Yukon-Kuskokwim HEALTH CORPORATION

Clinical Guideline

Acute Coronary Syndrome (ACS) Management

Symptoms suggestive of acute coronary syndrome

Perform 12 lead EKG.
If patient in a village, see Box 3.

Perform immediate interventions. See Box 1.

STEMI? See Box 2.
- Unclear → Tiger Text ANMC Cardiology On-Call with picture of EKG
- Yes → <12 hours from symptom onset?
  - No → Yes
  - Yes → Complete Fibrinolytic Checklist. Contraindications to fibrinolytics?
    - No → **Initiate fibrinolytic therapy. Do not delay fibrinolytics while awaiting troponin in STEMI. See next page for dosing.**
    - Yes
- No → • HS-cTnT (high sensitivity troponin), serial EKGs.
• Consider critical diagnoses. See Box 5.
• Consider P2Y12 inhibitor
• Consider morphine if pain not relieved by nitro and no contraindications

Diagnostic EKG or HS-cTnT findings? (Box 2 & 4)
- Unclear → Tiger Text ANMC Cardiology On-Call with picture of EKG.
- Yes → **High risk NSTE-ACS**
- No → **Low/Intermediate risk for NSTE-ACS**

• Administer additional medications. See table on next page.
• Activate medevac if appropriate.

Box 1: Immediate Interventions

• Supplemental oxygen *prn* to maintain SpO_2 90-96%.
• Aspirin 324 mg PO chewed (four 81 mg "baby" aspirin).
• Nitroglycerin 0.4 mg sublingual *prn* pain (up to three times as BP permits) unless contraindicated. Contraindications: recent phosphodiesterase use, sBP <90, right ventricular infarct (consider when evidence of inferior wall ischemia).

NOTE: pain relief with nitroglycerin (or lack thereof) is not diagnostic of cardiac ischemia.

Disclaimer

• This algorithm is not intended for undifferentiated chest pain without an apparent cause.
• Acute coronary syndrome is defined as acute occlusion of a coronary artery and does not include type 2 MI/demand ischemia.

Consulting Cardiology

• For all STEMI patients, consult PAMC Cardiology by calling the PAMC ED at (907) 212-3433 and asking for the cardiologist on call. For beneficiary patients, ANMC Cardiology should be made aware of the transfer on a non-urgent basis.
• For NSTE-ACS patients, consult ANMC Cardiology for beneficiary patients and PAMC Cardiology for non-beneficiary patients.

Box 2: EKG Criteria

STEMI:
• ST elevation in 2 contiguous leads of >0.2mV in V2-V3 OR >0.1mV in all other leads
• New or presumably new LBBB
• Positive Sgarbossa criteria for pre-existing LBBB

High risk Non-ST elevation ACS (NSTE-ACS):
• Dynamic T wave inversions
• Transient ST elevation

Box 3: Village Management

• If EKG meets high risk criteria in Box 2, review with ED Physician and activate medevac. Perform interventions in Box 1.
• ED physician coordinates with ANMC/PAMC regarding whether to have LifeMed give lytics and whether to stop in Bethel or ramp transfer to Anchorage.

• If EKG or health aide not available, use clinical history and validated tool such as EDACS to stratify risk for ACS. Consult with ED Physician and/or CD on call regarding appropriateness of medevac for risk factors alone.

Box 4: HS-cTnT Evaluation for Acute Cardiac Injury

The lowest reported value is "<6 ng/L," which equates to "undetectable."
FDA-approved normal values (99th percentiles in healthy subjects) are:
• Men: <22
• Women: <14
• Change in one hour (Δ1h) : <3
Cutoffs are arbitrary and do not correspond to any evidence-based positive-predictive value for ACS.
For patients with elevated troponins and clinical history consistent with ACS, consult cardiology.
This information is from data available February 2020. Please see wiki page for further information.

Box 5: Critical Differential Diagnosis

• Aortic dissection
• Tension pneumothorax
• Pulmonary embolism
• Perforated peptic ulcer

This guideline is designed for the general use of most patients but may need to be adapted to meet the special needs of a specific patient as determined by the medical practitioner.
Approved by Clinical Guideline Committee 3/24/23.
Click here to see the supplemental resources for this guideline.
If comments about this guideline, please contact clinical_guidelines@ykhc.org.

Yukon-Kuskokwim HEALTH CORPORATION

Clinical Guideline

Acute Coronary Syndrome (ACS) Management

Emergency Department Medication Summary

	STEMI <12 hours	STEMI >12 hours	NSTE-ACS
Oxygen	Maintain SpO_2 90-96%	Maintain SpO_2 90-96%	Maintain SpO_2 90-96%
Nitrates (*prn* pain, HTN)	Sublingual or drip	Sublingual or drip	Sublingual or drip
Fibrinolytic	Tenecteplase See below.	Not indicated	Not indicated
Antiplatelet agents: Aspirin	Aspirin 324 mg PO chewed (four 81 mg "baby" aspirin)	Aspirin 324 mg PO chewed (four 81 mg "baby" aspirin)	Aspirin 324 mg PO chewed (four 81 mg "baby" aspirin)
Antiplatelet agents: $P2Y_{12}$ receptor blocker	Clopidogrel Age ≤75: 300 mg PO Age >75: 75 mg PO	Clopidogrel 600 mg PO	Consult cardiology.
Anticoagulation	Enoxaparin (see table for dose)	Enoxaparin (see table for dose)	Enoxaparin (see table for dose)
Beta-blocker	Metoprolol 5 mg IV *prn* Q5 minutes (max 15 mg)	Metoprolol 5 mg IV *prn* Q5 minutes (max 15 mg)	Metoprolol 5 mg IV *prn* Q5 minutes (max 15 mg)
Morphine	No longer routinely given; associated with increased mortality. Reserve for significant pain refractory to NTG and beta-blocker.		

At time of Dx unless contraindicated

Nitroglycerin (NTG)
- Contraindications: PDE-inhibitor use, cardiogenic shock, RV infarct, sBP<90, marked tachycardia or bradycardia.
- Sublingual dosing: 0.4 mg SL Q5 minutes up to three doses
- IV dosing: start at 10-20 mcg/min, titrate Q3-4 minutes to typical range 60-100 mcg/min

Beta-Blockers
- No evidence of benefit from routine immediate beta-blocker.
- Indicated for HTN and/or ongoing ischemia refractory to NTG.
- Contraindications: cardiogenic shock, RV infarct, symptomatic asthma.
- Cautions: risk for cardiogenic shock (bradycardia, HR>110, sBP<120, age>70, increased time since STEMI onset), inferior MI, controlled asthma.

Fibrinolytic Therapy (Tenecteplase)

Goal: administer ≤ 30 minutes from arrival.
Rapidly complete the fibrinolytic checklist and consent.

Dosing:
- <60 kg: tenecteplase 30 mg IV bolus
- ≥60 kg to <70 kg: tenecteplase 35 mg IV bolus
- ≥70 kg to <80 kg: tenecteplase 40 mg IV bolus
- ≥80 kg to <90 kg: tenecteplase 45 mg IV bolus
- ≥90 kg: tenecteplase 50 mg IV bolus

Administer concurrent aspirin, clopidogrel, and anticoagulant therapy, per table above.

Enoxaparin Dosing

	Age <75 years and STEMI	Age ≥75 years and STEMI	Any age and NSTE-ACS
Creatinine clearance ≥30 mL/min	30 mg IV + (1 mg/kg SC now then Q12h) Max dose 100 mg	0.75 mg/kg SC Q12h Max dose 75 mg	1 mg/kg SC now then Q12h
Creatinine clearance <30 mL/min	30 mg IV + (1 mg/kg SC now then Q24h) Max dose 100 mg	1 mg/kg SC Q24h Max dose 100 mg	1 mg/kg SC now then Q24h

NOTE: Enoxaparin and unfractionated heparin are NOT dialyzable; ESRD/dialysis patients should receive fondaparinux, which is not on the YKHC formulary. Discuss with cardiologist if appropriate.

This guideline is designed for the general use of most patients but may need to be adapted to meet the special needs of a specific patient as determined by the medical practitioner.
Approved by Clinical Guideline Committee 3/24/23.
Click here to see the supplemental resources for this guideline.
If comments about this guideline, please contact Megan_Young@ykhc.org and Andrew_Swartz@ykhc.org.

Yukon-Kuskokwim HEALTH CORPORATION

Clinical Guideline

Acute Coronary Syndrome (ACS) Management

Fibrinolytic Checklist

INDICATIONS *(initial yes or no)*		
YES	**NO**	
		Presentation consistent with acute coronary syndrome (coronary artery occlusion)
		AND at least one of the following: • 1 mm J-point elevation in two contiguous leads (other than V_2-V_3) • In leads V2-V3 Men ≥ 40 years: ≥ 2 mm J-point elevation Men <40: ≥ 2.5 mm J-point elevation Women: ≥ 1.5 mm J-point elevation
ABSOLUTE CONTRAINDICATIONS *(initial yes or no)*		
YES	**NO**	
		History of any intracranial hemorrhage
		History of prior ischemic stroke, significant closed head injury or facial trauma, or intracranial or spinal surgery in the previous three months
		Presence of a cerebral vascular malformation
		Presence of a primary or metastatic intracranial malignancy
		Symptoms or signs suggestive of an aortic dissection
		Any bleeding diathesis
		Any active bleeding that is severe or has high potential for life-threatening blood loss; this does not include menstrual bleeding
		sBP > 180 and/or dBP >110 at presentation in patient at low risk of cardiac death (age < 55, no prior MI, and Killip class I).
		Terminal illness, defined as end of life care or documented/expressed patient wish to abstain from high risk or invasive procedures
RELATIVE CONTRAINDICATIONS *(initial yes or no) – If any of below are present, used shared decision making with patient.*		
YES	**NO**	
		Age 65-74 (ICH relative risk 3.12 [2.54-3.83]); Age ≥ 75 years (ICH relative risk 5.40 [4.40-6.63])
		History of chronic severe poorly controlled HTN
		sBP > 180 and/or dBP >110 at presentation in patient at high risk of cardiac death (age ≥ 55, Hx prior MI, or Killip class ≥ II).
		History of ischemic stroke more than three months ago
		Dementia OR any known intracranial disease that is not an absolute contraindication
		Traumatic or prolonged (>10 minutes) cardiopulmonary resuscitation
		Major surgery in the previous three weeks
		Internal bleeding in the previous 2-4 weeks
		Active peptic ulcer
		Non-compressible vascular punctures
		Pregnancy
		Current warfarin therapy (the risk of bleeding increases as the INR increases)

This checklist is advisory for clinical decision-making and may not be all-inclusive. Risks and benefits will need to be assessed individually.

Physician signature: _____

Printed name: _____ Date and time: _____

Place patient ID sticker here.

PROCEDURE CONSENT

I hereby authorize _____ and such assistants as he/she may designate, to perform the following operation or procedure:

TECHNICAL DESCRIPTION	Intravenous thrombolytic therapy for acute STEMI (ST-elevation myocardial infarction).
LAY DESCRIPTION	Give clot-dissolving medication through an IV to dissolve the clot which is causing a heart attack.

_____ has discussed with me the information briefly summarized below:

BENEFITS	• When PCI is not available within two hours, thrombolytic medication is the "standard of care" for achieving coronary reperfusion within 12 hours of acute STEMI onset. • When administered within 6 hours of pain onset, about 1 in 40 persons will have their life saved. • When administered between 6-12 hours after pain onset, about 1 in 60 persons will have their life saved. • Decreased risk of developing heart failure. • A STEMI patient who receives thrombolytic medication is about 3-5 times more likely to have their life saved than to have brain bleeding (see below).
RISKS *(some, but not all)*	• About 1 in 100 persons will experience non-life-threatening bleeding. • About 1 in 100-250 persons will experience bleeding into the brain which usually results in either death or significant disability.
RISKS OF NOT HAVING THE PROCEDURE	• Higher risk of death. • Higher risk of developing heart failure.
ALTERNATIVE TREATMENTS	None are available at this facility.

Patient signature: _____

Printed name: _____ Date and time: _____

Witness signature: _____

Printed name: _____ Date and time: _____

Physician signature: _____

Printed name: _____ Date and time: _____

Witness signature: _____

Printed name: _____ Date and time: _____

Place patient ID sticker here.