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Clinical update



Cardiac arrest survival 15.2%

In 2008/09 10,051 cardiac arrests were attended by the Service, 5,910 (58.8%) were beyond any resuscitation attempt on arrival of the ambulance personnel. Crews commenced resuscitation for 4,141(41.2%) patients. Over one quarter of patients (28%; n=925) were reported to have achieved a return of spontaneous circulation (ROSC) at some point during their treatment by the Service. **LAS Utstein survival rate for 2008/09 was 15.2 per cent.** The Utstein calculation is the number of patients discharged alive divided by the number of patients who had resuscitation attempted following a cardiac arrest of a presumed cardiac aetiology, where the arrest was bystander witnessed and the initial rhythm was VF or VT. This is an internationally validated method for calculating out-of-hospital cardiac arrest survival rates that enables comparisons between services. The overall survival rate is based on all patients who had resuscitation commenced by the Service following an out-of-hospital cardiac arrest of a presumed cardiac cause. **The overall survival rate for 2008/09 was 5.6 per cent.**

¹ Cummins RO, Chamberlain DA, Abramson NS et al. Recommended Guidelines for Uniform Reporting of Data from Out-Of-Hospital Cardiac Arrest: The Utstein Style. *Annals of Emergency Medicine*, 1991; 20: 861-873.

Have You Seen!

Medical Directors Bulletin

Norovirus (winter vomiting)
22/01/2010

Loss of Morphine Ampoules
08/01/2010

Contaminated Heroin
18/12/2009

Transport of Patients Connected to Intra Aortic Balloon Pump
09/12/2009

Wound closure

We understand that a very small minority of staff may be performing wound closure – steri-strips, gluing or suturing in the community without any London Ambulance Service recognised training, supervision or governance.

Patients must be referred to either suitably **trained ECPs (or CRU at Heathrow) who are currently the only service staff allowed to undertake wound closure**, or conveyed to their local minor injury unit, or other suitable alternative care pathway or emergency department. The value of good basic wound care and an appropriate referral, can not be overstated.

Flu

The National Pandemic Flu Line was turned off on 1 February. If you need to refer a patient with flu-like symptoms who you feel can be safely managed in the community, then consider referring them to their GP. The community assessment tool can still be used to assist staff when determining if a patient is safe to be referred or conveyed. The current levels of both swine flu and seasonal flu are low. Remember that multiple serious conditions can present with flu-like symptoms at first, eg meningococcal disease.



An increased pulse rate - a cause for concern or not?

An ambulance crew are called to attend a 20-year-old female who has been unwell for four days with a cough and flu like symptoms. The patient was seen by her GP two days ago and prescribed oral antibiotics but the patient has continued to get worse and an ambulance was called by the family.

Respiratory Rate	22
Pulse Rate	138
Blood Pressure	110/64
Temperature	37.9
GCS	E4, V5, M6
Capillary Blood Glucose	8.2

Past Medical History
Recent Miscarriage
Drug History
Taken two amoxicillin tablets
Over the counter Cold & Flu
Tablets
Allergies
Nil known

- Patient alert orientated.
- No obvious shortness of breath.
- Patient has productive cough for three days with yellow sputum.
- Complains generalised tight feeling in chest when coughs.
- Patient complains of fever and feeling generally weak.

The crew advised the patient to see her GP if the antibiotics do not work in a couple of days

This is an example of the type of cases that the Medical Directorate is asked to comment on. **This patient developed respiratory sepsis and was “blued” into hospital but died 24 hours after the initial call.**

The question that has to be asked is, were there any features within the initial call which would suggest that this patient was significantly unwell?

Of note in the patient’s observations is a slightly increased temperature; however the patient has been taking paracetamol which may have reduced their temperature. She also has an increased respiratory rate. However, the most obvious abnormality is the markedly increased pulse rate which demonstrates a significant physiological response and points towards a notable underlying pathology.

A patient’s observations provide a cornerstone to patient assessment and their importance should not be underestimated when deciding the most appropriate pathway. Even a slightly increased heart rate (tachycardia) can be a response to significant illness and should not be disregarded as “just a high pulse rate”.

There are numerous physiological changes that can increase the heart rate from hypoxia to infection and from drug toxicity to pain. An increased heart rate is a significant finding and its seriousness should not be underestimated when assessing a patient.

Cause of an increased heart rate

- Exercise or exertion
- Fever/Sepsis
- Blood loss
- Dehydration
- Hypoxia
- Pain
- Arrhythmias
- High blood pressure
- Low blood pressure
- Congestive cardiac failure
- Drugs & medications
- Anaemia
- Hyperthyroidism
- Kidney disease
- Liver disease
- Cancer
- Potassium deficiency
- Cardiomyopathy
- Vitamin B deficiency
- Anxiety
- Large meal

Remember

- Any patient who has a marked tachycardia (or bradycardia) should have a 12 lead ECG to rule out a arrhythmia.
- Always consider making a direct referral to another health care professional rather than asking the patient to do so. This can be done through EOC.
- The community assessment tool would indicate in this case that the patient should be conveyed to hospital

Major trauma

The case for change

The clinical evidence behind plans for new trauma services is clear – care of major trauma patients in the UK, and in London, compares poorly with other countries. With the current system the majority of people who have a major trauma injury are taken to their local hospital often assessed by a junior clinician. A number of trauma patients end up being transferred because their local hospital is unable to provide the expert care.

Major trauma patients tend to have multiple and complex injuries, which local hospitals deal with, on average, just once a week. Across the UK, the standard of care delivered to the majority of trauma patients has shown to be sub-standard. The *National Confidential Enquiry into Patient Outcome and Death "Trauma Who Cares"* noted a lack of appreciation of severity of illness, incorrect clinical decision-making and a lack of experienced evening staff in some hospitals.

A 2006 article published in the *New England Journal of Medicine* compared outcomes for patients treated in major trauma centres with those treated in the local hospitals and found a 25 per cent decrease in death rates among the patients who received specialist care¹. A study in Florida to determine the effectiveness of trauma centre care in a well-established trauma system, compared road accident death rates in counties with a trauma centre to those without a trauma centre. It was found that counties with trauma centre had 50 per cent less deaths¹.

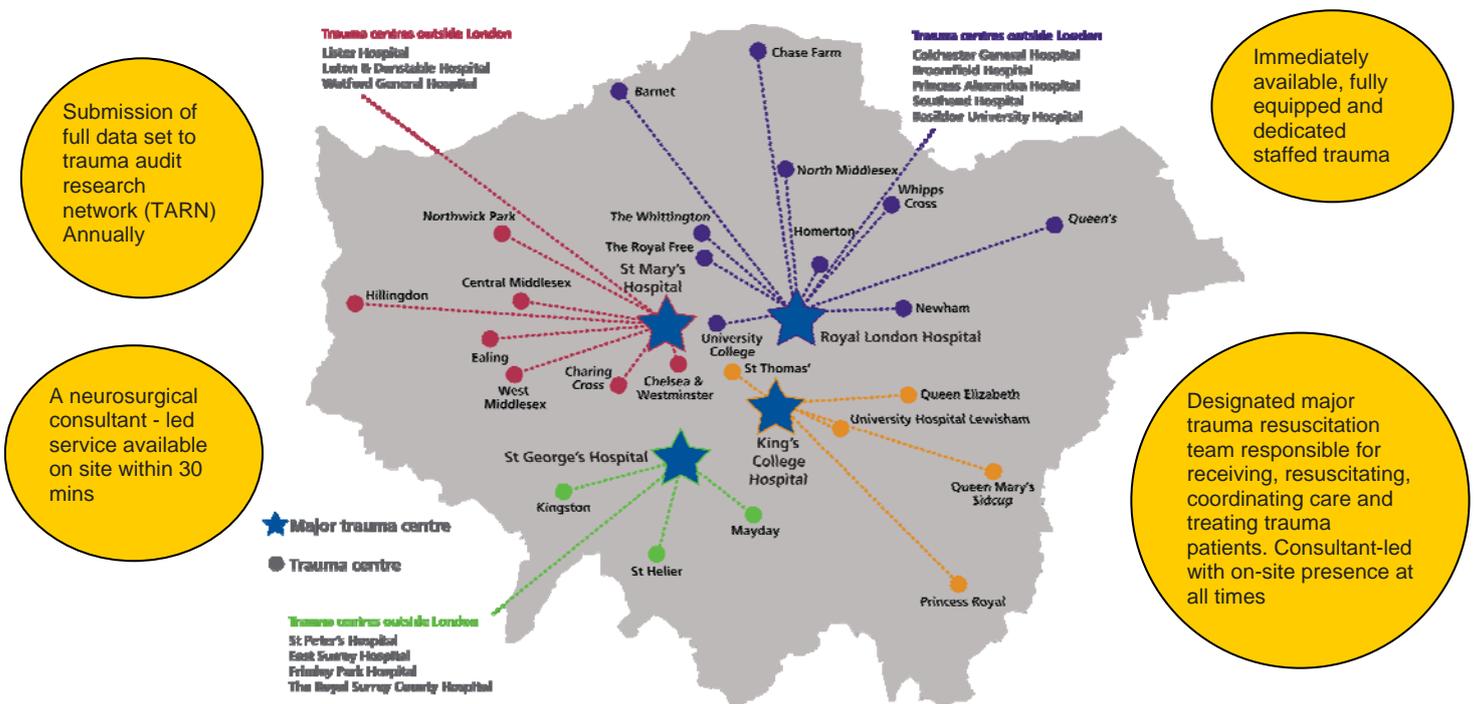
There are about 1,600 major trauma cases each year in London – or on average one patient per hospital each week (0.1 per cent of all A&E cases). Most of these cases occur in central London. Major trauma patients often have complex injuries and need expert care to have the best chance of surviving and recovering. Few of London's hospitals are set up to provide highly specialised care for major trauma patients, and services are often poorly co-ordinated. The best evidence shows that dedicated major trauma centres with expert teams of professionals can save more lives. Full copies of both the cardiac arrest and STEMI report is available (X:\Clinical Audit & Research Unit\Cardiac Reports\Annual Reports\Cardiac Arrest Annual Reports

¹ MacKenzie EJ, Rivara FP, Jurkovich GJ, et al. N Engl J Med. "A national evaluation of the effect of trauma-center care on mortality". 2006 Jan 26;354(4):366-78

² Durham R, Pracht E, Orban B, et al. Evaluation of a mature trauma system. Ann Surg 2006; 243:775-783

So what's new?

The new London trauma system will comprise of four trauma **networks** to give injured patients direct access to dedicated specialists and treatment. Each network will have a **major trauma centre** providing immediate treatment to people with the most serious injuries. Each major trauma centre and network has undergone a complex designation process. Below are some examples of the designation criteria for a major trauma centre.

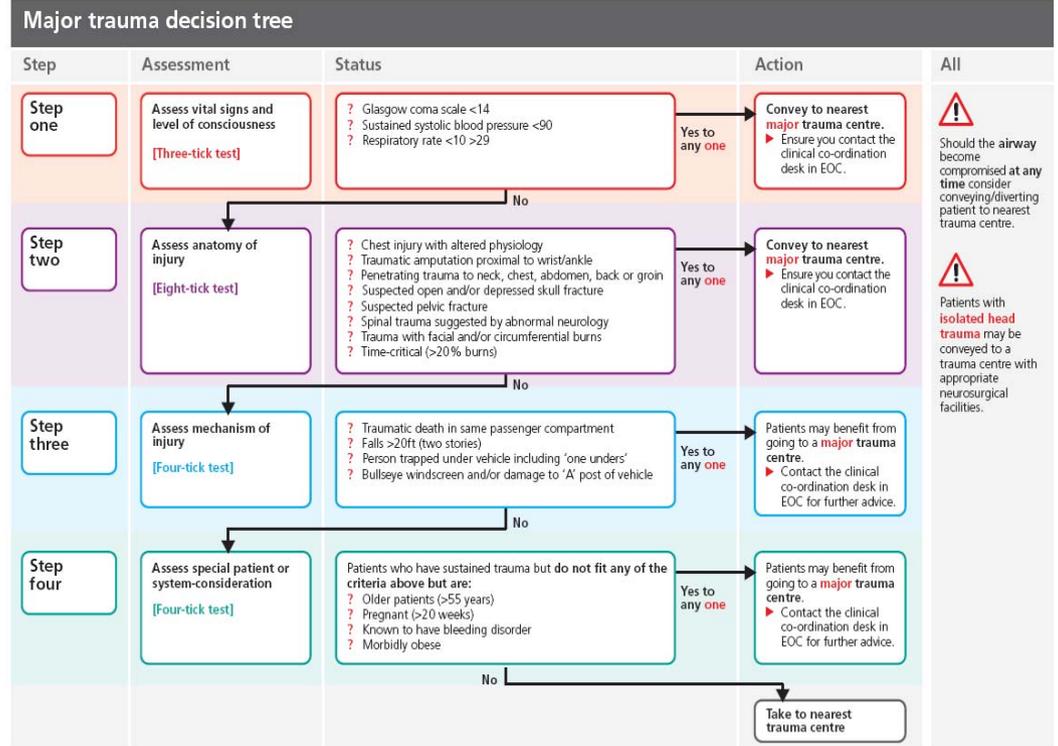


Which patients will go to a major trauma centre?

The London Ambulance and The Pre Hospital Care Committee from Healthcare for London have designed a triage tool which will determine which patients should be taken direct to a major trauma centres. This has been adapted from the American College of Surgeons Committee on Trauma Guidance.

This tool is designed to be both sensitive and specific to major trauma and aims to ensure that major trauma patients are taken direct to a major trauma centre without overwhelming them with other patients who can be appropriately managed by their local trauma unit.

The tool is designed to be applied in the context of major trauma and should not be applied to patients where the mechanism does not indicate a major traumatic injury eg tripped over the kerb.



Paediatric major trauma

All children who have suffered major trauma indicated by either their clinical presentation or mechanism of injury should be conveyed direct to a major trauma centre. Remember that apparently stable children can compensate very well for serious injuries and can deteriorate alarmingly quickly. Minimise on-scene time and remember. The clinical coordination desk will be able to provide advice and support around conveying paediatric major trauma.

The clinical coordination desk

The clinical coordination desk (CCD) brings together the existing HEMS desk and the clinical support desk in EOC and an EOC allocator. The CCD will coordinate the triage for severely injured and ill patients, ensuring the most appropriate resources are deployed to the scene and help ensure the patient is conveyed to the most appropriate hospital. As well as major trauma the clinical coordination desk will develop to monitor and manage the flow of stroke and obstetrics patients.

The CCD will also aim to ensure that no one centre is overloaded with patients which will mean that sometimes crews will be asked to convey patients to a different centre to the one they would usually travel to. This way the patient receives optimal care by not arriving at an already overloaded centre. This will occur in areas that fall roughly between two major trauma centres.

The CCD will be able to support crews with decisions around which patients should be conveyed direct to a major trauma centre. The CCD will coordinate the dispatch of HEMS and the London BASICS doctors as well as continuing to provide the advice and support for crews as the clinical support desk has in the past.

It is essential that clinical coordination desk is contacted for all patients who a crew are considering taking to a major trauma centre even if they are within the normal catchment of that hospital.

Airway management in trauma a LIFESAVING skill



The patient with a compromised airway following serious trauma is perhaps one of the biggest challenges in pre-hospital care but a challenge that can often be overcome with the simplest of intervention. Always think is the airway open, maintained and protected and am I maximising oxygenation

Airway options – use a stepwise approach to managing the trauma airway

- Lateral position allows free drainage of fluids from the mouth and nose (although can be difficult with C Spine protection)
- Gentle, directed suction
- Nasopharyngeal tubes **can** be used in the patient with a head injury and are an excellent way of getting past trismus (clenched teeth) and allowing suction of the back of the mouth.
- Oropharyngeal tubes – but only if the patient has no gag reflex; remember to size them correctly
- LMAs are a good option in the trapped patient, but remember that forcing one in to a patient who still has a gag reflex could induce vomiting, a rise in intracranial pressure and make the patient more agitated
- Intubation – this is impossible if the patient a gag reflex, and even then can be very challenging. RSI – anaesthetising the patient to secure a definitive airway is often the best option, but is not without risk. HEMS and some BASICS doctors may be able to undertake this, so consider getting them involved very early.

If you are still unable to manage the patient's airway safely, you should divert to the nearest trauma unit so that this can be stabilised, before the patient is moved to a major trauma centre.



Major trauma centre questions & answers

When do we start taking patients to major trauma centres?

The South West (St George's), South East (King's College) North East (Royal London) Trauma networks will go live on 6 of April and will start to accept major trauma patients but remember to phone the clinical coordination desk prior to going to a major trauma centre. The North West (Imperial Mary's Site) network will go live in October 2010.

What will happen in North West London until October?

Patients with a major isolated head injury should be taken to Charing Cross or the Royal Free. Patients with a major chest injury should be taken to St Mary's. All other major trauma patients should be taken to their nearest major trauma centre. The clinical coordination desk will be able to help with this.

Can we start taking major trauma patients to the major trauma centres now?

No! The major trauma centres are not funded to accept additional patients until their go live dates.

Where can we find out more information?

Team leaders, Training officers or The Medical Directorate will be able to help.

What about patients with an isolated head injury?

If a major trauma patient (according to the decision tree) appears to have an isolated head injury, they can be conveyed to one of the three trauma units with a neurosurgical facilities.

- Royal Free Hospital
- Queen's Hospital Romford
- Charing Cross Hospital

if they are nearer to the neurosurgical hospitals rather than the major trauma centre. Again, remember to contact the clinical coordination desk prior to conveying the patient.

Will HEMS still be available?

YES. London HEMS is key part of the London trauma system along with the Service. HEMS will be available and their operating hours in the cars are being extended remember there are also BASICS doctors to assist.

What about major incidents?

The London trauma system should offer increased resilience in a major incident and the Emergency Planning Unit, Medical Directorate and the London Trauma Office are working together to ensure systems are in place that the most appropriate patients are taken to a major trauma centre in a major incident.

How many patients a day will go to major trauma centres in London?

Major trauma is a rare event and we estimate that around six patients a day will be taken to major trauma centres by the Service or HEMS.

Stroke

Stroke remains a major cause of death and disability. It is estimated that 11,500 people suffer a stroke in London every year. There are approximately 2,000 deaths as a result of stroke. Strokes are more common in older people, and 85 per cent arise when a blood clot occludes the supply of blood to an area of the brain (an ischemic stroke).

The major determinant for stroke is age and for this reason incidence is highest around the periphery of London where there is a relatively older population (see map below).

Healthcare for London is changing the way strokes are managed. Patients will now be taken directly to a hyper-acute stroke unit (HASU) for assessment possible thrombolysis aggressive treatment and then will be repatriated back to their local unit at 72 hours.

The three-hour time-limit

Evidence suggests that thrombolysis is most effective if given within three hours of the onset of the symptoms. Because of this, patients with symptoms less than three hours old are taken to a HASU as soon as possible, with a pre-alert so that the stroke team are ready and waiting when you arrive. Some units are running trials to establish whether thrombolysis is effective within much wider time windows. This work, along with the huge benefits of early specialist assessment means that in future any patient with a new stroke will still be taken to a HASU, even if they may be outside the current three-hour window for thrombolysis.

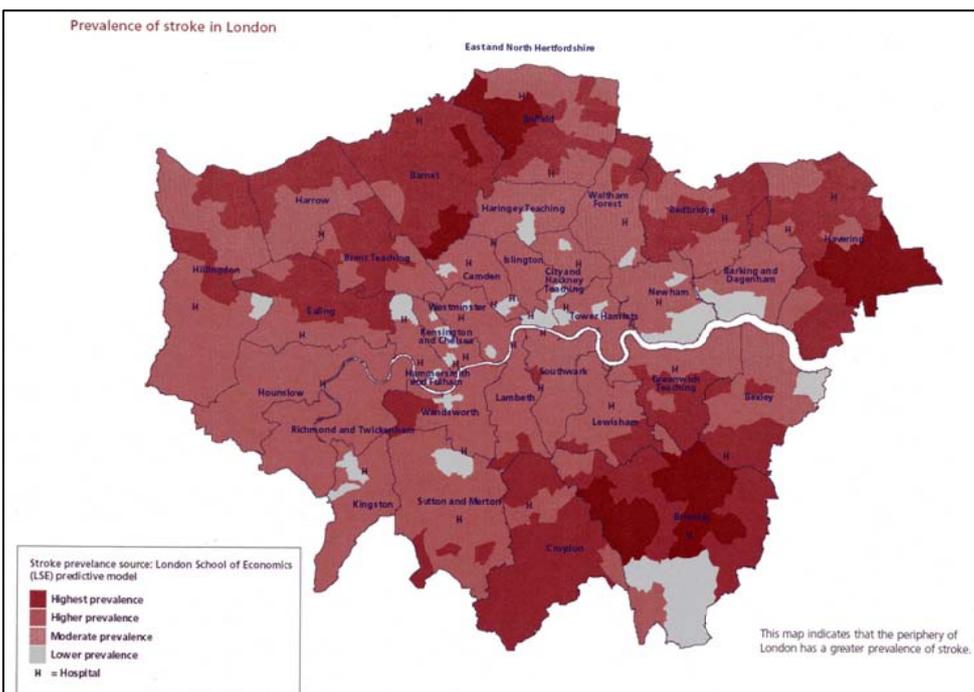
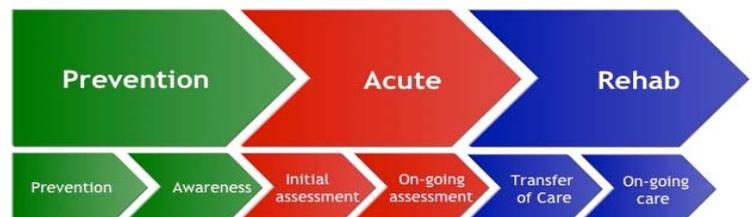
What is a specialist hyper-acute stroke unit?

Specialist hyper-acute stroke units will bring experts and equipment under one roof to provide world-class stroke treatment 24-hours a day, reducing death rates and long-term disability. This includes:

- Access to a CT scan within 30 minutes of arrival;
- Early treatment using clot-busting drugs (thrombolysis), if the scan shows they are needed, within three hours of having a stroke (and 30 minutes of arrival);
- 24/7 monitoring in a high dependency bed; and a multi-disciplinary specialist team on call 24/7; including consultants, specialist nurses and therapists.
- Very early access to specialist rehabilitation services.
- Whether or not a patient is thrombolysed, this is of huge benefit. Many stroke patients have difficulty in swallowing, and are at risk of aspiration and then pneumonia. Early assessment and rehabilitation will reduce the incidence of this, and maximise the patient's chances of meaningful recovery.

Patients are expected to stay in a HASU until they are stable - typically, this will take no longer than 72 hours. After this, patients will be moved to a hospital with a stroke unit closer to their home, for ongoing rehabilitation, physiotherapy and eventually outpatient follow-up.

Healthcare for London stroke pathway



London's HASUs

- Northwick Park Hospital
- Charing Cross Hospital
- University College Hospital
- Royal London Hospital
- Queen's Hospital, Romford
- St Thomas' Hospital
- King's College Hospital
- St George's Hospital
- *Princess Royal, Bromley (opening 2011)*

Transient ischaemic attacks (TIAs)

TIAs are common and are often a precursor to Stroke. NICE recommends that a patient who has an ABCD2 score of four or more, or has two or more events in a week has specialist assessment and investigation within 24 hours of the symptoms.

ABCD2 Scoring

	+1	+2
Age > 60	Yes	
BP > 140/90	Yes	
Features	Speech Only	Unilateral Weakness
Duration	10-59	
Diabetes	Yes	

What is the Service doing?

- Improving the way we respond to patients who may have had a recent stroke (within three hrs of onsets) – MPDS now classifies these as a Category A call
- Improving recognition of stroke – through the use of the FAST tool, and a trial of the ROSIER tool, that could identify another 1,000 strokes per year.
- Taking FAST+ patients to directly to HASUs
- Identifying patients with abnormal blood sugars or ECG's, even if they present with something different, thus detecting patients at risk
- Involvement in public awareness – we will be taking part in the 'know your blood pressure' April.

The ISRAS Study - use of the ROSIER stroke assessment tool

Healthcare for London has identified the role of the Service as critical in enhancing its ability to accurately recognise stroke. Over the past two years, the Service has been using the FAST to identify patients with stroke. Although this test is reliable it may miss some patients, predominantly those with strokes in the posterior cerebral circulation (PCC). A hospital study found that the **Recognition Of Stroke In The Emergency Room - ROSIER**, a validated enhanced stroke assessment tool widely used in hospitals, picks up more strokes and is better in the detection of strokes in the PCC than the FAST¹. This research has never been trialled in a pre-hospital setting.

The Clinical Audit & Research Unit is conducting the **Improving Stroke Recognition by the Ambulance Services – ISRAS** study. The study aims to investigate whether the use of the ROSIER by ambulance crews will result in more accurate identification of cases of stroke than would have been detected by the FAST. The study started on 4 January 2010 and data collection will be for a year. The study is being run in collaboration with the Royal London Hospital (RLH). Participating ambulance crews include City & Hackney, Tower Hamlets and Newham as they routinely convey patients to the RLH.

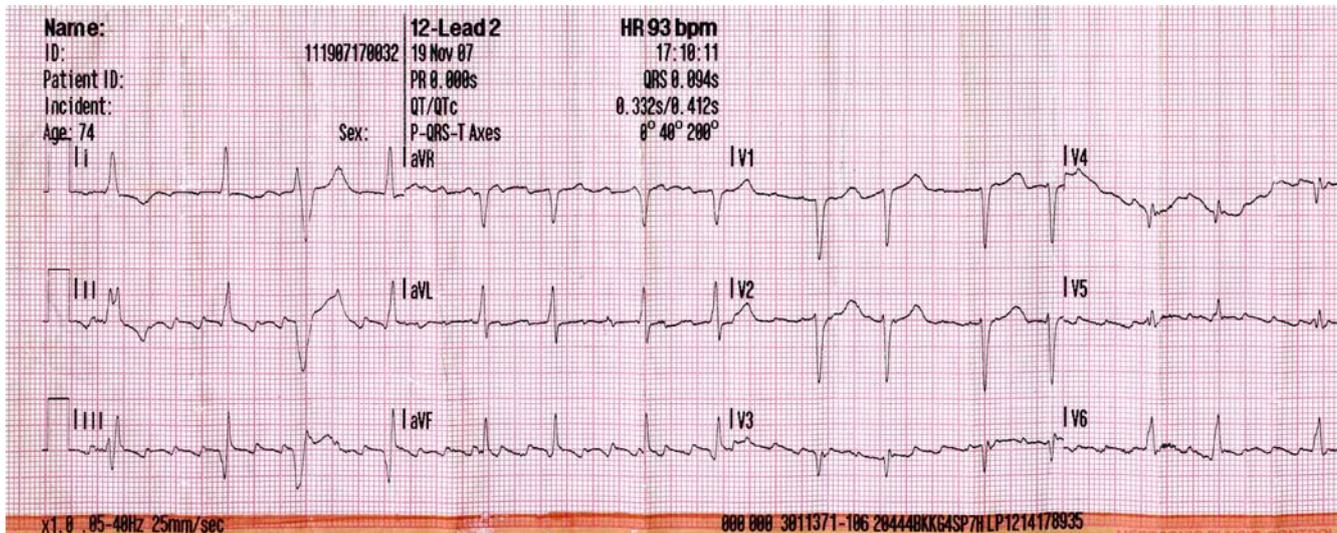
Dr Rachael Donohoe, Chief Investigator, designed the study and was successful in obtaining over £100,000 funding from the Stroke Association in a process of open competition. The project has also been adopted by the NHS National Institute of Health Research (NIHR) - being associated with the NIHR is regarded in high esteem. The ISRAS study was also one of three research projects selected ahead of over 40 other projects to be showcased to royalty at The Stroke Association Royal Annual Lecture at Kensington Palace.

For further information please contact Naomi Loyse, Stroke Researcher, CARU. Email: Naomi.Loyse@lond-amb.nhs.uk

¹ Nor AM, Davis J, Sen B, Shipsey, D, Louw SJ, Dyker AG, Davis MD and Ford GA. The Recognition of Stroke in the Emergency Room (ROSIER) scale: development and validation of a stroke recognition instrument. *Lancet Neurol.* 2005;4:727-34

New destination codes for stroke and major trauma

KINGS COLLEGE HOSPITAL MAJOR TRAUMA CENTRE	1520	NORTHWICK PARK HOSPITAL HYPER ACUTE STROKE UNIT	1540
ST GEORGES HOSPITAL MAJOR TRAUMA CENTRE	1521	CHARING CROSS HOSPITAL HYPER ACUTE STROKE UNIT	1541
ROYAL LONDON MAJOR TRAUMA CENTRE	1522	UNIVERSITY COLLEGE HOSPITAL HYPER ACUTE STROKE UNIT	1542
ST MARY'S W2 MAJOR TRAUMA CENTRE	1523	ROYAL LONDON HOSPITAL HYPER ACUTE STROKE UNIT	1543
		QUEEN'S HOSPITAL, ROMFORD HYPER ACUTE STROKE UNIT	1544
ROYAL FREE HOSPITAL NEUROSURGICAL TRAUMA UNIT	1530	ST THOMAS' HOSPITAL HYPER ACUTE STROKE UNIT	1545
QUEENS HOSPITAL ROMFORD NEUROSURGICAL TRAUMA UNIT	1531	KING'S COLLEGE HOSPITAL HYPER ACUTE STROKE UNIT	1546
CHARING CROSS HOSPITAL NEUROSURGICAL TRAUMA UNIT	1532	ST GEORGES HYPER ACUTE STROKE UNIT	1547



Last issue's ECG: The underlying rhythm is an atrial flutter the ECG also shows multi focal ventricular ectopics. The atrial flutter appears to have a variable AV conduction, hence the irregular rate. This ECG demonstrates the classic saw tooth (flutter waves) pattern which is indicative of atrial flutter.

- Atrial flutter is much less common than atrial fibrillation.
- Although the exact incidence is not known, it is a common arrhythmia estimated to be present in approximately 10 per cent of patients presenting with a supraventricular tachycardia.³
- The prevalence increases with age.
- Atrial flutter is more common in men.
- Atrial flutter is common during the first week after open heart surgery.

Major trauma decision scenarios: Rather than the normal ECG this month we have prepared a couple of trauma scenarios using the trauma decision tree, consider if this patient would be taken direct to a major trauma centre as of 1 April 2010.

- 25-year-old
- Motorcyclist vs car 40 mph bull's-eye to the windscreen
- Airway Patent, Breathing Resp 24 Spo2 100% (100% O₂), Circulation Pulse: 110 B/P: 140/100
- GCS 10 (Eyes 3, Verbal 2, Motor 5)
- Has obvious fractured lower limb
- St Somewhere trauma centre 10 minutes
- St Elsewhere major trauma centre 20 minutes
- 45-year-old
- Car Vs Pedestrian
- Airway Patent, Breathing Resp 20 Spo2 98% (air), Circulation Pulse: 98 B/P: 168/98
- GCS 15 (Eyes 4, Verbal 5, Motor 6)
- Has a closed # tib fib and no other obvious injuries
- St Somewhere trauma centre 8 minutes
- St Elsewhere major trauma centre 14 minutes

Questions

- Should I use the trauma decision tree?
- Trauma centre or major trauma centre?
- If appropriate which part of the decision tree does the patient flag on?
- Do I need to contact the clinical coordination desk?
- The patient is in North West London - where should they go until October 2010?
- Where can I get help or additional advice from?