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Treatment of Alzheimer disease and Parkinson disease with CT scans

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Original Article

Treatment of Alzheimer Disease With CT Scans: A Case Report

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Abstract

Alzheimer disease (AD) primarily affects older adults. This neurodegenerative disorder is the most common cause of dementia and is a leading source of their morbidity and mortality. Patient care costs in the United States are about 200 billion dollars and will more than double by 2040. This case report describes the remarkable improvement in a patient with advanced AD in hospice who received 5 computed tomography scans of the brain, about 40 mGy each, over a period of 3 months. The mechanism appears to be radiation-induced upregulation of the patient's adaptive protection systems against AD, which partially restored cognition, memory, speech, movement, and appetite.

Keywords

Alzheimer disease, CT scan, adaptive protection systems, ionizing radiation

Update on a Patient With Alzheimer Disease Treated With CT Scans

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This letter updates the April 2016 case report[1] about an 81-year-old patient who was in the final stages of advanced Alzheimer disease (AD) in hospice care. A neuropsychologist examined her on May 21, 2015, and concluded that she was "completely nonresponsive." Following treatment by 4 computed tomography (CT) scans of the brain from July to August 2015, the patient made a remarkable recovery. A fifth scan on October 1 caused a setback, from which she gradually recovered. On November 20, she was judged to be no longer eligible for hospice care because her condition was sufficiently improved. Since then, she has participated in a stimulating, dementia day care program. Photos on December 4, 2015, Figures 1 and 2, demonstrate restoration of appetite and responsiveness.

Recognizing that the efficacy of the CT scan treatments would likely be transitory, the patient's spouse requested ongoing booster scans every 4 to 5 months. These started on February 24, 2016, about 21 weeks after the October 1 treatment.

Dr William D. MacInnes (note 1) reexamined the patient on April 15, 2016. His progress note states:

> Unlike our last visit, Mrs XXX was able to give simple verbal responses to direct, simple questions. Not all of her responses were related to the direct questions, but she seemed to be reacting appropriately to the prosody and nonverbal cues of those around her. This represents some improvement from October 12, 2015, when I last saw her." . . . "Mr XXX reported that his

Figure 1. Restoration of appetite of patient with Alzheimer disease (AD).

Alzheimer disease (AD), what is it?

- Neurodegenerative disorder --- of older adults
- Doubles in prevalence every 5 years after age 65
- AD accounts for more than 50% of dementia cases
- Cause and pathologic mechanism are uncertain
- Earliest manifestation: selective memory impairment
- AD a leading source of morbidity and death in the old
- In US 2012, ~ 5.2 million AD > 65 y; 2050 ~14 million
- Patient care costs $200 billion/y; will double by 2040
- Treatments can relieve some symptoms
- No cure or modifying therapy; progresses inevitably
- Survival from 3 to 20 years; average is 8 to 10 years
- AD progresses quickly in young; slower in old folks

Alzheimer disease symptoms

- Advanced AD increases vulnerability to other disorders, commonly infections, which lead to death
- In addition to memory impairment, executive dysfunction and visuospatial impairment may present early
- Deficits in language and behavioral symptoms come later
- Then progressive difficulty performing learned motor tasks, complex multistep activities, dressing, using utensils to eat, self-care tasks – leads to dependency in mid to late stages
- Less sense of smell, appetite, sleep disturbance, seizures
- Variety of atypical symptoms and mixed dementia, i.e., AD coexisting with vascular dementia and Parkinson disease

Alzheimer disease progresses inexorably

- Manage symptoms by treating behavioral disturbances, environmental manipulations to support functions, counseling about safety issues
- Patients succumb to terminal-stage complications, such as dehydration, malnutrition and infection
- Patients with advanced AD are admitted to hospice for palliative care, as their end-of-life approaches
- Scientists are associating Alzheimer disease with the accumulation of diffuse and neuritic protein plaques in the brains of patients
- However, autopsy data show that symptomatic AD does not occur in every patient with plaque in the brain

Condition of AD patient before treatment

- 81-year-old patient began to exhibit dementia symptoms 10 years earlier, when illness diagnosed as onset of AD
- It gradually progressed to final stages; she was admitted to hospice April 8, 2015. On May 21, a neuropsychologist found her “completely nonresponsive”
- Patient refused medications; was non-communicative; rarely uttered single word, it was not appropriate; almost immobile; did not try to rise from wheelchair in months
- Spouse knew that low radiation doses stimulate protection systems against diseases and age-related deterioration

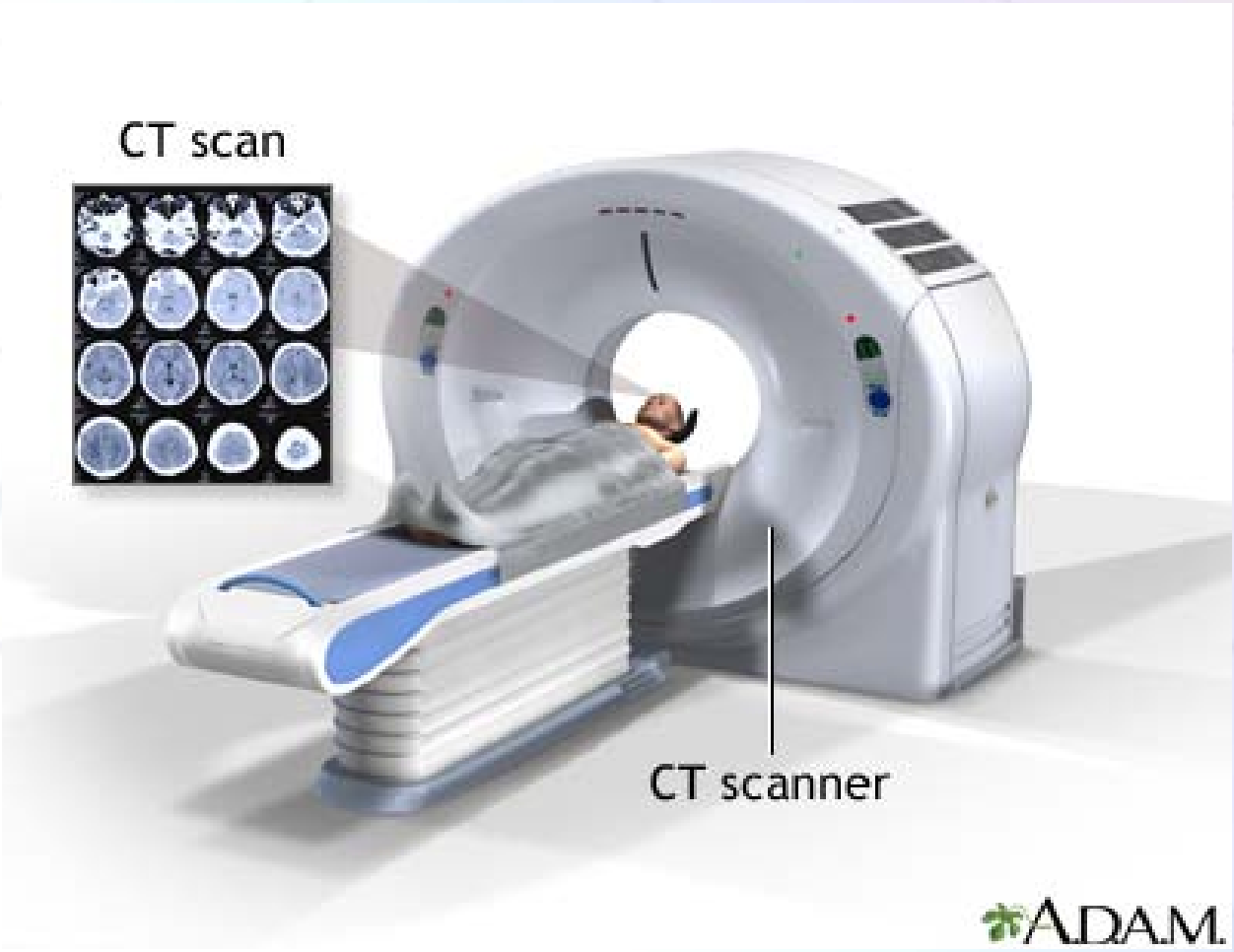
CT scan treatments and results

- Spouse requested whole-body low-dose x-ray treatments
- Patient's MD prescribed normal CT scans to image brain
- 2 days after Jul 23 scans, caregiver reports improvement
- "She is doing so well that it is amazing. I have never seen someone improve this much. She wanted to get up and walk. She was talking some, and she was feeding herself."
- Much more improvement after the Aug 6 and 20 scans
- Slow but steady improvement in Sep; talking and exercise
- Major setback after Oct 1 scan, followed by slow recovery to Sep level, and then further steady improvements
  - On Nov 20 judged no longer eligible for hospice care
    - Photos on Dec 4 show patient eating and posing

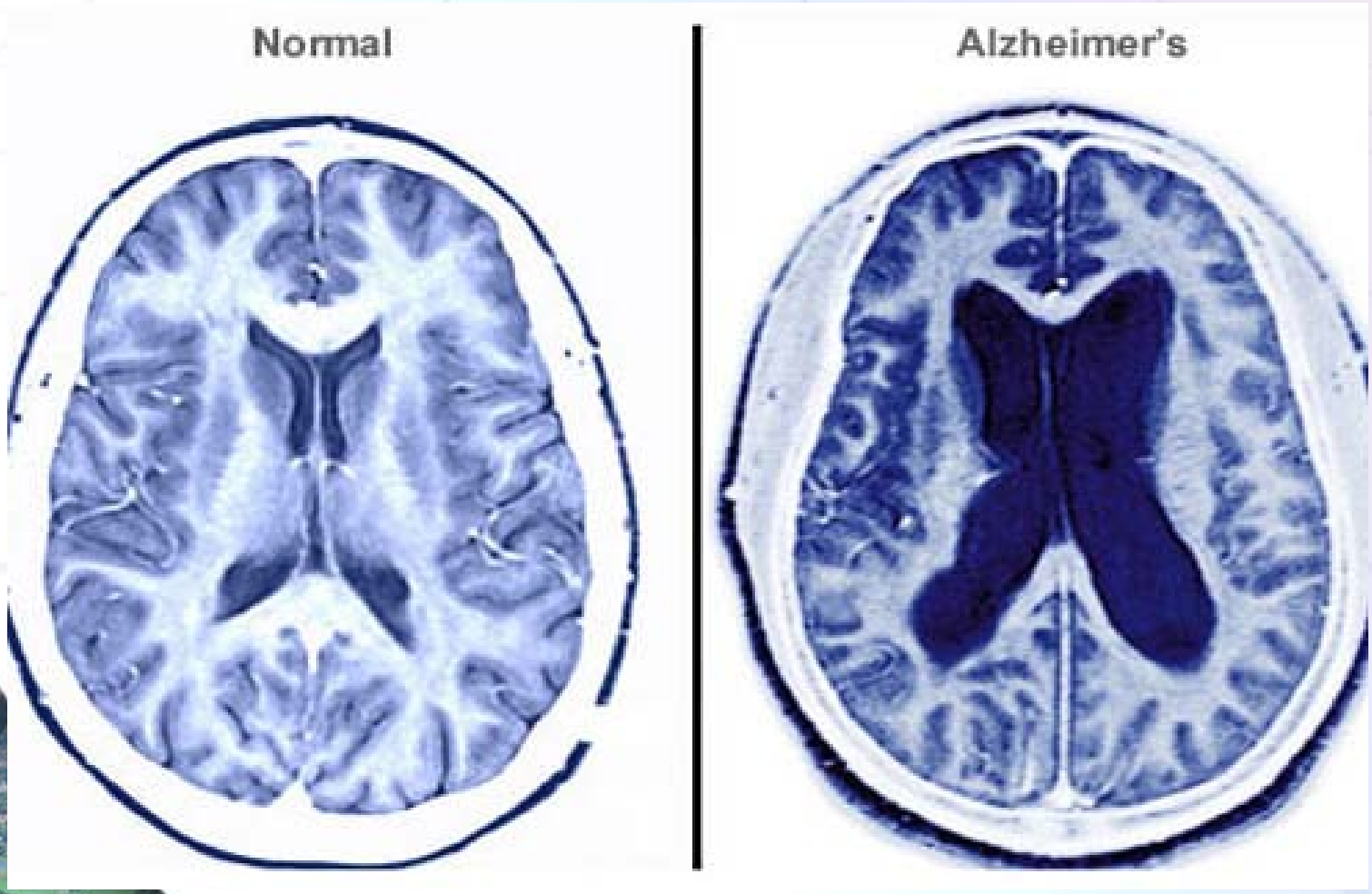
Appetite restored

Responds to request to look at camera

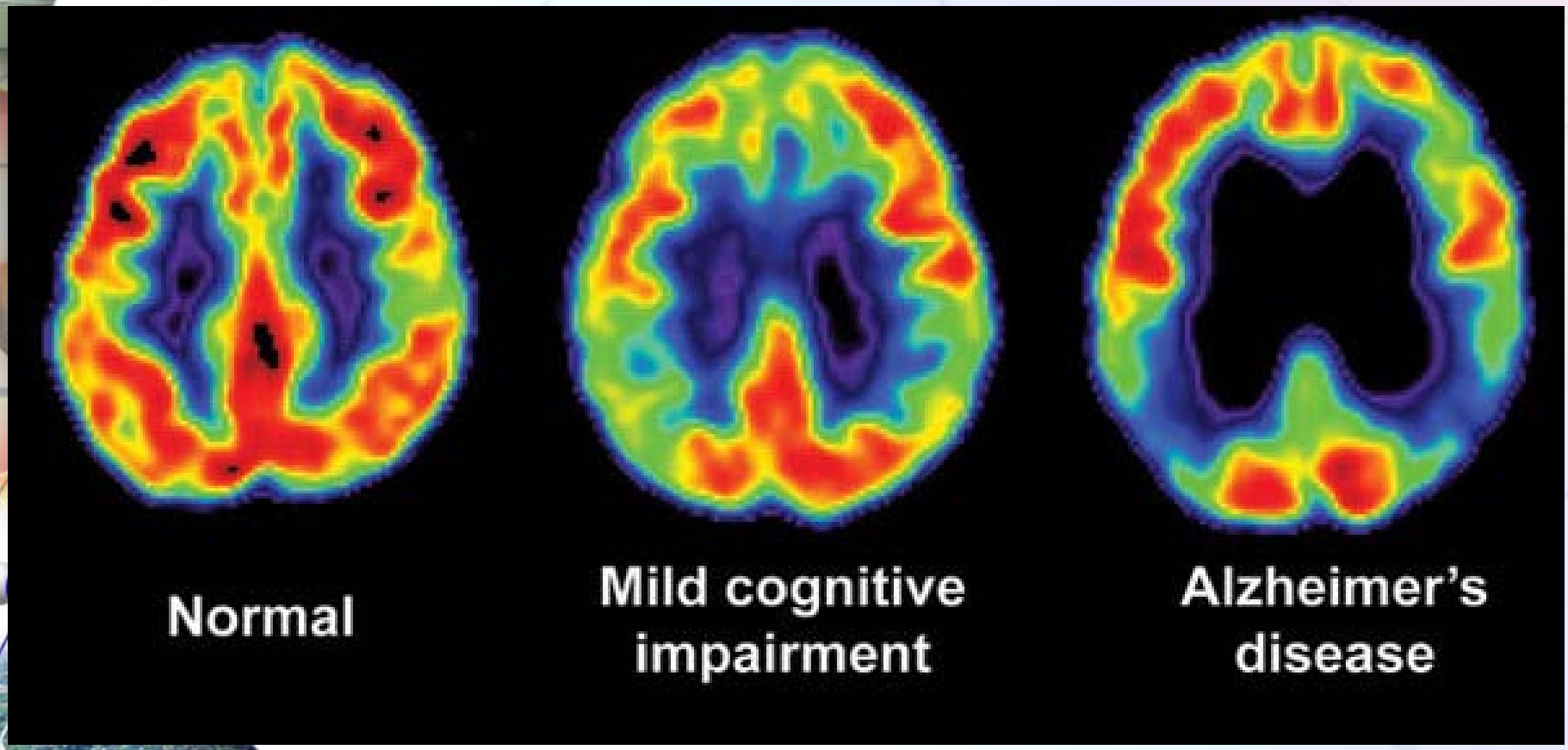
CT scanner



CT scan images

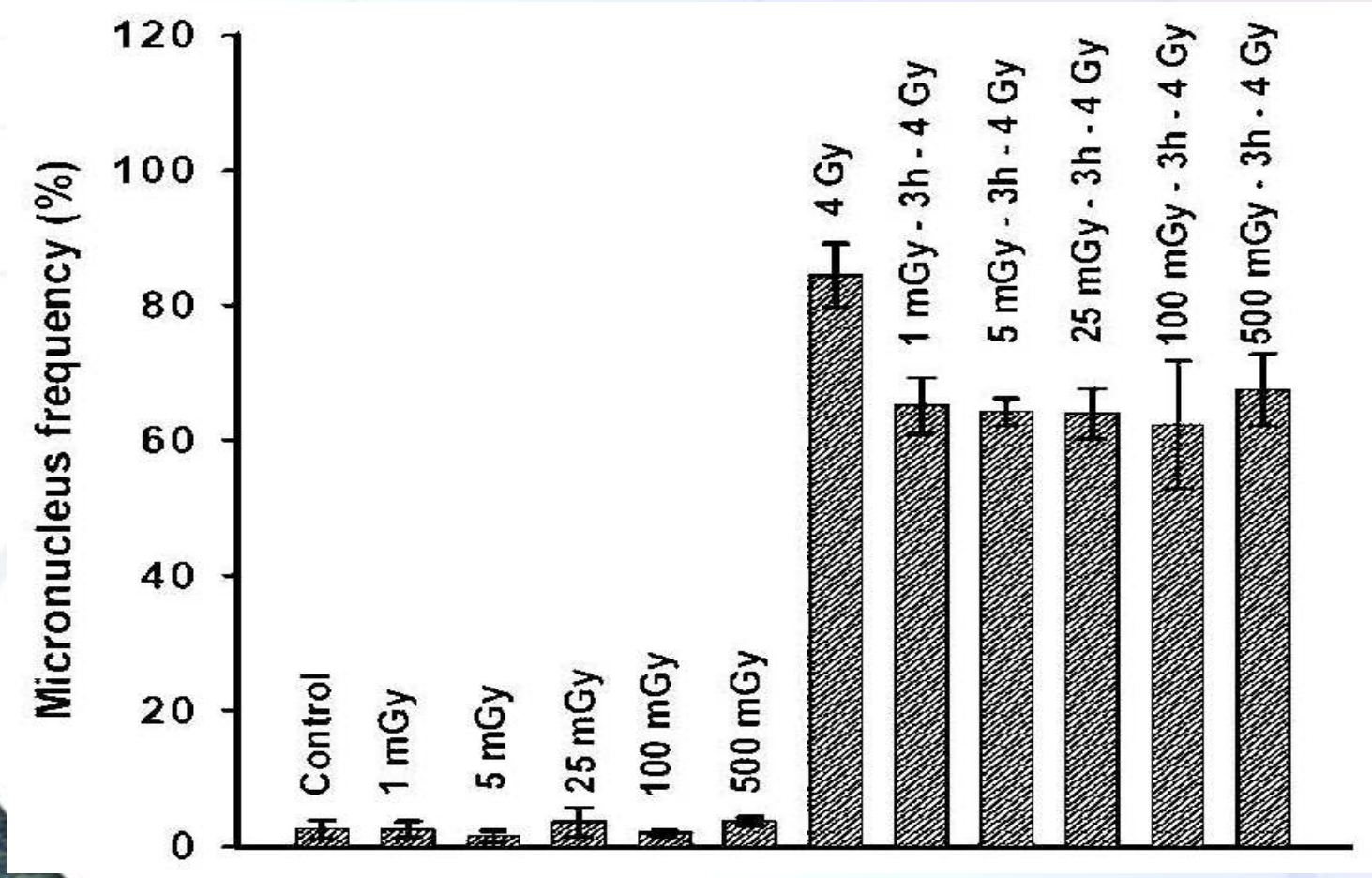


PET-CT scan images

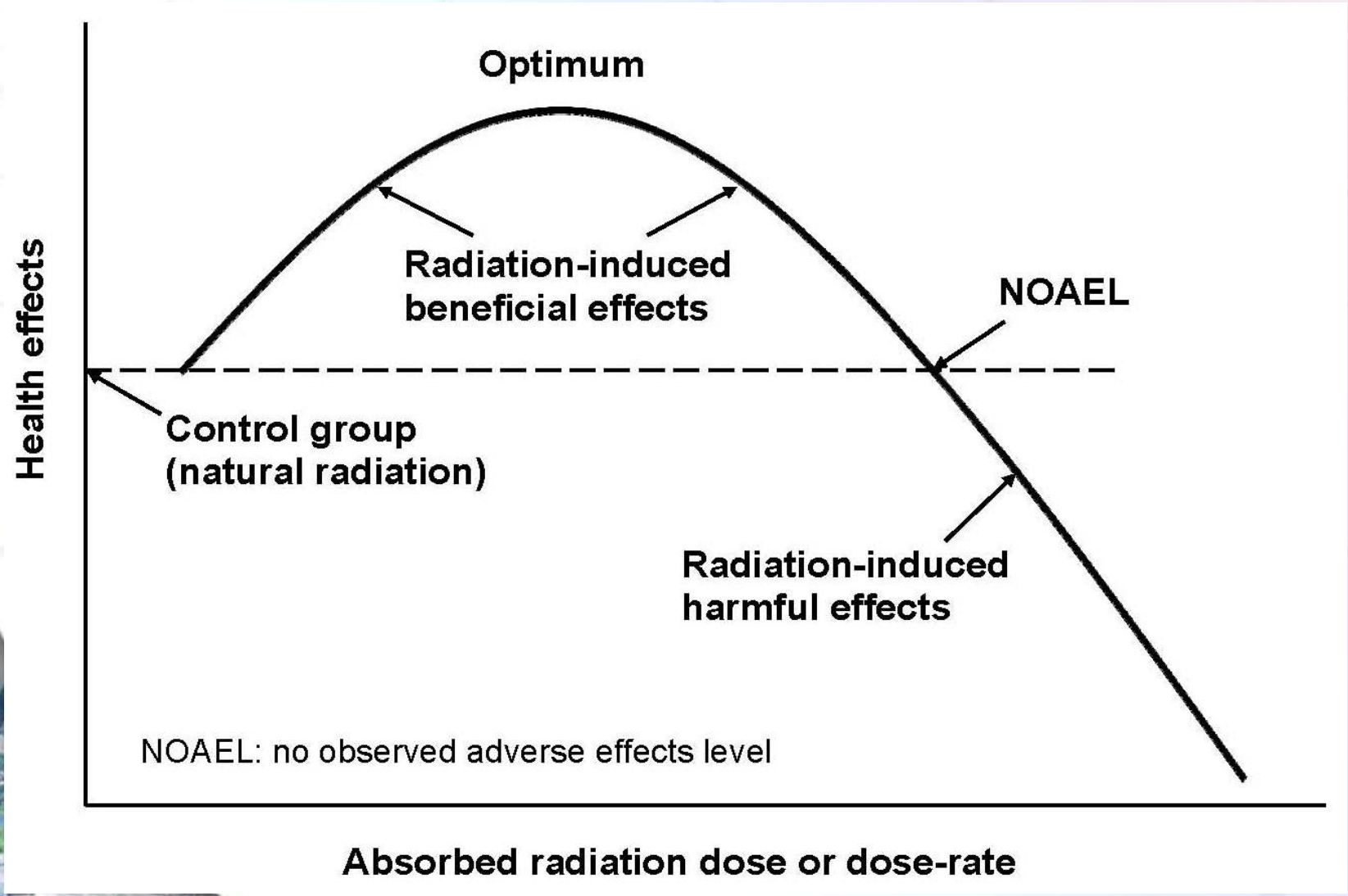


Adaptive response with human cells

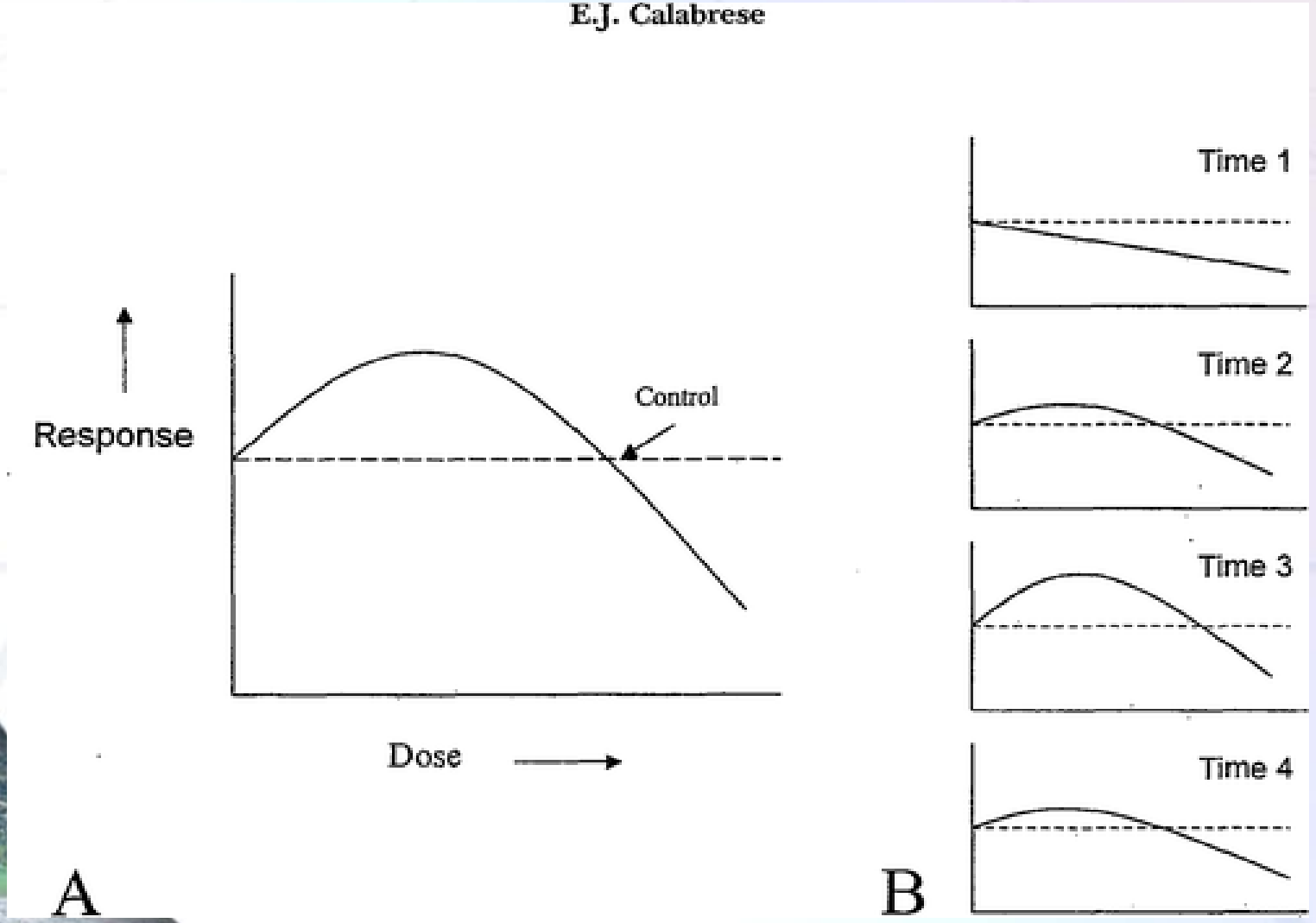
A low radiation dose up-regulated cell repair capability that decreased chromosome damage by the 4 Gy challenging dose



Radiation dose-response model



Temporal sequence of hormetic dose-response



Scans to stabilize the recovery

- Expecting inexorable neurodegenerative regression, spouse requested periodic “booster” CT scans
- Neuropsychology examination Apr 15, 2016: “Mrs. XXX was able to give simple verbal responses to direct, simple questions. Not all of her responses were related to the direct questions, but she seemed to be reacting appropriately to the prosody and nonverbal cues of those around her. This represents some improvement from Oct 12 when I last saw her. … He indicated that she was able to get out of the car by herself with some standby assist. … Mr. XXX reported that his wife occasionally feeds herself, but she still requires cueing.”

Date	Interval (days)	Dose (mGy)
07/23/2015		82**
08/06/2015	14	39
08/20/2015	14	47
10/01/2015	42	39
02/24/2016	146	40
06/22/2016	119	40
10/27/2016	127	40
12/13/2016	47	40
01/24/2017	41	80**

** two CT scans

Treating Parkinson disease with CT scans

- On discovering the efficacy of CT scans for AD, the spouse requested a scan to alleviate his Parkinson disease
- After a scan Oct 6, 2015, he noticed the complete absence of tremors while sleeping (and waking at about 4 am)
- He decreased his medication (Carbidopa/Levodopa 25/100 mg) from 6 to 2-3 pills/day
- Jun 13, 2016, received in-depth neuropsychological exam
- Based on experience with booster scans, 4-week intervals between CT scans are preferable

Date and x-ray dose ($CTDI_{vol}$) of PD treatments

Date	Interval (days)	Dose (mGy)
10/06/2015		40
06/16/2016	253	40
07/13/2016	28	40
09/29/2016	51	40
11/21/2016	80	40
12/21/2016	30	40

Parkinson disease treated with CT scans

Conclusions and Recommendation

- Based on these two cases, it is likely that treatments by CT scans of the brain may relieve symptoms of both Alzheimer disease and Parkinson disease.
- CT scan may stop (and partially reverse) progression of AD and PD neurodegenerative diseases.
- Carry out clinical studies on both AD and PD patients using normal CT scans, which are approved by the medical authorities for imaging of the brain.