Adenosine (antiarrhythmic) SESLHDPR/583 Prescribing Protocol

Health
South Eastern Sydney
Local Health District

Prescribing Protocol		
Title	Adenosine Protocol – Antiarrhythmic	
Areas where applicable	Cardiac, Critical Care, Emergency Medicine Services and Clinical Emergency Response Systems teams as therapeutic treatment or diagnostic aid.	
Areas where not applicable	**NOT** for use with radionuclide myocardial perfusion imaging or for non-antiarrhythmic use in Cardiac Catheter Laboratory	
Authorised Prescribers	Medical officers familiar with the product.	
Indications for use	**Therapeutic:** Rapid conversion to a normal sinus rhythm of paroxysmal supraventricular tachycardia (SVT), including those associated with accessory bypass tracts (Wolff-Parkinson-White syndrome). **Diagnostic:** As an aid to differential diagnosis of narrow or broad complex tachycardia due to the slowing of AV conduction which makes atrial activity more visible on ECG.	
Drug Action **Pharmacokinetics**	Antiarrhythmic actions: • Slows impulse formation of the sino-atrial node • Slows conduction time through the atrio-ventricular node • Can interrupt re-entry pathways through the atrioventricular node • Coronary vasodilator Onset: Immediate Peak: 10 seconds Duration: 10 – 30 seconds	
Contraindications	• Hypersensitivity to adenosine • Second or third degree heart block (unless a functioning artificial pacemaker present) • Bronchoconstriction or bronchospastic lung disease (e.g. asthma) either known or suspected	• Sinus node dysfunction, such as sick sinus syndrome or symptomatic bradycardia (unless a functioning artificial pacemaker present) • Severe hypotension
Precautions	• Convulsion /seizure history • Recent myocardial infarction • Recent heart transplant (less than 1 year) • First degree AV or bundle branch block • Atrial fibrillation, flutter, especially with accessory pathway • Heart failure • Hypotension, hypertension • Bronchoconstriction in patients with asthma • Heart failure	• Obstructive lung disease not associated with bronchoconstriction e.g. COPD, bronchitis • Bradycardia • Prolonged QT interval • Pregnancy and/or breastfeeding. Limited data available about use in first trimester. Use during second and third trimester is considered safe and effective. Higher doses may be required. Monitor foetal heart rate during administration.

Proposed Place in Therapy	Adenosine is first line drug therapy choice (after physical manoeuvres that enhance vagal tone)
Dosage	**Therapeutic:** To be administered by rapid bolus (2 seconds), followed by a rapid 20mL sodium chloride 0.9% flush. **<u>Dose 1</u>** Adenosine 6 mg rapid peripheral IV bolus OR 3 mg if administered by central venous access **<u>Dose 2</u>** If the first dose is ineffective but well tolerated, after 2 minutes give Adenosine 12mg rapid peripheral IV bolus OR 6 mg if administered by central venous access **<u>Dose 3</u>** If second dose is ineffective but well tolerated after a further 2 minutes, give a further dose of Adenosine 18 mg rapid peripheral IV bolus OR 12 mg if administered by central venous access **Diagnostic:** • The above ascending dosage schedule should be employed until sufficient diagnostic information has been obtained. • Patients who develop high level AV block at a particular dose should not be given further dosage increments. **General information**: • The initial adenosine dose should be reduced to 3 mg in patients taking dipyridamole or carbamazepine, those with a transplanted heart or if given by central venous access. • Dose adjustment is **not** required for hepatic or renal impairment • IV infusion is ineffective in treating supraventricular tachycardia
Administration instructions	• Administer adenosine undiluted by rapid IV bolus (over 2 seconds) followed by a rapid 20 mL sodium chloride 0.9% flush. • Adenosine has a very short duration of effect making it necessary to give as a rapid bolus • **Warn patient they may experience anxiety or a feeling of "impending doom", chest pressure/feeling of constriction and flushing - this will pass quickly.** • Administer either directly into a large peripheral vein or into an IV line (injected as proximally as possible). • Patients who develop high level AV block at a particular dose should not be given further dosage increments.

Important Drug Interactions	**Caffeine** and **theophyllines** antagonise the effects of adenosine; a higher dose of adenosine may be required. **Dipyridamole** inhibits cellular uptake of adenosine, increasing the risk of bradycardia, so that the dose for stopping a tachycardia may be much less than usual. Stop dipyridamole 24 hours before planned use of adenosine or use lower initial dose of adenosine (a quarter to a half). **Carbamazepine** has been reported to increase the degree of heart block produced, so lower the initial dose of adenosine. The effect of adenosine is **not** blocked by atropine.
Presentation	6 mg in 2 mL vial
Monitoring requirements	• The patient should have continuous cardiac monitoring throughout the procedure. A defibrillator and emergency resuscitation equipment must be available for immediate use. • Ensure that the monitor printer or 12 lead ECG is set to record continuously as soon as adenosine is injected. Continue to record until rhythm returns to normal. Heart blocks and asystole may occur. These are generally transient due to the short half-life. • Monitor vital signs observations pre and post administration and with change of rhythm. Given the short half-life of adenosine, the frequency and duration of cardiac monitoring and vital signs will be dependent on subsequent rhythm and haemodynamic status. • Blood pressure should be measured in the arm opposite to adenosine administration
Adverse effects and **Management of complications**	Adverse effects resolve rapidly on stopping treatment due to the drug's short duration of action. Explain possible adverse effects to patient before administration. Ensure patient understands that these effects will be short-lived. **Common:** flushing, dyspnoea, chest pain/pressure, nausea or abdominal discomfort, headache, dizziness, apprehension, burning sensation, bradycardia, asystole, sinus pause & A-V block **Infrequent:** transient arrhythmias, recurrence of SVT, hypotension, tingling in arms or legs, metallic taste **Rare:** bronchospasm, injection site reaction blurred vision, cardiac arrest, respiratory arrest, seizure

Basis of Protocol/Guideline:	1. Adenocor® TGA approved Product Information 16/8/2021 accessed via MIMS Online 20/08/2021 2. Australian Medicines Handbook July 2021 accessed 20/08/2021 3. Weismuller P, Kattenbeck K, Heinroth KM, et al. [Terminating supraventricular tachycardia with adenosine--comparing the effectiveness of 12 mg and 18 mg]. *Dtsch Med Wochenschr*. 2000;125(33):961–969. 4. Curtis A, Belardinelli L, Woodard D, Brown C, Conti J. Induction of Atrioventricular Node Reentrant Tachycardia With Adenosine: Differential Effect of Adenosine on Fast and Slow Atrioventricular Node Pathways. *J Am Coll Cardiol.* 1997;30(7):1778-1784. 5. Domanovits, H., et al., Adenosine for the management of patients with tachycardias:a new protocol. *European Heart Journal*, 1994. **15**(5): p. 589-593. 6. Elkayam U., Goodwin TM. Adenosine therapy for supraventricular tachycardia during pregnancy. *American Journal of Cardiology*. **75** (7):521.
Groups consulted in development of this guideline	• District Clinical Emergency Response System Committee • Cardiac and Respiratory Clinical Stream • Critical Care and Emergency Medicine Clinical Stream • Drug and Quality Use of Medicine Committee • Pharmacy Departments • Royal Hospital for Women

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GOVERNANCE	
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