

2018



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Thrombectomy

Thrombectomy is mechanical clot retrieval for treating acute ischaemic stroke to remove the obstructing blood clot or other particles from arteries within the brain, restoring blood flow and minimising permanent tissue damage (NICE 2018)

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Mr CLEAN Study 2014

- Prospective National Multi-Centre Registry - 500 patients with acute ischaemic stroke caused by proximal arterial occlusion in the anterior circulation
- 89% of all patients received iv alteplase before randomisation
- The control group received usual care in comparison to the intervention group who received thrombectomy within 6 hrs of onset and usual care
- They demonstrated that 33% of the intervention group achieved a MRS score 0-2, good outcomes, in comparison to 19% of the control group. Mortality was not statistically different between either groups
- **Findings: thrombectomy is safe and effective within 6hrs of onset for patients with AIS secondary to proximal arterial occlusion**

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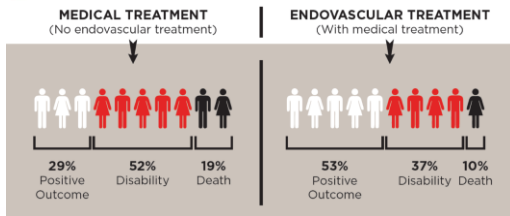
ESCAPE 2015

- International prospective, randomised, controlled multi-centre trial including 22 centres with blinded outcome evaluation
- Eligibility included adults with disabling AIS, small infarct core and moderate collaterals on CT/CTA
- The intervention group received standard care and thrombectomy within 12 hours of onset and the control group received standard care
- After the MR CLEAN results were published a planned interim analysis was accelerated. This analysis recommended terminating the trial early due to efficacy after 243 patients

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ESCAPE Trial Results



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DAWN Trial 2018

- DAWN trial was a multicenter, prospective, randomized, open-label trial with blinded assessment of end points enrolling 206 patients
- Eligible patients included those with occlusion of the intracranial ICA or proximal MCA who had been LSW 6-24 hours previously & who had a mismatch between clinical deficit severity and the infarct volume on imaging
- Again the intervention group received thrombectomy plus standard care in comparison to the control group who received standard care
- Day 90 median MRS post EVT was 3 compared to 5 in the control group with functional independence (MRS 0-2) 49% post thrombectomy compared to 13%
- **Findings: DAWN demonstrated evidence of the benefit of thrombectomy in AIS patients with mismatch between clinical stroke severity and infarct volume on imaging up to 24 hours post onset**

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National Thrombectomy Service

- Beaumont Hospital on a 24 hour basis, 7 days a week
- Cork University Hospital provides an 8-8 service, 5 days a week for their surrounding network. Outside these hours patients are referred to Beaumont
- In 2017 4,319 patients were discharged from Irish hospitals with stroke diagnosis
 - 248 thrombectomies were performed in Beaumont
 - 31 were performed in CUH

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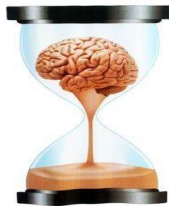
2017 Thrombectomies

Hospital	% Referral (N)	Total N of Strokes	Hospital	% Ref (N)	Total N of Strokes
• Mater	16(47)	298	• Limerick	3(8)	303
• Beaumont	16(44)	269	• JCMH	3(5)	155
• Naas	13(24)	182	• Sligo General	3(5)	154
• Mullingar	11(5)	117	• Mayo	3(5)	184
• St James	32(5)	221	• Galway	2(7)	205
• Kilkenny	9(8)	91	• Wexford	1(2)	140
• SVUH	7(18)	269	• Bon Secours	1(2)	Unknown*
• Tallaght	7(15)	224	• Tullamore 1(1)	0	80
• OLOL	7(15)	164	• Portlincula	0	73
• Cork	6(27)	418	• University Hospital Kerry	0	144
• Letterkenny	4(7)	178	• South Tipperry General	0	103
• Cavan	4(6)	147	• Mercy University	0	98
• Waterford	4(4)	102	• Navan	0	68
			• Bantry	0	58

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Hospital	Total	Door To CT (Min)	Door To Needle (Hr:Min)	Door To BH NeuroRad Contact (Hr:Min)	DIDO (Hr:Min)
Mater	47	17*	0:48	0:54*	1:25
Beaumont	44	23	0:34*	N/A	N/A
Naas	24	38	0:51	1:14	1:34
St. James	20	30	1:05	0:56	1:36
SVUH	18	33	0:51	1:28	1:55
Tallaght	15	38	1:15	1:37	2:30
Mullingar	13	28	1:06	1:02	2:00
OLOL	11	23	0:50	1:15	1:55
Kilkenny	8	29	0:39	1:24	1:50
Letterkenny	7	59	1:40	1:36	2:14

Hospital	Total (I.P)	Door To CT (Min)	Door To Needle (Hr:Min)	Door To BH NeuroRad Contact (Hr:Min)	DIDO (Hr:Min)
Galway	7	20	0:50	1:00	1:28
Cavan	6	37	1:05	1:49	2:06
JCMH	5	44	N/A	1:28	1:49
Sligo General	5	54	1:11	1:55	1:59
Mayo	5	57	2:49*	2:20	3:01
Waterford	3(2)	19	1:13	0:55	1:05
Limerick	3	37	0:51	0:50	1:44
Cork	2	51	1:45	2:37	3:31*
Wexford	2	59	N/A	1:25	1:58
Bon Secours*	2(2)	N/A	N/A	N/A	N/A
Tullamore	1	60*	N/A	3:00*	3:15



National QI project Aim for Door To Decision < 30 minutes

Round 1

Waterford
Kilkenny
Letterkenny
Beaumont
SVUH
MMUH
Limerick
OLOL
Galway
CUH

Round 2

Bantry
Kerry
Portlincula
Connolly
Wexford
Sligo
Mayo
Tallaght
South Tipp
Mullingar

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Eligibility for Thrombectomy

- Clinical examination consistent with acute ischaemic stroke
- Non contrast CT brain showing no infarct or evidence of early acute small core infarct (ASPECTS >4)
- CTA if available showing large vessel occlusion (Intracranial or extracranial ICA, M1 or M2 middle cerebral or basilar artery)
- Suitable or unsuitable for IV thrombolysis. If suitable, start immediately but do not wait to see the effect before calling neuroradiology
- Time of onset or LSW less than 24 hours ago

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Thrombectomy Procedure

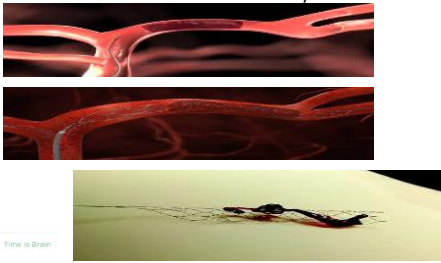
- Thrombectomy video

<https://www.youtube.com/watch?v=RKeKdAWsO4o>

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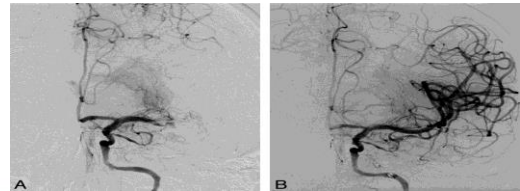
Thrombectomy



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Angiography Pre & Post Thrombectomy



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Post Thrombectomy Nursing Care

- Glasgow Coma Score
 - Report if any deterioration in motor status or any 2 points overall
- Early Warning Score
 - If unstable for 24 hrs cardiac monitoring/telemetry
- Post angiogram nursing care (local policy)
 - Pedal pulses present?
 - Stab site dry and intact?
 - Colour, Movement, Sensation normal?
 - Bed rest for 4-6 hours if above are stable

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Nursing the AIS Patient

IHF Thrombolysis Guidelines (2015)

General Nursing Management

- Pulse oximetry - maintain O2 saturations above 95%
- Maintain normal temperature. Paracetamol if temp > 37.0C
- Blood Glucose: Maintain blood glucose < 10 mmol/l using IV insulin if necessary
- DVT prophylaxis - ideally with automated spontaneous compression devices
- Early mobilisation in first 24 hours if tolerated
- Risks and benefits of all invasive procedures should be carefully considered ... No urinary catheters/NGT/IVC for at least 1 hour after tPA infusion ended if possible.
- Falls Risk Assessment & Prevention measures
- If thrombolysed: no aspirin, clopidogrel, dipyridamole or anticoagulant (heparin, warfarin, NOAC's) for 24 hours. Repeat CTB after 24 hours and if no haemorrhage start anti-platelet therapy
- NPO until swallow screen assessment - Early hydration / nutrition

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Contact Stroke Registrar if:

- Change in neurological condition/GCS
- Signs of significant bleeding from any site, groin haematoma
- Loss of pedal pulses or CMS change
- Systolic BP >180mmHg or <100mmHg
- Diastolic BP >105mmHg or <50mmHg
- HR >120/min or <50/min
- RR >24/min or <8<min
- Temp >38 degrees
- Urinary output <30mls/hr

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Intracerebral Haemorrhage

Signs & Symptoms

- New or worsening severe headache acute headache or worsening severity of headache
- Acute hypertension > 180mmHg systolic BP, or >105mmHg diastolic BP
- Nausea and vomiting
- Agitation
- Seizure
- Glasgow Coma Score drops by two or more points
- NIHSS rises by more than 4 points
- New motor signs contralateral to the stroke

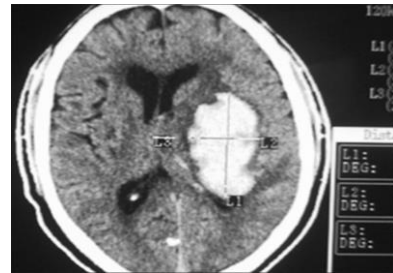
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Intracerebral Haemorrhage Management

IHF 2015

Repeat CTB urgently and Send CT via image-link / NIMIS to local Neurosurgical Unit and discuss case with neurosurgical registrar on call and consider administration of:

- Fibrinogen 4g (aim is for post-treatment fibrinogen level > 1.5 g/L) - If not available then give fresh frozen plasma 15mL/kg
- Platelets 2 pools (= 10 units) - Platelets are given for platelet dysfunction and not thrombocytopenia as rt-PA can impair platelet function.
- Consideration can be given to an anti-fibrinolytic agent i.e. Tranexamic acid (1g bolus IV, followed by 1g IV over 30 minutes) after discussion with Haematology but only in extremis and if given early



Hypertension

- Generally not over treated but closely monitored, maintain limits (180/105)
- Blood pressure is increased in up to 75-80% of patients with acute stroke and usually decreases spontaneously
- Hypertension can lead to cerebral oedema, haematoma expansion or haemorrhagic transformation
- Low BP can lead to increased cerebral infarction
- Re-start prescribed anti-hypertensives as soon as safe to do so

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Hypertension Continued

- Labetalol 10mg IV over 1-2 mins. May repeat or double every 10mins to a max of 300mg; or give initial dose then infusion at 2-8 mg/min. Monitor BP every 5 minutes during labetalol treatment
- Glyceryl trinitrate IV starting as 5-10mcg/min and titrated according to effect
- GTN patch 5 mg topically (which can be increased to 10mg if required) however onset of action time is up to 30 mins, with a peak effect at 2 hours
- Nicardipine 5mg/hour IV infusion, may increase by 2.5 mg/hour every 5 mins to max 15 mg/hour OR
- Sodium nitroprusside 0.5mcg/kg/min infusion

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Seizure (NICE guidelines 2018)

Nursing management of generalised tonic-clonic seizures (convulsive status epilepticus):

- Assess and secure airway
- Administer high-concentration oxygen
- Assess cardiac and respiratory function
- Check blood glucose levels
- Insert secure intravenous access in a large vein
- Report to medical team urgently

Consider with medical team:

- Administration of intravenous lorazepam as first-line treatment. Administration of intravenous diazepam if intravenous lorazepam is unavailable, or buccal midazolam if unable to secure immediate intravenous access. Administer a maximum of two doses
- If seizures continue, administration of intravenous phenobarbital or phenytoin as second-line treatment
- Commencement of regular Anti-Epileptic Drugs (AEDs)

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Raised Intracranial Pressure

- Glasgow Coma Score decrease in motor status or any drop in 2 overall
- Pupil difference (late sign)
- Cushing's Triad
 - Widening pulse pressures
 - Increased systolic BP
 - Decreased pulse
 - Decreased respirations



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Decompressive Hemicraniectomy (NICE 2018)

- People with MCA infarction who meet all of the criteria below should be considered for decompressive hemicraniectomy. They should be referred within 24 hours of onset of symptoms and treated within a maximum of 48 hours.
- Aged 60 years or under.
- Clinical deficits suggestive of infarction in the territory of the middle cerebral artery, with a score on the National Institutes of Health Stroke Scale (NIHSS) of above 15.
- Decrease in the level of consciousness to give a score of 1 or more on item 1a of the NIHSS.
- Signs on CT of an infarct of at least 50% of the MCA territory, midline shift with or without additional infarction in the territory of the anterior or posterior cerebral artery on the same side, or infarct volume greater than 145 cm³ as shown on diffusion-weighted MRI.

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