

## DRUG GUIDELINE

### ADENOSINE

<b>SCOPE (Area):</b>	<b>FOR USE IN:</b>	Intensive Care Unit, Coronary Care Unit, ED, Theatre General wards <b>by MET Liaison Nurse</b> only
	<b>EXCLUSIONS:</b>	Paediatrics (seek Paediatrician advice) and General Wards
<b>SCOPE (Staff):</b>		Medical, Nursing and Pharmacy

#### BRAND NAMES

Adenocor<sup>®</sup> and adenosine aspen.

#### PHARMACOLOGY AND PHARMACOKINETICS

Adenosine depresses sinus node activity and slows conduction through the atrioventricular node. Adenosine has a rapid onset and short duration of action, with a half-life of less than 10 seconds.

#### INDICATIONS

- Acute treatment of paroxysmal supraventricular tachycardias, including those associated with Wolff-Parkinson-White syndrome.
- Diagnostic aid for broad or narrow QRS complex supraventricular tachycardias.

#### CONTRAINDICATIONS

- **Second and third degree atrioventricular block (without pacemaker).**
- **Sick sinus syndrome (without pacemaker).**
- **Known hypersensitivity to adenosine.**

#### PRECAUTIONS

- **Asthma and other obstructive lung disease** – may precipitate severe bronchospasm in reactive airways disease that can last 30 minutes. Use with caution and consider lowering initial dose to 3 mg and observe for bronchospasm.
- **Atrial fibrillation or atrial flutter** - adenosine may rarely accelerate ventricular rate, especially with an accessory conduction pathway e.g. Wolff-Parkinson-White syndrome.
- **Long QT syndrome** – use with caution, increased risk of torsades de pointes.
- **Severe hypotension** – adenosine can worsen hypotension, use with caution.
- **Recent heart transplant (less than one year)** - increased sensitivity to the effects of adenosine, use with caution and lower initial dose to 3 mg.
- **Digoxin** – may increase adverse effects of adenosine. Most cases of ventricular fibrillation associated with adenosine use occur in patients taking digoxin.

## PREGNANCY AND BREASTFEEDING

Seek specialist advice before prescribing, information may update regularly.

## DRUG INTERACTIONS

- **Dipyridamole** – enhances effect of adenosine (especially bradycardia). Lower initial dose to 3 mg, with further doses determined by the response to the first dose. Monitor carefully.
- **Carbamazepine** – may increase the degree of heart block experienced with adenosine. Lower initial dose to 3 mg, with further doses determined by the response to the first dose. Monitor carefully.
- **Caffeine, theophylline** – antagonises the effect of adenosine – a higher dose of adenosine, or a different drug may be required.
- **Nicotine** – may increase effect and toxicity of adenosine, monitor carefully.
- **Digoxin** – see Precautions.

## DOSAGE AND ADMINISTRATION

**Requires continuous ECG monitoring and the availability of resuscitation equipment.**

**For administration only:**

- **in Intensive Care Unit, ED or Theatre**
- **in Coronary Care Unit on the order of the Cardiology Advanced Trainee or Cardiologist with the Cardiology Advanced Trainee or Cardiologist in attendance**
- **by MET or Code Blue**
- **on General Wards by MET Liaison Nurse on the order of a Registrar with the Registrar in attendance**

**Adenosine is only effective if it reaches the heart as a concentrated bolus (as half-life is less than 10 seconds). To ensure efficacy:**

- **give as a rapid IV injection (over 2 seconds)**
- **follow injection immediately with 10-20 mL sodium chloride 0.9% flush to ensure all drug is removed from tubing**
- **use the largest vein available**
- **use the smallest amount of tubing possible**

Note: Some patients who have previously received adenosine and become distressed by the 'impending feeling of doom' associated with its use may require a small IV dose of midazolam prior to administration of adenosine.

### **IV injection**

#### **Initial dose:**

Adenosine 6 mg (2 mL from ONE vial) undiluted by rapid IV injection over 2 seconds. Inject as proximally as possible, and follow dose with an immediate, rapid flush of sodium chloride 10-20 mL.

**Initial dose is reduced to 3 mg (1 mL from part vial) if the patient has had a heart transplant in the last year OR adenosine is being administered via central venous access OR the patient is also taking carbamazepine or dipyridamole (+/- aspirin) – see Drug Interactions. Further doses for these patients are determined by the response to this first dose.**

**Also consider a lower initial dose of 3 mg for patients with asthma and obstructive lung disease - see Precautions.**

Leave 1-2 minutes before further dosing (if required).

**Second dose:** (only if initial dose unsuccessful and well tolerated):

Adenosine 12 mg (4 mL from TWO vials) undiluted by rapid IV injection over 2 seconds.

Inject as proximally as possible, and follow dose with an immediate, rapid flush of sodium chloride 10-20 mL.

Leave 1-2 minutes before further dosing (if required).

**Third dose:** (only if second dose unsuccessful and well tolerated):

Adenosine 12 mg (4 mL from TWO vials) OR 18 mg (6 mL from THREE vials) undiluted by rapid IV injection over 2 seconds.

Inject as proximally as possible, and follow dose with an immediate, rapid flush of sodium chloride 10-20 mL.

### **General Administration Information**

#### ▪ **Routes of administration:**

IV injection:	Yes
IV intermittent infusion (15-60 minutes):	No
IV continuous infusion:	No
IM injection:	No
Subcut injection:	No

#### ▪ **Compatible/incompatible IV drugs/fluids:**

Consult the Australian Injectable Drugs Handbook ('Yellow book') in your ward area. **Assume all unlisted drugs and IV fluids are incompatible – contact Pharmacy for further advice.**

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### **MONITORING (INCLUDING BLOOD TESTS)**

- Warn patient prior to administration that they may experience a short period of facial flushing, chest tightness, dizziness, dyspnoea and a sense of impending doom.
- If angina, severe bradycardia, severe hypotension, respiratory failure, high level heart block or asystole occur do not give any more doses of adenosine.
- New arrhythmias may present at the time of conversion (occur in 55% of patients), but generally only last a few seconds.

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### **NURSING PRACTICE POINTS**

- Requires continuous ECG monitoring.
- Undertake baseline and post dose blood pressure, heart rate and respiratory rate measurements.
- Monitor patient for adverse effects and reassure due to the feeling of impending doom that often accompanies adenosine administration.
- All injections are to be labelled as per CPP0022 Labelling of Injectable Medicines and Lines.

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### **ADVERSE EFFECTS**

**Adverse effects usually resolve rapidly (after approximately 15 seconds) after each dose due to its short duration of action.**

- **Very common** – bradycardia, sinus pause, skipped beats, atrial extrasystoles, atrioventricular block, ventricular extrasystoles, nonsustained ventricular tachycardia, dyspnoea, flushing, chest pain, sense of impending doom.
- **Common** – nausea, headache, dizziness.

- **Uncommon** – transient arrhythmias, recurrence of SVT, hypotension, blurred vision, sinus tachycardia, palpitations, metallic taste, head pressure, hyperventilation, sweating, feeling of general discomfort/weakness/pain.
  - **Rare** – atrial fibrillation, ventricular fibrillation, torsades de pointes, severe bradycardia, bronchospasm, injection site reaction, reversible worsening of intracranial hypertension.
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#### **DRUG PRESENTATIONS AND STORAGE**

Adenosine 6 mg/2 mL vials.

Store below 25°C. Do not refrigerate.

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