

The National

Methamphetamine Symposium

Making Research Work in Practice

12 May 2015 | Arts Centre, Melbourne

Physical and psychological effects of methamphetamine use

Amanda Baker PhD

**NCETA's
NATIONAL METHAMPHETMINE
SYMPOSIUM**

Making Research Work in Practice

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Physical and psychological effects of methamphetamine use

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NHMRC CENTRE OF RESEARCH EXCELLENCE
in MENTAL HEALTH and SUBSTANCE USE

Why examine physical and psychological effects?

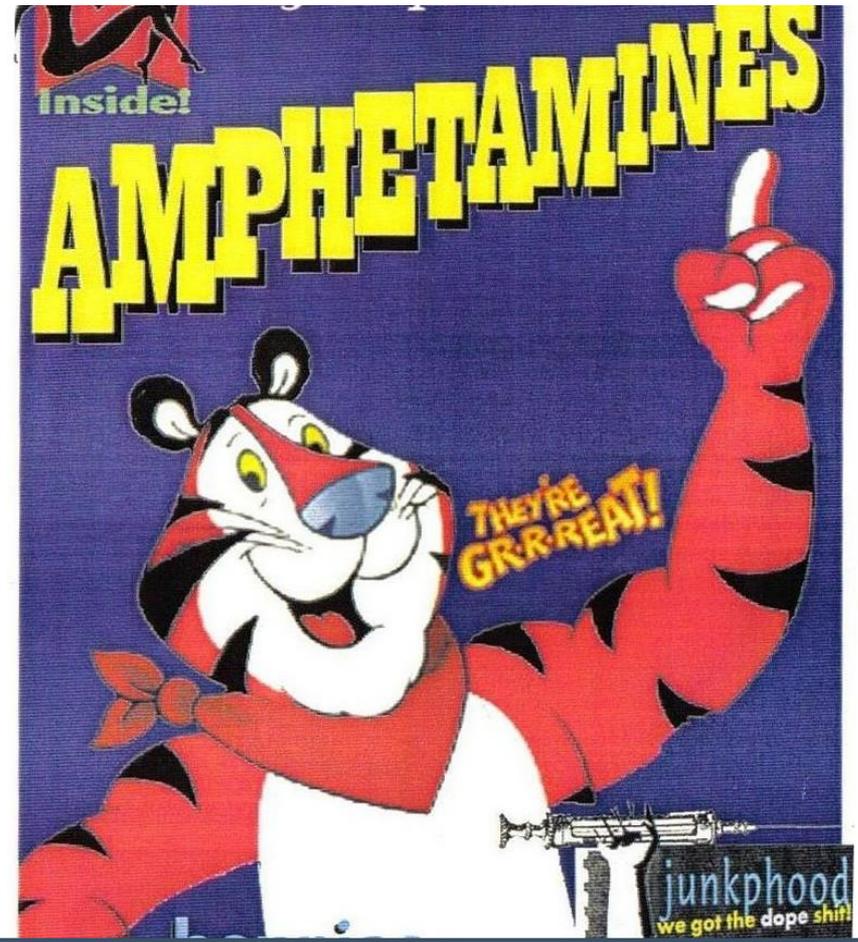
- Effective public health responses

(Marshall & Werb 2010)

Immediate psychological effects

(Majumder & White 2012)

- Euphoric state
- Increase in energy levels
- Enhancement of mood
- Increased self-esteem
- Alleviation of fatigue
- Increased attention



Immediate physiological effects

(Majumder & White 2012)

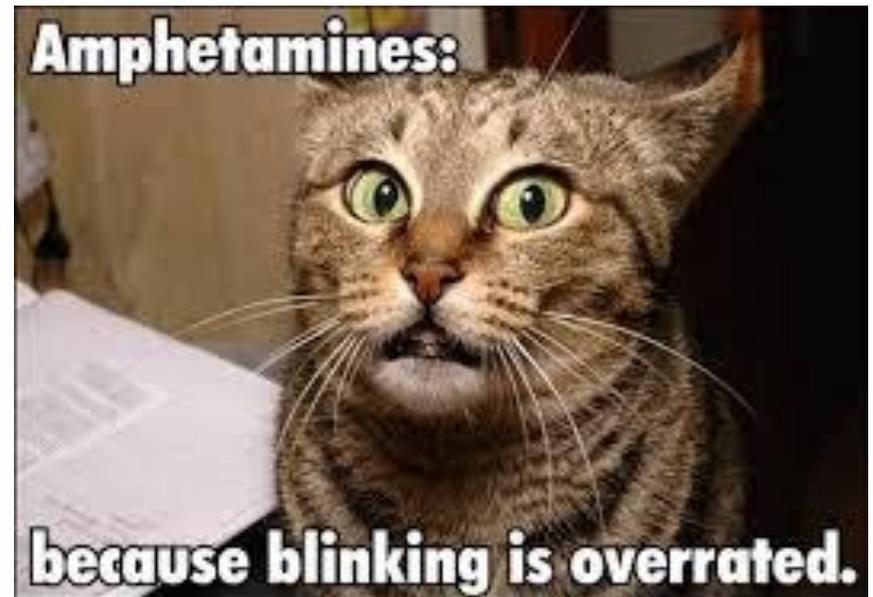
- Signs of activation of the adrenergic system:
 - Increased HR & resp rate
 - Hypertension
 - Decreased appetite
 - Psychomotor stimulation
 - Euphoric state
- NT from hypothalamus
 - Increase in body temperature



4 broad types of adverse health effects

(Degenhardt & Hall 2012)

- (i) Acute toxic effects, OD
- (ii) Acute effects of intoxication
 - Accidental injury
 - Violence
- (iii) SUD
- (iv) Sustained chronic use
 - Chronic disease, eg CVD
 - Blood-borne bacterial & viral infections
 - Mental disorders



Polydrug use

(Darke et al, 2008)

Increases toxicity:

- ETOH/MA ↑ HR, BP
- Heroin/MA ↑ O₂ demand with ↓ respiration (cardiac failure)
- MA/cocaine
↑ vasoconstrictive & cardiotoxic effects

Multiple substances are detected in around half of fatal MA toxicity cases



(i) Acute toxic effects

(Darke et al, 2008)

- Toxic reactions can occur irrespective of
 - Dose
 - Frequency of use
 - Route of administration
 - With small amounts
- No well delineated dose response for MA
 - Dose and frequency may influence likelihood
 - Accumulated damage from L/T use → CHD → MI

(i) Acute toxic effects (cont'd)

(Darke et al, 2008)

- Physical symptoms of toxicity include:
 - Excited delirium
 - Nausea & vomiting
 - Chest pain
 - Tremors
 - Increased body temp
 - Increased heart rate
 - Breathing irregularities
 - Seizures

(i) Acute toxic effects (cont'd)

(Darke et al, 2008)

- Psychological symptoms of toxicity include:
 - Extreme anxiety
 - Panic
 - Extreme agitation
 - Extreme paranoia
 - Hallucinations
 - Excited delirium



(i) Acute toxic effects (cont'd)

(Degenhardt & Hall, 2012)

- Psychostimulant overdoses can trigger fatal:
 - Cardiac arrhythmias
 - Stroke
- Otherwise rare in healthy young adults
- Crude mortality rates similar to opioids

(ii) Acute effects of intoxication

(Degenhardt & Hall, 2012)

- Compared to non-users, more common causes of death include:
 - Road traffic crashes
 - Falls
 - Drowning
 - Injuries

(iii) Substance use disorder

- DSM V: (substance use disorder)
 - Cluster of cognitive, behavioural and physiological symptoms
 - Impaired control (criteria 1-4)
 - Social impairment (criteria 5-7)
 - Risky use (criteria 8 & 9)
 - Pharmacological criteria (tolerance & withdrawal; criteria 10 & 11)
 - Mild (2-3), moderate (4-5), severe (6 or more)

(iii) Substance use disorder (cont'd)

(Degenhardt et al 2013; Darke et al 2008)

- MA use disorder:
 - may be chronic or involve bingeing with brief drug free periods
 - Associated strongly with smoking and injecting (rapid bioavailability) and potency of the drug



(iv) Adverse health effects

(Degenhardt et al 2013; Darke et al 2008)

- BBV transmission
 - Sharing used injecting equipment
 - Sexual risk behaviour
 - MA use ↑ sexual arousal
 - Some people use it to enhance sex
 - Elevated levels of sexual activity & unprotected sex
 - Among homosexual men who use MA there is an elevated incidence of HIV



(iv) Adverse health effects (cont'd)

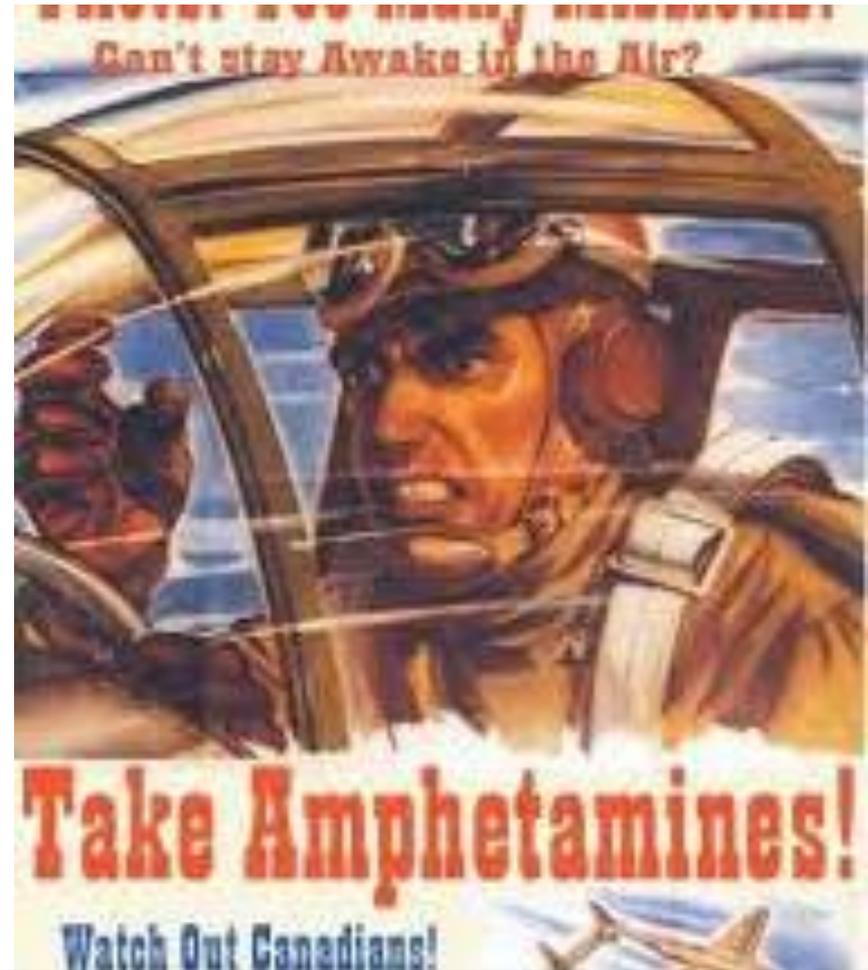
(Jenner, 2012)

- Other physical consequences
 - Gum disease, teeth grinding and decay
 - Poor sleeping patterns and insomnia
 - Weight loss and under nutrition
 - Dehydration
 - Kidney problems (prolonged constriction of blood vessels & poor hydration)
 - Lowered immunity
 - Skin lesions (associated with repetitive picking)

(iv) Adverse health effects – mental health

(Darke et al 2008)

- MA use associated with elevated rates of
 - Psychosis
 - Mood and anxiety disorders
 - Violent behaviours
 - Cognitive deficits



(iv) Adverse health effects – mental health

(cont'd) (Darke et al 2008)

- Psychostimulant use can induce psychosis
 - Typically transient (hrs - days)
 - Delusions (persecution)
 - Hallucinations (commonly auditory & visual)
 - May be emotionally labile, agitated & hostile
 - Repetitive, stereotyped behaviour & social withdrawal



(iv) Adverse health effects – mental health

(cont'd) (Darke et al 2008; Degenhardt & Hall, 2012)

- Depressive and anxiety symptoms - common
 - Majority report lifetime history of depression
 - Rates of suicidal ideation & attempted suicide are high
 - A quarter of psychostimulant users have a lifetime history of attempted suicide (vs <5% of general population)
 - Depression, suicide and anxiety associated with longer use, frequent use, & dependence.
 - Depression + intoxicating effects of the drugs + stresses of an illicit drug dependent lifestyle ↑ risk.

(iv) Adverse health effects – violence

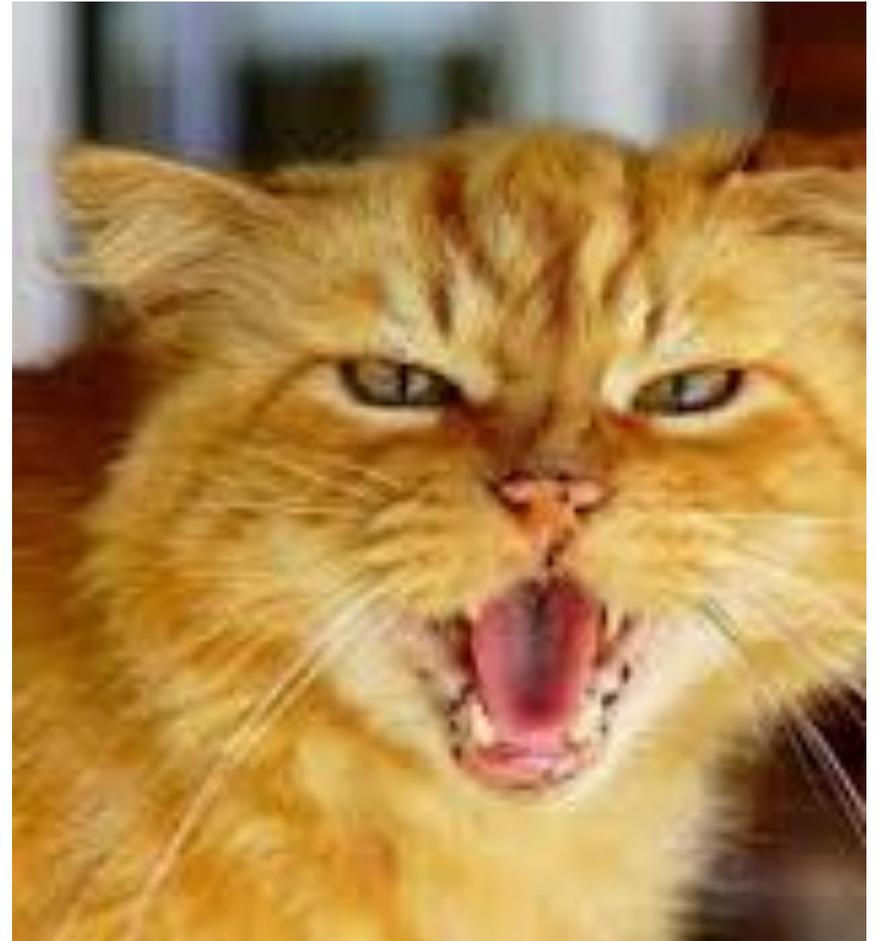
(Darke et al 2008; Degenhardt & Hall, 2012))

Chronic use of MA can ↑
aggressive behaviour

Acute intoxication can ↑
aggressive response

Psychosis can be
accompanied by violent
behaviours

High rates of pre-existing
conduct disorder



(iv) Adverse health effects - violence

(cont'd) (McKetin et al 2014)

- Longitudinal study (n=278): *frequent use* associated with more violence
- *Psychotic* symptoms and heavy *alcohol* use increased the risk of violent behaviour
- Violence was characterised by *interpersonal violence* ranging from altercations to unprovoked physical attacks



(iv) Adverse health effects – Neurotoxicity

(Jenner, 2012)

- Chronic use of MA
→ neurochemical abnormalities
- Consequences:
 - Concentration
 - Memory
 - Decision-making
 - Irritability, insomnia, mood swings, loss of interest, lack of motivation

Effective responses

(Degenhardt et al., 2013)

- Behavioural interventions are effective
 - Research into how to scale these up needed
- Needle & syringe programs
- HIV antiretroviral therapy

Health and well-being

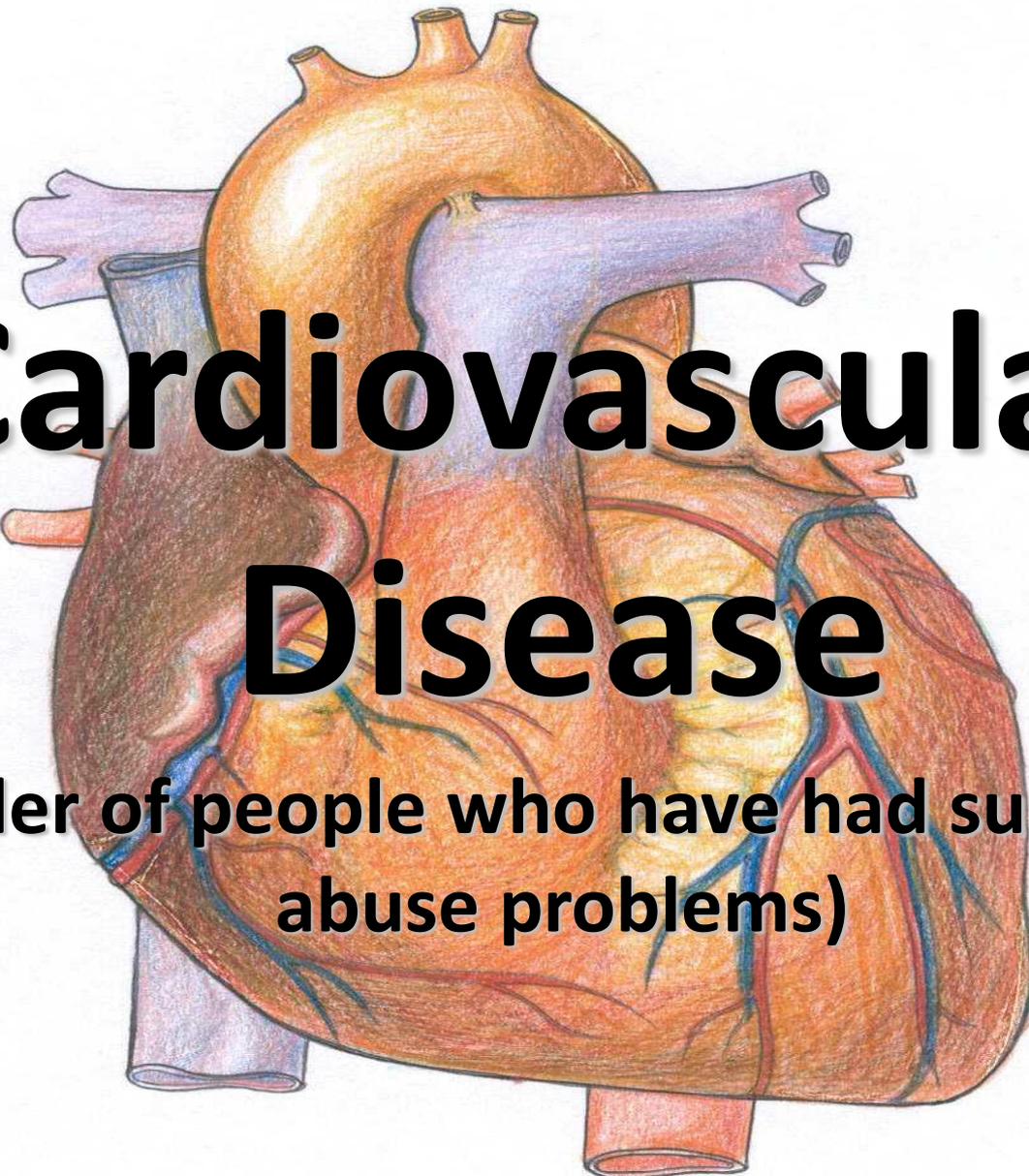
(Butler, Wheeler & Sheridan, 2010)

- Health and well-being information:
 - Mental health
 - Diet
 - Skincare
 - Sleep hygiene
 - Smoking cessation /reduction
 - Other drugs
 - Physical activity



Healthy Lifestyles Approach

- Substance users care about their health
- Like the approach
- Dr Pete Kelly (University of Wollongong)
 - Groups or individual
 - Peer delivery
 - Telephone

An anatomical illustration of a human heart, showing the four chambers (right and left atria and ventricles) and the major blood vessels (superior and inferior vena cava, aorta, and pulmonary artery and vein). The heart is rendered in a realistic style with shading to show its three-dimensional form and the texture of the surrounding vessels.

Cardiovascular Disease

**(#1 killer of people who have had substance
abuse problems)**

**Isn't cutting down / quitting drugs
enough???**

(what are you trying to do to me!)

Multi-component interventions: feasible, effective, and more efficient *(Spring et al 2010)*



Healthy Lifestyles Approach

- While addressing substance use
 - Mental health
 - Smoking
 - Diet
 - Physical Activity
 - Others

- Engagement and flexibility

Conclusions

- Address physical AND psychological harms
- Effective public health responses
- Consider a healthy lifestyles approach