Acute Chest Pain Pathway

Chest Pain/Suspected Acute Coronary Syndrome (ACS)

Review of pre-hospital and departmental **ECG** by appropriate clinical staff **within 10 mins**

Immediate bloods including **high-sensitivity cardiac troponin (hs-cTnT)**

Consider IV access and cardiac monitoring

Non-diagnostic

- Consider Aspirin 300 mg oral stat dose
- GTN / analgesia
- CXR as indicated

ST-depression/T-wave inversion

New horizontal or downsloping ST-depression ≥2mm ***or*** deep symmetrical T-wave inversion in 2 adjacent leads

Senior review *or* cardiology referral

- Aspirin 300mg oral stat dose
- Sublingual GTN / IV Morphine
- Consider Clopidogrel 300mg oral stat dose*
- Fondaparinux 2.5mg SC** (if not anticoagulated)
- Consider high risk NSTEMI GJUNH pathway (Appendix 1)

ST-segment elevation

≥2mm in 2 adjacent chest leads
or >1mm in 2 adjacent limb leads
or new LBBB
or >2mm ST depression V1-V3 (posterior)

Email Hairmyres ECG:
primary.pci@lanarkshire.scot.nhs.uk
(or fax 01355 584807)
Phone Hairmyres CCU 01355 584819

- Aspirin 300mg oral stat dose
- Clopidogrel 600mg oral stat dose*
- Heparin 5000units IV (if not anticoagulated)
- Sublingual GTN / IV Morphine

Admit and hs-cTnT at 6 hours (then see ACCU guidelines for ongoing management)

Blue Light transfer Hairmyres

Review baseline hs-cTnT

< 5ng/l ***

Myocardial Infarction ruled out

A) **Clear alternative diagnosis**
Treat as appropriate. Referral to cardiology usually not indicated.

B) **Possible cardiac chest pain with no previous investigations.**
Assess risk factors / ASSIGN score.
Consider IP/OP exercise test.
Consider Aspirin 75mg oral once daily and GTN Spray as required.
Copy result / discharge letter to cardiology.

C) Known coronary disease.
Consider IP/OP referral to cardiology

≥ 5ng/l AND ≤ 14ng/l

hs-cTnT 3 hours from arrival

CHANGE <3ng/l from initial sample

CHANGE ≥ 3ng/l AND < 10ng/l from initial sample

Admit and hs-cTnT 6 hours from arrival

CHANGE < 10ng/l from initial sample

> 14ng/l

CHANGE ≥ 10ng/l from initial sample

Myocardial Infarction/Injury (Appendix 2)

Arrange for admission, senior medical review and repeat hs-cTnT testing at 6 hours

A) If diagnosis of Type 1 myocardial infarction confirmed:

- Clopidogrel 300mg oral stat dose*
- Fondaparinux 2.5mg SC** (if not anticoagulated)
- Referral to cardiology for in-patient assessment

B) Consider other causes of myocardial injury (e.g. heart failure, arrhythmia, sepsis, pulmonary embolism)

CHANGE > 10ng/l from initial sample

Myocardial Infarction/Injury (Appendix 2)

- Follow guidance A and B in box above

* Patients who receive PCI will be switched to prasugrel (by interventional centre) unless contraindicated (previous TIA, CVA, ICH / patients on anticoagulation / severe hepatic impairment / patients for thrombolysis / propensity to bleeding (anaemia, GI bleed).
** Avoid fondaparinux if CrCl<20ml/min – can use appropriately dosed dalteparin as alternative (refer to ADTC 176).
*** In all patients with chest pain onset <3 hours from presentation, repeat hs-cTnT at 3 hours from arrival.

Reference: ADTC 426/01
Written by: Dr McGowan (Cardiologist), Mandy Cooke (Senior Pharmacist, Cardiology)
Date approved: 25th August 2023
Supersedes: None
Date written: August 2023
Review Date: August 2026

Appendix 1
GJUNH High Risk NSTEMI pathway

High Risk NSTEMI defined by:

- Heart Score ≥ 5*
- Ongoing chest pain and/or ECG changes *despite medical therapy*

Contact GJUNH Service:

NSTEMI Hotline: 07976 986058 or

GJUNH CCU telephone: 0141 951 5299

Send ECGs on request:

GJUNH CCU Fax: 0141 951 5867

GJUNH ECG email: ecg.gjnh@gjnh.scot.nhs.uk

If patient accepted for immediate coronary angiography/intervention, request **Emergency 999** ambulance transfer to GJUNH CCU

HEART

History (Anamnesis)	Highly suspicious	2	
	Moderately suspicious	1	
	Slightly suspicious	0	
ECG	Significant ST-deviation	2	
	Non-specific repolarisation disturbance/LBBB/PM	1	
	Normal	0	
Age	≥ 65 years old	2	
	45-64 years old	1	
	≤ 45 years old	0	
Risk Factors	≥ 3 risk factors or history of atherosclerotic disease	2	
	1 or 2 risk factors	1	
	No known risk factors	0	
Troponin	≥ 29 ng/l	2	
	5 – 28 ng/l	1	
	< 5 ng/l	0	
		Total	

Risk Factors:

- Hypercholesterolaemia
- Hypertension
- Diabetes Mellitus
- Cigarette smoking
- Positive family history
- Obesity (BMI>30)

***HOW TO CALCULATE THE HEART SCORE**

The HEART score is a risk stratification tool first used in the Emergency Department to predict the likelihood of a major adverse cardiac event within 6 weeks following presentation with chest pain.
A score is assigned from 5 specific elements (History, ECG changes, Age, Risk factors and Troponin) to give a value between 0 and 9. Three of the elements are explained in detail below:

History - From your history characterise the patient's chest pain as typical or atypical. The following distinctions have been agreed:

1. Typical pain - central of left-sided chest pain with radiation to the arms or throat, or associated sweating or clamminess.
2. Atypical pain - without chest pain or right sided chest pain or pain that radiates to the back or is worsened by inspiration/palpation.

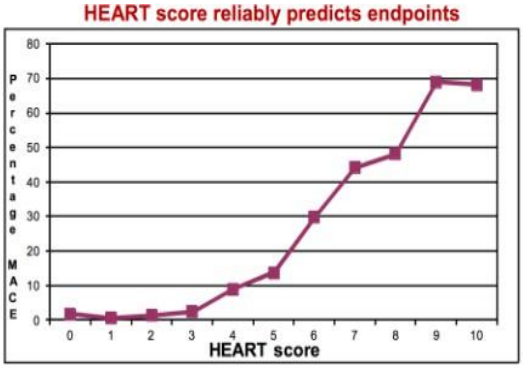
➔ 2 points: highly suspicious chest pain (i.e. typical pain)
➔ 1 point: moderately suspicious chest pain (i.e. mixed typical/atypical features)
➔ 0 point: chest pain slightly or moderately suspicious

Electrocardiogram (12 Lead ECG) - From the 12 lead ECG:

➔ 2 points: ECG shows features new/presumed new features of acute ischaemia or infarction (eg. significant ST depression, T-wave inversion)
➔ 1 point: ECG is abnormal but not diagnostic of ischaemia (eg. right bundle branch block, paced rhythm) or if ECG suggests previous infarction
➔ 0 points: ECG is normal

Risk Factors: Count the number of risk factors for coronary artery disease:
Diabetes mellitus
Current or recent (<90 days) smoker
Hypertension (diagnosed or treated)
Hypercholesterolaemia
Family history of coronary disease
Obesity (BMS >30)

➔ 2 points: 3 or more risk factors or significant atherosclerotic disease (including previous coronary revascularisation, myocardial infarction, peripheral arterial disease)
➔ 1 point: 1-2 risk factors
➔ 0 point: no risk factors



HEART	~ % pts	MACE/n	MACE	Death	Proposed Policy
0-3	32%	38/1993	1.9%	0.05%	Discharge
4-6	51%	413/3136	13%	1.3%	Observation, risk management
7-10	17%	518/1045	50%	2.8%	Observation, treatment, CAG

*MACE = Major Adverse Cardiac Event = Myocardial Infarction, PCI/CABG, all-cause death. Based on N=6174
http://www.heartscore.nl/

Appendix 2
Diagnosis of Myocardial Infarction with High Sensitivity Cardiac Troponin (hs-cTnT)

Elevated hs-cTnT level should always be interpreted in the context of patient symptoms and ECG findings. Typical chest pain with ECG changes makes * Type 1 MI likely. Conversely, in the absence of evidence of ischaemia, other causes should be sought. Percentage change in hs-cTnT over 6 hours should be taken into account:

≥ 100% change – consistent with myocardial infarction
20-99% change – acute event but also consider non-coronary causes
< 20% change – unlikely an acute event, consider chronic causes

Causes of Elevated hs-cTnT other than *Type 1 MI
(*MI due to a primary coronary event, usually atherosclerotic plaque rupture)

Acute Conditions	Chronic Conditions
Imbalance of Demand/Supply (*Type 2 MI)*	
Tachy- or bradyarrythmias	Tachy- or bradyarrythmias
Aortic Dissection	
	Severe aortic valve stenosis
Cardiogenic, hypovolaemic and septic shocks	
	Anaemia
	Hypertension
	Left Ventricular Hypertrophy
Coronary Embolism or Vasculitis	
Coronary Spasm	Coronary Spasm
Endothelial dysfunction	Endothelial dysfunction
Cocaine use	
Non-ischaemic Myocardial Damage	
Cardiac contusion	
Cardiac surgery	
Radiofrequency or cryoblation therapy	
Pacing or defibrillation shocks	Pacing or defibrillation shocks
Rhabdomyolysis with cardiac involvement	
Myopericarditis	Myopericarditis
Cardiotoxic agents	Cardiotoxic agents
Some chemotherapeutics	Some chemotherapeutics
Carbon monoxide poisoning	
Multifactorial Causes of Myocardial Damage	
Heart Failure	Heart Failure
Takotsubo cardiomyopathy	
Severe pulmonary embolism	
	Pulmonary Hypertension
Extreme exertion	
Sepsis	
Gastrointestinal bleeding	
Rhabdomyolysis without cardiac involvement	
Renal Failure	
	Infiltrative diseases such as sarcoidosis or amyloidosis
Severe acute neurological disease, such as stroke or trauma	
Skeletal myopathies	