Plan

- 46 months of data, n=2444, average 638 admissions per year.
- Model mimics the flow of patients from admission to an acute stroke unit through to community rehabilitation and ESD.
- AIM:
    - identify current capacity bottlenecks effecting patient flow,
    - future capacity requirements in the presence of increased admissions,
    - the impact of colocation and pooling of the acute and rehab units and the impact of complex neurological patients; cared for by stroke team; on capacity requirements.

Simulation Model requirements

- Patient breakdown:
    - Stroke – 1320, 54%
    - High risk transient ischemic attack 158, 6%
    - Complex neurological – 456, 19%
    - Other – 510, 21%
- Number of beds in acute stroke unit – 10
- Number of beds in community rehab unit – 12
- POISSON DISTRIBUTION

PARAMETERS

These parameters replicate the base scenario, i.e. with current levels of demand. Scenarios investigating increased demand multiply the mean arrivals rates (supplied in main text) by the appropriate factor. To exclude a particular patient group the mean inter-arrival time for that group is multiplied by a large number such that no arrivals will occur in the modelled time horizon.

Table S2: Acute Length of stay parameters

				Percentiles			
	Mean	**Stdev**	**Median**	**5th**	**95th**	**25th**	**75th**
Strokes – No ESD	7.4	8.6	4.0	1.0	23.0	2.0	9.0
Strokes – ESD	4.6	4.8	3.0	1.0	11.0	2.0	6.0
Stroke – Mortality	7.0	8.7	4.0	0.5	22.0	2.0	8.0
TIA	1.8	2.3	1.0	0.5	4.0	1.0	2.0
Complex-neurological	4.0	5.0	2.0	0.5	13.6	1.0	5.0
Other	3.8	5.2	2.0	0.5	12.1	1.0	5.0

All distributions modelled as lognormal.

Table S2: Rehabilitation length of stay parameters

				Percentiles			
	Mean	**Stdev**	**Median**	**5th**	**95th**	**25th**	**75th**
Strokes - No ESD	28.4	27.2	20.0	3.0	86.9	9.0	38.0
Strokes - ESD	30.3	23.1	22.0	6.0	78.0	13.8	44.0
Complex-neurological	27.6	28.4	18.0	2.5	88.5	8.0	36.0
Other	16.1	14.1	11.5	1.0	43.0	5.8	24.3
TIA	18.7	23.5	11.0	1.1	41.6	5.5	28.0

All distributions modelled as lognormal.

Table S3: Patient transfer matrix from acute stroke unit

Destination	**Stroke**	**TIA**	**Complex-neurological**	**Other**
Rehab	24%	1%	11%	5%
ESD	13%	1%	5%	10%
Other*	63%	98%	84%	85%

*Other includes any destination other than rehab or ESD. For example own home, care home or mortality.

Model Variables:

- Patient arrival rates
- Patient flow through the department
- Bed Occupancy within the stroke unit

Factors accounted for:

- Patient type
- Patient complexity
- Eligibility for ESD
- Seasonal (daily/quarterly) effects
- Overflow from other hospital wards

Model estimates unfettered demand – patients flow to appropriate ward as soon as is required.