

# Bale/Doneen Live Chat Session

November 9, 2011

5:30-6:30 pm PST

Amy L. Doneen MSN, ARNP

# Outline for November Live Chat Session

New topics in November 2011

1. EDFROG cartoons
2. Red Flags – Prehypertension
3. Structural data
  1. Vascular bed calcifications
  2. Intracranial IAC
  3. ICA data
  4. Internal carotid stenosis
  5. Plaque Morphology
  6. Carotid Stiffness
  7. Bale/Doneen vascular report
4. Vitamin D
5. Cases

# Red Flags

# Pre-hypertension Independently Increases Stroke Risk About 50%

- 12 prospect. studies; 518,520 middle aged adults; 2.7 to 32 yrs
- RR of stroke: 1.55 (95% CI 1.35-1.79)  $p < 0.001$   
adjusted for age, sex, DM, BMI, smoking, cholesterol

## Risk of stroke by prehypertension category

Prehypertension range (mm Hg)	Relative risk (95% CI)
SBP 120-129 or DBP 80-84	1.22 (0.95-1.57)
SBP 130-139 or DBP 85-89	1.79 (1.49-2.16)

Lee M, et. al. *Neurology* 9/28/2011; 77:1330-1337.

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# Structure

# One-year Outcomes for Patients with Established Vascular Disease at One or More Sites

Parameter	Any 1 system	CAD alone	CVD alone	PAD alone
n =	42,716	28,867	10,603	3,246
CV death, MI, or stroke (%)	4.07	3.64	5.54	3.06

Steg PG, et al. *JAMA*. 2007;297:1197-1206.

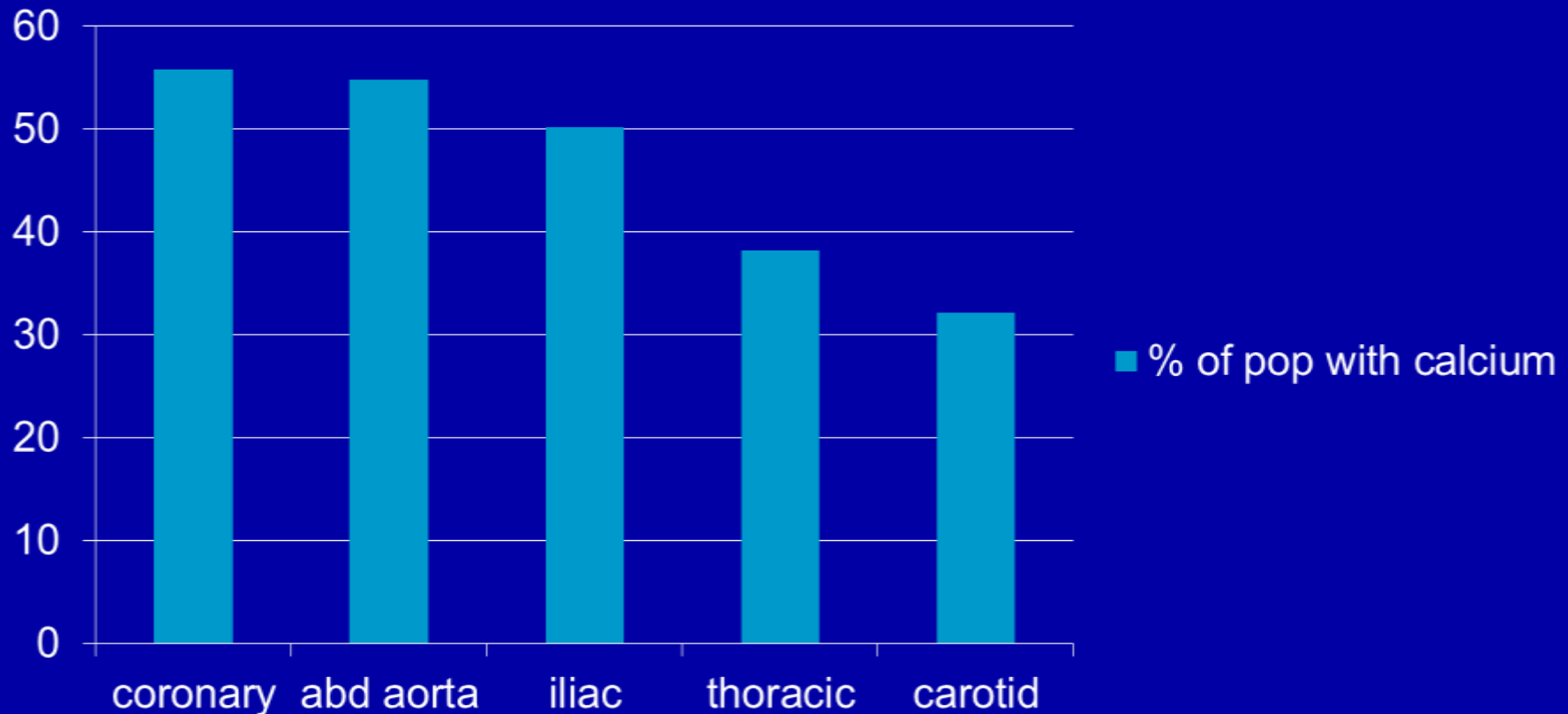
# Mortality Risk and Calcified Atherosclerosis in Different Beds

- 4,544 pts; CT scans for calcium in different vascular beds; 43% female; mean age 57; followed 7.8 yrs; 163 deaths
- After full adjustment, mortality HR was significant for thoracic, carotid and iliac beds
  - thoracic HR- 2.1 (95% CI -1.2–3.5)
  - carotid HR- 1.6 (95% CI -1.1–2.5)
  - iliac HR- 1.7 (95% CI -1.0 –2.9)
- After full adjustment, mortality HR was not significant for coronary or abdominal aorta calcium

Allison M A., et.al. *Arterioscler Thromb Vasc Biol.* 1/2012;32:00-00.

# Calcium Revealed by Total Body CT Scans in Various Arterial Beds

% of pop with calcium



43% female; mean age 57



# Intracranial Artery Calcification (IAC) Assoc. with CV Events in Post Stroke Pts

- 302 post IS pts; follow-up 2 yrs.; 45 CV events
- IAC score was significantly associated with CV events  
HR 1.39; (95% CI, 1.10 –1.76)  $p=0.007$

Bugnicourt, Jean-Marc, et. al. *Stroke* 10/2011

<http://stroke.ahajournals.org/content/early/2011/09/22/STROKEAHA.111.618652>

# Carotid-Wall Intima–Media Thickness and Cardiovascular Events

Hypothesized that the IMT of the CCA and ICA would add to the predictive value of FRS regarding new-onset cardiovascular events.

Increased IMT of the CCA represents a form of atherosclerosis that is manifested as diffuse arterial-wall thickening, whereas increased IMT of the proximal ICA is a surrogate for focal atherosclerotic plaque.

*Joseph F. Polak, M.D., M.P.H., Michael J. Pencina, Ph.D., Karol M. Pencina, Ph.D., Christopher J. O'Donnell, M.D., M.P.H., Philip A. Wolf, M.D., and Ralph B. D'Agostino, Sr., Ph.D.*



*Polak JF et al. N Engl J Med July 21, 2011;365:213-221*



## Study population:

Framingham Offspring Study cohort, composed of non-Hispanic whites, who were undergoing the sixth examination cycle, 2/1995 through 9/1998.

Of the 3532 persons seen during the clinic visit, 2946 had interpretable images of the internal carotid artery.

Mean CCA IMT: measured over a segment of the common carotid artery that was 1 cm long, located approximately 0.5 cm below the carotid-artery bulb, exclude plaque

Max IMT of Internal: Defined as the greatest intima–media thickness in either the right or left internal carotid artery extending from the bulb to 1 cm above the carotid sinus.

Plaque: defined as an intima–media thickness of more than 1.5 mm

Reproducibility: 37 participants. 0.94 for the mean IMT CCA and 0.76 for the Max IMT of Internal carotid artery.

*Polak JF et al. N Engl J Med July 21, 2011;365:213-221*

# Results

The results showed that the Framingham risk factors were all significant predictors of cardiovascular disease.

Addition of mean CCA IMT: was significantly associated with the risk of cardiovascular disease: HR per 1-SD increase in thickness, 1.13; 95% [CI], 1.02 to 1.24; P=0.02

Addition of maximum IMT of ICA was also significantly associated with the risk of cardiovascular disease: HR per 1-SD increase in thickness, 1.21; 95% CI, 1.13 to 1.29; P<0.001

When ICA IMT was added to the model, the predictability sign increased by 0.010 (95% CI, 0.003 to 0.016; P=0.003), from 0.748 (95% CI, 0.719 to 0.776) to 0.758 (95% CI, 0.730 to 0.785).

# Reclassification Index of FRS

## Inclusion of max IMT of the ICA: (P<0.001)

5.8% for participants with cardiovascular events

1.8% for participants without cardiovascular events

7.6% overall

## Addition of IMT of ICA but not for mean IMT of CCA (P=0.99)

0.4% for events

0.4% for nonevents

0.0% overall

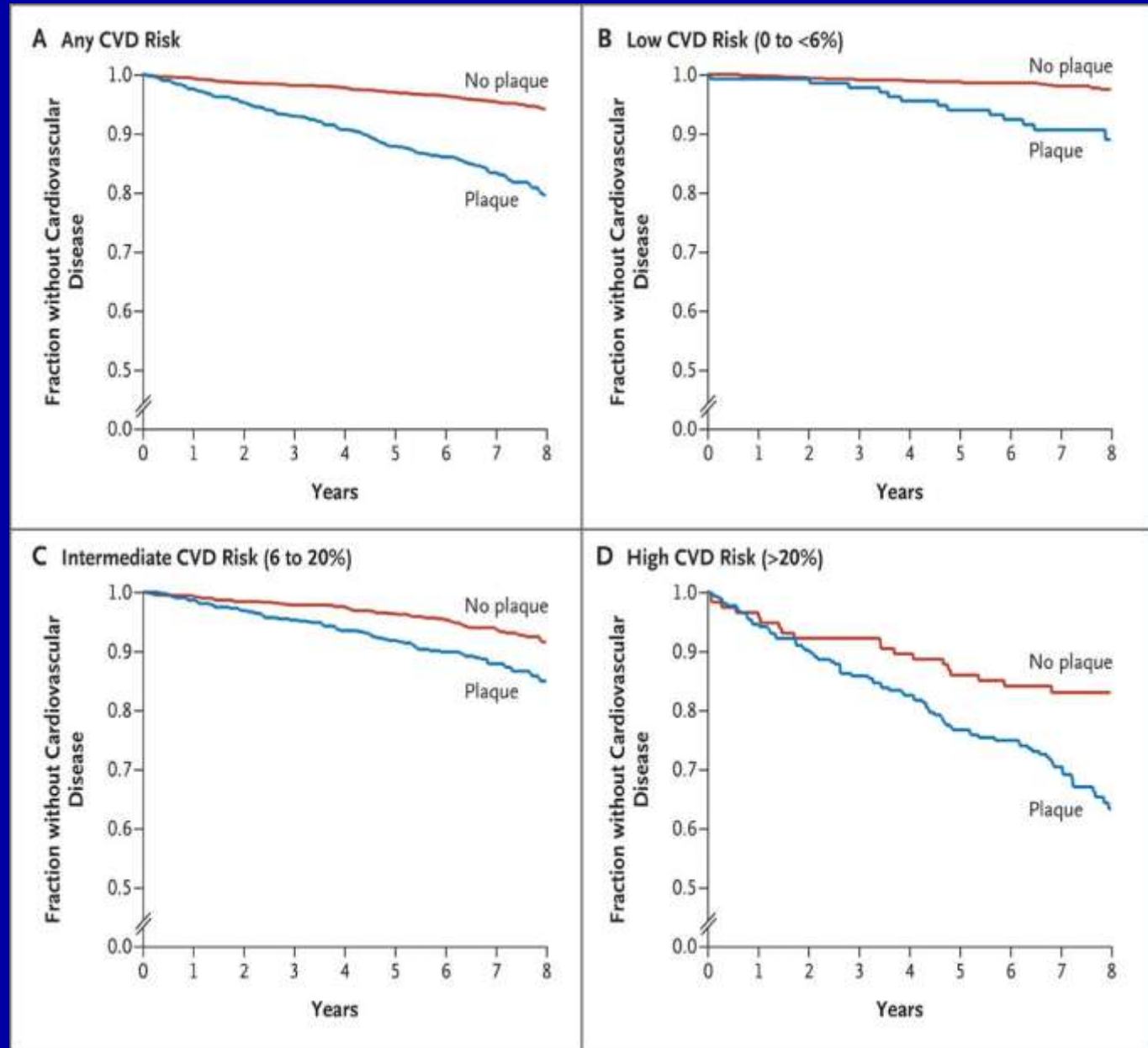
## ICA IMT sign increased the net reclassification index (P<0.05 for all)

6.7% for men and 9.2% for women

9.1% for persons  $\leq$  60 years old

7.6 % for persons  $\geq$  60 years old

# Probability of New-Onset (CVD) based on the presence of plaque in the ICA.



# Internal Carotid Stenosis Associated with Dementia

- Autopsy exam 112 dementia and 577 controls
- Left internal carotid stenosis ( $\geq 70\%$ ) was associated with dementia  
OR, 2.30 (95% CI, 1.14–4.74)  $p=0.02$  - after multivariate logistic regression models
- Right internal carotid stenosis showed nonsignificant trend OR, 1.96 (95% CI, 0.94–4.08)  $p=0.07$

Claudia K., et. al. *Stroke* 10/2011

<http://stroke.ahajournals.org/content/early/2011/09/22/STROKEAHA.111.628156>

# Intracranial Artery Calcification (IAC) Assoc. with CV Events in Post Stroke Patient

- 302 post IS pts; follow-up 2 yrs.; 45 CV events
- IAC score was significantly associated with CV events  
HR 1.39; (95% CI, 1.10 –1.76)  $p=0.007$

Bugnicourt, Jean-Marc, et. al. *Stroke* 10/2011

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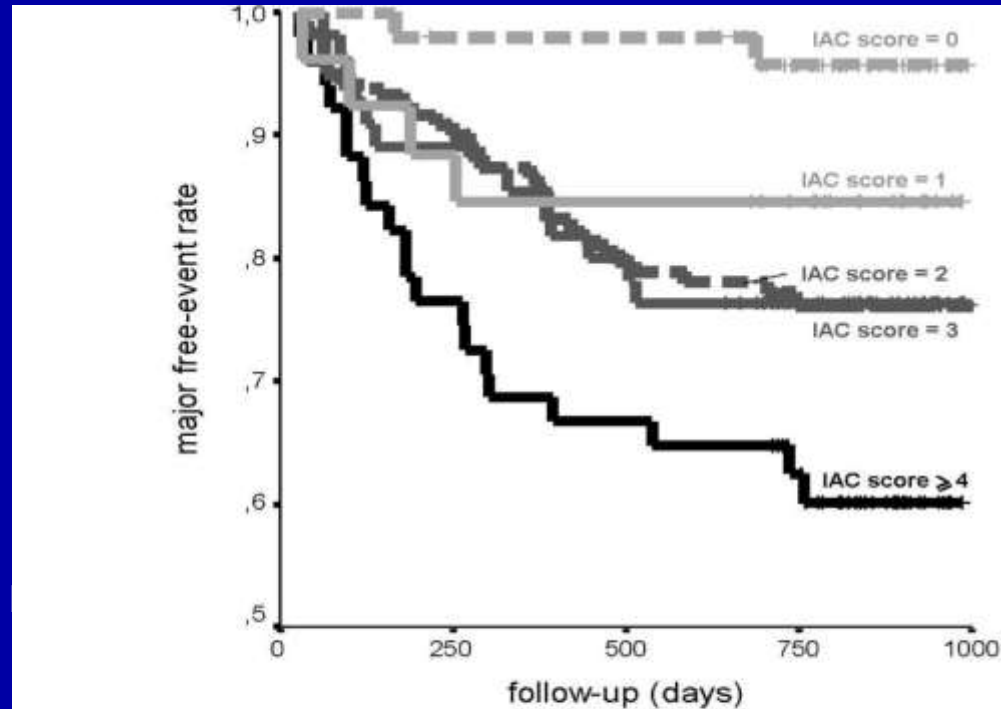


# Intracranial Artery Calcification (IAC) Assoc. with CV Events in Post Stroke Pts

Kaplan–Meier analysis of the incidence of major clinical events in patients with ischemic stroke according to the IAC scores.

Patients with the highest IAC scores had significantly higher rates of death and vascular events than those with the Scores

(log rank test,  $P=0.029$ ).



Cumulative events					
IAC score	0	250	500	750	1000
IAC score = 0	0	1	1	2	2
IAC score = 1	0	4	4	4	4
IAC score = 2	0	12	25	28	28
IAC score = 3	0	7	13	13	13
IAC score ≥ 4	0	13	17	19	20

Bugnicourt, Jean-Marc, et al. *Stroke* 10/2011

<http://stroke.ahajournals.org/content/early/2011/09/22/STROKEAHA.111.618652>

# Plaque quality/morphology

# Carotid Plaque Morphology Associated with Inflammation

- FDG uptake was greater in noncalcified vs. calcified plaques: Median [IQR]: (2.0 vs. 1.6)  $p=0.03$
- Confirms prior observations that FDG uptake is reduced in vascular segments containing densely calcified plaques.
- Also found macrophage staining is reduced in calcified segments.
- It should be noted this comparison was only btw dense vs. no calcification - did not evaluate the different patterns of moderate calcium deposition (e.g. spotty calcification) which in the coronaries, was observed to be closely linked with atherothrombotic risk.

Amparo L. Figueroa, et. al. *Circ Cardiovasc Imaging* published online October 28, 2011  
DOI: 10.1161/CIRCIMAGING.110.959478

# The future – Carotid stiffness

# Carotid Artery Stiffness Related to Stroke Risk – not CHD Risk

- 10,047 ARIC subjects; mean age 55; followed 13.8 yrs; 1,267 MI; 383 IS
- Carotid arterial strain and compliance, distensibility and stiffness indices, pressure–strain, and Young elastic moduli were measured with B mode US
- After adjustment for risk factors and CIMT, the following were significant predictors of stroke: carotid arterial strain; arterial distensibility; stiffness; pressure–strain; Young elastic moduli
- Arterial compliance was not predictive of risk
- None of the measures predicted CHD risk

Eric Y. Yang, MD, et. al. *Stroke*. 2012;43:00-00

doi: 10.1161/STROKEAHA.111.626200

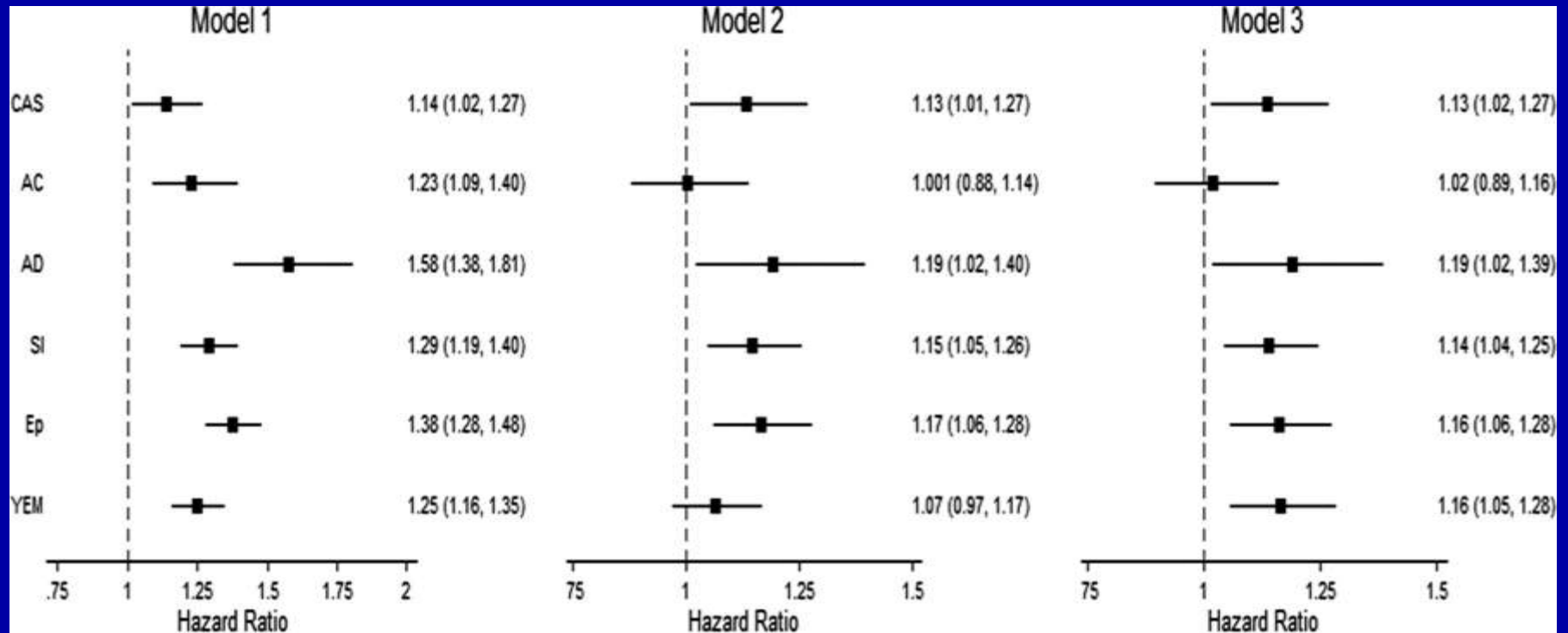
# Carotid Artery Stiffness Related to Stroke Risk

- Carotid stiffness measures are associated with incident stroke.
- These measures are independently predictive.
- These measures can be obtained with little addition to the CIMT procedure.
- They could quickly be implemented providing additional information related to the arterial health of an individual.
- Advances in ultrasound technology may allow for more accurate estimation of the arterial dimensions in multiple planes, thus further improving stiffness measurement.

Eric Y. Yang, MD, et. al. ***Stroke***. 2012;43:00-00

doi: 10.1161/STROKEAHA.111.626200

# Carotid Artery Stiffness Related to Stroke Risk



Hazard ratios for incident strokes examining a 1-SD difference toward adverse arterial stiffness\* for each vascular wall characteristics adjusted for different covariates. Model 1 included age, gender, study site, and race; Model 2 included Model 1 covariates plus height, weight, diabetes, total cholesterol, high-density lipoprotein cholesterol, smoking status, systolic blood pressure, and antihypertensive medication use; and Model 3 included Model 2 covariates plus carotid intima-media thickness. \*1-SD decrease for carotid arterial strain (CAS), arterial compliance (AC), and arterial distensibility (AD). 1-SD increase for stiffness index (SI), pressure-strain modulus (Ep), and Young's elastic modulus (YEM).

Eric Y. Yang, MD, et. al. **Stroke**. 2012;43:00-00

doi: 10.1161/STROKEAHA.111.626200

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# Bale/Doneen Vascular Report-

## In partnership with Vasolabs

- Report to include:
  - cIMT – complete with estimated flow velocities
  - FMT – plaque only
  - AAA – diameters and calcifications
  - ABI - with and without exercise
  
  - Working on: carotid artery stiffness evaluation.



# Vitamin D

# Major Risk Factors for Vit. D Deficiency

- Aging
  - Increased distance from the equator
  - Winter seasons
  - Darkly pigmented skin
  - Institutionalized/  
housebound
  - Sunscreens and cover-up clothing
  - Air pollution
  - Smoking
  - Obesity
  - Physical inactivity
  - Genetic factors
  - Malabsorption
  - Renal disease
  - Liver disease
  - Certain medications
  - Glucocorticoids
  - Antirejection medications
  - Human immunodeficiency virus medications
  - Certain antiepileptic drugs
- Lavie, C. J., et. al. *J. Am. Coll. Cardiol.* 10/4/2011;58;1547-1556

# Definitions of Vit. D Status

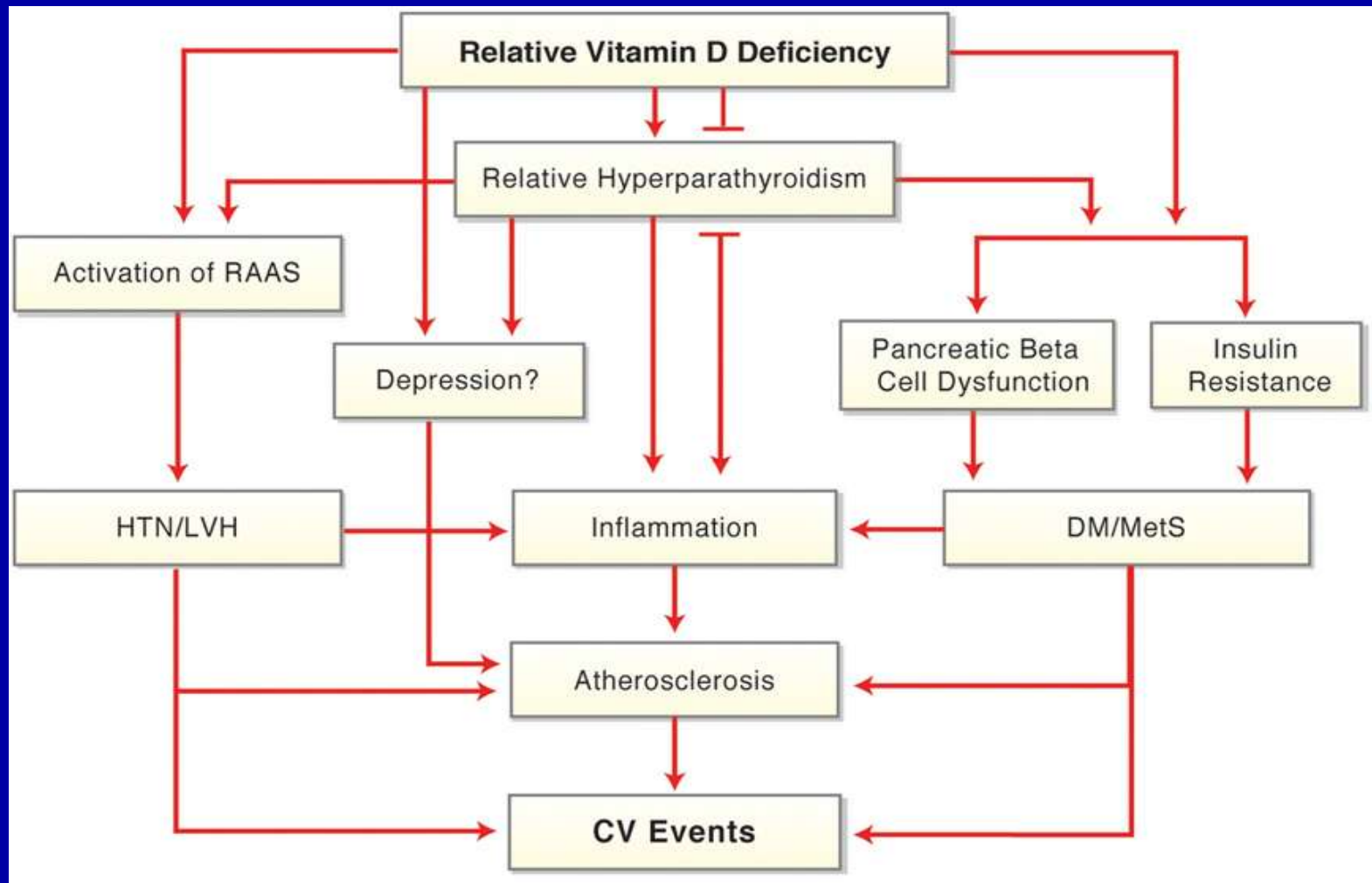
Serum 25-Hydroxyvitamin D, ng/ml	Vitamin D Status
10	Severe deficiency
10-20	Deficiency
20-30	Mild-moderate deficiency
30	Sufficient
40-50	Ideal
50-150	Intermediate data*
>150	Toxicity
<b>Institute of Medicine Definition†</b>	
12	At risk of deficiency
12-19	At risk of inadequacy
20-50	Sufficient
50	Possibly harmful

\*Some data suggest increased falls, fractures, certain cancers, and even cardiovascular risk at values 50 ng/ml.

†Definitions adapted from Looker et al.

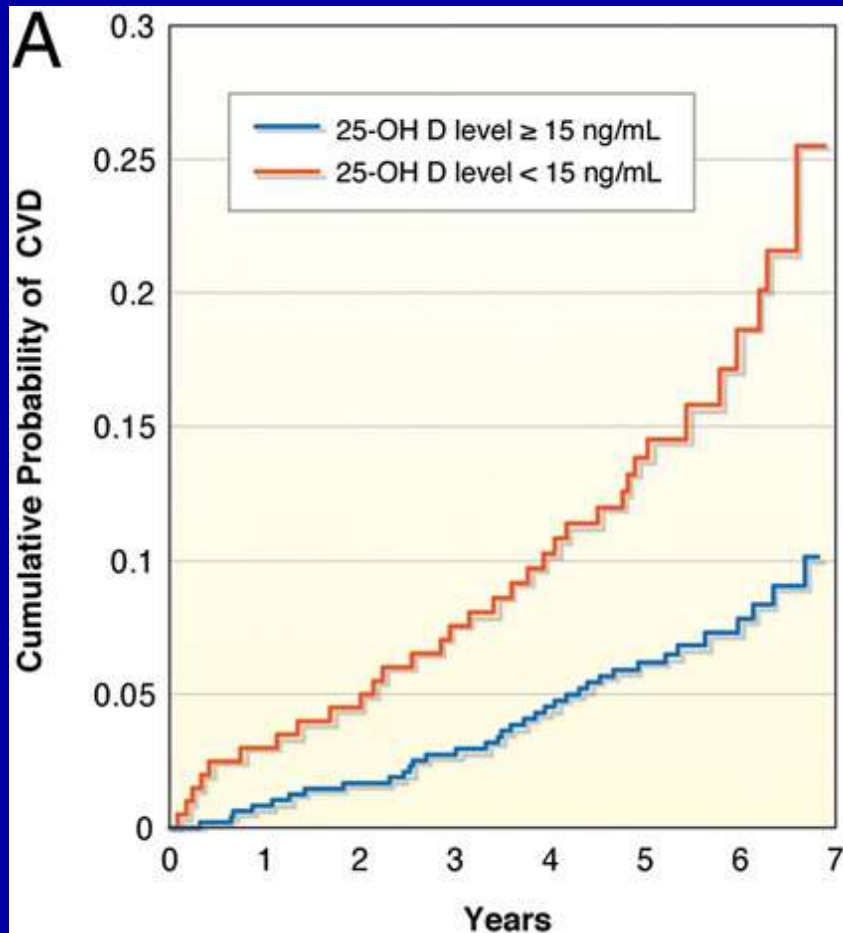
Lavie, C. J., et. al. *J. Am. Coll. Cardiol.* 10/4/2011;58;1547-1556

# Potential Mechanisms for CV Effects of Vitamin D Deficiency

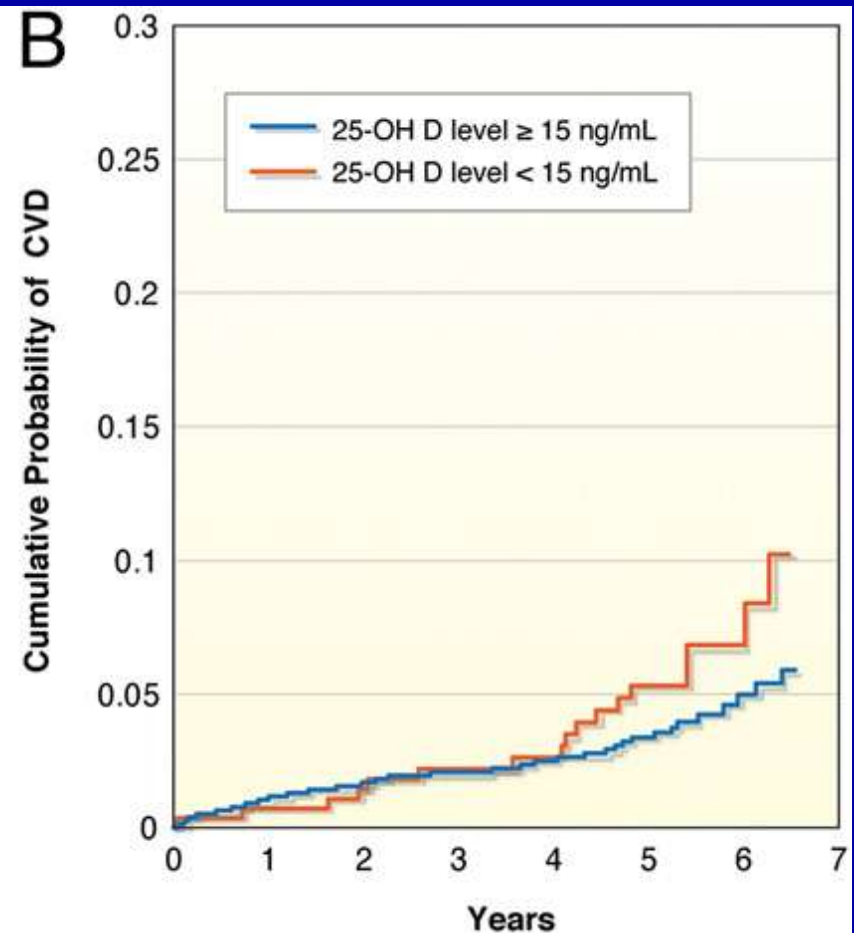


Lavie, C. J., et. al. *J. Am. Coll. Cardiol.* 10/4/2011;58;1547-1556

# Impact of Vitamin D and Hypertension for CV Events in the Framingham Study



A - hypertension



B – without hypertension

Lavie, C. J., et. al. *J. Am. Coll. Cardiol.* 10/4/2011;58;1547-1556

# Clinical Conclusions

- Considerable evidence indicates that vitamin D deficiency is extremely prevalent and associated with CV disease risk factors and is associated with increased CV disease events and all-cause mortality.
- Vitamin D deficiency can be prevented and corrected easily by sunlight and/or vitamin D supplementation.
- Definitive randomized controlled trials are needed to determine whether vitamin D therapy will live up to its hype.

Lavie, C. J., et. al. *J. Am. Coll. Cardiol.* 10/4/2011;58;1547-1556

# 25-hydroxyvitamin D Deficiency Is Associated With Subclinical Carotid Atherosclerosis

- 203 adults; mean age 68; 116 with plaque
- 25-hydroxyvitamin D inversely associated with IMT (0.01 per 10-ng/mL increase)  $p=0.05$   
*maximal plaque thickness*  
*(0.10 per 10-ng/mL increase)  $p=0.03$*
- After full adjustments: 25-hydroxyvitamin D accounted for 13% of the variance in both IMT and maximal carotid plaque thickness
- 1,25-dihydroxyvitamin D, calcium and parathyroid hormone were not associated with carotid measures

Angela L. Carrelli, MD, et. al. *Stroke*. 2011; 42: 2240-2245

# Cases



# Primary Prevention – Case 1

# 50 year old male with a positive premature family history of CAD and CVD

- Fm hx:
  - father had MI at 57 yrs
  - brother stent at 60 yrs
  - paternal grandmother had CVA at 63 yrs
- Personal hx:
  - non-smoker with hx of hyperlipidemia
  - exercise 5 days/wk on treadmill x 4 – 8 miles along with weights and core exercises
  - Mediterranean diet. Doesn't drink alcohol. MVI daily
- Occupation:
  - engineer/farmer, manages stress with exercise

# Mark's risk factors:

- **FRS:** 1% 10- year risk
- **Lipids:**
  - TC: 162, TG: 77, HDL: 43, LDL: 104
  - TC/HDL: 3.8, Apo B: 67
- **Vital signs:** BP 118/80, P: 68, Waist: 38",
  - Height: 5'10", weight: 180 lbs
- **Physical exam:** WNL – EKG, ABI, exam
- **ROS:** negative
- **General health:** CBC, CMP, thyroid all WNL, dental and optical all WNL

# What do we know so far?

- 50 year old healthy, asymptomatic male with normal lipids and a positive family of premature vascular disease.
- What is the first question to ask?
- Does Mark have disease?

# How to find vascular disease in an asymptomatic 50 year old male?

- EXAM: no bruits – carotid, abd, femoral
- CXR: WNL – no microvascular calcification
- ABI: WNL – no PAD
- EKG: NSR
- CIMT:
  - Mean CCA IMT: 0.670mm > age by 5 years
  - Max CCA mean IMT: 0.82mm - normal
  - Plaque: none

# What else?

## Can we stop there?

- CACS: no calcium – zero score
- What is next?
- We know Mark has a slight accelerated atherosclerotic process (cIMT) with no evidence of vascular disease.
- Let's find out why.....

# Why does Mark have an accelerated atherosclerotic process and a family history?

- Insulin resistance?
  - Metabolic Syndrome: 0/5
  - FBS: 96, A1C: 5.3, Insulin: 8, 2hr OGTT: **135**
- Lipo(a): 8
- Vitamin D: 81
- MPO: 147
- Genetics:
  - **Heterozygous for 9P21**
  - **Positive for TCF7L2**
  - KIF 6: TRP/TRP
  - Apo E 3/3
  - LPA: Ile/Ile

# Beta Cell Function in NGT, IGT and T2DM

- 2hr PG = 120-139 mg/dl: subjects have lost two thirds of their B-Cell function.
- By time T2DM diagnosis is made – patients have lost over 90% of B-Cell function.

“It is essential that the physician intervene aggressively with therapies known to correct known pathophysiological disturbances in B-cell function” - DeFranzo

*DeFranzo, R. Diabetes, Vol. 58, April 2009*



# Glucose Tolerance is a Continuum

The current diagnostic criteria for IGT and T2DM is arbitrary and should be viewed as a continuum of risk.

*DeFronzo, R. Diabetes, Vol. 58, April 2009*

# Mark's treatment:

- Insulin resistance with impaired glucose tolerance
- Accelerated atherosclerotic process driven by insulin resistance and genetics such 9P21 and TCF7L2. Treatment decisions aided by KIF 6 negative status and Apo E 3/3
- Treatment:
  - Improve lifestyle – add interval training and Apo E 3/3 advice with a dietician
  - Vitamin B3 – Niacin (KIF 6 negative)
  - Omega 3 fatty acids
  - Monitor IR and vascular disease regularly

# Goal of Treatment: NO DISEASE

	4/4/06	5/11/07	5/21/08	5/5/2010	10/12/2011
TC	164	133	149	135	140
TG	77	31	53	73	75
HDL	43	48	51	49	50
LDL	105	79	88	71	74
TC/HDL	3.8	2.8	2.9	2.8	2.9
BP	118/80	112/72	114/74	112/72	110/74
MPO		147	140	156	
Lp-PLA2	150	163	124	116	100
hsCRP	0.9	1.0	0.9	1.9*	0.8
MACR	5.1	4.8	5.0	3.8	4.0
FBS/A1C	96/5.3	89/5.3	92/5.5	95/5.5	98/5.3
2hr OGTT	135	92	102	114	
ALT/AST	43/18	43/31	28/24	39/21	35/20
Creat/GFR	0.9/95	0.9/95	0.9/98	0.9/95	0.8/99
clMT mean	0.67m m	0.64mm	0.65mm	0.64mm	FMT – no plaque
CACS	Zero			Zero	

# 63 year old female with coronary artery and carotid artery disease

- Family history – mom died at 74 with CHF and CVA, father died at 68 with CAD positive smoker, sister with coronary bypass surgery in her early 60's
- Lifestyle – retired, exercises off and on, non-smoker, recently lost 26 pounds with Jenny Craig – current weight 117 pounds, waist 24 inches, feels great (last appt 11/1/2011)

# Structural and cause of disease -

## Positive CACS in 2003

Initial diagnosis: hyperlipidemia, pre-HTN, lipo (a), CAD (CACS)

Initial treatment included lifestyle advice, aspirin 81mg, ramipril 10mg, pravastatin 40 mg and Niaspan 1000mg.

Started following her atherosclerosis with carotid IMT testing in 2007 –

IMT started to show lack of improvement in 2008 – searching for answers led to investigation of MPO and other root causes of aggressive atherosclerotic process.

# 2008 – All Risk Factors Stable

TC: 136

TG: 39

HDL: 79

LDL: 49

TC/HDL: 1.7

Lipo(a): 68

FBS: 91

A1C: 5.5

OGTT: 2hr: 112

CBC, CMP, Thyroid all WNL

BP: 112/62

Pulse: 72

Resp: 16

Waist 26 inches

Weight: 128 pounds

Exercise: 5 x week

ETOH: 1 d: Apo E 3/3

# Despite stable risk factors, cIMT and inflammation WAY off -

CIMT 11/5/2008 –

Mean CCA IMT: 0.75 mm

Plaque: all SOFT lesions!

Right: 3.3mm S bulb, 3.3mm S internal

Left: 2.5 mm S bulb, 2.2 mm S internal

Inflammation –

hsCRP: 3.3mg/L

LpPLA2: 237

Fibrinogen: 346

MACR: 2.5

# Why? What are we missing??

11/24/2008:

- MPO: 955 !
- Patient already taking statin, niacin, fish oil, ramipril, aspirin.....what else to do?
  - Question:
    - Tried to increase Niaspan to 1500mg – stay at 1000
    - Changed to Crestor 10 mg from Pravastatin 40mg
    - ??Adding off label pioglitazone 7.5mg?



	11/24/2008	7/23/2009	8/17/2010	10/17/2011
TC		151	163	147
TG		35	48	36
HDL		94	91	80
LDL		50	62	60
TC/HDL		1.6	1.8	1.8
F2-Iso		2.09	1.2	1.14
hsCRP	3.8	2.5	1.2	0.8
MACR	2.5	2.5	3.5	7.0
Lp-PLA2	237	167	181	213
MPO	988	<245	155	168
FBS/A1C	99/5.8	91/ 5.6	85/5.7	92/5.8
Wt / Waist	132/28 inch	127/ 26 inch	121/25 inch	117/ 24 inch
BP		112/70	102/62	110/70
Tx change	Crestor 10, Pio 7.5	Vit D3 5000	Ramipril 5	No med change

# Annual Structural Assessment

	11/5/2008	9/7/2011
Mean CCA IMT mm	0.75mm	0.59mm
Plaque size mm; echo	R: 3.3 S L: 3.3 S	R: 3.6 H L: 2.4 H

# Dwayne – lifestyle is powerful!

It has been a journey!

Started to see Dwayne in 2002 at the age of 48 – at the time he was 242 pounds, 6 foot 3 inches tall, long haul truck driver, 2 cigars/day, no exercise, poor sleep and diet, no alcohol – stopped at age 42.

Reason for visit – doesn't want to have a stroke while on the road and is afraid of a heart attack and diabetes. His father died of a heart attack in his early 60's and mom was diabetic.

Initial medications – none

Hobbies – photography – wildlife, enjoys Montana and Glacier National Park.

# Dwayne's Photography Glacier Park Montana



# Original Diagnoses – 2002

- Hyperlipidemia
- HTN
- IR with IFG and IGT
- Metabolic Syndrome
- ASVD/IMT

# Dwayne's Home



	3/15/2002
Wt/ Waist	242/42 in
BP	142/80
TC	214
TG	412
HDL	41
LDL	>400
Apo B	
FBS/OGTT	85/80
hsCRP	1.1
MACR	6.1
Lp-PLA2	152
ALT/AST	66/26
Creat/GFR	1.0/56
Apo E	3/2
	<b>Prava 40</b>
	<b>ASA 81</b>
	<b>Ramipril 10</b>

	3/15/2002	2004
Wt/ Waist	242/42 in	280/48 in
BP	142/80	130/76
TC	214	207
TG	412	356
HDL	41	31
LDL	>400	99
Apo B		93
FBS/OGTT	85/80	74
hsCRP	1.1	1.0
MACR	6.1	6.0
Lp-PLA2	152	
ALT/AST	66/26	42/21
Creat/GFR	1.0/56	1.0/58
Apo E	3/2	
	<b>Prava 40</b>	<b>Niaspan 1500</b>
	<b>ASA 81</b>	<b>Actos 30</b>
	<b>Ramipril 10</b>	



	3/15/2002	2004	2009		
Wt/ Waist	242/42 in	280/48 in	289/48.5 in		
BP	142/80	130/76	124/76		
TC	214	207	184	<b>What is next?</b>	
TG	412	356	271		
HDL	41	31	31		
LDL	>400	99	99		
Apo B		93	90		
FBS/OGTT	85/80	74	85		
hsCRP	1.1	1.0	2.2		
MACR	6.1	6.0	9.6		
Lp-PLA2	152		176		
ALT/AST	66/26	42/21	50/31		
Creat/GFR	1.0/56	1.0/58	1.1/62		
Apo E	3/2				
	<b>Prava 40</b>	<b>Niaspan 1500</b>	<b>Omega 3</b>		
	<b>ASA 81</b>	<b>Actos 30</b>	<b>Vitamin D3</b>		
	<b>Ramipril 10</b>				

	3/15/2002	2004	2009		
Wt/ Waist	242/42 in	280/48 in	289/48.5 in	LIFESTYLE	
BP	142/80	130/76	124/76	LIFESTYLE	
TC	214	207	184	LIFESTYLE	
TG	412	356	271	LIFESTYLE	
HDL	41	31	31	LIFESTYLE	
LDL	n/a	99	99	LIFESTYLE	
Apo B		93	90	LIFESTYLE	
FBS/OGTT	85/80	74	85	LIFESTYLE	
hsCRP	1.1	1.0	2.2	LIFESTYLE	
MACR	6.1	6.0	9.6	LIFESTYLE	
Lp-PLA2	152		176	LIFESTYLE	
ALT/AST	66/26	42/21	50/31	LIFESTYLE	
Creat/GFR	1.0/56	1.0/58	1.1/62	LIFESTYLE	
Apo E	3/2			LIFESTYLE	
	<b>Prava 40</b>	<b>Niaspan 1500</b>	<b>Omega 3</b>	LIFESTYLE	
	<b>ASA 81</b>	<b>Actos 30</b>	<b>Vitamin D3</b>	LIFESTYLE	
	<b>Ramipril 10</b>			LIFESTYLE	

# Lifestyle – what to do?

## Obstacles:

Still does long-haul trucking

Eating is limited to truck stops

Home just 1 day/week

Sleep pattern is sporadic

## Plan:

Must get 6-8 hours sleep in 24 hour period

Small Ice chest in truck – carrots, pea pods, celery, hummus dip, apples, cheese slices.

No more soda – water and black coffee

Exercise – must walk around truck 8 times at each stop

Now: added push ups on side of truck in between laps.

	<b>3/15/2002</b>	<b>2004</b>	<b>2009</b>	<b>10/2010</b>	<b>10/2011</b>
Wt/ Waist	242/42 in	280/48 in	289/48.5 in	<b>256/40.5 in</b>	<b>260/40 in</b>
BP	142/80	130/76	124/76	<b>112/60</b>	<b>112/70</b>
TC	214	207	184	<b>122</b>	<b>117</b>
TG	412 (10)	356 (11.4)	271 (8.7)	<b>76</b>	<b>70</b>
HDL	41 (5.2)	31 (6.1)	31 (5.9)	<b>67</b>	<b>62</b>
LDL	>400	99	99	<b>49</b>	<b>44</b>
Apo B		93	90	<b>48</b>	<b>46</b>
FBS/A1C	85/OGTT 80	74/5.1	103/5.5	<b>98/5.4</b>	<b>80/5.2</b>
hsCRP	1.1	1.0	2.2	<b>1.1</b>	<b>1.3</b>
MACR	6.1	6.0	9.6	<b>3.2</b>	<b>4.0</b>
Lp-PLA2	152		176	<b>150</b>	<b>93</b>
ALT/AST	66/26	42/21	50/31	<b>38/27</b>	<b>40/24</b>
Creat/GFR	1.0/56	1.0/58	1.5/58	<b>1.3/64</b>	<b>1.1/73</b>
Apo E	3/2	Vit D: 11		<b>Vit D: 52</b>	<b>53.2</b>
	Prava 40	Niaspan 1500	Omega 3	<b>Lose weight</b>	<b>UA neg</b>
	ASA 81	Actos 30	Vitamin D3	<b>Sleep</b>	<b>Continue</b>
	Pravastatin 40			<b>Triglycerides 90</b>	

# Dwayne wants to live well!

