Table 1 Examples of responses to the writing item on the MMSE, corrected according to different criteria.

Writing item	Correction criteria			
	Group of words that makes sense	Phrase	Sentence	Something understandable
Gracias [Thanks]	0	1	0	1
Pienso [I think]	0	1	1	1
Juan García	1	0	0	1
Voy [I'm coming]	0	1	1	1
Fuera de mi vista [Out of my sight!]	1	1	0	1
Hoy estoy largo [I'm long today]	1	1	1	0

scientific, pragmatic, economic, and legal reasons to grant the MMSE an honourable retirement in light of its nearly 40 years of dedicated service. I can only cite sentimental reasons for continuing to recommend this questionnaire.

Conflicts of interest

C. Carnero-Pardo is the author of Fototest and Eurotest.

References

1. No hay razones científicas para jubilar al MMSE. Neurologia. 2014.
2. Carnero-Pardo C. ¿Es hora de jubilar al Mini-Mental? Neurologia. 2013, http://dx.doi.org/10.1016/j.nrl.2013.07.003.
3. Carnero Pardo C, Cruz Orduña I, Espejo Martínez B, Cárdenas Viedma S, Torrero García P, Olazaran Rodríguez J. Efectividad del Mini-Mental en la detección del deterioro cognitivo en Atención Primaria. Aten Primaria. 2013;45:426—33.
4. Cruz-Orduña I, Bellón JM, Torrero P, Aparicio E, Sanz A, Mula N, et al. Detecting MCI and dementia in primary care: effectiveness of the MMS, the FAQ and the IQCODE. Fam Pract. 2012;29:401—6.
5. Carnero-Pardo C, Espejo-Martínez B, López-Alcalde S, Espinosa-García M, Sáez-Zea C, Vílchez-Carrillo R, et al. Effectiveness and costs of phototest in dementia and cognitive impairment screening. BMC Neurol. 2011;11:92.
6. Sackett DL, Haynes RB. Evidence base of clinical diagnosis: the architecture of diagnostic research. BMJ. 2002;324:539—41.

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There is no scientific basis for retiring the MMSE☆

No hay razones científicas para jubilar al MMSE

Dear Editor:

The article by Carnero-Pardo published in *Neurología*[1] has revived the debate on the possible obsolescence of the Mini-Mental State Examination (MMSE).[2] In his review article, the author advocates retiring the MMSE and argues that there are other tests which are shorter and more effective for detecting cognitive impairment. We feel that Dr Carnero-Pardo's arguments are biased by the lack of time faced by clinicians in Spain as well as by other specific circumstances.

The 4 arguments the author uses to support the 'well-deserved retirement' of the MMSE are the lack of standardisation for its items, the effect of socio-educational variables on results, its limited effectiveness for detecting cognitive impairment, and the fact that it is copyright-protected. At present, however, these arguments lack the scientific basis necessary to be considered valid, for several reasons.

(1) It is quite true that some items (words to be memorised, phrases to repeat, *etc.*) vary between versions and that a more uniform administration process would be helpful. Nevertheless, what defines a test's construct validity (and general validity) is the extent to which each item assesses what the test claims to assess. This has been demonstrated repeatedly in the case of the MMSE.[3,4] In Spain, the version translated by Tolosa et al.[5] and the version validated by the NORMACODEM group[6] are almost identical, and very similar to the original MMSE. These, along with the Mini-Examen Cognoscitivo (MEC, the first adaptation of the MMSE in Spain) are the most widely-used versions. The latest 30-point version of the MEC is more similar to the original MMSE, which indicates a progressive standardisation process.[7]

(2) The MMSE is sensitive to sociodemographic variables. This is also true for most cognitive tests, although in varying degrees: the clock drawing test, for example, is more affected by these variables. The effectiveness of the MMSE is known to be lower among Spanish speakers

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Table 1 Performance of MMSE, Mini-Cog, and Fototest for detecting cognitive impairment.

	Cut-off point	Sensitivity	Specificity	Diagnostic accuracy (95% CI)
MMSE	22/23	0.76	0.76	0.76
Mini-Cog	1/2	0.60	0.90	0.73
Fototest	28/29	0.69	0.93	0.78 (0.64-0.95)
MIS	4/5	0.73	0.87	0.79 (0.64-0.97)

MMSE: Mini-Mental State Examination; MIS: Memory Impairment Screen.
Data are taken from Carnero-Pardo et al.[13,14]

than among English speakers. Likewise, sex, age, educational level (<9 years of education), and especially illiteracy limit its effectiveness for assessing cognitive impairment and detecting dementia.[3] Illiteracy, however, does not seem to affect performance when the cut-off point is lowered, as Carnero-Pardo himself shows diagnostic utility of 0.86 in a sample in which illiterate individuals constituted 14.3%.[8] Another option would be to modify those items sensitive to illiteracy or a low educational level, as one study did to assess cognitive impairment in an Asian population,[9] or to include functional assessment scales with good sensitivity and high specificity for dementia screening.[10] Both of these strategies were used in the NEDICES study.[11] Furthermore, it is commonly accepted that people with severe limitations for completing cognitive evaluations (hearing or visual impairment, illiteracy) must be thoroughly assessed using *ad hoc* tools.

(3) As Carnero-Pardo correctly states, cognitive impairment (whether mild cognitive impairment or dementia) is the sole target to be detected, but his view on the utility of the MMSE is erroneous. The sensitivity and specificity values that he mentions, taken from a meta-analysis,[12] do not correspond to subjects with cognitive impairment but to subjects with mild cognitive impairment. The data he presents,[1,13] which supposedly favour the Fototest, are biased since he did not use the optimal cut-off point for the MMSE. Comparative data from the Fototest and other short cognitive tests show similar diagnostic performance when the optimal cut-off points are applied (Table 1).

(4) As far as we are concerned, the copyright of the MMSE is only applicable to the original English version of the questionnaire and to validated and registered *ad hoc* versions in other languages and only in such cases in which they are used for potentially lucrative economic activities (clinical trials, among others). It seems highly unlikely that researchers would have to pay copyright fees in any other than the circumstances described above especially since public healthcare is a non-profit field, and considering that we do not use the original version. To the best of our knowledge, no lawsuits have ever been brought for using the MMSE in the contexts we have mentioned (even when results are subsequently published).

As previously stated and as shown in Carnero-Pardo's well-chosen figure, the MMSE has become a standard tool for assessing cognitive function, especially in the elderly (nearly 30 000 hits on PubMed in 2012). This is the case because the test now exists in so many languages and countries, and because of its versatility, which has given rise to multiple versions: short versions, long versions (3 MS), telephone versions, and versions adapted to specific populations (MMSE-37). Standard tools should not be retired; at most, they might be replaced by better tools, but there is no consensus as to which tool is better than this one. As such, there is no scientific basis for retiring the MMSE, although adaptations for specific populations or studies have already been made and are certainly welcome. While better cognitive assessment tools may be available in the future, the MMSE is the most widely accepted option to date.

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References

1. Carnero-Pardo C. ¿Es hora de jubilar al Mini-Mental? Neurología. 2014;29:473—81.
2. Folstein MF, Folstein SE, McHugh PR. Mini-mental state. A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12:189—98.
3. Tombaugh TN, McIntyre NJ. The mini-mental state examination: a comprehensive review. J Am Geriatr Soc. 1992;40:922—35.
4. Prieto G, Contador I, Tapias-Merino E, Mitchell AJ, Bermejo-Pareja F. The mini-mental-37 test for dementia screening in the Spanish population: an analysis using the Rasch model. Clin Neuropsychol. 2012;26:1003—18.
5. Tolosa E, Alom J, Forcadell F. Criterios diagnósticos y escalas evaluativas en la enfermedad de Alzheimer. Rev Clin Esp. 1987;181 Suppl. 1:56—9.
6. Blesa R, Pujol M, Aguilar M, Santacruz P, Bertran-Serra I, Hernández G, et al. Clinical validity of the ''mini-mental state'' for Spanish speaking communities. Neuropsychologia. 2001;39:1150—7.
7. Lobo A, Saz P, Marcos G, Día JL, de la Cámara C, Ventura T, et al. Revalidación y normalización del Mini-Examen Cognoscitivo (primera versión en castellano del Mini-Mental Status Examination) en la población general geriátrica. Med Clin (Barc). 1999;112:767—74.
8. Carnero Pardo C, Cruz Orduña I, Espejo Martínez I, Cárdenas Viedma S, Torrero García P, Olazarán Rodríguez J. Efectividad

del Mini-Mental en la detección del deterioro cognitivo en Atención Primaria. Aten Primaria. 2013;45:426—33.
9. Kabir ZN, Herlitz A. The Bangla adaptation of Mini-Mental State Examination (BAMSE): an instrument to assess cognitive function in illiterate and literate individuals. Int J Geriatr Psychiatry. 2000;15:441—50.
10. Castilla JR, López-Arrieta J, Bermejo-Pareja F, Sanchez-Sanchez F, Trincado R. Instrumental activities of daily living in the screening of dementia in population studies: a systematic review and meta-analysis. Int J Geriatr Psychiatry. 2007;22:829—36.
11. Bermejo F, Gabriel R, Vega S, Morales JM, Rocca WA, Anderson DW, Neurological Disorders in Central Spain (NEDICES) Study Group. Problems and issues with door-to-door, two-phase surveys: an illustration from central Spain. Neuroepidemiology. 2001;20:225—31.
12. Mitchell AJ. A meta-analysis of the accuracy of the mini-mental state examination in the detection of dementia and mild cognitive impairment. J Psychiatr Res. 2009;43:411—31.
13. Carnero-Pardo C, Espejo-Martinez B, Lopez-Alcalde S, Espinosa-Garcia M, Saez-Zea C, Vilchez-Carrillo R, et al. Effectiveness and costs of phototest in dementia and cognitive impairment screening. BMC Neurol. 2011;11:92.
14. Carnero-Pardo C, Cruz-Orduña I, Espejo-Martínez B, Martos-Aparicio C, López-Alcalde S, Olazarán J. Utility of the mini-cog for detection of cognitive impairment in primary care: data from two Spanish studies. Int J Alzheimers Dis. 2013;2013:285462.

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Reflections on endovascular treatment for ischaemic stroke. A stroke care plan for the Region of Madrid☆

Reflexiones sobre el tratamiento endovascular en el ictus isquémico agudo. Plan de atención al ictus en la Comunidad de Madrid

Dear Editor:

We are pleased that our study, 'Reflections on endovascular treatment for ischaemic stroke. A stroke care plan for the Region of Madrid', has generated the interest expressed in this letter, which raises the possibility of establishing criteria for defining, from the very beginning, which stroke patients are candidates for endovascular treatment. These patients would therefore be transferred directly to the on-call reference hospital with no other unnecessary transfers.

We fully agree that proper identification of candidates will contribute to reducing treatment delays. Nevertheless, we believe that the current system now achieves a good balance between effectiveness and optimal use of resources.[1—3]

First of all, all patients with stroke, and particularly those who may be candidates for specific treatment, must be assessed in centres with all the necessary resources to provide an exact diagnosis and indicate the appropriate treatment.[4] The right actions carried out by non-hospital emergency medical services are crucial in order to stabilise patients and transfer them to the hospital as quickly and in the best condition as possible. Nevertheless, these services are not able to identify candidates for endovascular treatment with sufficient precision given the means at their disposal. This intervention is indicated based on strict criteria and expert assessment, after which only a small percentage of all stroke patients will be determined eligible to undergo endovascular treatment.[5] Sending patients who have not received this initial screening to hospitals of reference for treatment would saturate them with patients who, for the most part, would not be candidates for the procedure. This would make the system less efficient. The 2014 update to the Region of Madrid's Stroke Care Plan has improved the system with the addition of the 'neurologist-case manager'. The effect of this addition is that as soon as the emergency services make contact with the neurologist to activate code stroke, the doctor can then determine if the patient is not a candidate for intravenous thrombolysis but may benefit from endovascular treatment. In that case, the neurologist will contact the reference hospital for neurointerventional surgery to address immediate transfer of the patient.

On the other hand, the treatment shown to be the most effective in patients with ischaemic stroke is care in a stroke unit and intravenous thrombolysis in selected cases.[4] The Region of Madrid's Stroke Care Plan ensures that all patients with stroke in our area will have rapid access to these resources, regardless of place of residence, by means of a code stroke system to facilitate emergency patient transfers to the nearest stroke units. This system is under the very effective management of the Madrid emergency medical responders (SUMMA/SAMUR), and it has yielded excellent results with regard to both the number of patients treated and the number of good outcomes. Endovascular treatment may be an alternative for some patients who are not candidates for or do not respond to standard treatment, but it has

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