general:
- MR may be caused by disease of distortion of any component of the mitral valve apparatus including the mitral valve annulus, leaflets, chordae & papillary muscles as well as by alterations in left ventricular geometry or systolic function.

clinical presentation:
- Many patients with chronic mitral regurgitation may be asymptomatic for many years,
- the regurgitation lesion imposes a volume load on the left ventricle because an increased total stroke volume is needed to maintain a normal forward cardiac output.
- Chronic mitral regurgitation is usually well tolerated even when there is a superimposed haemodynamic load such as systemic infection, pregnancy or trauma.
- Acute severe MR is a surgical emergency.

management:
- In chronic MR and heart failure, management is directed at treating the process that lead to decomposition & optimising loading conditions.
- Acute severe MR is a surgical emergency. Medical stabilisation should occur concurrently with cardiac surgical referral. Acutely, placement of an IABP provides optimal afterload reduction while improving diastolic coronary blood flow.
- Timing of surgical intervention depends on the aetiology of the acute MR: (i) spontaneous chordal rupture can usually be treated with mitral valve repair (ii) timing of repair in endocarditis varies but most centres favour repair as early as possible and recent studies suggest delaying surgery does not decrease infection.

- Acute ischaemic MR due to RWMAs may improve after percutaneous revascularisation & IABP and medical therapy may be sufficient to get patient through as myocardial function improves.
- Acute ischaemic MR due to papillary muscle rupture requires urgent surgery (urgent surgery has a 50% mortality; however, without surgery complete rupture has a 95% two week mortality). Some surgeons advocate a period of medical stabilisation in the presence of partial papillary muscle rupture.

general:
- Mitral stenosis is nearly always due to Rheumatic heart disease & is a slowly progressive disease with insidious onset over many years.
- Rarer causes are left atrial myxoma, ball-valve thrombus, annular calcification, SLE.

clinical presentation:
- In asymptomatic patients with compensated moderate or severe mitral stenosis, acute decomposition can occur in the setting of increased systemic haemodynamic demands.
- Because mitral stenosis most commonly occurs in women (80%) and occurs in the reproductive years, the most common emergency presentation is of a pregnant or post-partum woman with heart failure.
- The clinical presentation may also be caused by or exacerbated by atrial fibrillation.
- Main symptoms are breathlessness on exertion, recurrent bronchitis, fatigue, palpitations, AF, haemoptysis and stroke.
- Classic signs are mitral facies, small volume pulse, right ventricular hypertrophy, a tapping apex due to a palpable first heart sound, a loud first heart sound & an opening snap with a diastolic murmur.

management:
- Most patients with mitral stenosis and acute decomposition can be managed conservatively with treatment of the superimposed illness.
- Efforts should be directed towards increasing oxygen delivery and decreasing oxygen demand.
- If atrial fibrillation is present rate and/or rhythm control is required.
- Beta blockers may improve ventricular function by improving diastolic filling.
- In patients who do not respond to conservative therapy, urgent percutaneous balloon mitral valvotomy should be performed; patients with left atrial thrombus, co-existing moderate to severe MR or deformed valves may require urgent valve replacement.

- Pulmonic valve disease is nearly always congenital in origin with a chronic disease course.
- Tricuspid valve stenosis is rare and usually accompanies rheumatic mitral valve disease.
- Tricuspid regurgitation can present acutely with severe acute regurgitation due to endocarditis or to blunt or penetrating chest wall trauma.

- Mechanical heart valves are very durable and complications are most often due to valve thrombosis or paravalvarular regurgitation.
- Valve thrombosis occurs in the setting of inadequate anticoagulation & may result in either functional stenosis or regurgitation (depending on whether the clot impedes opening or closing of the valve).
- Treatment of valve thrombosis is controversial with options including systemic anticoagulation, thrombolysis and occasionally urgent surgery.

- Paravalvarular regurgitation early after valve replacement may be related to suture dehiscence at a site of annular calcification. There may be associated haemolytic anaemia.
- Core decompression may be considered conservatively, but may require re-operation if severe.
- New onset of paravalvar leak should prompt careful evaluation for endocarditis.

- Tissue valves are subject to degeneration of the leaflets with superimposed calcification that may result in stenosis or regurgitation.
- Degeneration is usually a slowly progressive process with presentation 10-15 years after valve replacement.
- As with native valve disease, acute decompression can occur with superimposed haemodynamic stress.

clinical presentation:
- Acute mitral regurgitation presents with pulmonary oedema and is a surgical emergency.
- Myxomatous disease with flail leaflet.
- Spontaneous chordal rupture.
- Endocarditis.
- In acute myocardial infarction due to: (i) papillary muscle rupture (ii) regional wall motion abnormality (iii) left ventricular dilatation and systolic dysfunction.

general:
- Acute aortic stenosis is a surgical emergency.
- Medical stabilisation should occur concurrently with cardiac surgical referral. Acutely, placement of an IABP provides optimal afterload reduction while improving diastolic coronary blood flow.
- Timing of surgical intervention depends on the aetiology of the acute MR: (i) spontaneous chordal rupture can usually be treated with mitral valve repair (ii) timing of repair in endocarditis varies but most centres favour repair as early as possible and recent studies suggest delaying surgery does not decrease infection.
- Acute ischaemic MR due to RWMAs may improve after percutaneous revascularisation & IABP and medical therapy may be sufficient to get patient through as myocardial function improves.
- Acute ischaemic MR due to papillary muscle rupture requires urgent surgery (urgent surgery has a 50% mortality; however, without surgery complete rupture has a 95% two week mortality). Some surgeons advocate a period of medical stabilisation in the presence of partial papillary muscle rupture.

general:
- Aortic stenosis is a chronic, slowly progressive condition.
- In patients with asymptomatic chronic stenosis, decomposition can occur due to a superimposed haemodynamic burden.
- Examples of this include mitral stenosis presenting with acute pulmonary oedema in the setting of systemic infection & aortic stenosis presenting with cardiogenic shock in the setting of acute GI bleeding.

management:
- In patients with asymptomatic chronic stenosis, decomposition can occur due to a superimposed haemodynamic burden.
- Examples of this include mitral stenosis presenting with acute pulmonary oedema in the setting of systemic infection & aortic stenosis presenting with cardiogenic shock in the setting of acute GI bleeding.

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