Clinical Practice Procedures:
Cardiac/Autonomous pPCI referral

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Purpose	To ensure a consistent procedural approach to autonomous pPCI referral.
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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Autonomous pPCI referral

December, 2021

Rapid recognition of STEMI with prompt restoration of coronary artery perfusion is the key to myocardial salvage and decreased mortality. The triage of STEMI patients by paramedics direct to a primary percutaneous coronary intervention (pPCI) has demonstrated a reduction in mortality.[1–6]

Indications

Autonomous pPCI referral must be considered for all adult patients *(irrespective of age)* who meet the following criteria:

- **Proximity to a pPCI facility:**
  - Patient is located less than 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a pPCI hospital.
- **Patient assessment:**
  - GCS = 15; **AND**
  - Classic ongoing ischaemic chest pain less than 12 hours in duration. ***Note: Atypical 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.

Contraindications

- History of serious systemic disease (e.g. advanced/terminal cancer, severe liver or kidney disease)
- Suspected aortic dissection (including new neurological symptoms)
- Resident of an aged care facility requiring significant assistance with activities of daily living
- Myocardial infarction in the setting of acute trauma

Complications

- Haemorrhage

QAS Approved Autonomous pPCI Hospitals

REGION	PUBLIC HOSPITAL	PRIVATE HOSPITAL
Far Northern	**Cairns Hospital**[a] *(24/7)*	
Northern	**The Townsville University Hospital**[a] *(24/7)*	**Mater Private Pilmico Hospital**[a] *(Mon–Fri 0800–1600 hrs)*
Central	**Mackay Hospital**[a] *(24/7)*	
Darling Downs & South West		**St Andrew's Toowoomba Hospital**[a,b] *(24/7)*
Sunshine Coast & Wide Bay	**Sunshine Coast University Hospital**[a] *(24/7)*	**Buderim Private Hospital**[a] *(24/7)* **Sunshine Coast University Private Hospital (Birtinya)**[a] *(24/7)*
Metro North	**The Prince Charles Hospital**[a] *(24/7)* **The Royal Brisbane & Women's Hospital**[a] *(24/7)*	**St Vincent's Private Hospital Northside** *(24/7)* **The Wesley Hospital**[a] *(24/7)*
Metro South	**Princess Alexandra Hospital**[a] *(24/7)*	**Greenslopes Private Hospital**[a] *(24/7)* **Mater Private Hospital Brisbane**[a] *(24/7)*
Gold Coast	**Gold Coast University Hospital**[a] *(24/7)*	**Gold Coast Private Hospital**[a] *(24/7)* **John Flynn Private Hospital**[a] *(24/7)* **Pindara Private Hospital**[a] *(24/7)*

Note: [a] *Identifies hospitals facilitating direct CCP to interventional cardiologist referral.*

[b] *Will also be accepting PUBLIC patients until further notice.*

Procedure – Autonomous pPCI referral

1. Confirm the patient is indicated for Autonomous pPCI referral, specifically:
   - Patient is located < 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a PCI hospital;
   - GCS = 15;
   - Classic ongoing ischaemic chest pain less than 12 hours in duration;
   - 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** RBBB identified on the 12-Lead ECG.
2. Complete the *Autonomous pPCI Referral Checklist (January, 2020)*.
3. Obtain informed consent from the patient and request the patient sign the *Autonomous pPCI Referral Checklist* prior to any further action.
4. **At the earliest opportunity**, contact the appropriate pPCI facility using the dedicated **QAS pPCI referral line ([redacted])** and ask to speak to the interventional cardiologist. The following narrative is suggested:

   "Can I confirm I have contacted [hospital]? I am an Critical Care Paramedic with the QAS. I have a [XX] year old [gender] located at [suburb] who has had an onset of chest pain at [time] and the 12-Lead ECG is consistent with a(n) [XX] STEMI. The estimated arrival time at your facility is [HH:MM], are you willing to accept this patient for primary PCI"?

5. **If the patient is accepted for pPCI,** confirm with the interventional cardiologist their preferred antiplatelet agent (180 mg ticagrelor **OR** alternative) then administer medications (heparin **AND EITHER** ticagrelor **OR** alternative) in accordance with the *Autonomous pPCI Referral Checklist* and the appropriate QAS DTP.
6. **If the patient is unable to be accepted for pPCI** discuss with the interventional cardiologist, the option of referring the patient to an alternate pPCI facility **OR** administering pre-hospital fibrinolysis.
7. For some cases involving 'hot' STEMI (pain less than 1 hour duration) the interventional cardiologist may request the CCP to administer fibrinolysis in preference to pPCI (Refer to *CPP: Autonomous fibrinolysis administration*).
8. Transport the patient 'Code 1' to hospital ensuring early pre-notification.

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. If doubt exists regarding the suitability of pPCI referral, the Paramedic must exercise extreme caution. If required, the case may be discussed with the appropriate Interventional Cardiologist to determine suitability for pPCI referral.
- Should the QAS pPCI referral line be diverted to a message bank, paramedics are required to leave a brief message regarding an urgent QAS pPCI referral and must leave an appropriate return contact phone number. If the call is not returned promptly, paramedics should make a further attempt to recontact the pPCI facility.
- If contact with the duty interventional cardiologist is unable to be established, for whatever reason, paramedics are required to contact the relevant Emergency Department and advise of a potential pPCI referral.

Additional information *(cont.)*

- If there is any concern regarding the clinical management advice provided by the hospital the QAS on-call Medical Officer must be immediately contacted.
- All public patients with acute STEMI that meet the QAS reperfusion criteria, must be transported to the closest appropriate public hospital pPCI facility.
- Where possible, Paramedics should avoid IV cannulation in the region of the right wrist for those patients accepted for pPCI, to prevent delaying a radial pPCI approach.
- Private patients with acute STEMI must be transported in accordance with the CPP, but every attempt should be made to refer the patient to a private hospital of their choice that has 24/7 pPCI capability. The private hospitals have no fixed geographical boundaries, but time to reperfusion must be a priority. Therefore, the closest private pPCI facility should be chosen where possible.
- Private patients with a history of previous cardiac investigations or interventions should be transported to the hospital of their treating cardiologist where possible.
- 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.**

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 *Autonomous pPCI Referral Checklist, eARF, STEMI Capture Form* and *12-Lead ECG* to:

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

STEMI

Assuming standard cares given

Patient meets pPCI criteria according to the QAS Autonomous pPCI checklist

Patient informed consent obtained for heparin **AND** EITHER ticagrelor **OR** clopidogrel administration

At the earliest opportunity, refer the patient to a pPCI facility ([redacted])

Confirm with the interventional cardiologist their preferred antiplatelet agent (ticagrelor **OR** alternative) and requested heparin dose

Administer medications as per interventional cardiologist's instruction.

Transport code 1 to hospital

Autonomous pPCI Referral Checklist *(January, 2020)*

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

INDICATIONS FOR pPCI REFERRAL – if the answer is NO or UNSURE to ANY of the following, do NOT refer the patient for pPCI and do NOT administer the patient any heparin, ticagrelor or clopidogrel.	**Yes**	**No**	**Unsure**
Located < 60 minutes transport time (from time of first STEMI 12-Lead ECG) to a QAS approved pPCI capable hospital?			
GCS = 15?			
Classic ongoing ischaemic chest pain < 12 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 identified on the 12-Lead ECG?			
CONTRAINDICATIONS FOR pPCI REFERRAL – if the answer is YES or UNSURE to ANY of the following questions, do NOT refer the patient for pPCI and do NOT administer the patient any heparin, ticagrelor or clopidogrel.	**Yes**	**No**	**Unsure**
History of serious systemic disease (e.g. advanced/terminal cancer, severe liver or kidney disease)?			
Suspected aortic dissection (including new neurological symptoms)?			
Resident of an aged care facility requiring significant assistance with activities of daily living?			
Acute myocardial infarction in the setting of trauma?			
ABSOLUTE CONTRAINDICATIONS FOR HEPARIN ADMINISTRATION – if the answer is YES or UNSURE to ANY of the following the patient may still be referred for pPCI however, do NOT administer the patient heparin.	**Yes**	**No**	**Unsure**
Known severe adverse reaction to heparin?			
Patient < 18 years?			
Active bleeding (excluding menses) **OR** clotting disorder (e.g. haemophilia)?			
Prior intracranial haemorrhage?			
Current use of anticoagulants (e.g. apixaban, dabigatran, rivaroxaban, warfarin)?			
RELATIVE CONTRAINDICATIONS FOR HEPARIN ADMINISTRATION – if the answer is YES or UNSURE to ANY of the following the paramedic must consult the interventional cardiologist prior to heparin administration.	**Yes**	**No**	**Unsure**
Uncontrolled hypertension (systolic BP > 180 mmHg **AND/OR** diastolic BP > 110 mmHg at any stage during current acute episode)?			
Known cerebral disease, in particular a malignant intracranial neoplasm **OR** arteriovenous malformation?			
Ischaemic stroke **OR** Transient Ischaemic Attack (TIA) within last 3 months?			
History of significant closed head / facial trauma within last 3 months?			
History of major trauma or surgery (including laser eye surgery) within last 6 weeks?			

Autonomous pPCI Referral Checklist *(continued)*

CONTRAINDICATIONS FOR TICAGRELOR ADMINISTRATION – if the answer is YES or UNSURE to ANY of the following the patient may still be referred for pPCI however, do NOT administer the patient ticagrelor.	**Yes**	**No**	**Unsure**
Known severe adverse reaction to ticagrelor?			
Patient currently taking ticagrelor **OR** clopidogrel?			
Patient < 18 years?			
Active bleeding (excluding menses)?			
Prior intracranial haemorrhage?			
History of hepatic impairment?			
CONTRAINDICATIONS FOR CLOPIDOGREL ADMINISTRATION – if the answer is YES or UNSURE to ANY of the following the patient may still be referred for pPCI however, do NOT administer the patient clopidogrel.	**Yes**	**No**	**Unsure**
Known severe adverse reaction to clopidogrel?			
Patient currently taking clopidogrel **OR** ticagrelor?			
Patient < 18 years?			
Active bleeding (excluding menses)?			
Prior intracranial haemorrhage?			

CONSENT

All patients eligible for Autonomous pPCI Referral **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. I would like to refer you to an interventional cardiologist for a procedure to restore cardiac blood flow. If this procedure is able to be performed the interventional cardiologist may request the following medications be administered with your consent:

- a drug which reduces new clot formation called heparin; **AND**
- either a drug called ticagrelor **OR** clopidogrel which will assist in maintaining cardiac blood flow.

Heparin **AND** either ticagrelor **OR** clopidogrel can cause significant bleeding in a small number of patients however, the use of these drugs is supported by national and international cardiology guidelines.

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 *Autonomous pPCI Referral Checklist* and the patient **has given / has not given** *(circle appropriate response)* consent for the administration of ticagrelor / clopidogrel *(circle appropriate response)* and heparin.

Number		Signature	