

ALCOHOL & DRUG SCREENS

A GUIDE TO THE INTERPRETATION AND EFFECTIVE USE OF SCREENS FOR SUBSTANCES OF ABUSE

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SUBSTANCE USE DISORDERS ARE
CHRONIC DISORDERS; RELAPSE MAY
OCCUR AT ANY TIME.

PATIENTS MAY DENY OR MINIMIZE DRUG
USE.

DRUG TESTING CAN DETERMINE DRUG
USE AND IS AN INTEGRAL PART OF
ONGOING EVALUATION AND TREATMENT,
MUCH LIKE GLUCOSE LEVELS ARE
IMPORTANT FOR THE ONGOING
EVALUATION AND TREATMENT OF
DIABETES.

BEFORE TESTING - ISSUES THAT NEED TO BE CONSIDERED

- IS THIS ROUTINE OR REASONABLE CAUSE TESTING ?
- INFORMED CONSENT ISSUES FOR THE ADOLESCENT (SEE SPECIAL ISSUES SECTION)
- ARE YOU USING AN APPROVED LAB?
- DO YOU NEED A CLIA LICENSE (SEE SPECIAL ISSUES)?
- DO YOU NEED A HARD COPY OF THE RESULT?
- ARE THERE CHAIN OF CUSTODY ISSUES?
- DO YOU NEED TO DO A SPLIT URINE SAMPLE*?
- HOW MANY TESTS MUST BE POSITIVE FOR YOU TO DO SOMETHING?
(CAREFUL CLINICAL DECISIONS SHOULD BE MADE BASED UPON THE RESULTS OF A SINGLE TEST)
- IF POSITIVE RESULT WHAT ARE YOU GOING TO DO WITH IT?
REFERRAL?
- HAVE YOU TAKEN A COMPLETE DRUG/MEDICATION USE HISTORY TO
INCLUDE OVER - THE - COUNTER MEDICATIONS AND HERBAL
PREPARATIONS?

* SPLIT SAMPLE: SPLITTING A SINGLE URINE VOID INTO 2
SEPARATE BOTTLES LABELED A AND B; A IS TESTED AND B
REMAINS SEALED AND AVAILABLE FOR TESTING AT A LATER DATE

DRUG TESTING OBSERVATION CHECKLIST

SYMPTOMS AND BEHAVIORS

PRESENCE OF ONE OR MORE MAY PROVIDE REASONABLE
CAUSE FOR TESTING

- CHANGE IN ATTENDANCE
- CHANGE IN WORK QUALITY OR QUANTITY
- INCREASE IN ACCIDENTS
- CARELESSNESS
- LABILE (CHANGING) MOOD
- UNEVEN JUDGMENT
- WITHDRAWAL FROM FRIENDS AND PEERS
- LETHARGY
- INABILITY TO LOCATE FOR PERIODS OF TIME
- FREQUENT BURNS AND BRUISES WITH POOR EXPLANATIONS
- INCREASE IN VISITS TO RESTROOM, CAR, ETC.

DRUG TESTING OBSERVATION CHECKLIST

SYMPTOMS AND BEHAVIORS

- CHANGE IN BEHAVIOR (INCREASE OR DECREASE)
 - FRIENDLY
 - HYPERACTIVE
 - INACTIVE
 - NERVOUS
 - ALERT
 - EVASIVE
 - SUSPICIOUS
 - BELIEVABLE (TRUTHFUL)
 - COOPERATIVE
- CHANGE IN THOUGHTS
 - DOES HE/SHE MAKE SENSE?
 - CAN YOU FOLLOW HIS/HER THINKING?
 - DOES HIS/HER ATTENTION WANDER?
 - IS HE/SHE SCARED?
 - DOES HE/SHE SCARE YOU?
 - DOES HE/SHE ANSWER QUESTIONS APPROPRIATELY?

TEST METHODS

- IMMUNOASSAYS

- BASED ON PRINCIPLE OF COMPETITION BETWEEN LABELLED AND UNLABELLED ANTIGEN (DRUG) FOR BINDING SITES ON A SPECIFIC ANTIBODY.

- 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

- 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.

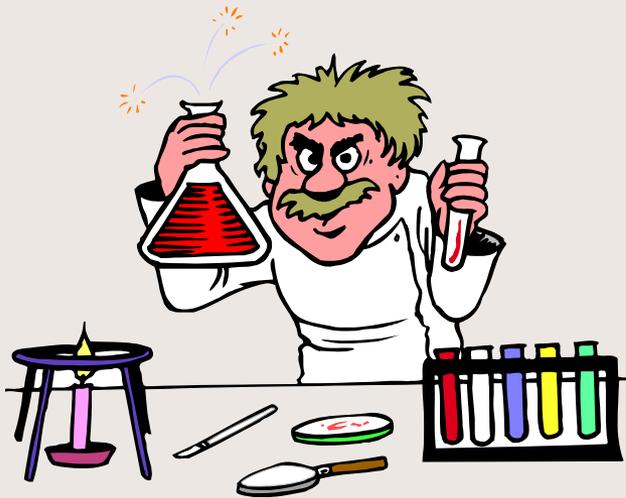
TEST METHODS

- THIN LAYER CHROMATOGRAPHY (TLC)
 - BASED ON AN ABSORBENT (GEL, CELLULOSE) BEING APPLIED TO A GLASS PLATE OR PLASTIC FILM. A MIXTURE OF KNOWN DRUG COMPOUNDS (STANDARD) ARE APPLIED TO SPECIFIC AREAS AND ARE ALLOWED TO MOVE ACROSS THE PLATE BY CAPILLARY ACTION. THE UNKNOWN SAMPLES ARE COMPARED TO KNOWN SAMPLES AS TO THEIR VERY SPECIFIC MOVEMENT.

TEST METHODS

- GAS - LIQUID CHROMATOGRAPHY (GLC)
 - BASED ON AN INERT GAS AS THE MOVING PHASE TO TRANSPORT A VAPORIZED SAMPLE OF DRUG THROUGH A COLUMN CONTAINING A STATIONARY LIQUID PHASE.
- GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)
 - COMBINES THE EFFICIENT SEPARATING POWER OF THE GLC WITH THE HIGH SENSITIVITY OF A MASS SPECTROMETRIC INSTRUMENT TO DETECT SPECIFIC DRUGS.

SAMPLE ALTERNATIVES



- URINE
- BLOOD
- BREATH
- SALIVA
- HAIR
- SWEAT

URINE DRUG TESTING

- ADVANTAGES
 - EXTENSIVE SCIENTIFIC BASE AND RESEARCH
 - ACCURATE AND RELIABLE
 - TECHNOLOGY HAS BEEN IN PLACE FOR YEARS
- DISADVANTAGES
 - EASY TO ADULTERATE
 - AMOUNT OF DOSE MAY NOT CORRELATE WITH CONCENTRATION
 - COLLECTION ISSUES
 - TESTING MAY NOT CORRELATE WELL WITH LEVELS OF IMPAIRMENT

URINE DRUG SCREEN CUTOFF LEVELS FOR A POSITIVE TO BE REPORTED

DRUG/METABOLITE	INITIAL TEST (ng/ml)	CONFIRMATION (ng/ml)
MARIJUANA	50	
DELTA-9-THC		15
COCAINE	300	150
PHENCYCLIDINE	25	25
AMPHETAMINE	1000	500
METHAMPHETAMINE		500
OPIATE	2000	
CODEINE		2000
MORPHINE		2000
6-ACETYL MORPHINE		10

URINE DRUG SCREEN CUTOFFS

- DEPARTMENT OF TRANSPORTATION IN THEIR WORKPLACE TESTING HAS SET UP STANDARD CUTOFFS. CHECK WITH YOUR LAB FOR THE VALUES THAT THEY USE.
- IF CONFIRMING METHAMPHETAMINE, RESULTS MUST ALSO SHOW AMPHETAMINES > 200 NG/ML.

BLOOD DRUG TESTING

- ADVANTAGES

- CAN DETECT IMPAIRMENT AS IT GIVES CURRENT LEVEL
- DETECTION PERIOD IS MINUTES TO DAYS AFTER INGESTION
- BREATH LEVELS CAN BE CORRELATED WITH BLOOD LEVELS

- DISADVANTAGES

- INVASIVE
- RISK OF NEEDLE STICKS TO HEALTHCARE WORKERS

BREATH DRUG TESTING

- ADVANTAGES

- SHOWS CURRENT USE
- CAN BE CORRELATED WITH BLOOD LEVEL
- CARBON MONOXIDE MONITORS CAN BE USED TO DETERMINE IF ONE IS SMOKING
 - USEFUL IN SMOKING CESSATION PROGRAMS

- DISADVANTAGE

- TESTING EQUIPMENT IS NEEDED
 - COST
 - MAINTENANCE (DEPENDS ON MANUFACTURERS DIRECTIONS)
 - QUALITY CONTROL
- USEFUL FOR ALCOHOL PRIMARILY

BLOOD/BREATH LEVEL CORRELATES WITH IMPAIRMENT

BLOOD/BREATH ALCOHOL CONCENTRATION (BAC)

20 - 99 mg%: LOSS OF MUSCULAR COORDINATION

100 - 199 mg%: NEUROLOGIC IMPAIRMENT, ATAXIA, PROLONGED REACTION, MENTAL IMPAIRMENT, INCOORDINATION

200 - 299 mg%: NAUSEA, VOMITING, ATAXIA

300 - 399 mg%: HYPOTHERMIA, DYSARTHRIA, AMNESIA, STUPOR

400 - > mg%: SERIOUS DECREASE IN PULSE, BLOOD PRESSURE, TEMPERATURE AND RESPIRATORY RATE; COMA

* BAC GREATER THAN 150 IF NOT SHOWING SIGNS OF INTOXICATION OR ANY TIME BAC IS > 300 EQUALS A DIAGNOSIS OF **ALCOHOL DEPENDENCE**

SALIVA (ORAL FLUID) DRUG TESTING



- USED FOR MANY YEARS
- CAN USE IMMUNOASSAY, GAS CHROMATOGRAPHY OR GC/MS

SALIVA (ORAL FLUID) DRUG TESTING

- ADVANTAGES
 - EASY SPECIMEN TO OBTAIN
 - SPITTING OR SWABBING
 - EASILY OBSERVED COLLECTION
 - DIFFICULT TO ADULTERATE OR DILUTE
 - CORRELATION BETWEEN DRUG CONCENTRATION AND IMPAIRMENT
 - MAY NOT BE USEFUL IN DETECTING VERY RECENT DRUG USE

SALIVA (ORAL FLUID) DRUG TESTING

- DISADVANTAGES

- INDIVIDUAL VARIATIONS IN THE RATE OF SALIVA PRODUCTION
- ORAL OR SMOKED DRUGS CAN PRODUCE CONTAMINATION OF SALIVA
- NARROW WINDOW OF DETECTION
- ACIDITY OF THE SALIVA AND MOUTH (pH) CAN INFLUENCE FREE DRUG DIFFUSION

SWEAT DRUG TESTING

- ADVANTAGES

- NONINVASIVE (MOST FREQUENT DEVICE IS THE PATCH)
- RELATIVELY TAMPER PROOF
- AVOIDS ADULTERATION AND DILUTION PROBLEMS
- FDA APPROVED FOR 5 DRUG PANEL
- PRESENCE OF THE PARENT DRUG (HEROIN, THC, COCAINE) AND NOT THEIR METABOLITES CAN BE DETECTED
- USEFUL FOR MONITORING FOR 1-2 WEEKS

SWEAT DRUG TESTING

- DISADVANTAGES

- HIGH INTERSUBJECT VARIABILITY ESPECIALLY IN THE RATE OF SWEAT PRODUCTION
- POSSIBLE ENVIRONMENTAL CONTAMINATION
- RISK OF ACCIDENTAL REMOVAL
- LIST OF DETECTED DRUGS IS LIMITED
 - ETHANOL, NICOTINE/COTININE, MORPHINE, AMPHETAMINE, METHAMPHETAMINE, PHENCYCLIDINE, METHADONE, COCAINE

SWEAT DRUG TESTING

- SPECIAL ISSUES

- COCAINE

- FIRST APPEARANCE IS IN 60 MINUTES
 - MAJORITY EXCRETED IN 8 – 48 HOURS
 - CONSIDERABLE VARIABILITY IN EXCRETION RATE AND AMOUNT

SWEAT DRUG TESTING

- SPECIAL ISSUES

- HEROIN AND METABOLITES

- STUDY CONDUCTED BY KINTZ ET AL OF 14 HEROIN USERS IN A HEROIN TREATMENT PROGRAM IN EUROPE. EACH HAD A SWEAT PATCH APPLIED PRIOR TO HEROIN ADMINISTRATION.

- ANALYSIS FOUND SIGNIFICANT VARIABILITY IN AMOUNTS OF HEROIN AND IT'S METABOLITES:

- HEROIN 2.1 TO 96.3 NG/PATCH

- 6-ACETYLMORPHINE 0 - 24.6 NG/PATCH

- MORPHINE 0 - 11.2 NG/PATCH

- * CAREFUL INTERPRETATION IS NEEDED WHEN EVALUATING A SINGLE TEST RESULT

HAIR DRUG TESTING

- USED SINCE 1979
- COMPLEMENTS URINE DRUG TESTING (SHORT VS. LONG SURVEILLANCE WINDOW)

HAIR DRUG TESTING

- ADVANTAGES

- LONG TIME WINDOW FOR DRUG DETECTION
- EASY TO COLLECT, HANDLE AND STORE
 - SAMPLE IS CUT, GROUND UP THEN WASHED WITH WATER AND/OR SOLVENTS. EXTRACTION AND PURIFICATION PROCESS PRECEDES ASSAY
 - STORAGE IS AT ROOM TEMPERATURE (NO NEED TO REFRIGERATE OR FREEZE PATIENT SAMPLES)
- SECOND COLLECTION CAPABILITY
- NONINVASIVE
- BEATING THE TEST MAY BE DIFFICULT

HAIR DRUG TESTING

- DISADVANTAGES

- MAY NOT DETECT RECENT USE
- ENVIRONMENTAL CONTAMINATION IS A POSSIBLE PROBLEM
- MECHANISM OF DRUG DEPOSITION IS NOT WELL UNDERSTOOD
 - DUE TO EITHER DIFFUSION FROM BLOOD TO HAIR FOLLICLE, SWEAT SECRETION, SEBACEOUS GLAND SECRETION OR ENVIRONMENTAL CONTAMINATION
- DOSE/TIME RELATIONSHIPS ARE NOT WELL ESTABLISHED
- FEW CONTROLLED STUDIES

HAIR DRUG TESTING

- UNRESOLVED ISSUES

- RELATIONSHIP OF AMOUNT OF DRUG USED TO HAIR CONCENTRATION
- RELATIONSHIP OF DURATION OF USE AND TIME OF USE VS. DETECTION TIME
- MECHANISM OF DRUG ENTRY INTO HAIR
- ENVIRONMENTAL EXPOSURE TO DRUG CAUSING CONTAMINATION OF HAIR CAN RESULT IN A POSITIVE REPORT

HAIR DRUG TESTING

- UNRESOLVED ISSUES

- INFLUENCE OF HAIR COLOR AND TEXTURE ON TEST RESULTS

- STUDY BY GYGI ET AL IN 1997 FOUND THAT PIGMENTED HAIR IN VARIOUS SPECIES OF RATS INCORPORATED 3 - 44 TIMES THE AMOUNT OF CODEINE THAN NON-PIGMENTED RATS, EVEN IN THE SAME RAT. THERE WERE LARGE DIFFERENCES SEEN FOR MORPHINE AND NORCODEINE. HOWEVER, PHENOBARBITAL WAS FOUND IN THE SAME CONCENTRATION IN PIGMENTED AND NON-PIGMENTED HAIR.
- STUDY BY HOFFMAN IN 1999 SHOWED THAT RACIAL DIFFERENCES DID NOT CREATE A DISPARITY

- TREATMENT ISSUE:

IS A 90 - DAY DETECTION WINDOW CONSIDERED RECENT OR CURRENT USE?

DRUG CLASSES

ALCOHOL

SEDATIVE/HYPNOTICS

OPIATES*

STIMULANTS (**COCAINE***, **AMPHETAMINE***)

HALLUCINOGENS

CANNABINOIDS*

DISSOCIATIVE ANESTHETICS (**PCP***)

INHALANTS/SOLVENTS

ANABOLIC STEROIDS

*NIDA 5-DEPT. OF TRANSPORTATION TESTING

EXPECTED DURATION FOR A POSITIVE URINE DRUG SCREEN

- AMPHETAMINE
 - METHAMPHETAMINE
 - BARBITURATES (SHORT ACTING)
 - BARBITURATES (LONG ACTING)
 - BENZODIAZEPINES
 - COCAINE
 - HEROIN/MORPHINE
 - MARIJUANA (CHRONIC USE)
 - MARIJUANA (OCCASIONAL USE)
 - METHADONE
 - PCP (CHRONIC USE)
 - PCP (OCCASIONAL USE)
- 2 - 4 DAYS
 - 2 - 4 DAYS
 - 2 - 4 DAYS
 - UP TO 30 DAYS
 - UP TO 30 DAYS
 - 1 - 3 DAYS
 - 1 - 3 DAYS
 - UP TO 30 DAYS
 - 1 - 3 DAYS
 - 2 - 4 DAYS
 - UP TO 30 DAYS
 - 2 - 7 DAYS

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

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.

DRUG TESTING GUIDELINES (NON ALCOHOL)

- **DRUG TESTING DOES NOT MEASURE THE LEVEL OF IMPAIRMENT, UNLIKE ALCOHOL TESTING WHICH CAN BE CORRELATED WITH IMPAIRMENT**
- ALL POSITIVE SCREENING RESULTS SHOULD BE CONFIRMED WITH AN EQUALLY SENSITIVE TEST THAT USES A DIFFERENT CHEMICAL PROCESS.

BARBITUATES

- CLASS

- ULTRASHORT ACTING (THIOPENTAL)
 - HALF LIFE = 6 - 26 HR
 - DETECTION TIME IN URINE = LESS THAN A DAY
- SHORT ACTING (SECOBARBITAL, PENTOBARBITAL)
 - HALF LIFE = 22 - 30 HR
 - 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

- ISSUES

- APPROXIMATELY 14 DIFFERENT BENZODIAZEPINES MEDICATIONS ARE AVAILABLE
- APPROXIMATELY 63 BENZO/METABOLITES EXCRETED INTO THE URINE
- MOST SCREENING TESTS CALIBRATED WITH OXAZEPAM
- WIDE RANGE OF CONCENTRATIONS DUE TO WIDE DOSE RANGES USED IN PATIENTS
- MOST CONFIRMATION TESTS MINIMALLY DETECT OXAZEPAM
- OFTEN DALMANE, ATIVAN, XANAX, KLONOPIN ARE NOT REPORTED
- AMBIEN (ZOLPIDEM) DOES NOT CROSS REACT WITH BENZODIAZEPINE SCREEN (PIERGIES ET AL, 1997)
- CHINESE HERB PILLS [COWS HEAD PILLS, MIRACLE HERB PILLS, POTENTSEX PILLS, BLACK PEARLS (TUNG SHEUH PILLS, CHUIFONG TOUKUWAN) CONTAIN BENZODIAZEPINES]

BENZODIAZEPINES

NAME	URINARY METABOLITE
SERAX (OXAZEPAM)	OXAZEPAM
RESTORIL (TEMAZEPAM)	TEMAZEPAM, OXAZEPAM
ATIVAN (LORAZEPAM)	LORAZEPAM
DALMANE (FLURAZEPAM)	HYDROXYETHYLFLURAZEPAM DESALKYLFLURAZEPAM
LIBRIUM (CHLORDIAZEPOXIDE)	OXAZEPAM, NORDIAZEPAM
VALIUM (DIAZEPAM)	TEMAZEPAM, NORDIAZEPAM, OXAZEPAM
XANAX (ALPRAZOLAM)	α -HYDROXYALPRAZOLAM
KLONOPIN (CLONAZEPAM)	7-AMINOCIONAZEPAM

OPIATES ARE DERIVED FROM THE POPPY PLANT

CONTENTS OF THE POPPY

POD FLUID:

- Morphine 4 - 21 %
- Codeine 1 - 25%



*There are at least 20 other alkaloids in the fluid

OPIATES

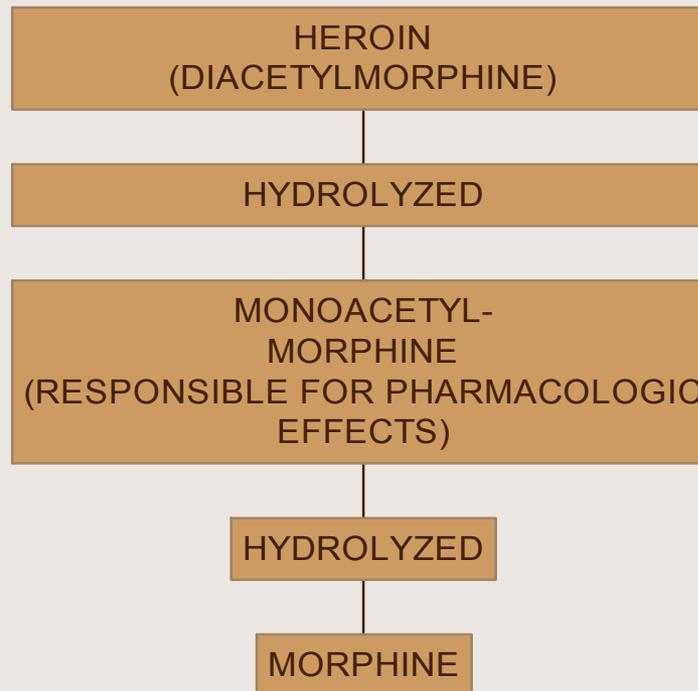
- MORPHINE AND/OR CODEINE MAY BE SEEN ON EVALUATION OF A SPECIMEN IF THE PATIENT:
 - USED HEROIN
 - INGESTED POPPY SEEDS
 - USED A CODEINE – CONTAINING PRODUCT
 - USED A MORPHINE – CONTAINING PRODUCT

OPIATES

- HEROIN
 - HEROIN DOES NOT OCCUR NATURALLY, BUT IS A SEMI - SYNTHETIC OPIATE (ACETYLATION OF MORPHINE)

OPIATES

HEROIN METABOLISM



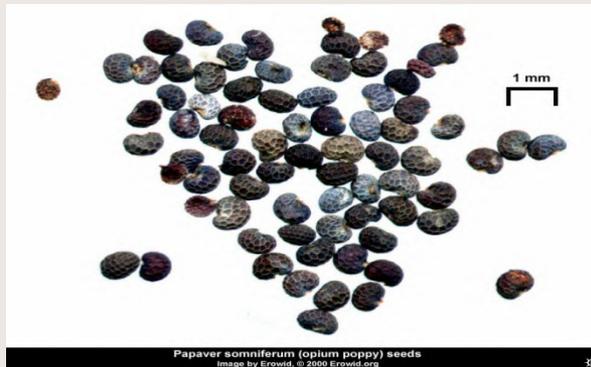
*THUS HEROIN USE CAN SHOW UP AS ONE OF SEVERAL DIFFERENT SUBSTANCES ON A DRUG SCREEN.

OPIATES

- HEROIN USE - URINE DRUG SCREEN SHOWS
 - FREE MORPHINE
 - MORPHINE GLUCURONIDE
 - FREE CODEINE
 - 6 - MONOACETYLMORPHINE OR 6 - MAM (THIS METABOLITE CAN ONLY BE SEEN WITH HEROIN USE)

OPIATES

- POPPY SEEDS IF EATEN IN QUANTITY (THE AMOUNT IS DEPENDENT UPON THE TYPE OF SEED AND THE AMOUNT USED TO MAKE THE PRODUCT) CAN SHOW UP AS A POSITIVE URINE DRUG SCREEN FOR MORPHINE AND CODEINE

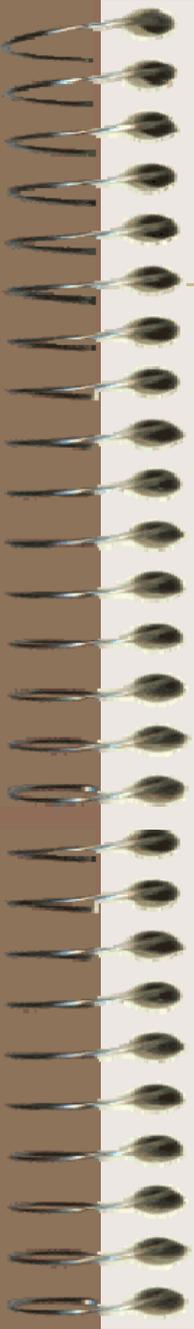


MORPHINE AND CODEINE CONCENTRATIONS DIFFER BY TYPE OF POPPY SEED AND TYPE OF FOOD INGESTED



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.



DRUGS/MEDICATIONS THAT DO NOT
METABOLIZE TO MORPHINE AND
CODEINE

- HYDROCODONE (LORTAB, VICODIN)
- HYDROMORPHONE (DILAUDID)
- METHADONE

STIMULANTS (COCAINE)

- COCAINE IS METABOLIZED TO BENZOYLECGONINE (BE) AND ECGONINE METHYL ESTER (EME)
 - BE IS NOT PSYCHOACTIVE
 - 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

STIMULANTS (COCAINE)

- 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

STIMULANTS (COCAINE)

- CAN COCAINE SHOW UP POSITIVE ON A DRUG SCREEN FROM ENVIRONMENTAL EXPOSURE?
 - WORK OF CONE ET AL, 1995 SHOWS THAT PASSIVE INHALATION OF COCAINE VAPOR FAILS TO PRODUCE POSITIVE URINE RESULTS AT USUAL CUTOFF CONCENTRATIONS (300 ng/ml)
- CAN COCAINE SHOW UP POSITIVE ON A DRUG SCREEN FROM FOODS?
 - "HEALTH INCA TEA" BANNED BY FDA DOES CONTAIN 4.8MG OF COCAINE

STIMULANTS (AMPHETAMINE)

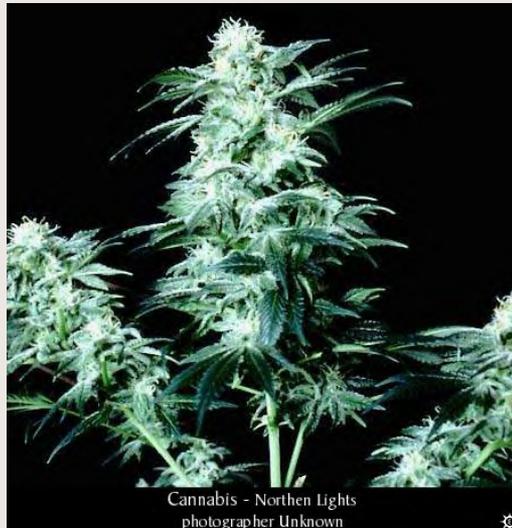
- AMPHETAMINES ARE FOUND IN FORMS: L & D ISOMERS
- VICKS INHALER IS THE L FORM – NOT PSYCHOACTIVE BUT SHOWS UP POSITIVE FOR AMPHETAMINE
- PSYCHOACTIVE FORM OF AMPHETAMINE IS THE D FORM, IF LESS THAN 80% IS L FORM, THEN VICKS CANNOT BE THE SOLE SOURCE

STIMULANTS (AMPHETAMINE)

- 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

CANNABINOIDS

- WHEN ONE OBTAINS A POSITIVE DRUG SCREEN FOR CANNABINOIDS, ONE HAS TO LOOK FOR MEDICAL REASONS FOR A POSITIVE TEST IN ADDITION TO MARIJUANA USE.
- PASSIVE INHALATION IS NOT USUALLY A REASON FOR A POSITIVE TEST.



Cannabis - Northern Lights
photographer Unknown

CANNABINOIDS

- MEDICAL EXPLANATION FOR A POSITIVE DRUG SCREEN
 - MARINOL®
 - CHEMICALLY IS Δ - 9 - THC
 - DEA SCHEDULE II MEDICATION

CANNABINOIDS

- SOCIAL EXPLANATION FOR A POSITIVE DRUG SCREEN
 - PASSIVE INHALATION IS NOT USUALLY A REASON FOR POSITIVE SCREEN (SEE NEXT PAGE)
 - MARIJUANA LACED BROWNIES CAN CAUSE A POSITIVE TEST
 - HEMP SEED OIL INGESTION CAN CAUSE A POSITIVE TEST
 - IMPORTING PRODUCTS CONTAINING THC IS BANNED BY THE FDA

MARIJUANA - PASSIVE INHALATION IS NOT USUALLY A
 REASON FOR A POSITIVE TEST (MRO TEXT, 2002)

# JOINTS EXPOSED TO	AREA	EXPOSURE TIME	TEST RESULT	REF.
4	SMALL ROOM	1 HR	<5 ng/ml	MULE ET AL 1988
6	SMALL ROOM	3 HRS	< 7 ng/ml	LAW ET AL 1984
6	SMALL CAR	½ HR	NEGATIVE @ 20 ng/ml	MORLAND ET AL 1985
8	SMALL ROOM	1 HR	NEGATIVE @ 20 ng/ml	PEREZ-REYES ET AL 1983
12	SMALL CAR	½ HR	POSITIVE (>20 ng/ml)	MORLAND ET AL 1985
4	SMALL ROOM	1 HR X'S 3 DAYS	POSITIVE (>20 ng/ml)	PEREZ-REYES ET AL 1983

HALLUCINOGENS

- THIS CLASS OF DRUGS FREQUENTLY HAVE TO BE SPECIFIED AS ADD ONS WHEN ORDERING DRUG SCREENS.

PHENCYCLIDINE (PCP)

- ONE MUST DIFFERENTIATE BETWEEN KETAMINE USE AND PCP. KETAMINE CAN GIVE A FALSE POSITIVE RESULT, SHOWING UP ON A SCREEN AS PCP.
- THERE IS NEVER A MEDICAL REASON FOR A POSITIVE DRUG SCREEN FOR PCP

INHALANTS

- THIS CLASS OF DRUGS IS ALMOST NEVER FOUND ON A DRUG SCREEN, THOUGH ONE CAN TEST FOR HIPPURIC ACID WHICH IS AN INDICATION OF TOLUENE USE

ANABOLIC STEROIDS

- CLINICAL SUSPICION MUST BE PRESENT AND THE LAB MUST BE ASKED TO LOOK FOR THIS GROUP OF DRUGS/MEDICATIONS.
- ONE MUST CHECK TO SEE IF THERE ARE MEDICAL REASONS PRESENT FOR THEIR USE.

DRUG SCREEN RESULTS

- DRUG SCREEN RESULTS ARE NOT ALWAYS CLEAR CUT IN THEIR INTERPRETATION. USE OF CONFIRMATORY TESTS ARE USUALLY NECESSARY IF THERE IS AN INITIAL POSITIVE SCREEN. ALWAYS LOOK FOR A MEDICALLY ACCEPTABLE REASON FOR THE RESULT AND MAKE CLINICAL DETERMINATIONS ON MORE INFORMATION THAN A SINGLE TEST RESULT.

*ALWAYS MAKE SURE CORRECT SPECIMEN WAS TESTED
(NAME, DATE, ETC.)

DRUG SCREEN RESULTS

- RESULTS CAN BE REPORTED AS
 - **NEGATIVE**; THOUGH THEY CAN BE A TRUE NEGATIVE OR A FALSE NEGATIVE.
 - **POSITIVE**; THOUGH THEY CAN BE A TRUE POSITIVE, A TRUE POSITIVE WITH A MEDICALLY ACCEPTABLE REASON, OR A FALSE POSITIVE.
 - FOR 4 OF THE 5 NIDA DRUGS TESTED (THE EXCEPTION IS PCP) THERE CAN BE A LEGITIMATE MEDICAL REASON
 - **INDETERMINANT** (ADULTERATED OR DILUTED)

RESULTS

- TRUE POSITIVE-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

RESULTS

- POSITIVE

- MEDICAL REASON ??

- ALCOHOL

- INHALERS

- » ASTHMA INHALERS AND NASAL DECONGESTANT SPRAYS TESTED BY BREATH ALCOHOL METHOD; ONLY ONE TO GIVE A POSITIVE WAS PRIMATINE MIST (CONTAINS 34% ETHYL ALCOHOL) AND THE TEST BECAME NEGATIVE IN 5 MINUTES (LOGAN ET AL, 1998)

- MOUTHWASH

- MARIJUANA

- MARINOL SYNTHETIC DELTA 9 -THC USED FOR NAUSEA

- COCAINE

- TOPICAL ANESTHETIC (TAC:TETRACAINE, ADRENALIN, COCAINE)

- » RECENT DENTAL, EAR, NOSE AND THROAT PROCEDURE OR OPHTHALMOLOGICAL VISIT

RESULTS

- POSITIVE
 - MEDICAL REASON ??
 - AMPHETAMINE
 - OVER THE COUNTER MEDS
 - » PSEUDOEPHEDRINE
 - » PHENYLPROPANOLAMINE
 - » DEXEDRINE IS AN AMPHETAMINE
 - » VICK'S INHALER CONTAINS L-METHAMPHETAMINE (DRUG OF ABUSE IS D-METHAMPHETAMINE)
 - OPIATES
 - UNDER THE CARE OF A PAIN SPECIALIST
 - RECENT SURGERY

DRUG SCREEN RESULTS

- FALSE NEGATIVES
 - 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

DRUG SCREEN RESULTS

- FALSE NEGATIVES

- ROUTINE SCREENS MAY NOT INCLUDE:

- BENZODIAZEPINES AND BARBITUATES, FOR EXAMPLE, 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

DRUG SCREEN RESULTS

- FALSE POSITIVES
 - CROSS REACTION
 - PATIENT TAKING ANOTHER SUBSTANCE THAT IS REPORTED AS A DRUG OF ABUSE
 - CHINESE HERB PILLS [COWS HEAD PILLS, MIRACLE HERB PILLS, POTENTSEX PILLS, BLACK PEARLS (TUNG SHEUH PILLS, CHUIFONG TOUKUWAN) CONTAIN BENZODIAZEPINES]

POTENTIAL CROSS - REACTING DRUGS CAUSING FALSE POSITIVE TESTS

DRUG GROUP FOUND	POTENTIAL CROSS REACTING SUBSTANCE
CANNABINOIDS	NON STEROIDAL ANTI-INFLAMATORY MEDICATIONS
	EFAVIRENZ
OPIATES	POPPY SEEDS (SEE NEXT SLIDE)
	CHLORPROMAZINE
	RIFAMPIN
	FLUOROQUINOLONES (EX.-CIPRO)
	DEXTROMETHORPHAN (A SINGLE NORMAL DOSE DOES NOT GIVE A POSITIVE OPIATE RESULT (STORROW ET AL, 1995)
	QUININE IN TONIC WATER

POPPY SEEDS



- 2-252ug OF MORPHINE/GRAM OF SEEDS, SO CANNOT GIVE AN EXACT NUMBER OF BAGELS WHICH WOULD GIVE A POSITIVE TEST
- 0.4 - 57.1ug OF CODEINE/GRAM OF SEEDS
- SAME INDIVIDUAL INGESTING SAME AMOUNT OF SEEDS 4 SEPARATE TIMES GAVE 4 DIFFERENT RESULTS

(PELDERS ET AL, 1996)

POTENTIAL CROSS - REACTING DRUGS CAUSING FALSE POSITIVE TESTS

DRUG GROUP FOUND	POTENTIAL CROSS REACTING SUBSTANCE
AMPHETAMINE	EPHEDRINE (SEE IF INGESTING HERBAL DRUGS; MA-HUANG (EPHEDRA sinica))
	METHYLPHENIDATE
	PHENYLPROPANOLAMINE AND OTHER DECONGESTANTS AND COUGH PREPARATIONS
	TRAZEDONE
	BUPROPION
	DESIPRAMINE
	AMANTADINE
	RANITIDINE

POTENTIAL CROSS - REACTING DRUGS CAUSING FALSE
POSITIVE TESTS

DRUG GROUP FOUND	POTENTIAL CROSS REACTING SUBSTANCE
PHENCYCLIDINE	CHLORPROMAZINE
	THIORIDAZINE
	MEPERIDINE
	DEXTROMETHORPHAN
	DIPHENHYDRAMINE
	DOXYLAMINE

POTENTIAL CROSS - REACTING DRUGS CAUSING FALSE POSITIVE TESTS

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
ALCOHOL	<p>ASTHMA INHALERS AND NASAL DECONGESTANT SPRAYS TESTED BY BREATH ALCOHOL METHOD;</p> <p>ONLY ONE TO GIVE A POSITIVE WAS PRIMATINE MIST (CONTAINS 34% ETHYL ALCOHOL) AND THE TEST BECAME NEGATIVE IN 5 MINUTES</p> <p style="text-align: center;">(LOGAN ET AL, 1998)</p>

DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST
 - CRITERIA FOR DILUTE OR SUBSTITUTED URINE
 - DILUTED URINE:
 - SPECIFIC GRAVITY < 1.003
 - CREATININE < .2 GM/L
 - SUBSTITUTED URINE
 - CREATININE < 5 mg/dl
 - SPECIFIC GRAVITY LESS THAN 1.002 OR GREATER THAN OR EQUAL TO 1.020

DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST

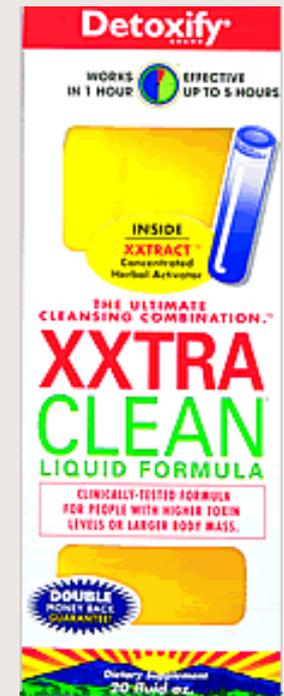
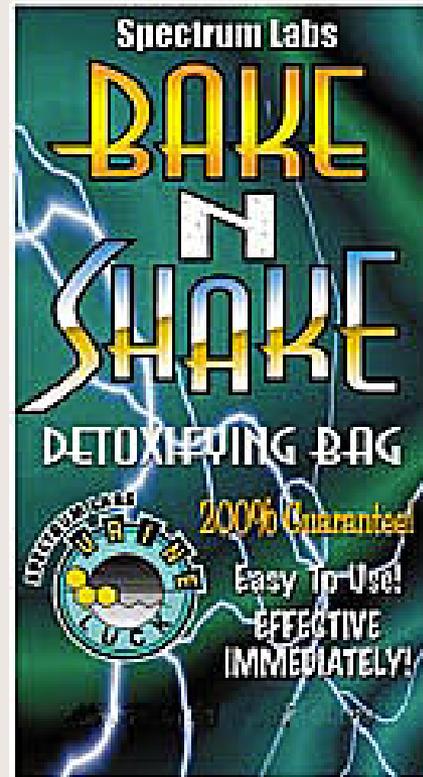
- ADULTERATED URINE

- CRITERIA ARE:

- NITRITE > OR EQUAL 500 mcg/ml
 - pH < 3 OR > THAN OR EQUAL TO 11

- CONTAINS AN EXOGENOUS SUBSTANCE, MANY OF WHICH ARE AVAILABLE BY MAILORDER, OVER THE INTERNET, ETC. EXAMPLES ARE:

- URINAID - GLUTARALDEHYDE (EMIT UNREADABLE)
 - MARY JANE SUPER CLEAR 13 - DETERGENT
 - KLEAR - POTASSIUM NITRITE
 - AMBER 13 - ACID
 - THC FREE - ACID
 - WHIZZIES - SODIUM NITRITE
 - URINE LUCK - PYRIDINIUM CHLOROCHROMATE
 - LL418 - PYRIDINIUM CHLOROCHROMATE
 - SWEET PEE'S SPOILER - PYRIDINIUM CHLOROCHROMATE



DRUG SCREEN RESULTS

- IF YOU THINK NITRITES WERE ADDED – IT CAN BE TESTED FOR IN THE SAMPLE. BE AWARE:
 - NITRITES WILL SHOW UP IF PATIENT IS ON ISOSORBIDE DINITRATE OR NITROGLYCERIN
 - MEDICAL NITRITE CONCENTRATIONS IN URINE ARE BELOW 500 mcg/ml

DRUG SCREEN RESULTS

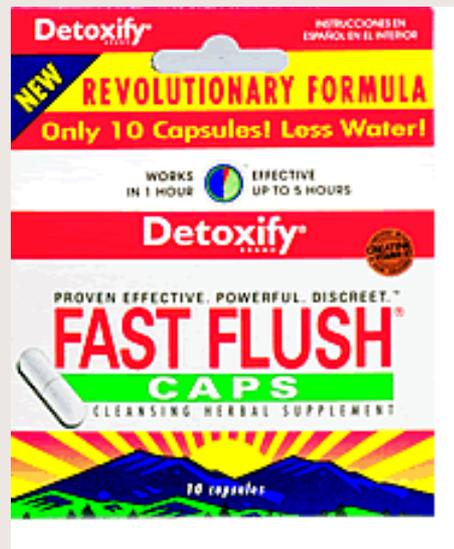
- NEW AGENT – “STEALTH”
 - ADDED TO URINE AND DESTROYS THC METABOLITES. IT THEN VANISHES IN SEVERAL HOURS
 - COMBINATION OF PEROXIDASE AND PEROXIDE
 - DOES NOT CAUSE THE URINE SAMPLE TO EXCEED ANY MONITORED VALUES (pH, CREAT., ETC.)
 - EFFECTIVE WHEN TESTED ON TRUE POSITIVE URINE DRUG SCREENS FOR MARIJUANA, LSD, AND MORPHINE. CUT-OFFS WERE 150% OF NORMAL AND ALL WERE NEGATIVE (CODY ET AL, 2001)

DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST

- FLUSH OUT THE DRUG

- » GOLDENSEAL - ROOT OF HYDRASTIS CANADENSIS
CONTAINS NATURAL DIURETICS



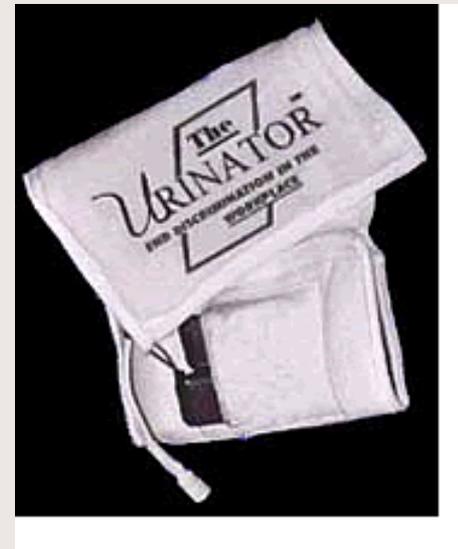
DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST
 - USE DIURETICS TO REMOVE DRUGS



DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST
 - USE URINE FROM SOMEONE ELSE OR URINE PURCHASED TO BEAT THE TEST



DRUG SCREEN RESULTS

- TRYING TO BEAT THE TEST

- USE SPECIAL SHAMPOOS TO "CLEAN" AND "DETOX" THE HAIR



DRUG SCREEN RESULTS

- TRYING TO BEAT THE HAIR TEST
 - “afterBurner”
 - APPLY THE DAY OF THE TEST
 - ADVERTISED TO PENETRATE THE CORE OF THE HAIR SHAFT AND REMOVE ALL DRUGS, LEAVING NO RESIDUE TRACE

SPECIAL ISSUES

- CLIA RULES
- ADOLESCENT TESTING
- PREGNANT WOMEN
- WORKPLACE
- COLLECTION
- USING THE DRUG SCREEN IN THE TREATMENT OF THE SUBSTANCE USING PATIENT

SPECIAL ISSUES

- 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
 - TESTING FOR EMPLOYMENT PURPOSES IS TEMPORARILY EXEMPT

SPECIAL ISSUES

- 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.)

SPECIAL ISSUES

- ADOLESCENT TESTING
 - INVOLUNTARY TESTING 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

SPECIAL ISSUES

- 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 (CSAT TIP #2)
 - 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

SPECIAL ISSUES

- WORKPLACE TESTING
 - PERFORMED IN ACCORDANCE WITH THE DEPARTMENT OF TRANSPORTATION RULES AND VARIES BY OCCUPATION
 - NIDA 5 TESTING

SPECIAL ISSUES

- WORKPLACE TESTING

- INDICATED FOR:

- PRE-EMPLOYMENT

- REASONABLE CAUSE

- » EMPLOYEE'S UNSAFE OR UNACCEPTABLE JOB CONDUCT CLEARLY POINTS TO A PROBLEM

- RANDOM TESTING

- POST ACCIDENT TESTING

- PERIODIC TESTING

- » USUALLY ASSOCIATED WITH RECERTIFICATION OF OCCUPATIONAL LICENSES

- REHABILITATION TESTING

- » IN REHAB PROGRAM AND WILL BE RE-ENTERING WORKPLACE

SPECIAL ISSUES

- 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
- CHAIN OF CUSTODY, IS THIS NEEDED?
- SELECTION OF THE LAB
 - NATIONAL INSTITUTE ON DRUG ABUSE CERTIFICATION IS NEEDED BY LABS PERFORMING FEDERALLY MANDATED DRUG AND ALCOHOL TESTING

SPECIAL ISSUES

- THERAPEUTIC VALUE OF DRUG TESTING
 - DRUG TESTING CAN BE A SIGNIFICANT PART OF THE TREATMENT PROCESS. WHILE THE INITIAL RESPONSE IS USUALLY ANGER, IT IS IMPORTANT TO UNDERSTAND THAT BEHIND MOST ANGER IS FEAR.
- THERAPEUTIC VALUE OF DRUG TESTING
 - TESTING IS ACTUALLY A VALIDATION OF RECOVERY WHEN PEOPLE ARE STAYING CLEAN AND SOBER.

SPECIAL ISSUES

- THERAPEUTIC VALUE OF DRUG TESTING
 - STAYING CLEAN AND SOBER IS THE RESULT OR CONSEQUENCE OF INCORPORATING NEW SKILLS AND BEHAVIORS AND MULTIPLE LEVELS OF SUPPORT.
 - ALL PEOPLE NEED ENCOURAGEMENT AND SUPPORT FOR MAKING GOOD DECISIONS AND CLEAR CONSEQUENCES FOR MAKING POOR DECISIONS. TEST PROVIDES FOR IMMEDIATE FEEDBACK AND ALLOWS FOR THERAPEUTIC INTERVENTIONS.

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