

THE 'PIT STOP' APPROACH TO THROMBOLYSIS

Ajith George MBBS

Ajith George is a staff grade in the Accident & Emergency (A&E) department at Furness General Hospital (FGH). Here he describes setting up a team to handle the arrival of patients with clinically obvious myocardial infarctions (MIs).

At FGH A&E we have achieved a remarkable reduction in door-to-needle times for clinically obvious MIs by adopting a team approach involving pre-hospital staff, receptionists, nurses, electrocardiograph (ECG) technicians and doctors.

BACKGROUND

As a Senior House Officer (SHO) working at Hope Hospital in 2000, I witnessed my consultant thrombolyse a patient within five minutes of arrival. He had established an advance call procedure with the paramedics. A call was received from paramedics about a patient with MI-type chest pain with ST elevation on monitor. He asked for the ECG machine and thrombolytic drugs to be kept ready before the patient arrived, relying on the judgement of the paramedics. This meant that as soon as the patient arrived the drug was ready to be given (provided there were no contraindications) before being booked into A&E.

Though at FGH we have not yet beaten this time in door-to-needle thrombolysis, we have shown that we can consistently thrombolyse clinically obvious MIs within 20 minutes of arrival, by adopting the team approach.

THE TEAM APPROACH

When I came to FGH in 2001, thrombolysis was carried out in the coronary care unit (CCU), which meant that the patient went straight to CCU from A&E. At this time our average door-to-needle time was 45 minutes.

At a meeting involving critical care and cardiology clinicians, and critical care and medicine managers it was decided that tenecteplase (TNK) and streptokinase were to be used for thrombolysis, depending on guidelines, and to use radio clocks to record the times. TNK is as effective as the drug it replaced, TPA (rt-PA, ie tissue plasminogen activator), and can be constituted and given to a patient in less than two minutes using a single injection. TPA on the other hand takes longer to be drawn up because it has to be administered by infusion pump and be given over one hour. I was given the opportunity to come up with ideas to improve our door-to-needle times and implement change in the patient flow system in A&E.

I decided that a team approach similar to that in a trauma or arrest team would cut down door-to-needle times. It would ensure a parallel approach with staff treating the patient simultaneously, rather than a vertical approach.

I now had to identify and assemble a team to be ready for

the patient and able to work together in the way that a Formula One pit stop team works.

THE TEAM

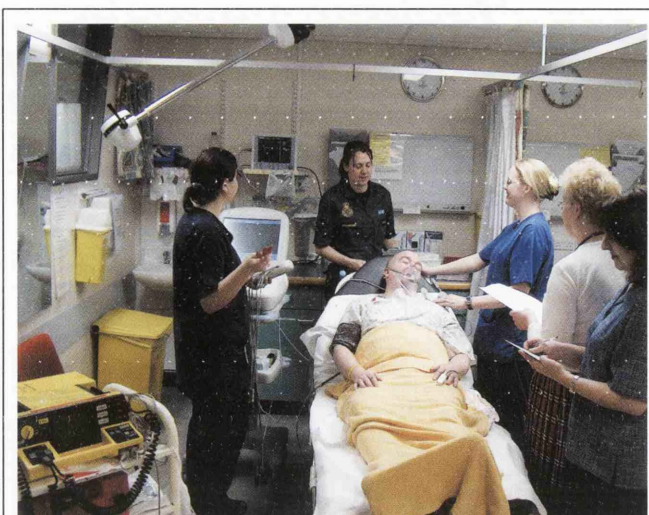
Receptionist	– to book in the patient
Nurse	– to record observations and prepare drugs
ECG technician or nurse	– to run an ECG
A&E doctor	– to take history, examine, rule out contraindications and thrombolyse
Medical SHO or medical registrar	– for help if needed

Nick Smith of the Cumbria Ambulance Service helped to set up the pre-hospital advance call procedure and a notice was sent to pre-hospital care staff to help them to explain to the patient that a team of medical staff would care for the patient on arrival.

The lead nurse for thrombolysis in A&E, Sr Judith Freeland, trains nursing staff and SHOs. She repeats the training on a regular basis to ensure that staff are familiar with the procedure. It is her hard work and repeated training that has helped to get our changes in procedure implemented.

Alison Croft in our ECG department agreed to set up a two-bleep system for the technicians. They carry an emergency bleep to which they respond by coming straight to A&E where they wait for the arrival of the patient.

With this system, a patient arriving by ambulance with chest pain typical of MI is greeted by a nurse, receptionist, ECG technician, an A&E doctor and possibly a medical SHO or registrar. The team assembles in the allocated cubicle with the thrombolytic drugs before the patient arrives.



*The team. This photograph was taken at 18:00 hours so instead of an ECG technician there is an additional nurse to do the ECG.
The 'patient' is a staff nurse*

Everything needed for delivering or reconstituting the thrombolytic drugs, such as the needle and syringes, are kept together in a kit.

Once the patient arrives the following happen simultaneously:

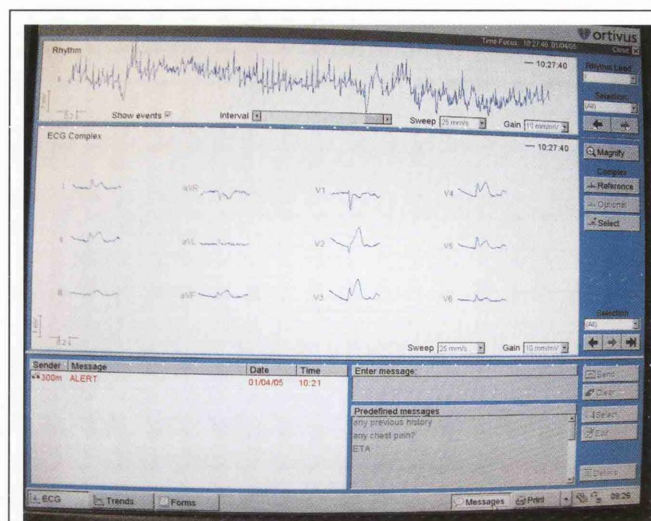
- *receptionist* talks to one of the paramedics (driver) to get patient details to book in the patient
- *nurse* puts patient on oxygen, sites BP cuff on one arm to record BP, measures the oxygen saturation (Sp O₂) and helps the ECG technician to record ECG
- *paramedic* hands over to doctor, who takes a brief history, goes through the list of contraindications, examines the patient and gives analgesia, aspirin and glyceryl trinitrate (GTN) if not already given

There is a brief pause whilst the ECG technician gets a good tracing. As soon as the ECG tracing is printed the nurse puts the BP cuff on the patient's other arm and sets the machine to record BP every five minutes. If the trace shows an MI, the relevant thrombolytic drug is chosen. The doctor consents the patient and sites a second cannula or takes blood for investigations while the nurse draws up the drug. Observations are recorded every five minutes during and after thrombolysis. The patient is transferred to CCU if stable after 15 minutes of thrombolysis, accompanied by a nurse trained in advanced life support (ALS) techniques, a defibrillator and a monitor.

If a patient self-presents to A&E, the reception staff take the patient straight in to the nurse in charge who then assesses the patient. If an MI-type chest pain is identified the team is quickly assembled and the nurse does the ECG.

Our audit form for door-to-needle times doubles as a guidance leaflet for the procedures described and contains a list of contraindications and methods of drug reconstitution with doses. This audit form is kept with the drug kits.

On board the ambulance is a MOBIMED machine, which can transmit data including an ECG trace, blood pressure, heart rate, Glasgow Coma Scale, trends on variables such as O₂ saturation, and an alphanumeric message. At FGH the receiver is kept in A&E; at Westmorland General Hospital it is in the CCU. We can communicate via text messages to the

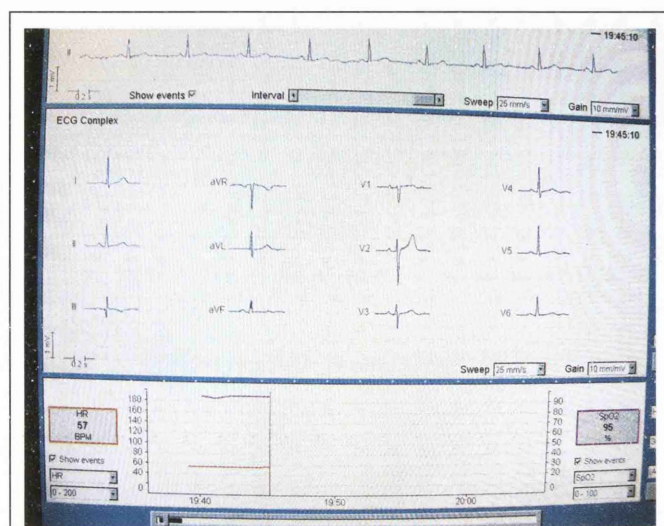


This screen displays a clinically obvious MI. The bottom part of the screen shows the message area where the team can exchange text messages with the ambulance crew

paramedics in the ambulance while it is on the scene or moving, and at the same time view a live ECG trace. The information is refreshed every minute so changes in ST elevation, rhythm changes and vital signs can be monitored and compared in real time. The system also gives patient details and date of birth, which makes it possible for the reception staff to get the patient's notes and generate the casualty card before the patient arrives. All the information transmitted is stored and can be printed out. This means that there is less potential for error than in a telephone conversation exchanging the same information.

MONTH	RLI			FGH		
	Carried out	Eligible	%	Carried out	Eligible	%
Oct-03	3	7	43	4	4	100
Nov-03	3	6	50	1	1	100
Dec-03	3	6	50	2	2	100
Jan-04	—	—	—	4	4	100
Feb-04	0	2	0	—	—	—
Mar-04	3	4	75	4	4	100
Apr-04	1	4	25	2	2	100
May-04	4	8	50	1	1	100
Jun-04	2	4	50	—	—	—
TOTALS	19	41	46	18	18	100

Numbers of eligible v. carried out within 20 minutes of arrival incidences of thrombolysis at the A&E departments of the Royal Lancaster Infirmary (RLI) and Furness General Hospital (FGH)



MOBIMED data received at FGH. The bottom part of the screen shows SpO₂ and heart rate

The door-to-needle time has been dramatically shortened by this change in patient flow procedure. It would be shortened further if TNK were used for all thrombolysis as it takes about five minutes to set up a streptokinase infusion. An audit done on door-to-needle times for clinically obvious MIs between August and December 2003 showed that we thrombolysed 80% of patients within 20 minutes. It also showed that we received an advance call or MOBIMED transmission for 67% of patients brought in with MI-type chest pains during this period. This needs to become 100%.

Our latest figures compiled by the Emergency Services Collaborative Manager show that thrombolysis was performed on 18 clinically obvious MIs in FGH A&E between October 2003 and June 2004 and that in all of them (ie 100%) thrombolysis was carried out within 20 minutes.

CONCLUSION

No change in procedures is possible without the motivation and enthusiasm of all staff involved. The team approach to thrombolysis works because all the staff involved make it work.

The team approach to thrombolysis is mentioned in the Oxford Handbook of Accident and Emergency Medicine in

the section on the treatment of MI. I believe that our patient flow procedures, equipment, and set-up can easily be adopted by other A&E departments across the country.

Finally, it should be emphasised that this treatment is designed for use where the diagnosis on clinical and electrocardiographic grounds is obvious. It is not intended as a substitute for further investigation and appropriately timed treatment if the initial diagnosis is in doubt.

NEWS & NOTES

APPOINTMENTS

Dr Alison Napier has taken over the role of Speciality Tutor for Psychiatry, Lancaster and Kendal Hospitals, from Dr L Ashworth. (From 1 February 2005.)

Dr Richard Neary, Consultant Chemical Pathologist, has taken up post from 1st December 2004. He is based at the RLI and can be contacted on ext. 3754 (Sec. ext 3751).

Dr Peter Nightingale appointed as S M Meiemillau Facilitator (St John's Hospice) – to foster interest in and knowledge of palliative care in Lancaster and Morecambe. Starting 1st August 2005.

NOTES

ST JOHN'S HOSPICE

Arrangements to train SpRs in palliative medicine start in May 2005.

WEDNESDAY LECTURE PROGRAMME EDUCATION CENTRE, RLI

Every Wednesday from 1:00pm to 2:00pm, with lunch at 12:30pm.

Please note – there will be no lectures in July and August. The programme resumes in September.

6th ENT study Half-Day

Organised by Mr M Baraka
Consultant Surgeon ENT
Royal Lancaster Infirmary

A decade of experience in paediatric otolaryngology

With guest speaker
Mr Ray Clarke
Consultant in Paediatric ENT
Alder Hey Hospital
Liverpool

Provisional date for your diary 6th November 2005