**Echocardiogram after ischaemic stroke or transient ischaemic attack**

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**Document control information**  
(Published as separate document)

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Who should read this document?

All medical and nursing staff involved in the management of acute ischaemic stroke patients and those diagnosed with a transient ischaemic attack (TIA) at Salford Royal Hospital should read this guideline.

Key Messages

1. Echocardiogram should not be performed routinely after acute ischaemic stroke or TIA

2. People with stroke or TIA should be investigated with transthoracic echocardiography if the detection of a structural cardiac abnormality would prompt a change of management AND if they have:

   a) clinical or ECG findings suggestive of structural cardiac disease that would require assessment in its own right

   and/or

   b) unexplained stroke or TIA, especially if other brain imaging features suggestive of cardioembolism are present.

Background & Scope

Cardiogenic embolism accounts for 20–30% of ischaemic strokes, with atrial fibrillation being the most common source of cardioembolism. Other sources of cardioembolism have traditionally been classified based on the risk of recurrence as high risk (mitral stenosis, left ventricular thrombus, mechanical valve prosthesis) and low/uncertain risk (PFO, atrial septal aneurysm [ASA], mitral annular calcification, aortic stenosis). The value of echocardiography in people with TIA and stroke depends upon the assumption that the risk of recurrent stroke can be modified by treatment which would otherwise not have been considered, should one of these pathologies be detected. With the notable exception of AF, it is unclear for the majority of putative cardioembolic pathologies what risk of stroke recurrence they pose, whether or not intervention genuinely lessens this risk and if so, whether the benefit outweighs the risk associated with intervention. Economic analysis, based on a systematic review conclude that standard trans-thoracic is a cost-effective use of NHS resource echocardiography when clinicians deem it the most appropriate test, and might be applied primarily to people with stroke of undetermined aetiology if they are also candidates for oral anticoagulation.

What is new in this version?

The protocol reflects latest guidance from RCP stroke guidelines (2016) and opinions from interventional cardiologists. There are changes to advice on investigating patients who have had a transient ischaemic attack.
All stroke patients should have a detailed neurological and cardiac evaluation from history and examination to look for a potential cardioembolic source. A 12 lead ECG is needed before an ECHO is requested.

**Transthoracic Echocardiography (TTE)**

Currently, transthoracic echocardiogram is not a mandatory investigation. It is only recommended when symptoms or examination suggest a potential suspected cardiac aetiology. There is currently not enough evidence to support routine inpatient TTE in acute stroke/TIA setting. However urgent inpatient TTE can be ordered, if clinically indicated (eg bacterial endocarditis) after discussing with the cardiorespiratory department, and in liaison with cardiology.

TTE after an acute stroke should be considered under the following circumstances:

1. Diagnosis of suspected cardiac cause of stroke (based on clinical or radiology findings) in whom detection of an abnormality will change management (eg introduction of anticoagulation). The diagnosis of thrombus, infective endocarditis and cardiac tumours will have therapeutic implications but other conditions such as patent foramen ovale, atrial septal aneurysm, carotid atheroma, spontaneous echo contrast have uncertain treatment strategies.
2. Ischaemic stroke patients with unknown or unexplained etiology may undergo TTE in an attempt to identify a cause.
3. Evaluating and managing conditions related to cardioembolic events (eg LV thrombus, left atrial appendage, poor LV function etc).
4. TTE with bubble contrast should be the first line cardiac imaging for patients with suspicion of a right-to-left shunt (<55 years). The TOE probe in the oesophagus and sedation prevent patients undergoing TOE from performing a Valsalva manoeuvre, decreasing the sensitivity of TOE in identifying a shunt. The optimal therapy for prevention of recurrent stroke in patients with cryptogenic stroke & PFO has still not been identified, although some cases might merit anticoagulation/PFO closure.
5. There is lack of evidence of PFO closure among patients who have had a TIA and bubble contrast ECHO should not routinely be offered to detect PFO in this group of patients.

**Transoesophagseal Echocardiography (TOE)**

Currently TOE (as a gold standard) is used for detecting intra-cardiac shunts & other rare causes of embolic stroke. Its use is to be considered only after assessment by TTE with bubble contrast (+/- repeat TTE bubble study via femoral line) if:

1. No cause identified (< 55 years) and
2. Multiple episodes / different territories with minimal risk factors
If TTE with contrast is positive for a shunt then TOE will need to be performed to assess the anatomy & suitability for percutaneous PFO closure.

If the TTE does not show a shunt but clinical suspicion is high then a TTE with femoral contrast can be performed to assess for shunt and a TOE to assess for other potential pathology such as aortic atherosclerosis and atrial/LAA thrombus.

Requests for TOE and TTE with bubble study via femoral should be discussed with a cardiologist.

**Standards**

1. European Society of Cardiology/European Association of Echocardiography
2. National Institute of Clinical Excellence (NICE)
3. American Heart Association

**Explanation of terms & Definitions**

ECG- Electrocardiography  
LV- Left Ventricle  
TIA- Transient Ischaemic Attack  
ECHO Echocardiography  
TTE- Transthoracic Echocardiography  
TOE- Transoesophageal Echocardiography  
PFO-Patent Foramen Ovale

**References and Supporting Documents**


Roles and responsibilities

Stroke Unit Ward managers and Consultants; to ensure all medical and trained nursing staff are familiar with, and comply with this policy, in accordance with agreed competencies set-out for nursing and medical staff.
Appendix: Flowchart

Ischaemic stroke/TIA

1. History and clinical examination
   2. 12 lead ECG
   3. ECHO likely to change management/treatment

1. No Cause identified (<55 y)
2. Multiple Territory involvement or Recurrent strokes

TTE with bubble contrast and Valsalva

Positive for shunt
Negative for shunt

No

TIA/Other patients

Any evidence of structural abnormality on ECG/history and clinical examination

Yes

No further cardiac imaging

Stroke confirmed on imaging >1 territory and no other cause

TOE/TTE with femoral contrast and refer to cardiology

TOE and refer to cardiology

TTE done with last 1 year? No reason for new finding?

Yes

No further cardiac imaging

No

TTE without contrast
Echocardiogram after ischaemic stroke or transient ischaemic attack

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Additional authors: Dr Anne Cooper

Document owner: Dr Amit Kishore
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Classification: Clinical policy
Scope: Medical Neurosciences and Cardiology
Applies to: stroke, neurology, cardiology
Document for public display: Yes

Keywords: stroke; acute ischaemic stroke; ischaemic stroke; TIA; transient ischaemic attack; echocardiogram; echocardiography; electrocardiogram; ECG; ECHO; TOE; transoesophageal echocardiography; patent foramen ovale.

Associated Documents:
- TWCG34(12) - Issue No 3 - Echocardiogram after ischaemic stroke or transient ischaemic attack [pdf / 98KB]

Unique Identifier: TWCG34(12)
Issue number: 4.1
Replaces: TWCG34(12) issue 4
Authorised by: Stroke subspecialty CG, Cardiology CG & CEC
Authorisation date: March 2018
Next review: March 2021

Policy Implementation Plan

The Stroke Service Ward Manager, Clinical Stroke Lead and Cardiology Lead will hold the implementation plan.
The Stroke and Cardiology Clinical Governance Group will review progress in implementation.
Stroke and cardiology medical staff will be made aware of the policy through in-service training. New medical staff would also be made aware of the policy during staff induction (local induction).
The policy will be implemented from the date of the Clinical Effectiveness approval.
Monitoring and Review

After appropriate training of ward staff and implementation of this new policy, repeat audit will be undertaken during 2017-18 by a member of the stroke clinical team. The policy will be reviewed by Stroke Clinical Governance on a 3 yearly basis unless new evidence is published in the interim.

Endorsement

<table>
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<tr>
<th>Endorsed by:</th>
<th>Position of Endorser or Name of Endorsing Committee</th>
<th>Date</th>
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<tbody>
<tr>
<td>Martin Punter</td>
<td>Chair, Stroke Clinical Governance</td>
<td>27/01/2018</td>
</tr>
<tr>
<td>Martin Punter</td>
<td>Chair, MNARC</td>
<td>09/03/2018</td>
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<tr>
<td>Karen Coverley</td>
<td>Chair, DARC</td>
<td>12/03/2018</td>
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<tr>
<td>Peter Turkington</td>
<td>Chair, CEC</td>
<td>12/03/2018</td>
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<tr>
<td>Alan Fitchet</td>
<td>Chair Cardiology CG</td>
<td>Jan 2018</td>
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The Trust is required to ensure that all our policies/procedures meet the requirements of its service users, that it is accessible to all relevant groups and **further the aims of the Equality Duty for all protected groups by age, religion/belief, race, disability, sex, sexual orientation, marital status/civil partnership, pregnancy/maternity, gender re-assignment.** Due consideration may also be given to carers & socioeconomic factors.

### Have you been trained to carry out this assessment? Yes

**Name of policy or document:**
Echocardiogram after ischaemic stroke or transient ischaemic attack

**Key aims/objectives of policy/document:** This policy provides guidance on when an echocardiogram should be requested after an ischaemic stroke and transient ischaemic attack.

<table>
<thead>
<tr>
<th>1) a) Who is this document or policy aimed at?</th>
<th>Patients with ischaemic stroke and transient ischaemic attack</th>
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<tbody>
<tr>
<td>2) a) Is there any evidence to suggest that your ‘end users’ have different needs in relation to this policy or document; (e.g. health/employment inequality outcomes) <strong>(NB If you do not have any evidence you should put in section 8 how you will start to review this data)</strong></td>
<td>No</td>
</tr>
<tr>
<td>3) a) Does the document require any decision to be made which could result in some individuals receiving different treatment, care, outcomes to other groups/individuals?</td>
<td>Yes Patients over 55 years of age</td>
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<td>b) If yes, on what basis would this decision be made?  (<strong>It must be justified objectively</strong>)</td>
<td>1. Patients under 55 years of age are more likely to have a patent foramen ovale needing closure and could need a transeosophageal echocardiogram if clinically indicated. Patients over 55 years of age will not undergo transoesophageal echocardiogram for detection of patent foramen ovale</td>
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<td>4) a) Have you included where you may need to make reasonable adjustments for disabled users or staff to ensure they receive the same outcomes to other groups?</td>
<td>N/A</td>
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5) a) Have you undertaken any consultation/involvement with service users or other groups in relation to this document? 
   Discussed among stroke/cardiology medical staff before implementation

   b) If yes, what format did this take? Face/face or questionnaire? (please provide details of this) 
   Email circulation of policy and peer review

   c) Have any amendments been made as a result? 
   Minor changes only

6) a) Are you aware of any complaints from service users in relation to this policy? 
   No

   b) If yes, how was the issue resolved? Has this policy been amended as a result? 
   NA

7) a) To summarise; is there any evidence to indicate that any groups listed below receive different outcomes in relation to this document?

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<td>Socio/economic**2</td>
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8) How will the future outcomes of this policy be monitored?
   Prospective or retrospective audit

9) If any negative impact has been highlighted by this assessment, you will need to undertake a full equality impact assessment:

   Will this policy require a full impact assessment? No
   (if yes please contact Equality Team, 62598/67204, for further guidance)

   High/Medium/Low Type/sign____Amit Kishore___________________________
   date: 06/03/17