ONLINE SUPPLEMENT

Supplementary Table I. Summary of mRS outcomes (%) from DEFUSE 3 and DAWN trials.

Trial	Intervention group	mRS 0-2 (%)	mRS 3-5 (%)	mRS 6 (%)
DAWN	Thrombectomy + Medical Treatment	54	16	30
12 hrs	Medical Treatment alone	20	48	33
DEFUSE 3	Thrombectomy +Medical Treatment	44	41	14
16 hrs	Medical Treatment alone	16	58	26
DAWN	Thrombectomy + Medical Treatment	44	35	21
24 hrs	Medical Treatment alone	8	52	40

Supplementary Table II. Model parameters and range of values for sensitivity analysis.

	Base-Case value	Distribution	Range	Alpha-Beta	Source
Probabilities from 6 to 12 hours					
mRS 0-2 after medical therapy and thrombectomy	0.54	Dirichlet	0-1	54-46	15
mRS 3-5 after medical therapy and thrombectomy	0.16	Dirichlet	0-1	16-84	15
mRS 6 after medical therapy and thrombectomy	0.30	Dirichlet	0-1	3070	15
mRS 0-2 after medical therapy alone	0.20	Dirichlet	0-1	20-81	15
mRS 3-5 after medical therapy alone	0.48	Dirichlet	0-1	48-53	15
mRS 6 after medical therapy alone	0.33	Dirichlet	0-1	33-68	15
If medical therapy alone					
mRS 0-2 after recurrent stroke	0.20	Dirichlet	0-1	198-802	Short
mRS 3-5 after recurrent stroke	0.55	Dirichlet	0-1	475-525	term
mRS 6-death after recurrent stroke	0.55	Dirichlet	0-1	327-673	model
If endovascular thrombectomy					
mRS 0-2 after recurrent stroke	0.54	Dirichlet	0-1	540-460	Short
mRS 3-5 after recurrent stroke	0.16	Dirichlet	0-1	160-840	term
mRS 6-death after recurrent stroke	0.30	Dirichlet	0-1	300-700	model
Probabilities from 6 to 16 hours					
mRS 0-2 after medical therapy and thrombectomy	0.44	Dirichlet	0-1	44-55	14
mRS 3-5 after medical therapy and thrombectomy	0.41	Dirichlet	0-1	41-58	14
mRS 6 after medical therapy and thrombectomy	0.14	Dirichlet	0-1	14-85	14
mRS 0-2 after medical therapy alone	0.16	Dirichlet	0-1	16-85	14
mRS 3-5 after medical therapy alone	0.58	Dirichlet	0-1	59-42	14
mRS 6 after medical therapy alone	0.26	Dirichlet	0-1	26-75	14
If medical therapy alone					
mRS 0-2 after recurrent stroke	0.16	Dirichlet	0-1	158-842	Short
mRS 3-5 after recurrent stroke	0.55	Dirichlet	0-1	584-416	term
mRS 6-death after recurrent stroke	0.55	Dirichlet	0-1	257-743	model
If endovascular thrombectomy					
mRS 0-2 after recurrent stroke	0.44	Dirichlet	0-1	444-556	Short
mRS 3-5 after recurrent stroke	0.41	Dirichlet	0-1	414-586	term
mRS 6-death after recurrent stroke	0.14	Dirichlet	0-1	141-859	model
Probabilities from 6 to 24 hours					
mRS 0-2 after medical therapy and thrombectomy	0.44	Dirichlet	0-1	44-56	15
mRS 3-5 after medical therapy and thrombectomy	0.35	Dirichlet	0-1	35-65	15
mRS 6 after medical therapy and thrombectomy	0.21	Dirichlet	0-1	21-79	15
mRS 0-2 after medical therapy alone	0.08	Dirichlet	0-1	8-93	15
mRS 3-5 after medical therapy alone	0.52	Dirichlet	0-1	53-48	15
mRS 6 after medical therapy alone	0.40	Dirichlet	0-1	40-61	15
If medical therapy alone					
mRS 0-2 after recurrent stroke	0.08	Dirichlet	0-1	79-921	Short
mRS 3-5 after recurrent stroke	0.55	Dirichlet	0-1	525-475	term
mRS 6-death after recurrent stroke	0.55	Dirichlet	0-1	396-604	model
If endovascular thrombectomy					
mRS 0-2 after recurrent stroke	0.44	Dirichlet	0-1	440-560	Short
mRS 3-5 after recurrent stroke	0.35	Dirichlet	0-1	350-650	term
mRS 6-death after recurrent stroke	0.21	Dirichlet	0-1	210-790	model

(continues)

Supplementary Table II. Model parameters and range of values for sensitivity analysis (continued).

	Base-Case value	Distribution	Range	Alpha-Beta	Source
Transition probabilities					
Movement from up to end of year 1 to 3 months					
Independetnt mRS 0-2					
Independent mRS 0-2	0.955	Dirichlet	0-1	1337-63	21
Dependent mRS 3-5	0.024	Dirichlet	0-1	34-1366	21
Recurrent stroke	0.013	Dirichlet	0-1	18-1382	21
Dead mRS 6	0.008	Dirichlet	0-1	11-1389	21
Dependent mRS 3-5					
Dependent mRS 3-5	0.919	Dirichlet	0-1	1287-113	21
Independent mRS 0-2	0.029	Dirichlet	0-1	41-1359	21
Recurrent stroke	0.013	Dirichlet	0-1	18-1382	21
Dead mRS 6	0.039	Dirichlet	0-1	55-1345	21
Movement from after year 1 to 3 months					
Independent mRS 0-2					
Independent mRS 0-2	0.979	Dirichlet	0-1	1371-28	21
Dependent mRS 3-5	0.000	Dirichlet	0-1	17-1382	21
Recurrent stroke	0.013	Dirichlet	0-1	11-1388	21
Dead mRS 6	0.008	Dirichlet	0-1	11-1388	21
Dependent mRS 3-5					
Dependent mRS 3-5	0.948	Dirichlet	0-1	1327-72	21
Independent mRS 0-2	0.000	Dirichlet	0-1	17-1382	21
Recurrent stroke	0.013	Dirichlet	0-1	54-1345	21
Dead mRS 6	0.039	Dirichlet	0-1	55-1345	21
Recurrent stroke after medical therapy alone					
Independent mRS 0-2	0.834	Dirichlet	0-1	834-165	21-24
Dependent mRS 3-5	0.137	Dirichlet	0-1	136-863	21-24
Dead mRS 6	0.029	Dirichlet	0-1	28-971	21-24
Recurrent stroke after medical therapy and thrombectomy					
Independent mRS 0-2	0.867	Dirichlet	0-1	867-132	21-24
Dependent mRS 3-5	0.104	Dirichlet	0-1	103-896	21-24
Dead mRS 6	0.029	Dirichlet	0-1	28-971	21-24

*mRS indicates modified Rankin Scale

(continues)

Supplementary Table II. Model parameters and range of values for sensitivity analysis (continued).

	Base-case value	Univariate SA	Distribution	Range	Alpha - Beta	Source
Utilities						
Independent mRS 0-1-2	0.185	0.1725-0.1925	Beta	0-1	684-3021	25
Dependent mRS 3-4-5	0.095	0.0725-0.1175	Beta	0-1	60-590	25
Recurrent stroke	0.087	0.08-0.090	Beta	0-1	540-5685	24
Dead mRS 6	0			0		25
Costs						
Medical Therapy	$ 2,346	$ 1,578 - $ 2,997	Gamma			8,20,21
Mechanical Thrombectomy (16 hrs)	$ 8,320	$ 7,694 - $ 14,289	Gamma			8,20,21
Mechanical Thrombectomy (12 -24 hrs)	$ 6,339	$ 5,824 - $ 10,816	Gamma			8,20,21
Acute costs first 3 months						
Independent mRS 0-1-2	$ 9,006	$ 8,156 - $ 9,849	Gamma			8,21
Dependent mRS 3-4-5	$ 19,272	$ 17,482 - $ 21,061	Gamma			8,21
Acute event fatal stroke mRS 6	$ 12,380	$ 8,666 - $ 17,919	Gamma			8,21
Cost of recurrent stroke	$ 458	$327 - $474	Gamma			internal model
Ongoing costs every 3 months						
Independent mRS 0-1-2	$ 600	$ 430 - $ 799	Gamma			8,21
Dependent mRS 3-4-5	$ 1,612	$ 1,156 - $ 2,147	Gamma			8,21

Supplementary Table III. Detailed breakdown costs for Medical Therapy and Mechanical Thrombectomy.

Cost of Alteplase Treatment	Cost (US$ 2017)
Cost of drug	738.78
Cost of staff	
Additional nurse time (5 min)	11.16
Registrar time (190 min)	301.03
Consultant time (50 min)	155.09
Routine observation by senior nurse (5 min)	2.12
Additional set of observation x 12 (5 min)	186.11
Senior nurse care 1:1 (5 hours)	930.54
Overnight senior nurse care (10 min)	9.15
Total cost of administration of Alteplase	1,595.20
Total cost of Alteplase Treatment	2,333.97

Cost of Mechanical Therapy	Cost (US$ 2017)
Thrombectomy (material) DAWN trial -12, -24 hours	
Trevo® stentriever	4,168.45
Guidecatheter (Flowgate™)	961.95
Guidewire (Transend®)	141.09
Trevo® Pro 18 microcatheter	128.26
Total cost of material	5,399.75
Thrombectomy (material) DEFUSE trial - 16 hours	
Solitaire™ stentriever	4,867.47
Guidecatheter (Envoy®)	127.20
Guidewire (Traxcess®)	192.39
Microcatheter	468.15
Carotid Stent	1,019.67
Aspiration catheter	705.43
Total cost of material	7,380.30
Cost of staff	
Interventional neuroradiologist	328.03
Radiographer	86.69
Instrument nurse/scrub nurse	51.55
Circulating nurse	49.20
Anaesthesist	328.03
Anaesthetic nurse/ODP	96.07
Total cost staff	939.58
Total cost of Thrombectomy in DAWN trial	6,339.32
Total cost of Thrombectomy in DEFUSE 3 trial	8,319.88

Supplementary Table IV. Probabilistic Sensitivity Analysis: Expected values per 1,000 patients. Costs are based on 2017 prices. The Net Monetary Benefit is calculated at the lower and upper limits of the willingness to pay for a QALY, which in the UK are $25,600 (£20,000) and $38,400 (£30,000) respectively.

Cost utility of Mechanical Thrombectomy performed within 12 hours

	Medical Therapy alone	Mechanical Thrombectomy	Difference
Costs	$35,375,699	$37,929,541	$2,553,841
(95% CI)	($32,124,664 - $38,516,498)	($35,203,952 - $40,553587)	(-$1,648,269-$6,682,749)
QALYs	3,065	4,692	1,627
(95% CI)	(2,560 – 3,599)	(3,998-5,363)	(760-2,473)
ICER			$1,570
(95% CI)			($-1,649 - $3,685)
Net Monetary Benefit			
Lower	$43,258,415	$82,428,773	
Upper	$82,575,472	$142,607,931	

Cost utility of Mechanical Thrombectomy performed within 16 hours

	Medical Therapy alone	Mechanical Thrombectomy	Difference
Costs	$40,582,093	$49,435,191	$8,853,098
(95% CI)	($37,398,484 - $43,522,487)	($46,890,573 - $51,736,576)	($5,103,214 - $12,711,247)
QALYs	3,119	4,805	1,686
(95% CI)	(2,668-3,592)	(4,248-5,352)	(952-2,391)
ICER			$5,252
(95% CI)			($3,094-$7,954)
Net Monetary Benefit			
Lower	$39,425,686	$73,815,507	
Upper	$79,429,575	$135,440,856	

Cost utility of Mechanical Thrombectomy performed within 24 hours

	Medical Therapy alone	Mechanical Thrombectomy	Difference
Costs	$34,363,357	$42,639,941	$8,276,584
(95% CI)	($30,826,319 - $37,732,263)	($39,861,955-$45,235,024)	($3,906,006-$12,689,364)
QALYs	2,323	4,557	2,234
(95% CI)	(1,914-2,777)	(3,950-5,151)	(1,494-2,956)
ICER			$3,704
(95% CI)			($2,032-$5,518)
Net Monetary Benefit			
Lower	$25,222,958	$74,262,957.14	
Upper	$55,016,116	$132,714,406.50	