

**ANTITHROMBOTIC DRUG  
MANAGEMENT IN PATIENTS WITH  
MECHANICAL AND BIOPROSTHETIC  
HEART VALVES**



**Thrombosis** Canada  
**Thrombose** Canada

**TARGET AUDIENCE:** All Canadian health care professionals.

**OBJECTIVE:**

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

**ABBREVIATIONS:**

<b>ASA</b>	acetyl salicylic acid
<b>INR</b>	international normalized ratio
<b>LMWH</b>	low-molecular-weight heparin
<b>UFH</b>	unfractionated heparin

**BACKGROUND:**

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

**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) is suggested, to be followed by long-term acetyl salicylic acid (ASA) (81 mg) therapy.
- 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) therapy is suggested.

**Mechanical Valves**

There are 3 basic types of mechanical valves:

- a) bileaflet (e.g. St. Jude, most frequently seen today)
- b) tilting disc (e.g. Bjork-Shiley, infrequently seen today)
- c) ball-cage (e.g. Starr-Edwards, rarely seen today)

Patients with mechanical heart valves are at increased risk for stroke and valve thrombosis and, therefore, require long-term anticoagulant therapy. The risk of stroke/thrombosis is greater with mechanical mitral valves (0.9%/year) than for mechanical aortic valves (0.5%/year), and the risk is 1.2%/year in those with two mechanical valves. Long-term anticoagulation reduces the annual risk of stroke/thrombosis from 8.6% to 2.0% and the annual risk of valve thrombosis from 1.8% to 0.4%.

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

## **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 between 2.0 and 3.5, depending on the valve type (e.g. bileaflet or tilting disc) and location (e.g. aortic or mitral). See **Table** below. After valve implantation, warfarin should be initiated at a dose of approximately 5 mg daily (> 5 mg in younger patients; < 5 mg in the elderly). Patients with mechanical heart valves should be bridged with unfractionated heparin (UFH) or low-molecular-weight heparin (LMWH) until a therapeutic INR has been attained.

### **Aspirin**

Patients with a mechanical aortic or mitral valve who are at a low risk of bleeding should receive co-administered 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.

## **MONITORING:**

INR monitoring should be initiated within 1-2 weeks after initiation of warfarin therapy. Once patients are on a stable dose of an anticoagulant, INR testing should be done approximately every 4 weeks; see Warfarin guide.

## **SPECIAL CONSIDERATIONS:**

In patients with a mechanical heart valve who need an elective surgery or procedure (e.g. dental work), see the clinical guides for the respective agents (Warfarin: Peri-Operative Management and ASA guides).

## **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.

## REFERENCES:

ACC/AHA 2006 Guidelines for the Management of Patients with Valvular Heart Disease: Executive Summary. *Circulation* 2006;114:450-527.

Stein PD, Alpert JS, Bussey HI, et al. Antithrombotic therapy in patients with mechanical and biological prosthetic heart valves. *Chest* 2001;119(1Suppl):220S-227S.

Whitlock RP, Sun JC, Fries SE, et al. Antithrombotic and thrombolytic therapy for valvular disease: Antithrombotic Therapy and Prevention of Thrombosis, 9<sup>th</sup> ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest* 2012;141(2Suppl):e576S-600S.

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

<b>Mechanical Valve Location*</b>	<b>INR Target and Range</b>	<b>Need for ASA (81 mg daily)‡</b>
Aortic	2.5 (range 2.0-3.0)†	Yes
Mitral	3.0 (range 2.5-3.5)	Yes
Combined aortic and mitral	3.0 (range 2.5-3.5)	Yes
Pulmonic	2.5 (range 2.0-3.0)	No
Tricuspid	3.0 (range 2.5-3.5)	No
Combined pulmonic and tricuspid	3.0 (range 2.5-3.5)	No

\* For patients with ball-cage valves (e.g. Starr-Edwards), a higher intensity INR may be required (target: 3.0)

† Higher-intensity INR (target: 3.0) can be considered in selected patients with additional risk factors for stroke

‡ ASA should be considered in selected patients at low risk for bleeding

*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.*