

# Designing Dementia Friendly Neighborhoods

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## What Is Dementia?

- An umbrella term for a family of diseases
- Characterized by cognitive behavioral deficits that involve some form of permanent brain damage.
- Risk of developing dementia increases with age.
- Symptoms include:
  - Drastic behavioral, cognitive, and personality changes
  - Acute time and space disorientation
  - Memory lapses,
  - Irritability
  - General confusion

## Walking and Dementia

Abbott et al, 2004

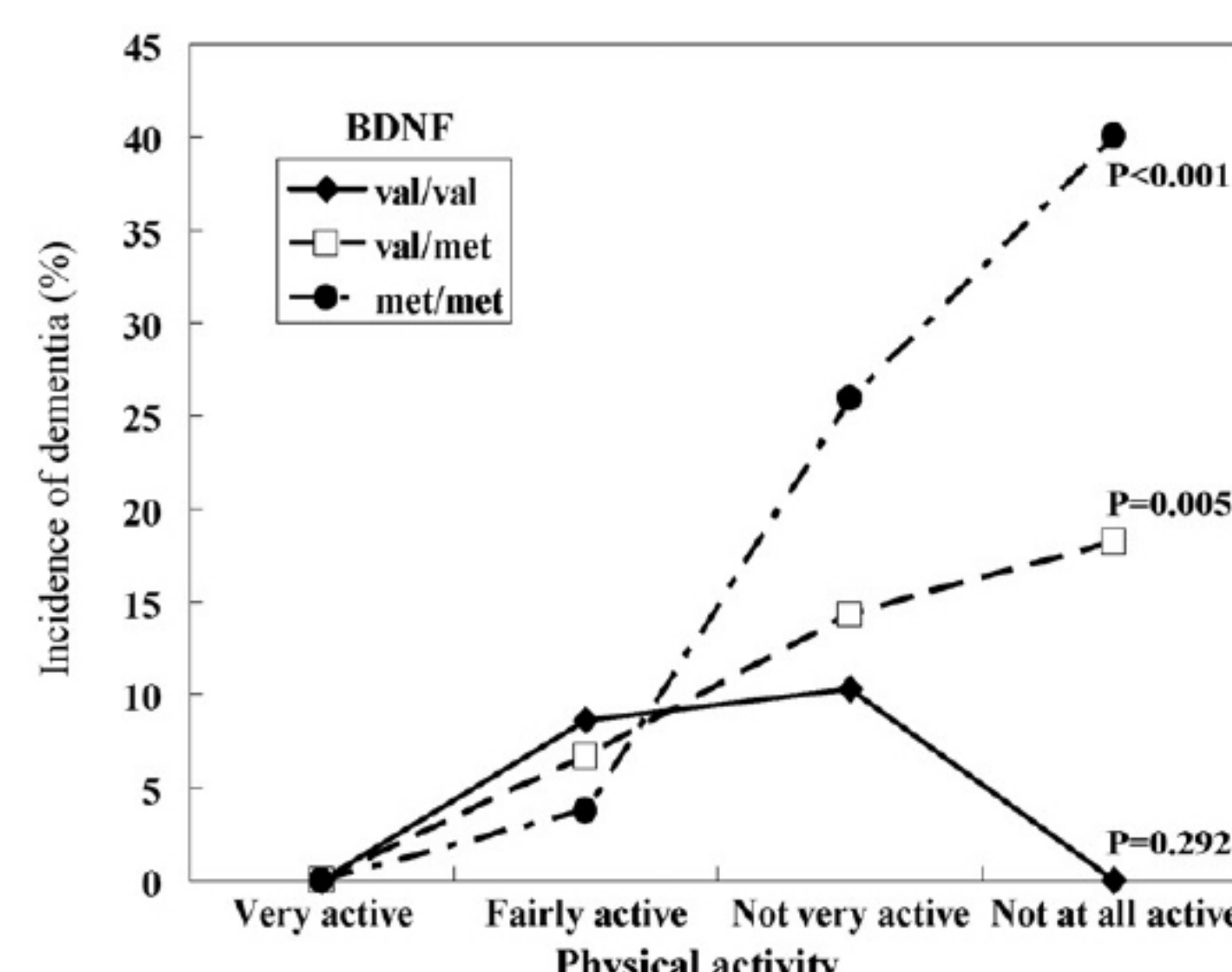
- Those that walked <.25 or .25-1 mile per day had 1.8 times greater excess risk of developing dementia compared to those that walked >2 miles/d
  - 17.8 vs 10.3/1000 persons developed dementia, respectively
- 1.7 greater excess risk of dementia was also observed in those who walked a middling amount 0.25 to 1 mile/d, compared to those who walked >2 miles/d
  - 17.6/1000 persons developed dementia who walked 0.25 to 1 mile/d
- A certain amount of exercise is required to prevent dementia
- Promoting active lifestyles earlier in life can help later life cognitive function

## Physical Activity and the Brain:

Kim et al, 2011

- Physical activity increases the production of brain-derived neurotrophic factor (BDNF) in the brain
- BDNF is a neurotrophin in the brain responsible for:
  - Neuronal survival
  - Neuron growth and maintenance
  - Synaptic plasticity

- Low BDNF as a result of low levels of activity meant higher incidence and baseline dementia
- The met allele (low BDNF) may make low-activity adults more vulnerable to dementia

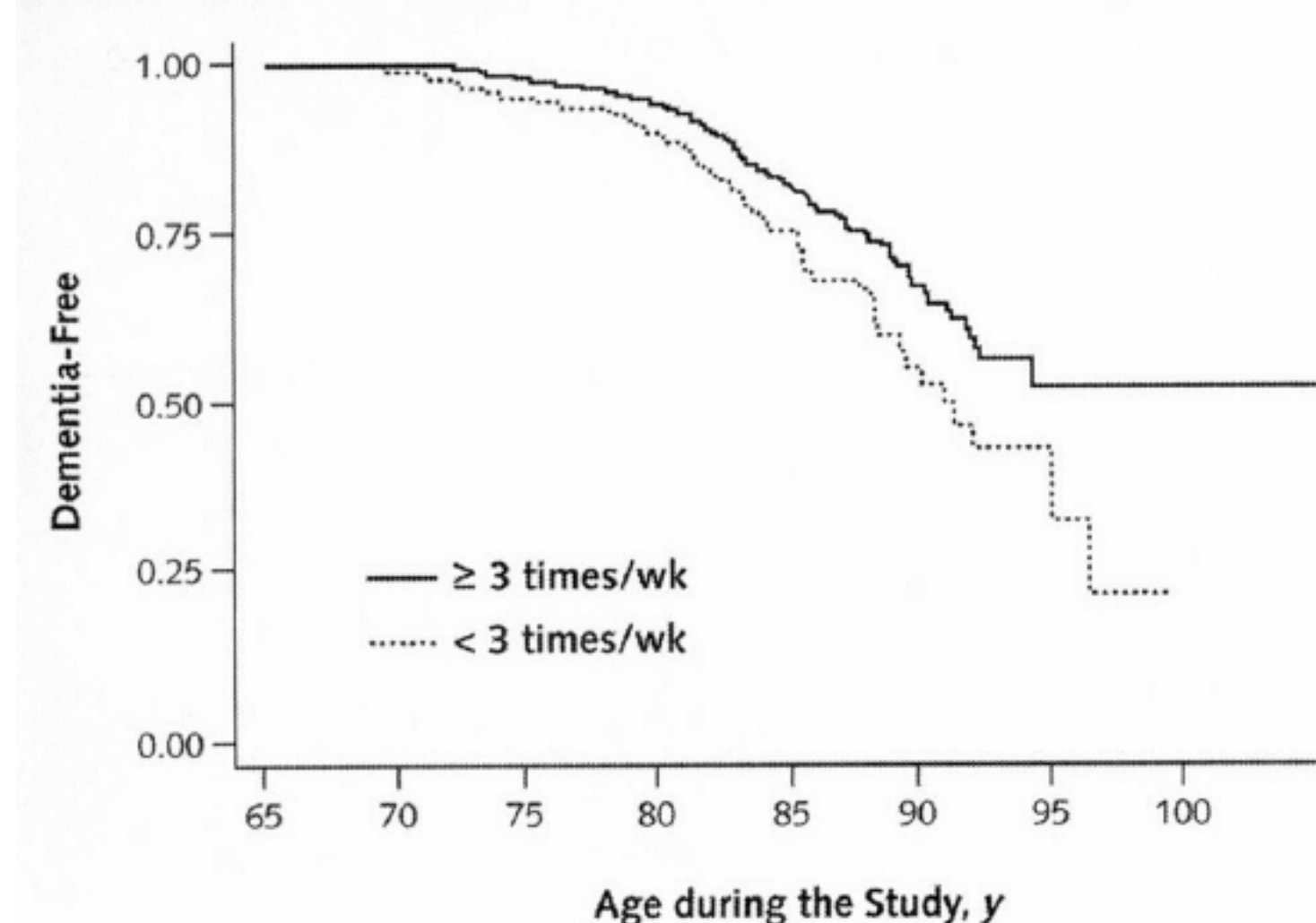


## Exercise and Incident Dementia

Larson et al, 2006

- Within the sample that developed dementia, those that exercised < 3 times a week had a 19 out of 1000 persons chance of developing dementia
- Those that exercised >3 times a week only had a 13 out of 1000 persons chance - a 32% reduction of dementia risk.

### Kaplan-Meier Estimates: The Probabilities of Being Dementia Free



## Urban Wayfinding and Dementia

Mitchell et al, 2003; Sheehan & Burton & Mitchell, 2006

- When those with dementia went outdoors, measurable parts of the environment aided navigation in town
- Things that worked best in aiding navigation were:
  - Clearly displayed signs using explicit words or numbers
  - Legible and stark lettering on orange-red vibrant coloring (color agnosia)
- Those with dementia preferred secluded areas away from open traffic
- Often relied on landmarks, public art, and other urban detail to wayfind
- Clear and bright street lighting were preferred as well as less straightforward street layouts

## References

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## Neighborhood Open Spaces (NOS) and Quality of Life (QoL)

Sugiyama & Thompson & Alves, 2009

- Quality of the paths available in NOS was a significant predictor to the degree of walking activity
- Those that had good paths to an open space were twice as likely to be a high level walker (2.5+ hrs/week)
- Factors that encouraged walking:
  - Easy to walk paths
  - Enjoyableness of the open spaces
  - Absence of obstacles
- Having an NOS within 10 minutes or 700 m away was associated with having greater life satisfaction

## Proposed Urban Recommendations

### Legible

1. Street signs should have bold, clear, legible typeface on a contrasting background, and should be large
2. Red-Orange spectrum signs should be favored over green-blue.
3. Iconic signs, maps, and other 3-D representational signs should be avoided

### Distinctive and Familiar

4. ArtPrize pieces should be more permanently installed to provide new and distinct landmarks for those with dementia to use in wayfinding
5. New development should take care not to cover or replace old landmarks

### Accessible, Comfortable, and Safe

6. Adequate street lighting and public seating every 100m
7. Provide more enclosed, quiet spaces like parks, accessible from within the street
8. Clear, well maintained paths should be made, with open spaces and aesthetic appeal

## Practical Concerns

- Replacing signs across GR will be tedious, but ultimately doable
- Suppressing new urban development to favor familiarity is not always feasible or safe
- Inevitable modernization aesthetics may have no interest in keeping things familiar
- Spaces and street designs are not always flexible or spacious enough to allow for dementia-relevant design implementation