

Cardiology – when to refer

Referral criteria are never absolute but some essential guidelines can be found here.

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It is not possible to give absolute instructions as to when patients should be referred. Only guidelines can be offered to practitioners to interpret and implement, based on an understanding of their own abilities and competence and a knowledge of the support structures and staff available in the area in which they practise.

As we have based our recommendations on experience gained in public service hospitals in the Western Cape, their application may be found primarily in that sector. However, the principles proposed are generic and should find application in other health care spheres as well.

Referral can seldom be accomplished immediately and certain essential interventions (an important part of the referral process) must be performed while awaiting transfer. It is also important

to point out that referral has to take place in two directions for a system to function appropriately. Referral from tertiary level back to secondary and primary levels is essential to allow tertiary facilities to accommodate new patients.

The guidelines below describe the management of common cardiac diseases as we believe they should be managed in an ideal world. While recognising that we do not live in such a world, the recommendations attempt to point out the basic common medications, equipment and staff that should be available at each level of care for these referral guidelines to be implemented.

Guidelines for the management of common cardiac diseases are as follows:

Primary	Secondary	Tertiary
Acute myocardial infarction (STEMI)	Acute myocardial infarction (STEMI)	Acute myocardial infarction (STEMI)
Aspirin (300 mg dissolved or chewed and swallowed immediately, 75 -150 mg daily thereafter)	Aspirin	Aspirin
Nitrates (1 - 2 buccal doses)	Nitrates	Nitrates
Adequate analgesia (morphine sulphate IV)	Adequate analgesia	Adequate analgesia
Streptokinase (1.5 mU IV over 45 min)	Streptokinase	Streptokinase
DO NOT INSERT CENTRAL LINES (UNLESS ABSOLUTELY NECESSARY)	Beta blocker	Beta blocker
(Transfer to secondary-level facility in ambulance equipped with ECG monitor, defibrillator and staff able to interpret the ECG and defibrillate)	ACE inhibitor	ACE inhibitor
Need: Functioning ECG	Statin	Statin
	Excellent BP control	Excellent BP control
	Diet, lifestyle advice	Diet, lifestyle advice
	Exercise test	Exercise test
	DO NOT INSERT CENTRAL LINES (UNLESS ABSOLUTELY NECESSARY)	Some patients who present early may be candidates for primary angioplasty, many referred patients will require urgent coronary angiography, angioplasty, stenting or coronary bypass grafting
	(Transfer to tertiary-level facility if there are complications of heart block, post-infarction angina, severe heart failure, cardiogenic shock or strongly positive exercise test)	Need: Cath lab (staffed)
	Need: External pacemakers	Cardiologists
	Exercise testing	Cardiac surgery
	Echocardiography	Disposables
	Specialist physician	Once treated most patients may be referred back to secondary or primary level. Treatment/supervision for these patients should be available at these levels

Primary	Secondary	Tertiary
<p>Unstable angina/non-Q-wave infarction (NSTEMI)</p> <p>Aspirin (300 mg dissolved or chewed and swallowed immediately, 75 -150 mg daily thereafter)</p> <p>Nitrates (1 - 2 buccal doses)</p> <p>Adequate analgesia (as above)</p> <p>Heparin</p> <p>Clopidogrel (300 mg immediately, 75 mg daily thereafter for 9 months)</p> <p>Diet, lifestyle advice</p> <p>Excellent BP control</p> <p>(Transfer to secondary-level facility)</p>	<p>Unstable angina/non-Q-wave infarction (NSTEMI)</p> <p>Aspirin</p> <p>Nitrates</p> <p>Adequate analgesia</p> <p>Clopidogrel</p> <p>Heparin</p> <p>Beta blocker (atenolol 50 - 100 mg/day)</p> <p>Diet, lifestyle advice</p> <p>ACE inhibitors</p> <p>Statins</p> <p>Excellent BP control</p> <p>(Transfer to tertiary-level facility if symptoms persist, exercise test is strongly positive, there is reason to believe that revascularisation may improve prognosis, or there are recurrent admissions with same diagnosis (provided patient wants further investigation and intervention and is fit enough to benefit. Check haemoglobin, renal and lung function prior to transfer))</p> <p>Need: As above</p>	<p>Unstable angina/non-Q-wave infarction (NSTEMI)</p> <p>Aspirin</p> <p>Nitrates</p> <p>Adequate analgesia</p> <p>Clopidogrel</p> <p>Heparin</p> <p>Beta blocker</p> <p>Diet, lifestyle advice</p> <p>ACE inhibitors</p> <p>Statins</p> <p>Most referred patients at tertiary level will require coronary angiography and many will need urgent intervention by means of angioplasty, stenting or coronary bypass grafting</p> <p>Need: As above</p> <p><i>Once treated most patients may be referred back to secondary or primary level. Treatment/supervision for these patients should be available at these levels</i></p>
<p>Chronic stable angina</p> <p>Aspirin (75 -150 mg/day)</p> <p>Nitrates (isosorbide dinitrate 5 mg or equivalent prn)</p> <p>Beta blockers (atenolol 50 - 100 mg/day)</p> <p>Calcium-channel blockers if beta blockers are contraindicated</p> <p>Diet, lifestyle advice</p> <p>Statins</p> <p>(Refer to secondary facility if symptoms interfere with normal activities despite optimal treatment (provided patient wants further investigation and intervention and is fit enough to benefit. Check renal function and haemoglobin prior to transfer))</p>	<p>Chronic stable angina</p> <p>Aspirin</p> <p>Nitrates</p> <p>Beta blockers</p> <p>Calcium-channel blockers if beta blockers are contraindicated</p> <p>ACE inhibitors</p> <p>Diet, lifestyle advice</p> <p>Statins</p> <p>(Refer to tertiary level if symptoms persist, exercise test is strongly positive, or there is reason to believe that revascularisation may improve prognosis (provided the patient wants further investigation and intervention and is fit enough to benefit. Check renal function, haemoglobin and lung functions prior to transfer))</p> <p>Need: Exercise testing</p> <p>Echocardiography</p> <p>Specialist physician</p>	<p>Chronic stable angina</p> <p>Aspirin</p> <p>Nitrates</p> <p>Beta blockers</p> <p>Calcium-channel blockers if beta blockers are contraindicated</p> <p>ACE inhibitors</p> <p>Diet, lifestyle advice</p> <p>Statins</p> <p>At this level most patients will require coronary angiography, angioplasty and stenting or coronary bypass grafting</p> <p>Need: As above</p> <p><i>Once treated most patients may be referred back to secondary or primary level. Treatment should be available at these levels</i></p>

Primary	Secondary	Tertiary
<p>Valvular heart disease (asymptomatic)</p> <p>Prophylaxis against infective endocarditis (amoxicillin 2 g 1 hour before dental procedures) Prophylaxis against recurrent rheumatic fever if appropriate (long-acting penicillin 1.2 mU IM 3-weekly) Advice regarding lifestyle, sporting activities, pregnancy and contraception</p> <p>(Refer to secondary level if in doubt regarding diagnosis)</p>	<p>Valvular heart disease (asymptomatic)</p> <p>Prophylaxis against infective endocarditis Prophylaxis against recurrent rheumatic fever if appropriate Advice regarding lifestyle, sporting activities, pregnancy and contraception Some patients may need clinical evaluation by a specialist physician and echocardiography</p> <p>(Refer to tertiary level if in doubt regarding diagnosis, ventricular function abnormal or valve lesion considered to be severe)</p> <p>Need: Echocardiography Specialist physician</p>	<p>Valvular heart disease (asymptomatic)</p> <p>As for primary and secondary levels. Most of these patients should not need to be seen at tertiary level unless there is doubt about the clinical diagnosis If there is doubt or if ventricular function is abnormal then patients should be evaluated at tertiary level</p>
<p>Valvular heart disease (symptomatic)</p> <p>Prophylaxis as above Diuretic (furosemide) Digoxin Warfarin anticoagulation (if appropriate)</p> <p>(Refer to secondary level with a view to onward referral to tertiary level for definitive treatment)</p>	<p>Valvular heart disease (symptomatic)</p> <p>Prophylaxis as above Diuretic Digoxin Warfarin anticoagulation (if appropriate)</p> <p>(Refer to tertiary level for definitive treatment (provided patient wants further investigation and intervention and is fit enough to benefit. Check renal function, haemoglobin and lung function prior to transfer))</p> <p>Need: Specialist physician Echocardiography</p>	<p>Valvular heart disease (symptomatic)</p> <p>Prophylaxis as above Treatment as at primary and secondary level Valve replacement surgery Balloon valvuloplasty</p> <p>Need: As above</p> <p><i>After definitive treatment most patients may be referred to secondary and primary levels for anticoagulation, follow-up and supervision.</i></p> <p><i>Adequate services and staff should be available at these levels</i></p>
<p>Heart failure (cause established)</p> <p>Diuretic (furosemide in dosages sufficient to maintain stable, dry body weight) ACE inhibitor in full dose (e.g. enalapril 10 mg twice daily), spironolactone (25 - 50 mg daily, potassium monitoring) Digoxin (0.125 - 0.25 mg daily), carvedilol (6.25 - 25 mg twice daily) Advice regarding diet, alcohol, salt restriction, pregnancy and contraception</p> <p>(Refer via secondary level to tertiary level if severe symptoms persist despite optimal therapy)</p>	<p>Heart failure (cause established)</p> <p>Diuretic ACE inhibitors Spironolactone Digoxin Carvedilol Advice regarding diet, alcohol, salt restriction, pregnancy and contraception</p> <p>(Refer to tertiary level if symptoms persist despite optimal therapy (provided patient wants further investigation and intervention and is fit enough to benefit))</p> <p>Need: Specialist physician Echocardiography</p>	<p>Heart failure (cause established)</p> <p>Diuretic ACE inhibitors Spironolactone Digoxin Carvedilol Advice regarding diet, alcohol, salt restriction, pregnancy and contraception</p> <p>Revascularisation LV aneurysmectomy Valvuloplasty Valve replacement A-V node ablation Resynchronisation therapy Automatic implantable cardioverter defibrillator (AICD) implantation Heart transplantation</p> <p>Need: As above</p> <p><i>Many such patients will require long-term follow-up at tertiary level</i></p>

Primary	Secondary	Tertiary
Heart failure (cause unclear)	Heart failure (cause unclear)	Heart failure (cause unclear)
Diuretics, digoxin, ACE inhibitors, aldactone, carvedilol (Refer all patients in whom the cause of the heart failure syndrome is unclear to secondary level for diagnostic evaluation)	Diuretics, digoxin, ACE inhibitors, aldactone, carvedilol (Refer all patients to tertiary level if cause unclear after specialist evaluation or if symptoms persist despite optimal therapy) <u>Need:</u> Specialist physician Echocardiography	Diuretics, digoxin, ACE inhibitors, aldactone, carvedilol Cardiac catheterisation, endomyocardial biopsy and further investigation or therapy as above
Symptomatic complete heart block	Symptomatic complete heart block	Symptomatic complete heart block
External pacemaker Adrenaline (if indicated) DO NOT ADMIT (Urgent transfer to tertiary facility with ECG monitoring, defibrillator and competent staff) <u>Need:</u> ECG	External pacemaker Adrenaline (if indicated) DO NOT ADMIT (Urgent transfer to tertiary facility with ECG monitoring, defibrillator and competent staff) <u>Need:</u> ECG	Temporary pacemaker Permanent pacemaker implantation Follow-up in specialist pacemaker clinic <u>Need:</u> Disposables Cath lab Skilled staff <i>After definitive treatment many patients may be transferred back to secondary or primary level for follow-up with transtelephonic monitoring of pacemaker function</i>
Syncope (cause unknown)	Syncope (cause unknown)	Syncope (cause unknown)
Clinical evaluation ECG Refer to secondary level if recurrent or problematic after clinical evaluation and ECG <u>Need:</u> ECG	Clinical evaluation, ECG, echocardiography Refer to tertiary level if recurrent, no cause found, or cause such as complete heart block (CHB) warrants urgent transfer (see above) <u>Need:</u> Specialist physician Echocardiography	Clinical evaluation, ECG, echocardiography, ambulatory ECG monitoring, tilt-table testing, electrophysiological testing Pacemaker implantation, tachycardia ablation, AICD implantation <u>Need:</u> Staff Cath lab Equipment Disposables
Aortic dissection	Aortic dissection	Aortic dissection
Refer to tertiary facility immediately	Refer to tertiary facility immediately	Surgical repair <u>Need:</u> Cardiac surgery Cardiology Cath lab CT Transoesophageal echocardiography
Murmur ?cause (asymptomatic)	Murmur ?cause (asymptomatic)	Murmur ?cause (asymptomatic)
Clinical evaluation Chest X-ray ECG Refer to secondary facility if significant clinical abnormality or if ECG, chest X-ray abnormal	Clinical Chest X-ray ECG Echocardiography Refer to tertiary facility if recommended by specialist physician	Some patients will need further echocardiography or cardiac catheterisation. Some will turn out to have congenital heart disease, hypertrophic cardiomyopathy, etc. and may need further definitive therapy <i>Most will be referred back to primary or secondary facility after diagnostic evaluation</i>


Primary	Secondary	Tertiary
<p>Pericardial effusion (cause known, no tamponade)</p> <p>Treat cause</p>	<p>Pericardial effusion (cause known, no tamponade)</p> <p>Treat cause</p>	<p>Pericardial effusion (cause known, no tamponade)</p> <p>Treat cause</p>
<p>Pericardial effusion (cause unknown or tamponade)</p> <p>Refer immediately to facility where pericardial drainage/aspiration is available</p>	<p>Pericardial aspiration/drainage if expertise available</p> <p>Refer to tertiary facility immediately if expertise not available</p> <p>Need: Echocardiography Specialist physician or surgeon with necessary skills</p>	<p>Pericardial drainage/aspiration</p> <p><i>After the procedure most patients may be referred back to secondary or primary level for continued treatment</i></p>
<p>Constrictive pericarditis (requiring diuretics)</p>	<p>Constrictive pericarditis (requiring diuretics)</p>	<p>Constrictive pericarditis (requiring diuretics)</p>
<p>Refer to tertiary facility immediately if patient consents to surgery and is fit enough to undergo the procedure and benefit from it</p>	<p>Refer to tertiary facility immediately if patient consents to surgery and is fit enough to undergo the procedure and benefit from it</p>	<p>Pericardiectomy</p> <p><i>After the procedure most patients may be referred back to secondary or primary level for continued treatment</i></p>
<p>Review of disability grant</p>	<p>Review of disability grant</p>	<p>Review of disability grant</p>
<p>Review and complete if appropriate</p> <p>Do not refer unless there are major problems on clinical evaluation. It should always be possible to evaluate for disability on the basis of clinical grounds. Investigations do not contribute</p>	<p>Review and complete if appropriate</p> <p>Do not refer unless there are major problems on clinical evaluation. It should always be possible to evaluate for disability on the basis of clinical grounds. Investigations do not contribute</p>	<p>It should not be necessary for patients to return to tertiary facilities for review of disability grants</p>
<p>Atrial fibrillation</p>	<p>Atrial fibrillation</p>	<p>Atrial fibrillation</p>
<p>Clinical evaluation</p> <p>Thyroid functions</p> <p>Anticoagulate with warfarin or aspirin (choice based on clinical grounds)</p> <p>Control rate with beta blocker (e.g. atenolol 50 - 100 mg/day), digoxin (e.g. 0.125 - 0.25 mg/day), calcium-channel blocker (e.g. verapamil 120 - 240 mg/day)</p> <p>Review response, monitor</p> <p>Refer to secondary facility if thyrotoxic, rate control inadequate, severe symptoms or uncontrolled heart failure (see abovementioned heart failure)</p> <p>Need: ECG</p>	<p>Clinical evaluation</p> <p>Thyroid functions</p> <p>Anticoagulate with warfarin or aspirin (choice based on clinical grounds)</p> <p>Control rate (beta blockers, digoxin, verapamil)</p> <p>Treat thyrotoxicosis if appropriate</p> <p>Review response, monitor</p> <p>Perform echocardiogram</p> <p>Refer to tertiary facility if rate control inadequate, severe symptoms, impaired left ventricular function or uncontrolled heart failure</p> <p>Need: Specialist physician ECG Echocardiography</p>	<p>Clinical evaluation</p> <p>Thyroid functions</p> <p>Anticoagulate with warfarin or aspirin (choice based on clinical grounds)</p> <p>Control rate (beta blockers, digoxin)</p> <p>Treat thyrotoxicosis if appropriate</p> <p>Review response, monitor</p> <p>Perform echocardiogram</p> <p>Holter monitoring</p> <p>Exercise testing</p> <p>Amiodarone</p> <p>Electrical cardioversion</p> <p>A-V node ablation</p> <p>Pacemaker</p> <p>Pulmonary vein exclusion</p> <p><i>After evaluation and/or definitive treatment many patients may be referred back to secondary or primary level</i></p>

Primary	Secondary	Tertiary
Atrial flutter	Atrial flutter	Atrial flutter
Refer to secondary facility	Refer to tertiary facility if recurrence after cardioversion and/or rate not controlled (see rate control of atrial fibrillation mentioned above)	Flutter circuit ablation (permanent pacemaker) <i>After evaluation and/or definitive treatment many patients may be referred back to secondary or primary level</i>
Narrow complex tachycardia (other than flutter, fibrillation, sinus)	Narrow complex tachycardia (other than flutter, fibrillation, sinus)	Narrow complex tachycardia (other than flutter, fibrillation, sinus)
Refer to tertiary level (after electrical conversion to sinus rhythm) When available the presenting ECG must accompany the referral <u>Need:</u> ECG Defibrillator	Refer to tertiary level (after electrical conversion to sinus rhythm) When available the presenting ECG must accompany the referral <u>Need:</u> ECG Defibrillator	Electrophysiological evaluation A-V node modification Bypass tract ablation <i>After evaluation and/or definitive treatment many patients should be referred back to secondary or primary level</i>
Ventricular tachycardia	Ventricular tachycardia	Ventricular tachycardia
Refer to tertiary facility as soon as possible (after electrical conversion to sinus rhythm) When available the presenting ECG must accompany the referral <u>Need:</u> ECG Defibrillator	Refer to tertiary facility as soon as possible (after electrical conversion to sinus rhythm) When available the presenting ECG must accompany the referral <u>Need:</u> ECG Defibrillator	Clinical evaluation Echocardiography Cardiac catheterisation and angiography CT MRI Coronary surgery Aneurysmectomy Amiodarone AICD implantation <i>After evaluation and/or definitive treatment a few patients may be referred back to secondary or primary level</i>

These guidelines are proposed in an attempt to improve the service offered to patients with cardiovascular disease. Our experience is largely in public service hospitals in the Western Cape. It is understood that the situation with regard to facilities, expertise, drugs and levels of care may be different in other parts of the country and in other practice settings. Nevertheless, we believe that a schema such as this is a useful starting point to evaluate and discuss recommendations as to the

standard of care that should be available at various levels and the resources needed to provide that care. These are considered to be reasonable and affordable given the financial constraints within which the service functions. The guidelines are intended to be advisory rather than proscriptive. Practitioners will always evaluate their patients as individuals and may elect to deviate from these guidelines if clinical circumstances so dictate.

When your patients cannot hold back any longer



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