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# Approaches to Field Impairment Testing

**Third International Symposium on Drug-Impaired Driving**

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**Canadian Centre on Substance Use and Addiction, Ottawa, Canada**

**October 23, 2017**



# About CCSA

- **Vision: A healthier Canadian society where evidence transforms approaches to substance use**
- **Mission: To address issues of substance use in Canada by providing national leadership and harnessing the power of evidence to generate coordinated action**
- **National non-profit organization**
- **Pan-Canadian and international role**



# CCSA's National Priorities and Areas of Action



**National Framework  
for Action (2005):  
*Collective action for  
collective impact***

**In 2016: Consultations to  
inform the refresh of the  
National Framework for  
Action**



# Introduction

- **Driving while impaired by alcohol or drugs is the most prominent factor contributing to serious road crashes in Canada**
- **Field impairment testing provides evidence of behavioural and cognitive impairment from drugs and alcohol to assist police in making arrests**
- **This presentation summarizes evidence of the effectiveness of field testing in detecting drug impairment in drivers**



# Approaches to Field Impairment Testing

- **Standardized Field Sobriety Test (SFST)**
- **New Zealand: Compulsory Impairment Test**
- **Norway: Clinical Tests of Impairment**
- **United Kingdom: Field Impairment Test**
  
- **Observations of subject**
- **Standardized tests (WAT, OLS, HGN)**
- **Administered by Police officer or physician**



# What Is the SFST?

- A standardized test battery to detect impairment due to alcohol
- Widely implemented across Canada, the United States and parts of Australia
- Can correctly classify more than 80% of individuals who have a blood alcohol concentration (BAC) above 80 mg/dL
- Consists of three tests:
  1. One-Leg Stand Test
  2. Horizontal Gaze Nystagmus Test
  3. Walk and Turn Test
- Currently used by police to detect drug impairment



# Components of the SFST

**One Leg Stand**

**Horizontal Gaze Nystagmus**

**Walk and Turn**





# Validating the SFST for Drugs

- **SFST developed to detect alcohol impairment**
- **Drug impairment can be very different**
- **Sensitivity of SFST for cannabis 0.41**
- **Database of more than 5,000 DRE evaluations**
- **Includes three tests of the SFST plus others**
  
- **Supplementing SFST with Finger to Nose test and observations of eyelid tremors increased sensitivity for cannabis > 0.9**





# Drug Evaluation and Classification Program

- **Systematic, standardized 12-step procedure to document an individual's impairment and identify the category of drug or drugs responsible**
- **Seven drug categories:**
  - **cannabis, stimulants, depressants, inhalants, narcotic analgesics, dissociative anesthetics, hallucinogens**
- **Involves observations, psychophysical tests and clinical indicators**
- **Concludes with a demand for a sample of urine, oral fluid or blood to be tested for drugs**

# Statistics on DEC Program

- **Drug Evaluation and Classification Program implemented in Canada, 50 U.S. states and District of Columbia**
- **About 600 active Drug Recognition Experts (DREs) in Canada**
- **In 2015, 1,889 enforcement evaluations completed in Canada**
- **In 2015, there were >8,000 DREs in the U.S. who completed 28,295 enforcement evaluations**




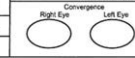


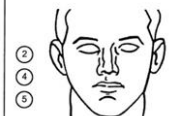




# DEC Program Effectiveness

- A study of 1,349 DEC evaluations completed by DREs in Canada documented an overall accuracy rate of 95%
- DREs reviewing the same case came to the same conclusion about drug category 71% of the time

Beirness, D.J., Beasley, E.E., & LeCavalier, J. (2009). The accuracy of evaluations by Drug Recognition Experts in Canada. *Canadian Society of Forensic Sciences Journal*, 42(1), 75–79.

# Prediction of Drug Category/Combinations

- More than 100 different elements in numerical, narrative and pictorial form are documented
- Challenging to consider all information when forming an opinion
- Can DREs focus on a core set of indicators without compromising accuracy?

DRUG INFLUENCE EVALUATION		EVALUATOR		DRE NO.		ROLLING LOG NO.	
RECORDER/WITNESS		GRASH: <input type="checkbox"/> None <input type="checkbox"/> Property		FILE #			
ARRESTEE'S NAME (LAST, FIRST, MI)		DOB (YY-MM-DD) AGE SEX RACE		ARRESTING OFFICER (NAME, SERIAL#)			
DATE EXAMINED/INITIALS/LOCATION		BREATH RESULTS: <input type="checkbox"/> Refused		CHEMICAL TEST: <input type="checkbox"/> Urine <input type="checkbox"/> Oral Fluid <input type="checkbox"/> Blood			
CHARTER WARNING GIVEN: <input type="checkbox"/> Yes <input type="checkbox"/> No		What have you eaten today? When?		What have you been drinking? How Much?		Time of last drink?	
Given by: _____		Are you sick or injured?		Are you diabetic or epileptic?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Time since? _____		When did you last sleep? How long?		Do you take insulin?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you take insulin? <input type="checkbox"/> Yes <input type="checkbox"/> No		Do you have any physical disabilities?		Are you under the care of a doctor/dentist?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are you taking any medication or drugs?		ATTITUDE		COORDINATION			
SPEECH		BREATH		FACE			
CORRECTIVE LENS: <input type="checkbox"/> None <input type="checkbox"/> Glasses <input type="checkbox"/> Contacts, if so <input type="checkbox"/> Hard <input type="checkbox"/> Soft		Eyes: <input type="checkbox"/> Reddened <input type="checkbox"/> Conjunctiva <input type="checkbox"/> Normal <input type="checkbox"/> Bloodshot <input type="checkbox"/> Watery		Blindness: <input type="checkbox"/> None <input type="checkbox"/> L. Eye <input type="checkbox"/> R. Eye		Tracking: <input type="checkbox"/> Normal <input type="checkbox"/> Unequal	
PUPIL SIZE: <input type="checkbox"/> Equal <input type="checkbox"/> Unequal (describe)		Hydrophic Pressure: <input type="checkbox"/> Yes <input type="checkbox"/> No		Able to follow stimulus: <input type="checkbox"/> Yes <input type="checkbox"/> No		Eyes: <input type="checkbox"/> Normal <input type="checkbox"/> Droopy	
PULSE & TIME		HGN: <input type="checkbox"/> Yes <input type="checkbox"/> No		Vertical Nystagmus? <input type="checkbox"/> Yes <input type="checkbox"/> No		ONE LEG STAND	
1. _____		Lack of Smooth Pursuit: <input type="checkbox"/> Yes <input type="checkbox"/> No		Convergence: <input type="checkbox"/> Yes <input type="checkbox"/> No			
2. _____		Max. Deviation: <input type="checkbox"/> Yes <input type="checkbox"/> No					
3. _____		Angle of Onset: _____					
ROMBERG BALANCE		WALK AND TURN TEST		Cannot keep balance			
				Starts too soon		<input type="checkbox"/> Sways while balancing <input type="checkbox"/> Uses arms to balance <input type="checkbox"/> Hooping <input type="checkbox"/> Puts foot down	
INTERNAL CLOCK: _____		Describe Turn: _____		Cannot Do Test (explain): _____		Type of Footwear: _____	
Estimated to 30 sec: <input type="radio"/> Right <input type="radio"/> Left Draw lines to spots touched		PUPIL SIZE: Room (2.5-5.5) Darkness (5.0-8.0) Direct (2.0-4.5)		NASAL AREA		ORAL CAVITY	
		Left Eye: _____		REPPUS: <input type="checkbox"/> Yes <input type="checkbox"/> No		REBOUND DILATION: <input type="checkbox"/> Yes <input type="checkbox"/> No	
		Right Eye: _____		REACTION TO LIGHT			
BLOOD PRESSURE: _____		RIGHT ARM		LEFT ARM			
MUSCLE TONE: <input type="checkbox"/> Near Normal <input type="checkbox"/> Flaccid <input type="checkbox"/> Rigid							
Comments: _____							
What medicine or drug have you been using? _____		How much? _____		Time of use? _____		Where were the drugs used? (Location) _____	
DATE/TIME OF ARREST		TIME DRE NOTIFIED		EVAL START TIME		TIME COMPLETED	
MEMBERS SIGNATURE		SERIALSREG. #		REVIEWED BY:			
OPINION OF EVALUATOR: <input type="checkbox"/> RULE OUT <input type="checkbox"/> MEDICAL <input type="checkbox"/> ALCOHOL <input type="checkbox"/> DEPRESSANT <input type="checkbox"/> STIMULANT <input type="checkbox"/> HALLUCINOGEN <input type="checkbox"/> DISSOCIATIVE ANESTHETIC <input type="checkbox"/> NARCOTIC ANALGESIC <input type="checkbox"/> INHALANT <input type="checkbox"/> CANNABIS <input type="checkbox"/> OPERATIONAL <input type="checkbox"/> TRAINING							



# Core Predictors of Drug Category

- Examined the signs and symptoms from the DEC protocol that best predicted four categories of drugs most commonly used by suspected drug-impaired drivers:
  - Cannabis
  - Stimulants
  - Depressants
  - Narcotic analgesics



# Core Predictors of Drug Category (cont.)

- **81% of drug cases were correctly classified from nine indicators:**
  - Mean pulse rate
  - Condition of eyes
  - Eyelids
  - Lack of convergence
  - Pupillary unrest
  - Reaction to light
  - Rebound dilation
  - Blood pressure
  - Presence of injection sites



# Core Predictors of Drug Combinations

- Examined the signs and symptoms from the DEC protocol that best predicted common two-drug combinations:
  - Stimulants and cannabis
  - Stimulants and narcotic analgesics
  - Cannabis and alcohol



# Core Predictors of Drug Combinations (cont.)

- 75% of drug combination cases correctly classified from 11 indicators:
  - Mean pulse rate
  - Condition of eyes
  - Lack of convergence
  - Reaction to light
  - Rebound dilation
  - Presence of injection sites
  - Pupil size in dark light
  - Muscle tone
  - Performance on HGN, OLS and WAT tests





# Summary and Implications

- **DREs can initially focus on a core set of drug-related signs and symptoms to help determine the categories of drugs taken by suspected drug-impaired drivers**
  - **Other signs, symptoms and observations can be considered to capture the totality of the case**
- **Findings can be integrated into DEC program training**
- **Results could help in developing an automated system to assist DREs in determining categories of drugs involved on a case-by-case basis**



# ARIDE

- **Advanced Roadside Impaired Driving Enforcement (ARIDE)**
- **Enhanced roadside drug influence detection**
- **Two-day course (also online) to teach common signs and symptoms associated with various categories of drugs**
- **Intermediate step between SFST and DEC program**
- **Provides officers with ability to recognize potential drug influence**
- **Identify suspects for more thorough evaluation by a DRE**



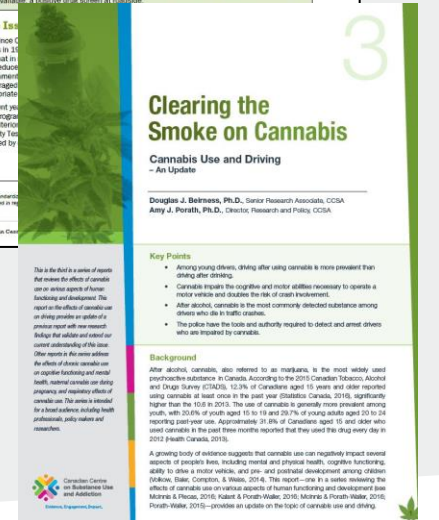
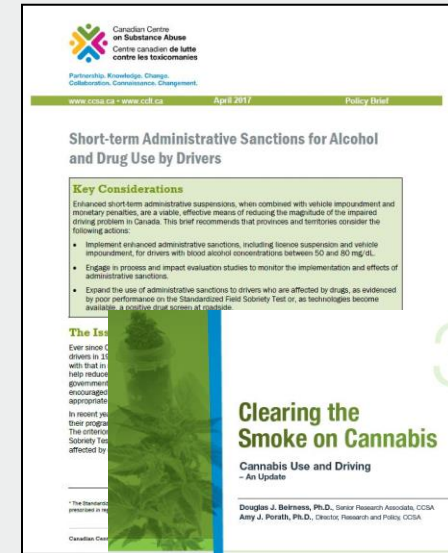
# Gaps and Challenges

- **Detection of drug-impairment in drivers**
  - **Need more research to validate the use of the SFST as a screening tool to detect drug impairment**
- **Limited enforcement capacity in Canada**
  - **Need more police officers to receive DEC program training**
  - **Need to train frontline officers to recognize signs of drug impairment**
- **Courts' acceptance of DEC and SFST for establishing drug impairment**



# Drug-Impaired Driving Resources

- Policy briefs: key considerations for addressing drug-impaired driving in Canada:
  - Drug *Per Se* Laws
  - Drug Evaluation and Classification Program
  - Oral Fluid Drug Screening
  - Short-term Administrative Sanctions for Alcohol and Drug Use by Drivers
- Clearing the Smoke on Cannabis: Cannabis Use and Driving — An Update (NEW)
- The Effects of Psychoactive Prescription Drugs on Driving





# Mobilization of Knowledge, Tools and Resources

- Communication guide to speak with youth about cannabis (**Coming in Winter 2018**)
- Drug-impaired driving toolkit for educators
- Online learning module
- Toolkit for hosting live learning events related to cannabis and youth

Parents: Help your teen understand what's fact and fiction about marijuana

The following facts might be surprising

- Youth
- Up to 10% of Grade 12

TEENS SAY,  
"IT'S JUST WEED"

Weed is natural  
and so it's harmless

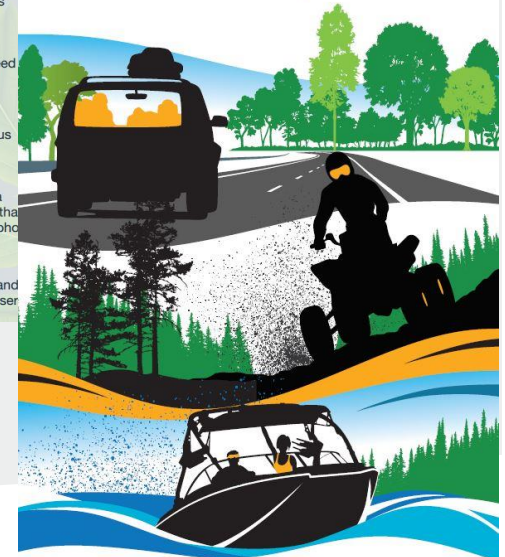
Everyone is using weed

Weed helps you focus

Weed makes you a  
better driver; it's safer than  
driving after using alcohol

Weed isn't addictive and  
does not "consume" users

Impaired **is** Impaired  
No matter what your ride.





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