

## How to Test – What do Tests Tell

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## Drug Testing – How do I get the Right Answer

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## Testing Implications

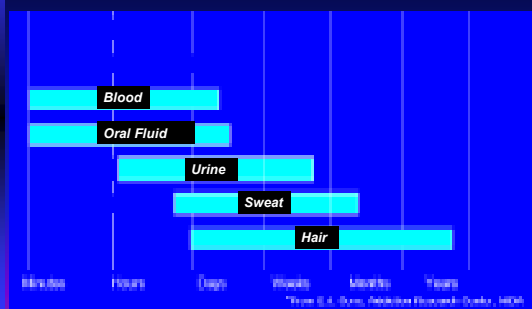
### False positive screening result

- ◆ Subject may no longer be allowed to remain in treatment program (continuing abuse)
- ◆ Subject suspended from work or contract terminated
- ◆ Lifestyle issue (Home, Family, Employment prospects)
- ◆ Social / wellbeing issues

### False negative screening result

- ◆ Subject may no longer be allowed to remain in treatment program (lack of compliance)
- ◆ Subject may continue to be chaotic poly drug user
- ◆ Continuing health / risk issues

## Windows of Detection



## Oral Fluid / Saliva

### Consists of secretions

- ◆ Submandibular (65%)
- ◆ Parotid (23%)
- ◆ Sublingual (4%)
- ◆ Numerous minor glands (8%)

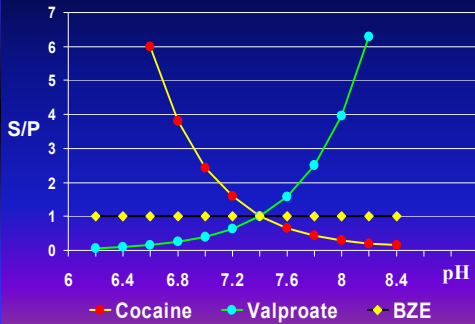
### Composition

- ◆ 99% Water
- ◆ 0.3% Protein
- ◆ 0.3% Mucin

## S/P Ratio for Common Drugs

Drug	S/P
Amphetamine	2.8
Benzodiazepines	0.03 - 0.5
Cannabinoids	0.5 - 2.0
Cocaine	0.5 - 3.0
Methadone	0.5
Buprenorphine	0.05 - 0.4

## Oral Fluid pH vs S/P Ratio



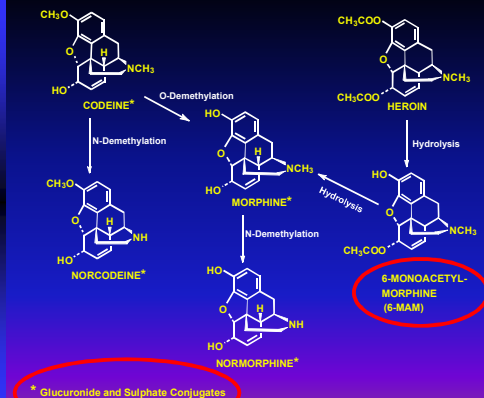
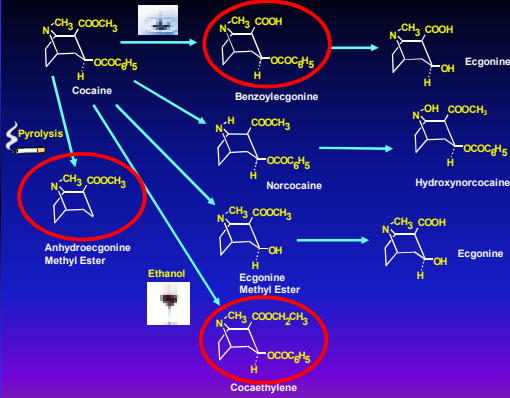
## Specimen Adulteration

- ⚠ Can occur through several mechanisms
  - *in-vitro*
    - ♦ bleach, detergent, specific products e.g. urine luck
  - *in-vivo*
    - ♦ 'Herbal Tea', 'Green Clean Drug Detox', water
  - **Specimen substitution**
    - ♦ E.g. the whizzinator
- ⚠ Estimated 400 different products currently available

## Hair as a Matrix

- ⚠ Drugs enter
  - ♦ From blood supply to follicle
  - ♦ Adsorption from external environment
    - Aerosols, smoke, sweat
- ⚠ Drug uptake varies with
  - ♦ Hair colour (Melanin content)
  - ♦ Hair treatments
    - Dying, perms, bleaching
  - ♦ Age, Gender
- ⚠ Variety of sampling sites

## Analytical approaches



## What's Morphine / Opiates ?

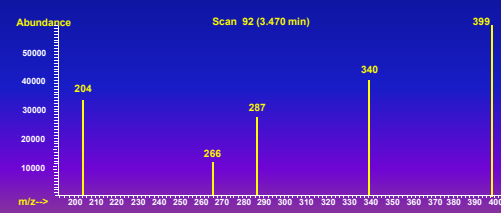
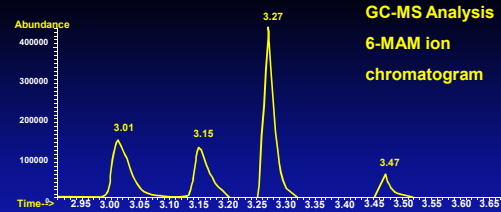
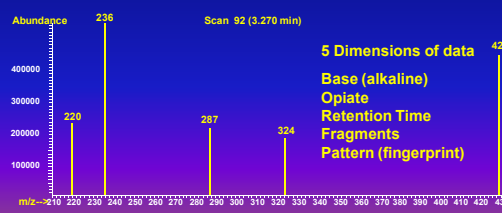
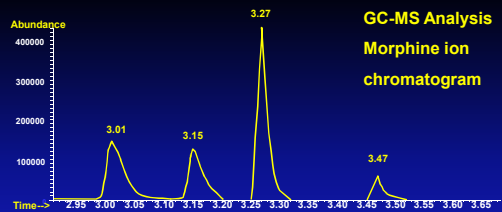
- ☠ Morphine
- ☠ Codeine
- ☠ Dihydrocodeine
- ☠ Heroin
- ☠ Pholcodine
- ☠ Poppy seeds
- ☠ Oxycodone
- Benylin
- Co-Codamol
- Co-Codaprin
- Co-Dydramol
- Diarrest
- Kaolin
- Paracodol
- Phensedyl
- Pholcomed
- Propain
- Solpadol
- Tylex
- Uniflu

## What's Amfetamine ?

- ☠ Amfetamine
- ☠ Metamfetamine
- ☠ Ecstasy
- ☠ Pseudoephedrine
- ☠ Mebeverine
  - (antispasmodic)
- ☠ Selegiline
  - (Parkinson's)
- Alka Seltzer Plus
- Antitussin
- Bayer Decongestant
- Contac
- Day Care
- Histadyl
- Novanistine
- Quiet-Nite
- Rhinidrin
- Robitussin
- Sinutab
- Sudafed
- Tussagesic
- Tylenol Cold Formula

## NACB EB POCT Review 2005

- ☠ Quality aspects affecting POCT devices : -
  - Accuracy (analytical sensitivity and specificity)
  - Cross-reactivity to drugs and metabolites
  - Impact of chemical interference or adulteration
  - Quality assurance and quality control
  - Appropriate interpretation of results
  - Impact of physiological variables
  - Availability and use of confirmatory methods



## Chain of Custody

- ☠ Specimen collection and storage
- ☠ Transport to laboratory
- ☠ Laboratory Receipt, Analysis, Reporting

## Newer Challenges 1

**ACMD**  
Advisory Council on the Misuse of Drugs

**Consideration of the major cannabinoid agonists** 2009

(1) naphthoylindoles;	n = 74
(2) naphthylmethylindoles;	n = 9
(3) naphthoylpyrroles;	n = 32
(4) naphthylmethylindenes;	n = 3
(5) phenylacetylindoles (i.e. benzoylindoles);	n = 28
(6) cyclohexylphenols;	n = 16
(7) classical cannabinoids (dibenzopyrans);	n = 9 (inc Δ <sup>9</sup> THC)
<b>Total = 171 Compounds</b>	

## Newer Challenges 2

**ACMD**  
Advisory Council on the Misuse of Drugs

**Consideration of the Novel Psychoactive Substances ('Legal Highs')** 2011

### EMCDDA Europol Annual Report Data

2005-06 n = 14	
2006-07 n = 7	
2007-08 n = 15	
2008-09 n = 13	
2009-10 n = 24	
2010-11 n = 41	
2011-12 n = 49	
<b>Total = 163 Compounds</b>	