Clinical Practice Procedures:
Cardiac/Decision supported fibrinolysis administration

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Date	July, 2021
Purpose	To ensure a consistent procedural approach to decision supported fibrinolysis administration.
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless stated otherwise.
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Decision supported fibrinolysis administration

July, 2021

Rapid recognition of STEMI with prompt restoration of coronary artery perfusion is the key to myocardial salvage and decreasing mortality. Paramedic initiated pre-hospital fibrinolysis has been demonstrated to be safe, effective and can minimise the time to definitive treatment.[1–6]

Indications

Decision supported fibrinolysis administration must be considered for all adult patients meeting the following criteria:

- **Proximity to a pPCI facility:**
  - Patient is located more than 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a pPCI capable hospital.
- **Patient assessment:**
  - GCS = 15; **AND**
  - Classic ongoing ischaemic chest pain less than 6 hours in duration. ***Note: Atypical ischaemic chest pain is excluded.***
- **12-Lead ECG consistent with STEMI:**
  - Persistent ST-segment elevation of 1 mm or greater in at least two contiguous limb leads; **AND/OR** ST-segment elevation of 2 mm or greater in at least two contiguous chest leads (V1 – V6); **AND**
  - Normal QRS width (less than 0.12 seconds); **OR** right bundle branch block (RBBB) identified on the 12-Lead ECG.

Indications *(cont.)*

- **Decision supported:**
  - Corpuls3 prints **acute [xx] myocardial infarction** on the 12-Lead ECG; **AND**
  - The treating paramedic has contacted the *QAS Clinical Consultation and Advice Line* and following review of the 12-Lead ECG has been advised that the patient is suitable for pre-hospital fibrinolysis administration.

Contraindications

- Less than 18 **OR** 75 years of age or older
- Uncontrolled hypertension (systolic BP greater than 180 mmHg **AND/OR** diastolic BP greater than 110 mmHg at any stage during current acute episode)
- Known allergy to tenecteplase, enoxaparin or clopidogrel
- Left BBB identified on 12-Lead ECG
- Current or history of thrombocytopenia
- Active tuberculosis
- Known cerebral disease, in particular a malignant intracranial neoplasm **OR** arteriovenous malformation

Contraindications *(cont.)*

- Prior intracranial haemorrhage
- Ischaemic stroke **OR** Transient Ischaemic Attack (TIA) within the last 3 months
- History of significant closed head or facial trauma within the last 3 months
- Suspected aortic dissection (including new neurological symptoms)
- History of major trauma or surgery (including laser eye surgery) within the last 6 weeks
- Internal bleeding (e.g. gastrointestinal (GI) or urinary tract bleed) within the last 6 weeks (excluding menses)
- Bleeding or clotting disorder e.g. haemophilia
- Current use of anticoagulants (e.g. apixaban, dabigatran, rivaroxaban, warfarin)
- Non-compressible vascular punctures
- Prolonged (more than 10 minutes) CPR.
- Known pregnancy or delivered within the last 2 weeks
- History of serious systemic disease (advanced/terminal cancer, severe liver or kidney disease)
- Resident of an aged care facility requiring significant assistance with activities of daily living
- Acute myocardial infarction in the setting of trauma

Complications

- Failure to achieve reperfusion
- Haemorrhage
- Life-threatening stroke

Approved decision supported fibrinolysis administration regions

REGION	APPROVAL STATUS
Far Northern	APPROVED
Northern	APPROVED*
Central	APPROVED*
Darling Downs & South West	APPROVED
Sunshine Coast & Wide Bay	APPROVED*
Metro North	APPROVED*
Metro South	APPROVED*
Gold Coast	APPROVED*

Note: * Identifies Regions where decision supported fibrinolysis administration is approved for selected stations.

Procedure – Decision supported fibrinolysis administration

1. Request 'Code 1' CCP attendance, where available – do not delay treatment **AND/OR** transport.
2. Confirm the patient is indicated for Decision Supported Fibrinolysis Administration, specifically:
   - Patient is located more than 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a PCI capable hospital;
   - GCS = 15;
   - Classic ongoing ischaemic chest pain less than 6 hours in duration; **AND**
   - Persistent ST-segment elevation of 1 mm or greater in at least two contiguous limb leads; **AND/OR** ST-segment elevation of 2 mm or greater in at least two contiguous chest leads (V1 – V6);
   - Normal QRS width (less than 0.12 seconds) **OR** RBBB identified on the 12-Lead ECG.
   - Decision supported 12-Lead ECG interpretation confirmation that:
     - When using the corpuls[3] **acute [xx] myocardial infarction** is printed on the 12-Lead ECG.

NOTE: *If the paramedic identifies a STEMI and does not have decision support from the 12-Lead ECG interpretation, decision support **must** be obtained from the QAS Clinical Consultation and Advice Line.*

3. Complete the *Decision Supported Fibrinolysis Administration Checklist (January, 2020).*

   If the patient has no contraindications for pre-hospital fibrinolysis

   - Send a photograph of the complete 12-lead ECG, annotated with the patient's name, date of birth and symptoms via email to QAS.STEMIgroup@ambulance.qld.gov.au. The subject of the email must include the patient's location and your contact phone number.
   - Contact the *QAS Clinical Consultation and Advice Line* ([redacted]) and request that the 12-Lead ECG be reviewed to confirm that the patient is suitable for pre-hospital fibrinolysis administration (pending satisfactory completion of the *Decision Supported Fibrinolysis Administration Checklist*).

     For cases involving transport to a non pPCI facility, the paramedic must provide the following information:

     - Case number
     - Patient name
     - Date of birth
     - Destination hospital
     - Estimated time of arrival.
   - Obtain informed consent from the patient and request the patient sign the *Decision Supported Fibrinolysis Administration Checklist* prior to any further action.
   - Administer medications (tenecteplase, enoxaparin, and clopidogrel) in accordance with the *Decision Supported Fibrinolysis Administration Checklist* and the appropriate QAS DTP. Transport the patient 'Code 2' (unless altered vital signs) to hospital ensuring early prenotification.

   If the patient has contraindications for pre-hospital fibrinolysis

   - Continue treatment in accordance with the relevant QAS Clinical Practice Guideline (CPG) and transport the patient 'Code 1' to hospital ensuring early pre-notification.
   - Contact the *QAS Clinical Consultation and Advice Line* ([redacted]) for further treatment and/or early retrieval options.
4. The *QAS Clinical Consultation and Advice Line* senior clinician will provide early notification of STEMI to the Retrieval Services Queensland (RSQ) Clinical Coordinator via the RSQ Rotary Emergency Medical Dispatcher ([redacted]). If the Clinical Coordinator is not available the RSQ Registered Nurse should be conferenced to the call.

Additional information

- Increased scrutiny and threshold must be applied to patients less than 35 years due to the higher likelihood of STEMI mimics such as pericarditis. Paramedics should exercise extreme caution and if doubt exists regarding the suitability of pre-hospital fibrinolysis administration the 12-Lead ECG must be reviewed by and discussed with the *QAS Clinical Consultation and Advice Line* for decision support and to determine suitability for fibrinolysis administration.
- Patients must be regularly reassessed and transported with continuous comprehensive monitoring. All ongoing treatment must be in accordance with the relevant CPG.
- Copies of the patient's 12-Lead ECG (annotated with the patient's name, date of birth and symptoms) and e-ARF **MUST** be left with the patient.
- All faults/difficulties associated with the QAS pPCI Referral Line must be reported via the **QAS Portal.**
- The collection of clinical images for the purpose of clinical consultation AND/OR quality assurance forms part of the patient's health care record and their existence must be documented on the patient's eARF. This can be done by selecting the image tick box in the eARF app at the following location: *Care/Procedure/Consult/Clinical Consultation and Advice Line*.

Audit

- All cases involving coronary artery reperfusion are subject to clinical audit and review. In situations where there are complications or concerns, officers must immediately contact the *QAS Clinical Consultation and Advice Line*.

Data collection and research

- All cases where a STEMI has been identified or suspected by a paramedic with a clinical level of ACP2 or above (including those not trained in reperfusion) are subject to specific data collection. This should be facilitated by the completion of a STEMI Capture Form by the treating paramedic and adherence to the following process:
  - On the eARF select final assessment as 'Acute Myocardial Infarction' and complete documentation in accordance with current standards.
  - Forward the *Decision Supported Fibrinolysis Administration Checklist, eARF, STEMI Capture Form* and *12-Lead ECG* to:

Manager, Cardiac Outcomes Program
Information Support, Research & Evaluation Unit
[redacted]

STEMI – Fibrinolysis pathway

Patient meets Decision Supported Fibrinolysis criteria according to the *QAS Decision Supported Fibrinolysis Administration checklist*

Assuming standard cares given

Contact the *QAS Clinical Consultation and Advice Line* ([redacted]) for decision support.

Patient informed consent obtained for tenecteplase enoxaparin, **AND** clopidogrel administration

Administer tenecteplase (weight calculated dose) IV

Administer enoxaparin 30 mg IV

Administer clopidogrel 300 mg oral

Administer enoxaparin 1 mg/kg (up to max 100 mg) SUBCUT at 15 min post initial dose

Prenotify as appropriate

Code 2 transport to hospital unless altered vital signs

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Decision Supported Fibrinolysis Administration Checklist *(January, 2020)*

PATIENT / CASE DETAILS			
Surname		**Given Name**	
Age		**Weight**	
Case Date		**Case Number**	

INDICATIONS – if the answer is NO or UNSURE to ANY of the following, do NOT administer the patient any tenecteplase, enoxaparin or clopidogrel.	**Yes**	**No**	**Unsure**
Patient located > 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a pPCI capable hospital?			
GCS = 15?			
Classic ongoing ischaemic chest pain < 6 hours in duration? **Note: Atypical chest pain is excluded.**			
12-Lead ECG with persistent ST-elevation ≥ 1 mm in at least two contiguous limb leads **AND/OR** ≥ 2 mm in at least two contiguous chest leads V_1–V_6?			
Normal QRS width (< 0.12 seconds) **OR** right bundle branch block?			
LIFEPAK®12 interpretation prints *****ACUTE MI SUSPECTED***** **OR** corpuls[3] prints **acute [xx] myocardial infarction** on the 12-Lead ECG?			
The treating paramedic has contacted the *QAS Clinical Consultation and Advice Line* and following review of the 12-Lead ECG has been advised that the patient is suitable for pre-hospital fibrinolysis administration?			
CONTRA-INDICATIONS – if the answer is YES or UNSURE to ANY of the following questions, do NOT administer the patient any tenecteplase, enoxaparin or clopidogrel.	**Yes**	**No**	**Unsure**
< 18 **OR** ≥ 75 years of age?			
Uncontrolled hypertension (systolic BP > 180 mmHg **AND/OR** diastolic BP > 110 mmHg at any stage during current acute episode)?			
Known allergy to tenecteplase, enoxaparin or clopidogrel?			
Left BBB identified on 12-Lead ECG?			
Current or history of thrombocytopenia?			
Active tuberculosis?			
Known cerebral disease, in particular a malignant intracranial neoplasm **OR** arteriovenous malformation?			
Prior intracranial haemorrhage?			
Ischaemic stroke **OR** Transient Ischaemic Attack (TIA) within last 3 months?			
History of significant closed head or facial trauma within last 3 months?			
Suspected aortic dissection (including new neurological symptoms)?			
History of major trauma or surgery (including laser eye surgery) within last 6 weeks?			
Internal bleeding (e.g. GI / urinary tract bleed) within last 6 weeks (excluding menses)?			
Bleeding or clotting disorder (e.g. haemophilia)?			
Current use of anticoagulants (e.g. apixaban, dabigatran, rivaroxaban, warfarin)?			
Non-compressible vascular punctures?			
Prolonged (> 10 minutes) CPR?			
Known to be pregnant or delivered within last 2 weeks?			
History of serious systemic disease (e.g. advanced / terminal cancer, severe liver or kidney disease)?			
Resident of an aged care facility requiring significant assistance with activities of daily living?			
Acute myocardial infarction in the setting of trauma?			

Decision Supported Fibrinolysis Administration Checklist *(continued)*

CONSENT
All patients eligible for Decision Supported Fibrinolysis Administration **MUST** read (or have read to them) the following information and if consent is given the patient must sign the bottom section of this form.
It is likely that you are suffering a heart attack. With your consent I would like to administer the following medications to restore blood flow to your heart: • drugs which reduce new clot formation called enoxaparin and clopidogrel; **AND** • a drug to disolve the clot (blockage) called tenecteplase. The sooner you receive these medications, the lower the risk from the heart attack. It is recommended that this treatment is started as soon as possible. Early treatment with these medications can improve your chance of survival by 20–25%. These medications can sometimes cause serious side effects in a small number of patients however, this treatment is supported by national and international cardiology guidelines. The biggest risk is a life-threatening stroke which affects about 1 patient in every 100 treated. Other significant bleeding which is not normally life-threatening can occur in about 4 patients in every 100 treated. Some patients also have allergic reactions and other side effects that do not usually cause major problems. **Medical Records:** I give permission for the QAS to access my hospital record for information relating to this procedure.

Patient signature	**X** .....

PARAMEDIC DETAILS

I certify that I have completed the *Decision Supported Fibrinolysis Administration Checklist* and the patient **has given / has not given** *(circle appropriate response)* consent for the administration of enoxaparin, tenecteplase and clopidogrel.

Number		Signature	