



# National Transportation Safety Board

## Impairment, Drug Categories, and Study Methodology

Mary Pat McKay, MD, MPH  
Chief Medical Officer

# Impairment

Continuum from fully awake and alert  
to unconscious

Ready to go

Unconscious



# Mental and Physical Functions

- Perception
- Attention
- Executive functioning
- Cognitive processing
- Judgment
- Alertness
- Reaction time
- Mood

# Accident Risk

- Complex relationships
  - Medical conditions
  - Drug effects
  - Time

# Accident Risk Research

- Study assesses the scope of the problem
- Further research required
  - Compare prevalence among accident and non-accident pilots
  - Assess risk of specific drugs

# Impairment and the Probable Cause

- Medical condition or drug with potential to cause impairment
- Impaired decision-making or behavior not reasonably predicted by skill and experience
- Associated with accident circumstances

# Impairment and the Probable Cause

- Cause or contributing factor
  - 3.0% impairment by drugs
  - 1.8% impairment by medical condition
- Study assessed evidence of use rather than impairment

# Accident Selection

- Included
  - Accidents 1990-2012
  - Flying pilot died
- Excluded
  - Pilots not flying
  - Intentional events
  - Toxicology not performed

# Methodology

- Metabolites
- Excluded
  - Duplicate results from metabolites or multiple specimens
  - Drug findings in urine only
  - Drugs from postaccident resuscitation

# Definitions

- Drugs
  - Over-the-counter
  - Prescription
  - Illicit
- Controlled substances
  - DEA defines Schedules I-V
  - Schedule I: no medical use
  - Marijuana Schedule I

# Potentially Impairing Drugs

- FDA warnings
  - Sedation
  - Hallucinations
  - Behavior changes
  - Driving or operating machinery
- Controlled substances
  - DEA Schedule II-V
- Illicit drugs

# Illicit Drugs

- Schedule I
- Schedule II misuse
  - Cocaine
  - Amphetamine
- Toxicology tests cannot identify non-medical use of other drugs

# Chemistry and Routine Use

- Sedating antihistamines
  - Most common category
- Diphenhydramine
  - Most common individual drug
  - Most common potentially impairing drug

# Drugs Indicating a Potentially Impairing Condition

- Drugs used primarily to treat
  - Psychiatric diseases
  - Severe pain
  - Neurologic diseases
  - Heart rhythm



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