

Implementing telemedicine to support specialist decision making in stroke care during the COVID-19 pandemic

**Professor Gary A Ford, Dr David Hargroves,
Dr Deb Lowe, Dr George Harston,
Dr Guy Rooney, Hannah Oatley, Jemma Lough**

May 2020

Scope

This document is aimed at stroke services that provide hyperacute care (thrombolysis and decision making for thrombectomy) and that do not currently utilise telemedicine 24/7 for all elements of the pathway. It aims to provide pragmatic guidance to support rapid implementation of remote decision making during the COVID-19 pandemic.

NHS England guidance on the COVID-19 pandemic recognises that most stroke physicians have dual or triple accreditation in medicine and/or geriatrics and that services may need to consider releasing specialist clinicians to support the general emergency medical take and inpatient bed base. This, together with high levels of staff absence anticipated due to COVID-19 infection, means that the number of stroke physicians available on any one site is likely to be significantly lower than usual.

Following an initial 'peak' of COVID-19 patient presentations, there is likely to be a significant prevalence of COVID-19 remaining within populations until effective treatment or a vaccine is widely available. A restoration and recovery phase must pre-empt this, minimising cross-infection while optimising stroke-specific expertise. The use of separate/virtual teams to minimise 'footfall' to potential and confirmed COVID-19 patients with stroke while maintaining standards is crucial.

This pressure on specialist expertise and the need to minimise unnecessary face-to-face contacts will require stroke units to work differently, with an increase in the use of telemedicine.

Contents

Introduction.....	9
Options for configuring a system of virtual assessment.....	9
Telestroke network	9
Remote decision making within an individual trust	9
Preparing to implement virtual assessment.....	10
Governance	10
Pre-hospital phase alerts	10
Videoconferencing within the ED	10
Image sharing and artificial intelligence	11
Training	11
Confidentiality and consent	11
Example pathway.....	12

Introduction

Telemedicine is a broad term, encompassing the use of formal videoconferencing, as well as image sharing supported by remote review and decision making via telephone.

The majority of stroke services providing hyperacute care in England use telemedicine out of hours to enable remote specialist decision making for thrombolysis and mechanical thrombectomy. However, a significant number still rely on face-to-face assessment for review, decision making and the delivery of thrombolysis both in and out of hours. **Stroke units that do not currently utilise telemedicine should strongly consider putting a system of virtual assessment in place. Additionally, those using telemedicine out of hours should consider moving to 24/7 use of telemedicine.** This could be at an individual trust level or at a network level.

The option for virtual assessment by a stroke physician should also be considered in the pre-hospital phase. This will help ensure that stroke mimics and those who would not benefit from admission are less likely to be inappropriately or unnecessarily transferred to hospital for further assessment.

This document aims to provide guidance for trusts seeking to rapidly establish a system of virtual assessment, drawing on the experiences of stroke services that have been working with these systems for many years.

Options for configuring a system of virtual assessment

Telestroke network

Telestroke networks involve decision making across a network of stroke physicians from different trusts. This typically includes videoconferencing connectivity and image sharing between specialists and the emergency department (ED). These networks have the advantage of involving a large number of individuals and so being resilient to staff absence. Telemedicine can also be used to support decision making for mechanical thrombectomy or referrals to neurosurgery for intracerebral haemorrhage (ICH).

There are challenges to implementing a telestroke network quickly. Clearly defined protocols are essential, alongside associated training. Despite these challenges, for those networks with good relationships across trusts and infrastructure to support such a service, a telestroke network may provide a resilient model to cover pressures on the availability of stroke physician expertise in individual trusts during the COVID-19 period and beyond.

Remote decision making within an individual trust

Setting up a system of remote decision making within an individual trust may be simpler to implement than across a network of multiple trusts. Transition to remote specialist decision making would reduce patient and clinician exposure and may potentially provide a mechanism for staff who are in self-isolation (but are physically well) to contribute to clinical care.

Implementation will require rapid access to high-quality images and communication between stroke physicians and front-door clinicians who are suitably experienced to take an accurate history and perform a neurological examination (e.g. a medical registrar or ED physician).

Advantages of this approach include familiarity of clinicians with existing pathways, understanding of colleagues' abilities and being covered by existing trust governance frameworks. This approach may also be used to support non-specialists covering an acute stroke unit in the context of staff shortages or relocation of the stroke unit to a different hospital site.

Preparing to implement virtual assessment

Governance

For trusts who do not have formal videoconferencing software in place, a pragmatic approach would be to use a telephone system alongside informal videoconferencing solutions such as FaceTime or WhatsApp. NHSX guidance for the COVID-19 period states that it is acceptable for clinicians to use these tools for video conferencing (www.nhs.uk/key-information-and-tools/information-governance-guidance/health-care-professionals).

Ideally a local or network agreement will be in place to acknowledge that decisions about treatment may be made by a consultant working in another trust. Additionally, the General Medical Council acknowledged in recent guidance (www.gmc-uk.org/news/news-archive/supporting-doctors-in-the-event-of-a-covid-19-epidemic-in-the-uk) that while doctors have a duty to recognise and work within their competence, in 'these exceptional circumstances, doctors at every level may be required to work at the limits of their comfort zone and in some cases beyond'.

Pre-hospital phase alerts

- Consider enhanced pre-hospital communication with stroke consultants to reduce unnecessary conveyance to hospitals for patients with a stroke mimic or TIA.
- Ensure stroke consultants are immediately available to give an opinion – the ambulance paramedics are not able to spend time making multiple attempts at contact or waiting a long time for calls to be answered.
- Ease of use of the system is critically important if it is to be implemented quickly.
- FaceTime between the stroke consultant and the ambulance service (on iPad) has been tried with success in some sites.
- Key points to note from sites that have implemented videoconferencing for ambulance pre-alert include:
 - The paramedic should provide the patient/family/carer with an explanation of how the information will be used and should gain and document consent.
 - The stroke physician should conduct the call in a private environment to preserve patient confidentiality, privacy and dignity.
 - The paramedic should document the remote clinician's name.
 - The paramedic should document clinical information and decision making resulting from the video call.
 - The stroke physician should separately record the consultation and the advice given to the paramedic.

Videoconferencing within the ED

- Decide on the remote assessment facilities that will be used.
- Video conferencing may be helpful in assessing some patients. Many trusts with existing virtual assessment systems or networks use videoconferencing units. These can be mobile or fixed and enable the remote stroke consultant to visualise the patient as well as the scan images.
- The practicalities of procuring formal videoconferencing facilities during the COVID-19 pandemic may make this unfeasible. In the absence of formal videoconferencing facilities, a pragmatic approach would be to use a telephone system alongside informal videoconferencing solutions such as FaceTime or WhatsApp.
- Ensure that all stroke physicians who will be participating in the telemedicine rota have adequate internet connectivity to participate in videoconferencing (if using) and to view the images.
- Agree the system for contacting the stroke consultant on-call.
- Telephone or messaging contact is recommended in the first instance to alert the stroke consultant of a potential acute stroke admission. They will then be prepared to review the patient and CT images when available.

- It is recommended that clinicians use work mobile telephones rather than personal telephones wherever possible.
- Agree the criteria and timescales for contacting the stroke consultant on call.
- Timing is critically important when thrombolysis or thrombectomy are treatment options. However, **all** stroke patients will benefit from an early virtual review by a stroke consultant.
- Ensure the trust switchboard and the ED have the stroke consultant rota.
- Decide how the decisions made by the stroke consultant on-call will be recorded in the patient's record.
- Agree the back-up system to be used if there is a failure in image transfer or videoconferencing software.

Image sharing and artificial intelligence

- To allow the stroke consultant to make treatment decisions, there needs to be a rapid transfer of imaging of sufficient quality.
- Ensure that there is the facility to share images with the stroke consultant working remotely and test this to ensure that speed of image transfer and quality/clarity of image are acceptable.
- Ensure that staff who will be sharing the images are trained in how to use the software.
- Systems that share images and use artificial intelligence to support decision making could also be used. These have the advantage of offering rapid image interpretation to support early referral for thrombolysis or mechanical thrombectomy, even with non-contrast CT.

Training

- If implementing a virtual assessment system will result in an enhanced role for another member of the healthcare team – for example, reliance on nursing staff to carry out the National Institutes for Health Stroke Scale (NIHSS) – ensure that they receive training and support to enable them to do this.
- Training for NIHSS can be accessed at www.nihstrokescale.org/.

Confidentiality and consent

- As with any consultation or examination, it is important to consider where and how the teleconference takes place so that confidentiality can be ensured.
- If practical, the patient or family should be informed that telemedicine is going to be used and their agreement sought.
- If the remote stroke physician is not employed by the trust where the patient is located, this should also be made clear.

Example pathway

