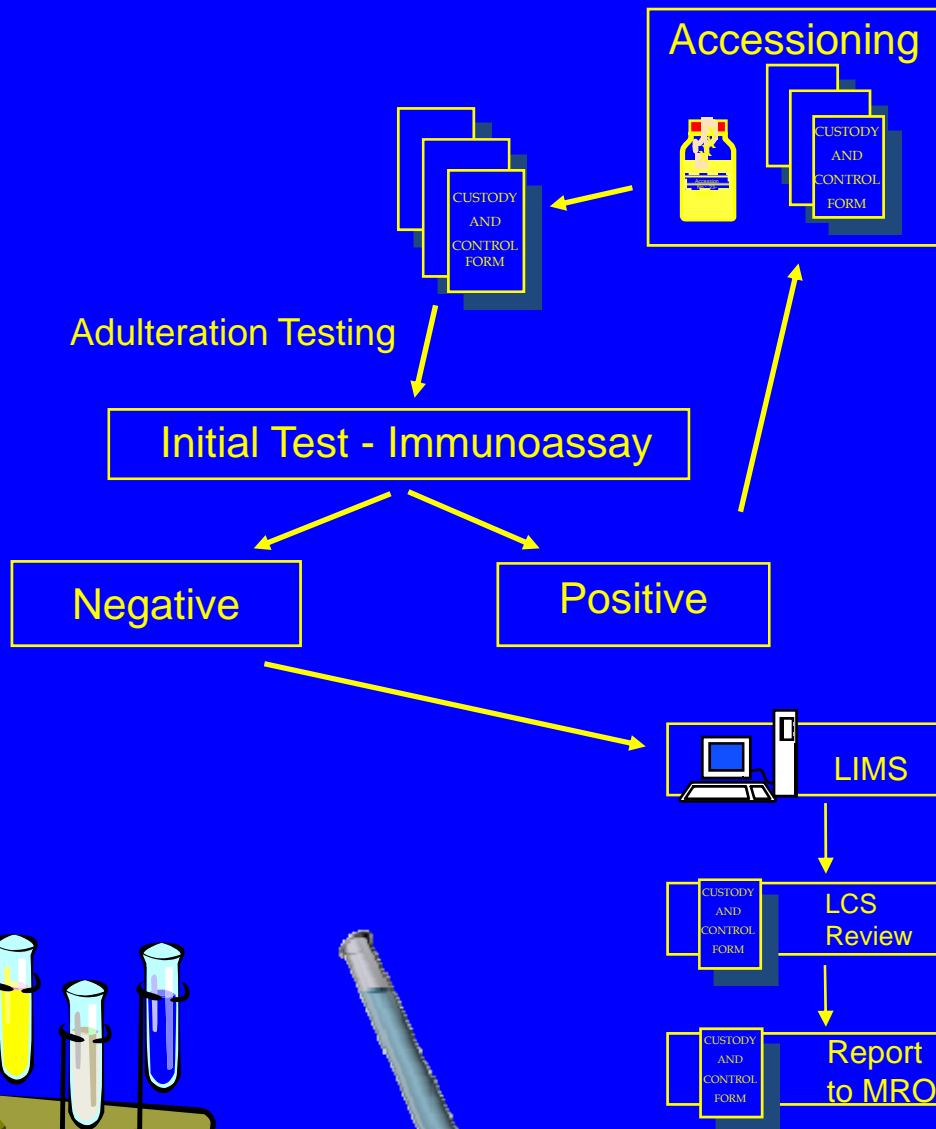
Components of a Comprehensive Drug-Free Workplace Program

- Formal Written Policy
- Employee Assistance Program
- Supervisor Training
- Employee Education
- Methods for Detecting Illicit Drug Users (i.e., drug testing)



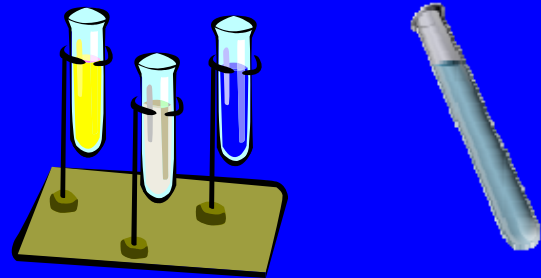
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Initial Testing for DOT or SAMHSA



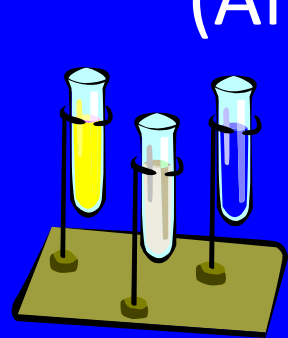
- Immunoassay
 - enzyme (EIA)
 - radioactive (RIA)
 - fluorescence (FPIA)
 - kinetic mobility (KIMS)
 - Cloned enzyme donor (CEDIA)

- Quality Control
 - calibrators
 - controls
 - linearity



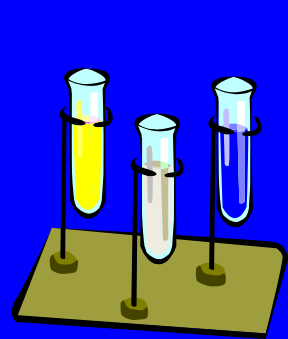
ENZYME IMMUNOASSAY (EIA)

- EMIT(ENZYME MULTIPLIED IMMUNOASSAY TECHNIQUE) SYSTEM IS FREQUENTLY USED. THE LABEL ON THE ANTIGEN IS AN ENZYME THAT PRODUCES A CHEMICAL REACTION WHEN INTERACTING WITH ANOTHER SUBSTANCE. ENZYME ACTIVITY IS DIRECTLY RELATED TO THE CONCENTRATION OF DRUG (ANTIGEN) PRESENT.



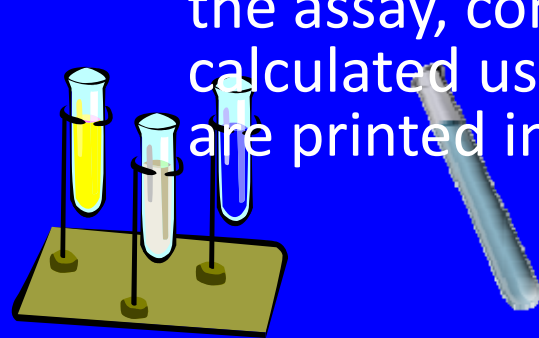
RADIOIMMUNOASSAY (RIA)

- KNOWN AMOUNTS OF RADIOACTIVE LABELLED DRUG ARE ADDED TO A SAMPLE WITH KNOWN ANTIBODY AMOUNTS. THE LABELLED AND UNLABELLED DRUGS COMPETE FOR THE ANTIBODY SITES. THE ANTIBODY – ANTIGEN COMPLEXES ARE CENTRIFUGED AND MEASURED IN A GAMMA COUNTER



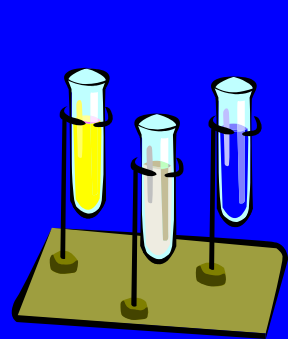
FPIA (Fluorescence Polarization Immunoassay) Drug Testing

- The ADx/AXsym FPIA Assay Systems use a competitive binding immunoassay methodology to allow tracer-labeled antigen and sample to compete for binding sites on the antibody molecules.
- The components in this competitive binding reaction are the antibody, the sample antigen, and the antigen labeled with fluorescein (tracer-labeled complex). When competitive binding occurs, the more tracer-antigen complex that becomes part of the very large antibody molecule, the less tracer-labeled antigen complex that remains in solution.
- Using the polarization values generated for each sample in the assay, concentrations of drugs in unknown samples are calculated using a stored calibration curve and the results are printed in reportable units.



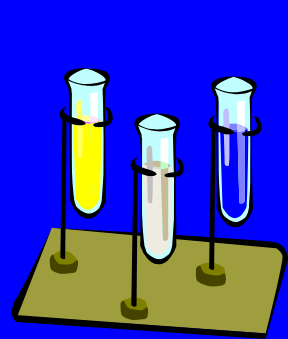
Kinetic Interaction of Microparticles in Solution (KIMS)

- Drug in the sample competes with drug derivative for binding sites on antibody
Microparticles bound to antibody form aggregates (clumping) increasing the absorbance of the reaction mixture.
- Absorbance is inversely proportional to drug concentration in the sample



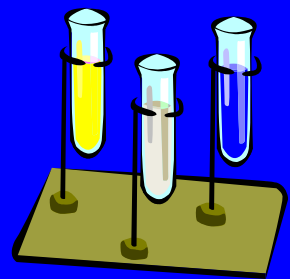
Cloned Enzyme Donor Immunoassay (CEDIA).

- Genetically engineered enzyme fragments of B-galactosidase enzyme spontaneously reassemble in **solution** to form active enzyme
- Drug in sample competes for antibody binding sites
- **Drug concentration is directly proportional to enzyme activity**



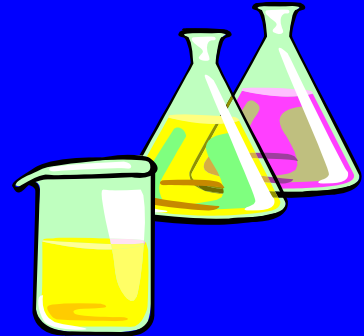
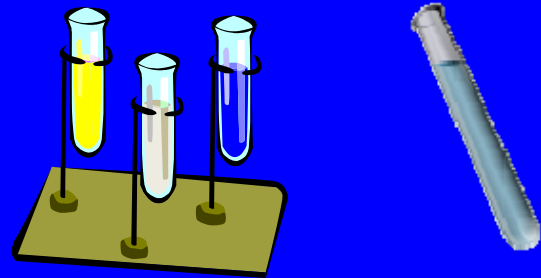
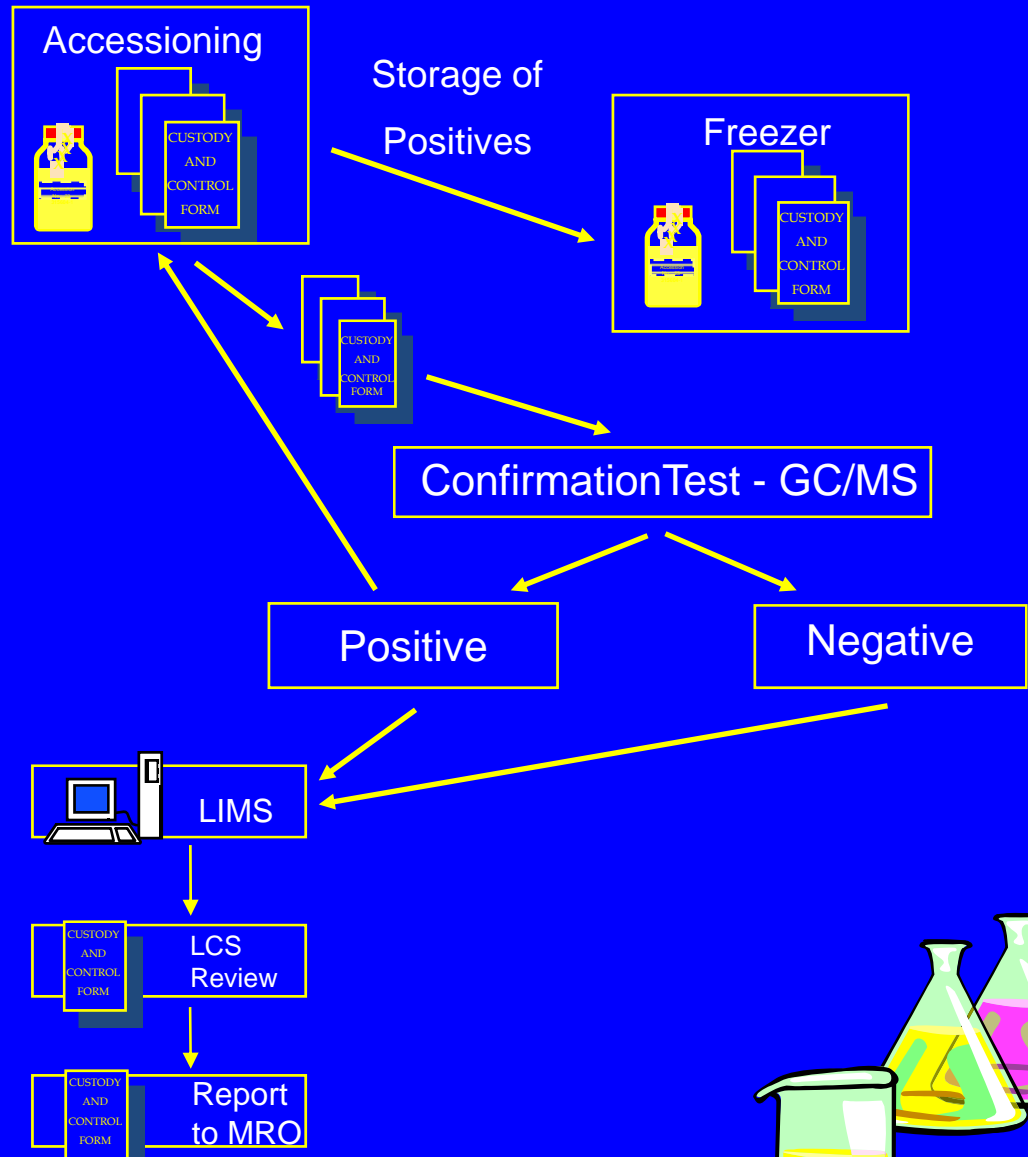
Drug Screen Results

- Use of confirmatory tests are recommended if there is an initial positive screen.
 - There may be a medically acceptable reason for the result
 - See if there clinical reasons for a single positive test result
- Check to make sure that it was the client's specimen that was tested, i.e., the correct name, date, and identification number.



Confirmation Testing

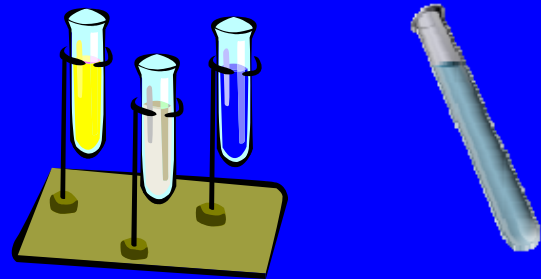
- Quality Control
 - Calibrators
 - Controls
 - Linearity
- Positive Specimen Criteria



Drug Test Results

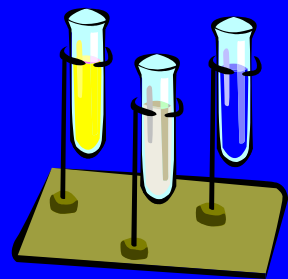
SAMHSA and DOT testing, results can be reported as:

- **Negative:** Which could mean
 - True
 - False
- **Positive:** Which could mean
 - True
 - True with Medical Explanation
 - False
- **Indeterminant:** Which could mean
 - rule-out adulteration
 - rule-out inappropriate dilution



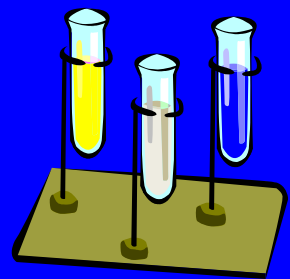
SAMHSA FIVE

- Cannabinoids (marijuana, hash)
- Cocaine (cocaine, crack, benzoylecognine)
- Amphetamines (amphetamines, methamphetamines, speed)
- Opiates (heroin, opium, codeine, morphine)
- Phencyclidine (PCP)



Other Tests

- Barbiturates (Phenobarbital, Secobarbital, Butalbital)
- Hydrocodone (Lortab, Vicodin)
- Methaqualone (Quaaludes)
- Benzodiazepines (Valium, Xanax, Librium, Serax, Halcion, Rohypnol)
- Methadone
- Propoxyphene (Darvon compounds)
- Ethanol (Alcohol)
- MDMA (Ecstasy)



HHS Cut-offs

National Laboratory Certification Program (NLCP)

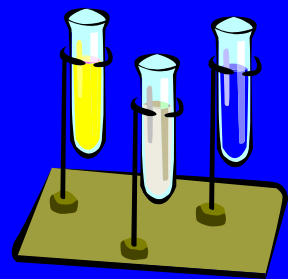
<u>Drug / Metabolite(s)</u>	<u>Initial</u>	<u>Confirmation</u>
Marijuana metabolites	50	15 (delta-9 THC acid)
Cocaine metabolites	300	150 (Benzoylecgonine)
Opiates		See next slide
Phencyclidine	25	25 (Phencyclidine)
Amphetamines	1000	500 (Amphetamine)

500 (Methamphetamine*)

(* to be reported there must be 200 ng/mL Amphetamine)

These cut-offs reflect current values as ng/mL.

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HHS Cut-offs

National Laboratory Certification Program (NLCP)

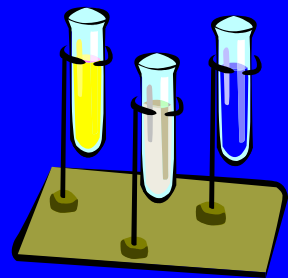
Opiate Cut-offs -

<u>Drug / Metabolite(s)</u>	<u>Initial</u>	<u>Confirmation</u>
Opiates	2,000 ng/mL	
Morphine		2,000 ng/mL
Codeine		2,000 ng/mL

If Morphine equals or exceeds 2,000 ng/mL,
then the laboratory must analyze for
6-acetylmorphine by GC/MS

6-Acetylmorphine

10 ng/mL

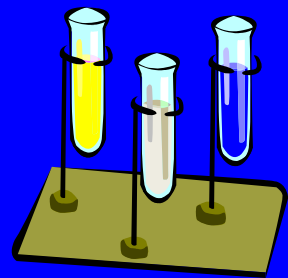


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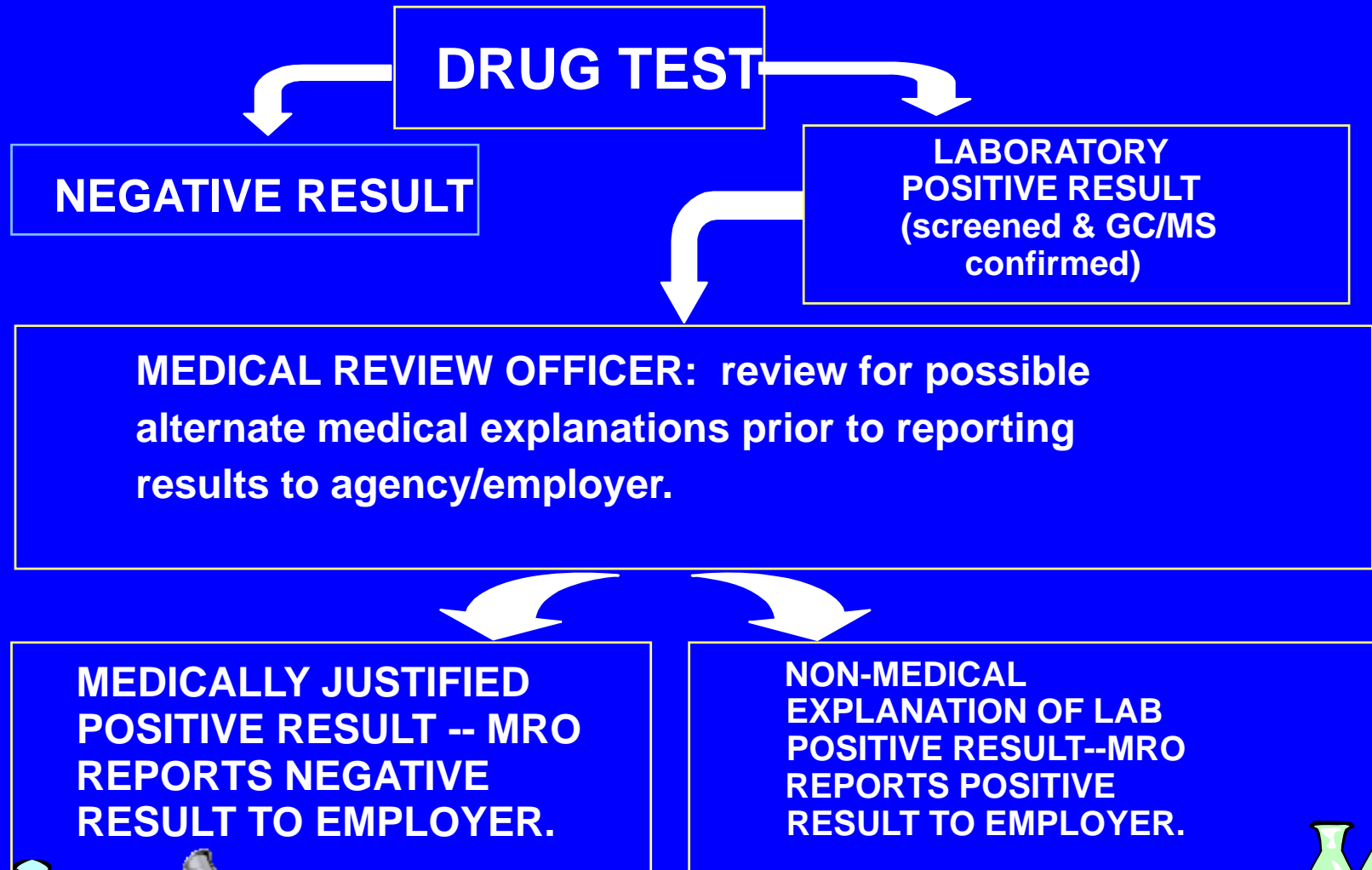
The Medical Review Officer (MRO) - I

- Must be a physician with knowledge of substance abuse disorders.
- Must afford an opportunity for the tested individual to discuss the test results prior to making a final decision to verify a test as positive.
- Must review all medical records made available by a tested individual when a confirmed positive could have resulted from a legally prescribed drug.

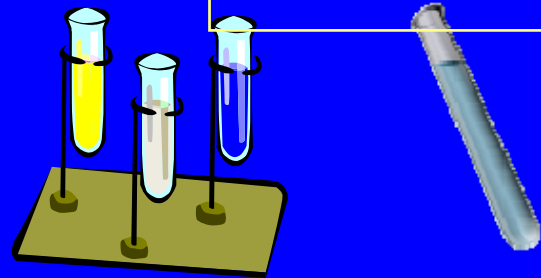


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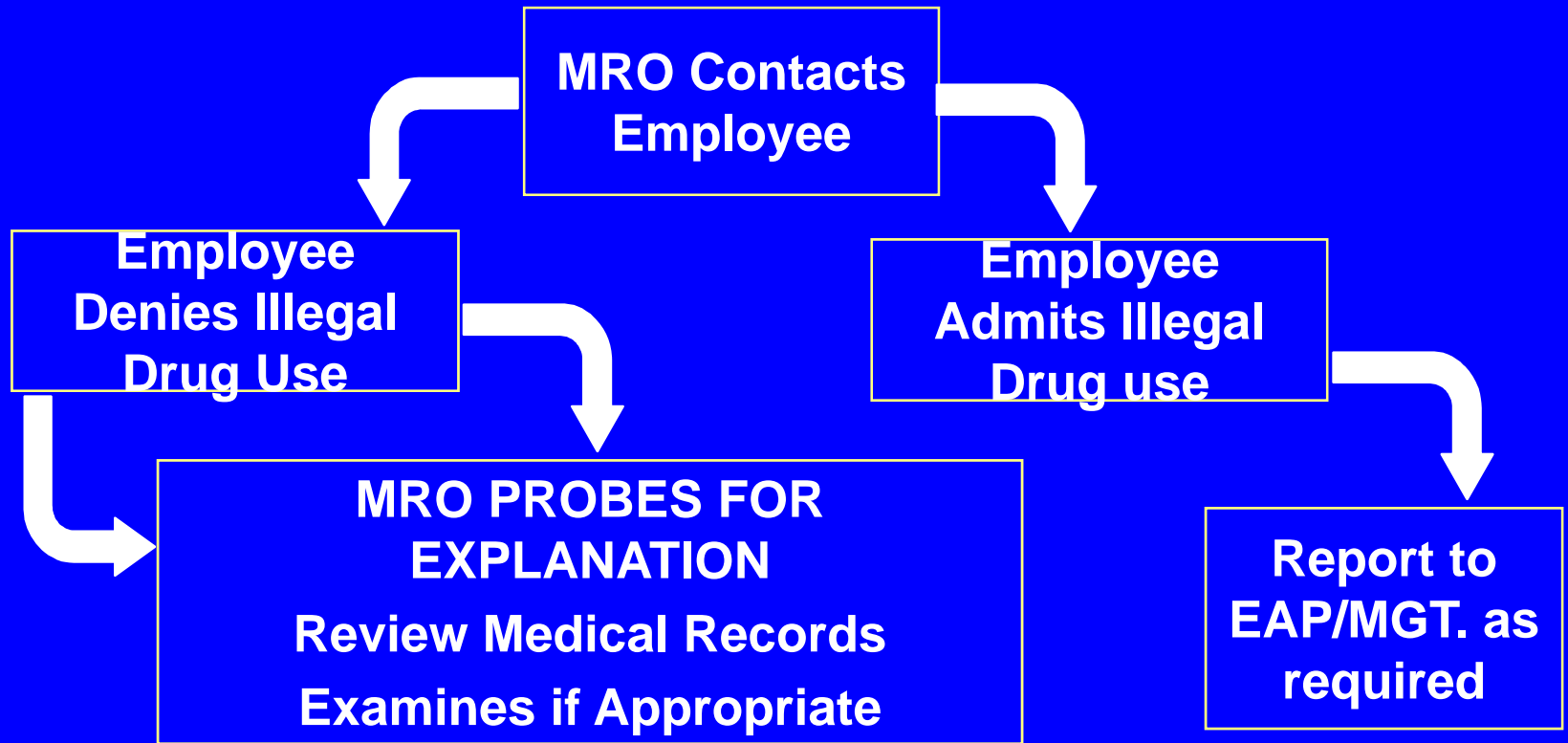
THE MRO CHAIN



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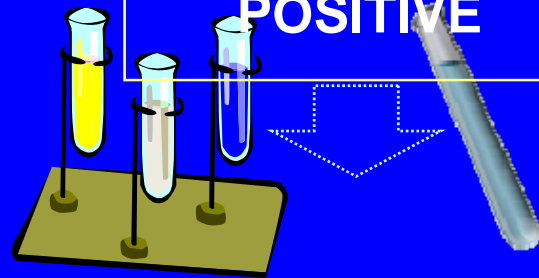


How MRO Reporting Works - I

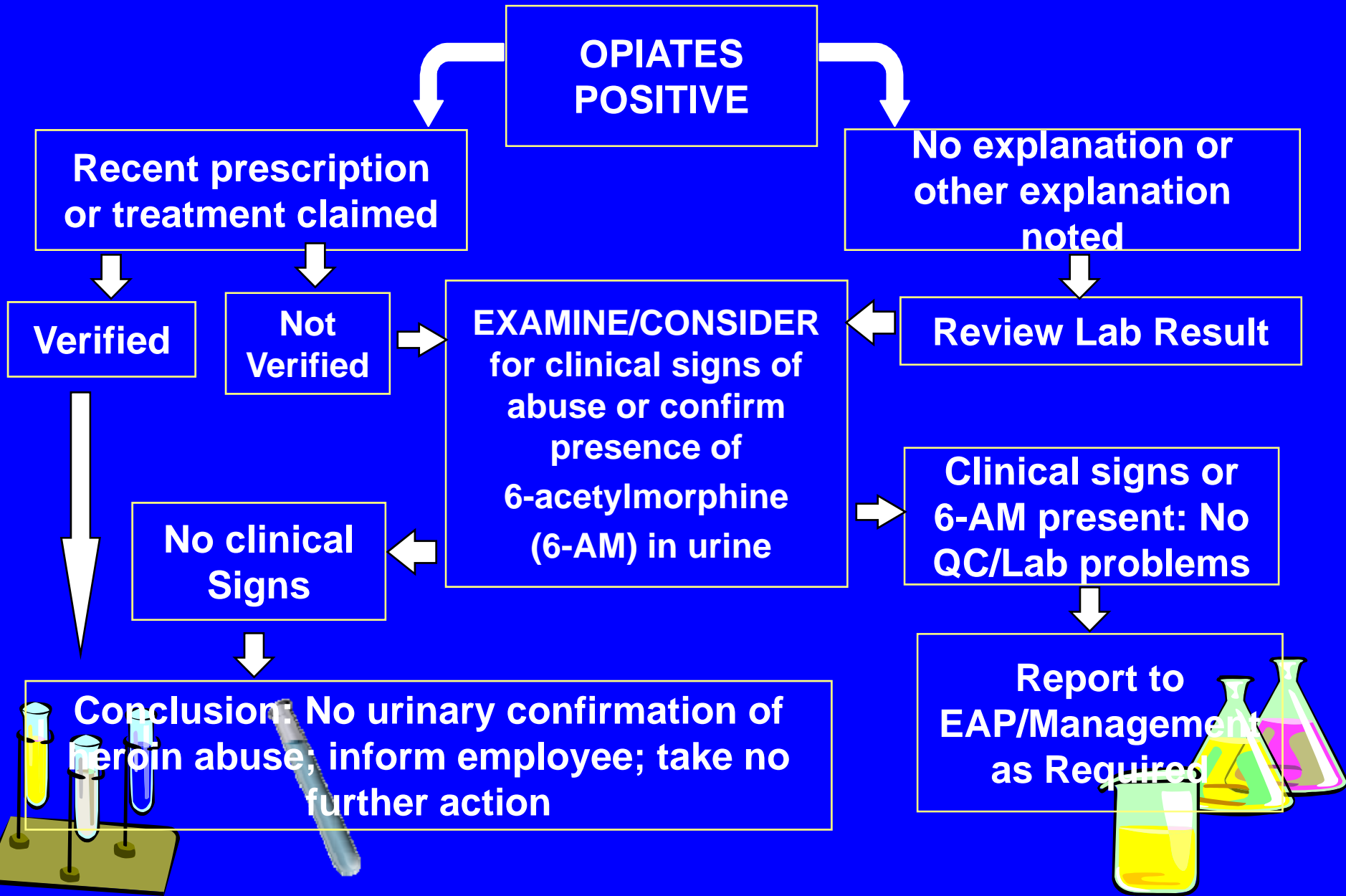


**OPIATES
POSITIVE**

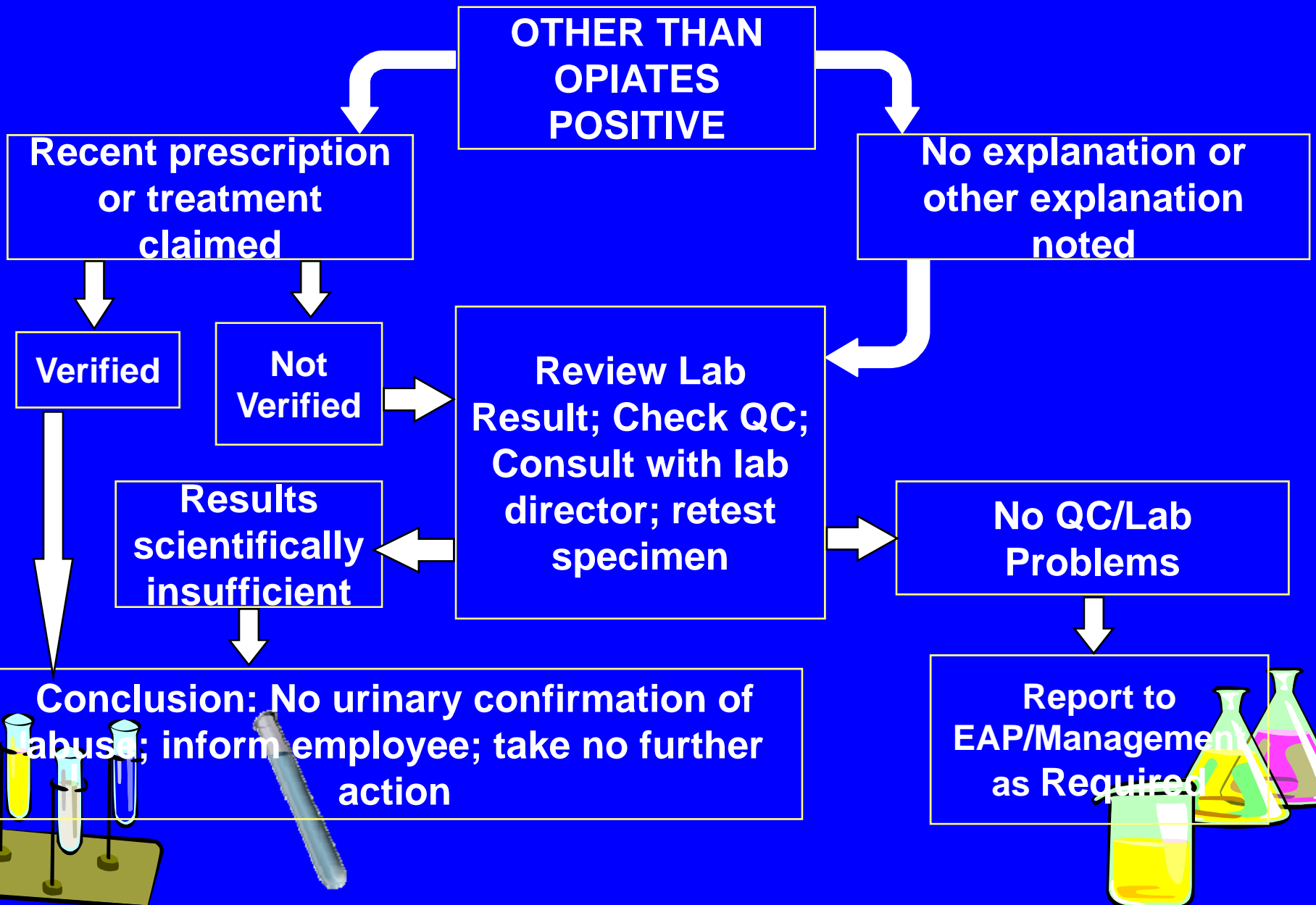
**OPIATES OTHER
THAN
POSITIVE**



How MRO Reporting Works- II

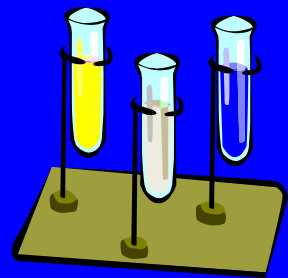


How MRO Reporting Works- III



The Medical Review Officer Manual for Federal Workplace Drug Testing Programs

- Provides additional guidance to the MRO in fulfilling his/her function in performance of the duties specified under the “certified” Federal agency plans and the requirements of the “Mandatory Guidelines for Federal Workplace Drug Testing Programs.”
- Copies available on the Internet at <http://www.workplace.samhsa.gov>

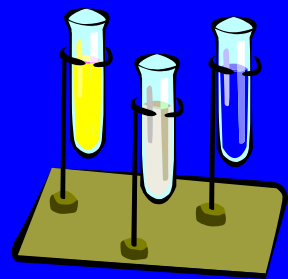


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Alternative Medical Explanations

- See MRO Manual
- THC -- Marinol -- appetite stimulant
- Cocaine -- Maxillo-facial Surgery, TAC -- local anesthetic, vasoconstrictor
- PCP -- NO Alternative Medical Explanation
- Amphetamines -- See MRO Manual
- Opiates – poppy seed pastries



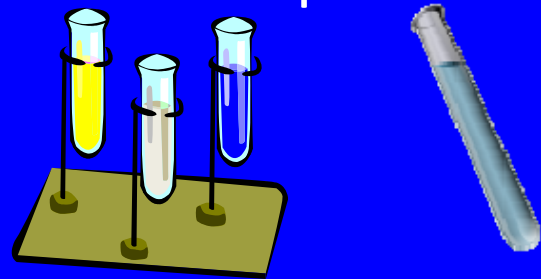
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Drug Test Interpretations

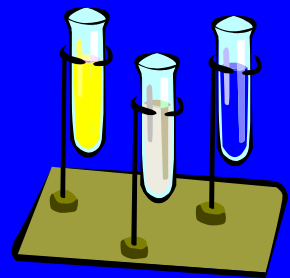
Current ONDCP Guidance to Federal Agencies and DOT
Guidance to their regulated industries:

- > The Medical Review Officers (MROs) shall not accept the ingestion of a foodstuff allegedly containing THC or the ingestion of hemp oil allegedly containing THC as a legitimate medical explanation for the presence of delta-9 THC acid in a regulated industry donor specimen.



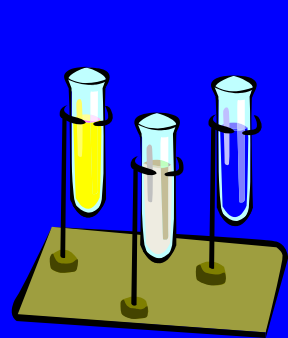
Drug Testing Sample Matrices

- Urine
- Blood
- Sweat
- Hair
- Saliva
- Breath



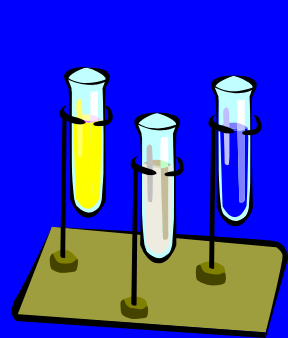
Urine Tests

- Are the least expensive of the test methods (~\$7-\$50 for home version).
- Are considered an intrusive method of testing.
- Can be done at home (for example by parents) though require lab verification for accurate results.
- Detect use primarily within the past week (longer with regular use).
- Can be affected by abstaining from use for a period of time before the test.
- Are often temperature tested to insure sample integrity.



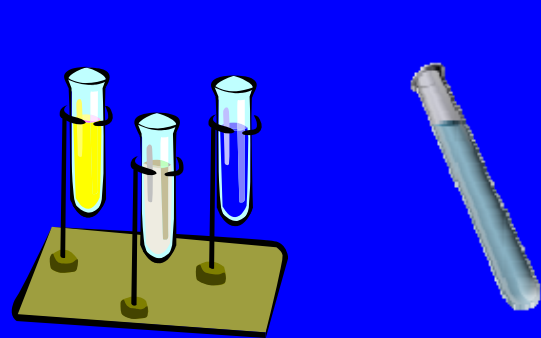
Blood Tests

- Are the most expensive method of testing.
- Are considered the most intrusive method of testing.
- Are the most accurate method of testing.
- Are the least common method of testing (most likely due to cost).



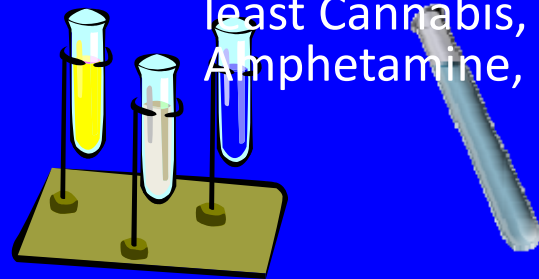
Sweat (Patches)

- Are considered a relatively intrusive method of drug testing because they require the wearing of a patch for an extended period of time.
- Are still relatively uncommon.
- Are controversial in terms of accuracy. There is some reason to believe that surface contamination (such as cannabis smoke) can cause a false reading.
- Avoids Problems with Adulteration and Dilution
- Can detect use which would not trigger other tests. Because of the short detection period for many drugs in urine, single use of many drugs longer than a week prior to using the patch will not cause a positive urine test. Because the skin patches are gathering sweat over an extended period of time, it is possible that any use during that time will produce a positive result.



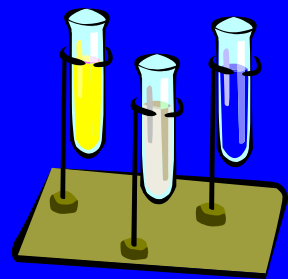
HAIR Tests

- More expensive than urine tests
- Are considered a relatively unintrusive method of drug testing.
- Detect substance use over a longer period.
- Do not usually detect use within the past week.
- Require a sample of hair about the diameter of a pencil and 1.5 inches long. They can not be done with a single hair.
- Test positive a little more than twice as often as a urine test.
- Are not significantly affected by brief periods of abstinence from drugs.
- Can sometimes be used to determine when use occurred and if it has been discontinued. Drugs, such as opiates (codeine, morphine, heroin) lay down on the hair shaft very tightly and are shown not to migrate along the shaft, thus, if a long segment of hair is available one can draw some "relative" conclusions about when the use occurred.
- Claims to be able to reliably differentiate between opiate and poppy seed use.
- Many hair tests now check for more than the SAMHSA-5, and include at least Cannabis, Ecstasy/MDMA, Cocaine, Opiates, Methamphetamine, Amphetamine, Phencyclidine (PCP), Benzodiazepines, & Barbiturates.



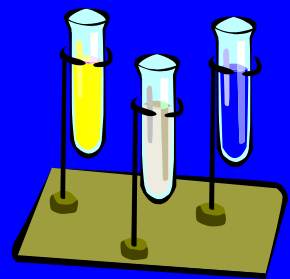
Saliva Testing

- Are considered a relatively unintrusive method of drug testing.
- Are easy to administer but require lab processing to ensure accuracy.
- Detect use primarily within the past few days.
- Have no nationally accepted standards or cutoff concentrations for detection, making results greatly dependent on the specific product purchased.
- Acidity of the Saliva and Mouth (pH) can influence free drug diffusion



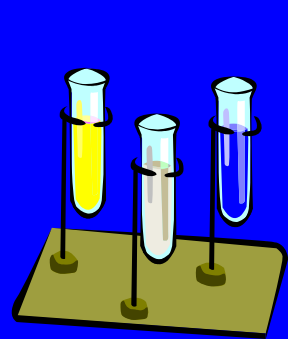
Breath

- Useful for primarily for alcohol testing
- Results can be correlated with blood levels
- Shows current use
- Carbon Monoxide Monitors can be used to determine cigarette smoking
- Testing equipment needs to be maintained
 - Quality Control can be an issue



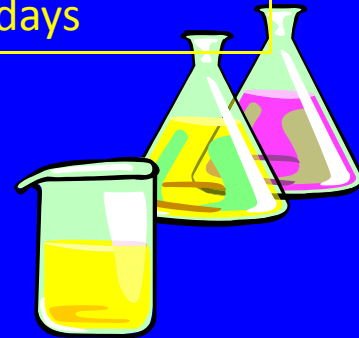
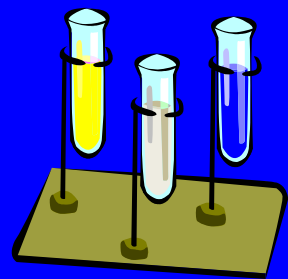
Drug Detection Times by Test Matrix

Substance	Blood	Saliva	Sweat	Urine	Hair
	Shortest Detectability-----Longest Detectability				
Alcohol	12 hrs	6-12 hrs	Unknown	6-24 hrs (5 days ETG)	n/a
Amphetamine	12 hrs	3 days	Unknown	1-4 days	Up to 90 days
Barbiturates	1-7 days	Unknown	Unknown	1-21 days	unknown
Benzodiazepines	6 – 48 hrs	Unknown	Unknown	1-42 days	unknown
Marijuana (THC) (single)	2-3 days	12-24 hrs	Unknown	2-3 days	Up to 90 days
Marijuana (Longer Term)	2 weeks	12-24 hrs	Unknown	Up to 12 weeks	Up to 90 days



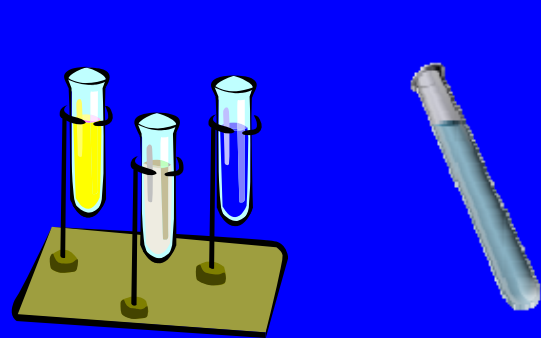
Drug Detection Times by Test Matrix

Substance	Blood	Saliva	Sweat	Urine	Hair
	Shortest Detectability-----Longest Detectability				
Cocaine	24 hrs	1 Day	Unknown	4-5 days	Up to 90 days
Morphine/ Codeine	12 hrs	12-36 hours	Unknown	2-4 days	Up to 90 days
Heroin	6 hrs	Unknown	Unknown	2-4 days	Up to 90 days
Meth- amphetamine	1-3 days	Unknown	Unknown	3-5 days	Up to 90 days
PCP	1-3 days	3 days	Unknown	3-7 days	Up to 90 days
Methadone	24 hrs	Unknown	Unknown	3 days	Up to 30 days



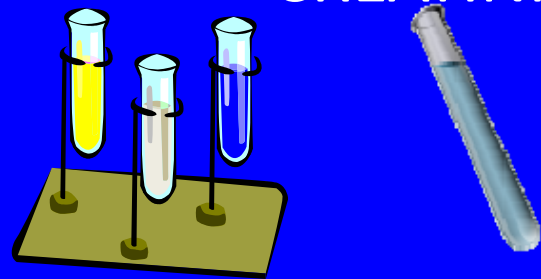
Integrity Tests

- Creatinine
- Specific Gravity
- pH (acidity)
- Oxidants



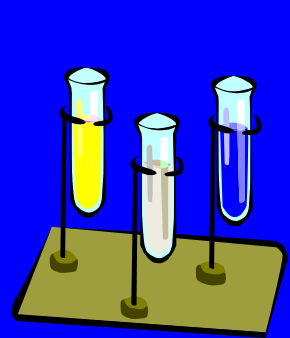
Compromised Urine Tests

- DILUTED URINE:
 - SPECIFIC GRAVITY < 1.003
 - CREATININE $< .2$ GM/L
- SUBSTITUTED URINE
 - SPECIFIC GRAVITY LESS THAN 1.002 OR GREATER THAN OR EQUAL TO 1.020
 - CREATININE < 5 mg/dl



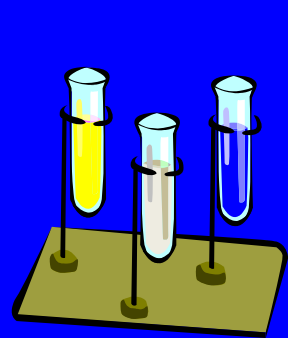
ADULTERATED URINE

- CRITERIA ARE:
 - pH < 3 OR > THAN OR EQUAL TO 11
 - NITRITE > OR EQUAL 500 mcg/ml
- CONTAINS AN EXOGENOUS SUBSTANCE



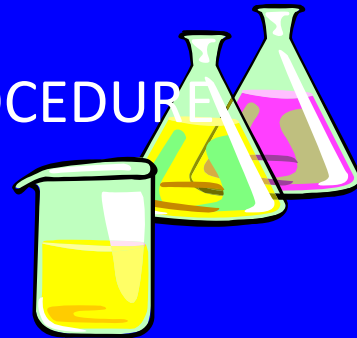
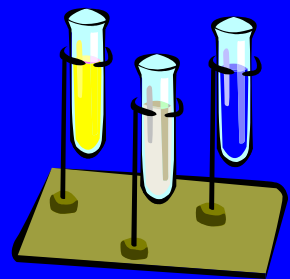
Fooling Drug Tests?

- Examples:
 - Detox drinks (“Ready Clean”) - vitamins and herbs to “clean the urine”
 - Urine additives (“Urine Luck”) – contain oxidizers to block marijuana detection, but labs can detect the oxidizer
 - Mouth rinses (“Saliva Cleanse”) – vitamins and herbs to “clean the saliva”
 - Shampoos (“Clear Choice”) – claim to coat hair with detection blockers – shampoos, bleaches and dyes can alter drug concentrations in hair



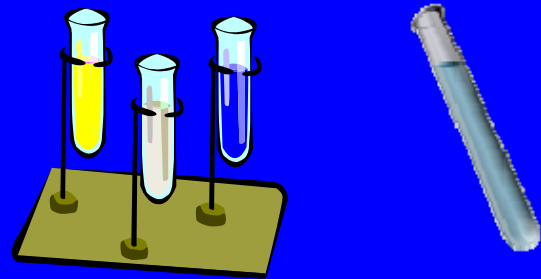
Assessing A Positive: DOT or Non-DOT

- CHECK FOR:
 - CORRECT SPECIMEN
 - LAB ERROR?
 - CORRECT DATE
 - MEDICAL REASON ??
 - URINE COLLECTED JUST AFTER A HOSPITAL DISCHARGE MAY REFLECT HOSPITAL ADMINISTERED MEDICATIONS (OPIATES, BENZODIAZEPINES)
 - PATIENT MAY NOT HAVE DOCUMENTED ALL OF THEIR MEDICATIONS
 - RECENT OUTPATIENT MEDICAL/SURGICAL PROCEDURE



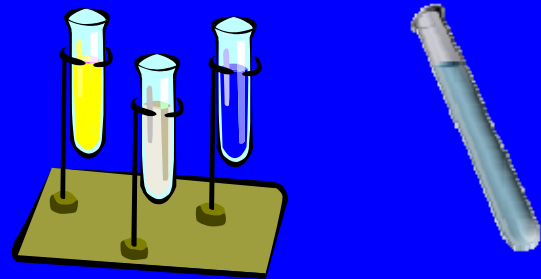
False-Positive Tests

- Risk
 - Inevitable, since no test is 100% specific
 - For a non-drug user, the only type of positive test
- Consequences
 - Puts public reputation and future employability in jeopardy
 - may disrupt long-standing relationships with patients
 - threatens large public financial investment in training
 - emotional and financial upheaval



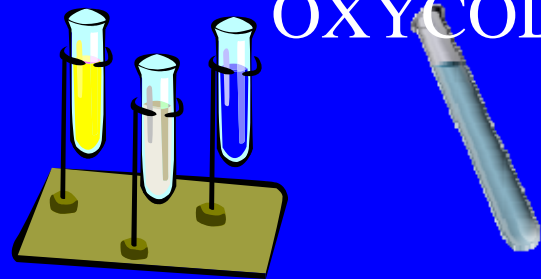
FALSE NEGATIVE DRUG TESTS

- WAS TEST TAKEN TOO LATE?
- OCCURS IF ADULTERATION/DILUTION WAS SUCCESSFUL AND UNDETECTED
- ROUTINE SCREENS MAY NOT INCLUDE:
 - ATHLETIC PERFORMANCE ENHANCING AGENTS
 - VOLATILE INHALANTS
 - DESIGNER DRUGS



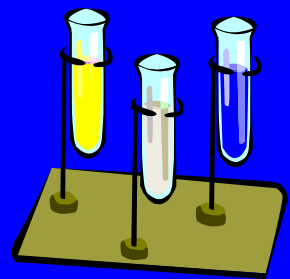
FALSE NEGATIVES DUE TO LIMITED ROUTINE SCREENS

- ROUTINE SCREENS MAY NOT INCLUDE:
 - E.G., BENZODIAZEPINES AND BARBITUATES, ARE NOT ON THE DEPT. OF TRANSPORTATION SCREENS
 - MDMA(ECSTASY),LSD, PSILOCYBIN ARE NOT DETECTED BY ALL SCREENS
 - OPIATE SCREENS FOCUS ON HEROIN,MORPHINE AND CODEINE USE AND MAY MISS:PROPOXYPHENE, MEPERIDINE, METHADONE,PENTAZOCINE, AND OXYCODONE



Opiates

- Morphine and/or Codeine may be seen on evaluation of a specimen if the patient:
 - Used Heroin
 - Ingested poppy seeds
 - Used a codeine - containing product
 - Used a morphine – containing product



Heroin

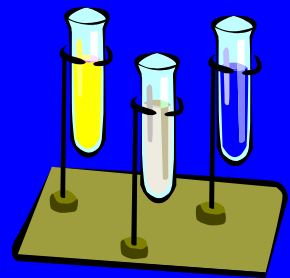
Heroin
(Diacetylmorphine)

Hydrolyzed

Monoacetyl-Morphine

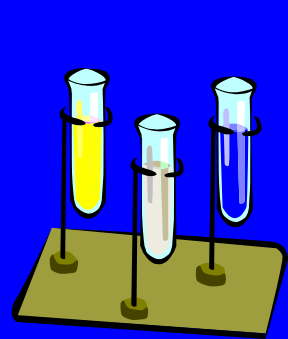
Hydrolyzed

Morphine



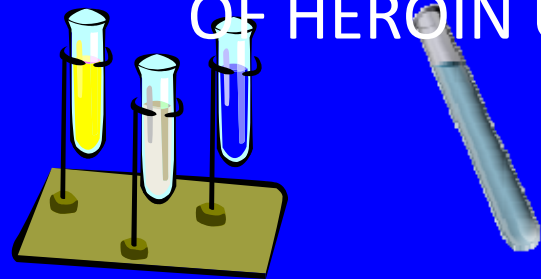
Urine Testing for Heroin Metabolites

- Free Morphine
- Morphine Glucuronide
- Free Codeine
- 6-Monoacetylmorphine (6-MAM)
 - This Metabolite is dispositive of heroin use



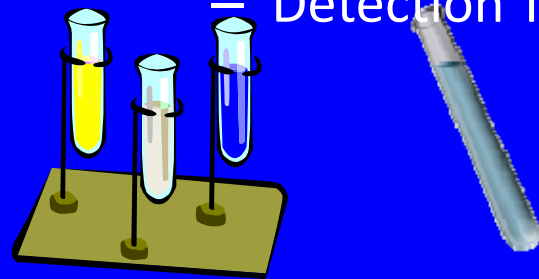
MORPHINE AND CODEINE GUIDELINES

- HIGH LEVELS OF TOTAL MORPHINE IN URINE (>5000 ng/ml) INDICATIVE OF ABUSE OF OPIATE PRODUCT (HEROIN, MORPHINE, CODEINE).
- HIGH LEVELS OF CODEINE (>300 ng/ml) WITH A MORPHINE TO CODEINE RATIO < 2 , IS INDICATIVE OF CODEINE USE AND NOT POPPY SEED USE
- PRESENCE OF 6 –MONOACETYLMORPHINE (6-MAM) IN URINE IS A POSITIVE INDICATION OF HEROIN USE.
- ONE ALWAYS NEEDS CLINICAL EVIDENCE OF HEROIN USE UNLESS 6 -MAM IS PRESENT WHEN DIAGNOSING A POSITIVE DRUG SCREEN FOR OPIATES AS A RESULT OF HEROIN USE.



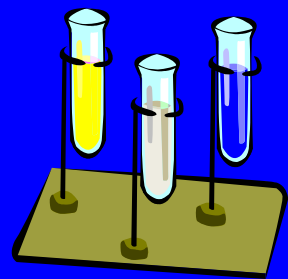
Barbiturates

- Ultrashort Acting (Thiopental)
 - Half Life = 6- 26 Hrs
 - Detection Time in Urine = Less than a day
- Short Acting (Secobarbital, pentobarbital)
 - Half Life – 22- 30 hrs
 - Detection Time in Urine = Less than a Day
- Intermediate Acting (Amobarbital)
 - Half Life = 24 hr
 - Detection Time in Urine = 2- 4 Days
- Long Acting (Phenobarbital)
 - Half Life = 4 Days
 - Detection Time in Urine = Several Weeks after Chronic Use



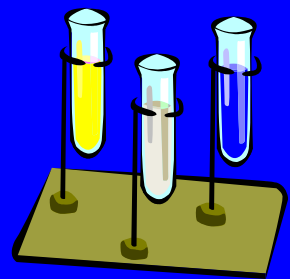
Benzodiazepines

- More than 15 different benzodiazepine medications available
- Approximately 63 Benzodiazepine metabolites are excreted in the urine
- Most Screening tests are calibrated with oxazepam
- Wide range of concentrations due to wide dose ranges used in patients



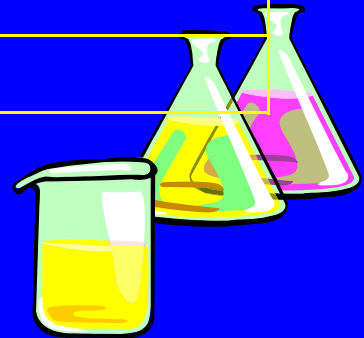
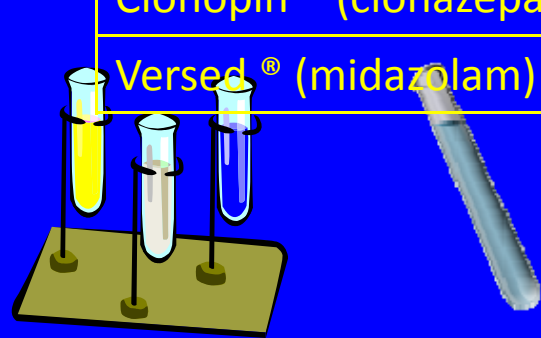
Benzodiazepines

- Most confirmation tests minimally detect oxazepam
- Often Dalmane, Ativan, Xanax, Klonopin are not reported
- Ambien (Zolpidem) does not cross react with benzodiazepine screen
- Chinese herb pills (Cows Head Pills, Miracle Herb Pills, Potentsex Pills, Black Pearls (Tung Sheum Pills, Chuifong Toukuwan) contain Benzodiazepines



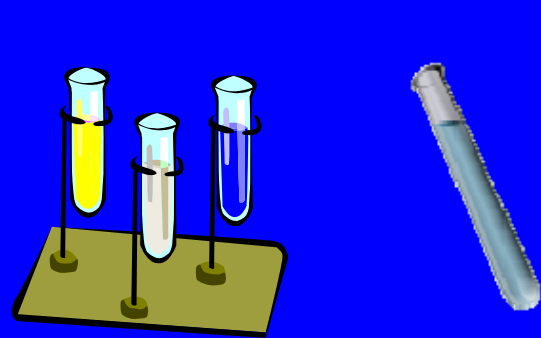
Benzodiazepine Urinary Metabolites

Drug	Metabolite
Serax [®] (oxazepam)	Oxazepam
Restoril [®] (tamazepam)	Temazepam, Oxazepam
Doral [®] (quazepam)	2-oxoquazepam, N-desalkylflurazepam
Ativan [®] (lorazepam)	Lorazepam
Halcion [®] (triazolam)	α -Hydroxytriazolam, 4-Hydroxytriazolam
Dalmane [®] (flurazepam)	Hydroxyethylflurazepam, Desalkylflurazepam
Librium [®] (chlordiazepoxide)	Oxazepam, Nordiazepam
Valium [®] (diazepam)	Temazepam, Nordiazepam, Oxazepam
Xanax [®] (alprazolam)	α -Hydroxyalprazolam
Clonopin [®] (clonazepam)	7-Aminoclonazepam
Versed [®] (midazolam)	α -Hydroxymidazolam



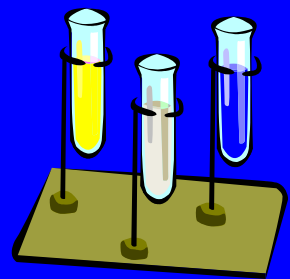
Opioid Medications That Do Not Metabolize to Morphine or Codeine

- Hydrocodone
- Hydromorphone
- Oxycodone
- Methadone
- Buprenorphine



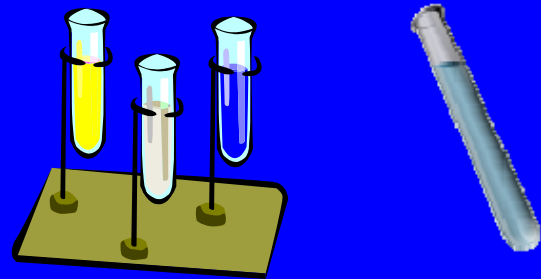
Cocaine Metabolites

- COCAINE IS METABOLIZED TO BENZOYLECGONINE (BE) AND ECGONINE METHYL ESTER (EME)
 - BE IS PREDOMINANT METABOLITE IN BLOOD AND URINE
 - EME IS FOUND IN GREATEST AMOUNTS WHEN COCAINE IS ORALLY INGESTED.
- BENZOYLECGONINE AND ECGONINE METHYL ESTER ARE METABOLIZED TO ECGONINE



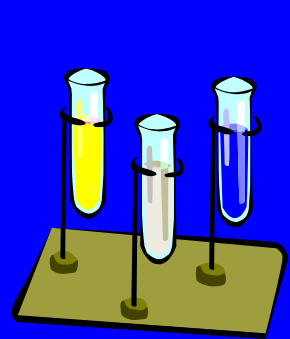
Cocaine Containing Medications

- COCAINE IS FOUND IN THESE LOCAL ANESTHETICS
 - TEN TO TWENTY PERCENT HCL SOLUTION
 - ONE TO FOUR PERCENT OPHTHALMOLOGIC SOLUTION
 - TAC:TETRACAINE,ADRENALINE AND COCAINE HCL
- COCAINE IS NOT FOUND IN THESE LOCAL ANESTHETICS
 - BENZOCAINE
 - LIDOCAINE
 - MEPIVACAINE



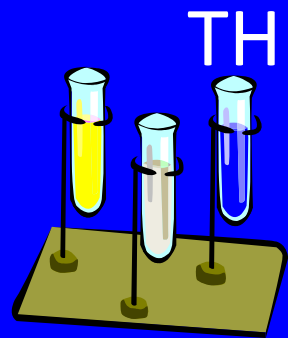
Cocaine Containing Foodstuffs

- “HEALTH INCA TEA” BANNED BY FDA DOES CONTAINS COCAINE
 - Enough to produce a True Positive on drug testing



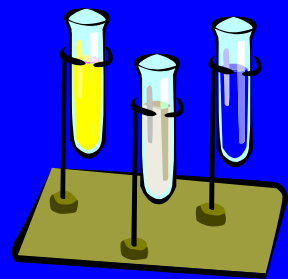
Amphetamine Containing Medications

- AMPHETAMINES ARE FOUND IN FORMS: L & D ISOMERS
- VICKS INHALER IS THE L FORM –NOT PSYCHOACTIVE BUT SHOWS UP POSITIVE FOR AMPHETAMINE
- PSYCHOACTIVE FORM OF AMPHETAMINE IS THE D FORM, IF LESS THAN 80% IS L FORM, THEN VICKS CANNOT BE THE SOLE SOURCE



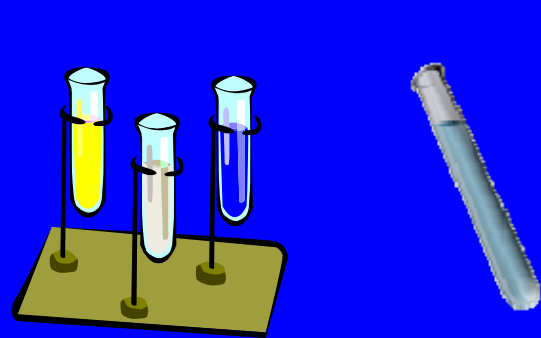
Medications Producing Screen Positive Amphetamines

- AMPHETAMINES CAN BE FOUND ON DRUG SCREENS IN PATIENTS USING:
 - PHENYLPROPANOLAMINE
 - PHENYLEPHRINE
 - SYNEPHRINE
 - DRISTAN®
 - NEOSYNEPHRINE
 - AMPHETAMINIL
- D AND L FORMS ARE SEEN IN EQUAL AMOUNTS IN PATIENTS USING:
 - ADDERALL®
 - BENZEDRINE®
 - BEPHETAMINE®
 - DEXEDRINE®
 - DUROPHET®
 - OBETROL®
- METHAMPHETAMINE SEEN IN PATIENTS USING:
 - SELEGILINE®
 - BENZPHETAMINE



Alcohol

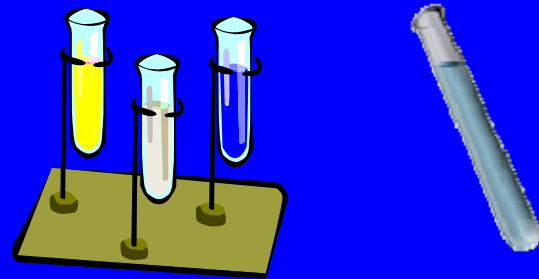
- BLOOD ALCOHOL CONCENTRATION = “BAC” – EXPRESSED AS A PERCENTAGE
 - URINE = 1.3 TIMES BLOOD LEVEL AFTER PEAK (2 HOURS AFTER DRINKING) CAUTION: THERE CAN BE IN SITU FERMENTATION IN URINE SAMPLES, SUCH THAT A HIGHER LEVEL OF ALCOHOL IS REPORTED
- BREATH TESTING USES INFRARED SPECTROMETRY – MEASURED AMOUNT OF ALCOHOL ON THE BREATH, THEN BLOOD/ALCOHOL LEVEL IS INFERRED.



Alcohol

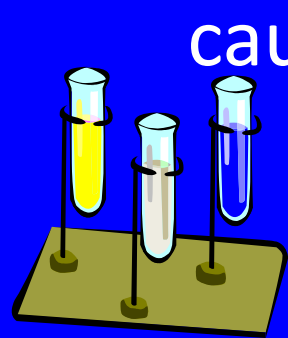
SPECIMEN TESTED

- BREATH
 - IMMEDIATE RESULTS
 - NEED EQUIPMENT AND TRAINING
- BLOOD
 - ACCURATE
 - INVASIVE
- URINE
 - ESTABLISHED COLLECTION ROUTINE
 - CORRELATION TO BLOOD LEVEL LESS ACCEPTABLE
- SALIVA
 - IMMEDIATE RESULT
 - NEWER TECHNOLOGY AVAILABLE



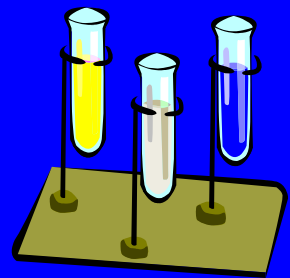
False Positive Phencyclidine (PCP)

- Venlafaxine (Effexor[®]) has been reported to cause a false positive for PCP using at least on immunochromatographic qualitative assay.
- Dextromethorphan (DXM) may cause a false-positive test result with some urine immunoassays for PCP
- Some anecdotal evidence that ketamine will cause a false positive PCP—not documented.



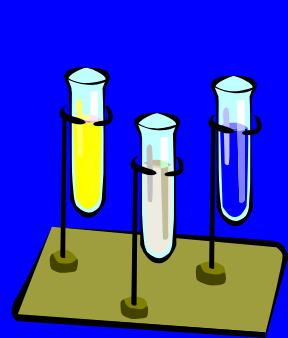
Other Issues

- CLIA RULES
- ADOLESCENT TESTING
- PREGNANT WOMEN
- COLLECTION



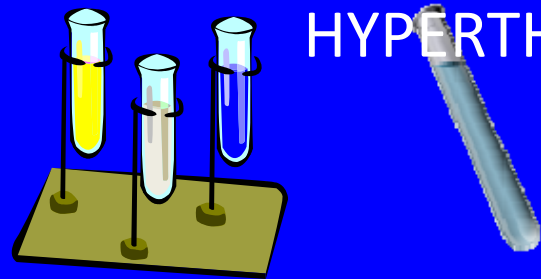
CLIA (CLINICAL LABORATORY IMPROVEMENT AMENDMENT OF 1988)

- TESTING OF ANY SPECIMEN IS SUBJECT TO THE CERTIFICATION REQUIREMENT OF CLIA IF TEST IS FOR MEDICAL PURPOSES, SUCH AS FOR TREATMENT.
 - BREATH IS NOT COVERED UNDER THIS AMENDMENT EXCEPT IN NEW YORK STATE



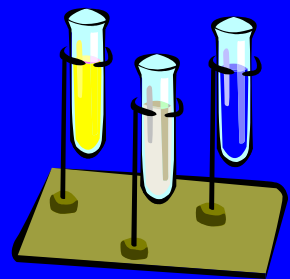
ADOLESCENT TESTING

- INFORMED CONSENT BY THE ADOLESCENT IS ESSENTIAL
- INVOLUNTARY TESTING IS JUSTIFIED WHEN:
 - EMERGENCY SITUATIONS EXIST IN WHICH A PATIENT IS UNABLE TO GIVE INFORMED CONSENT (SURGERY, UNCONSCIOUS, SERIOUSLY INJURED)
 - ALTERED MENTAL STATUS OR ACUTE PSYCHOSIS EXISTS
 - ACUTE MEDICAL SYMPTOMS THAT PUT PATIENT AT GRAVE RISK (CHEST PAIN, DYSRHYTHMIA, HYPERTHERMIA, HYPERTENSION, ETC.)



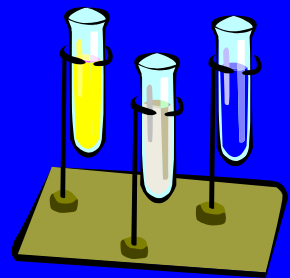
INVOLUNTARY TESTING OF ADOLESCENTS IS JUSTIFIED WHEN:

- COMPETENCY OF AN ADOLESCENT IS IN DOUBT
- ONE DOES NOT TRUST THE VERACITY OF THE ADOLESCENT (CONDUCT DISORDER, OPPOSITIONAL-DEFIANT OR ANTI-SOCIAL PERSONALITY DISORDERS ARE PRESENT)
- TESTING IS COURT ORDERED



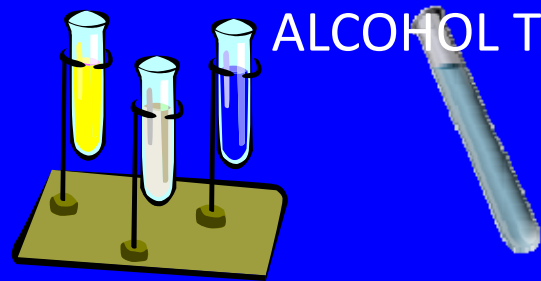
PREGNANT WOMEN

- A URINE AND/OR BLOOD TOXICOLOGY SCREEN IS NECESSARY ONLY IN THOSE CIRCUMSTANCES WHERE A HISTORY OF DRUG USE CANNOT BE RELIABLY OBTAINED
- INFORMED CONSENT SHOULD ALWAYS BE OBTAINED
 - A TOXICOLOGY SCREEN MAY BE INDICATED IN THE NEWBORN –HOWEVER, BE AWARE:
 - DURATION OF DRUGS IN URINE ARE USUALLY GIVEN FOR NON –PREGNANT ADULTS AND MAY DIFFER IN NEONATES.
 - THERE ARE ALTERNATIVE METHODS OF SCREENING, THOUGH THESE MAY NOT BE READILY AVAILABLE NEWBORN MECONIUM



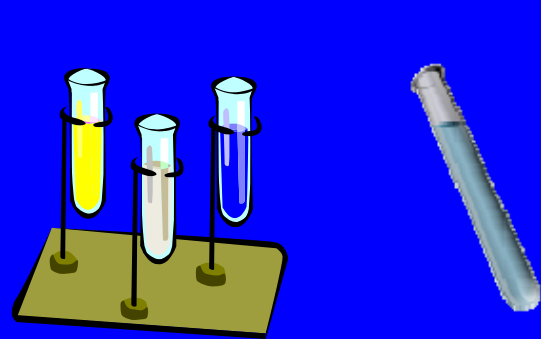
COLLECTION

- OBSERVED
- NON-OBSERVED
 - BLUE WATER IN THE BOWL
 - HOT WATER TURNED OFF IN THE BATHROOM
 - DO NOT FLUSH UNTIL SAMPLE IS TAKEN
 - MEASURE THE TEMPERATURE OF THE URINE IF NOT OBSERVED
 - MUST BE PERFORMED WITHIN 4 MINUTES OF COLLECTION
 - BETWEEN 90°F AND 100°F OR WITHIN 1.8°F OF ORAL OR EAR TEMPERATURE
- SPLIT THE SAMPLE: See DOT Testing
- CHAIN OF CUSTODY, IS THIS NEEDED?
 - SELECTION OF THE LAB SAMHSA CERTIFICATION IS NEEDED BY LABS PERFORMING FEDERALLY MANDATED DRUG AND ALCOHOL TESTING



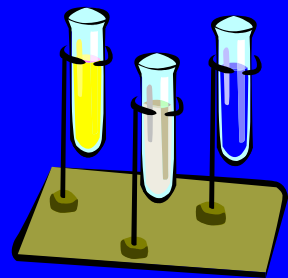
False Positives

- <http://www.askdocweb.com/falsepositives.html>



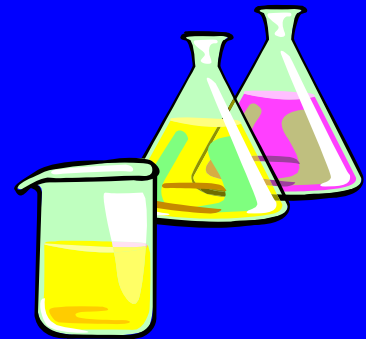
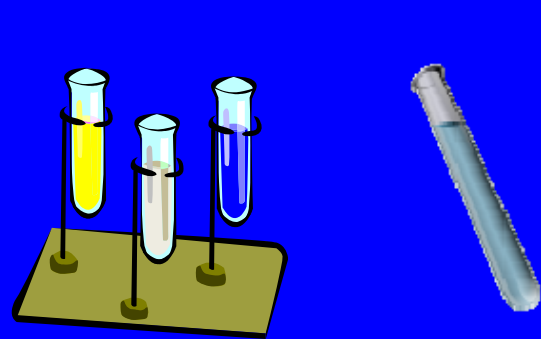
Potential Cross Reacting Substances Causes False Positive Drug Screens

Drug Group Found	Potential Cross Reacting Substance
CANNABINOIDS	NON STEROIDAL ANTI-INFLAMMATORY MEDICATIONS
	EFAVIRENZ
	Promethazine
	Tolectin®
Opiates	CHLORPROMAZINE
	RIFAMPIN
	Dolobid
	FLUOROQUINOLONES



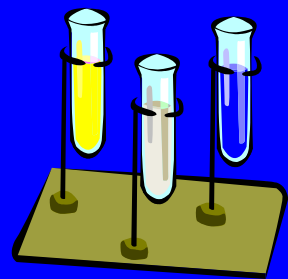
Potential Cross Reacting Substances Causes False Positive Drug Screens

Drug Group Found	Potential Cross Reacting Substance
AMPHETAMINE	TRAZEDONE
	Eldepryl
	AMANTADINE
	DESIPRAMINE
	Bupropion
	Fluoxetine
	RANITIDINE
	Actifed



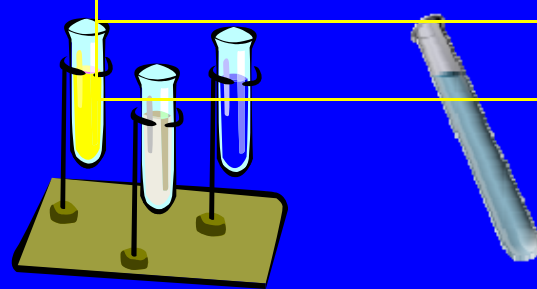
Potential Cross Reacting Substances Causes False Positive Drug Screens

Drug Group Found	Potential Cross Reacting Substance
PHENCYCLIDINE	CHLORPROMAZINE
	THIORIDAZINE
	MEPERIDINE
	DEXTROMETHORPHAN
	DIPHENHYDRAMINE
	DOXYLAMINE



Potential Cross Reacting Substances Causes False Positive Drug Screens

Drug Group Found	Potential Cross Reacting Substance
Benzodiazepine	OXAPROZIN (DAYPRO)
	CHINESE HERB PILLS [COWS HEAD PILLS, MIRACLE HERB PILLS, POTENTSEX PILLS, BLACK PEARLS(TUNG SHEUH PILLS,CHUIFONG TOUKUWAN) CONTAIN BENZODIAZEPINES
	Zoloft



SAMHSA/CSAT Information

- SAMHSA web site: www.samhsa.gov
- CSAT web site: <http://csat.samhsa.gov>
- For information regarding grants & application:
<http://www.grants.gov/>
- SHIN 1-800-729-6686 for publication ordering or information on funding opportunities
SHIN TDD Line: 1-800-487-4889
- 1-800-662-HELP – SAMHSA's National Helpline
(average # of sub abuse tx calls per mo.- 24,000)

