

## TNT estimates to implement recommendations on multidisciplinary rehabilitation in stroke units

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**Please note that we judge these estimates to be very uncertain due to the assumptions we had to make (see below), and these estimates should not be used to guide clinical practice.**

Table 2a

Time needed to improve the outcome for one person	Time needed to provide the intervention for all eligible in the UK population	Time needed as proportion of time available
101 h for one fewer person to die (10 y after stroke; time split between nurses, physiotherapists, occupational therapists, and speech and language therapists).	350 000 h each for nurses, physiotherapists, occupational therapists, and speech and language therapists, per year would be needed to provide the intervention to all eligible in the UK population.	0.09% of nurses time, 1.4% of physiotherapists time, 0.9% of occupational therapists time, and 2.7% of speech and language therapists time available with patients (for all causes), would be needed to implement the recommendation.

### How TNT estimates were derived (more details available in Table 2b below):

The NICE guideline document available here: <https://www.nice.org.uk/guidance/cg162/chapter/1-Recommendations> ).

In summary, the major assumptions we made were; that implementing stroke units would not require any extra time for doctors (we assumed that doctors would not participate in the rehabilitation themselves, and the evidence cited by NICE suggested the intervention did not result in increased length of hospital stay), that the time needed to implement the intervention would be equally split between nurses, physiotherapists, occupational therapists, and speech and language therapists (we made this assumption for the sake of simplicity, and because we had no way of retaining information on differences in time requirements for these professions in clinical practice), that the time specified by NICE for multidisciplinary rehabilitation (45 min 5 days a week) was the only extra time required to achieve the effect, and that all patients with stroke would receive this time of rehabilitation (although it is stated in the guidelines that some patients will not be able to participate in rehabilitation to this extent and that some patients may require more intense rehabilitation).

*Considering all these assumptions, the TNTs for this intervention should be considered as an even rougher estimate than the other estimates of TNT in this publication. The rationale for performing these estimates, despite the major uncertainties, is to exemplify to the reader that also very resource intense interventions can result in comparably low TNTs if the recommendation applies to a relatively small proportion of the population and the NNT is comparably low. However, we want to make clear to the reader that the TNT estimates for this intervention should not be directly used to guide policy or clinical practice. Further, we believe that it would be possible for the guideline panel, having access to more information, to make more accurate TNT estimates.*

11.25 hours for 0.2% of the total population every year, split between nurses, physiotherapists, occupational therapists and speech and language therapists to 2.8 h for 0.2% of the population (125 000 people): 350 000 h for each of these categories of healthcare personnel = 1 400 000 h in total.

There are 301 491 FTEs of nurses working in the NHS in England (<https://www.gov.uk/government/news/record-number-of-nhs-doctors-and-nurses-in-england>). We assumed that there were the same number of nurses working per capita in England as in the whole of UK. England's

population is 56 million, and the UK population is 67 million, which means that the corresponding number of FTEs for nurses in the whole of UK would be 360 712.

There are 21 846 FTE of physiotherapists working in the NHS (<https://www.nuffieldtrust.org.uk/chart/progress-against-targets-on-physiotherapist-numbers>).

For occupational therapists and speech and language therapists we could only find information on number of people working – and not on FTE. We therefore used the information on physiotherapists to convert the numbers into FTEs in the following way: 28 000 physiotherapists were working in the NHS 2018, which corresponded to 18 700 FTEs in the same year – ie converting from number of physiotherapists to FTEs would mean multiplying the number of physiotherapists by 0.67.

There are 47 300 occupational therapists in the UK (<https://www.statista.com/statistics/318909/numbers-of-occupational-therapists-in-the-uk/>), which converted into FTEs means: 47 300 x 0.67 = 31 691 FTEs

There are 17 000 speech and language therapists in the UK (<https://www.prospects.ac.uk/job-profiles/speech-and-language-therapist>), which converted into FTEs means: 17 000 x 0.67 = 11 390 FTEs

We calculated total hours available face-to-face with patients as follows;

Nurses: 360 712 FTEs. 1128 hours per FTE. 406 883 136 hours.

Physiotherapists: 21 846 FTEs. 1128 hours per FTE. 24 642 288 hours.

Occupational therapists: 31 691 FTEs. 1128 hours per FTE. 35 747 448 hours.

Speech and language therapists: 11 390 FTEs. 1128 hours per FTE. 12 847 920 hours.

We thereby calculated “time needed as proportion of time available” as follows;

Nurses: 350 000 / 406 883 136 = 0.09%

Physiotherapists: 350 000 / 24 642 288 = 1.4%

Occupational therapists: 350 000 / 35 747 448 = 0.9%

Speech and language therapists: 350 000 / 12 847 920 = 2.7%

The NICE evidence synthesis (<https://www.nice.org.uk/guidance/cg162/evidence/full-guideline-pdf-190076509>) reports high certainty evidence that the intervention results in 108 fewer deaths per 1000 patients (from 42 fewer to 175 fewer) after 10 y follow-up. This corresponds to an NNT of 9 (i.e. 9 people would need to be treated for one fewer person to die).

Our estimates indicate that approximately 11.25 h would be needed for to provide the intervention to each patient, split between nurses, physiotherapists, occupational therapists, and speech and language therapists. Thereby, the corresponding “time needed to improve the outcome for one person” can be calculated as follows: 11.25 x 9 = 101 h.

**Table 2b**

Recommendation	Category of healthcare personnel	Time needed to provide the intervention to each person	Population eligible	Proportion of total population	Time needed per personnel category for all eligible
<p>People with disability after stroke should receive rehabilitation in a dedicated <a href="#">stroke inpatient unit</a> and subsequently from a specialist stroke team within the community.</p> <p>An inpatient <a href="#">stroke rehabilitation service</a> should consist of the following:</p>	<p><i>Specified by NICE as follows:</i></p> <ul style="list-style-type: none"> <li>-consultant physicians</li> <li>-nurses</li> <li>-physiotherapists</li> <li>-occupational therapists</li> <li>-speech and language therapists</li> <li>-clinical psychologists</li> </ul>	<p><i>Specified by NICE as follows:</i></p> <p>Offer initially at least 45 minutes of each relevant stroke rehabilitation</p>	<p><i>Specified by NICE as follows:</i></p> <p>Each year, approximately 110,000 people in England, 11,000 people in Wales and 4,000 people in</p>	<p>125 000 per 67 million people (population in the UK); 0.2% of the population each year.</p>	<p>11.25 h for 0.2% of the population.</p> <p>It is not specified in the guideline how much of the rehabilitation that is usually done by each</p>

<p>- a dedicated stroke rehabilitation environment</p> <p>- a core multidisciplinary team (see <a href="#">recommendation 1.1.3</a>) who have the knowledge, skills and behaviours to work in partnership with people with stroke and their families and carers to manage the changes experienced as a result of a stroke</p> <p>- access to other services that may be needed, for example:</p> <p>contenance advice</p> <p>dietetics</p> <p>electronic aids (for example, remote controls for doors, lights and heating, and communication aids)</p> <p>liaison psychiatry</p> <p>orthoptics</p> <p>orthotics</p> <p>pharmacy</p> <p>podiatry</p> <p>wheelchair services</p> <p>-a multidisciplinary education programme.</p>	<p>-rehabilitation assistants</p> <p>-social workers.</p> <p>Since the evidence synthesis suggested that the intervention did not result in prolonged stay in the hospital, and that the consultant physicians would not be providing rehabilitation, we assumed that the intervention would not require more time from consultant physicians than the alternative (i.e. ordinary care).</p> <p>We assumed that the extra time needed to provide the intervention compared to the alternative would be equally split between nurses, physiotherapists, occupational therapists and speech and language therapists.</p>	<p>therapy for a minimum of 5 days per week. It is not clearly specified whether this represents all extra time needed for the intervention, but we make this assumption.</p> <p>In the included studies, mean stay in hospital ranged between approximately 12 to 120 days and did not significantly differ between stroke units vs ordinary care. We chose to assume a mean hospital stay of 3 weeks.</p> <p>This means a total time needed to provide the intervention to each person of; 45 min, 5 days a week for 3 weeks: 675 minutes = 11.25 hours.</p>	<p>Northern Ireland have a first or recurrent stroke, which means 125 000 in the UK every year.</p>		<p>category of personnel. For the sake of simplicity, we assume that the time is equally split between the following personnel categories:</p> <p>Nurses: 2.8 h for 0.2%</p> <p>Physiotherapists: 2.8 h for 0.2%</p> <p>Occupational therapists: 2.8 h for 0.2%</p> <p>Speech and language therapists: 2.8 h for 0.2%</p>
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