





**DrugTest 5000: What's Your Tolerance?** 

**2019 Mining Health and Safety Conference** 

Dräger, April 11th 2019

#### **Dräger Mining Solutions**

#### An extensive portfolio



























Mine Exploration, Planning and Construction

Opencast Mining

Underground Mining

Processing and Refining

Fitness for Duty

Emergency Escape

Emergency Response and Rescue

Cleaning, Disinfection and Maintenance



















#### **Dräger Mining Solutions**

#### An extensive portfolio





### **Extended portfolio**Alcohol and drug detection

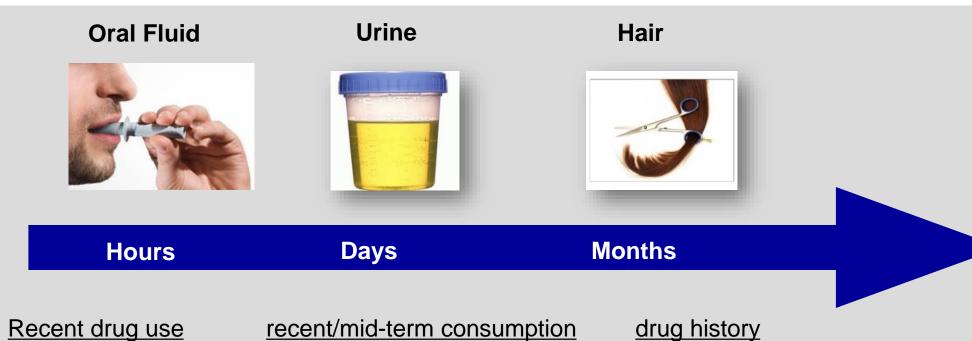
From providing top of the line evidential breath alcohol testing to roadside alcohol and drug screening, Draeger is dedicated to improving safety.

With our alcohol and drug detection devices you benefit from the results of our **extensive experience**.

#### How to detect for drugs in the workplace

Dräger

DrugTest 5000: What's Your Tolerance?



"...because marijuana metabolites are detectable for many days to weeks after cessation of use, a positive urinary drug screen does not imply impairment."

Dr. Brendan Adams, Marijuana and the Safety-Sensitive Worker, COAA website, 2018

# **Dräger DrugTest® 5000 – How it Works** DrugTest 5000: What's Your Tolerance?



#### Our Drug Detection Instrument for Oral Fluid screening consists of 2 main parts:

**DrugTest Cassette** 



**DrugTest 5000 Analyzer** 



#### **Current Affairs**

DrugTest 5000: What's Your Tolerance?



Approved by Minister of Justice for Law Enforcement Use

"A positive result [on the Draeger DrugTest 5000 oral fluid screener] would be a strong indication of recent use."

How has workplace prepared for the decriminalization of marijuana?

Vol. 152, No. 18

#### Canada Gazette



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#### Gazette du Canada Partie II

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#### **Current Affairs**

#### DrugTest 5000: What's Your Tolerance?

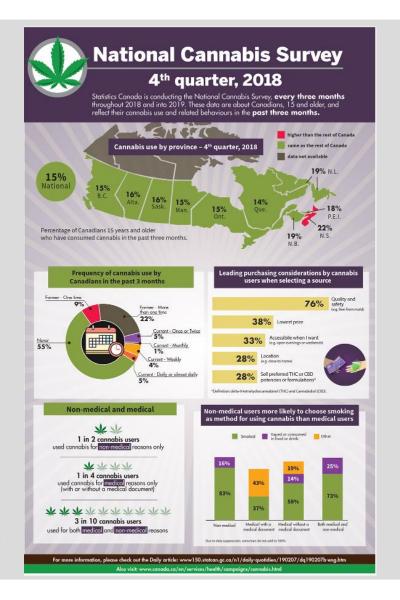


Cannabis use amongst youth aged 15-24 is 3X more than adults\*

Rate of daily use among general population is steadily increasing\*

Canadians already spend \$6B a year on cannabis\*\*

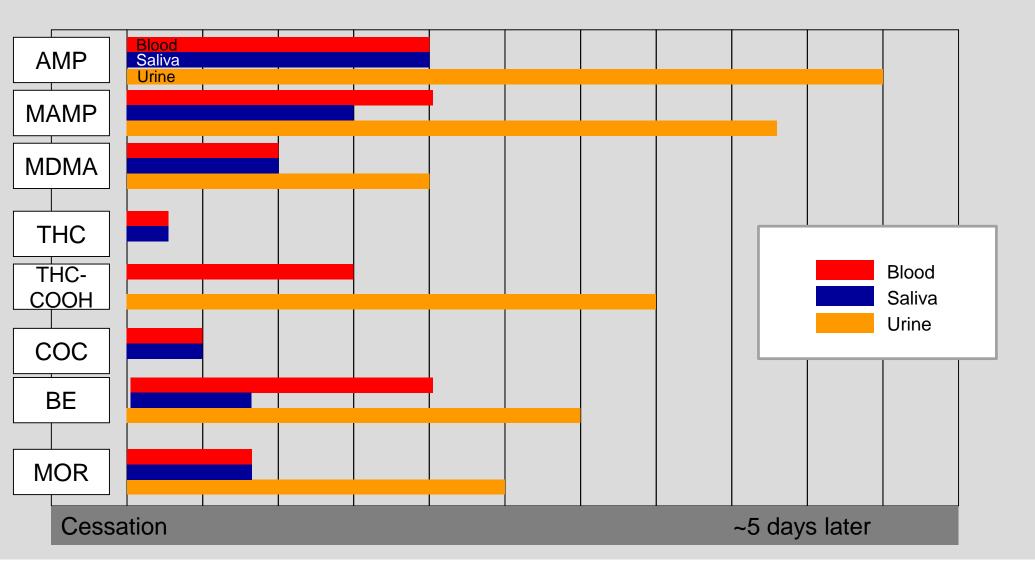
<sup>\*</sup>Canadian Center on Substance Use and Addiction, Canadian Drug Summary, June 2018 \*\*Statistics Canada, Cannabis Economic Account, 1961 to 2017



#### **Detection Times after consumption**



Blood, Saliva & Urine



#### **Recent Use**



DrugTest 5000: What's Your Tolerance

"Well established that cannabis is an impairing drug. Blood concentrations do not correlate well with impairment - blood concentration can decline rapidly after smoking well before the impairing effects have dissipated

From a toxicologist point of view, recency of use can give useful information about whether an individual is impaired by cannabis use"

Karen Woodall, Forensic Toxicologist, "Oral Fluid Screening Devices and Toxicology", presented at Arrive Alive Conference 2018

#### Which test methods to choose

Dräger

DrugTest 5000: What's Your Tolerance?

# Oral Fluid





Hair



Hours Days Months

Recent drug use

reasonable cause

post-incident, post accident

pre-entry

random

recent/mid-term consumption

pre-employment

random

drug history

pre-employment

## Cannabis - Pharmacology Cannabinoids



> 500 chemicals & 109 Cannabinoids, like:

Cannabigerol, CBG

Cannabidiol, CBD

**Tetra Hydro Cannabinol**, ∆9-THC

Cannabinol, CBN

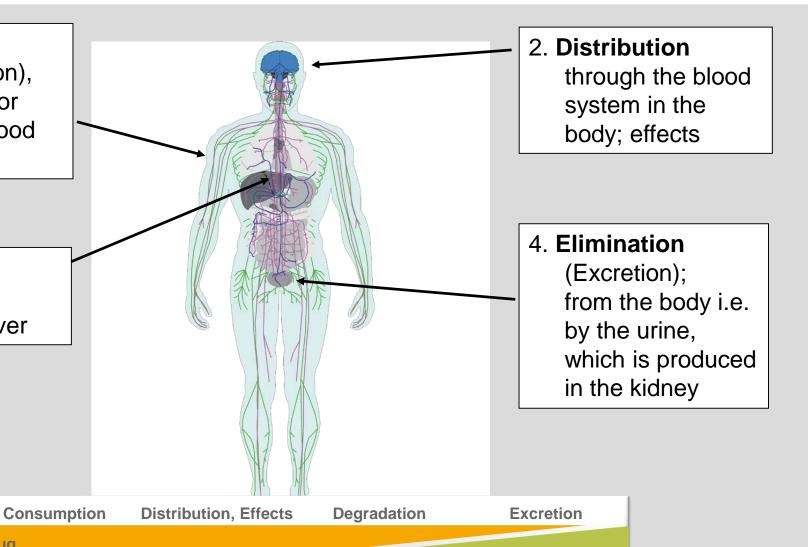
#### The Path of Drugs in the Human Body



Absorbtion
 (Consumption),
 i.e. via lung or
 veins into blood
 stream

Metabolism,
 (Degradation)
 mainly in the liver

Drug

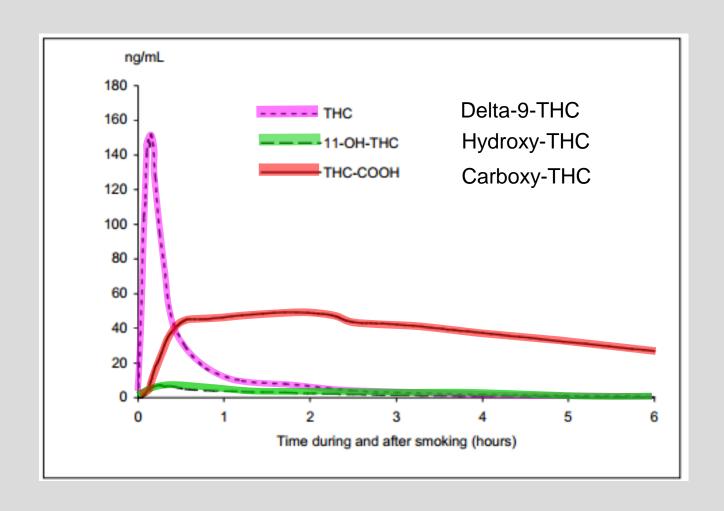


**Metabolites** 



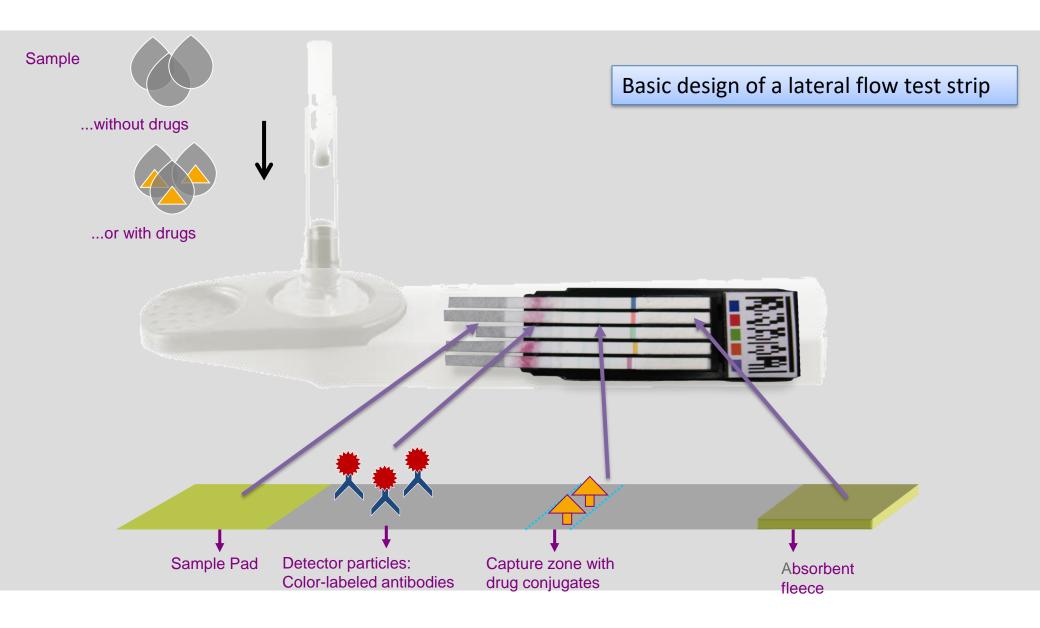


Main Metabolism Route – Plasma Concentrations after smoking



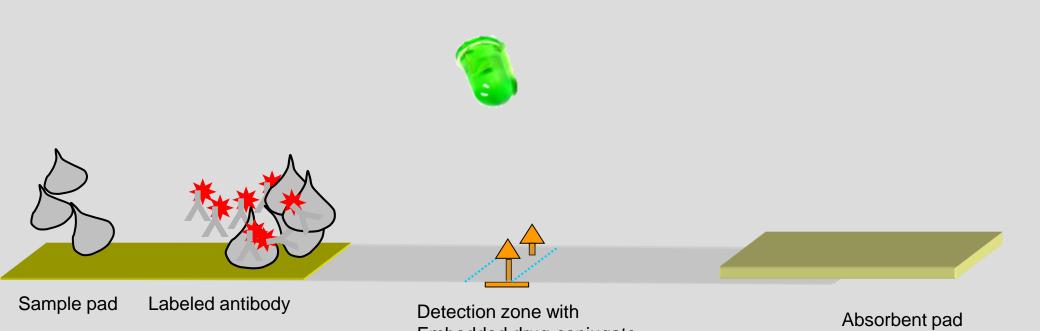
#### **Inside the Test Cassette**





#### **Oral Fluid when NO Drug is present**

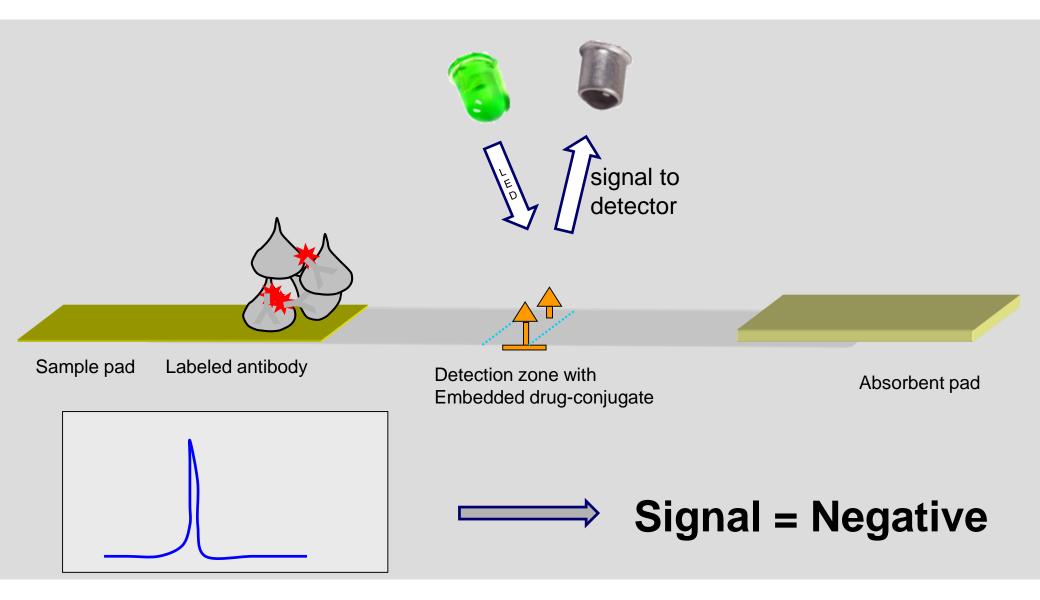




Embedded drug-conjugate

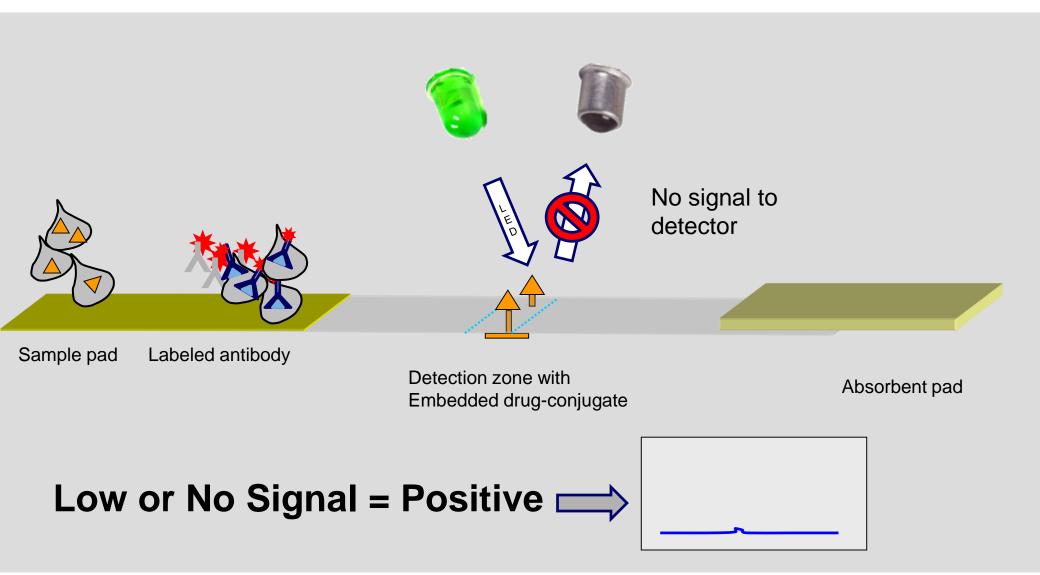
#### Oral Fluid when NO Drug is present





#### Oral Fluid when a DRUG is present





#### **Validation and Evaluation**



As the analyser determines a positive or negative sample based on the intensity of the line, line intensity is the key.

Its precise and reproducible occurrence is based on many factors, like the quality of the antibody, but also on the quality of marking reagents.



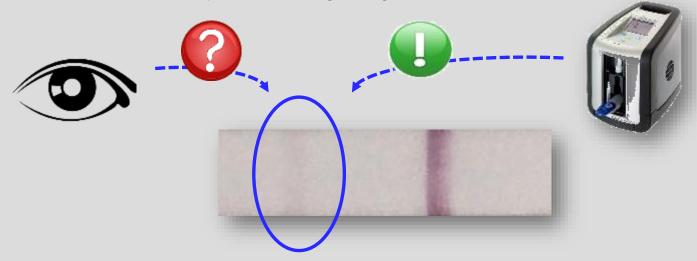


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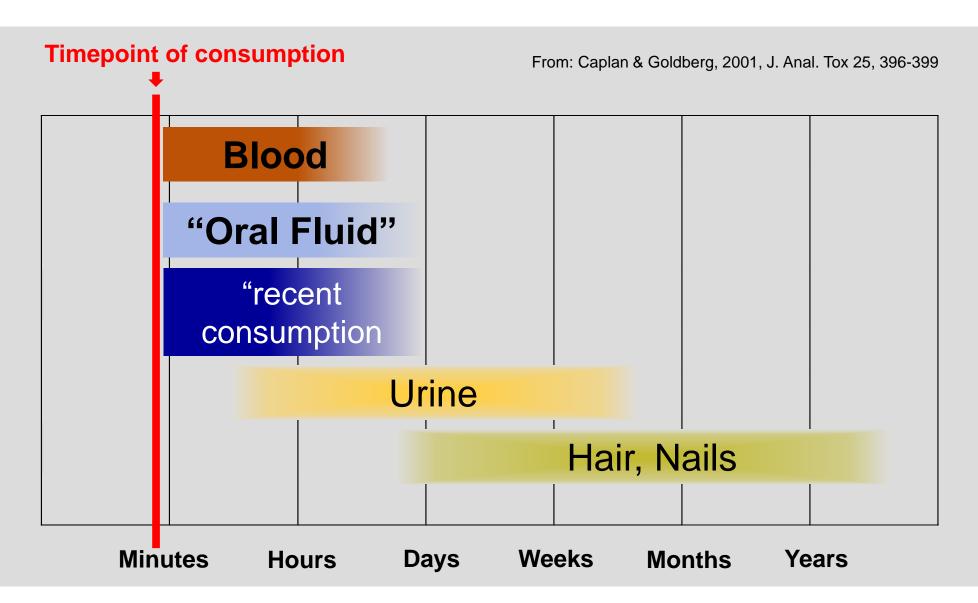
A faint signal may be negative or positive depending on intensity compared to calibration values stored in the barcode.

This technique makes the DrugTest® 5000 system more reliable than visually read tests.

Plus: Temperature control

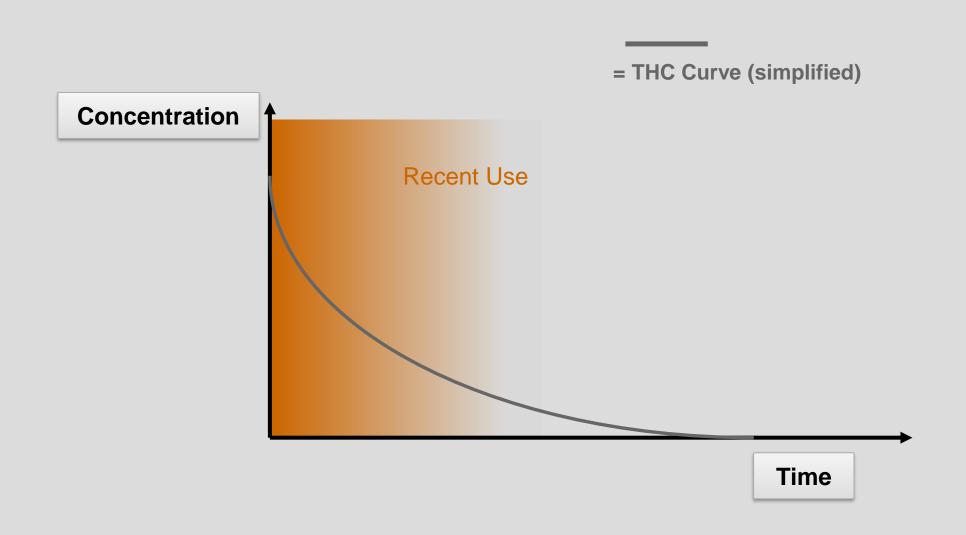
#### **Window of Detection**





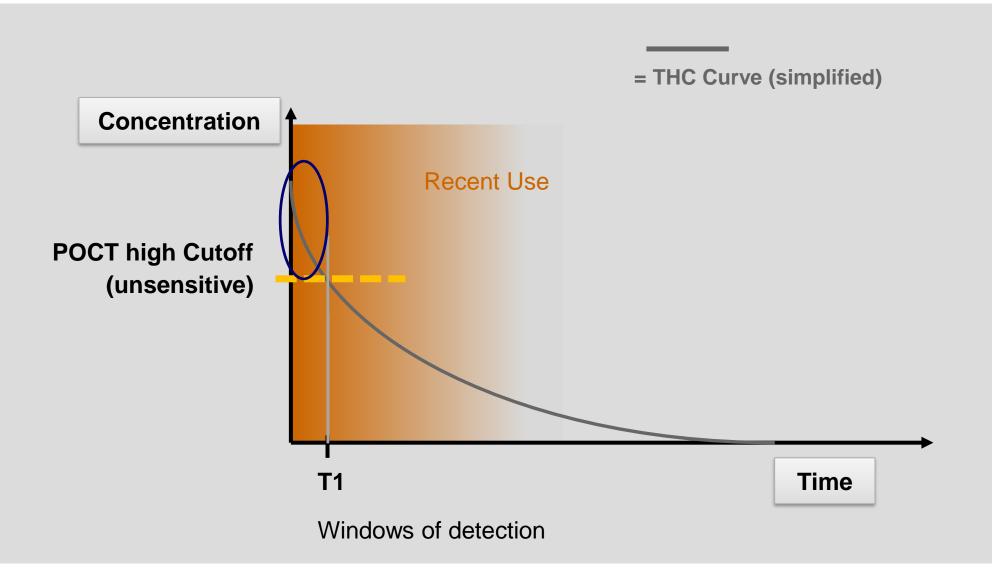
#### "Cut-off" when drug testing





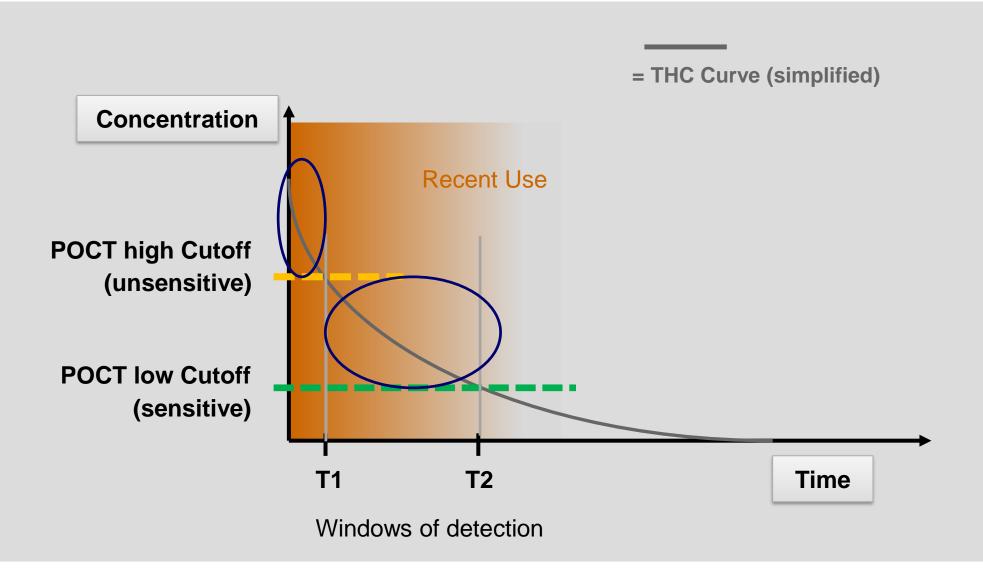
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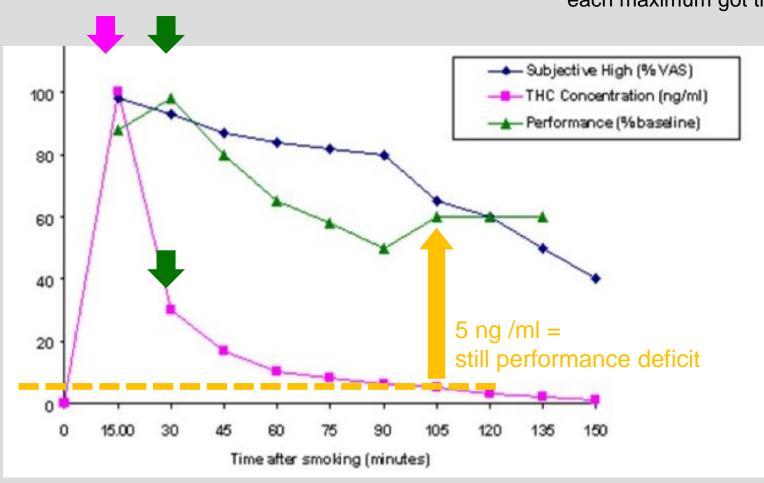


#### **Cannabis - Pharmacology**



THC Conc – Performance Deficit – Subjective High

Standardization: each maximum got the value 100



To cover as much potentially impaired persons as possible  $\rightarrow$  sensitive detection, low cutoff

#### **Cost Calculator**



#### DrugTest 5000: What's Your Tolerance

Value Calculator Oral-Fluid versus Urine Drug Testing (hypothetical)		
Item Description	Oral-Fluid	Urine
Number of Tests	1,000	1,000
Cost per screening test	\$40.00	\$20.00
Cost per test regime	\$40,000.00	\$20,000.00
Positive Rate in %**	2%	6%
Number of Lab Confirmations	20	60
Cost for Lab Confirmation Each	\$150.00	\$100.00
Total Cost for Lab Confirmation	\$3,000.00	\$6,000.00
Downtime in days	20	180
Cost per downtime day	\$200.00	\$200.00
Total Downtime Cost****	\$4,000.00	\$36,000.00
Lab Re-test	\$3,000.00	\$6,000.00
Labour Hire Per Person, Per Day	\$300.00	\$300.00
Labour Hire Total	\$6,000.00	\$54,000.00
Total Cost	\$56,000.00	\$122,000.00

<sup>\*\*</sup> There are more positive tests in Urine testing due to the longer duration of test period – ie months not hours.

<sup>\*\*\*\*</sup> There is a longer downtime in Urine testing as it takes longer for the drug to dissipate and so the employee must stay away from the workplace longer

#### **DrugTest 5000: What's Your Tolerance**



Risk	Mitigation
Employee gets positive test days after consuming THC	Replace urine test with oral fluid test to ensure small window of detection and best indication of recent use
Lost time due to employees waiting for test results	Use OF POCT screener to get result on-spot within minutes. Return workers to work upon negative test
Lack of national standard for workplace drug testing	Develop policy that suits the workplace using proven technology – OF mobile screener validated by Canadian government for roadside law enforcement
Challenge by employees/unions	Use technology with least invasive sample collection, high degree of accuracy, results in minutes, indication of recent use (short window of detection)

## **Draeger DrugTest 5000**Test Cassette – Cut Off Levels



5 ng/ml THC ( $\Delta^9$ -tetrahydrocannabinol)

Immunoassay (Competitive Inhibition)

**Electro-Optical Reader** 

Clear Results / No Interpretation

**Integrated Data Management** 

Non-invasive & hygienic

Only oral fluid screening device approved in Canada by the DOJ for roadside testing





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## **THANK YOU**

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