OBJECTIVE:

To summarize evidence-based recommendations for the management of antithrombotic drugs in patients with mechanical and bioprosthetic heart valves.

BACKGROUND:

Heart valve replacement can be done with either a mechanical or bioprosthetic (tissue) prosthesis.

Mechanical Valves

There are 3 basic types of mechanical valves:
1. Bileaflet (e.g. St. Jude, most frequently seen today)
2. Tilting disc (e.g. Bjork-Shiley, infrequently seen today)
3. Ball-cage (e.g. Starr-Edwards, rarely seen today)

Patients with mechanical heart valves are at increased risk for embolic stroke and thrombosis of the valve itself, and, therefore, require long-term anticoagulation. Even with anticoagulation, the risk of stroke/valve thrombosis is ~0.9%/year with mechanical mitral valves, ~0.5%/year for mechanical aortic valves, and ~1.2%/year in those with two mechanical valves.

In selecting the optimal anticoagulation for patients with a mechanical heart valve, it is also important to consider the risk of bleeding, the different targets for the INR depending on valve type and location, and the need for bridging anticoagulant therapy for surgical procedures.

Bioprosthetic Valves

Long-term anticoagulation for patients with bioprosthetic valves is not indicated as the risk of thrombosis and thromboembolism is low (about 0.2%/year):

- In patients with a bioprosthetic mitral valve who are in sinus rhythm and have no other indications for anticoagulant therapy, 3 months of warfarin therapy (international normalized ratio [INR] range: 2.0-3.0) after valve replacement is suggested, to be followed by long-term acetyl salicylic acid (ASA) 81 mg once daily.
- In patients with a bioprosthetic aortic valve who are in sinus rhythm and have no other indications for anticoagulant therapy, there is no need for warfarin therapy; long-term ASA (81 mg) once daily is suggested.
**Antithrombotic Agents and Dosing for Patients with Mechanical Valves:**

**Warfarin**
Long-term warfarin therapy is indicated in all patients with mechanical heart valves. The target INR is dependent on the valve type (e.g. bileaflet or tilting disc) and location (e.g. aortic or mitral). See Table below for INR targets.

Patients requiring long-term warfarin therapy should be bridged with unfractionated heparin (UFH) or low molecular weight heparin (LMWH) until a therapeutic INR has been attained. Maintenance of a therapeutic INR is important to reduce the risk of thrombosis. [See Warfarin Guide and Warfarin: Management of Out-of-Range INR Guide].

**Aspirin**
It is recommended that patients with a mechanical aortic or mitral valve who are at low risk of bleeding should receive ASA (81 mg daily) in addition to the warfarin therapy. Caution should be used in patients with an increased bleeding risk, especially with a history of gastrointestinal bleeding.

**Direct Oral Anticoagulants**
The direct factor inhibitor anticoagulants, such as apixaban, dabigatran, edoxaban, and rivaroxaban, are contraindicated in patients with mechanical heart valves. A randomized trial demonstrated that dabigatran is associated with more thrombosis and bleeding compared with warfarin in patients with mechanical heart valves.

**Table: Anticoagulant Drug Management in Patients with Mechanical Heart Valves**

<table>
<thead>
<tr>
<th>Mechanical Valve Location</th>
<th>INR Target and Range</th>
<th>Recommendation for ASA (81 mg daily)‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic</td>
<td>2.5 (range 2.0-3.0)†</td>
<td>Yes</td>
</tr>
<tr>
<td>Mitral</td>
<td>3.0 (range 2.5-3.5)</td>
<td>Yes</td>
</tr>
<tr>
<td>Combined aortic and mitral</td>
<td>3.0 (range 2.5-3.5)</td>
<td>Yes</td>
</tr>
<tr>
<td>Pulmonic</td>
<td>2.5 (range 2.0-3.0)</td>
<td>No</td>
</tr>
<tr>
<td>Tricuspid</td>
<td>3.0 (range 2.5-3.5)</td>
<td>No</td>
</tr>
<tr>
<td>Combined pulmonic and tricuspid</td>
<td>3.0 (range 2.5-3.5)</td>
<td>No</td>
</tr>
</tbody>
</table>

† Higher-intensity INR (target: 3.0) can be considered in selected patients with additional risk factors for stroke and in patients with ball-cage valves (e.g. Starr-Edwards).
‡ Co-administration of ASA should be considered in selected patients at low risk for bleeding.
SPECIAL CONSIDERATIONS:

In patients with a mechanical heart valve who need an elective surgery or procedure, bridging with UFH or LMWH is indicated. [See Warfarin: Peri-Operative Management Guide]. Interruption of warfarin in patients with mechanical heart valves is not recommended for minor procedures, such as cataract removal, dental procedures and skin biopsies.

PEDIATRICS:

There are few studies and no randomized controlled trials on the safety and efficacy of antithrombotic therapy post-heart valve placement in children. Children should be managed post-valve placement by a cardiologist, and adult recommendations for management should be followed.

OTHER RELEVANT THROMBOSIS CANADA CLINICAL GUIDES:

- Acetyl Salicylic Acid (ASA)
- Warfarin: Management of Out-of-Range INR
- Warfarin: Peri-Operative Management
- Warfarin: Point-of-Care INR Monitoring
- Warfarin

REFERENCES:


Date of Version: 2017Jan22

Please note that the information contained herein is not to be interpreted as an alternative to medical advice from your doctor or other professional healthcare provider. If you have any specific questions about any medical matter, you should consult your doctor or other professional healthcare providers, and as such you should never delay seeking medical advice, disregard medical advice or discontinue medical treatment because of the information contained herein.