

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?

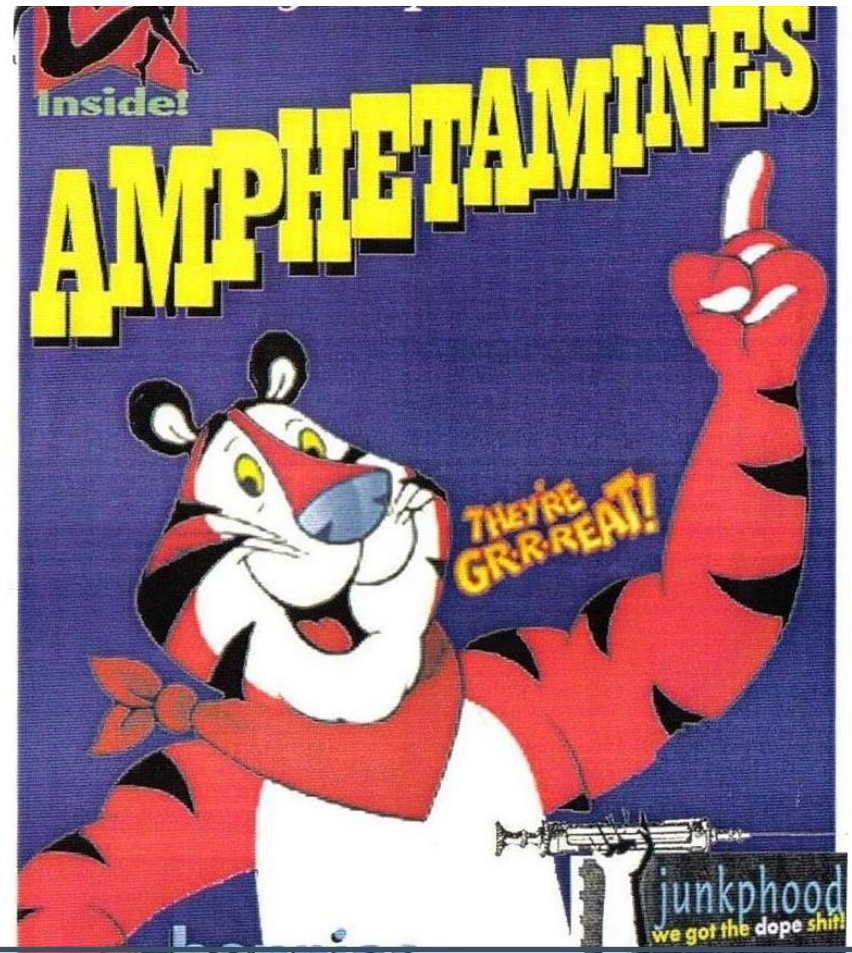
- Effective public health responses

(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 \uparrow HR, BP
- Heroin/MA \uparrow O_2 demand with \downarrow respiration (cardiac failure)
- MA/cocaine \uparrow 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

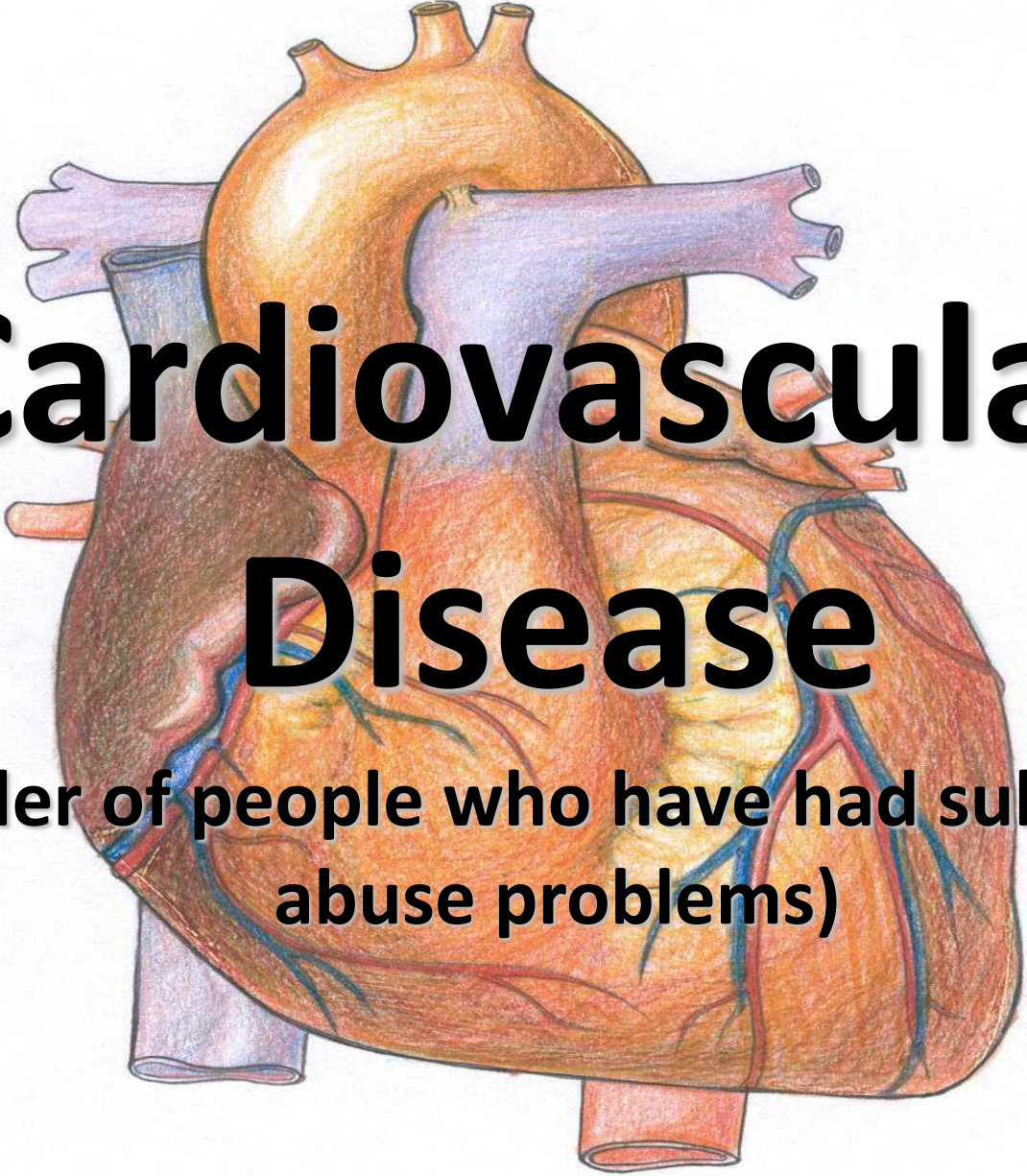
(Butler, Wheeler & Sheridan, 2010)

- 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



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