University of Central Lancashire
UCLan

Central Lancashire Online Knowledge (CLoK)

Title	Does the Addition of Non-Approved Inclusion and Exclusion Criteria for rtPA Impact Treatment Rates? Findings in Australia, the UK, and the USA
Type	Article
URL	https://clok.uclan.ac.uk/24195/
DOI	
Date	2019
Citation	Watkins, Caroline Leigh, Lightbody, Catherine Elizabeth, Craig, Louise, Middleton, Sandy, Hamilton, Helen, Cudlip, Fern, Swatzell, Victoria, Alexandrov, Andrei, Philip, Sheeba et al (2019) Does the Addition of Non-Approved Inclusion and Exclusion Criteria for rtPA Impact Treatment Rates? Findings in Australia, the UK, and the USA. Interventional Neurology, 8 (1). ISSN 1664-9737
Creators	Watkins, Caroline Leigh, Lightbody, Catherine Elizabeth, Craig, Louise, Middleton, Sandy, Hamilton, Helen, Cudlip, Fern, Swatzell, Victoria, Alexandrov, Andrei, Philip, Sheeba, Cadilhac, Dominique, McInnes, Elizabeth, Dale, Simeon and Alexandrov, Anne

It is advisable to refer to the publisher's version if you intend to cite from the work.

For information about Research at UCLan please go to http://www.uclan.ac.uk/research/

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the http://clok.uclan.ac.uk/policies/

Table 1 **Reported rt-PA eligibility criteria by country**

INCLUSION CRITERIA	AUS	UK	USA
	N=63	**N=93**	**N=229**
Standard all (n=2)	**n(%)**	**n(%)**	**n(%)**
Clinical diagnosis of acute ischaemic stroke causing measurable neurological deficit	58 **(92)**	89 **(96)**	180 **(79)**
Exclusion of Intracranial haemorrhage by appropriate imaging techniques[1]	59 **(94)**	90 **(97)**	NA
Standard USA only (n=2)			
Age > 18 years	57 **(91)**	81 **(87)**	179 **(78)**
Ability to start <3 hours from symptom onset	1 **(1.6)**	1 (**1.1**)	54 **(24)**
Standard UK & AUS (n=1); Standard by USA Guidelines/Non-standard by USA Label			
Ability to start <4.5 hours from symptom onset	62 **(98)**	92 **(99)**	172 **(75)**
Non-standard all (n=4)			
NIHSS > 4	31 **(49)**	47 **(51)**	80 **(35)**
~~Perfusion lesion on CTP~~ Favourable CTP penumbra.	14 **(22)**	10 **(11)**	43 **(19)**
Occlusion on CTA	13 **(21)**	15 **(16)**	60 **(26)**
Age <80 years, for 3-4.5hr since onset	11 **(18)**	33 **(36)**	111(63)[2] (**65.7**)
Non-standard USA (n=1)			
Order for IV rtPA given only by a neurologist	NA	NA	71 **(31)**
STANDARD EXCLUSION Criteria	**AUS**	**UK**	**USA**
Bleeding risk	**n(%)**	**n(%)**	**n(%)**
Standard all (n=12)			
Active Internal Bleeding	59 **(94)**	85 **(91)**	181 **(79)**
Clinical presentation suggestive of SAH, even if CT is normal	54 **(86)**	78 **(83)**	150 **(66)**
Known bleeding diathesis	51 **(81)**	75 **(81)**	160 **(70)**
INR >1.7	59 (**94**)	86 **(93)**	179 **(78)**
APTT greater than upper limit of normal on lab report	37 **(59)**	47 **(51)**	163 **(71)**
Prothrombin Time > 15 seconds	19 **(30)**	24 **(26)**	113 **(49)**
Platelet count of below 100,000/mm[4]	47 **(75)**	53 **(57)**	170 **(74)**
History of serious head trauma or ischaemic stroke within 3 months of this event	52 **(83)**	78 **(84)**	180 **(79)**
History of structural lesions including arteriovenous malformation, aneurysms or tumours	49 **(78)**	71 **(76)**	161 **(70)**
History of intracranial haemorrhage at any point in the past	45 **(71)**	72 **(77)**	194 **(85)**

Past major surgery or serious trauma in past 3 months	43 **(68)**	64 **(69)**	174 **(76)**
Evidence of intracranial haemorrhage on CT-scan	50 (79)	83 (89)	NA[3]
Standard USA only (n=1)			
Systolic BP > 185 mm Hg and/or diastolic BP > 110 mm Hg at the time of rtPA treatment	NA	NA	181 **(79)**
Standard AUS & UK only (n=10)			
Significant bleeding disorder at present or within last 6 months	40 **(64)**	69 **(74)**	NA
Recent arterial puncture at a non-compressible site	47 **(75)**	73 **(79)**	153 **(67)**
Neoplasm with increased risk of bleeding	35 **(56)**	60 **(65)**	NA
Manifest or recent severe or dangerous bleeding	40 **(64)**	73 **(79)**	NA
Severe uncontrolled arterial hypertension	40 **(64)**	60 **(65)**	NA
Systolic BP >185 or diastolic BP >110 mm Hg, or aggressive (IV) management	49 **(78)**	54 **(58)**	NA
History of gastrointestinal or urinary tract haemorrhage within 21 days	45 **(71)**	73 **(79)**	163 **(71)**
Recent (less than 10 days) traumatic CPR or obstetrical delivery	39 **(62)**	64 **(69)**	NA
Patients receiving other intravenous thrombolytic agents	31 **(49)**	58 **(62)**	NA
Any current use of anticoagulation regardless of coagulation study findings	14 **(22)**	15 **(16)**	51 **(22)**
Stroke severity and/or disability			
Standard AUS & UK (n=4)			
Symptoms beginning more than 4.5 hours / unknown onset time	48 **(76)**	72 **(77)**	NA
Severe neurological disability e.g. NIHSS >25	39 **(62)**	39 **(42)**	70 **(31)**
Prior stroke within the last 3 months	37 **(59)**	58 **(62)**	NA
Rapidly improving stroke symptoms, even if measurable disability remains	22 **(35)**	40 **(43)**	100 **(44)**
Comorbidity			
Standard all (n=1)			
Observed seizure at stroke onset	45 **(71**)	53 **(57)**	122 **(53)**
S*tandard UK & AUS only(n=7)*			
Suspected post-myocardial infarction pericarditis	21 **(33)**	36 **(39)**	77 **(34)**
Acute pancreatitis	20 **(32)**	55 **(59)**	NA
Suspicion of endocarditis	32 **(51)**	47 **(51)**	58 **(25)**
Severe liver disease, including hepatic failure, cirrhosis, portal hypertension & active hepatitis	35 **(56)**	58 **(62)**	NA
Abnormal blood glucose; <50mg/dL (<2.8mmol/L) or >400mg/dL (22.2mmol/L)	53 **(84)**	53 **(57)**	133 **(58)**
Documented ulcerative gastrointestinal disease (last 3 months), oesophageal varices, arterial aneurysm, arterial/venous malformation	40 **(64)**	73 **(79)**	NA
Patients with any history of prior stroke and concomitant diabetes	9 **(14)**	19 **(20.4)**	NA

Demographics			
Standard UK & AUS only(n=1)			
Age <18 years	38 **(60)**	59 **(63)**	NA
NON-STANDARD EXCLUSION Criteria	**AUS**	**UK**	**USA**
Bleeding risk *(n=5)*	**n (%)**	**n (%)**	**n (%)**
Current use of novel anticoagulants (NOACS)	36 **(57)**	67 **(72)**	132 **(58)**
Use of continuous intravenous infusion to control blood pressure	18 **(29)**	22 **(24)**	17 **(7.0)**
Patients pre-treated with acetyl salicylic acid	1 **(1.6)**	7 **(7.5)**	NA
On other antiplatelet medication[4]	NA	NA	12 **(5.2)**
Other conditions deemed high risk for haemorrhage[4]	3 **(4.8)**	2 **(2.2)**	NA
Stroke severity and/or disability *(n=4)*			
Level of consciousness severely depressed (obtunded, stuporous or comatose)	39 **(62)**	39 **(42)**	16 **(7.0)**
Minor neurological disability	23 **(37)**	29 **(31)**	59 **(26)**
History of previous ischaemic stroke at any point in the past	5 **(7.9)**	7 **(7.5)**	NA
Large artery occlusion warranting primary intra-arterial treatment	1 **(1.6)**	8 **(8.6)**	31 **(14)**
Comorbidity *(n=11)*			
Pregnancy	47 **(75)**	38 **(41)**	112 **(49)**
Concurrent acute myocardial infarction	30 **(48)**	15 **(16)**	60 **(26)**
Serious, advanced or terminal illness[4]	8 **(13)**	0	NA
Suspected septic emboli[4]	8 **(13)**	0	NA
Elevated liver enzymes	4 **(6.4)**	17 **(18)**	NA
Not observed, but suspected seizure at stroke onset	18 **(29)**	21 **(23)**	45 **(20)**
Pre-existing moderate to severe disability (mRS >3/4)[4]	7 **(11)**	9 **(9.7)**	NA
Known hypersensitivity to Alteplase or gentamicin[4]	5 **(7.9)**	0	NA
Recent lumbar puncture	24 **(38)**	50 **(54)**	114 **(50)**
Myocardial infarction in last 3 months[4]	1 **(1.6)**	0	NA
Lactation or parturition in last 30 days[4]	1 **(1.6)**	0	NA
Demographics*(n=4)*			
Age >75 years	0	0	NA
Age > 80 years	8 **(13)**	3 **(3.2)**	36 **(16)**
Only to be used by physicians trained and experienced in the use of thrombolytic treat	11 **(18)**	40 **(43)**	NA
Inability to obtain written informed consent for on-label treatment	5 **(7.9)**	3 **(3.2)**	21 **(9.2)**

1 - This was specified as an exclusion on the USA survey and therefore not specified on inclusions. 2 – The 54 respondents that selected the standard USA criteria “Age <80 years, for 3-4.5hr since onset” were removed from the calculation. 3 - Haemorrhage on CT was specified as an exclusion on the USA survey, so these data were not collected. 4 - This was specified as an ‘other’ by respondents
NA = not applicable refers to a criterion that was not pre-specified in the country-specific survey.

SAH: Subarachnoid Haemorrhage; CT: Computed Tomography; CTP: Computed tomography perfusion; CTA: Computed tomography angiography; INR: International Normalised Ratio; APTT: Activated Partial Thromboplastin Time; BP: Blood Pressure; CPR: Cardiopulmonary Resuscitation; NIHSS: National Institute of Health’s Stroke Scale; mRS: Modified Rankin Scale; ROSIER: Recognition of Stroke in the Emergency Room Scale.