

Iloprost inhaled for management of Acute Pulmonary Hypertension and Right Heart Failure in Cardiac Theatre



Areas where Protocol/Guideline applicable	SESLHD Operating Theatres
Authorised Prescribers:	Anaesthetists
Indication for use	Management of acute pulmonary hypertension and right heart failure in Cardiac Theatre
Clinical condition	Management of moderate to severe pulmonary hypertension and right heart failure in the context of cardiac surgery
Proposed Place in Therapy	<p>First line.</p> <p>Preferred over inhaled nitric oxide and epoprostenol due to timeliness and ease of administration in the event of acute right heart failure seen post cardiac surgery.</p>
Adjunctive Therapy	<p>Treatment of pulmonary hypertension and right heart failure requires a tailored approach to management.</p> <p>An individualised approach is required which is guided by haemodynamic parameters including direct measurement of pulmonary artery pressure, echocardiographic assessment of cardiac function.</p> <p>Adjusting the patient’s preload by adjusting volume status, right heart contractility by the addition of inotropes such as adrenaline, milrinone, dobutamine as well as right heart afterload reduction with pulmonary vasodilators such as iloprost, is required for the safe management of these complex patients.</p>

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<p>Contra-indications</p>	<ul style="list-style-type: none"> • Hypersensitivity to iloprost or to any of the excipients. • Conditions where the effects of iloprost on platelets might increase the risk of haemorrhage (e.g. active peptic ulcers, trauma, intracranial haemorrhage). • Severe coronary heart disease or unstable angina, myocardial infarction within the last six months, decompensated cardiac failure if not under close medical supervision, severe arrhythmias, suspected pulmonary congestion, cerebrovascular events (e.g. transient ischaemic attack, stroke) within the last 3 months. • Pulmonary hypertension due to venous occlusive disease. • Congenital or acquired valvular defects with clinically relevant myocardial function disorders not related to pulmonary hypertension
<p>Precautions</p>	<ul style="list-style-type: none"> • Iloprost nebuliser solution should not come into contact with skin and eyes. • Oral ingestion of iloprost solution should be avoided. During nebulisation a facial mask must be avoided and only a mouthpiece should be used. • The use of iloprost is not recommended in patients with unstable pulmonary hypertension, with advanced right heart failure. • In case of deterioration or worsening of right heart failure transfer to other medicinal products should be considered. • The pulmonary vasodilatory effect of inhaled iloprost is of short duration (one or two hours). • Caution is advised in patients with COPD or severe asthma as iloprost can lead to bronchospasm and hypotension.
<p>Important Drug Interactions</p>	<p>Caution is recommended in case of co-administration of iloprost with vasodilating or antihypertensive agents as dose adjustment might be required.</p> <p>Iloprost inhibits platelet function, its use with anticoagulants (such as heparin, coumarin type anticoagulants), or other inhibitors of platelet aggregation (such as acetylsalicylic acid, nonsteroidal anti-inflammatory drugs, nonselective phosphodiesterase inhibitors [e.g. theophylline, pentoxifylline, dipyridamole], selective phosphodiesterase 3 [PDE3] inhibitors [e.g. milrinone, cilostazol, anagrelide] and nitrovasodilators) may enhance iloprost mediated platelet inhibition, thereby increasing the risk of bleeding</p>

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Dosage	Iloprost 20 microg nebulised over 10 minutes up to 1 – 2 hourly in Cardiac Theatre, as required.
Duration of therapy	As needed
Prescribing Instructions	To be prescribed and documented on the anaesthetic chart as an intraoperative medication
Presentation	Iloprost 20 microg/2mL nebuliser solution
Administration Instructions	Administer nebulised iloprost via the Aeroneb nebuliser in Cardiac Theatre. The content of the ampoule must be transferred into the nebuliser chamber immediately before use.
Monitoring requirements Safety Effectiveness	<ul style="list-style-type: none"> • ECG • Oxygen saturations • Airway pressures • End Tidal Capnography Monitoring (ETCO2) • Blood pressure - SBP, DBP, MAP, CVP, MPAP • Cardiac Index • Transoesophageal echocardiogram monitoring <p>Careful monitoring of the patients taking anticoagulants or inhibitors of platelet aggregation is required.</p>
Adverse effects	<ul style="list-style-type: none"> • Increased cough • Vasodilation • Headache • Hypotension • Bleeding events • Bronchospasm • Peripheral oedema
Management of Complications	If bleeding occurs, iloprost administration should be stopped.
Basis of Protocol/Guideline:	<ol style="list-style-type: none"> 1. Iloprost (Ventalis®) Nebuliser Solution Product Information. Accessed via CIAP 28/08/24. Last Updated 03 March 2020. 2. The perioperative use of inhaled prostacyclins in cardiac surgery: a systematic review and meta-analysis. Canadian Journal of Anaesthesia. 2023 Aug;70(8):1381-1393. 3. Effect of iloprost inhalation on postoperative outcome in high-risk cardiac surgical patients: a prospective randomized-controlled multicentre trial (ILOCARD). Can J Anest, 2019 66:907–920 4. Aerosolized Vasodilators for the Treatment of Pulmonary Hypertension in Cardiac Surgical Patients: A Systematic Review and Meta-analysis. Anesthesia and Analgesia. 2017 Aug;125(2):393-402.

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Groups consulted in development of this guideline	Cardiac Anaesthetists
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GOVERNANCE	
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