

Results of a UK-wide vignette study with Occupational Therapists to explore cognitive screening post-stroke

Abstract

Background.

There is a paucity of evidence in the UK regarding occupational therapy (OT) cognitive screening, and whether, and how, cognitive impairments are identified and assessed.

Aims

To identify current OT practice for the assessment of cognitive problems in patients following stroke.

Methods

OTs were invited to complete an online vignette study. Participants were asked to identify any presenting cognitive problems, decide whether to complete cognitive assessments and list any assessments they would use. Data were analysed using descriptive analysis.

Findings

Fifty-three OTs from across the UK participated. OTs identified key cognitive issues but some problems, such as apraxia and attention, were overlooked. A large number of potential assessments were suggested: the most common were the Montreal Cognitive Assessment and Oxford Cognitive Screen.

Conclusion

The variation found in OTs' recognition and assessment of cognitive problems has potential to impact on management and rehabilitation in stroke services, survivor outcomes, education and research.

Keywords: Occupational therapy, stroke, cognitive screening, community, rehabilitation

Key points:

- There is variation in OTs' recognition and assessment of cognitive problems.
- OTs use a wide variety of cognitive assessments.
- OTs favour functional assessments over cognitive assessments.
- The variation has the potential to impact on stroke rehabilitation, research and education.

Introduction

It is estimated that over 100,000 people have a stroke in the UK every year (Stroke Association 2018). The prevalence of first time stroke in adults aged 45+ years is expected to increase by 59% by 2035 (Patel et al, 2018) with people most likely to have a stroke aged 55 years and over (Wang et al, 2013). Cognitive problems are common after stroke (Lincoln et al, 2011) and are reported in over half of stroke survivors six months post stroke (Mellon et al, 2015). Also, importantly, they occur in approximately half of those who have a transient ischemic attack (TIA) (Fens et al, 2013). Cognitive problems encompass impairments of attention, memory, language, visuospatial and executive abilities. Such impairments may vary in severity and indeed may not be significant until after discharge from hospital when the patient returns home and undertakes daily living activities (Patel et al, 2017; Zinn et al, 2004), or when they return to work (Grant et al, 2014; Sinclair et al, 2014) and find that they are not independent or need substantial help and support with activities

UK clinical guidelines advise screening patients early for cognitive problems (Department of Health, 2007; British Psychological Society, 2010; Royal College of Physicians [RCP], 2016a). The RCP clinical guideline for stroke states: *'People with stroke should be considered to have at least some cognitive impairment in the early phase. Routine screening should be undertaken to identify the person's level of functioning, using standardised measures'* (4.3.1.1.A) (Royal College of Physicians, 2016a). Current UK audit data suggests that many stroke survivors are screened before being discharged from hospital (Sentinel Stroke National Audit Programme, 2017). The increasing emphasis on discharging stroke survivors from hospital early has important implications for rehabilitation management within community stroke teams, particularly with regard to how information is passed on and how results of tests are used. There can also be issues around who should take responsibility

for follow-up of stroke survivors with cognitive problems. Tang et al (2017), in a study of primary and secondary care, found professionals were unsure who was ultimately responsible for longer term care and highlighted problems around lack of experience in some clinicians in conducting assessments and difficulties in communicating findings.

Occupational therapists (OTs) play an important role in the rehabilitation of stroke survivors, and are regarded as having a key role in cognitive rehabilitation (Govender and Kalra, 2014) particularly amongst Allied Health Professionals. There has been some exploration internationally of cognitive assessment practices undertaken by OTs with stroke survivors.

A previous telephone survey by Korner-Bitensky et al (2011) of OTs in Canada explored assessment and management of cognitive impairments following stroke; they found detection of problems was lower in community-based patient scenarios. They also found that a large number of assessments were used for screening, but highlighted that the most frequently cited was the Mini- Mental State Examination (MMSE). Korner-Bitensky et al (2011) found that few clinicians indicated that they would reassess cognitive function after the initial assessment which may result in missed opportunities to identify changes in cognition, which in turn, impacts on missed opportunities to adjust rehabilitation. In addition, the authors found that, of the clinicians who would repeat a cognitive assessment, they reported that they would use MMSE, which is not an appropriate measure for monitoring cognition post stroke as it does not predict deterioration or improvement in cognitive function over time (Bour et al 2010).

Korner-Bitensky et al (2011) noted the marked variation in practice between OTs participating in their survey and felt that less emphasis was placed on cognition in community

services. Similarly, findings from interviews in the qualitative phase of the present study, (Ablewhite et al, 2019) also showed marked variation in the cognitive screening of stroke survivors by OTs working in the community. It seemed that cognitive assessments were selected based on availability and familiarity rather than evidence for appropriateness to the suspected cognitive problem. Similarly, a Danish study that surveyed the choices made by OTs when selecting assessments for screening cognitive deficits during the immediate post-acute phase of stroke found only 9% of participants were using standardised assessments (Pilegaard et al, 2014). The authors also found that 13 different screening methods were being used.

The impact of cognition on recovery after stroke has been recognised (McKevitt et al, 2011) and, indeed, the James Lind Alliance cited it first in their list of the top ten priorities relating to life after stroke (Pollock et al., 2012). In the recent European Stroke Action Plan (ESAP) for 2018-2030 the variability in access to rehabilitation following stroke within and between countries (Norrving et al, 2018) was highlighted and the effective management of cognitive impairment following stroke was identified as a research and development priority. In addition, ESAP also agreed that the improvement of community rehabilitation is a target.

Despite emerging international research findings, relatively little is known about the identification of cognitive problems by OTs in the UK, the assessments that OTs routinely undertake or how these are used to shape rehabilitation, particularly in the community. Thus the aim of this study was to identify current OT practice in the UK for the assessment of cognitive problems in stroke survivors, in the community. We wanted to specifically explore: (i) OTs' identification of common cognitive problems after stroke, (ii) OTs' intention to

screen stroke survivors, and (iii) which cognitive assessments were suggested and the reasons for this choice.

Methods

Ethics

Ethical approval was obtained from the Health Research Authority (Reference 232332; 6/10/17). Approvals were also obtained from University of Nottingham as the study sponsor (02/10/17), Nottinghamshire Healthcare NHS Foundation (12/05/17), and Derbyshire Health Services NHS Foundation Trust (22/12/17).

Recruitment

OTs were invited to take part in the study via advertisements circulated within the Royal College of Occupational Therapists' Specialist Section in Neurological Practice and via a professional Twitter account. We aimed to recruit 40 OTs; this was a pragmatic target in accordance with the time and resources available for this exploratory study.

The eligibility criteria were that participants were OTs, working primarily in UK community stroke services and willing to give informed consent.

Development of questionnaire

A questionnaire was developed by the research team with input from the research steering group, which consisted of OTs, neuropsychologists, experts in stroke rehabilitation and stroke survivors and carers with personal experience of stroke. A series of ten vignettes (brief descriptions of stroke survivor scenarios) were produced. Each vignette contained realistic examples of common cognitive problems listed in the UK Stroke Association Guide (Stroke

Association, 2018) in individuals of different ages, genders, occupations, activity levels and social support systems. The vignettes were generated to identify OTs' current knowledge and understanding of cognition and cognitive assessment. OTs were asked to record whether the patient had a cognitive problem and their thoughts around screening assessment. In some scenarios, they were asked what further assessments might be administered, and to describe the likely implications of the given test results for patient management. The vignettes were circulated amongst the steering group for comments and iteratively developed.

Each vignette was set out slightly differently to minimise response bias and fatigue. In some vignettes, we provided a Montreal Cognitive Assessment (MoCA) (Nasreddine et al, 2005) score from a previous assessment in hospital, and in others the scenario unfolded over several statements in order to reflect gathering information over time and to find out at what point (if any) the OTs would complete a cognitive assessment with the stroke survivor. Each vignette contained signs and symptoms of two common cognitive problems after stroke such as a memory problem an executive function problem (see Table 3 for further details on this). An example of a 'closed' vignette is shown in Table 1 and an 'unfolding' vignette is shown in Table 2.

Insert Table 1 here

Insert Table 2 here.

The question response formats included a 6-point Likert scale (6 was deemed 'very likely') to indicate how likely participants felt the presenting issues were due to cognitive problems and yes/no response formats to record whether participants would administer a cognitive assessment. Participants were asked to complete free text responses to identify any cognitive problems, note any relevant issues for screening, or any other factors they considered

relevant. Responses were categorised into cognitive domains based on the definitions provided in the Stroke Association Guide (Stroke Association, 2018). In addition, OTs were asked to provide information about: their NHS banding to note their seniority, the higher the band, the more senior the occupational therapist, (explanation of the NHS clinical bands can be found at <https://www.nhsemployers.org/your-workforce/pay-and-reward/job-evaluation/national-job-profiles/allied-health-professionals>), how long they have worked clinically with stroke patients, whether the bulk of their work was in a hospital or community setting and their geographical location.

The questionnaire underwent a review with three clinical psychologists (who were not part of the research team or steering group) who had expertise in cognitive rehabilitation in stroke. This was to ensure the cognitive issues described were accurate, relevant and could be identified from the vignette. Some changes were made at this stage to clarify the wording, to ensure cognitive issues were central. A final review was conducted by the research team before formally pilot testing the questionnaire.

Three clinical OTs, recruited via contacts within the East Midlands, agreed to pilot test the questionnaire. Further minor changes were made to the wording of certain vignettes, based on their feedback. Furthermore their feedback on the length of the questionnaire and the time needed to complete it, led the research team to remove two vignettes. This was in order to ensure the questionnaire took approximately 30 minutes to complete. The data collected in the pilot study was not included in the final data analysis.

The vignettes and questionnaire were uploaded onto Bristol Online Survey. Participants were emailed a participant information sheet, informed consent was taken online and a link to the

online survey was provided. A written version of the questionnaire was also available on request.

Data Analysis

Descriptive statistics were used to examine the numbers of participants who identified cognitive problems within the vignettes, and the number of participants who, based on the information in the vignettes, indicated an intention to administer a cognitive assessment. We also examined the proportion who stated that they required additional information prior to deciding whether to administer a cognitive assessment, although the research team felt there was sufficient information in the scenarios. We also analysed the combination of proposed cognitive assessments with cognitive problem included within the vignette. Quantitative data were analysed using Statistical Package for the Social Sciences (SPSS) version 24. Free text responses were explored for key themes. The free text responses were coded and analysed using content analysis, following Krippendorff (2004). We coded free text segments into meaning units, which were then condensed to specific codes that coalesced around a meaning unit. These codes were then collapsed into categories and higher level themes.

Results

Participant Characteristics

A total of 53 OTs participated in the study and completed all 8 vignettes. The majority of OTs were employed at an NHS clinical Band 6 (56.6%, n=30) and 7 (37.7%, n=7), with small numbers employed at Band 5 (1.9%, n=1), Band 8 (1.9%, n=1) and Band 9, (1.9%, n=1). (Note that the higher the banding, the more senior the OT was). The majority had a community caseload (64.2%, n=34), with the remainder having a hospital caseload (30.2%, n=16) and combined caseload (5.6%, n=3). OTs' experience of working with stroke survivors ranged from 1 month to 30 years (mean 9.4 years, SD 7.44). OTs were from across the UK:

Scotland (15.2%, n=8), England (64%, n=34), Wales (1.9%, n=1), Northern Ireland (1.9%, n=1), or no location given (17%, n=9).

Vignette Responses

Identification of cognitive problems and intention to conduct screening assessment

Between 85% and 95% (n=45-51) of OTs correctly identified that the issues presented in vignettes 1, 3 and 8 were due to cognitive problems. Vignettes 1, 3 and 8 were also the stroke survivor scenarios where OTs indicated that they would cognitively assess.

Vignette 4 was least likely to be considered as having a cognitive issue, with 60% (n=32) of the participants identifying a cognitive problem. Despite this, 79% (n=42) indicated that they would administer a cognitive assessment in this scenario.

In each of the vignette responses, a higher number of OTs indicated they would administer a cognitive assessment compared to the number of OTs who identified the stroke survivor to have a cognitive issue (Figure 1).

Insert Fig 1 here

When asked to identify the cognitive problem, memory was accurately recognised between 79% -93% (n=42-49) of OTs. Visual neglect was also accurately identified by the majority of OTs (83%, n=44). The cognitive domains that were least well identified were apraxia 47% (n=25), and attention (between 8% - 59%, n= 4-31). Identification was more varied for executive function (between 45% -100%, n=24 -53) and visuospatial perception (between 19% - 96% n=10-51).

For most of the vignettes, participants indicated that they required additional information regarding the stroke survivor in order to decide whether or not to administer cognitive assessments, with the exception of vignettes 1 (89%, n=47), vignette 3 (81%, n=43) and 8 (89%, n=47) (Figure 2).

Insert Figure 2 here.

Proposed cognitive screening assessments

Participants proposed a number of assessments they would use to screen for cognitive problems. Table 3 presents the most common assessments proposed by OTs to screen for cognitive problems and the percentages of OTs who would use these assessments in each vignette.

Insert Table 3

As shown in table 3, for each of the vignettes, the OTs said they would use a ‘functional’ assessment. Although they did not define what they meant by this, the impression given was that they were observing patients undertaking a functional activity (such as a kitchen task). This was particularly in vignettes 2 and 6 that included a scenario with visuospatial and attention problems.

Free text comments

Participants had the opportunity to provide free text comments. The key issues raised are listed in Table 4 with representative quotations to illustrate the points raised.

Insert Table 4

Discussion

In this exploratory study, data were gathered on UK OTs' recognition of cognitive problems in stroke survivors (based on eight vignettes), their intention to administer cognitive assessments based on that recognition, and the assessments most frequently used. While there are research findings from other countries, this study and other results (Drummond et al 2019), provides a foundation for understanding UK OTs' cognitive assessment practices.

Although the aim was to recruit 40 OTs working in stroke teams primarily in the community, we recruited 53 OTs from throughout the UK. We believe this demonstrated the interest of the OTs who responded in the topic of cognitive problems after stroke.

Our results demonstrated inconsistencies in the identification of common cognitive problems. Although the majority of the OTs identified difficulties such as memory loss and visual neglect, apraxia and attention were less well recognised. This has implications for rehabilitation as these cognitive deficits may not be factored into or addressed in the rehabilitation programme, which suggests variability in rehabilitation as identified in the development of ESAP (Norrving et al, 2018). There were also discrepancies in the identification of the cognitive problems within the same domain, which might be explained by the presentation of other symptoms in the vignette (such as aphasia) which might have confused the OTs.

In some vignettes, where the OTs were able to identify a cognitive problem, they felt that the stroke survivors' presenting difficulties were not a result of cognitive problems. This suggests

that there are individual differences in the knowledge of cognitive problems, and that there is some uncertainty in how to assess cognition when stroke survivors display perceptual or language issues.

Our findings also showed that not all OTs would consider routinely assessing all stroke survivors for cognitive problems and that the likelihood of assessment varied depending on the signs and symptoms described. OTs were most likely to conduct an assessment when they felt stroke survivors had memory loss and executive function difficulties, and least likely when they believed stroke survivors had visuospatial issues. The most common reasons for not administering assessments were because the OTs felt 'functional' assessments would be more suitable for older patients or those with speech or perceptual issues would find assessments difficult. Although the OTs did not define what they meant by 'functional assessments', the impression is that they were observing patients undertaking a functional activity (such as dressing). This impression would be very much in keeping with what Koh et al (2009) reported in their survey of Australian OTs whereby a number of OTs felt that performance on paper and pencil activities may not be transferrable to activities of daily living. Some OTs did not consider assessments to be appropriate when the stroke survivor was demonstrating perceptual issues as they did not perceive this to be a cognitive issue.

Consistent with other study findings (Pilegaard 2014, Ablewhite et al 2019) a variety of assessments were suggested by OTs. The most commonly suggested were the MoCA and the OCS, followed by the ACE and the CAM (Addenbrooke's Cognitive Assessment (Mioshi et al, 2006) and Cognitive Assessment of Minnesota (Rustad et al, 1993)). Key reasons for choosing assessments included speed and ease of use, and familiarity which is consistent with other findings (Ablewhite et al, 2019). The MMSE was only proposed once and for only one

vignette, unlike findings by Koh et al (2009) and Korner-Bitensky et al (2011) in which the MMSE was one of the most popular tools reported. Functional assessments were also a popular choice when OTs considered exploring cognitive problems after stroke either, instead of, or as well as, another assessment. Functional assessments were most commonly suggested if the stroke survivor was retired or had language issues, or because they believed they would highlight both cognitive issues and rehabilitation goals. This was also similar to the results from the Koh et al (2009) who found that OTs relied heavily on clinical observations.

These findings offer some preliminary insights into the identification and management of cognitive problems after stroke in the UK. They must, however be considered in light of the study's limitations. There is a possibility of sampling bias, as participants with a particular interest and knowledge of cognitive problems after stroke would have self-selected to participate in the research. We were also very interested in gaining responses from OTs who worked in the community but, as this was an online tool, we could not control this. However, it was clear from the responses that the majority of the respondents were currently employed in, or had recent experience of working in the community. We also did not define any of the terms used but left the OTs to use these as they would routinely and as they thought appropriate. It was clear from the findings that OTs used many terms interchangeably- notably assessments, tools, and screening measures.

Notwithstanding these limitations, this is the first UK study to examine the day to day assessment of cognitive problems by OTs and the findings are in keeping with literature from other countries where similar research has been undertaken. The results suggest there is interest in the topic and the real possibility of professionally developing OT skills further in identifying cognitive problems, which could potentially improve the rehabilitation of people

with stroke. Not only would this have the potential to improve the independence and quality of life for stroke survivors but would have implications for caregivers and support services. Given the current issues with clinical psychology staffing and provision for stroke in the UK (RCP, 2016b), and the role of OT in providing ecologically valid assessments (Crist, 2015). OTs would be ideally placed to manage day to day cognitive issues in people with stroke.

Conclusion

There is variation within UK OTs recognition and assessment of cognitive problems which has potential to impact on rehabilitation in stroke services, survivor outcomes, education and research.

Acknowledgements:

The authors greatly appreciate the time given by participants to contribute to this phase of the COMPASS study. We would also like to acknowledge the contribution of the steering group members: Karen Clements, Robert Norbury, Professor Nikola Sprigg and Stephen Simpson. In addition, we acknowledge the contribution of Drs Kimberley Fletcher, Nima Moghaddam and Karen Treece for their help with the development of the vignettes. We are also grateful to Dr Esme Worthington who contributed to the overall development of this study and to Jade Kettlewell for administrative support.

Conflict of Interest

‘The Author(s) confirm that there is no conflict of interest’

Funding

This project was undertaken with the support of a Research Priority Grant from the UK Occupational Therapy Research Foundation awarded in 2017.

References

Ablewhite J, Geraghty J, das Nair R, Lincoln N, Drummond A. 2019. Cognitive management pathways in stroke services (COMPASS): A qualitative investigation of key issues in relation to community stroke teams undertaking cognitive assessments. *Brit J Occup Ther*. [Internet]. [cited 15 Oct 2019];82(7). Available from: <https://doi.org/10.1177%2F0308022619841320>

Baddeley AD, Emslie H, Nimmo-Smith I. 1994. *The doors and people test: A test of visual and verbal recall and recognition*. Bury-St-Edmunds UK): Thames Valley Test Company.

Bour A, Rasquin S, Boreas A, Limburg M, Verhey F. 2010. How predictive is the MMSE for cognitive performance after stroke? *J Neurol*. 257(4):630-637.

Crist PA. 2015. Framing Ecological Validity in Occupational Therapy Practice. *Open J Occup Ther* [internet]. [cited 22 Oct 2019]; 3(3). Available from: <https://doi.org/10.15453/2168-6408.1181>

Demeyere N, Riddoch MJ, Slavkova ED, Bickerton W-L, Humphreys GW. 2015. The Oxford cognitive screen (OCS): validation of a stroke-specific short cognitive screening tool. *Psychol Assessment*. 27(3):883-894.

Department of Health. 2007. *National Stroke Strategy* [Internet]. London (UK): Department of Health; [cited 2019 Oct 15]. Available from: https://webarchive.nationalarchives.gov.uk/20130104224925/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_081059.pdf

Drummond A, Geraghty J, Ablewhite J, et al. 2019. Cognitive management pathways in stroke services (COMPASS): The identification and management of cognitive problem by community stroke teams [Internet]. London (UK): Royal College of Occupational Therapists; [cited 2019 Oct 15]. Available from <https://www.rcot.co.uk/files/cognitive-management-pathways-stroke-services-compass-identification-and-management-cognitive>

Fens M, van Heugten CM, Beusmans GH, Limburg M, Haeren R, Kaemingk A, Metsemakers JF. 2013. Not as transient: patients with transient ischaemic attack or minor stroke experience cognitive and communication problems; an exploratory study. *Eur J Gen Pract*.19(1):11-16.

Govender P, Kalra L. 2007. Benefits of occupational therapy in stroke rehabilitation. *Expert Rev Neurother*. 7(8): 1013-1019.

Grant M, Radford K, Sinclair E, Walker M. 2014. Return to work after stroke: recording, measuring, and describing occupational therapy intervention. *Brit J Occup Ther*. 77(9);457-465.

Helm-Estabrooks N. 2001. *Cognitive linguistic quick test (CLQT)*. San Antonio (TX): Psychological Corporation.

Krippendorff K. 2004. *Content analysis: an introduction to its methodology* (2nd ed.) [Internet]. Thousand Oaks (CA): Sage Publications. [cited 15 Oct 2019]. Available from

https://books.google.co.uk/books?id=q657o3M3C8cC&pg=PP5&source=gbs_selected_pages&cad=3#v=onepage&q&f=false

Koh CL, Hoffmann T, Bennett S, McKenna K. 2009. Management of patients with cognitive impairment after stroke: a survey of Australian occupational therapists. *Aust Occup Ther J.* 56(5):324-331.

Korner-Bitensky N, Barrett-Bernstein S, Bibas G, Poulin V. 2011. National survey of Canadian occupational therapists' assessment and treatment of cognitive impairment post-stroke. *Aust Occup Ther J.* 58(4):241-250.

Lincoln NB, Kneebone II, Macniven JAB, Morris RC. 2011. Psychological management of stroke [Internet]. John Wiley & Sons, Ltd. [cited 15 Oct 2019] Available from <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119961307>

McKevitt C, Fudge N, Redfern J, Sheldenkar A, Crichton S, Rudd AR, Forster A, Young J, Nazareth I, Silver LE, et al. 2011. Self-reported long-term needs after stroke. *Stroke.* 42(5):1398-1403.

Mellon L, Brewer L, Hall P, Horgan F, Williams D, Hickey A, and on behalf of the ASPIRE-S study group. 2015. Cognitive impairment six months after ischaemic stroke: a profile from the ASPIRE-S study. *BMC Neurol* [Internet]. [cited 15 Oct 2019];15(31). Available from: <10.1186/s12883-015-0288-2>

Mioshi E, Dawson K, Mitchell J, Arnold R, Hodges JR. 2006. The Addenbrooke's cognitive examination revised (ACE-R): a brief cognitive test battery for dementia screening. *Int J Geriatr Psychiatry.* 21(11):1078-1085.

Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. 2005. The Montreal cognitive assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc.* 53(4):695-699.

NHS Employers. 2018. Allied health professionals [Internet]. UK: NHS employers; [cited 2019 Feb 13]. Available from <https://www.nhsemployers.org/your-workforce/pay-and-reward/job-evaluation/national-job-profiles/allied-health-professionals>

Norrving B, Barrick J, Davalos A, Dichgans M, Cordonnier C, Guekht A, Kutluk K, Mikulik R, Wardlaw J, Richard E, et al. 2018. Action Plan for Stroke in Europe 2018 – 2030. *Eur Stroke J.* 3(4):309 – 336.

Patel A, Berdunov V, King D, Quayyum Z, Wittenberg R, Knapp M. 2017. Current, future and avoidable costs of stroke in the UK. Executive summary [Internet]. UK: Stroke Association; [cited 2019 Oct 15]. Available from https://www.stroke.org.uk/sites/default/files/costs_of_stroke_in_the_uk_report_-_executive_summary_part_1.pdf

Pilegaard MS, Pilegaard BS, Birn I, Kristensen HK, Morgan MFG. 2014. Assessment of occupational performance problems due to cognitive deficits in stroke rehabilitation: a survey. *Int J Ther Rehabil.* 21(6):280-288.

Pollock A, St George B, Fenton M, Firkins L. 2012. Top ten research priorities relating to life after stroke. *Lancet Neurol.* 11(3):209.

Robertson IH, Nimmo-Smith I, Ward T, Ridgeway V. 1994. Test of everyday attention (TEA) [Internet]. Thames Valley Test Company; [cited 15 Oct 2019]. Available from: [https://www.pearsonclinical.co.uk/Psychology/AdultCognitionNeuropsychologyandLanguage/AdultAttentionExecutiveFunction/TestofEverydayAttention\(TEA\)/TestofEverydayAttention\(TEA\).aspx](https://www.pearsonclinical.co.uk/Psychology/AdultCognitionNeuropsychologyandLanguage/AdultAttentionExecutiveFunction/TestofEverydayAttention(TEA)/TestofEverydayAttention(TEA).aspx)

Royal College of Physicians Intercollegiate Stroke Working Party. 2016a. National clinical guidelines for stroke [Internet]. London (UK): Royal College of Physicians; [cited 2019 Oct 15]. Available from [https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-\(1\).aspx](https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx)

Royal College of Physicians. 2016b. Are stroke services in the NHS still improving?[Internet]. London (UK): Royal College of Physicians; [cited 2019 Jan 07]. Available from <https://www.rcplondon.ac.uk/news/are-stroke-services-nhs-still-improving>

Royal College of Physicians, Clinical Effectiveness and Evaluation Unit on Behalf of the Intercollegiate Stroke Working Party. 2017. Sentinel stroke national audit programme (SSNAP): clinical audit August - November 2016 public report [Internet]. London (UK): Royal College of Physicians; [cited 2018 Jul 31]. Available from <https://www.strokeaudit.org/Documents/National/Clinical/AugNov2016/AugNov2016-PublicReport.aspx>

Rustad RA, DeGroot TL, Jungkunz ML, Freeberg KS, Borowick LG, Wanttie AM. 1993. The cognitive assessment of Minnesota: examiner's guide. Tucson (Ariz): Therapy Skill Builders.

Sinclair E, Radford K, Grant M, Terry J. 2014. Developing stroke-specific vocational rehabilitation: a soft systems analysis of current service provision. *Disabil Rehabil.* 36(5):409-417.

Stroke Association. 2018. A complete guide to cognitive problems after stroke [Internet]. UK: Stroke Association; [cited 2019 Oct 15]. Available from https://www.stroke.org.uk/sites/default/files/user_profile/a_complete_guide_to_cognitive_problems_after_stroke.pdf

Tang EYH, Price C, Stephan BCM, Robinson L, Exley C. 2017. Gaps in care for patients with memory deficits after stroke: views of healthcare providers. *BMC health services research* [Internet]. [cited 15 Oct 2019];17(1):634. Available from: <https://bmchealthservres.biomedcentral.com/track/pdf/10.1186/s12913-017-2569-5>

The British Psychological Society. 2010. Psychological Services for Stroke Survivors and their Families. Briefing Paper 19 [Internet]. [cited 2019 Oct 15] Available from: <https://shop.bps.org.uk/psychological-services-for-stroke-survivors-and-their-families.html>

Wang Y, Rudd AG, Wolfe CD. 2013. Age and ethnic disparities in incidence of stroke over time: the south London stroke register. *Stroke.* 44(12):3298-3304.

Whiting SE, Lincoln NB, Bhavnani G, et al. 1985. Rivermead perceptual assessment battery (RPAB). Windsor (UK): NFER-Nelson.

Wilson B, Cockburn J, Halligan P. 1988. The Behavioural Inattention Test. Fareham (UK): Thames Valley Test Company.

Wilson BA, Emslie H, Evans JJ, Alderman N, Burgess PW. 1996. Behavioural assessment of dysexecutive syndrome. St. Edmunds (UK): Thames Valley Test Company.

Wilson BA, Greenfield E, Clare L, Baddeley A, Cockburn J, Watson P, Tate R, Sopena S, Nannery R, Crawford J. 2008. Rivermead behavioural memory test (RBMT-3). London (UK): Pearson Assessment.

Zinn S, Dudley TK, Bosworth HB, Hoenig HM, Duncan PW, Horner RD. 2004. The effect of poststroke cognitive impairment on rehabilitation process and functional outcome. *Arch Phys Med Rehabil.* 85(7):1084-1090.

Table 1- Example of a closed vignette

Mr Taylor is 55 years old and works full-time as a bank-clerk. Mr Taylor had a right frontal hemisphere stroke and had a MoCA score of 22 prior to discharge; he dropped points on trail making, letter fluency, attention and abstraction. He has coped well with most aspects of his phased return to work, but seems to cope less well when things don't go to plan, e.g. if he has to tackle an unexpected problem or change his plans at the last minute. His daughter reports that Mr Taylor also sometimes does things that seem a little impulsive, such as making large purchases over the internet.

- What cognitive problems do you think this person may have?

.....
.....
.....

- Would you undertake any further screening for cognitive problems for this person? (please circle) YES/NO

If **YES**, what further cognitive assessment tools would you use?

.....
.....

Why have you chosen these specific cognitive assessment tools?

.....
.....

If **NO**, why wouldn't you screen this person for cognitive problems?

.....
.....

- Do you have any immediate thoughts on issues relevant here, e.g., age of the patient?

.....
.....
.....

- How likely is it that this person is experiencing problems with regards to their cognitive abilities? (please circle)

Unlikely **1** **2** **3** **4** **5** **6** *Likely*

- Do you think you have enough information in the above scenario to make a judgement about whether to conduct cognitive screening with this person? (please circle)

Not Enough **1** **2** **3** **4** **5** **6** *Enough*

Please use the space below to make any further comments on this scenario.

.....
.....

Table 2 Example of an unfolding vignette

Mr March is 82 years old, is retired and lives at home usually independently. Mr March is usually a keen and active gardener. He was discharged from the stroke unit 10 weeks ago following a left hemisphere stroke and has now been referred to the community stroke team. He has experienced persistent right sided weakness and significant word finding and speech difficulties.

- Would you screen this person for cognitive problems? (please circle) YES/NO

Following discharge from hospital his daughter now does all his shopping and organises all his meals. His daughter reports that he forgets things that she has told him and she has to write down a meal plan for each day. He is unable to remember when people have visited him recently. His daughter reports that he gets easily confused.

- Would you screen this person for cognitive problems now? (please circle) YES/NO

Mr March is managing at home but is finding it difficult to move from room to room. His daughter reported that he tried to kill an insect with such extraordinary force she was quite taken aback.

- Would you screen this person for cognitive problems now? (please circle) YES/NO

If **YES**, what cognitive assessments would you use?

.....

Why have you chosen those particular cognitive assessment tools?

.....

.....

.....

If **NO**, why wouldn't you screen this person for cognitive problems?

.....

- What are your thoughts on issues relevant here? E.g. age, gender etc.

.....

.....

- What cognitive problems do you think this person may have?

.....

.....

- How likely is it that this person is experiencing problems with regards to their cognitive abilities? (please circle)

Unlikely **1** **2** **3** **4** **5** **6** *Likely*

- Do you think you have enough information in the above scenario to make a judgement about whether to conduct cognitive screening this person? (please circle)

Not Enough **1** **2** **3** **4** **5** **6** *Enough*

Please use the space below to make any further comments on this scenario.

.....

.....

.....

Figure 1- OTs perceptions on whether patient was displaying cognitive problems and their intention to cognitively screen

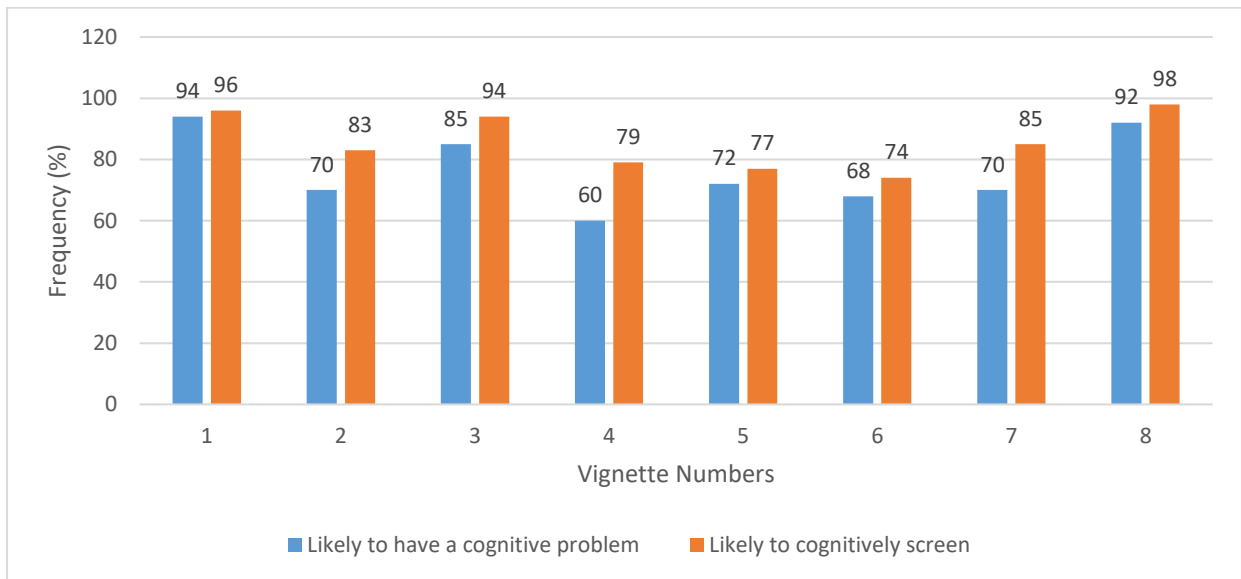


Figure 2- Sufficiency of information to decide if OTs should cognitively screen

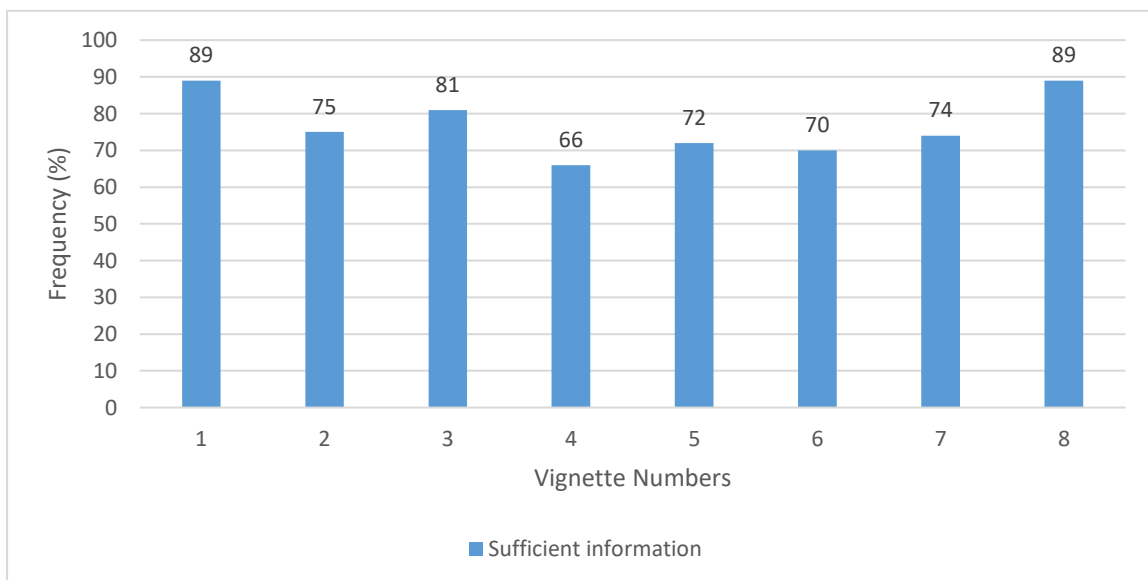


Table 3 OTs' suggestions for tests in each vignette

Vignette	Cognitive problem presented	'Functional'	MoCA	OCS	ACE	CAM	CLQT	RBMT	RPAB	BADS	TEA	BIT
		% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
1	Memory & EF	24.5 (13)	56.6 (30)	28.3 (15)	18.9 (10)	13.2 (7)	3.8 (2)	36 (19)	0	13 (7)	11 (6)	2 (1)
2*	Neglect & Visuospatial	37.7 (20)	9.4 (5)	24.5 (13)	5.7 (3)	5.7 (3)	1.9 (1)	2 (1)	11 (6)	2 (1)	4 (2)	34 (18)
3*	EF & Attention	13.0 (7)	13.2 (7)	13.2 (7)	5.7 (3)	13.2 (7)	1.9 (1)	8 (4)	0	43 (23)	17 (9)	0
4*	Memory & Attention	18.9 (10)	28.3 (15)	28.3 (15)	11.3 (6)	3.8 (2)	1.9 (1)	19 (10)	2 (1)	0	4 (2)	0
5	Attention & Visuospatial	24.5 (13)	22.6 (12)	13.2 (7)	5.7 (3)	1.9 (1)	3.8 (2)	0	38 (20)	0	0	2 (1)
6*	Apraxia & Visuospatial	37.7 (20)	18.9 (10)	26.4 (14)	3.8 (2)	7.5 (4)	1.9 (1)	2 (1)	11 (6)	11 (6)	4 (2)	8 (4)
7	Memory & EF	30.2 (16)	22.6 (12)	41.5 (22)	9.4 (5)	3.8 (2)	1.9 (1)	6 (3)	4 (2)	0	0	0
8*	EF & Attention	32.1 (17)	5.7 (3)	11.3 (6)	5.7 (3)	9.4 (5)	1.9 (1)	2 (1)	4 (2)	70 (37)	9 (5)	2 (1)

* = vignettes included a MoCA score EF= Executive Function

MoCA= Montreal Cognitive Assessment (Nasreddine et al, 2005), OCS= Oxford Cognitive Screen (Demeyere et al, 2015) ACE= Addenbrooke's Cognitive Assessment (Mioshi et al, 2006) CAM= Cognitive Assessment of Minnesota (Rustad et al, 1993), CLQT= Cognitive Linguistic Quick Test (Helm-Estabrooks ,2001) RBMT= Rivermead Behavioural Memory Test (Wilson et al, 200), RPAB= Rivermead Perceptual Assessment Battery (Whiting et al, 1985), BADS= Behavioural Assessment of Dysexecutive Syndrome (Wilson et al, 1996), TEA= Test of Everyday Attention (Robertson et al, 1994), BIT= Behavioural Inattention Test (Wilson et al, 1988).

Table 4. Free text comments

Theme	Supporting quotation
Functional or perceptual issues identified rather than cognitive issues	<p><i>"...may indicate an inattention to the left, may be poor attention to detail or physical difficulties that are affecting her functional performance" (OT 36 vignette 2)</i></p> <p><i>"... he clearly has a change in his functional abilities" (OT 5 vignette 1)</i></p>
Issues relating to aphasia	<p><i>"Impact of hearing deficit and potentially language mean many standardised assessments not appropriate". (OT 34 vignette 4)</i></p>
Uncertainty regarding sensitivity and usefulness of cognitive screening assessments	<p><i>"He scored well in the inpatient screen, most cognitive screens are not sensitive enough to pick up higher level cognitive difficulties. Further exploration of the difficulties he is having in the work context would offer a better insight and compensatory strategies could be explore in his work situation to overcome difficulties". (OT 49 vignette 3)</i></p>
Choice of cognitive screening assessments	<p><i>Good initial broad screening tool to identify what the issues are. I would then go on to use a more specific standardised assessment if required to gather more info, or to further explore specific deficits (OT 23 vignette 1)</i></p> <p><i>They are assessments that I am familiar with, available to use in the department and help to identify where problems may lie so that I can then look at those areas in more detail. I think they are valid for the specified population. (OT 35 Vignette 1)</i></p>

