SESLHDMG/105

Medicine Guideline

Adenosine (antiarrhythmic)

Areas where Protocol/Guideline applicable	Cardiac, Critical Care, Emergency Medicine Services and Clinical Emergency Response Systems teams as therapeutic treatment or diagnostic aid.
Areas where Protocol/Guideline is NOT applicable	Use with radionuclide myocardial perfusion imaging or for non-antiarrhythmic use in Cardiac Catheter Laboratory. Refer to local procedures.
Authorised Prescribers:	Medical Officers
Indication 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.
Proposed Place in Therapy	Adenosine is first line drug therapy choice (after physical manoeuvres that enhance vagal tone)
Contraindications	• Hypersensitivity to adenosine • Second or third degree heart block (unless a functioning artificial pacemaker present) • Long QT syndrome • 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 • Decompensated states of heart failure
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 • Heart failure • Obstructive lung disease not associated with bronchoconstriction e.g. COPD, bronchitis • Bradycardia • Prolonged QT interval • Pregnancy and/or breastfeeding: *There is limited information available describing the use of adenosine during pregnancy. Intravenous administration of adenosine is unlikely to cause serious maternal or fetal harmful effects as the medicine has a short half-life and duration of action. If adenosine is the medicine of choice, use the lowest effective dose for the shortest duration possible.*

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<table>
<tr><td>Important Drug Interactions</td><td>

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.

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<tr><td>Dosage</td><td>
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

Therapeutic: To be administered by rapid bolus (2 seconds), followed by a rapid 20 mL sodium chloride 0.9% flush.
<table>
<tr><th></th><th>Peripheral Access</th><th></th><th>Central Access</th></tr>
<tr><td>Dose 1</td><td>6 mg</td><td>OR</td><td>3 mg</td></tr>
<tr><td colspan="4">If the first dose is ineffective but well tolerated, after 2 minutes give</td></tr>
<tr><td>Dose 2</td><td>12 mg</td><td>OR</td><td>6 mg</td></tr>
<tr><td colspan="4">If second dose is ineffective but well tolerated after a further 2 minutes, give a further dose</td></tr>
<tr><td>Dose 3</td><td>18 mg</td><td>OR</td><td>12 mg</td></tr>
</table>
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.
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<tr><td>Duration of therapy</td><td>If well tolerated - until elimination of supraventricular tachycardia (therapeutic) or until sufficient diagnostic information has been obtained (diagnostic)</td></tr>
<tr><td>Prescribing Instructions</td><td>Adenosine must be prescribed on the eMR or eRIC. In the absence of eMM systems, the appropriate paper medication chart may be used.</td></tr>
<tr><td>Administration Instructions</td><td>

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 a central 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.

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Adverse Effects	Adverse effects resolve rapidly on stopping treatment due to adenosine's short duration of action (10 – 30 seconds). 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
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
Management of Complications	Adverse effects resolve rapidly on stopping treatment due to the drug's short duration of action.
Basis of Protocol/Guideline: (including sources of evidence, references)	1. Adenocor® TGA approved Product Information accessed via eMIMS. Last updated 23 August 2022 2. Australian Medicines Handbook July 2024. 3. Australian Injectable Drugs Handbook 9th Edition accessed 29/07/2024 4. McDowell, M. and N. Lyons (2023). "Adenosine Should Be First-Line Treatment for Supraventricular Tachycardia." Annals of Emergency Medicine 83. 5. Pregnancy and Breastfeeding Medicine Guideline. Adenosine. The Women's. The Roual Women's Hospital. Victoria, Australia. Updated 20 March 2024. 6. McIntosh-Yellin NL, Drew BJ and Scheinman MM. Safety and efficacy of central intravenous bolus administration of adenosine for termination of supraventricular tachycardia. Journal of America College of Cardiology. Volume 22, Issue 3, 1993, Pages 741-745.
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 Therapeutics Committee, Pharmacy Departments and Royal Hospital for Women

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GOVERNANCE	
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