Vitamin D and Cancer Prevention

Carole A. Baggerly, GrassrootsHealth
Cedric F. Garland, Dr. P.H.
UCSD School of Medicine

D*action Project

A worldwide population level public health intervention

1. Solve the deficiency epidemic--now!
   - Get serum levels to 100-150 nmol/L
2. Create Evidence-Based Public Health Policy Recommendations
   - Large scale intervention: *Education*
   - Testing
   - Voluntary/individual intake adjustment
   - Results

Sponsors Supporting the Call to Action: 100-150 nmol/L

- *Individuals:* Over 8000 sponsors in the D*action project
  - US, Canada, United Kingdom, Japan, India, New Zealand, Australia

Sponsors Supporting the Call to Action: 100-150 nmol/L

- *Associations/Organizations*
  - Ontario Society of Physicians for Complementary Medicine
  - Section of Complementary and Integrative Medicine of the Ontario Medical Association
  - DIRECT-MS.org, multiple sclerosis organization

Sponsors Supporting the Call to Action: 100-150 nmol/L

- *Clinics/Medical Groups*
  - All About Children Pediatric Partners
  - Courtyard Chiropractic Health Centre
  - Homefirst Health Services
  - Mattapan Community Center
  - Reading Hospital Cancer Center
  - Roswell Park Cancer Institute
  - Skardis Pain Management Clinic
  - Steiner Medical and Therapeutic Center

Sponsors Supporting the Call to Action: 100-150 nmol/L

- *Pharmacies (all in the US to date)*
  - Apotheca Compounding Pharmacy
  - Bella Vista Pharmacy
  - Collier Drug
  - Debbie's Pharmacy
  - Glenn Ellen Pharmacy
  - ++++ many more

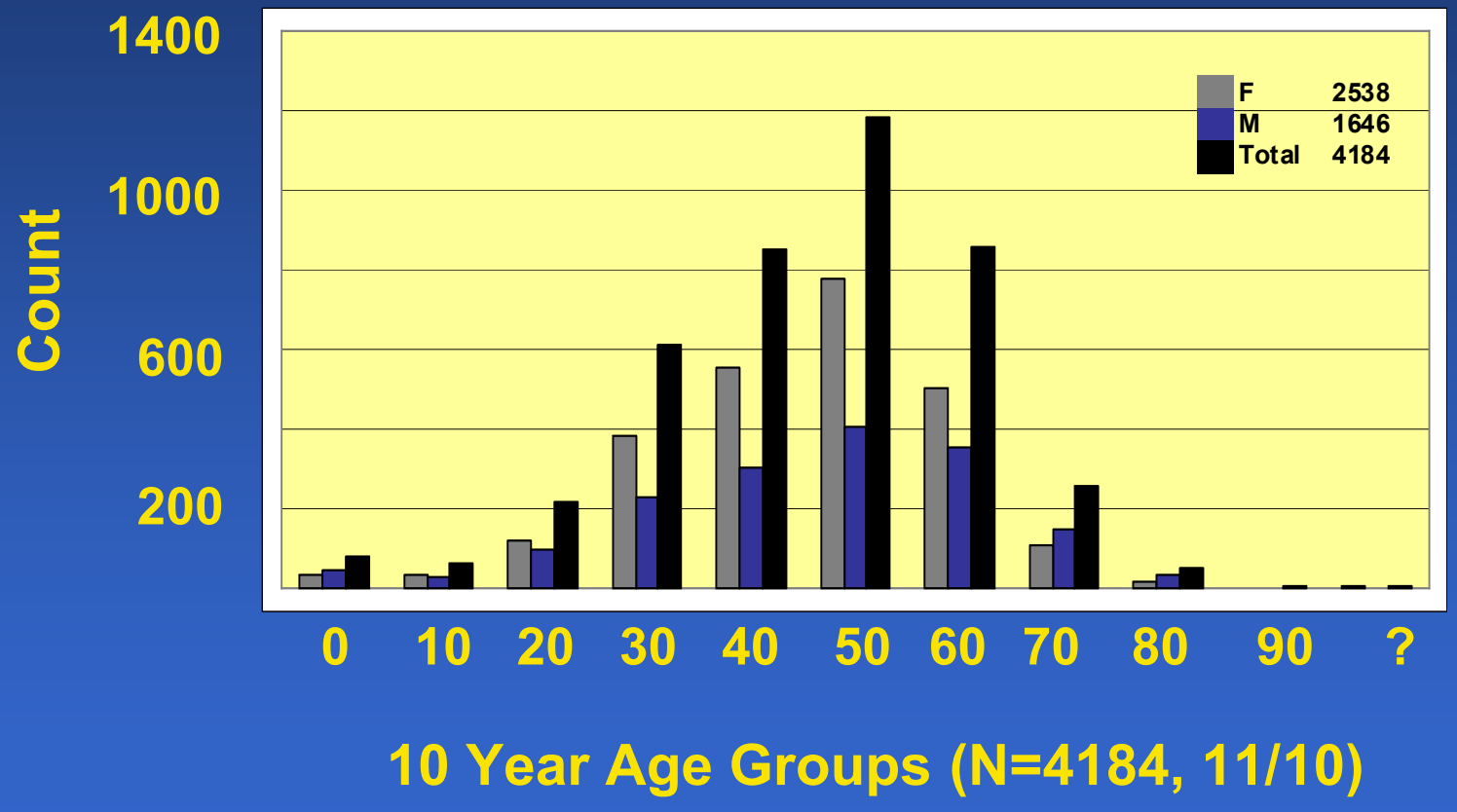
Sponsors Supporting the Call to Action: 100-150 nmol/L

- *Community & Research Projects*
  - Northwest Arkansas Breast Cancer Prevention
  - MS group in Vermont
  - State of Alaska
  - Minority Group in Georgia
  - University partnership/NIH grant
  - MORE Coming!

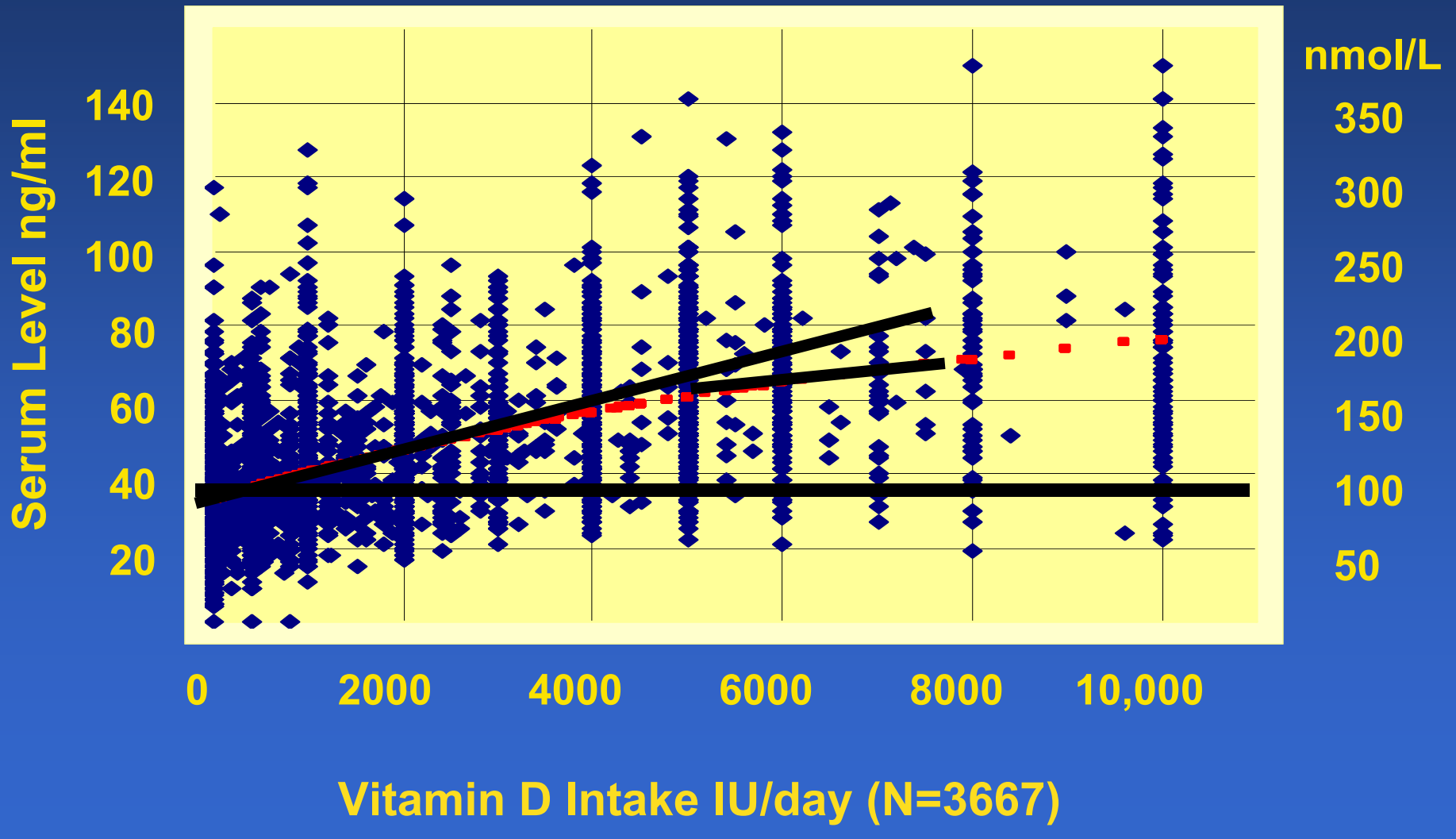
Project Results to Date

- Who's listening?
- How are they interpreting the message?
- What's next?

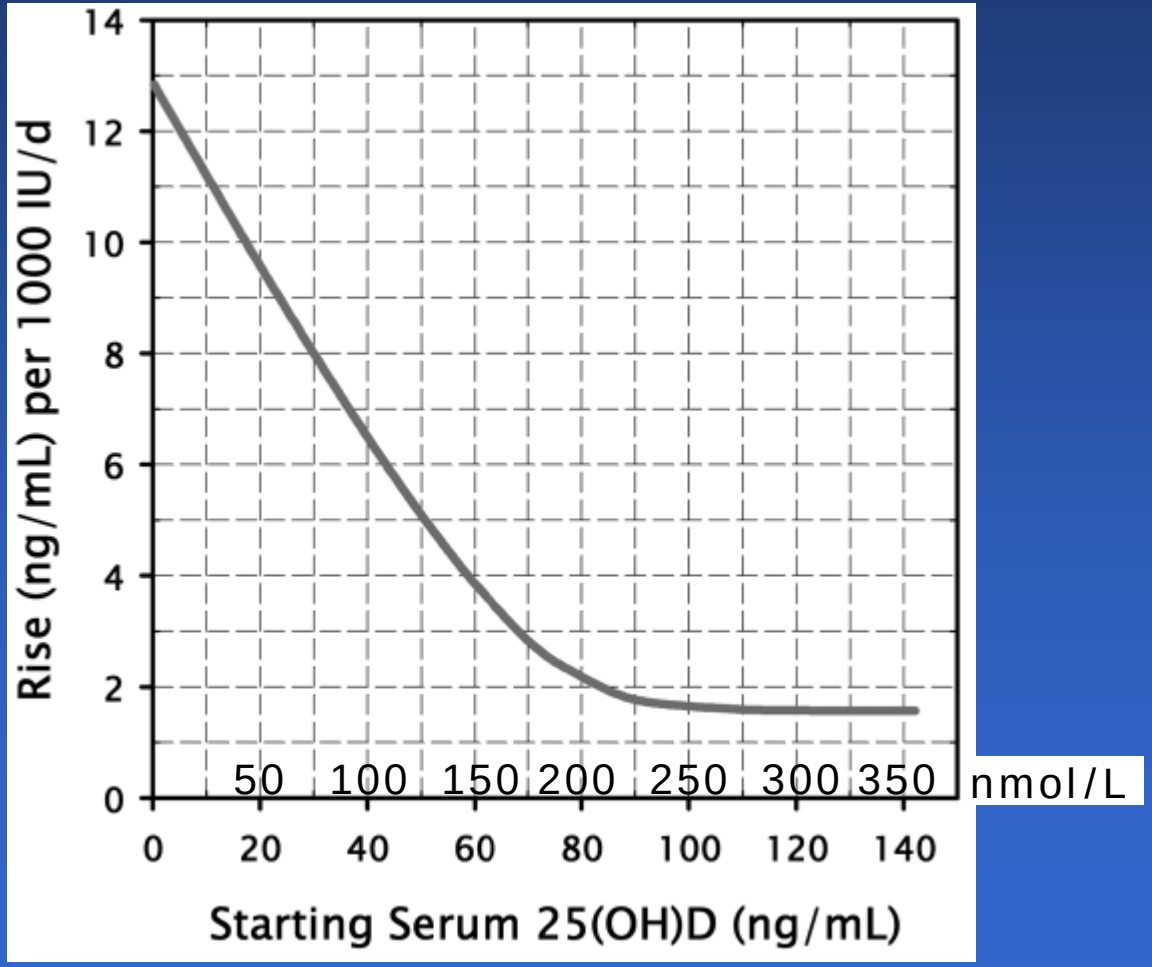
D*action Age Distribution



D*action Project: Serum Level vs Intake



Rise in serum 25(OH)D per 1,000 IU D3 per day



(Copyright Robert P. Heaney, 2011. Used with permission.)

Expected Serum Level (nmol/L)

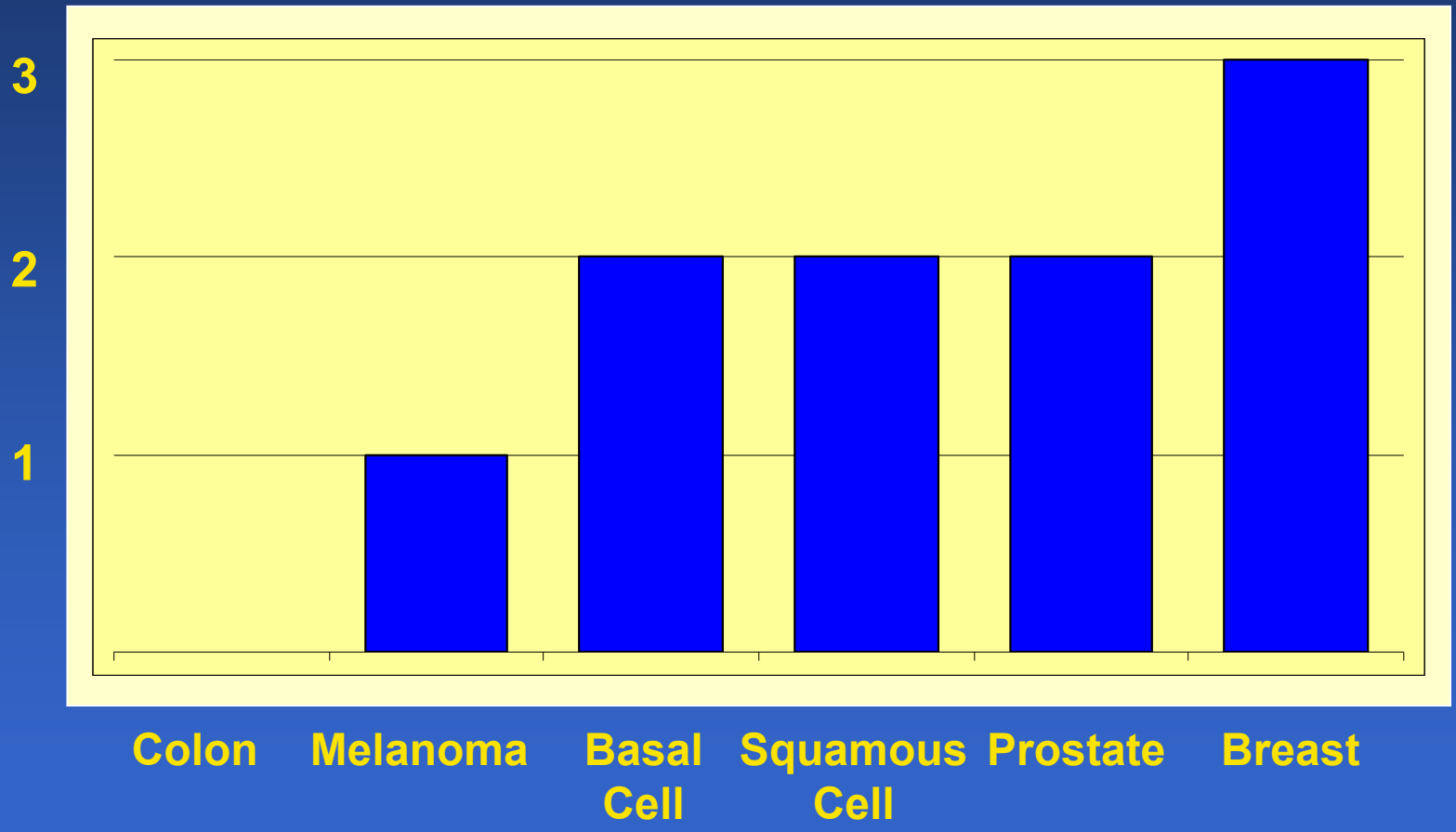
Current Serum Level (nmol/L)

	50	75	100	125	150	175	200
25	1000	2200	3600	5300	7400	10100	13800
38	500	1700	3200	4900	7000	9700	13400
50		1200	2600	*4300*	6400	9100	12800
63		600	2000	3700	5800	8600	12300
75			1400	3100	5200	7900	11600
88			800	2500	4600	7300	11000
100			--	1700	3800	6500	10200
113			--	900	3000	5700	9400
125			--	--	2100	4800	8500
150			--	--	--	2700	6400
175			--	--	--	--	3700

Example: To go from 50 nmol/L to 125 nmol/L would require an average additional intake of 4300 IU/day

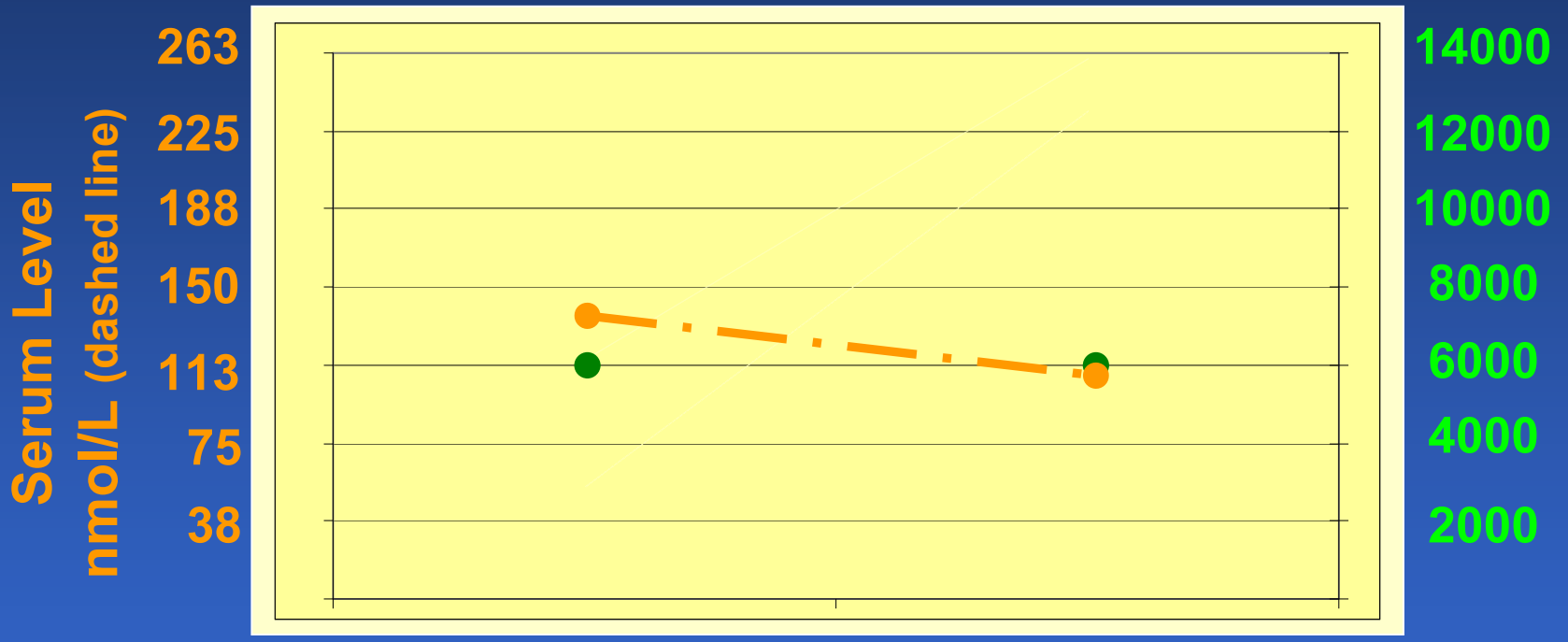
©GrassrootsHealth, AntiCancer Research 2/20/2011

D*action Project: Cancer Diagnosis Between Tests 1 & 2



A total of 1589 participants have taken at least 2 tests.

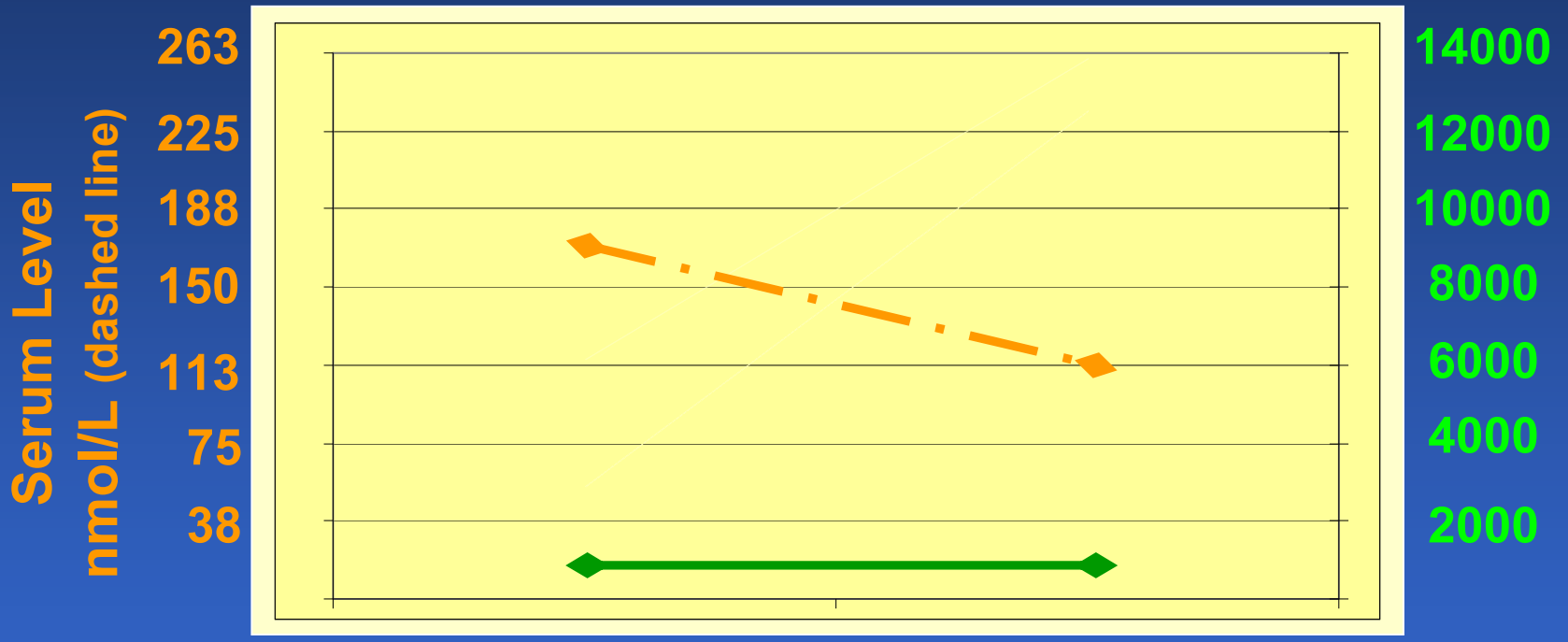
Case #1: Breast Cancer Diagnosis Between Tests 1 & 2



Meet Case #1

- Breast Cancer diagnosis
- 61 yrs old, Caucasian
- 163 lbs
- 5’9”
- Blood Pressure: 116/78
- Spring/summer sun: 60 minutes/day
- Physical activity: 1 mile/day
- 6000 IU/day

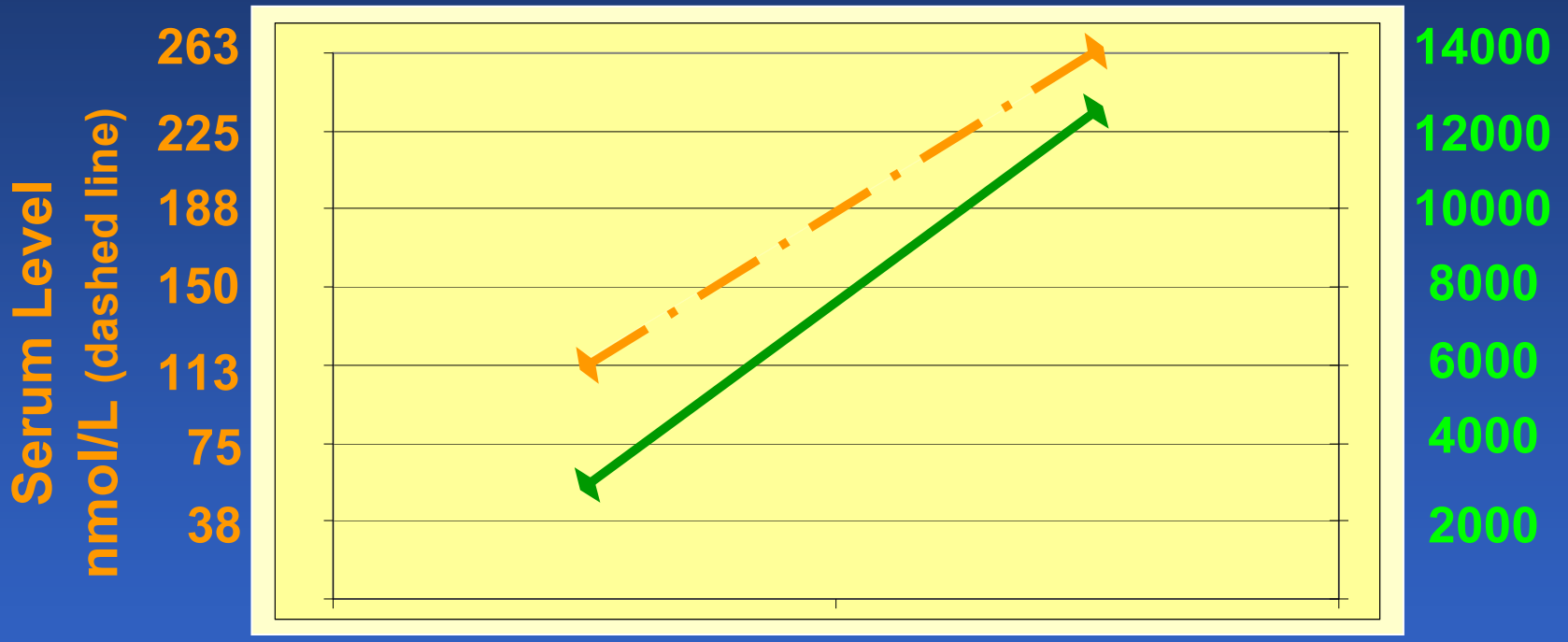
Case #2: Breast Cancer Diagnosis Between Tests 1 & 2



Meet Case #2

- DCIS diagnosis
- 60 yrs old, Caucasian
- 134 lbs
- 5’3”
- Blood Pressure: 106/50
- Spring/summer sun: 60 minutes/day
- Physical activity: 1 mile/day
- Garden
- 800 IU/day

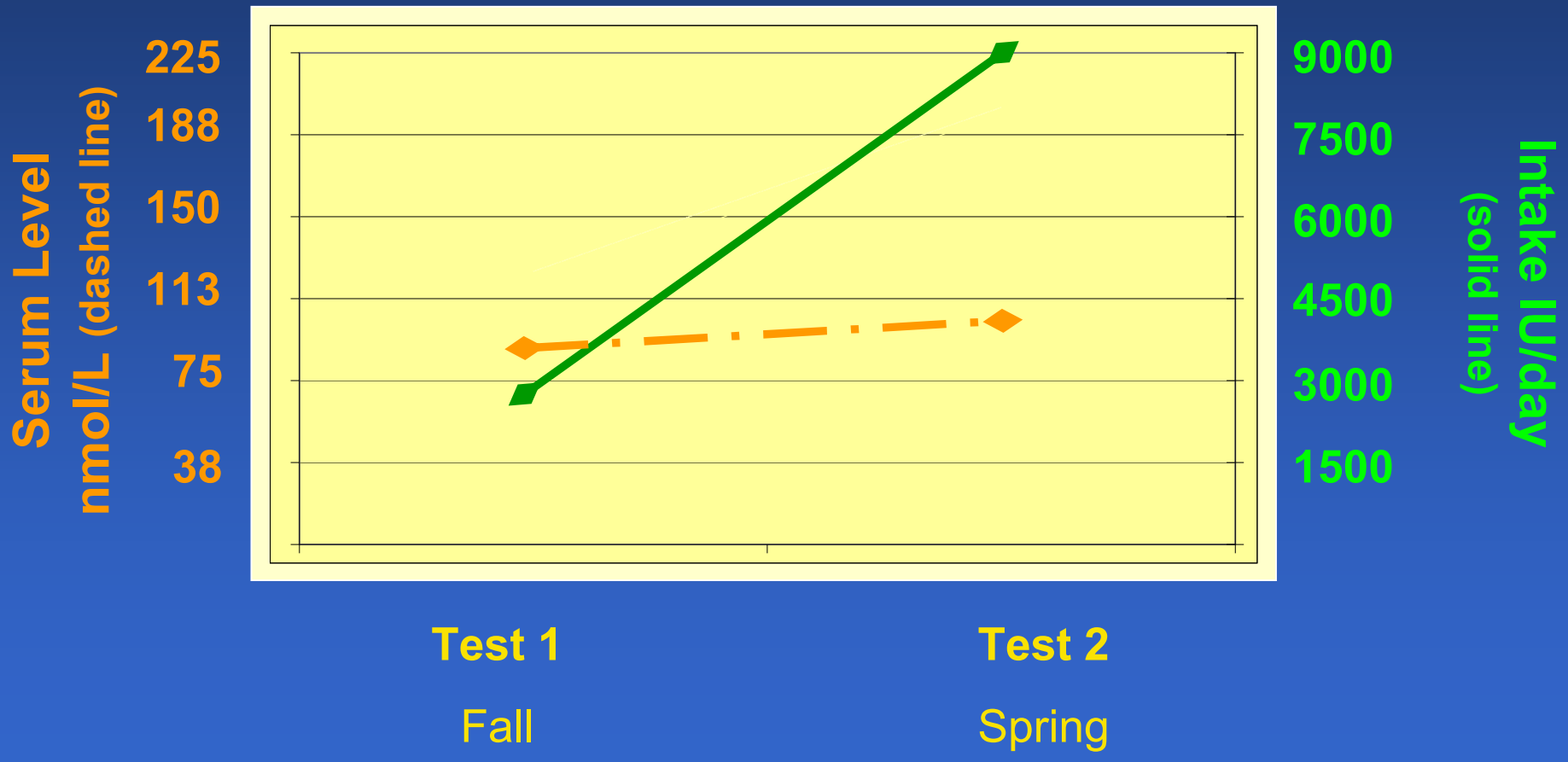
Case #3: Breast Cancer Diagnosis Between Tests 1 & 2



Meet Case #3

- Breast Cancer diagnosis
- 43 yrs old, Caucasian
- 190 lbs
- 5’3”
- Blood Pressure: 118/75
- Spring/summer sun: 0 minutes/day
- Physical activity: none
- 2900 IU/day to 12,500 IU/day

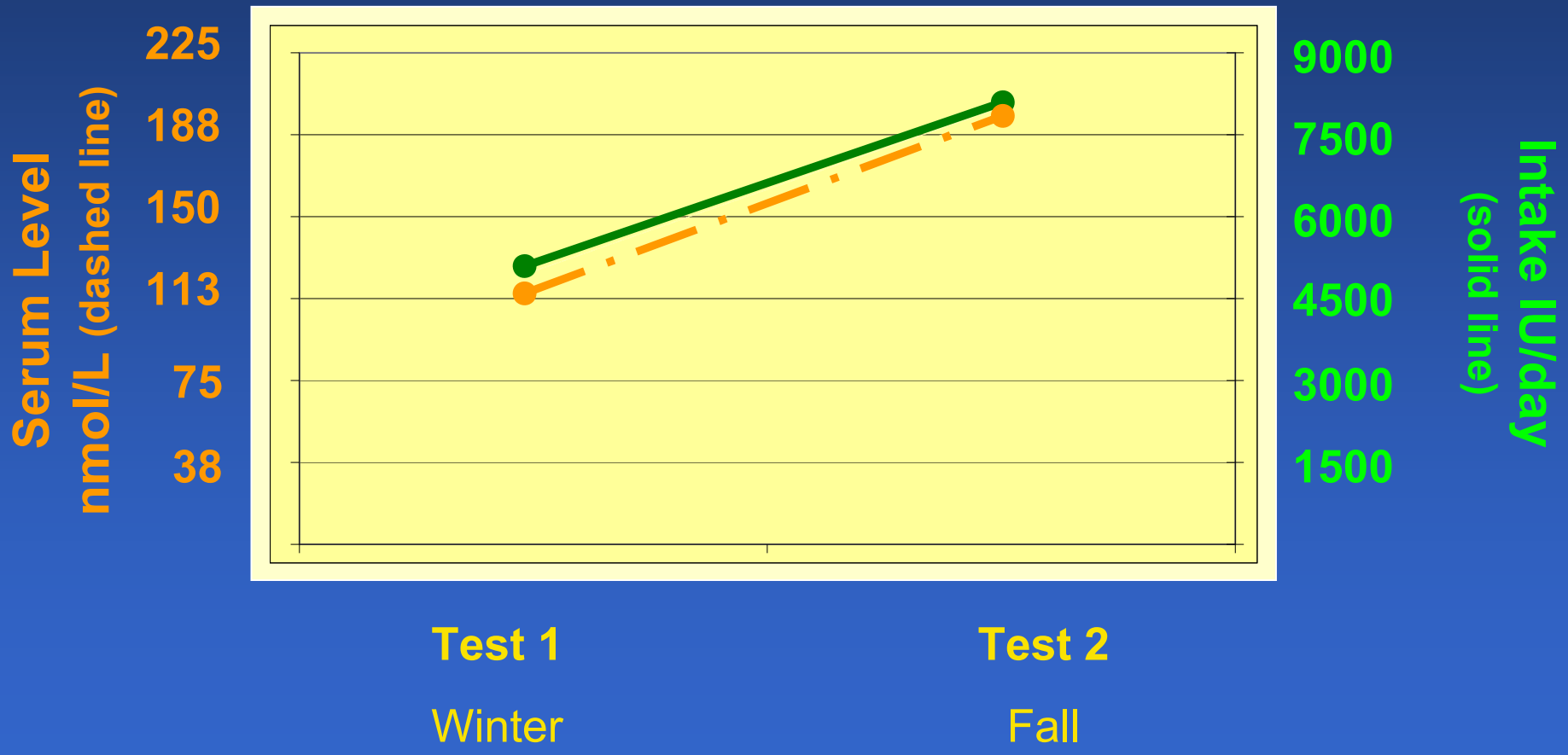
D*action Project: Prostate Cancer Diagnosis Between Tests 1 & 2



Meet Prostate Cancer, Case #1

- Prostate Cancer diagnosis
- 55 yrs old, Caucasian
- 285 lbs
- 6’5”
- Blood Pressure: 120/90
- Spring/summer sun: 0 minutes/day
- Physical activity: none
- 2800 IU/day to 9000 IU/day

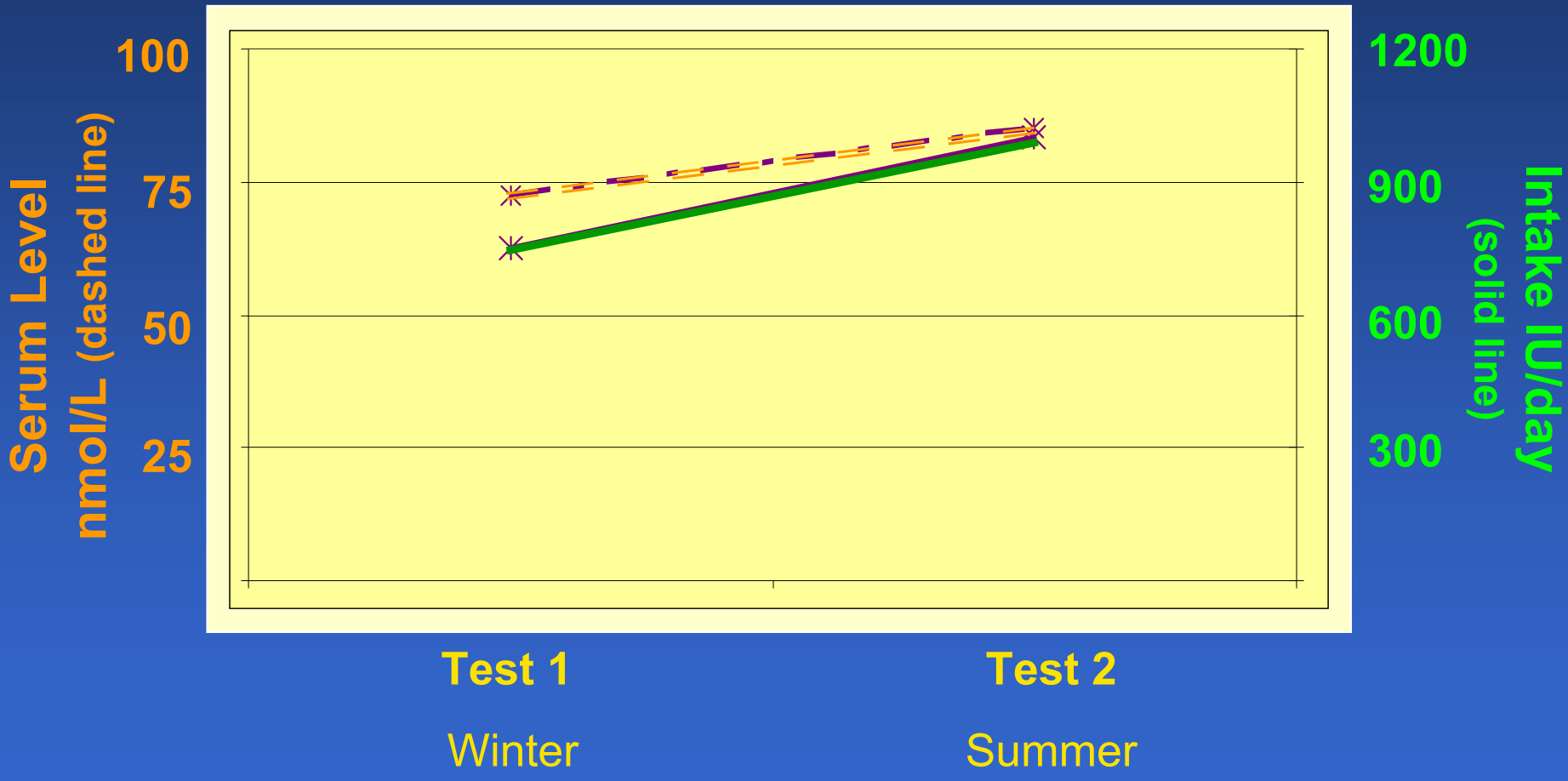
D*action Project: Prostate Cancer Diagnosis Between Tests 1 & 2



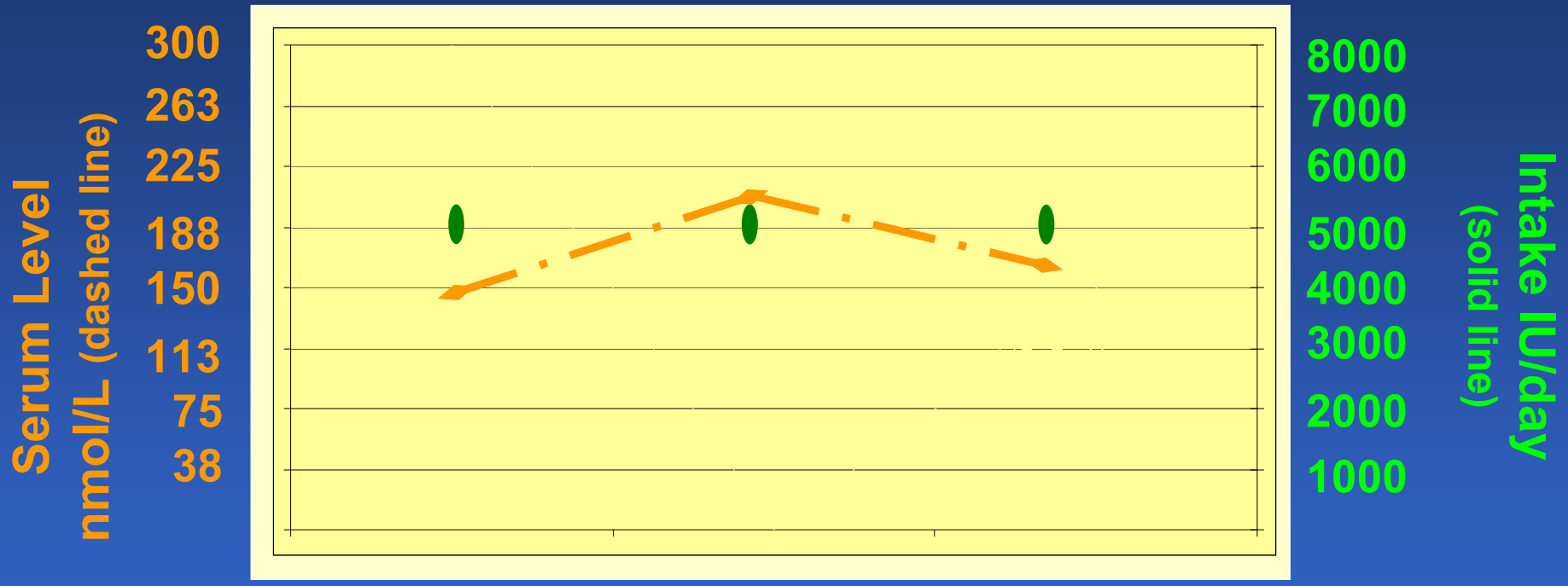
Meet Prostate Cancer Case #2

- Prostate Cancer diagnosis
- 71 yrs old, Caucasian
- 185 lbs
- 5’7”
- Type 2 diabetes
- Spring/summer sun: 45 minutes/day
- Physical activity: none
- 5000 IU/day to 8000 IU/day

D*action Project: Melanoma Diagnosis Between Tests 1 & 2

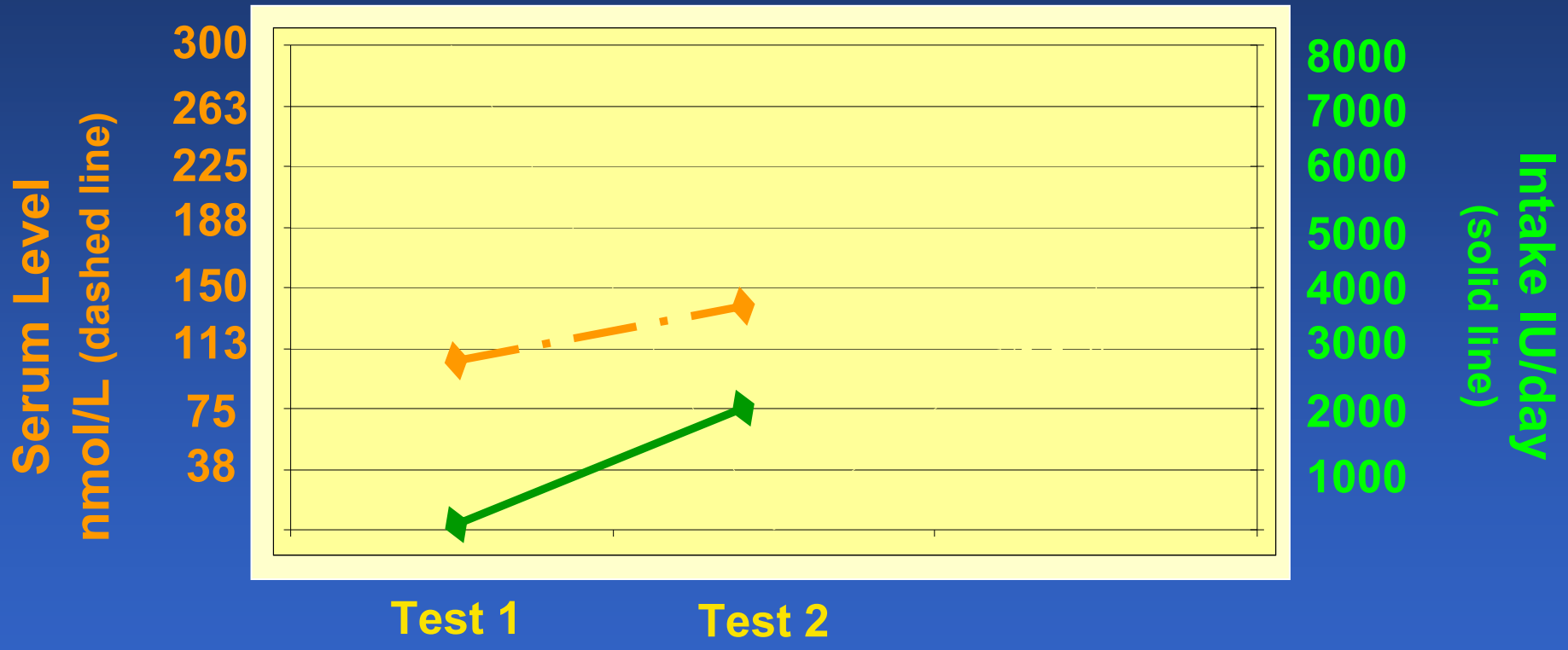


D*action Project: Basal Cell Carcinoma Diagnosis After Test 1



diagnosed between tests 1 & 2

D*action Project: Basal Cell Carcinoma Diagnosis After Test 1



Observations

- Average serum level of all but melanoma is >100 nmol/L (40 ng/ml): Success of recommendation!
- Is it high enough?
  - With our recent publication in AntiCancer Journal, it will take approximately 9600 IU/day to get everyone to 100 nmol/L. How can we proceed with this?
  - Recent publication from NHANES data, no impact on Breast Cancer at levels < 40 ng/ml (100 nmol/L)
- Some cancer drugs lower vitamin D serum levels (tamoxifen for a common one)
- How do we best get this word and action to the people AND the oncologists?

Next Steps

- More focus on oncology sponsoring clinics so women can get advice re vitamin D as well as other treatment
- Publication of data on various chemotherapeutic drugs and effect on vitamin D status
- Review dosages in current trials to see if they can be amended for higher serum levels

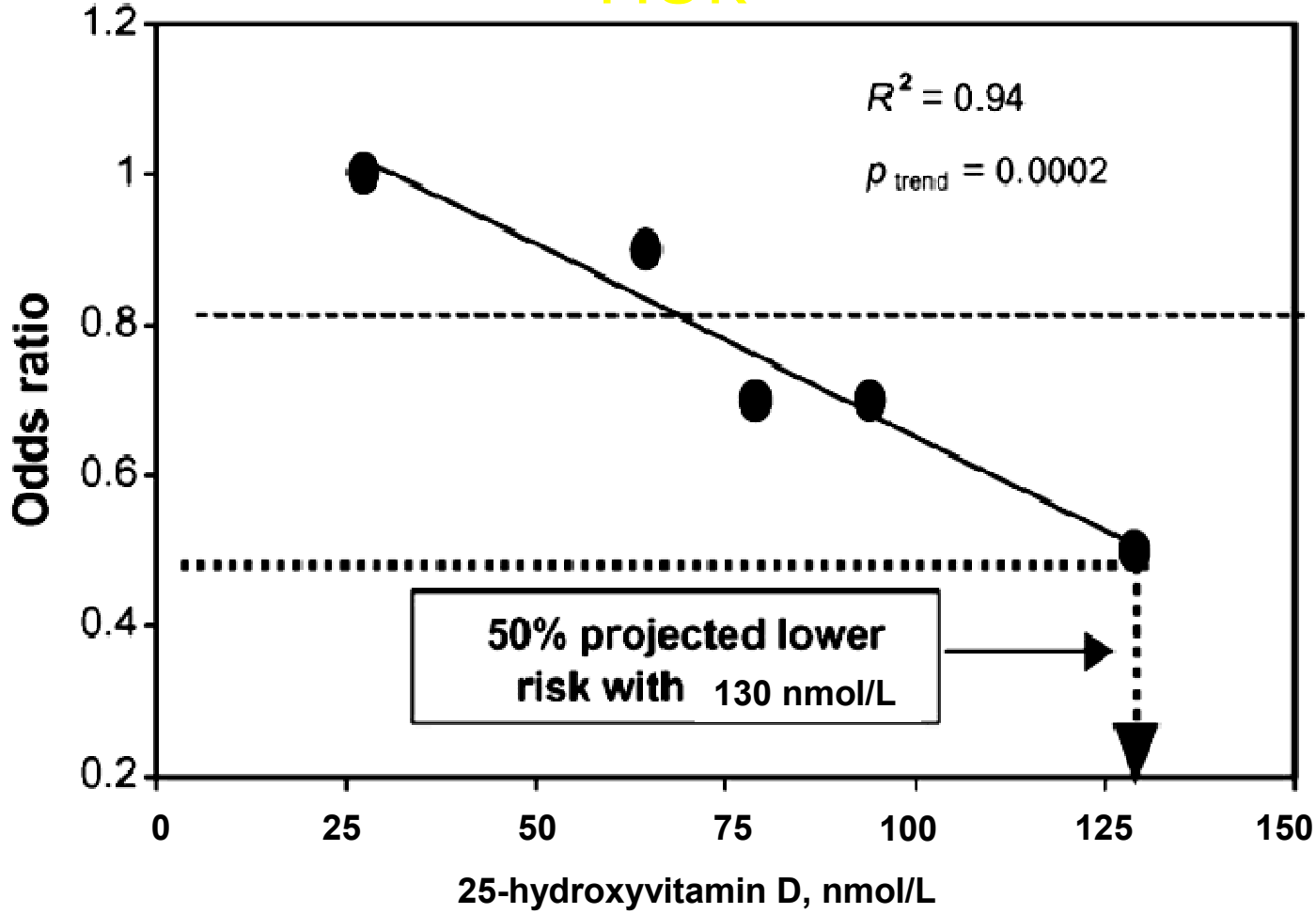
Special Thanks

- Cedric F. Garland, Dr. P.H.
- Robert P. Heaney, MD
- Christine B. French, MS
- Leo L. Baggerly, Ph.D.
- ALL 8000 sponsors!

Thank you!

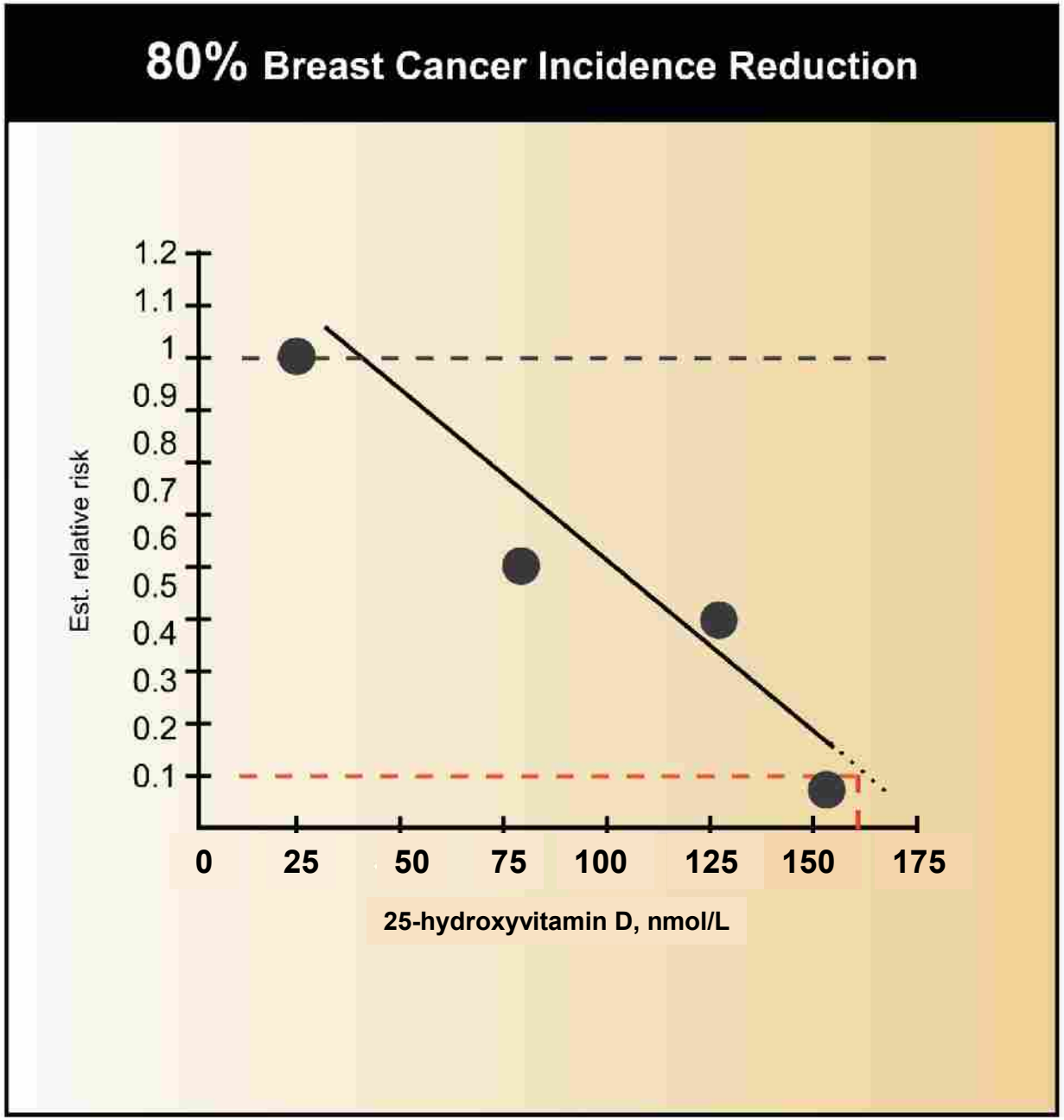
Get your serum level to *at least*
100-150 nmol/L
(40-60 ng/ml)

Meta-analysis of breast cancer risk



Dose–response gradient of risk of breast cancer according to serum 25-hydroxyvitamin D concentration, pooled analysis.

80% Breast Cancer Incidence Reduction



Source: Garland et al. (2007) based on data in Lowe et al. (2006)