NHS
Eileanan Siar
Western Isles

ACUTE CORONARY SYNDROME PATHWAY 2023

(Use Common Admission Document in conjunction with this ICP)

CONTENTS

REMEMBER:

- **All patients with chest pain should be assessed in A+E (inc. ECG/Trop I)**

- **STEMI-urgent transfer for all to GJNH (contact GJNH CCU 0141 951 5299)**
  - **STEMI do not need SCI Gateway referral**

- **NSTEMI-consider urgent transfer for high risk/unstable patients.**
  - **(Contact GJNH scheduler 07917 616501)**
  - **Unstable NSTEMI *do not* need SCI ref. / Stable NSTEMI *do* need SCI ref.**

(GP run units: use SCI Gateway and use their name instead of consultant)

- **ECG Interpretation remote support: FAX ECG to GJNH on 0141 951 5867 (ecg.gjnh@gjnh.scot.nhs.uk if no fax) This MUST be followed with a phone call to ensure the CCU charge nurse is aware (Tel: 0141 951 5299 or 0141 951 5202)**
- **For non-ACS ECG support consider contacting the CSN in WIH for assistance. Alternatively, Raigmore CCU will provide non-urgent advice on ECG's, e-mail to: ECG.highland@nhs.net. This MUST be followed with a phone call to ensure the CCU charge nurse is aware of the need to give advice (Tel: 01463 729711).**

- **Refer *all* ACS patients to the Cardiac Rehabilitation team at the point of admission. Can be contacted via Switchboard. (use SCI Gateway for referral).**

- **Troponin I was introduced in August 2023 as the biomarker used in the assessment of acute MI. The algorithm and an online calculator can be found on the intranet under SHARED CLINICAL GUIDELINES> CARDIOLOGY**

- **Antiplatelet Guidance Updated 11/23 (no longer use Ticagrelor, Clopidogrel used instead unless advised otherwise by GJNH. GJNH will start Prasugrel after PCI/Angio. Ticagrelor will only be used in patients who have a STEMI/NSTEMI who are already taking Ticagrelor).**

• CHEST PAIN ICP: INITIAL ASSESSMENT

Use for all patients presenting with chest pain/symptoms consistent with a diagnosis of cardiac ischaemia

Name	
DOB/CHI	
Address (affix label)	

Date	
Time of Symptom Onset	
Time of Arrival	
Completed by	

NB: Check to see if patient has received any treatment prior to admission and record here:

- **Name:** **Dose:** **Time Given:**
- **Name:** **Dose:** **Time Given:**
- **Name:** **Dose:** **Time Given:**

Actions	**Time**	**Value**	**Reason if not done**	**Information**
1) 12 lead ECG				
2) Aspirin 300mg p.o.				Soluble or crushed.
3) GTN spray given				Give x3 doses at 5 minute intervals if reqd for pain
4) Pulse oximetry attached				(state if on air or % O2)
5) Administer O2 to maintain target O2 saturation opposite *(O2 only required if hypoxic, pulmonary oedema or ongoing ischaemia)*				Target O2 sat 94-98%. (COPD patients or hypercapnia risk 88-92%) (Use 24% Venturi mask at 2-4l/min if history of hypercapnic respiratory failure until blood gases available to guide O2 therapy)
6) Attach CONTINUOUS Cardiac Monitoring				
7) IV Access				
8) Check Troponin I level/ creatinine and glucose urgently (*all required in immediate management*) (also send samples for; FBC/U+E/LFT/TSH/Chol/HDL/) (If Trop I raised admit HDU)				Check Trop I on admission in all cases. (Repeat at 3 hrs from admission sample to detect any rise/fall)
9) Anti emetic: metoclopramide 10mg IV				
10) Analgesia: Diamorphine 2.5-5mg IV (can be repeated if necessary) ***or*** Morphine 5-10mg IV (can be repeated if necessary)				

ECG INTERPRETATION:
ST elevation ≥ 1mm in two or more adjacent limb leads?
ST elevation ≥ 2mm in two or more contiguous chest leads?
Presumed new onset of Left Bundle Branch Block?
Posterior Infarction?

YES TO ANY:
Go to ACS STEMI Pathway PAGE 3

NO TO ALL:
Go to ACS NSTEMI/UA Pathway PAGE 5

Signed:	**Date:**	**Time:**

ACUTE MYOCARDIAL INFARCTION- STEMI

(Complete for all patients with STEMI- for NSTEMI go straight to page 5)

Name	
DOB/ CHI	
Address (affix label)	

Date	
Time of Symptom onset	
Completed by	

CHECKLIST OF CONTRAINDICATIONS FOR THROMBOLYSIS
Symptom onset > 6hours prior to presentation (may be considered in certain cases. d/w consultant on call)
Recent (within 8 weeks) haemorrhage, trauma, surgery or major dental procedure
Ischaemic Stroke in the last 3/12
Aortic Dissection
Coma
Previous intracerebral haemorrhage or known intracerebral lesion including neoplasms.
Uncontrolled hypertension (SBP >180) NB: If raised SBP only contraindication try to lower with an infusion of IV nitrate to SBP<180
Pregnancy (up to 2 weeks after delivery)
Prolonged CPR within the last 2 weeks
Active peptic ulceration
Bleeding Diathesis
Acute pancreatitis
Oesophageal varices
Current oral anticoagulant therapy (INR > 1.3) (may be considered in certain cases. d/w consultant on call)
Novel Anticoaglants (Rivaroxaban/ Dabigatran/ Apixaban)

STEP 1. **ADMINISTRATION OF THROMBOLYSIS USING TENECTAPLASE (if thrombolysis contraindicated go to STEP 2)**		
1.	Clopidogrel 300mg p.o (check if already given pre hospital) (STEMI patients over 75: current licence is for a dose of 75mg as the loading dose)	**_____mg** **_____Time given**
2.	Patient Weight	_____kg
3.	Calculate dose of tenectaplase from table below	_____units
4.	Administer tenectaplase as an IV bolus and flush line with 0.9% NaCl	____**Time Given** **(please enter exact time given)**
5.	Administer IV Bolus dose of Heparin (5000U) Preferably through a separate line. If unavailable flush the thrombolysis line before administration.	____Time Given (This provides immediate anti thrombotic protection)
6.	Calculate and administer dose of LMWH (**Enoxaparin**) for SC injection. (Dose = 1mg/kg)	____mg ____Time given (This provides additional 12hour anti thrombotic protection)

TENECTEPLASE DOSE CALCULATOR			
Patients' body weight category kg. (Stones/ Pounds)	Tenecteplase (U)	Tenecteplase (mg)	Volume of Tenectaplase reconstituted solution (ml)
< 60 (<9st 6lb)	6,000	30	6
≥60 to < 70 (9st 6lb to 10st 12lb)	7,000	35	7
≥70 to < 80 (11st to 12st 6lb)	8,000	40	8
≥80 to < 90 (12st 8lb to 14st)	9,000	45	9
≥90 (>14st)	10,000	50	10

STEP 2.

INTRAVENOUS BETA BLOCKER THERAPY

(Patients *must* be haemodynamically stable to allow the use of IV beta blockers. Caution in inferior MI. Discuss with consultant if uncertain):

If patients have P>65 and SBP >105mm/Hg and no clinical evidence of heart failure then administer IV metoprolol 5-15mg IV (Give 5mg at 2 minute intervals if tolerated).

If tolerated, give a stat oral dose of metoprolol 50mg 15 minutes later. Oral metoprolol 50mg should be given qid for the first 24 hrs. A long acting beta blocker (atenolol, bisoprolol) can be substituted on day 2 if the above is tolerated.

IV Beta blocker given?	Name:	_____Dose _____Time given
Oral Beta blocker given	Name:	_____Dose _____Time given

STEP 3.

PATIENTS *SUITABLE* FOR TRANSFER URGENTLY TO GJNH (DEFAULT POSITION)

(For primary or rescue PCI or angiography: SCI Gateway referral not required)

CONTACT GJNH CCU ON: 0141 951 5299 (5202 if no reply)/ Fax 0141 951 5867

(If unavailable contact GJNH Scheduler on: 07917 616501)

Contact SAS Air Ambulance for transfer

Contact on call consultant interventionalist for clinical advice if required

(Note. Following intervention at GJNH, patients will be immediately repatriated to the Western Isles by air ambulance. Relatives who travel with the patient will not be repatriated)

If NOT thrombolysed	1. *If already given Clopidogrel pre hospital* then: Administer further Clopidogrel to Total dose of Clopidogrel 600mg. (i.e.: If < 75 years old give further 300mg /If > 75 years old give further 525mg in line with SAS pre hospital protocol) 2. If no Clopidogrel administered by this point, then administer Clopidogrel 600mg 3. If already on Ticagrelor give Ticagrelor 180mg stat INSTEAD of Clopidogrel then c/w Ticagrelor 90mg twice a day	_____Dose _____Time Given _____Dose _____Time Given
	Give IV Heparin 5000U	_____Time Given
	?Gp IIb/IIIa Inhibitor advised*	_____Dose _____Time Given

*Tirofiban is the only GpIIb/ IIIa inhibitor held in pharmacy and is the preferred agent used by GJNH. Use in STEMI patients is usually restricted to those who have not been thrombolysed and have ongoing ischaemia in spite of dual antiplatelet therapy, nitrates, beta blockers and heparin.

STEP 4.

PATIENTS *UNSUITABLE* FOR TRANSFER WHO HAVE BEEN THROMBOLYSED

c/w Enoxaparin 1mg/kg s/c twice a day during inpatient stay (maximum of eight days total use)

N.B. In severe renal impairment (creatinine clearance < 30ml/ min) the product literature recommends 1mg/kg/s/c once daily

STEP 5.

PATIENTS *UNSUITABLE* FOR TRANSFER WHO HAVE NOT BEEN THROMBOLYSED

	Weight	_____Kg
1.	1. *If already given Clopidogrel pre hospital* then no further Clopidogrel indicated at this point 2. If no Clopidogrel administered at this point then: Administer Clopidogrel 300mg stat (Write patient up for Clopidogrel 75mg a day from Day 2 on Ward Kardex, as well as Aspirin 75mg) 3. If already on Ticagrelor give Ticagrelor 180mg stat INSTEAD of Clopidogrel then c/w Ticagrelor 90mg twice a day	_____Dose _____Time Given
4.	Administer Fondaparinux 2.5mg s/c Once daily (CI if eGFR <20)	_____Time Given
5.	If Fondaparinux CI use LMWH (Enoxaparin 1mg/kg s/c twice a day) N.B. In severe renal impairment (creatinine clearance <30 ml/min) the product literature recommends 1mg/kg s/c *once* daily Continue until discharge or day 8 whichever comes first.	_____Dose _____Time Given

STEP 6. HYPERGLYCAEMIA

All patients with a prior diagnosis of diabetes (Type 1 or 2) as well as those in whom their admission random glucose is >11 mmol/l should have glucose levels maintained in the range 7.0 to 11mmol/l (avoiding hypoglycaemia). See page 7

ACUTE CORONARY SYNDROME: NSTEMI

(Complete for all patients with NSTEMI- for STEMI complete pages 3-4)

Name	
DOB/ CHI	
Address (affix label)	

Date	
Time of Symptom Onset	
Time of Arrival	
Completed by	

NB. If there is any clinical doubt re ongoing ischaemia repeat ECG at 15-20 minute intervals dependant on severity of symptoms until diagnosis established/ patient stable

RISK STRATIFICATION

The optimal therapeutic intervention for patients with an ACS depends upon their relative risk of MI/ Death. All patients should have their risk assessed by the use of the GRACE risk calculator. Remember however this is a guide to risk only and does not take the place of clinical judgement.

GRACE Risk Calculator. Available on desktops in A+E, Medical 1 and 2 or @:
http://www.outcomes-umassmed.org/grace/acs_risk/acs_risk_content.html

CALCULATED RISK of IN-HOSPITAL DEATH IN POINTS = _____points
(GRACE SCORE ≥140 points is classed high risk (approximately equivalent to a 2% risk)

WHO TO REFER URGENTLY TO GJNH?

- **Ongoing pain/dynamic ECG changes-urgent referral**
- **GRACE SCORE ≥140 – if clinically felt appropriate**
- **Any patient in whom the clinician is concerned based on clinical judgement**

HOW TO REFER TO GJNH (Use SCI Gateway for stable patients, use the procedure below for urgent transfer)

- **Contact GJNH Cardiology Clinical Scheduler on 07917 616501 Fax 0141 951 5867 (24 hour number)**
- **(if unavailable contact GJNH CCU on 0141 951 5202)**
- **Decision on need for and timing of transfer for urgent angiography will depend on clinical status**
- (Note. Following intervention at GJNH, patients will be immediately repatriated to the Western Isles usually by air ambulance. Relatives who travel with the patient will not be repatriated)

Step 1: **Patient *Suitable* for Transfer (GRACE Score ≥140)**		
1.	• Administer Clopidogrel 300mg stat (then 75mg a day from Day 2 along with aspirin 75mg a day until transfer) (Unless given Clopidogrel pre hospital) • If already on Ticagrelor give Ticagrelor 180mg stat INSTEAD of Clopidogrel then c/w Ticagrelor 90mg twice a day	____Dose ____Time Given
2.	Contact tertiary centre. Immediate transfer for invasive assessment may be warranted. For transfer check:	
	• ? Bolus LMWH/UFH advised	____Dose ____Time Given
	• ? S/C dose of LMWH recommended	____Dose ____Time Given
	• ? Gp IIb/IIIa Inhibitor advised*	____Name ____Dose ____Time Given
*Tirofiban is the only GpIIb/ IIIa inhibitor held in pharmacy and is the preferred agent used by GJNH. Use in NSTEMI patients is usually restricted to those who have ongoing ischaemic symptoms in the presence of dynamic ECG changes in spite of dual antiplatelet therapy, nitrates, beta blockers and heparin.		
	• ? Beta Blocker	____ Name ____Dose ____Time Given
Step 2: **Patients *Unsuitable* for transfer or low risk on GRACE score**		
1.	• Administer Clopidogrel 300mg stat (Unless given Clopidogrel prehospital) (Write patient up for Clopidogrel 75mg a day from Day2 on Ward Kardex, as well as Aspirin 75mg)) (If already on Ticagrelor give Ticagrelor 180mg stat INSTEAD of Clopidogrel then c/w Ticagrelor 90mg twice a day)	____Dose ____Time Given
2.	Administer Fondaparinux 2.5mg s/c Once daily (CI if eGFR <20)	____Time Given
3.	If Fondaparinux CI use LMWH (**Enoxaparin** at a dose of 1mg/kg s/c Twice Daily) N.B. In severe renal impairment (creatinine clearance <30 ml/min) the product literature recommends 1mg/kg s/c *once* daily	____Units ____Time Given
4.	Administer beta blocker if no contraindication (IV then oral) according to the protocol below.	
	IV Beta blocker given?Name:	____Dose ____Time Given
	Oral Beta blocker given Name:	____Dose ____Time Given
INTRAVENOUS BETA BLOCKER THERAPY (Patients *must* be haemodynamically stable to allow the use of IV beta blockers. Caution in inferior MI. Discuss with consultant if uncertain): If patients have P>65 and SBP >105mm/Hg and no clinical evidence of heart failure then administer IV metoprolol 5-15mg IV (Give 5mg at 2 minute intervals if tolerated). If tolerated, give a stat oral dose of metoprolol 50mg 15 minutes later. Oral metoprolol 50mg should be given qid for the first 24 hrs. A long acting beta blocker (atenolol, bisoprolol) can be substituted on day 2 if the above is tolerated.		
STEP 6. HYPERGLYCAEMIA All patients with a prior diagnosis of diabetes (Type 1 or 2) as well as those in whom their admission random glucose is >11 mmol/l should have glucose levels maintained in the range 7.0 to 11mmol/l (avoiding hypoglycaemia). See page 7		

INTEGRATED CARE PATHWAY-HYPERGLYCAEMIA

ELEGIBILITY
All patients presenting with an ACS with diabetes mellitus *or* an admission plasma glucose level is >11mmol/l regardless of prior diagnosis of diabetes. The following regime should be continued for a minimum of 24hrs after admission.

Name	
DOB/ CHI	
Address affix label)	
Completed by	

	INSTRUCTIONS FOR VARIABLE RATE INFUSION	Value
Step 1:	Discontinue any oral hypoglycaemic medication	
Step 2:	**Prepare Insulin Infusion:** Human Actrapid 50 units in 49.5 mls of saline (Total Volume 50mls: Ready prepared syringes available from pharmacy)	
Step 3:	**Prepare IV fluids (low volume due to risk of overload):** 10% glucose plus Potassium 20mmol/ litre (10mmol in a 500ml bag) to be run at 50mls/hour	
Step 4:	Measure finger prick blood glucose	____mmol/l ____Time
Step 5:	Commence fluids and Insulin infusion	____mmol/l ____Time
Step 7:	Use the guide below to decide on dosage adjustment and record on following page	

VARIABLE INSULIN INFUSION TABLE	
Capillary Glucose	Insulin Infusion Rate (Units/ Hour)
<4.0	0
4.1-7	1
7.1-10.9	2
11-15.9	3
16-19.9	4
>20	5-6

NOTES

- Measure glucose hourly until stable then 2 hrly sufficient
- Aim for blood glucose in the range 7-11mmol/l
- Monitor Potassium 4-6 hrly (if initial level >5.4 mmol/l give initial fluids without added Potassium)
- If Glucose < 4mmol/l stop insulin infusion and consider giving 100mls of 10% glucose IV over 10-15 minutes, repeated as necessary dependant on response

Time												
Blood Glucose mmol/l												
Infusion Rate mls/hr												

Time												
Blood Glucose mmol/l												
Infusion Rate mls/hr												

Time												
Blood Glucose mmol/l												
Infusion Rate mls/hr												

Time												
Blood Glucose mmol/l												
Infusion Rate mls/hr												

- This IV regime should be continued for a minimum of 24hrs or until the patient is able to eat and drink normally.

ACUTE CORONARY SYNDROME INTEGRATED CARE PATHWAY: WARD/DISCHARGE TREATMENT PLAN

Name	
DOB/ CHI	
Address (affix label)	

1.MEDICATION GUIDANCE FOR ACS PATIENTS		
a. Medication of prognostic Benefit (use in all patients unless contraindicated/not indicated after assessment)		
Antiplatelet Therapy	1. Aspirin 75mg/day *PLUS* 2. Clopidogrel 75mg/day 3. If already on Ticagrelor c/w Ticagrelor 90mg twice a day	**Aspirin for all long term unless contraindicated.** **For all ACS patients (NSTEMI/STEMI whether or not they have received PCI/ Stenting), the recommended duration of DUAL ANTIPLATELET therapy in 6 months. This is the advice regardless of combination chosen.** **Where the risks of bleeding are high this may be shortened to 3 months and where the risks of atherothrombotic events are high this may be prolonged to 12 months.** **Clinical judgment should be used and after PCI advice from the tertiary centre should be observed.**
Anticoagulation	**Warfarin remains first choice for all patients.**	**See table on next page: affects choice of antiplatelet**
Beta blocker	Bisoprolol 1.25mg- 10mg/day	12 months minimum post MI **(SIGN recommends longterm),** lifelong if LVSD on ECHO. Patients with clinical heart failure/evidence of LV dysfunction need to be stable before commencing a beta blocker.
Statin	Atorvastatin 80mg/day*	Long-term treatment. Atorvastatin 80mg* first line in all ACS patients lifelong *Lower Dose if intolerant
Angiotensin Converting Enzyme Inhibitor (ACEI)	Lisinopril 2.5mg – 20mg/ day	Long Term Treatment for all *regardless of LV function.* Commence on Lisinopril 5mg on Day 1 if Systolic Blood Pressure allows (prognostic benefit of early treatment)
Angiotensin Receptor Blocker (ARB)	Candesartan 2mg – 32mg/ day	Use only if patient intolerant of ACEI
Mineralocorticoid Antagonist	Eplerenone 25mg – 50mg/day	Use for patients Post-MI with reduced LVEF (<40%) and *either* clinical heart failure *or* diabetes.
b. Medication of Symptomatic Benefit The following medications have been shown to improve symptoms in patients with Angina but have no known significant prognostic benefit. Use if ongoing symptoms not amenable to intervention. • Nitrates • Calcium channel blockers • Nicorandil etc		
c. Medications of no proven benefit (do not recommend) • Omacor • Vitamin C/E/Beta Carotene/Folic Acid		

2.SMOKING CESSATION
All patients admitted with ACS who are current smokers should receive advice and support to quit smoking. This includes the use of Nicotine Replacement Therapy and referral to the smoking cessation service. (Smoking cessation service: Tel. 701623 or 702712)
3.CARDIAC REHABILITATION
All patients admitted with ACS should be referred to the local Cardiac Rehabilitation service prior to discharge. (Contact 703545 after 1pm Mon-Fri)
4. HEART FAILURE NURSE
All patients admitted with ACS should receive an ECHO as an inpatient to assess Left Ventricular function. All with a diagnosis of systolic heart failure should be referred to the BHF Heart Failure Nursing Team.
5. LBBB CARDS/ COPY ECG
All patients with Left Bundle Branch Block should be given a copy of the wallet sized card stating that they have known LBBB (cards available from all ward areas or the Coronary Heart Disease Managed Clinical Network). Patients with other persistent ECG changes (e.g. other bundle branch block or ST segment changes) should be given a copy of their ECG at discharge to assist future management should they represent with a suspected acute coronary syndrome.

Summary of Anticoagulation recommendations (after acute management (NICE 2013))