



# **Management of Patients with Psychostimulant Toxicity:**

Guidelines for Ambulance Services



*National  
Drug Strategy*

**Management of Patients with  
Psychostimulant Toxicity:**  
Guidelines for Ambulance Services

May 2006

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The opinions expressed in this document are those of the authors and are not necessarily those of the Australian Government.

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# Executive Summary

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1. The use and availability of psychostimulants is increasing.
2. Adverse effects of psychostimulants fall along a continuum with mild symptoms at one end of the spectrum and life-threatening toxicity at the other [p.10].
3. Psychostimulant toxicity has been identified among both naïve and regular users and a wide range of medical presentations are recognised. These include myocardial infarction, CVA, cerebral vasculitis, disseminated intravascular coagulation, hypertension, hyperthermia, seizures, coma, agitation, panic states and other acute behavioural disturbances, delirium, psychosis (particularly paranoid hallucinations and delusions), and (rarely) serotonin toxicity of varying severity.
4. A thorough assessment should be undertaken [p.8] which includes drug use history and presence of psychostimulant toxicity (including cerebrovascular and cardiovascular complications, and serotonin toxicity).
5. Urgent transport to hospital is indicated in the context of suspected or confirmed psychostimulant use if the patient has a temperature of 38°C or higher; has an altered level of consciousness (disorientation, confusion, delirium); has a severe headache; is hypertensive; has respiratory difficulties; has had a seizure; has chest pain; is extremely agitated or acutely behaviourally disturbed; does not respond to verbal de-escalation strategies and is a risk to themselves or others [p.11].
6. Control of behavioural disturbance is the first priority. Calming communication to de-escalate potentially dangerous situations is recommended if a patient becomes hostile or violent in the pre-hospital setting. Police assistance might be required in a high-risk situation but physical restraint should be used as a last resort [p.12-13].
7. If severe behavioural disturbance cannot be controlled by strategies covered in point 6, then urgent sedation can be administered by appropriately trained ambulance officers (advanced skill paramedics), in states where regulations allow, to patients exhibiting acute behavioural disturbance secondary to psychostimulant intoxication or toxicity (see below and p.13-16).
8. Patients should be referred to specialist alcohol and drug services for ongoing support and counselling following treatment in the emergency department [p.19].
9. For those who decline follow-up care, provision of information about psychostimulant use or other educational material is recommended.
10. Patients who do not require transport to the emergency department should be cautioned against using more stimulants (or other drugs); should be left in the supportive care of friends or family; be offered information about stimulant use; and be offered referral to an alcohol and drug treatment agency for further support.

## *Midazolam Sedation Protocol*

An initial dose of 2.5-5mgs of midazolam should be administered intravenously (or 5mg intramuscularly if no access). If a state of "rousable drowsiness" (Defined ideally as sleepy if undisturbed, rouses and cooperates to voice or pain) is achieved within 10 minutes of the first dose, no more sedation should be administered. Apply oxygen when able. If there is no clinical response at 10 minutes, a higher dose of 10 mgs of midazolam IM or 5-10mg IV should be administered. Repeat this regime once more if needed until the patient is in a state of rousable drowsiness or consider the regimen failed. If failed seek medical consultation for alternate agent use or transport to hospital with physical restraint [p.14].

# Midazolam Sedation Protocol

## *Observations*

Visual observations should be maintained continuously during transport to the emergency department, and other observations should include ECG, respiration rate, blood pressure, pulse, temperature, and Glasgow Coma Scale score.

## *Transport*

All sedated patients should be transported to hospital. Not all psychostimulant affected patients require transport to hospital. The box below outlines indications for urgent transport.

### **Urgent transport is indicated if:**

- the patient has a temperature of 38°C or higher (check for flushing or sweating if no thermometer available)
- has an altered level of consciousness (disorientation, confusion, delirium)
- has severe headache
- is hypertensive
- has respiratory difficulties
- has had a seizure
- has chest pain
- is extremely agitated or acutely behaviourally disturbed
- does not respond to verbal de-escalation strategies and is a risk to themselves or others

# Background

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## Purpose and Scope of the Draft Guidelines

The purpose of this document is to provide draft guidelines for ambulance services throughout Australia to effectively and safely manage individuals who are experiencing, or suspected of experiencing psychostimulant toxicity (includes use of amphetamines, cocaine, and methylenedioxyamphetamine (MDMA) or ecstasy), and associated severe behavioural disturbance.

The aim of these draft guidelines is to assist ambulance officers (paramedics) to:

1. Respond to patients who are suspected of being intoxicated with psychostimulants
2. Identify patients who present with suspected psychostimulant toxicity
3. Rapidly and safely manage suspected or confirmed psychostimulant toxicity utilising a standardised sedation protocol.

These draft guidelines are not intended to replace any existing guidelines currently in use in each state or individual ambulance service. Rather, the draft guidelines have been developed to assist decision making in the pre-hospital setting, and can be used to inform the adaptation of existing practices related to the management of patients presenting with suspected or confirmed psychostimulant toxicity. The draft guidelines are designed to be easily adapted to ensure consistency with available resources (i.e. adoption of the guidelines should be cost-neutral) and appropriate state legislation including the relevant state Mental Health Act.

These draft guidelines are intended to be used in conjunction with the publication *Models of Intervention and Care for Psychostimulant Users, Second Edition, Commonwealth Monograph Series Number 51*, Baker, A., Lee, N.K., & Jenner, L. (eds) (2004). The Monograph can be obtained by contacting the Australian Government Department of Health and Ageing, or is available to be downloaded from the department website: <http://www.health.gov.au/pubhlth/publicat/mono.htm>. As a thorough review of the literature is presented in the monograph these draft guidelines provide a synopsis of the evidence only.

## Definition of Psychostimulants

These guidelines refer to the range of substances collectively known as psychostimulants, which include:

1. MDMA (methylenedioxymethamphetamine) 'ecstasy'
2. Cocaine
3. Amphetamine sulphate or hydrochloride, 'speed'
4. Methamphetamine
  - a. crystal methamphetamine, 'ice', 'crystal meth'
  - b. methamphetamine tablets, 'pills'
  - c. methamphetamine 'base', which is a moist, oily substance
  - d. methamphetamine powder
5. Paramethoxyamphetamine (PMA)
6. Paramethoxymethamphetamine (PMMA)

## Target Groups

These draft guidelines have been designed for use by all ambulance services and apply to all psychostimulant-affected individuals including Indigenous peoples, women and those with suspected co-existing mental health problems. The sedation protocol is recommended for those over 16 years of age, who have no known sensitivity to benzodiazepines.

## Ambulance Services and Police Services: Recommendation for Collaborative Response

Paramedics might be first on the scene and require police assistance if the patient's behavioural disturbance is severe. Similarly, police officers might be first on the scene and require urgent assistance from paramedics to manage a medical emergency. A collaborative approach between police, ambulance services and emergency departments is therefore essential to ensure prompt and timely management of individuals who are experiencing, or suspected of experiencing, psychostimulant toxicity. Companion guidelines have been produced for police services and emergency departments to ensure consistency of approach in managing such a medical emergency.

Effective partnerships might be achieved in local areas by undertaking collaborative training in appropriate responses to amphetamine users; undertaking a formal service agreement or a memorandum of understanding; and collaboratively adapting these guidelines (including implementing

additional field trials of the midazolam sedation protocol) to meet local legislative conditions including the relevant state Mental Health Act and to ensure consistency with available resources.

If police are first at the scene and subsequently call paramedics to assist, then it is recommended that paramedics proceed according to these guidelines.

### Key points

- The use of psychostimulants in Australia is increasing.
- Ambulance responses and transfer to emergency departments following overdose of psychostimulants is reportedly increasing.
- Psychostimulant toxicity has been recognised among both naïve and regular users and represents a medical emergency when severe.

## Patterns of Psychostimulant Use

Psychostimulants are a group of drugs that stimulate the activity of the central nervous system, causing individuals to feel falsely or overly confident, euphoric, alert and energetic.

The use and availability of psychostimulants, in particular methamphetamines ('meth', 'crystal meth', 'ice', 'base') and amphetamine sulphate or hydrochloride ('speed') are increasing throughout Australia (1, 2). Population studies estimate that more than half a million Australians had used an illicit stimulant during the year 2000 (2).

Users of amphetamines can be categorised as:

- a) experimental (naïve users)
- b) recreational (those who use irregularly, generally in a social setting)
- c) binge users (an 'on again – off again' pattern of moderate to large quantities of use)
- d) regular daily users.

Intranasal 'snorting' or oral ingestion 'bombing' are common routes of administration by experimental and recreational users, however a significant proportion of users (particularly regular users) do choose to inject. Injection, while becoming increasingly common in Australia, is typically associated with greater potential for toxicity, higher levels of dependence and other physical, psychological and social problems (1).

## Acute Psychostimulant Toxicity

According to Dean and Whyte (3) “adverse effects (of psychostimulants) can exist on a spectrum of severity from minor symptoms to life threatening toxicity.” The definition of ‘acute psychostimulant toxicity’ utilised by these draft guidelines describes an individual who has administered psychostimulants and subsequently experiences acute symptoms of toxicity although it is recognised that intoxication with other drug classes such as alcohol, cannabinoids or opioids may also be evident, as patterns of use of psychostimulants suggest that co-administration of other drugs is extremely common (1).

Consequences of psychostimulant toxicity can include (3):

1. Agitation, panic states and acute behavioural disturbances
2. Psychosis (particularly paranoid hallucinations and delusions)
3. Hyperthermia
4. Cerebrovascular and neurological complications (e.g. CVA, cerebral vasculitis, disseminated intravascular coagulation, seizures, coma)
5. Cardiovascular complications (e.g. myocardial infarction and ischaemia, hypertension, tachycardia, arrhythmia)
6. Delirium
7. Electrolyte disturbances (e.g. hyponatremia, hyperkalemia)
8. Hypoglycaemia
9. Rhabdomyolysis
10. Serotonin toxicity of varying severity (see Appendix 1 for diagnostic criteria).

It is important to recognise that psychostimulant toxicity can occur among both experimental (naïve) and regular users of psychostimulants, and smoking a crystalline form of methamphetamine (‘ice’) puts people at risk for developing psychostimulant toxicity (3).

## The Midazolam Sedation Protocol

Sedation using sedative drugs is acceptable to patients with severe behavioural disturbances, provides a humane alternative to physical restraint, and ensures simpler and safer essential physiological monitoring than other types of restraint (3). Benzodiazepines have been recommended as the agent of choice when there is unlikely to be an ongoing need for antipsychotic medication after acute treatment as benzodiazepines influence fewer neurotransmitter systems than antipsychotic agents, and are thus a safer choice of drug. In addition, most agitated patients are more willing

to accept treatment with a benzodiazepine than with an antipsychotic, and following sedation with benzodiazepines patients tend to be calmer and better organised (3).

Secondary benefits of selecting a benzodiazepine are that they are also part of first line treatment for cardiac toxicity associated with psychostimulant use and psychostimulant-induced seizures, and may exert some benefit in the agitation of serotonin toxicity (3). Researchers have recommended parenteral midazolam to control agitated or aggressive patients due to its rapid onset (4), shorter duration of action, and its reduced potential to cause hypotension. In addition, prolonged administration of midazolam results in more rapid awakening (3, 4) when administration has ceased.

A midazolam sedation protocol which is recommended for the emergency management of individuals suspected of experiencing acute psychostimulant toxicity with associated severe behavioural disturbance accompanies these guidelines. Midazolam is the only benzodiazepine currently approved for all ambulance services nationally. Each state and territory has legislation pertaining to medication administration by paramedics and the midazolam protocol is therefore only relevant to those states and territories where restrictions do not apply.

A pilot study examining the safety and effectiveness of the protocol among patients suspected of suffering from psychostimulant toxicity has recently finished in an emergency department in Queensland. The pilot study aimed to test the hypothesis, based on common clinical observation, that the dose of midazolam that is required for control of severe behavioural disturbance among psychostimulant users is **higher** than the dose considered standard or currently accepted. The study intended to provide foundation evidence to inform the initiation of local field trials by ambulance services in the pre-hospital setting in the various states and territories.

Analysis of the data reveals the high dose protocol is unsafe in 18% of patients. This group of patients is likely to respond to normal sedation doses without such risk so the recommended ambulance protocol has been modified to give a standard sedation dose for the first dose. Rapid sedation to the point of rousable drowsiness could only be achieved in 75% of cases after two higher doses. Further field trials of the modified midazolam sedation protocol by ambulance services are recommended in the pre-hospital setting. Exploration of safer oral sedation for less severely disturbed patients and alternate agents for failed sedation warrant consideration in light of the above study.

# Draft Guidelines

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The current draft guidelines for the management of persons with suspected or known psychostimulant intoxication or toxicity address the following areas:

1. Role of the ambulance service
2. Context and possible precipitants of acute behavioural disturbance
3. Assessment
  - a. drug use
  - b. medical and psychiatric history
  - c. psychostimulant toxicity
  - d. when to transport a patient to the emergency department
4. Recommendations for management
  - a. acute behavioural disturbance
  - b. psychostimulant toxicity
  - c. serotonin toxicity
5. Aftercare
6. Recommendations for implementation of the draft guidelines.

## **The Role of the Ambulance Service**

The role of the ambulance service in responding to patients with known or suspected psychostimulant toxicity includes:

1. Prompt assessment
2. Effective management at the scene
3. Safe transport to hospital if indicated
4. Rapid and safe management of symptoms of toxicity, including acute behavioural disturbance
5. Provision of information or other resources and appropriate referral when patient transport to hospital is unnecessary.

## Context

Paramedics may be called to attend incidents involving an individual who is under the influence of a psychostimulant, or who may be experiencing acute psychostimulant toxicity. Individuals suffering from acute psychostimulant toxicity often become extremely agitated, irrational, impulsive, paranoid and psychotic, which may lead the person to behave in an uncontrollable, aggressive and/or violent manner. The number of ambulance attendances to patients presenting with putative psychostimulant intoxication or toxicity has risen in some Australian locations, and paramedics are increasingly required to manage the acute behavioural disturbances associated with psychostimulant use (5).

There are many possible causes of acute behavioural disturbances however, and other factors must be considered under the following headings:

1. Drug intoxication, toxicity or withdrawal. Due to the effects of drugs or alcohol (including drug/alcohol withdrawal), the person may be anxious, fearful or even paranoid. Impulsive behaviour is also a risk in the context of intoxication.
2. Mental health disorders such as psychotic illness (e.g. schizophrenia, mania). The individual may seem to be out of contact with reality. For example, they may appear to be hearing 'voices' (auditory hallucinations); may be acting on fixed, false beliefs ('delusions' such as people are out to hurt them); or responding in a manner that is significantly out of proportion to the precipitating event.
3. Physical disorders such as head injury, delirium or confusion.

It is often difficult for paramedics at the scene to accurately determine if an individual is intoxicated with psychostimulants or suffering from an acute mental health disorder. For this reason these guidelines recommend that both situations be responded to in the same way. Specifically, both are considered to be a medical emergency. However, due to the complexity and range of possible presentations, an accurate assessment is necessary prior to initiation of any response.

## Assessment

### Drug Use History

A thorough drug history should be taken at the time of triage if possible. The following points may serve as a guide (6), although if the patient is obviously intoxicated or exhibiting signs of agitation or acute behavioural disturbance, an emphasis on rapidly controlling the behaviour and reassuring the patient should take priority. Collateral information gained from friends or family members if in attendance, or other support people who might be present, may be useful if the patient is severely disturbed.

#### **If the Patient is Cooperative with Assessment, Record:**

1. Psychostimulant use ('speed', 'go-ee', 'base', 'ice', 'meth', 'whizz' etc)
  - a. type of psychostimulant used (e.g. methamphetamine, amphetamine, cocaine, MDMA, prescription drug)
  - b. amount of psychostimulant used<sup>1</sup>
  - c. time of administration
  - d. route of administration (intranasal, intravenous, oral, inhalation)
  - e. potency of psychostimulant used ('Was it strong?')
2. Other drug use
  - a. concurrent use of other drugs (particularly alcohol, benzodiazepines, opiates, party drugs, prescription medicines or antidepressants), including criteria above. Co-administration of psychostimulants and antidepressants increases risk of serotonin toxicity. Co-administration of large amounts of alcohol, opioids or other party drugs such as GHB will affect the decision to sedate the person in the field.

#### **Medical and Psychiatric History (if possible)**

1. Other conditions that might impact on management
  - a. presence of recent medical illness, or chronic illness including blood borne viruses
  - b. presence of any physical injury (particularly head injury) that might have been recently sustained
  - c. presence of concomitant psychiatric illness or psychiatric symptoms (psychosis, paranoia, depression, suicidal ideation etc).

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<sup>1</sup> Amount can be measured in local dollar value, grams, or numbers of 'pills' taken.

## If the Patient is not Cooperative with Assessment or Denies Psychostimulant Use

### Setting

If verbal information cannot be obtained, the immediate surroundings can also inform the assessment process. Look for items that may indicate recent drug use, such as needles, syringes, or resealable plastic bags. Also take into consideration where the incident is occurring.

The following settings may increase suspicion of psychostimulant use:

- a nightclub
- a dance party or 'rave'
- a private party
- a music concert
- a large one-day event
- a dealer's house or a place of psychostimulant manufacture (clandestine laboratory).

### Signs

The following signs might also indicate the patient has recently used psychostimulants or is moderately to severely intoxicated (although some signs might be indicative of other medical conditions or intoxication with other drug classes such as anticholinergic medications):

- dilated pupils that react sluggishly to light
- clenched jaw
- restlessness, agitation, repetitive movements
- rapid speech
- motor agitation or pacing
- hypertension
- tachycardia
- sweaty palms, flushed diaphoretic facial skin
- hypervigilance, paranoia

The following signs might indicate long-standing or regular psychostimulant use:

- obvious signs of poor- or under-nutrition
- sores on face, arms or legs
- evidence of needle marks or thrombophlebitis.

If the patient is uncooperative with assessment and is acutely behaviourally disturbed, initiate verbal de-escalation strategies as detailed on page 12.

## Other Physical Observations Relevant to Assessing for Psychostimulant Toxicity(3)

1. **Temperature** (although taking an accurate temperature is strongly recommended observe for facial flushing and sweating, if no thermometer is available)
  - a. severe hyperthermia may develop (temperature above 38°C is clinically significant, and hyperthermia above 39.5°C indicates severe, potentially life threatening toxicity and mandates immediate cooling, sedation and rapid transfer to the emergency department).

2. **An ECG should be obtained** in all patients complaining of chest pain.

Continuous cardiac monitoring should be instituted.

## Medical Indicators for Urgent Transport to the Emergency Department

If recent use of psychostimulants is suspected or confirmed, urgent transport to the emergency department is indicated if the patient<sup>2</sup>:

1. has a temperature of 38°C or higher
2. has an altered level of consciousness (disorientation, confusion, delirium)
3. has a severe headache
4. is hypertensive
5. has respiratory difficulties
6. has had a seizure
7. has chest pain
8. is extremely agitated or acutely behaviourally disturbed, does not respond to verbal de-escalation strategies and is a risk to themselves or others.

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<sup>2</sup> If the patient does not meet medical criteria for emergency transport to hospital then follow local guidelines for transport in that case.

# Management

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## Acute Behavioural Disturbance

The primary aim of management of behavioural disturbance is to reduce the risk of harm to the patient, paramedics and others at the scene and to facilitate transfer to the emergency department when indicated. Use established protocols for the management of behavioural disturbances in the event of such an incident. However, special precautions must be observed when the behavioural disturbance results from psychostimulant toxicity. Reliance on physical restraint alone is often not adequate for psychostimulant users experiencing acute behavioural disturbance, and **may actually cause harm** if agitation increases. Stimulant use has been suggested as a possible risk factor for sudden death of individuals being physically restrained (3). Hence, verbal de-escalation should be attempted in the first instance. Early intervention to calm the patient might reduce the risk of onset of physical complications (e.g. adverse cardiovascular events) secondary to over stimulation and hyperarousal.

## Verbal De-Escalation Strategy

Respond to the patient in a calm and confident manner. Be aware that if the person is acutely intoxicated with psychostimulants and experiencing great fear or paranoid symptoms, unexpected stimuli such as loud noises or sudden movements may worsen the situation. So at all times use calming, de-escalating communication strategies. Individuals affected by psychostimulants are more likely to respond in a positive way to communication strategies that are not perceived to be aggressive, threatening or confrontational. Recommended communication techniques include:

1. Listening to the patient
2. Using the patient's name to personalise the interaction
3. Calm, open-ended questioning to ascertain the cause of the behaviour
4. A consistently even tone of voice, even if the person's communication style becomes hostile or aggressive
5. Avoidance of the use of "no" language, which may prompt an aggressive outburst. Statements like *"I'm sorry, our policy doesn't allow me to do that but I can offer you other help....."* often has a calming effect on the patient
6. Allow the individual as much personal space as is possible while still maintaining control of the situation
7. Avoid too much eye contact if possible as this can increase fear or promote aggressive outbursts in some hostile or paranoid individuals.

These techniques will assist paramedics to determine the individual's level of responsiveness to de-escalation strategies and to further assess the degree of risk to all involved.

### **If the patient responds to verbal de-escalation strategy**

When the patient is calm, paramedics can then undertake a thorough assessment as outlined in the assessment section of these guidelines.

If the person **does not** fit the medical criteria for urgent transfer to hospital (see page 10), remains calm and cooperative, paramedics are confident that the person is not suffering from psychostimulant toxicity, and the person refuses the offer of transport to hospital for review and observation, the following responses are recommended.

1. Caution the patient against using more psychostimulants or other drugs, but if they choose to do so despite advice then abstinence for **at least 48 hours** until the current effects of the drug have worn off is recommended
2. Provide information on the effects of psychostimulants if available e.g. 'A users guide to speed' (available from the National Drug and Alcohol Research Centre, University of New South Wales)
3. Ensure the patient is left in the care of a responsible friend or relative, or peer supporter if at a dance party or rave (support people should be encouraged to seek medical attention if the person's condition later deteriorates, or if the person uses more psychostimulants despite advice to the contrary)
4. Offer the patient referral to a specialist drug treatment service for further assessment and specialist intervention.

### **If the patient does not or cannot respond to verbal de-escalation strategy**

If the patient:

- a. is experiencing acute psychostimulant toxicity, and
- b. has not responded to calming verbal de-escalation strategies, and
- c. has a severe behavioural disturbance such that they pose a risk to themselves or others.

Then duty of care should be observed. The relevant state **Mental Health Act or Guardianship Regulation** should be invoked in this case and paramedics should call for police assistance if the behavioural disturbance cannot be safely contained at the scene. A collaborative response by ambulance and police services is critical to improving outcomes for these patients. *Therapeutic Guidelines Version 5: Psychotropic (7)* recommend that: protocols for intervention by a well-drilled team in behavioural emergencies be developed

that are suitable for the particular characteristics of the setting in which emergencies will be managed; if the police have someone in mechanical restraints (e.g. handcuffs), police officers and restraints should remain in place until decisions have been made regarding management; restraints can be removed once the individual has been assessed and it has been determined that it is safe to do so; and that the patient may need sedating medication before the restraints are removed.

The accompanying midazolam sedation protocol could also be administered, but only by those with appropriate advanced airway management skills, and in accordance with state legislation. In addition, each state will have guidelines for the level of training paramedics require to administer sedating medications in a pre-hospital setting. As stated previously, it is recommended that local field trials of the revised protocol be undertaken.

Suspected drug-induced psychosis should not be considered a contraindication to urgent sedation. Rather, a period of sedation and behavioural control will allow emergency department staff to re-assess the patient after the acute effects of the psychostimulant have worn off, allowing for a more accurate differential diagnosis. In general, treatment of patients with psychostimulant-induced psychosis is similar to treatment of acute mania or schizophrenia and establishing a 'safe' environment should be the first priority (3).

## Midazolam Sedation Protocol

The aim of sedation is to control dangerous behaviour sufficiently to facilitate assessment, safe transport to the emergency department and further management.

Sedation should generally be titrated until the patient's acute behavioural disturbance is controlled or to the point of rousable sleep, not unconsciousness. Paramedics and all health care providers who administer sedation, regardless of practice setting, should have access to advanced airway assessment and management skills so that successful 'rescue' of patients can be made should an adverse sedation event occur (3).

The most common adverse events of sedation include (8):

1. Airway obstruction
2. Respiratory depression
3. Aspiration
4. Significant hypotension
5. Laryngospasm

The dose of midazolam that is recommended after the first dose in this protocol for control of severe behavioural disturbance among psychostimulant users is higher than the dose considered standard or currently accepted. It is believed the group not responding to a standard first dose are a group likely to be more tolerant to benzodiazepines. Further trials based on the current pilot study in the pre-hospital setting are recommended.

An initial dose of 2.5-5mgs of midazolam should be administered intravenously (IV) (Table 1) as the superior route of administration (or use intramuscular (IM) protocol (table 2) if there is no immediate access to a vein or IV protocol not authorised<sup>3</sup>). If the patient's behaviour is controlled or a state of rousable drowsiness is achieved within ten minutes of the first dose, no more sedation should be administered.

If there is no clinical response at ten minutes to an initial dose, a higher dose (5-10mg) of midazolam should be administered. Repeat this higher dose one further time after 10 minutes if no clinical response. If the patient's behaviour is controlled or they are in a state of rousable drowsiness monitor closely and transport to hospital. If they fail to respond, organise physical restraint and transfer under paramedic supervision.

Management of the sedated patient should follow standard procedures include positioning the patient in the lateral recovery position, supplementary oxygen and supportive measures of airway and breathing as required.

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<sup>3</sup> In locations where paramedics are accredited to administer IM midazolam only, further field trials are required to provide evidence for efficacy of an IM midazolam protocol for target patients.

## Table 1: Midazolam Intravenous Sedation Protocol

### Caution: Respiratory Depression

	Dose	Time given (Q 10mins)	Response
Dose 1	2.5-5mg IV midazolam		Aim for rousable drowsiness <sup>a</sup>
Dose 2	5-10 mg IV* midazolam		
Dose 3	5-10 mg IV* midazolam *give 10mg IM if IV access lost		
<b>TOTAL DOSE (Do not exceed 25mg)</b>	If failed, transport restrained or alternate agent by medical consult		

Table 1: Midazolam IV sedation protocol

## Observations During Transport to the Emergency Department

A paramedic should continuously monitor the patient until arrival at the emergency department or until awake. Observations should include visual observation of respiration and breathing, ECG, continuous oxygen saturation, end tidal CO<sub>2</sub> monitoring, respiration rate, blood pressure, pulse, temperature (if thermometer is available), and Glasgow Coma Scale score.

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<sup>a</sup> Rousable drowsiness is defined ideally as sleepy if undisturbed, rouses and cooperates to voice or pain.

## Table 2: Midazolam Intramuscular Sedation Protocol

### Caution: Respiratory Depression

	Dose	Time given (Q 10mins)	Response
Dose 1	5mg IM midazolam		Aim for rousable drowsiness <sup>a</sup>
Dose 2	10 mg IM midazolam		
Dose 3	10 mg IM midazolam		
<b>TOTAL DOSE (Do not exceed 25mg)</b>	If failed, transport restrained or alternate agent by medical consult		

Table 2: Midazolam IM Sedation Protocol

## Observations During Transport to the Emergency Department

A paramedic should continuously monitor the patient until arrival at the emergency department or until awake. Observations should include visual observation of respiration and breathing, ECG, continuous oxygen saturation, end tidal CO<sub>2</sub> monitoring, respiration rate, blood pressure, pulse, temperature (if thermometer is available), and Glasgow Coma Scale score.

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<sup>a</sup> Rousable drowsiness is defined ideally as sleepy if undisturbed, rouses and cooperates to voice or pain.

# Management of Other Symptoms of Psychostimulant Toxicity

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## Cardiovascular Complications

Hypertension is often transient and as such may not require pharmacological intervention unless severe. Hypertension requiring treatment often responds to sedation with IV benzodiazepines (e.g. midazolam, diazepam). Benzodiazepines are recommended for patients with cocaine-associated myocardial ischaemia who are anxious, have tachycardia, or are hypertensive as they reduce blood pressure and heart rate, thereby decreasing myocardial oxygen demand in addition to their anxiolytic effects (3).

**Beta-blockers**, one of the mainstays of treatment of acute myocardial ischaemia **should be avoided** in patients who have recently used psychostimulants as these drugs enhance stimulant-induced vasoconstriction and increase blood pressure and may exacerbate adverse effects (3).

**Aspirin is not recommended for chest pain if the patient is hypertensive** due to increased risk of cerebral haemorrhage.

## Cerebrovascular Emergencies

The use of cocaine or amphetamine derivatives is considered a strong risk factor for stroke or other forms of acute cerebrovascular emergencies (3). Symptoms of cerebrovascular complications have been reported to appear within six hours of methamphetamine use and include (3):

1. Weakness
2. Hypertension
3. Respiratory difficulties
4. Speech difficulties
5. Facial droop
6. Sudden headaches
7. Partial paralysis.

Management of cerebrovascular emergencies where psychostimulants are implicated in the aetiology should be managed using standard cerebrovascular emergency procedures.

Immediate management involves (3):

1. Airway management
2. Adequate oxygen
3. IV fluids.

## Serotonin Toxicity

The neurotransmitter, serotonin (5-hydroxytryptamine or 5-HT) is thought to be involved in a range of functions including: mood, appetite and sleep regulation; cognition; perception; motor activity; temperature regulation; pain control; sexual behaviour and hormone secretion (9).

An excess of serotonin in the synaptic cleft leads to a range of symptoms that are intensified as serotonin concentrations increase (10). Hence, clinical researchers argue that the concept of a spectrum of serotonin toxicity is more clinically relevant than the notion of a discrete serotonin syndrome per se (10). Therefore, serotonin toxicity may be a mild, self-limiting condition or be potentially fatal with symptoms such as muscle rigidity, coma, seizures, hypertension or hypotension evident. When serotonin toxicity is severe, rhabdomyolysis with hyperkalaemia, acidosis and frank renal failure may subsequently result (3).

Serotonin toxicity has typically been associated with the use of antidepressant medication, particularly the SSRIs. However there is a growing recognition of the incidence of serotonin toxicity in relation to the use of psychostimulants particularly the potent serotonergic agent MDMA (ecstasy). The occurrence of serotonin toxicity, although rare, is life threatening when it does occur hence it should be considered in relevant cases (see **Appendix 1 for diagnostic criteria**).

The treatment of serious serotonin toxicity involves early recognition, prompt supportive care and judicious use of specific agents. Supportive measures that can be implemented by paramedics for severe toxicity prior to arrival at the emergency department include (3):

1. IV fluids/volume resuscitation for dehydration, hypotension or rhabdomyolysis
2. External cooling (loosen clothing, cold compresses etc)
3. ECG should be monitored
4. Standard measures to manage secondary cardiac arrhythmias or seizures.

## After Care

When awake following sedation or treatment for other complications, the patient should be thoroughly informed of the steps that lead to the necessity for paramedics to administer urgent sedation or other emergency measures. The process is often distressing for some patients and an adequate explanation might help to alleviate the concern of patients, their family and friends (8).

Patients should also be offered the opportunity to access specialist alcohol and drug treatment services. Ideally, this would be best initiated while the person was still in the emergency department, but contact details or even an appointment might also be made prior to discharge. Suitable educational material such as *'A users guide to speed'* as previously mentioned (available from the National Drug and Alcohol Research Centre, University of New South Wales) might also be given to the patient particularly to those who decline follow-up specialist care.

Patients should be informed that if psychotic symptoms occur in the context of psychostimulant toxicity and behavioral disturbance, they are much more vulnerable to the effects of even small amounts of stimulants in the future (11).

## In a Nutshell

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1. The use and availability of psychostimulants is increasing
2. Adverse effects of psychostimulants falls along a continuum with mild symptoms at one end of the spectrum and life-threatening toxicity at the other
3. Ambulance services are increasingly required to manage a range of patient presentations from minor psychostimulant intoxication at one end of the spectrum to life threatening toxicity at the other
4. Calming communication to de-escalate potentially dangerous situations is recommended if a patient becomes hostile or violent in the pre-hospital setting, although the police may need to be called to a high-risk situation where de-escalation strategies have been ineffective
5. A midazolam sedation protocol is currently being evaluated for safety and efficacy among those with psychostimulant toxicity to inform further field trials in the pre-hospital setting, and is included with these guidelines
6. Serotonin toxicity, while rare, has been identified among some users of psychostimulants and can be diagnosed using a clinical decision matrix designed for this purpose
7. Some patients may benefit from referral to specialist alcohol and drug services for ongoing support following treatment by the ambulance service.

# References

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# Appendices

## Appendix 1: Serotonin Toxicity

Australian toxicologists have recently developed a clinical decision making algorithm to diagnose serotonin toxicity, which can also be used by ambulance services. An adaptation of The Hunter Serotonin Toxicity Criteria Decision Rules is provided below, and comprises the three domains in which the key clinical features of serotonin toxicity manifest (9):

- a. Autonomic signs
- b. Neuromuscular changes
- c. Altered mental status.

If the recent use of a serotonergic agent is suspected (peak risk time for cocaine is 20-40 minutes after administration, peak risk time for an amphetamine is approximately two to three hours after administration, and peak risk time for MDMA is 1-3 hours after oral ingestion) or confirmed, then the following criteria should be considered.

### **Serotonin Toxicity Criteria<sup>4</sup> (adapted from Dunkley et al., 2003)**

Criteria for serotonin toxicity are met if the following combination of signs is evident:

1. Spontaneous clonus
2. Induced clonus and agitation present
3. Induced clonus and diaphoresis present
4. Ocular Clonus and agitation present
5. Ocular Clonus and diaphoresis present
6. Tremor and hyperreflexia present
7. Hypertonic, temperature greater than 38°C and ocular clonus present
8. Hypertonic, temperature greater than 38°C and inducible clonus present.

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4 Hunter Serotonin Toxicity Criteria: Decision Rules (Dunkley, Isbester, Sibbritt et al. 2003)

## Appendix 2: Other Resources and Useful Internet Links

*A user's guide to speed.* National Drug and Alcohol Research Centre (NDARC) <http://ndarc.med.unsw.edu.au/ndarc.nsf/website/Publications.resources>.

*Alcohol and Other Drugs: A Handbook for Health Professionals.* Australian Government Department Health and Ageing, 2003.

Australian Drug Information Network (ADIN) [www.adin.com.au](http://www.adin.com.au)

*Management of patients with psychostimulant use problems: guidelines for general practitioners.*

Australian Government Department of Health and Ageing  
[www.nationaldrugstrategy.gov.au/publications/illicit.htm](http://www.nationaldrugstrategy.gov.au/publications/illicit.htm)  
[www.nationaldrugstrategy.gov.au/index.htm](http://www.nationaldrugstrategy.gov.au/index.htm)

*Models of intervention and care for psychostimulant users (2<sup>nd</sup> ed).*

Commonwealth Monograph Series Number 51, Baker, A., Lee, N. K., & Jenner, L. (eds) (2004) Australian Government Department of Health and Ageing.

*Psychostimulants - Management of acute behavioural disturbances: guidelines for police services.*

Australian Government Department of Health and Ageing  
[www.nationaldrugstrategy.gov.au/publications/illicit.htm](http://www.nationaldrugstrategy.gov.au/publications/illicit.htm)  
[www.nationaldrugstrategy.gov.au/index.htm](http://www.nationaldrugstrategy.gov.au/index.htm)

## Appendix 3: Recommendations for Implementation of the Draft Guidelines

1. Field trials of the revised midazolam sedation protocol in the pre-hospital setting are strongly encouraged.
2. Endorsement from relevant professional bodies should be sought. It is acknowledged that further revision of this draft may take place following this consultation process.
3. The draft guidelines, once ratified, could be promoted through relevant publications.
4. Consideration should be given to training opportunities for paramedics in the implementation of these draft guidelines (training may also address the area of psychostimulant use generally):
  - a. training would ideally include the utilisation of a set of educational resources to be used by all paramedics to standardise training across jurisdictions
  - b. resources might include videos demonstrating signs of psychostimulant toxicity and behavioural disturbances prompted by psychotic symptoms, and detailed photographs of the various types of psychostimulants
  - c. more intensive training could be offered to paramedics who have only minimal experience in the alcohol and other drugs field
  - d. combined training opportunities with police services and emergency department staff would assist in developing a collaborative response and the adaptation of these guidelines to meet local conditions, resources and legislation.
5. An evaluation strategy should be developed for each state (may include systematic data collection of numbers of patients with psychostimulant toxicity treated by ambulance services nationally, paramedics awareness of and satisfaction with the guidelines etc.).
6. Regular review of the guidelines should be undertaken to ensure the guidelines are updated and modified when required, in an effort to continue to meet local requirements and remain consistent with local resources and conditions.

## Appendix 4: Stakeholder Involvement and Thoroughness of Development

The development of these draft guidelines represent one component of the Update of the National Drug Strategy Monograph no. 32: Models of Intervention and Care for Psychostimulant Users project, funded by the Commonwealth Department of Health and Ageing. Draft guidelines for the management and treatment of individuals with psychostimulant-induced behavioural disorders and toxicity were developed for four front-line worker groups: ambulance services, emergency departments, general practitioners, and police services.

Due to a lack of available literature or evidence for management of psychostimulant users specific to the general practice setting, the development of these draft guidelines have been informed by the opinions of an expert panel of clinical and academic staff. The expert panel have also extrapolated from the general alcohol and other drug literature where appropriate.

An Expert Reference Group who oversaw the update of the monograph publication, at its inaugural meeting in July 2002, determined the methodology that would be undertaken in developing the draft guidelines. It was agreed that the model would be consistent with the National Health and Medical Research Council (NHMRC, 1998) and AGREE (2001) recommendations for developing guidelines. Specifically:

1. The monograph will describe the natural history of psychostimulant-related presentations for the four key groups, and provide a written resource
2. An expert panel of appropriate police, clinical and academic personnel will be convened to inform the content of the draft
3. Various scenarios will be put to the expert panels to determine if evidence for intervention and management of those conditions exist and are applicable and rate the quality of that evidence
4. The draft guidelines will be comprehensive, flexible and adaptable for various settings across Australia
5. The draft guidelines will be circulated to other relevant experts around the country for comment to ensure varied input and wide acceptance for the dissemination phase.

It was agreed that a full-day meeting of experts would be convened in Brisbane during December 2002. A guest list of experts from the relevant fields (police, ambulance, general practice and ambulance service) was generated, and preparations for the meeting were undertaken.

## **Appendix 5: Agenda and List of Experts Present at Development of Draft Guidelines Meeting, Brisbane, December 2002.**

**Management Guidelines Development Meeting  
Thursday 12th December 2002  
184 St Paul's Terrace, Fortitude Valley 9.30am–3.30pm**

### **AGENDA**

***Meeting opens 9.15 am for coffee and informal welcome***

**Session 1                      Whole Group**  
**9.30am–10.30am**      Introduction, welcome and outline of day.  
Dr Amanda Baker

**Session 2                      Three Key Groups**  
**10.30am–12.30pm**      Draft guideline development in discipline-specific groups.

Break into three small groups

- 1) Ambulance service staff & ambulance staff (group facilitated by Professor Ian Whyte & Mr Ron Henderson)
- 2) Police Officers (group facilitated by Inspector Peter Mansfield, Ms Megan Smith & Senior Sergeant Damien Hansen)
- 3) General Practitioners (group facilitated by Dr Ed Heffernan)

These groups will utilise case scenarios to generate discussion and a consensus approach to the development of draft guidelines for the 4 key areas.

***Lunch: 12.30–1pm***

**Session 3                      Three Key Groups Continue**  
**1pm–2pm**                      Finalise draft guidelines.

**2pm–3pm**                      Field trial planning: Who, where, how? Mechanism for feedback and revision, mechanism for circulation for comment from other experts including identification of experts, professional board ratification/approval.

**Session 4                      Whole Group**  
**3pm–3.30pm**                      Brief feedback from small groups and close.

***Close 3.30 pm***

## Guidelines Development Meeting Participants

Dr Amanda Baker, University of Newcastle (Chair of the Psychostimulant Monograph Group)

Associate Professor Ian Whyte, Senior Staff Specialist Clinical Toxicology & Pharmacology, Newcastle Mater Hospital

Dr Ed Heffernan, Forensic Mental Health Service

Dr Bill Kingswell, Forensic Mental Health Service

Ms Megan Smith, Senior Project Officer, Qld Police Services

Inspector Peter Mansfield, Drug & Alcohol Co-ordinator

Senior Sergeant Damian Hansen, Drug & Alcohol Co-ordination

Senior Sergeant Philippa Woolf, Operations Resource Co-ordinator, NSW Police

Senior Sergeant Ray Knight, Brisbane Watchhouse

Sergeant Don Schouten, Fortitude Valley

Sergeant Shane Turner, Brisbane City

Sergeant Terry Honour, Southport

Sergeant Troy Schmidt, Logan Central

Sergeant Bruce Diamond, Surfers Paradise

Mr Ron Henderson, Intensive Care Paramedic and QLD State Drug Unit Coordinator

Dr Richard Bonham, Queensland Ambulance Service Medical Director and Emergency Specialist

Mr Gavin Leader, Intensive Care Paramedic and Regional Drug Unit Coordinator for Ipswich area

Mr Christian Francois, Intensive Care Paramedic and Regional Drug Unit Coordinator for Greater Brisbane Region

Mr Darrin Hatchman, Intensive Care Paramedic and Regional Drug Unit Coordinator for Gold Coast Region

Dr David Spain, Emergency Department Gold Coast Hospital

Dr David Green, Emergency Department Gold Coast Hospital

Dr David Hunt, General Practitioner, AOD specialist

Dr Wendell Rosevear, General Practitioner, AOD specialist

Ms Kay McInnes, Queensland Health

Ms Tarra Adam, St Vincent's Hospital & NDARC

Mr Michael Arnold, NSW Users and AIDS Association

Mr Anthony Nutting, Queensland Health

Dr Wasana Pattanakumjorn, Visiting Psychiatrist, Thailand

Ms Angela Dean, Queensland Health

Ms Linda Jenner, University of Newcastle

## **Appendix 6: Draft Guidelines Reviewers and Guidelines Reviewers Form**

### **Invited Reviewers**

Dr Richard Bonham, Queensland Ambulance Service Medical Director and Emergency Specialist

Howard Wren, Manager, Clinical Services, ACT Ambulance Service

David Lighton, Tasmania Ambulance Service, Ambulance Educator (Paramedics)

Ralf Harries, Manager Operations, Clinical and Education Services, Rural Ambulance Service Victoria

Dr Garry Wilkes, Medical Director, St John Ambulance Western Australia

Craig Garraway, Acting Superintendent, Alice Springs Ambulance Service

Rob Elliott, Clinical Manager, South Australian Ambulance Service, NSW Ambulance Services representative



**Management of Patients with Psychostimulant Toxicity: Guidelines for Ambulance Services**



**Australian Government**  
**Department of Health and Ageing**