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# BSNR training guidance for mechanical thrombectomy

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Guidance for practitioners seeking training to participate in an acute ischaemic stroke thrombectomy service in the UK: a response to level-1 evidence of the benefit of mechanical thrombectomy for patients with acute ischaemic stroke and proven large vessel occlusion.

Guidance produced by members of the UK Neurointerventional Group and British Society of Neuroradiologists. March 2016

## Preamble

Following accumulating level-1 evidence of the benefit of timely mechanical thrombectomy (MT) for patients with acute ischaemic stroke (AIS) due to proven large vessel occlusion (LVO), there is an urgent need to train an additional cohort of practitioners to enable introduction of MT as a routine service in the UK.<sup>18</sup>

In the USA and Europe practitioners from different clinical backgrounds (radiology, neurology, neurosurgery, cardiology) can enter Interventional Neuroradiology (INR) training. This guidance proposes to create a pathway for practitioners (pre or post CCT) wishing to obtain RCR-recognised training to perform and participate in an acute stroke service in the UK.

This document draws on previous and current training guidance. It has been produced in response to an anticipated shortfall in service capacity and is intended to supplement, rather than replace current RCR training guidance.

## Introduction

Recent clinical trials have shown that if eligible patients with acute stroke caused by LVO are rapidly treated with MT, their prospects for independent recovery are significantly improved. Successful management of patients with acute

stroke is dependent on the swift, efficient function of a care pathway involving multiple pre-hospital and hospital services. A multi-societal consensus document describing service standards for practice in the UK has been published.<sup>18</sup>

NICE have reviewed the evidence for MT and have recently published updated guidance.<sup>23</sup> This guidance supports the use of MT providing requirements for patient selection, operator training and service standards are adhered to. In this light there is need to define and train the clinicians who will help expand and deliver this service in the future.

Opening a blocked artery is a mechanical task common to multiple clinical specialties, however any clinician undertaking MT for patients with acute stroke will need detailed knowledge of clinical neurology, neuroanatomy and neurophysiology. They will require advanced radiological skills to evaluate neuroimaging studies and they will depend on broad case experience to interpret imaging findings in the clinical context and to select and manage patients appropriately.

Key objectives of training will include: developing a thorough understanding of neurological diseases, acquiring the range of technical skills required to manage neurovascular conditions, and refining the ability to make independent clinical decisions about timely, appropriate and safe interventional procedures (in relation to alternative non-interventional approaches).

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In addition to having procedural technical skills and experience navigating catheter systems and thrombectomy devices in the cervical and intracranial circulation, operators will have to perform procedures under time pressure, frequently in challenging settings such as, difficult vascular access, patient movement and incomplete visualisation of the cerebral circulation.

After completing training, practitioners will be required to join teams providing a MT service and to contribute to on-call provision. Practitioners will need to maintain and refine their knowledge and skills, as evidence and technology evolves.

At current staffing levels, most INR services in the UK do not have sufficient resources to expand operating capacity to the level required to deliver a 24/7 MT service immediately. A crude estimate would require UK operator numbers to double (from 90 to 180) to enable robust on-call rotas to be established in existing INR centres. The RCR recommends a minimum 1/6 rota frequency to provide a sustainable IR on-call rota.<sup>19</sup> If UK trainee numbers were expanded to 20–25/year it would take 4–5 years to train the required number of INRs (accounting for up-coming retirements).

Within current specialty training programs in the UK, there is only one subspecialty that provides training to perform MT (INR). The current training programme for INR takes six years. This is divided into two parts. The first three years is dedicated to training in core radiology skills. The fourth year is focused on acquiring advanced competencies in diagnostic neuroradiology and the fifth and sixth years are dedicated to INR training and refining neuroradiology skills.<sup>15</sup>

It is widely understood within the INR community that INR training provides sound knowledge and a broad grounding in technical skills, but that a consultant will continue to accumulate essential case-experience during the early years of their consultancy. This on-going formative process usually occurs with the close support and guidance of experienced consultant colleagues.

In order to expand capacity to provide a MT service at a national level in the UK, it will be necessary to expand the UK INR training program. To address the required scale of expansion and the clinical imperative to provide a MT service, it is also important to consider options for training a cohort of practitioners in an accelerated time frame. As part of this process, it is proposed that INR training will be made available to clinicians from different clinical backgrounds.

To deliver this training successfully, the background and competencies of individual trainees will be taken into account and the content of training will focus on the knowledge, skills and competencies that are essential to enable the practitioner to function independently as part of a team providing a MT service.<sup>14,15,17</sup>

**In considering how to expand operator capacity to meet the anticipated demand for 24/7 MT, the subsequent issues should be accounted-for:**

Practitioners should adhere to the principles of Good Medical Practice Where practitioners undertake invasive clinical procedures for the 1<sup>st</sup> time, they should be properly trained and directly supervised.<sup>6,9</sup>

The term mechanical thrombectomy (MT) refers to a range of operative techniques that are tailored to specific

clinical and anatomical scenarios. MT is not a single procedure that can be quickly learnt and applied in practice.

Any specialist contributing to provision of a MT service should have completed a RCR-recognised training process. A patient is entitled to know the training background and clinical experience of a doctor providing their care that a clinician operating on them is appropriately trained and experienced to undertake this procedure competently and safely.

Training must account for the specific clinical background and prior experience of the trainee.

Trainees must acquire all of the skills required to provide a MT service. This must include a comprehensive understanding of the significance of imaging findings in the context of the patient's clinical status. It is not good interventional practice for another clinician (neurologist, stroke physician) to select the patient and instruct the operator, simply as a technician, when to perform a MT procedure.<sup>5,8,12,15,17,19,20</sup>

Qualified interventional radiologists and cardiologists have skill sets that exceed core radiology training and are equivalent to INR training in specific areas. However, trainers and trainees should be aware of the potential mismatch between technical competencies that may be acquired rapidly by clinicians with an interventional background and disease-specific knowledge and clinical judgment, which are acquired over a longer time, with broad case- experience.

Industry-sponsored educational courses, web-based teaching and scenario practice using simulators all provide useful educational opportunities. Whilst some of these options may contribute towards acquisition of competence, they are not as-yet integrated into radiology training in the UK, they are not recognised as qualifications by the RCR/GMC and they are not equivalent to training delivered in a recognised UK training program. Good quality web- based or simulation-based training should be accounted-for and may become creditable experience in the future (with a recommended limit of 10% of total required experience).<sup>5,9</sup>

The natural history of neurovascular diseases and the procedural complications related to INR practice can be associated with poor clinical outcomes, including severe disability and death. Operators will need the clinical and interpersonal skills to deal with poor patient outcomes, clinical error, duty of candour and investigation/complaint procedures.

Focused training to provide only one specific therapeutic procedure does not align with practice in any current UK specialty-training program, or with the anticipated process of credentialing.<sup>24</sup>

Many of the technical skills required to perform MT are common to other INR procedures. In order to acquire these skills efficiently, the trainee will participate in many varied INR procedures during their training.

Training to acquire MT skills will involve a significant full-time-equivalent commitment for individual trainees (due to the infrequent and unpredictable case referral rate for MT even in large, high-volume centres). As a result of the time commitment required to acquire the requisite case experience in stroke, the trainee will be in a position to acquire many of the skills required for the wider INR area of practice.

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