



AOTA Critically Appraised Topics and Papers Series
Alzheimer's Disease

**A product of the American Occupational Therapy Association's
Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

Focused Question

What is the evidence for the effect of interventions designed to modify and maintain perceptual abilities on the occupational performance of persons with dementia?

Passini, R., Rainville, C., Marchand, N., & Joanne, Y. (1998). Wayfinding and dementia: Some research findings and a new look at design. *Journal of Architectural and Planning Research*, 15(2), 133–151.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Dementia is an irreversible condition that not only influences one's memory, but also can result in spatial disorientation early on in the disease process and is often noted as the disease progresses. This influences way-finding ability and might be addressed through environment design.

RESEARCH OBJECTIVE(S)

List study objectives.

Identify way-finding abilities of patients with Dementia of the Alzheimer Type (DAT) at the early and middle stages of dementia in respect to decision making and information processing. Decision making was looked at in terms of the ability to make individual decisions and the subject's ability to problem solve solutions to the way-finding problem and sub-problems. Information processing with regard to the available architectural and graphic information (of typical hospitals) was studied.

Describe how the research objectives address the focused question.

One aspect of way-finding abilities includes one's perceptual abilities. This study examines the difficulties people with dementia have with way-finding and investigates designing environments that address losses associated with dementia (e.g., spatial disorientation) and environments that enhance remaining abilities.

Although the study does not specifically implement different environmental interventions, the environment in this study (geriatric institution) can be looked at as the intervention itself. The study highlights the difference in way-finding between the subjects with dementia versus the control group. The authors base their recommendations on these insights.

DESIGN TYPE:

Cohort design

Level of Evidence:

II

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes

No

SAMPLE SELECTION

Inclusion Criteria

All subjects in the dementia group underwent neuropsychological evaluation and fit the diagnostic criteria of DSM-III (1980). They had to score 4 or less on the Hachinski scale (to exclude patient with multi-infarct dementia) and had to be a stage 3, 4, or 5 on the Reisberg Global deterioration scale.

Exclusion Criteria

Multi-infarct dementia as noted in the inclusion criteria

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

✓ The authors did not state how the sample was recruited, so selection bias is possible.

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

N= 14 in the group with dementia; 28 in the control group

% Dropouts

(%) Male

(%) Female

Ethnicity

Disease/disability diagnosis

NR = Not reported

Check appropriate group:

<20/study group <input checked="" type="checkbox"/>	20–50/study group	51–100/study group	101–149/study group	150–200/study group
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NOTE: The control group consisted of 20-50/study group

Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes

No

Were the reasons for the dropouts reported?

Yes

No

INTERVENTION(S)—Included are only those interventions relevant to answering the evidence-based question.

Add groups if necessary

Group 1

Brief Description	Subject had to start from the closest bus stop in front of the hospital and find their way to the dental clinic in a large hospital. Once the destination was reached, they were to return to the bus stop using the same route. Subjects were given a card with the name of the dental clinic at the start of the experiment. The subjects were asked to verbalize everything that went through their mind while reaching the destination. If the subject did not verbalize their thoughts, the observer would ask the subjects what they were doing and why. An observer accompanied each subject. Their conversations were recorded and then transcribed.
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Setting	Geriatric institute (Hospital Cote-des-Neiges), where persons with dementia frequently go for outpatient consultation
Who Delivered?	An observer accompanied the subjects. The study does not provide clear information as to what training and qualifications the observers had, or if each subject has the same observer.
Frequency?	N/R
Duration?	N/R

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

Co-intervention

Yes

No

Timing

Yes

No The timing of the experiment was not described in the study.

Site

Yes

No

Use of different therapists to provide intervention

Yes

No The study did not describe if the same person acted as the observer or if different people took on this role. The environment (the hospital and task) were the same for all the subjects in both groups.

MEASURES AND OUTCOMES—Included are measures relevant to answering the focused question.

Name of measure:

The study did not describe a specific measure used. The study does reference using a *Typology of Decision Based on Environmental Information (Type A)* and *Typology of Exploratory Decisions (Type B)* when analyzing the type of decision making the subjects use. It is not clear who developed these typologies.

Outcome(s) measured (what was measured?):

N/A

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

N/A

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No Not addressed

Recall or memory bias *If yes, explain.*

Yes

No

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No Limited information provided about the typologies used to classify way-finding decisions.

RESULTS

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate ($p < 0.05$)

Include effect size if reported

Twelve of the 14 experimental group (DAT) subjects needed more than 3 interventions during their trip to the dental clinic, while 21 of 28 control subjects complete the task without any intervention. On the return trip to the bus stop, the DAT group showed no change, while in the control group, 24 of 28 did not receive any intervention. When the authors completed the decision type analysis (for the first half of the task) the type A decisions showed no significant difference between the two groups. Types A3 (decisions based on memory) were noted to be present more in the control group. Type B1 (looking and walking without specific aim) was present only for the experimental group. Type B2 (exploring in order to find the destination directly) was predominated by the experimental group. B4 decisions (exploring in order to find specific information) were made by both groups, but more so by the control group. Type B3 (exploring to find any useful information) was not discriminative. Return trip analysis showed a large shift from type B (exploratory) to type A decisions for the control group. 88.45% of all control group decisions were A3 (decisions based on memory), whereas the DAT group had a similar distribution to the first half of the trip.

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No Limitations in measurement and analysis make it difficult to determine if the study was adequately powered.

Were appropriate analytic methods used? *If no, explain.*

Yes

No Limited information about the data collection and analyses methods is provided.

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

- Based on the results of their study, the authors made several recommendations for way-finding design.

Spatial Organization Recommendations:

- The configuration of space in settings for people with DAT should be kept simple. The environment should not be organized so individuals need to find solutions to way-finding problems based on decisions based on memory or inferences. The environment should support people with DAT to proceed from one decision point to the next as they move along without having to develop a future plan.
- Visual accessibility of spaces and functions of spaces can help to facilitate the understanding of a given space.
- Spatial organization and circulation system should allow for wandering.

Environmental communication:

- Persons with DAT have difficulty retracing their steps. The authors suggest that architects should consider the “expression of exits” in their design plans. The authors did note that in a nursing home setting, it might not be desirable to highlight the exits to prevent patients from leaving the building.
- Based on this study, the authors strongly recommend de-cluttering information on circulation routes. They suggest that graphic information be clear and limited in number and that other information should be located elsewhere. This recommendation came from the observations that reading non-discriminatory information was the most confusing interference in the way-finding process. The authors also recommend the use of landmarks as a reference point.
- The study did not aim to analyze graphic communication, but the authors did make some recommendations. Abbreviations should be avoided wherever possible; messages on information boards need to be appropriately spaced to avoid nonsense links between the messages; and directional signs have to be close to the spatial proximity with the name of the destination, or the connection is not made.

Were the conclusions appropriate for the Study Design (Level of Evidence)? *If no, explain.*

Yes

No Although the conclusions are linked to the findings, the level of evidence is not strong enough from this study to undertake major building redesigns.

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No Considering limitations related to measurement and analyses, major redesigns of buildings can not be justified based on this study.

IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

People's abilities to find their way around an environment can become increasingly problematic for individuals with dementia, both in long-term-care homes and in the community. Problems with way-finding can lead to increasing isolation and reliance on others. Spatial disorientation is among the earlier signs in Alzheimer dementia. The authors provided several recommendations to promote way-finding abilities in persons with early to moderate dementia of the Alzheimer's type. Though the authors made several recommendations for environmental design, with the limited information provided on the sample characteristics, possible biases and limitations to the study design, the ability to generalize from the results is limited. For occupational therapists working in long-term-care homes as well as in the community, it may be worthwhile to work with designers and architects, caregivers, and individuals with early dementias to identify perceptual (and cognitive) difficulties for persons with dementia that affect way-finding abilities and problem solve using environmental design to enhance remaining abilities. This study suggests that appropriately designed environments will improve way-finding and quality of life for persons with dementia. It can be hypothesized that appropriately designed environments may delay admissions to nursing homes and possibly allow nursing homes to be more cost effective. Future research could explore how the recommendations made by the authors enhance way-finding abilities in persons with dementia.

This work is based on the evidence-based literature review completed in August 2005 by Lori Letts, PhD, OT Reg. (Ont.); Jacqueline Minezes, BSc (OT), OT Reg. (Ont.); Julie Berenyi, BHSc (OT) OT Reg. (Ont.); Mary Edwards, MHSc, OT Reg. (Ont.); Kathy Moros, BHSc (OT), OT Reg. (Ont.); Colleen O'Neill, BSc (OT), OT Reg. (Ont.); and Colleen O'Toole, MSc (OT), OT Reg. (Ont.).

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For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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