



Ambulance Service
of New South Wales

Pre Hospital Thrombolysis

Feasibility Of Field Administration By Paramedics
In Rural And Regional NSW

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Prehospital Thrombolysis

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A clinical imperative in New South Wales



Delivering high quality cardiac health care to the community



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The whole community feels the burden of heart attacks

THE COST OF A HEART ATTACK

Total heart attacks	55,074
Costs (million)	
Direct health care system costs	\$1191
Productivity loss (reduced participation)	\$1254
Productivity loss (premature death)	\$287
Informal care	\$411
Deadweight loss	\$328
Burden of disease (YLD)*	\$719
Burden of disease (YLL)^	\$11,307
Total costs	\$15,497m

Costs per individual attack **\$281 000**

*Years lived with disability

^Years of life lost

Source: Access Economics



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STEMI's happen in the most interesting places



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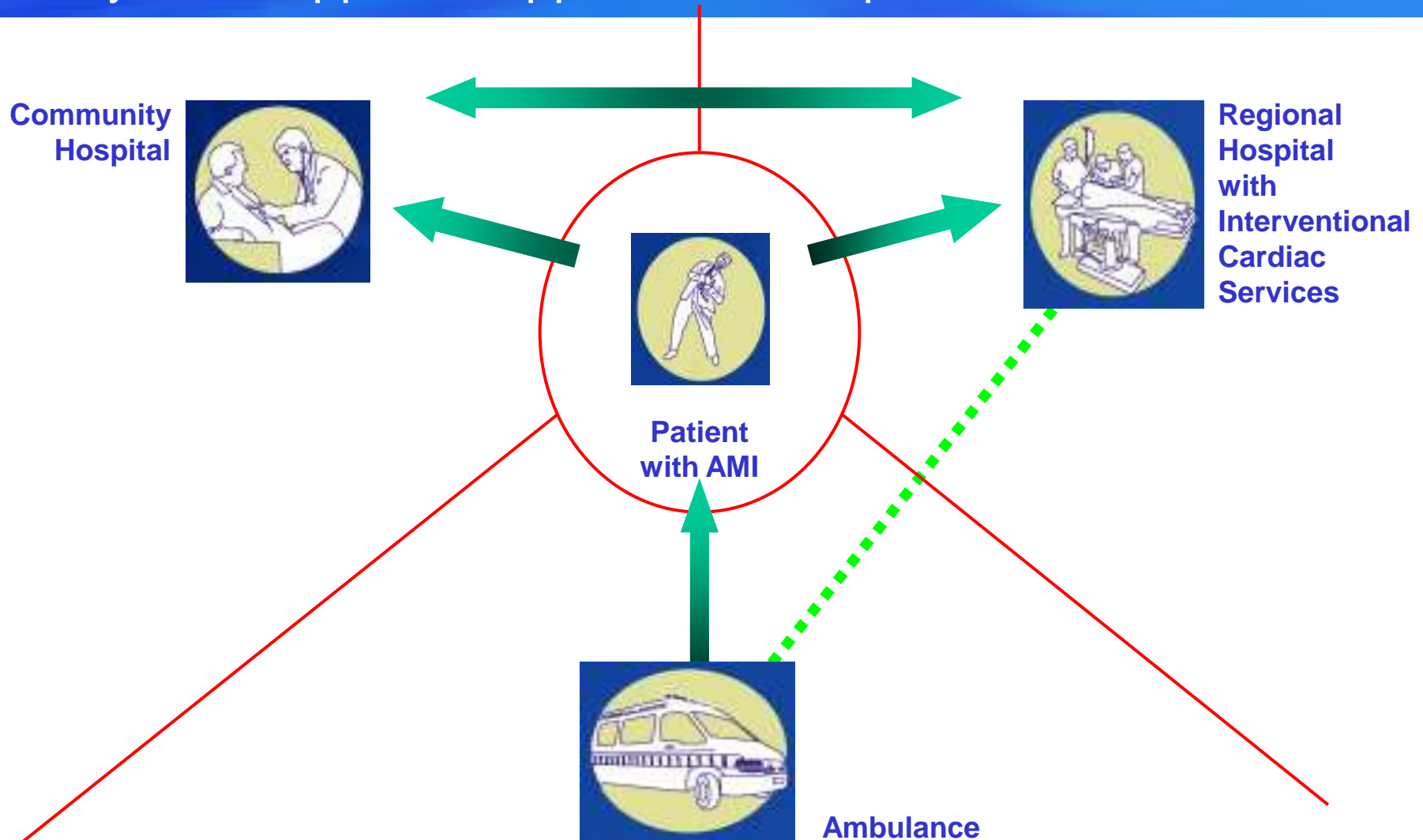
Communicating to reduce the risks



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A system-supported approach to the patient with STEMI



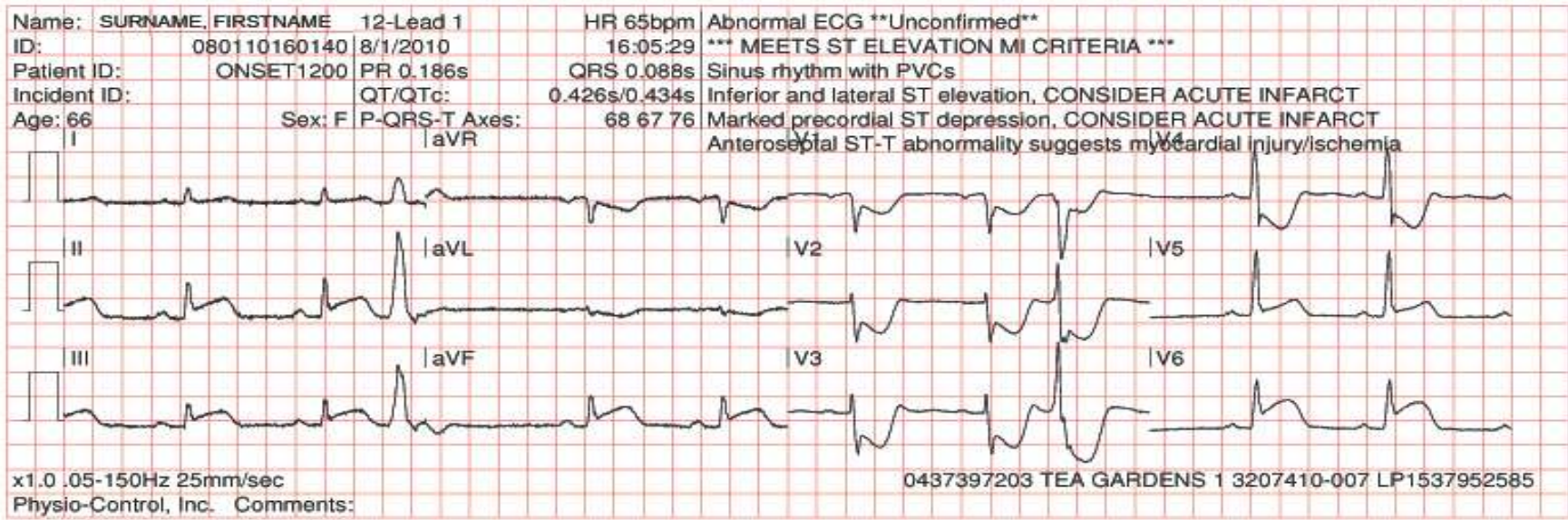
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Diagnostic quality ECG transmission

12-Lead 1

Name:	SURNAME, FIRSTNAME	Device:	LP15 0437397203 LP1537952585
Patient ID:	ONSET1200	Device Configuration:	25B55KKK02558P
Incident ID:		Software Revision:	3207410-007



ST measurements are measured at the J point and are expressed in mm.


I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
0.27	1.75	1.48	-1.01	-0.60	1.62	-2.61	-4.13	-4.71	-3.67	0.86	3.02

To ensure printer accuracy, confirm that the calibration markers are 10mm high and the grid squares are 5mm wide.

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PHT - Checklist and Consent Form

PRE-THROMBOLYSIS CHECKLIST		
		
Patient Health Care Record		Incident Number
Date		Car Number
Patient's Family Name		MI <input type="checkbox"/> Date of Birth
Patient's Given Name		F <input type="checkbox"/> Patient's Middle Name
Patient's Postcode		
Tick the box for a positive response		Comments
1	ST Elevation myocardial infarction has been identified by the central decision making point from your transmitted 12 Lead ECG.	<input type="checkbox"/>
2	The patient is conscious and orientated to time, place and person.	<input type="checkbox"/>
3	The patient has confirmed that the symptoms started less than 6 hours ago.	<input type="checkbox"/>
4	Pulse rate more than 50 bpm and less than 150 bpm. Systolic BP less than 180mmHg and Diastolic BP less than 110mmHg	<input type="checkbox"/>
5	The patient has confirmed that they have not had a previous diagnosed allergy, hypersensitivity or adverse reaction to clot dissolving drugs, such as Metalyse or to heparin and clexane.	<input type="checkbox"/>
6	The patient has complained of non-traumatic chest pain or other symptoms consistent with acute coronary syndrome / myocardial infarction	<input type="checkbox"/>
7	The patient has confirmed that she is not pregnant, nor has given birth within the last two weeks.	<input type="checkbox"/>
8	The patient has confirmed that they have not had a bleeding gastric ulcer within the last 6 months.	<input type="checkbox"/>
9	The patient has confirmed that they have not had a stroke of any sort including TIAs within the last 12 months and does not have a permanent disability from a previous stroke.	<input type="checkbox"/>
10	The patient has confirmed that they do not have an active or suspected bleeding or known bleeding tendency and has not had recent blood loss (except for normal menstruation).	<input type="checkbox"/>
11	The patient has confirmed that they are not taking warfarin (coumadin) or any other anticoagulant therapy.	<input type="checkbox"/>
12	The patient has confirmed that they have not had any surgical operation, tooth extractions, significant trauma requiring hospital admission or head injury within the last 4 weeks.	<input type="checkbox"/>
13	The patient has confirmed that they have not been treated recently for any serious head or brain condition, including cerebral tumor/s.	<input type="checkbox"/>
14	The patient has confirmed that they do not have a confirmed diagnosis of liver failure or renal failure.	<input type="checkbox"/>

DO NOT initiate the Thrombolysis Procedure unless all 14 boxes are ticked

PROVISION OF INFORMATION TO PATIENT - to be read to the patient exactly as stated

Your ECG (heart tracing), has been transmitted to a Senior Heart Specialist at John Hunter Hospital who has identified that you are suffering from a heart attack. Your treatment options include a clot busting drug TENECTEPLASE and a drug that reduces new clot formation called ENOXAPARIN.

The sooner you receive these drugs, the lower your risk of dying from this heart attack – which is why doctors recommend that the treatment is started as soon as possible.

The likely benefits of using these drugs are much greater than the risks.

Treatment at this stage improves the chances of surviving by approximately 25% but it can sometimes cause serious side effects. The biggest risk is potentially life-threatening stroke which affects up to 2 patients in every 100 patients. Significant bleeding which is not normally life threatening can occur in about 4 in 100 patients. Some patients also have allergic reactions and other side effects that do not usually cause any major problem.

PATIENT CONSENT

- > The paramedic has advised me that I am having a heart attack and has read the information above to me.
- > I understand that I will be given an injection of a clot dissolving drug and that this treatment carries some risks as described in the information above.
- > I request and consent to the treatment described above for me.

We wish to follow your progress. To do this we will require access to your hospital record for information relating to this procedure and HNEAHS may also wish to contact you. Your information will be kept strictly confidential.

- > I give permission for the Ambulance Service of New South Wales to access my hospital record for information relating to this procedure and I agree to be contacted. I understand that I can withdraw my permission at any time.

Patient Consent Signature (Patient/Guardian) SIGNATURE

Patient Decline Signature (Patient/Guardian) SIGNATURE

PARAMEDIC DECLARATION

I, Paramedic: have read the information above to the patient which informs the patient of their condition, the treatment offered and the material risks of receiving the thrombolysis treatment.

Paramedic Signature SIGNATURE Employee No.

Time of Administration DATE TIME

Receiving Hospital Handover Signature PRINT NAME SIGNATURE

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Cardiac Reperfusion - Pre Hospital Thrombolysis



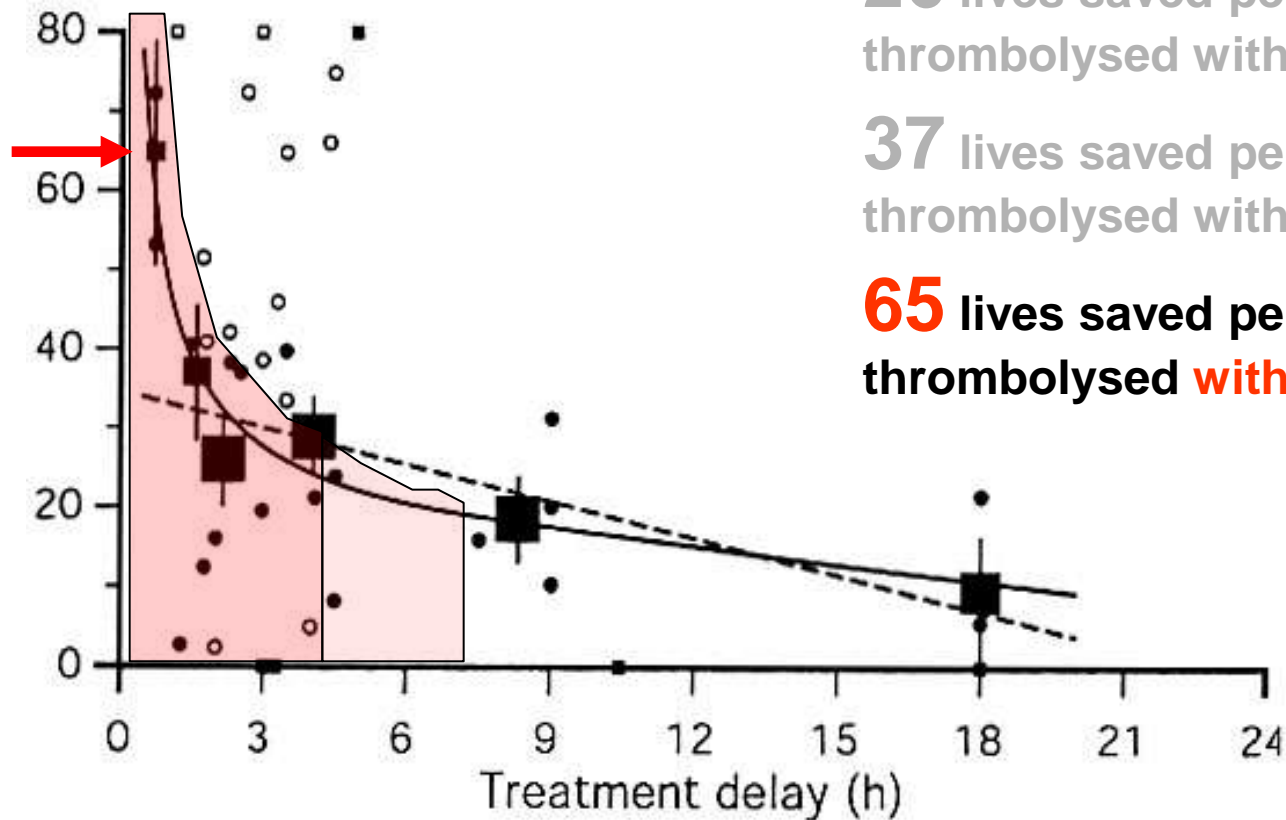
Aims

To deliver high quality cardiac health care to the community

- To develop an approach to pre-hospital thrombolysis in rural and regional NSW including issues of technology, communications, service development and workforce.

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26 lives saved per 1000 when thrombolysed within 3 hours

37 lives saved per 1000 when thrombolysed within 2 hours

65 lives saved per 1000 when thrombolysed **within 1 hour**

Absolute 35-day mortality reduction per 1000 treated

Boersma et al. *Lancet*; 1996;348(9030):771-5

PHT - A proof of concept within the HNEAHS

The proof of concept was implemented in July 2008

- The proof of concept is not a clinical trial
- Testing our ability to implement a proven intervention into clinical practice and protocols of NSW Ambulance
- **14** communities in a rural and a regional centre in NSW
- Selected locations based on:
 - challenged local medical resources
 - poor telecommunication infrastructure
 - rural area with regional cardiology centre within AHS

Proof of Concept Overview

- **Total transmissions to date: 925**
- **Number of confirmed STEMIs: 94**
- **Patients thrombolysed to date: 58**
- **Median time saved to thrombolysis: 100 minutes**
- **Median 12-lead ECG to Thrombolysis: 17 minutes**
- **Thrombolysis < 60 minutes from symptom onset: 26.8%**
- **Thrombolysis < 120 minutes from symptom onset: 73.2%**
- **Median time spent on scene: 25 minutes**
- **Median age of patient: 63 years**
- **Youngest patient: 37 years**

Project objectives and evaluation

- ❑ Eight project objectives (38 specific elements) testing our capacity to incorporate the proven clinical intervention into the pre-hospital operational setting
- ✓ Education of paramedics in acquisition and transmission of 12 lead ECGs
- ✓ Education of paramedics in patient assessment, clinical decision making and clinical practice to support the administration of thrombolytics and anticoagulants
- ✓ Arrangements at the cardiology service to provide 12 lead ECG interpretation and thrombolysis decision support

Project objectives and evaluation

- ✓ Technology and telecommunications required to support the project
- ✓ Clinical governance arrangements needed to deliver and monitor the project
- ✓ Quality systems and data collections required to support the project
- ✓ Appropriate whole of health clinical and operational performance indicators
- ✓ Requirements for the evaluation of the intervention

PHT - A multidisciplinary project perspective

“This project has been personally very rewarding. I am enjoying the hands on involvement with the ambulance paramedics”

Cardiologist

“This project is a significant step forward in multidisciplinary and interagency collaboration which is improving patient care and outcome”

Clinical Nurse Consultant

“The paramedics are very keen to see this project work for their own professional satisfaction but more importantly, for their community.”

Paramedic

“I thought there were 2 paramedics looking after me. I was amazed to find out how many people were working behind the scenes, preparing for my arrival at hospital. It made me feel very special.”

Patient

Strategic Importance

- The project addresses the problem of ST Elevation Myocardial Infarction (STEMI), a time-critical and life-threatening condition.
- Early access to cardiac reperfusion improves the patient outcomes for STEMI patients.
- For rural communities the most practicable reperfusion treatment is early administration of thrombolytic therapy.
- Paramedics are well positioned to deliver thrombolysis judiciously and appropriately, closest to symptom onset
- Patients, once thrombolysed, are taken to the most appropriate hospital and the cardiology referral system if needed is switched ON.

Conclusions

- Advanced cardiac reperfusion treatments can be afforded to patients with acute STEMI as soon as possible, and as safely as possible when supported by an integrated health care system
- The proof of concept approach enables an evidence based intervention to be trialled in a new setting
- The use of innovative technology in the pre-hospital area of patient care supports clinician decision making in high acuity cardiac events and this application may be valuable in rural health facilities

Transferability and Future Scope

- Demonstrated methodology for attaining coordination of pre-hospital and hospital care for a complex, life-threatening condition
- Methods used in this phase will be used in each geographic region as it comes on line
- Using a whole-of-health approach, and the joint identification of practical objectives
- Demonstrated teamwork and openness with which clinicians share experiences and develop improvement strategies irrespective of their role in the health care system



AMBULANCE

SERVICE

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