

Eye Clinic Rapid Screening Battery for Visual Cortical Dysfunction

As recommended by the Atypical Alzheimer's Disease Professional Interest Area (Atypical AD PIA) of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART)

Version 2.0, September 2023

Recommendation
for Eye Clinic Rapid
Screening Battery
for Visual Cortical
Dysfunction due to
neurodegenerative
disease

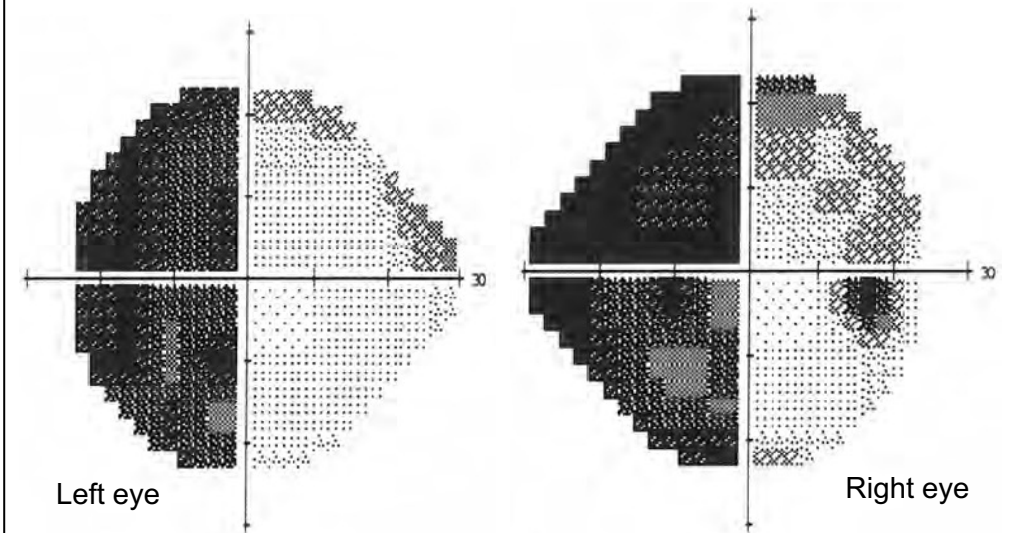
Visual field perimetry and at least two of the following tests are recommended for screening:

1. Interpretation of Poppelreuter-Ghent Overlapping figure(s)
2. Interpretation of Navon figure(s)
3. Copy an intersecting pentagon figure
4. Read two short paragraphs: one in cursive and one not in cursive
5. Test for visual crowding using the Cortical Vision Screening Test (CORVIST) crowding test
6. If there is no evidence of ocular cause for visual symptoms, have the patient complete the Colorado Posterior Cortical Questionnaire

- See the next slides for instructions for each recommendation
- Test stimuli are available at the end of the slide deck
- An abnormal screening test that is unexplained by ocular findings and/or by brain imaging abnormalities should prompt referral to a specialist

Visual field perimetry in cortical neurodegeneration

- Visual field perimetry can reveal homonymous defects that are often in the left hemifield
- Defects can be homonymous quadrant defects, homonymous hemifield defects, and even bilateral homonymous defects
- If no cause is found on brain imaging, for an older adult (>50 years), neurodegenerative disease should be suspected



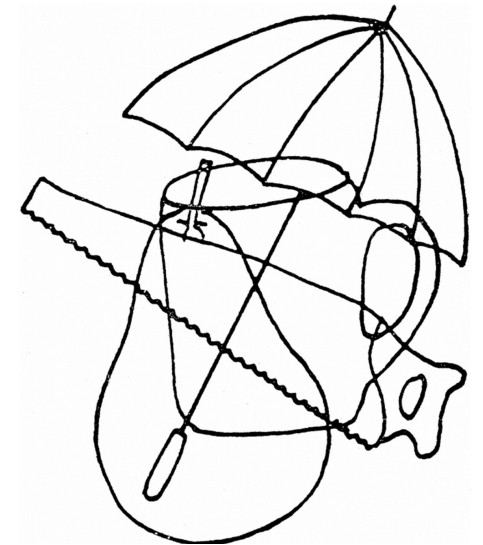
Left homonymous hemianopia
in a patient with Posterior
Cortical Atrophy syndrome due
to Alzheimer's disease
No brain lesion was evident
that would account for the
homonymous hemianopia

1. Interpretation of Poppelreuter-Ghent Overlapping figure(s)

- Ask the patient to name all items they see in the overlapping figure(s)
 - If problems arise naming an item or items, they should be asked to describe the item or its use, which is acceptable
- To pass this screening test, the patient should name or describe all items in the figure(s)
- See end of slides for figure(s) to use
- For more information, see:

Sala SD, Laiacona M, Trivelli C, and Spinnler H. (1995). Poppelreuter-Ghent's Overlapping Figures Test: Its sensitivity to age, and its clinical use. *Archives of Clinical Neuropsychology*, 10(6), 511–534. <https://doi.org/10.1093/arclin/10.6.511>

Example of
overlapping figure
with 4 items



2. Interpretation of Navon figure(s)

- Ask the patient to describe what they see
- To pass this screening test, a patient should describe both the local images and the global images
- See end of slides for figure(s) to use
- In the example here, the patient should describe an “M made up of Bs”; the Bs are the “local” image and the M is the “global” image
- For more information, see:

Navon, David (1977). "Forest before trees: The precedence of global features in visual perception". *Cognitive Psychology*. 9 (3): 353–383. doi:10.1016/0010-0285(77)90012-3.

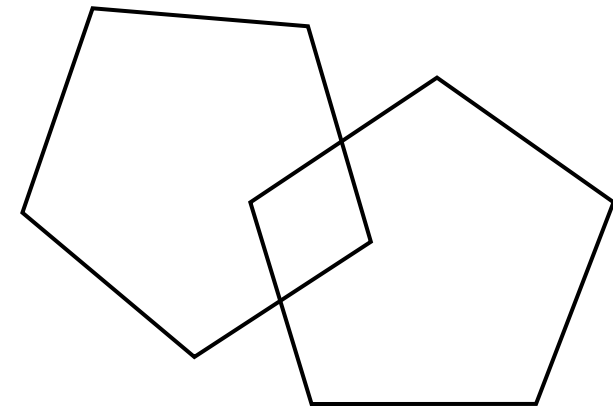
Example of
Navon figure

BB BB BB BB
BB BB BB BB
BB BB BB BB
BB BB BB BB
BB BB BB BB
BB BB BB BB
BB BB BB BB

3. Copy an intersecting pentagon figure

- Ask the patient to copy the drawing (do not describe the drawing or name the shapes they are to copy)
- The patient should copy the drawing accurately to pass this screening test, with five sides to each figure and an overlap of one corner on each pentagon
- See end of slides for the figure to use

Intersecting
pentagon drawing
to copy



4. Read two short paragraphs: one in cursive and one not in cursive

- This could be a useful test for patients who report problems reading despite normal visual acuity at near and/or distance viewing
- A paragraph in cursive can be more difficult to read than one with non-cursive font in a patient with cortical visual dysfunction
- To pass this test, the patient should be able to read both paragraphs without struggling to stay on the line of text they are reading or move to the next line, and the patient should read both paragraphs smoothly without more difficulty with the paragraph written with a cursive font
- See end of slides for two paragraphs that can be used
 - Note: both paragraphs provided are between the 7th and 8th grade reading levels

5. Test for crowding using the Cortical Vision Screening Test (CORVIST) crowding test

- Go to <https://www.corvist.org/> to buy a license to use the online CORVIST crowding tests. Currently (December 2022) the cost is £55 (pounds sterling), and calibration for computer presentation is available on the site
- None of the authors recommending this test will benefit from the sale of a CORVIST license
- In summary, the crowding test consists of reading strings of letters with numbers in crowded conditions and noncrowded conditions
- There are no stimuli available for this test in this slide deck

6. Have patient complete the Colorado posterior cortical questionnaire

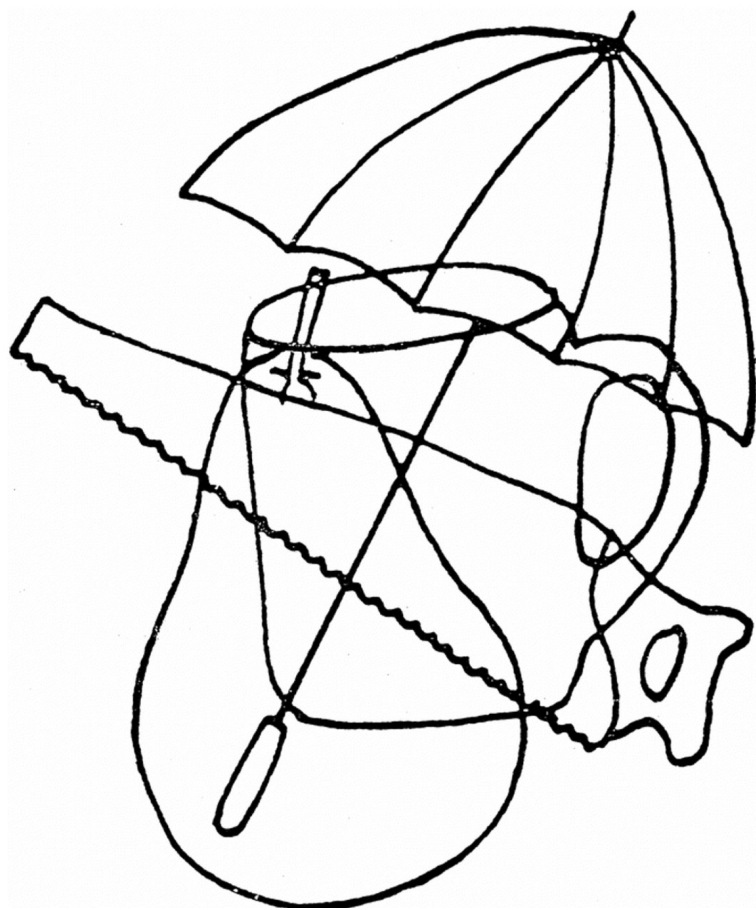
- The Colorado posterior cortical questionnaire (CPC-Q) is a 15-item self-report questionnaire that captures posterior cortical symptoms in older adults without significant ocular disease
- Higher scores indicate greater difficulty and a score of 7 or greater (of 60 possible points) indicates symptoms consistent with posterior cortical dysfunction
- The development of the CPC-Q and the questionnaire are described in the following manuscript:

Holden SK, Pelak VS, Sooy T, Heffernan KS, McConnell BV, Pressman PS, Bettcher BM. Development of the Colorado posterior cortical questionnaire within an Alzheimer's disease study cohort. *J Clin Exp Neuropsychol*. 2022 Apr;44(3):226-236. doi: 10.1080/13803395.2022.2105820. Epub 2022 Aug 1. PMID: 35913095; PMCID: PMC9420807.

Next slides: Stimuli for screening tests

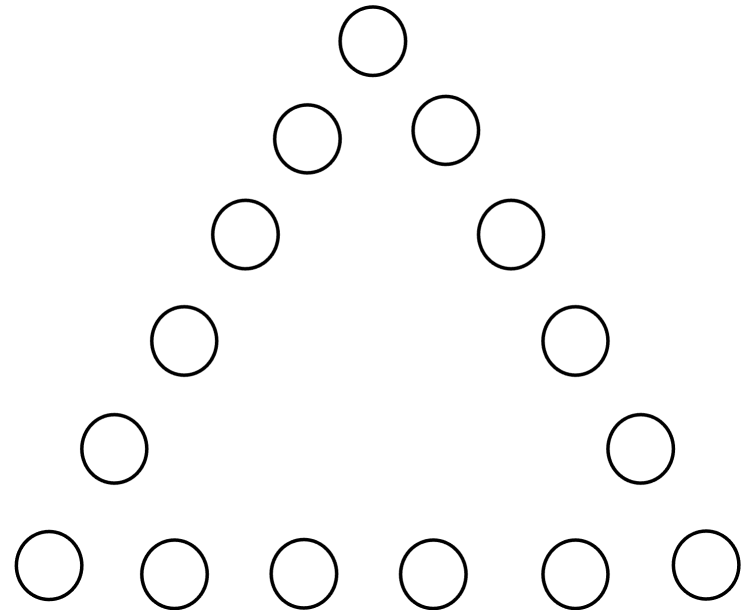
- The following slides provide stimuli for the first four test recommendations, and they can be printed and presented to patients for testing
- Note: the CPC-Q and stimuli for the CORVIST crowding test are not provided here

What do you see?

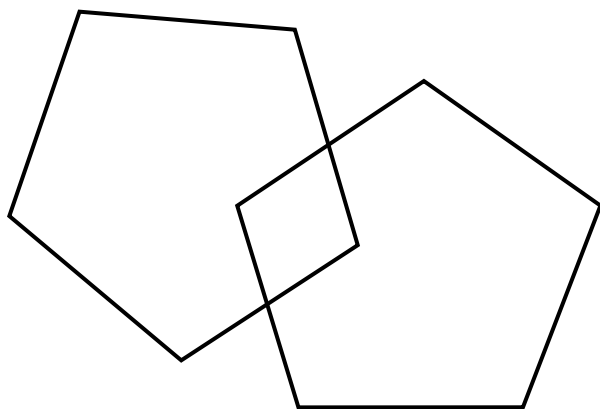


What do you see?

SS SS
SS SS
SS SS
SS SS SS SS
SS SS
SS SS
SS SS



Copy this drawing



Read these two paragraphs

Today was a day that was like no other for Mr. Jonathan Pembroke. He awoke to find that he was surrounded by hundreds of books that were scattered throughout his bedroom. There were books of all genres, including children's books, mysteries, nature books, short stories, novels, and poetry books. Mr. Pembroke was certain he was dreaming, but he could not wake up no matter what he did to try to do so. After he found his reading glasses, he decided to read each and every book.

Elizabeth was daydreaming in school, and she did not hear the teacher call her name. It was only Monday, and Elizabeth wished that the school week was already over. School was never difficult for Elizabeth, but her best friend Mary just moved to another city. The only thing she knew about where Mary was living was that it was far away. On Saturday, Elizabeth would be allowed to call Mary on the telephone, and she could hardly wait. She had so many questions to ask.

For stimuli to test crowding, go to CORVIST site to buy a license

- <https://www.corvist.org/>

For the CPC-Q, copies of questionnaire are available in the manuscript

- Holden SK, Pelak VS, Sooy T, Heffernan KS, McConnell BV, Pressman PS, Bettcher BM. Development of the Colorado posterior cortical questionnaire within an Alzheimer's disease study cohort. *J Clin Exp Neuropsychol*. 2022 Apr;44(3):226-236. doi: 10.1080/13803395.2022.2105820. Epub 2022 Aug 1. PMID: 35913095; PMCID: PMC9420807.