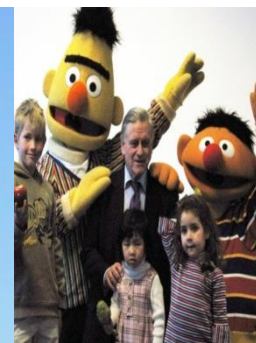


SCIENCE,
HEALTH.
EDUCATION!



4 Ts, 4 As

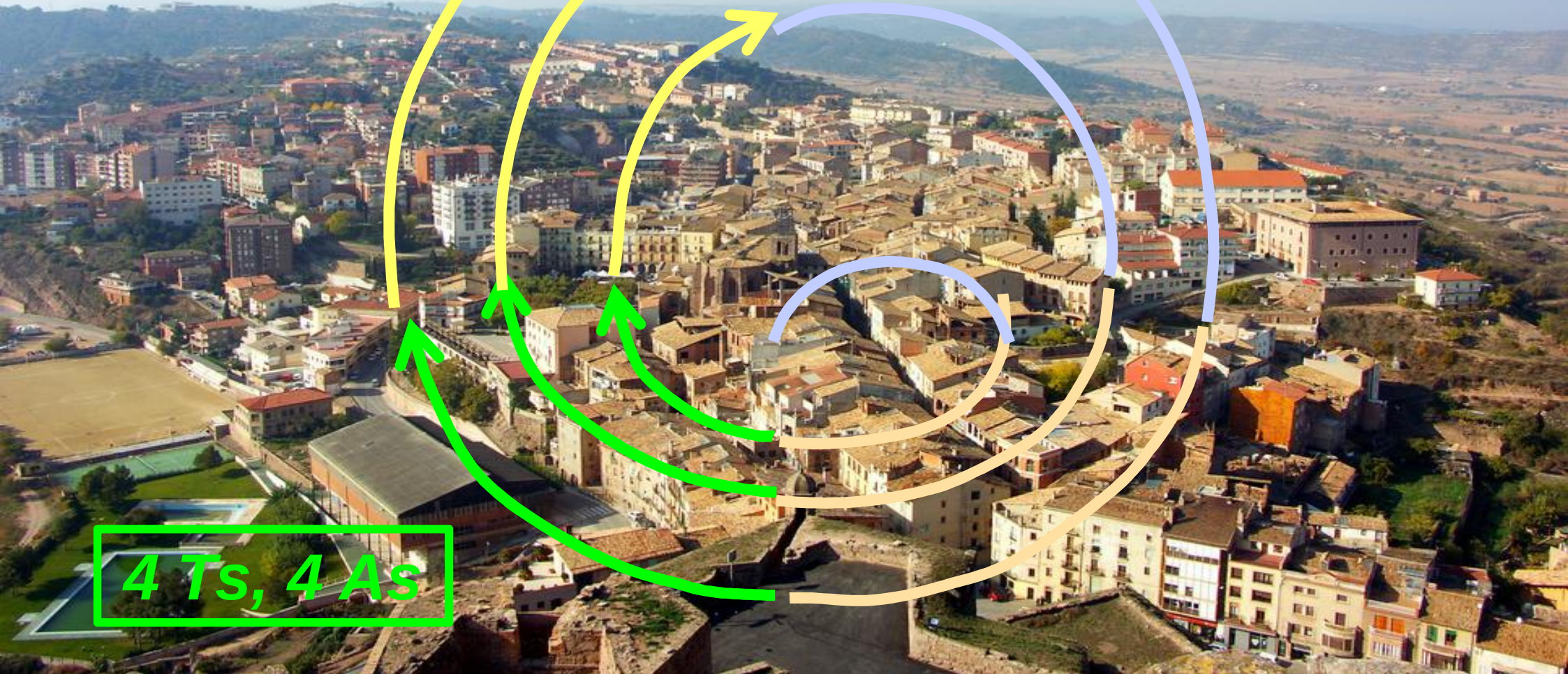
SHE, Community, All Ages

The Circle of Leadership



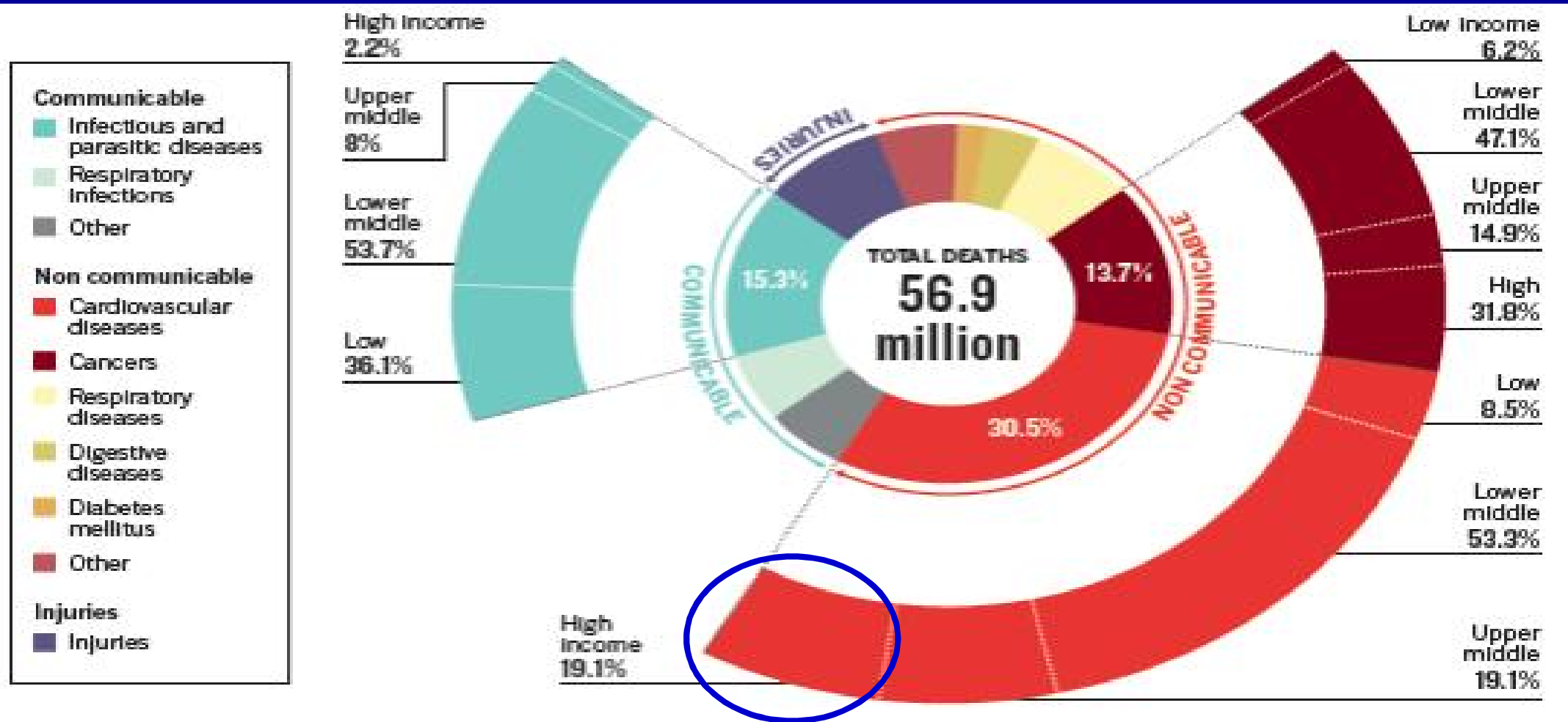
Valentín Carulla
President Barcelona University (1913-23)

SCIENCE,
HEALTH.
EDUCATION!



4 Ts, 4 As

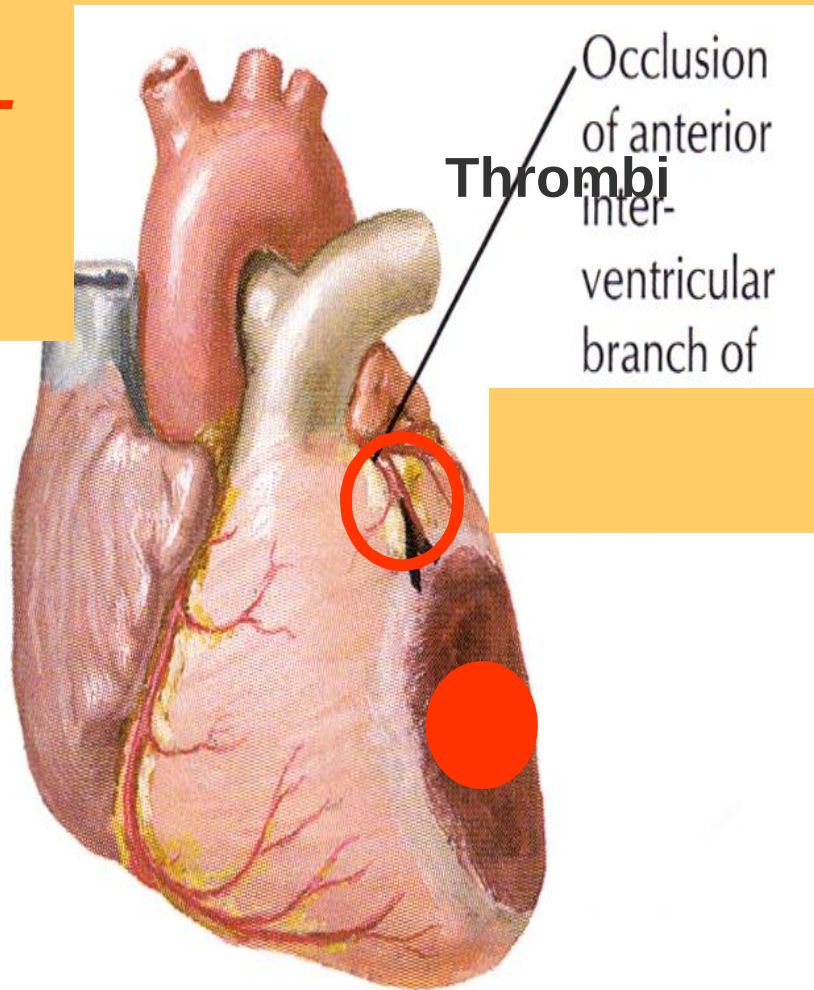
1. UN Targets Top Killers Warnings



Butler. Nature. 2011;477:261 (UN. NCD). At Present
 . Beaglehole et. al. Lancet 2008;372:1988 - > 30% Across, 2030
 REMISE (S Mendis et al) Bull. WHO 2005, 2007- LM-I, Pop / \$ Hig
 Fuster et al, Circ. 2011;123:1671 – H-I \$ Rx / Prom. Health High

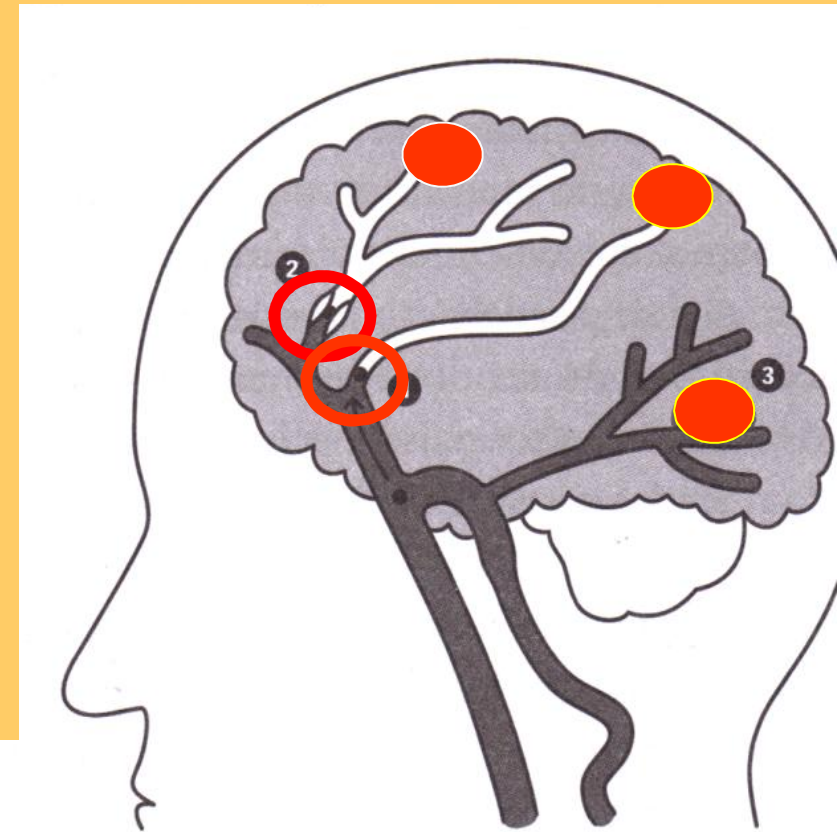
2. Cardiovascular Disease

HEART
II



**BRAIN -
STROKE**

- 1) Emboli
- 2) Thrombi
- 3) Hemorrh



Macrovascular & Microvascular

3. Cardiovascular Disease

Biological Imaging

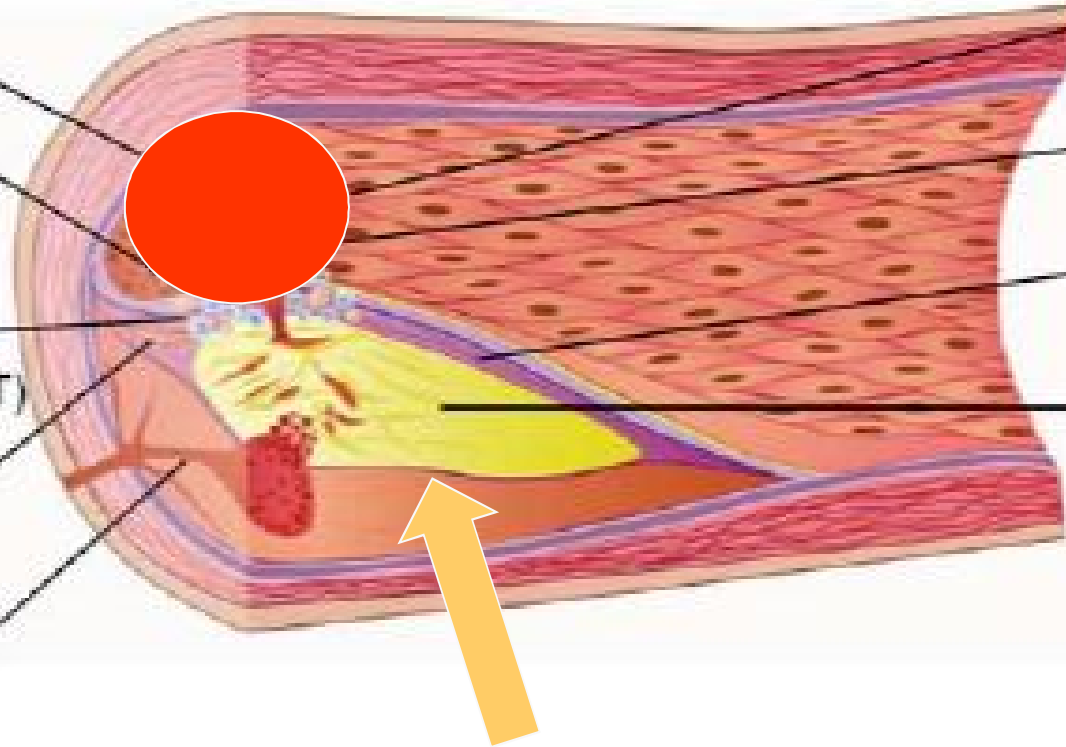
Thrombus
→ MRI, PET
- anti-fibrin

Adhesion molecules
→ PET, MRI, Fluo
- anti-VCAM-1

Macrophages
→ PET, MRI, Fluo, (OCT)
- FDG, FeOx

Matrix Remodeling
→ PET, Fluo, MRI
- ED-B fibronectin
- protease

Neovessels
→ PET, MRI, Fluo
- $\alpha_v\beta_3$, VEGF



Morphological Imaging

Lumen stenosis
→ CT, MRI, IVUS, OCT

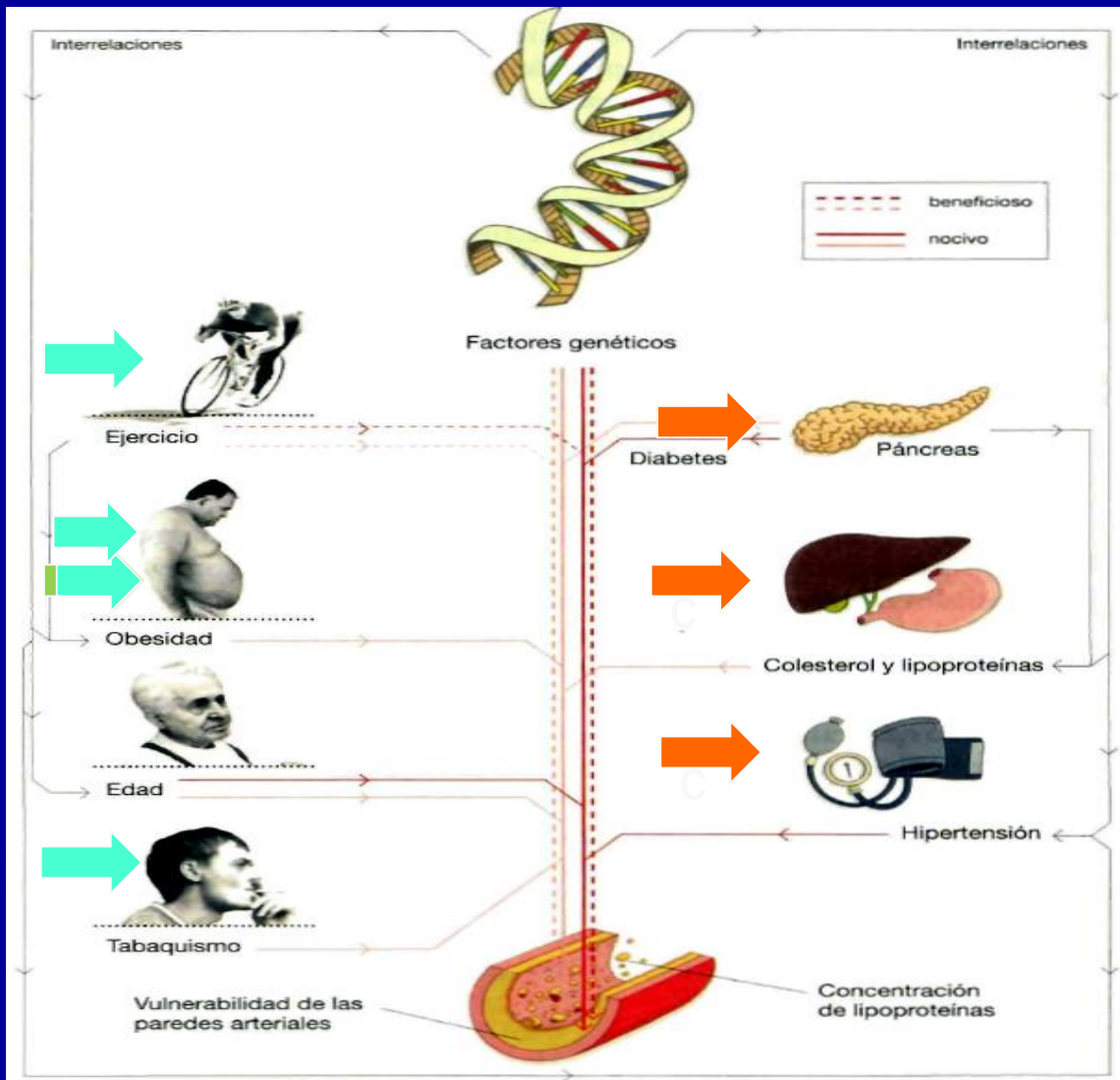
Thrombus
→ CT, MRI, OCT

Thin fibrous cap
→ OCT, OFDI, IVUS

Necrotic core
→ CT, IVUS, OCT, MRI

R Corti, V Fuster EHJ. 2011 (April 19)
A Arbab-Zadeh, M Nakano, R Virmani, V Fuster, Circ. 2012;125:1147

4. CARDIOVASCULAR RISK FACTORS (7) & LIFE STYLE



>2 Risk Factors

1. MI & 2. Stroke

25% in 10 Yrs

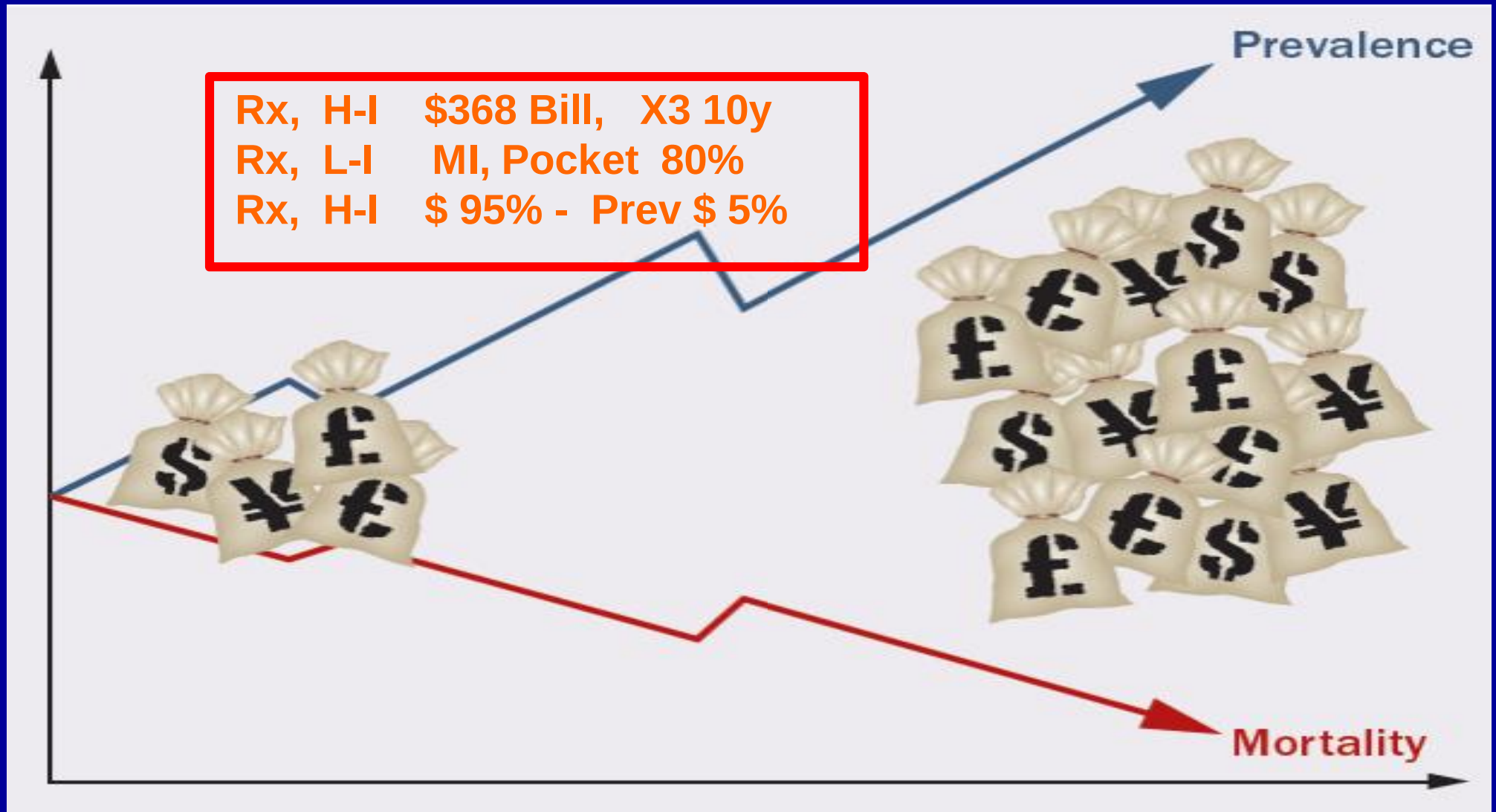
75% in 30 Yrs

3. DBD & 4. AD

Quality

Framingham (2010) 5, Interheart (2004) 2: Obesity, Sedentary (Die

5. Prevalence of CVD is Increasing Treatment (Live Longer) and Technology - \$



V Fuster et. al. Nat Rev. Cardiol. 2009;6:669.

EG Nabel, E Braunwald. NEJM 2012;366:54 – Age Adjusted

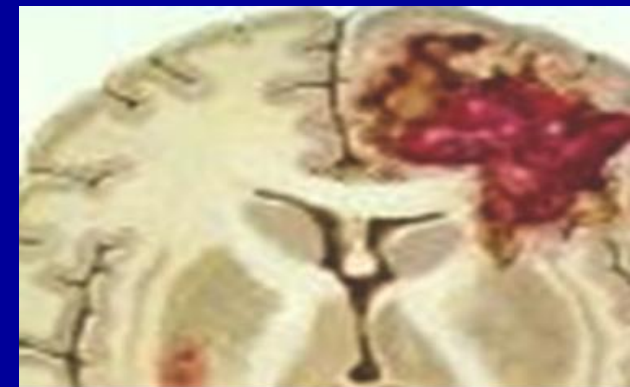
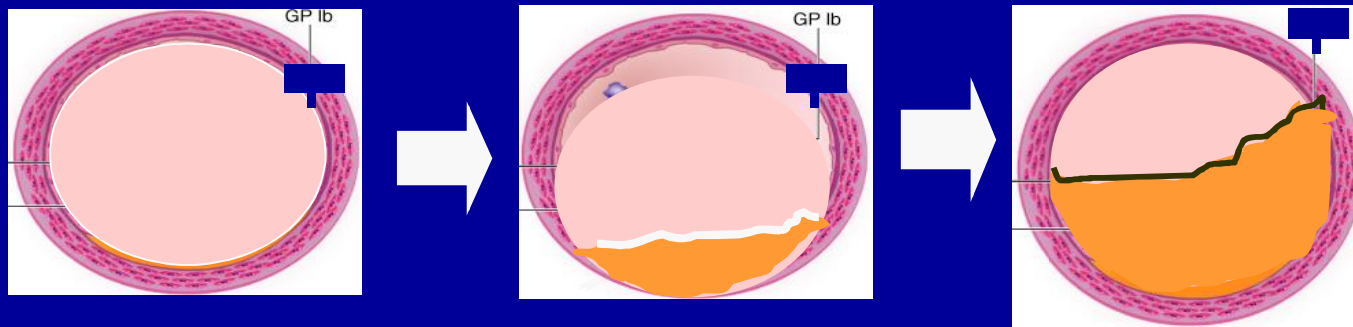
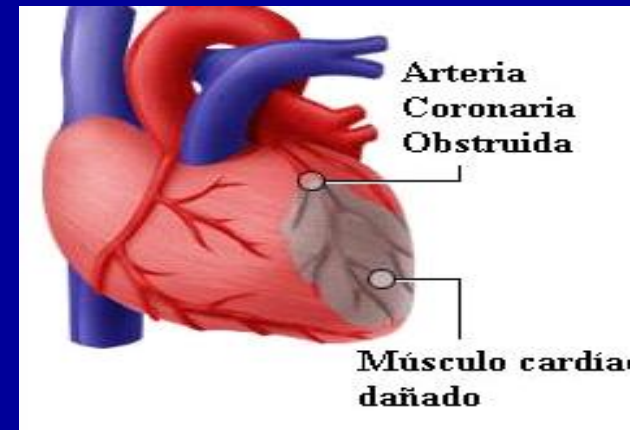
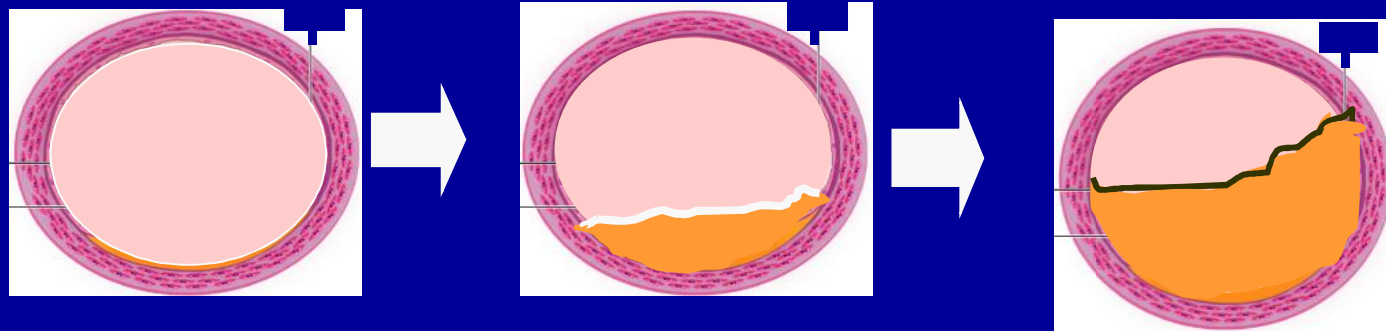
6.

PESA & AWHHS
40-54y, n= 8,000 , FU 0,3,6 y

HRP > 55y,
N=7000 FU 3y

Life Style & Imaging ?

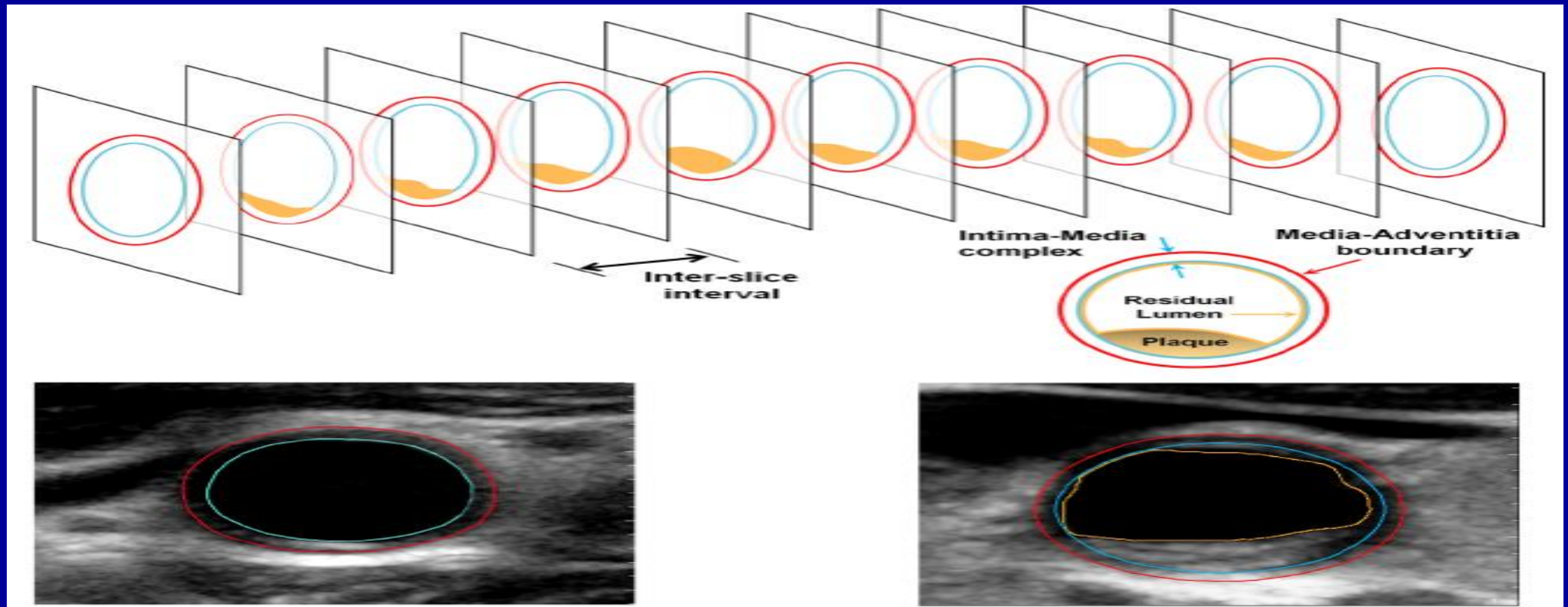
Predictive ?
Economics ?



Omics (Copenhagen, Duke, HRP, Framingham)
Telomere (S.blot, qPCR, Fresh)

6. Carotid Plaque Burden

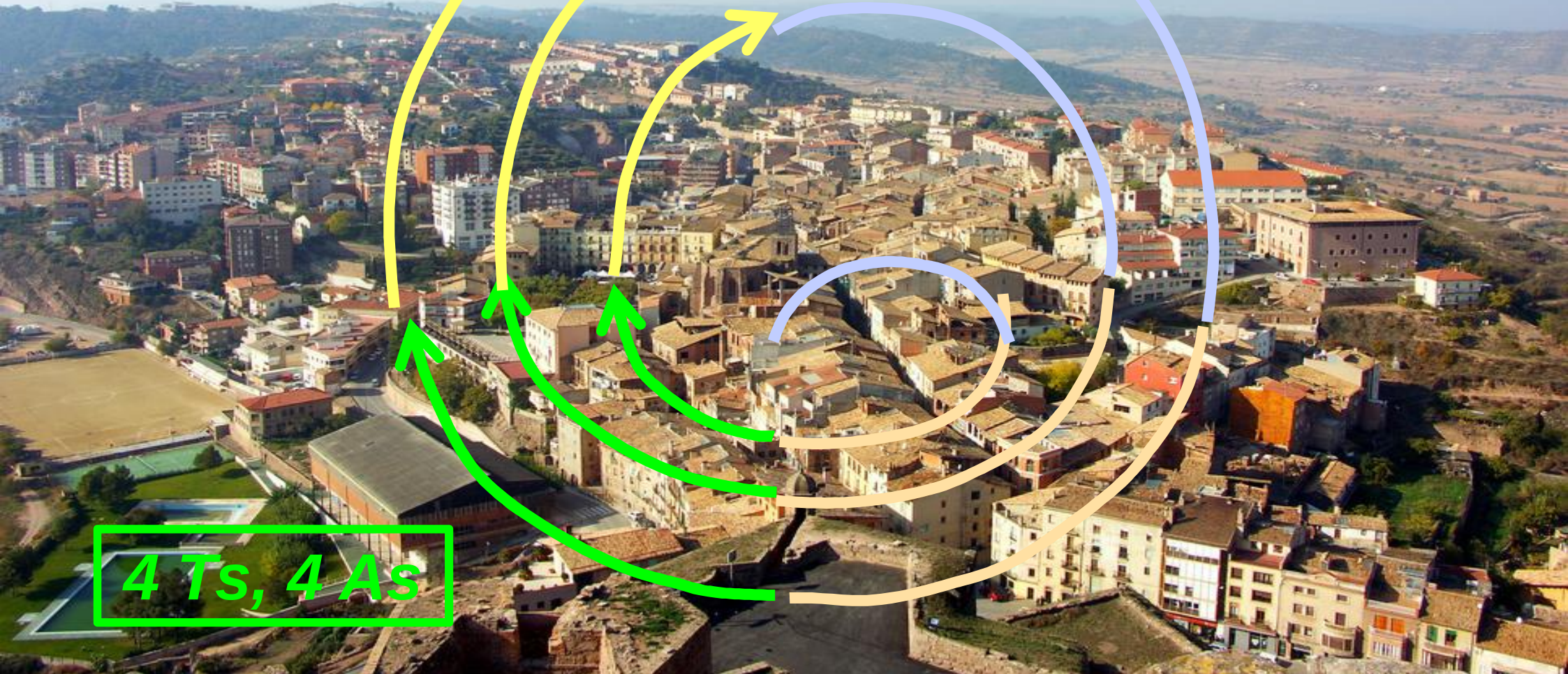
3D US Manual (Sweep 2D) vs 3D Transducer



local structure into the arterial lumen of at least 0.5 mm
or 50% of surrounding IMT value. 37% missed at Clasical 2D
CardioSCORE - R7 - ApoA1, Apo B, B2M, CEA, CRP, Lp(a), Transferrin

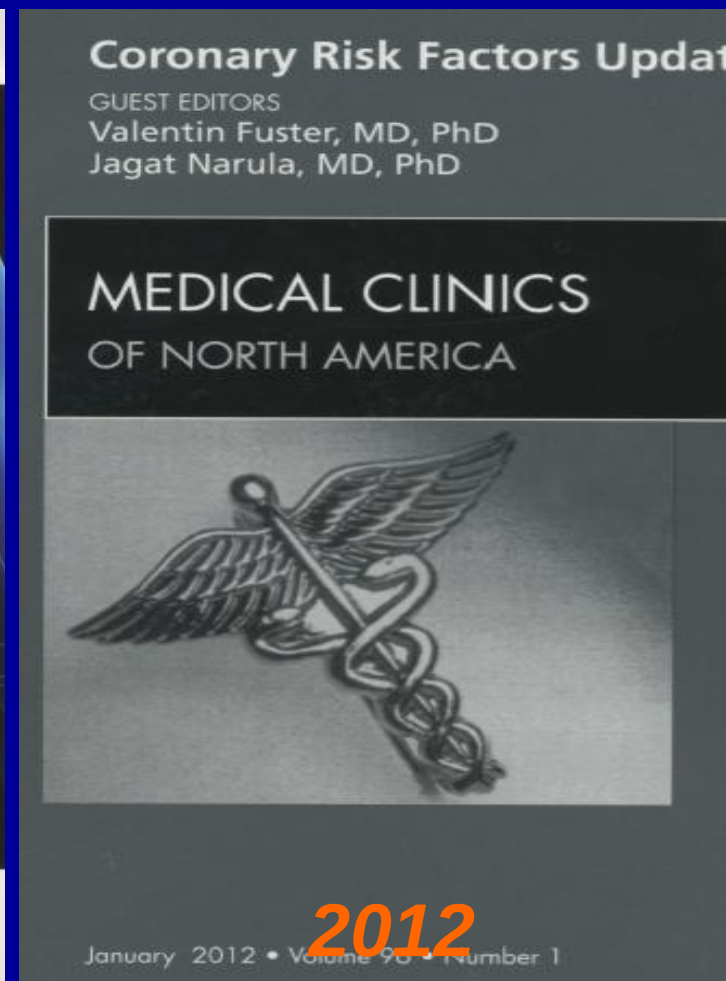
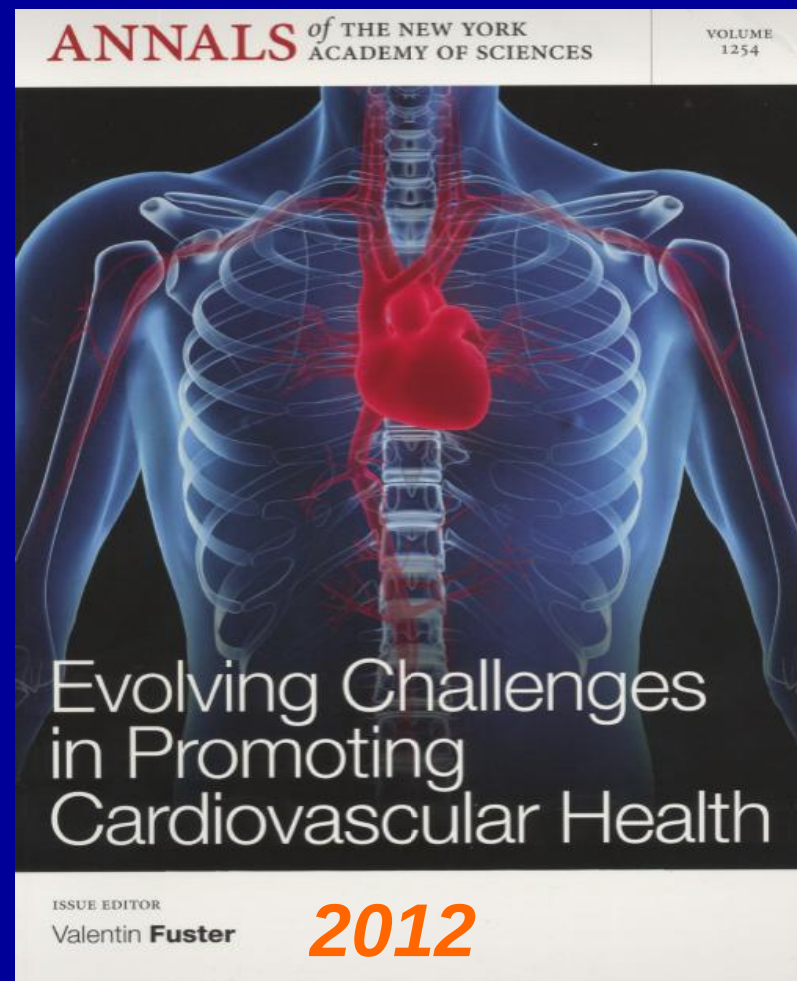
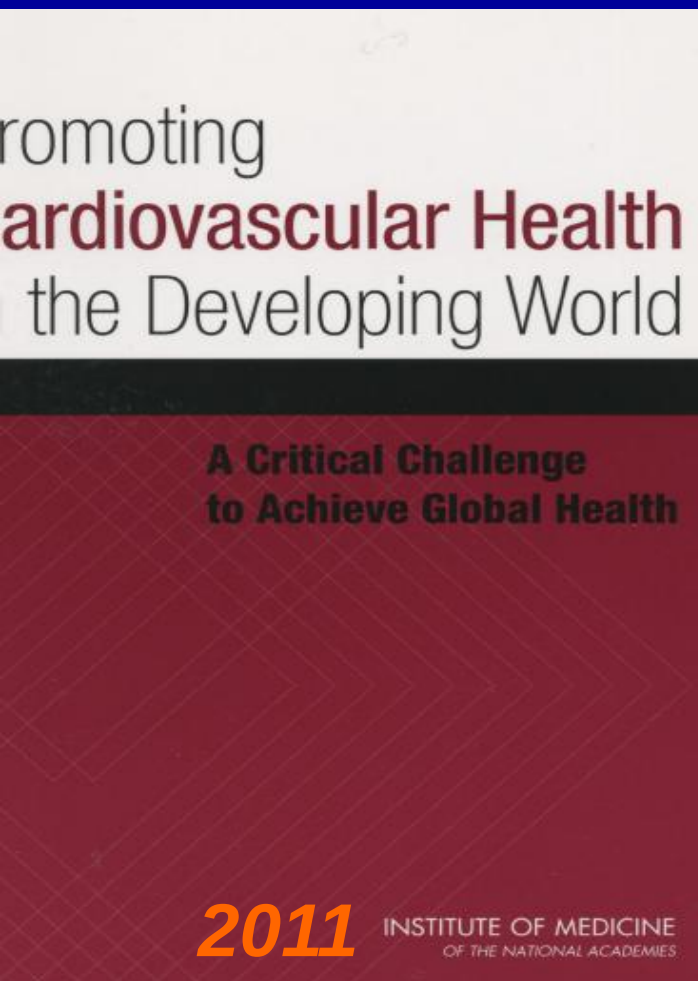
H Sillesen, V Fuster et. al JACC Imag 2012 (In Press).

SCIENCE, HEALTH, EDUCATION



4 Ts, 4 As

1. Promoting CV Health



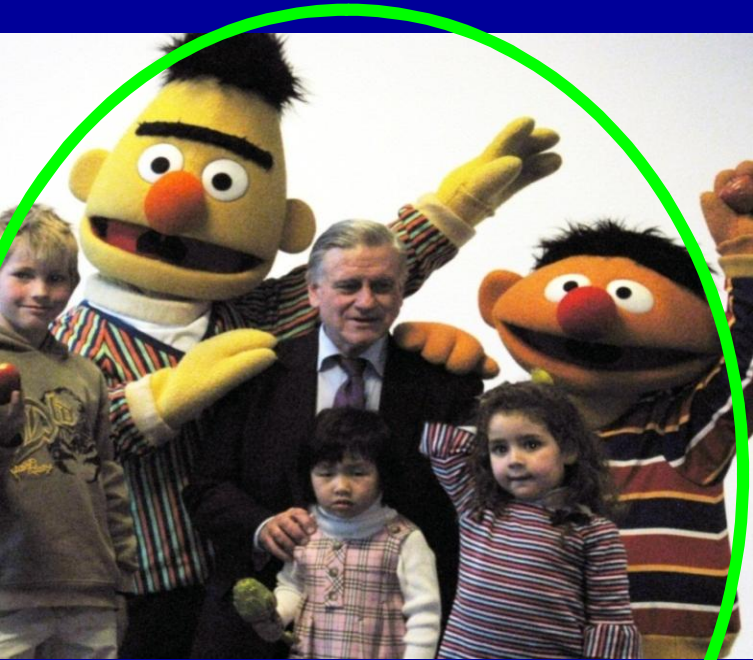
Circ. 2011;123:1671

2012 RECOMMENDATIONS:

a. Behavior Risk, b. Lack of Policy NCD,
c. No Intersectorial, d. Mixt Health Delivery

Scientific America 2013

2. Science, Health, Education (SHE) Powered by / for Three Ages



2

Motivation



2

Motivation



2

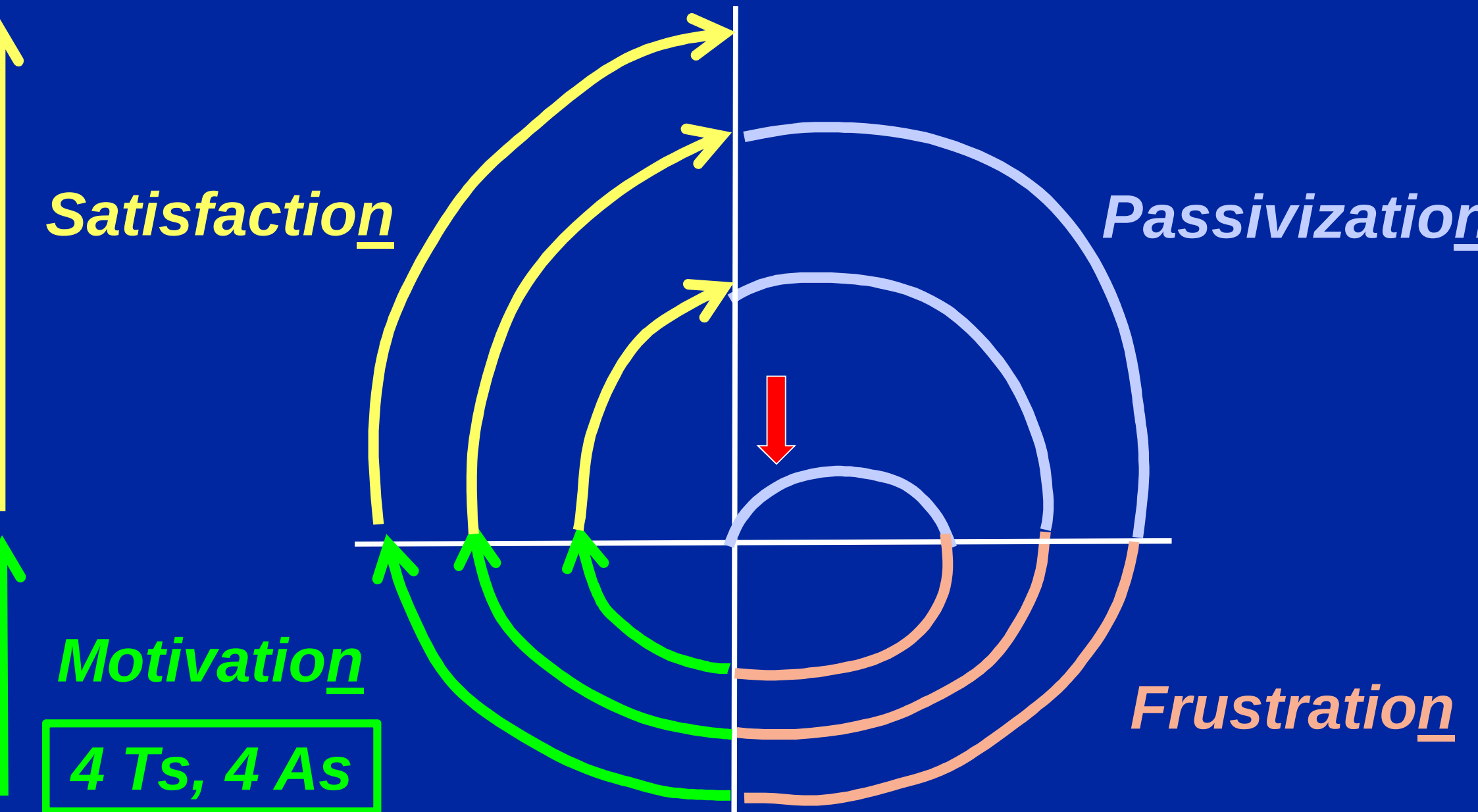
Motivation

*“Extended healthy lives” in part due to medical research
generates dramatic returns - Albert & Mary Lasker Found.- 2002*

1.



1. THE CIRCLE OF LIFE – “SESAME”



1. SHE – Progres & Diseminación



HOW YOUR BODY
& HEART WORK



HEALTHY FOOD
HABITS



PHYSICAL
ACTIVITY



EMOTIONAL
HABITS TO AVOID
ADDICTIONS

EDUCATIVE GOAL: HEALTHY HABITS FOR CHILDREN BETWEEN 3 & 5 YRS

CHILDREN

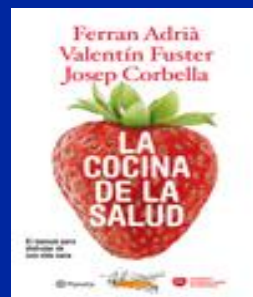
3-5

6-8

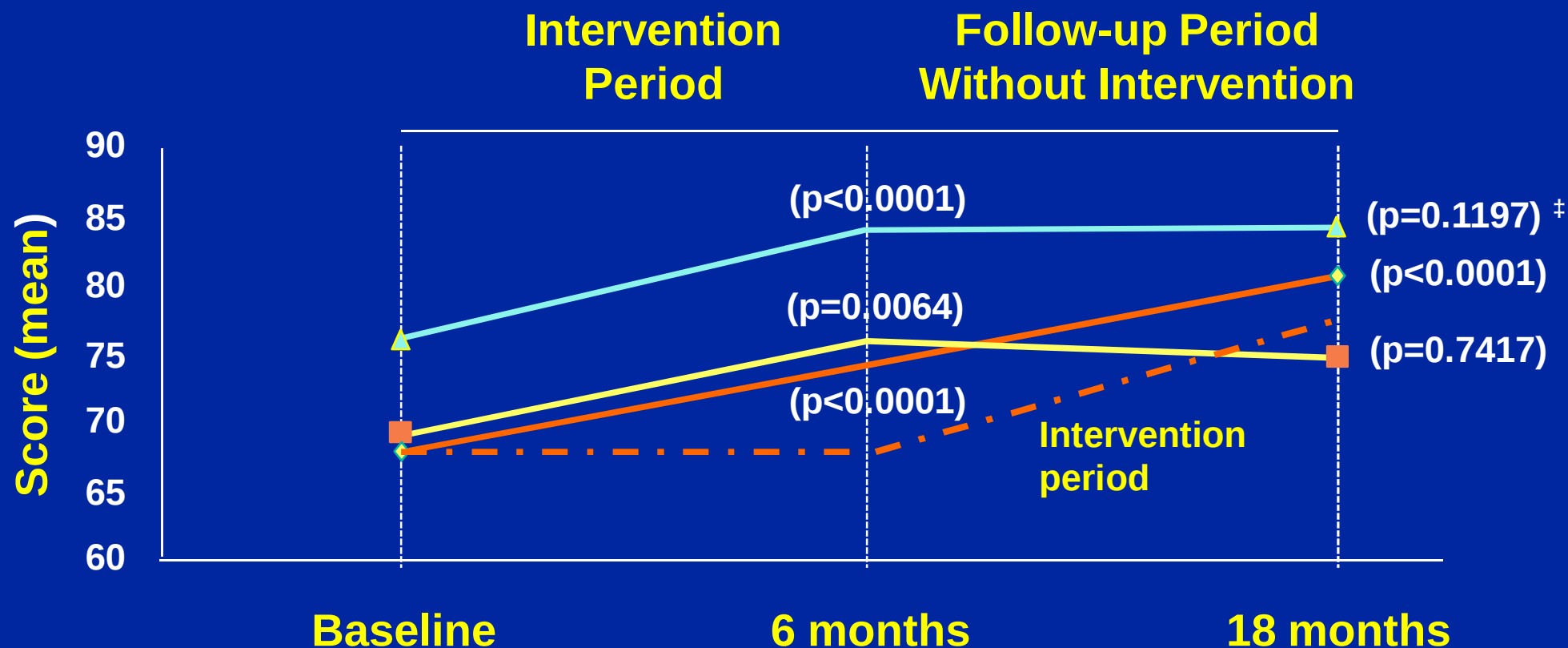
9-14



GENERAL
PUBLIC



1. KNOWLEDGE (70), ATTITUDES (20) & HABITS (10), AT 6 & 18 MONTHS AFTER RECEIVING THE INTERVENTION



Teachers — Parents — Children — Control - - -

A Cespedes, M Farkouh, M Hunn, V Fuster *Am.J.Med* 2012 (In Press)
 Colombia – 25,000 Children, Spain 64 Schools – 20,000, US.....



Dr. V. Ruster

1. Mental Health & Satisfaction

Cuida't com un Campió"

Campanya Hàbits Saludables

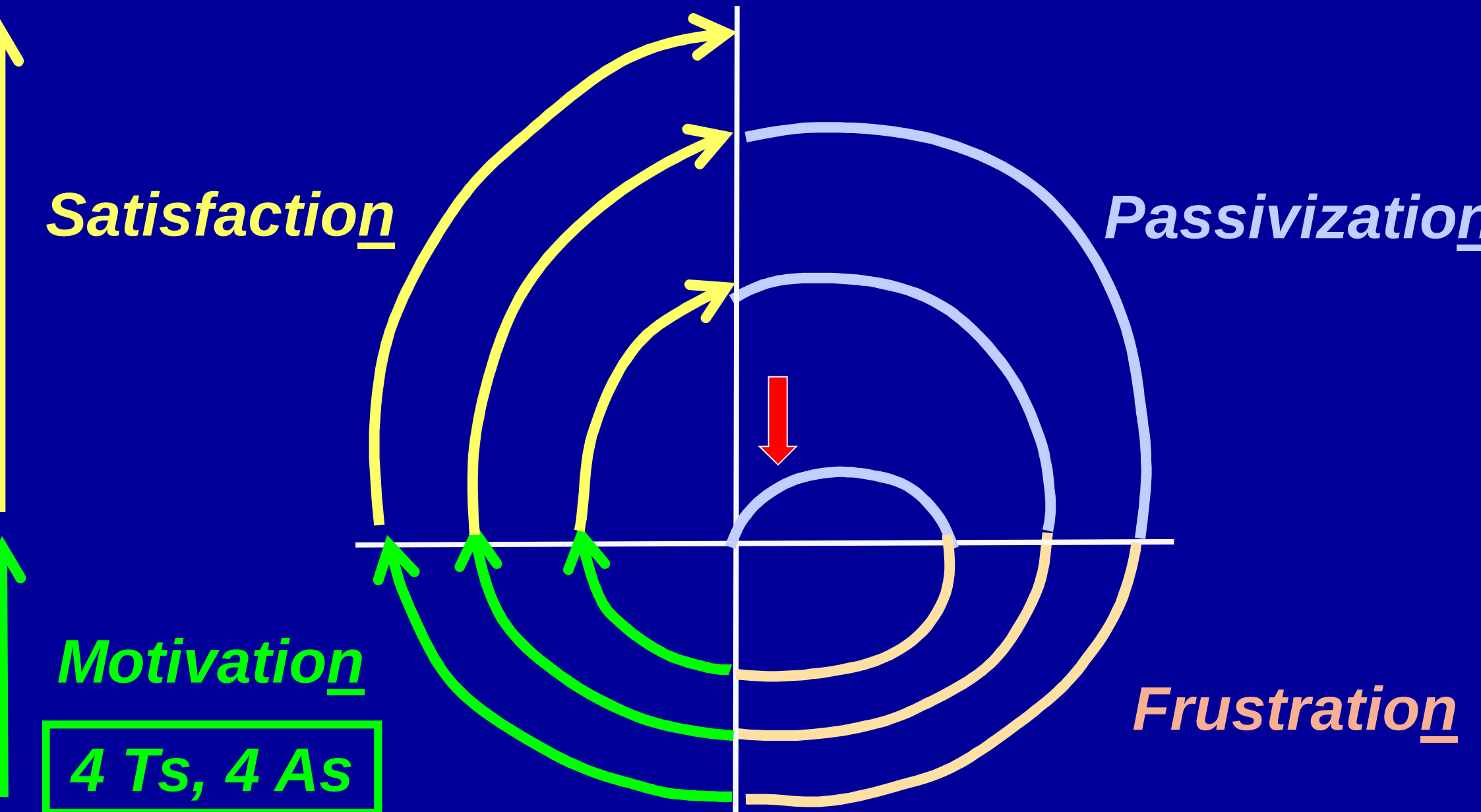


3 years old

>16 years old

4 T's Mental Health - Time, Talent, Transmit, Tutoring
4 A's Satisfaction - Attitude, Accept, Authenticity, Altruism

2. THE CIRCLE OF LIFE - CNIC



2. "Funding the Future"

Fundación procnic



Research: Intra & Extramural
Education: Intra & Extramural (15)
Facilities: Imaging, Experimental

SCIENCE July 8, 2005 & Sept 1, 2006

THE LANCET Aug 19, 2006, *CIRC* April 2007

REV. ESP. CARD. 2012;65:511

EUROPEAN HEART J 2010;31:2067, 2012



- 1.- César Alierta
Telefónica
- 2.- Ignacio Polanco
Grupo Prisa
- 3.- Emilio Botín
Fundación Marcelino Botín
- 4.- José Manuel Entrecanales
Acciona,
- 5.- Valentín Fuster
CNIC , President
- 6.- Isidro Fainé
La Caixa
- 7.- Francisco González
BBVA
- 8.- Luis Suárez de Lezo
Repsol YPF
- 9.- Ignacio Garralda
F. I. Médica Mutua Madrileña
- 10.- Carlos Martínez Echevarría
Fundación Ramón Arece
- 11.- Salvador Gabarró
Gas Natural
- 12.- Luis de Carlos
Uría Menéndez
- 13.- Rodolfo Martín Villa
Fundación Endesa
- 14.- Miquel Roca
Fundación Abertis
- 15.- Pablo Isla
Inditex

2. “CNIC–Joven” Training Plan



2008,

2009,

2010,

2011,

2012

2. Investigators of the Future–From Age 16 Yrs



Public CV Research Institution of The Spanish Government & Pro CNIC (13 Private Companies)

28,144 m² For Research. Equipped With The Most Advanced Facilities & Technology

2. Science, Health, Education (SHE) Powered by / for Three Ages



2

Motivation

2

2

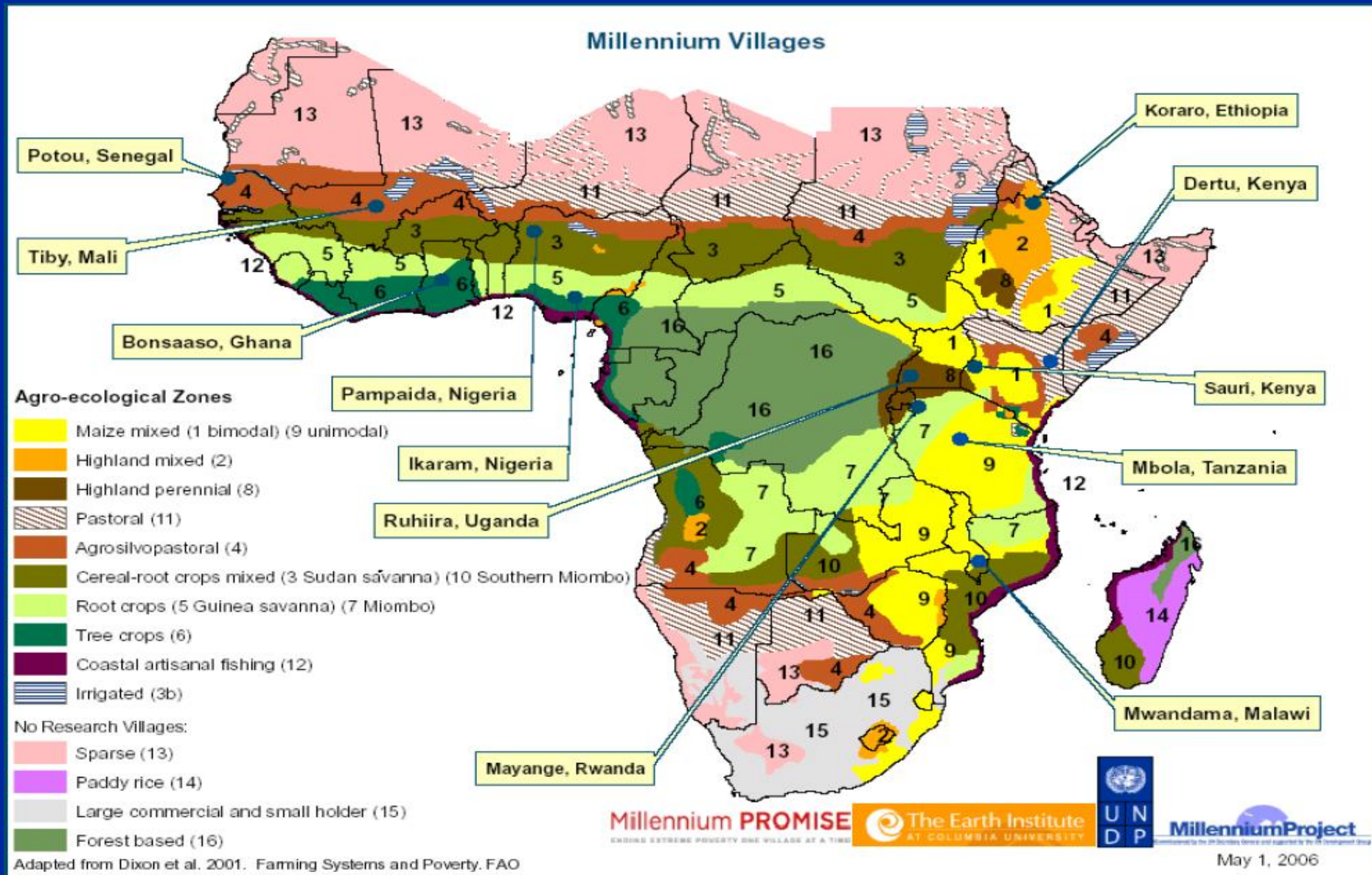
~~Motivation~~

2

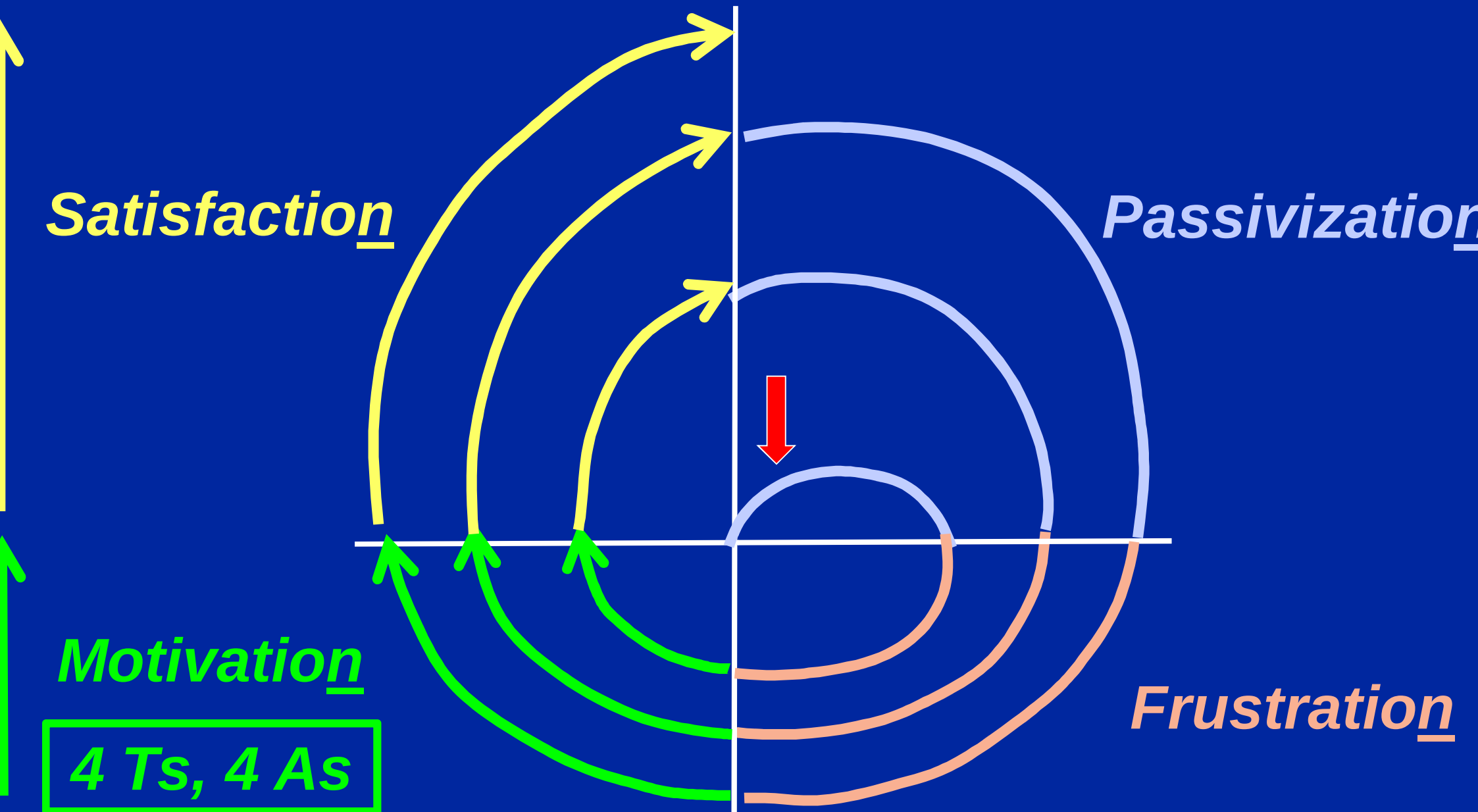
Motivation

*“Extended healthy lives” in part due to medical research
generates dramatic returns - Albert & Mary Lasker Found.- 2002*

1. Africa's Villages & "The Millennium" Project Earth Institute & UN, NY



1. THE CIRCLE OF LIFE – RWANDA / KENYA



1. AMPATH Centers In Kenya ***BP Control / Non MD / High Technology***



2. Global Demonstration Projects - GHP

1975



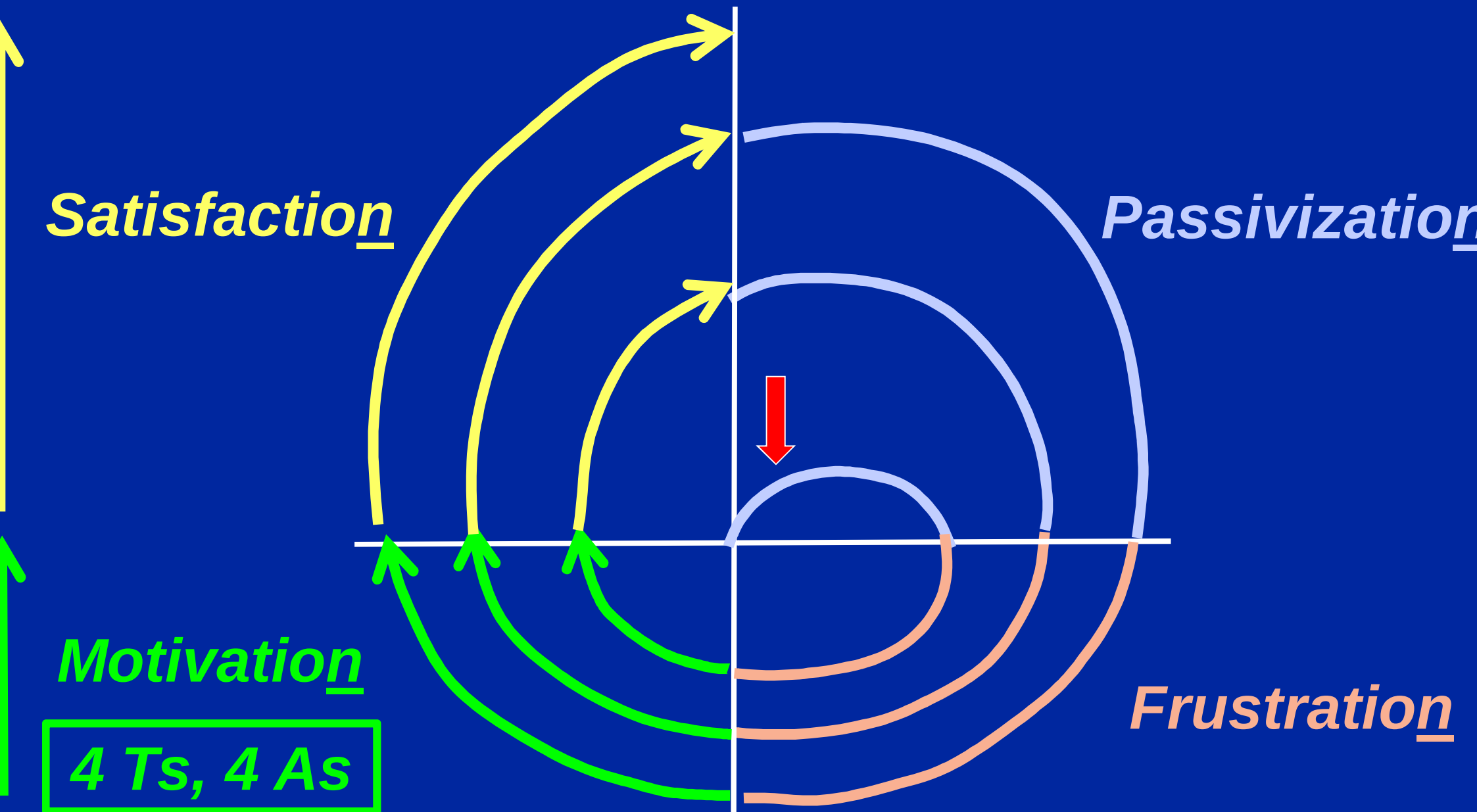
2000



2000

High Risk Factor Profile

2. THE CIRCLE OF LIFE – GRENADA / CARDONA



2. CARDONA INTEGRAL – “FIFTY-FIFTY” PROJECT LIFESTYLE CHANGE OUTCOMES

HABIT	YES	YES/NO	NO	BASE	3 MO	6 MO
SMOKING	0	1 ¹	2	--	--	2
OVERWEIGHT	0	1 ²	2	--	--	2
SEDENTARISM	0	1 ³	2	--	--	2
HYPERTENSION	0	1 ⁴	2 [†]	--	--	2
TOTAL LIFESTYLE SCORE				--	--	8

¹ Half - ² Half of Ideal (2 kg. Mo.) - ³ Half of Ideal (30' 5 Days w.)
⁴ Still High (Salt Reduction) -- [†] Still High (Medical Attention)

Science, Health, Education (SHE)

Powered by / for Three Ages



2

Motivation

2

Motivation

2

Motivation

*“Extended healthy lives” in part due to medical research
generates dramatic returns - Albert & Mary Lasker Found.- 2002*

1. MEETING TARGETS FOR RISK FACTOR CONTROL?

Risk Factors - Proportion of Participants at Goal % – 1 year

Trials	LDL	SBP	DBP	Hb A1C	Meet Goals	
					Base	FU
BARII-2D	75	56	70	52	14	20
COURAGE	51	55	55	59	12	19
FREEDOM	55	63	53	55	12	20

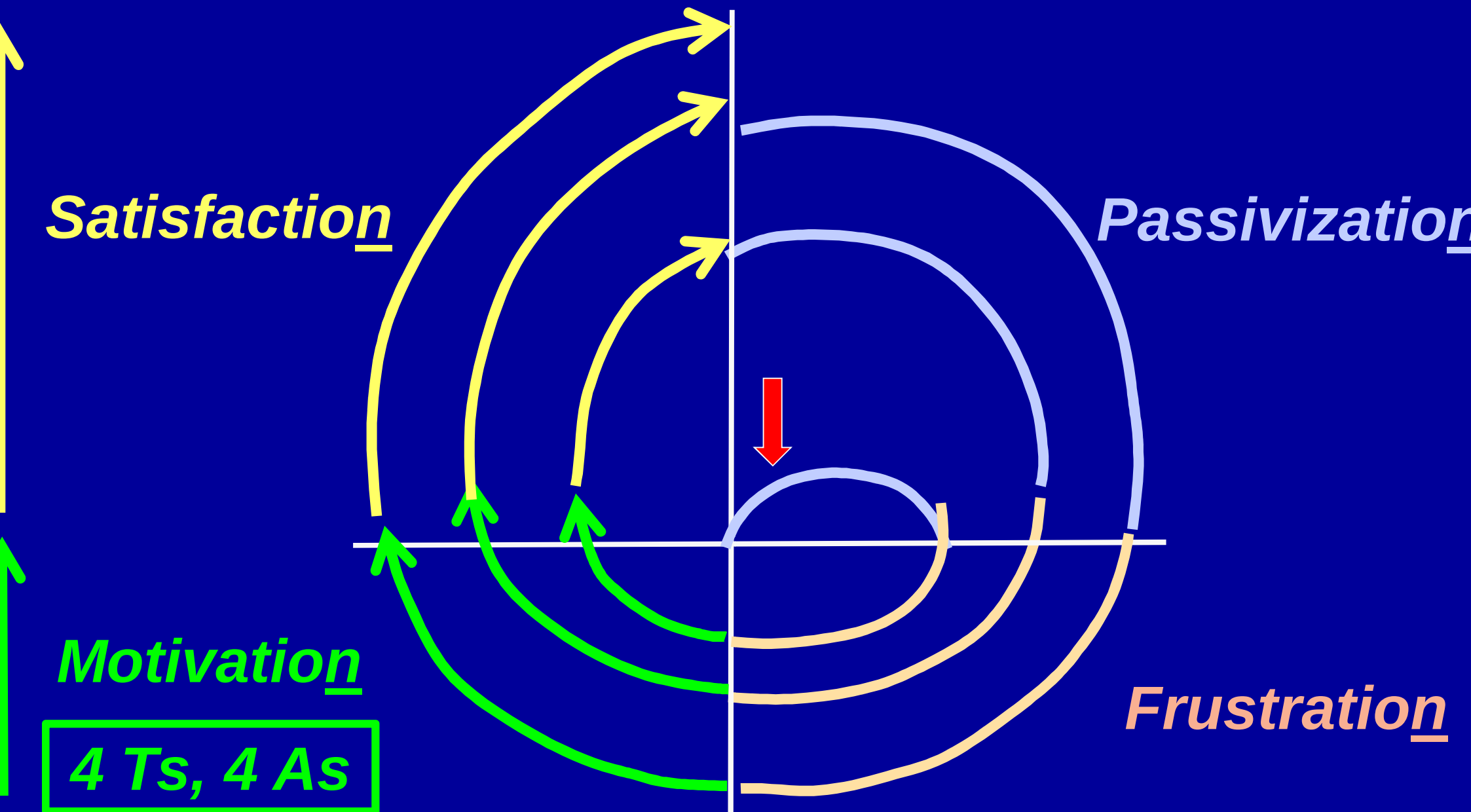
Freedom, Bari-2D, Courage Investigators, 2012 (Subm.)

PURE (S Yusuf et al.) Lancet 2011; Aug 28 - Poor Countries, 7% !!

SHANES, AHA, NHLBI-JNC-7, NHLBI-NCEP

P Muntner, V Fuster et al., AHJ 2011; 161: 719 – 49 seconds !!!!

1. THE CIRCLE OF LIFE - POLYPILL



1. POLYPILL CNIC-FERRER: ADHERENCE – ECONOMICS

FOCUS 1

General
Adherence

FOCUS 2

Polypill
Adherence

ASA, Statin, ACE-Inhibitor

FOOD INTERACTION

BIO-EQUIVALENCE

PHARMACOKINETIC
INTERACTION WITH ASPIRIN

PHARMACODYNAMIC
INTERACTION WITH RAMIPRIL

PHARMACOKINETIC
INTERACTION WITH
SYMVASTATIN

PHARMACODYNAMIC
INTERACTION WITH
SYMVASTATIN

PHARMACOKINETIC
INTERACTION WITH RAMIPRIL

PHARMACODYNAMIC
INTERACTION WITH ASPIRIN

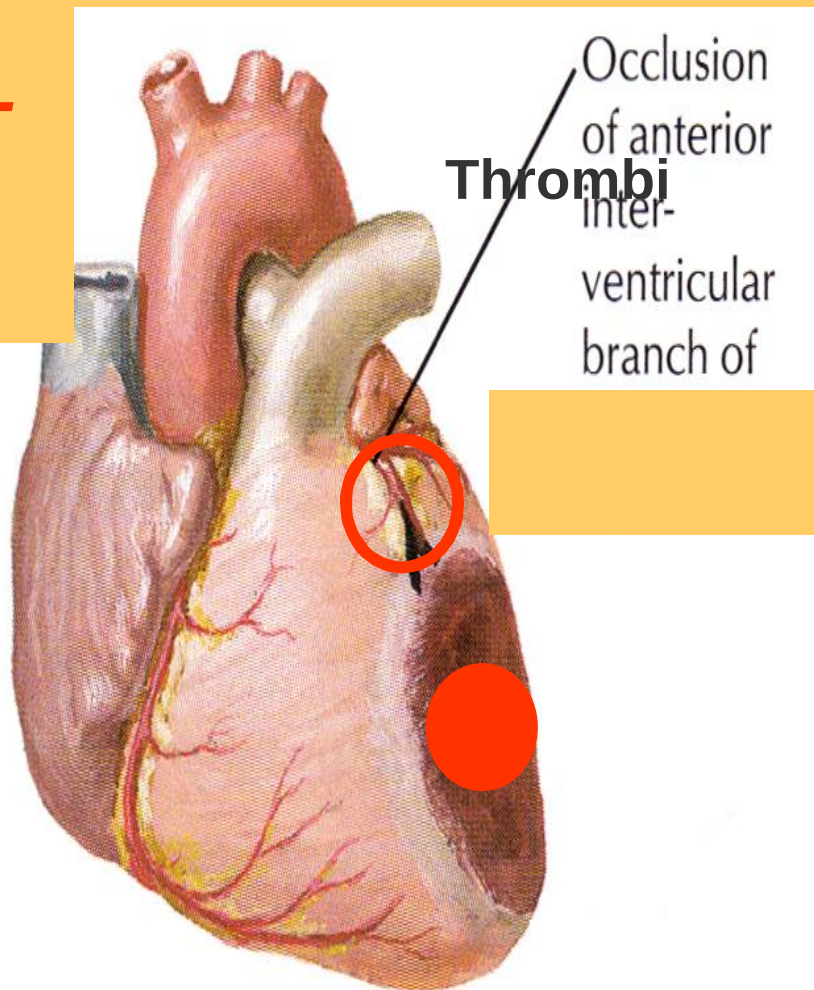


Argentina
Brazil
Paraguay

Italy
Spain

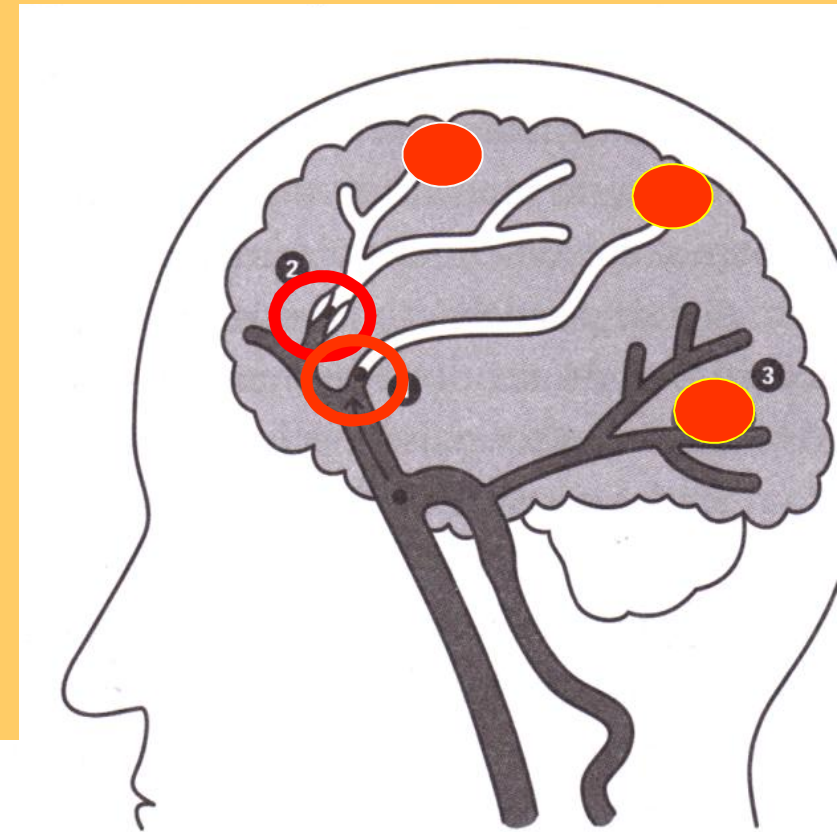
2. Cardiovascular Disease

HEART
II



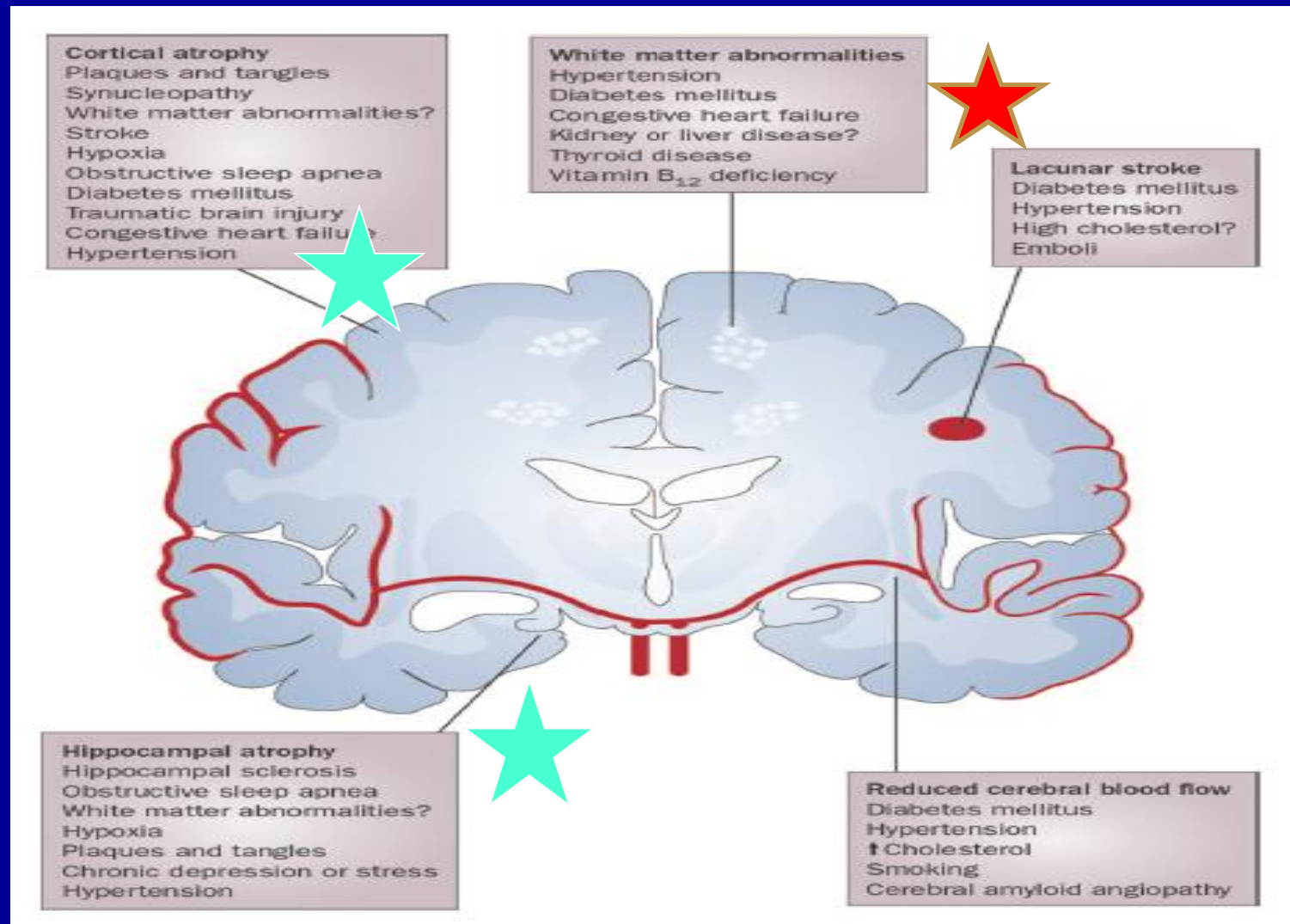
**BRAIN -
STROKE**

- 1) Emboli
- 2) Thrombi
- 3) Hemorrh



Macrovascular & Microvascular

2. Cortical Atrophy (Alzheimer's), White Matter Abnormalities & Lacunar Stroke (?)



JC Kovacic, V Fuster et. al. *Circulation*. 2011;123:1900
MA Lim et. al. *Clin Geriatr Med*. 2009;25:191.

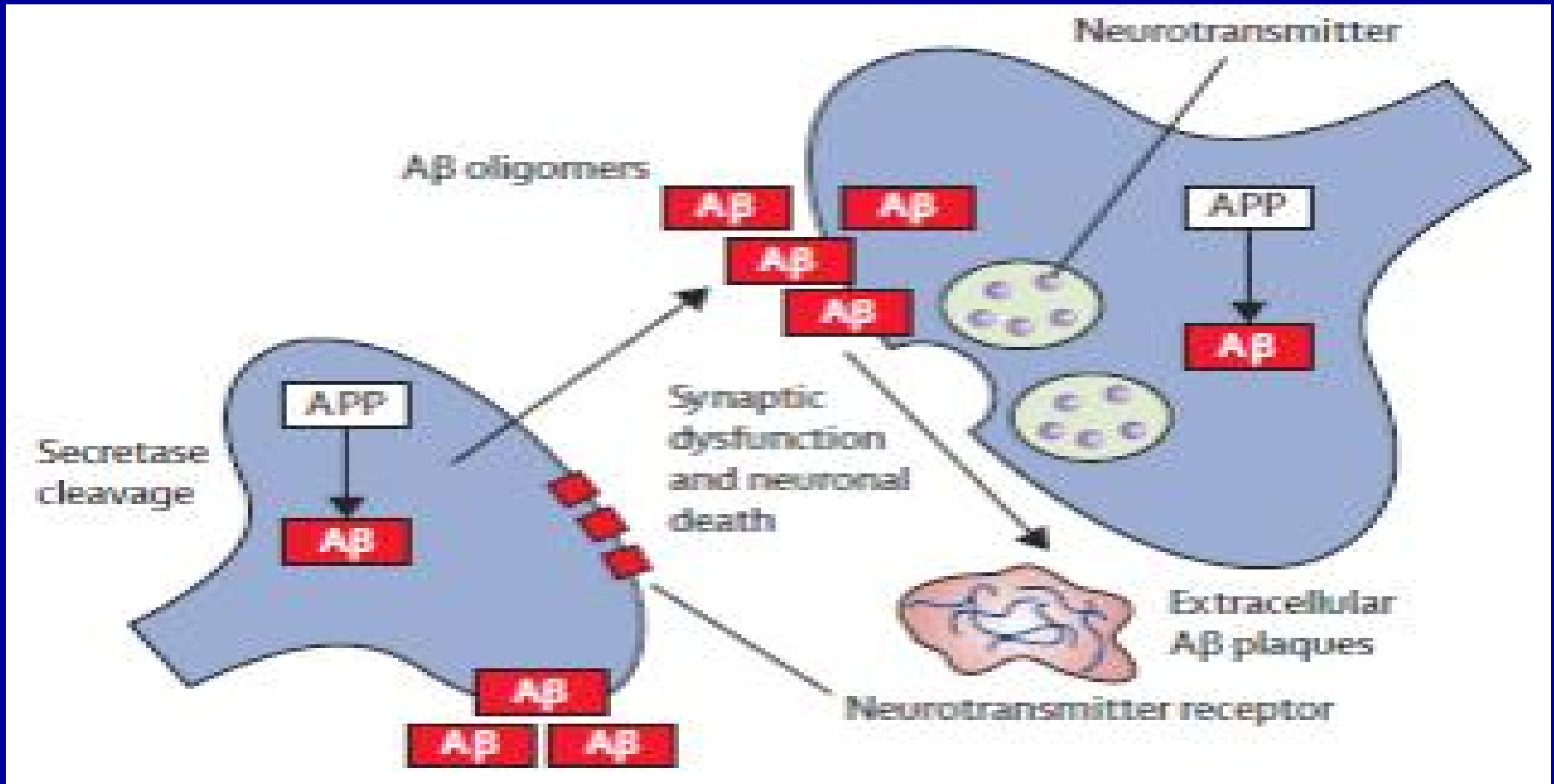
2. Cognitive Decline: ***The Whitehall II Prospective Cohort Study***

The objectives were to estimate **10-year decline in cognitive function** from **5198 men and 2192 women** office based civil servants, **aged 45-70**. Tests of **memory, reasoning, vocabulary, and phonemic and semantic fluency**, were assessed three times over 10 years. **All cognitive scores, except vocabulary, declined in all age categories**, with evidence of faster decline in older people.

A Singh-Manoux et al., BMJ 2012; 244:d7622 (UK, France)

2. Alzheimer's Disease

US > 65y. 10.5% - 2040 x4 – 1907 Vascular ?

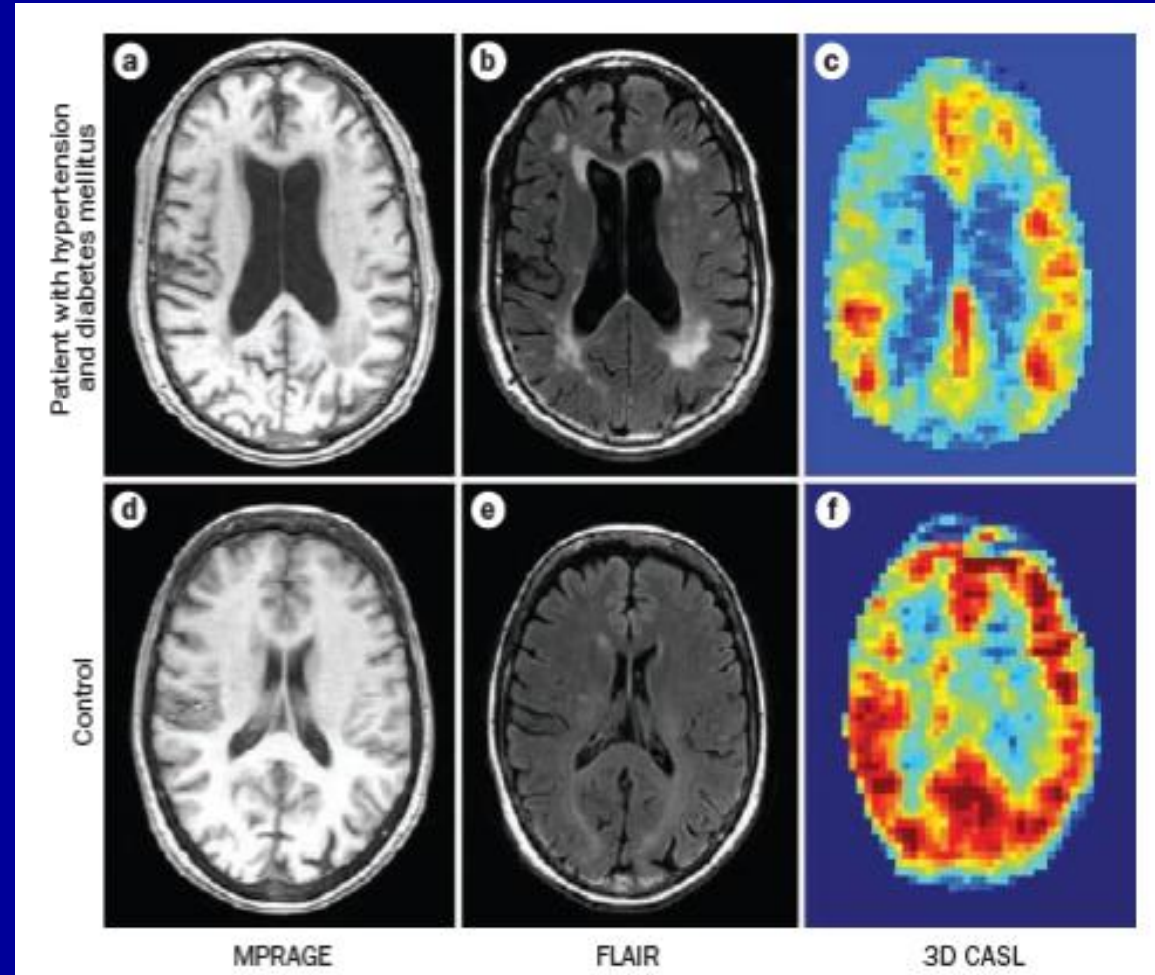
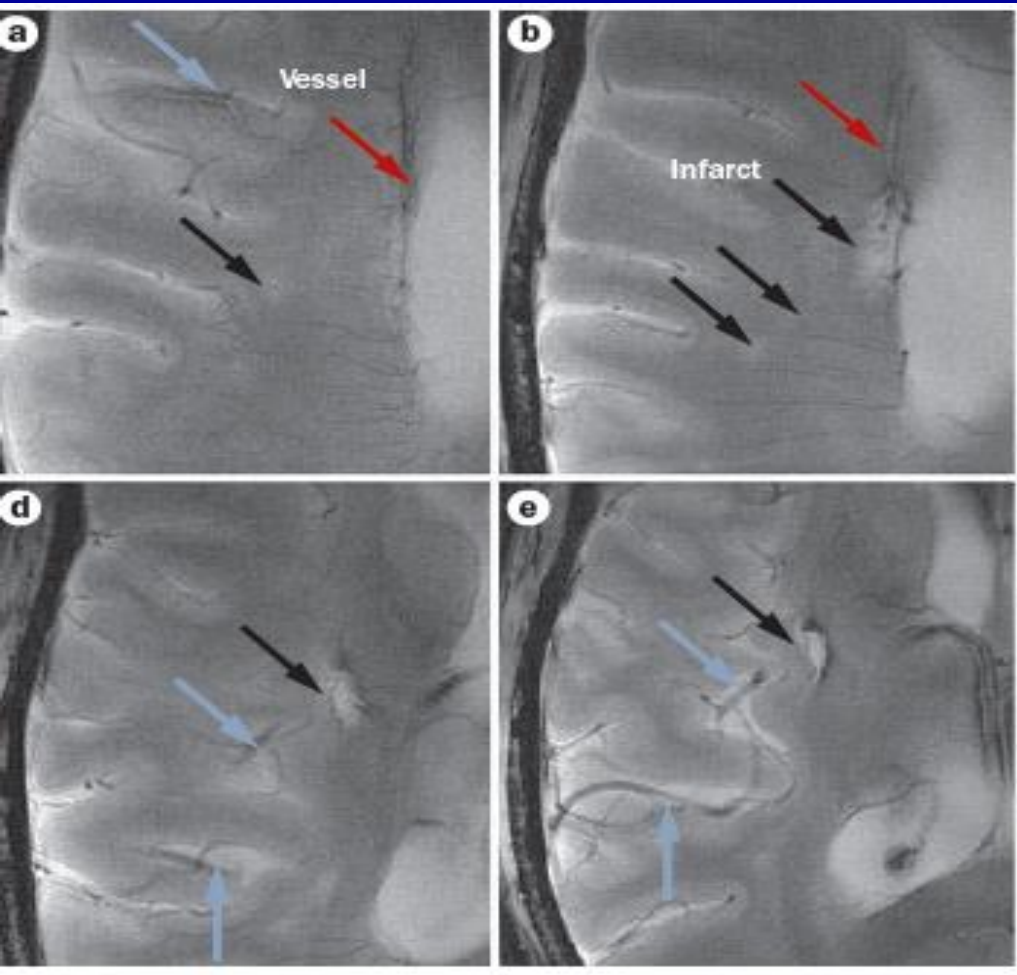


C Ballard et. al. *Lancet* 2011; 377: 1019

HW Querfurth et. al. *N Engl J Med* 2010;362:329 - **Tau**

2. Alzheimer's / DBD

MRI - Perfusion

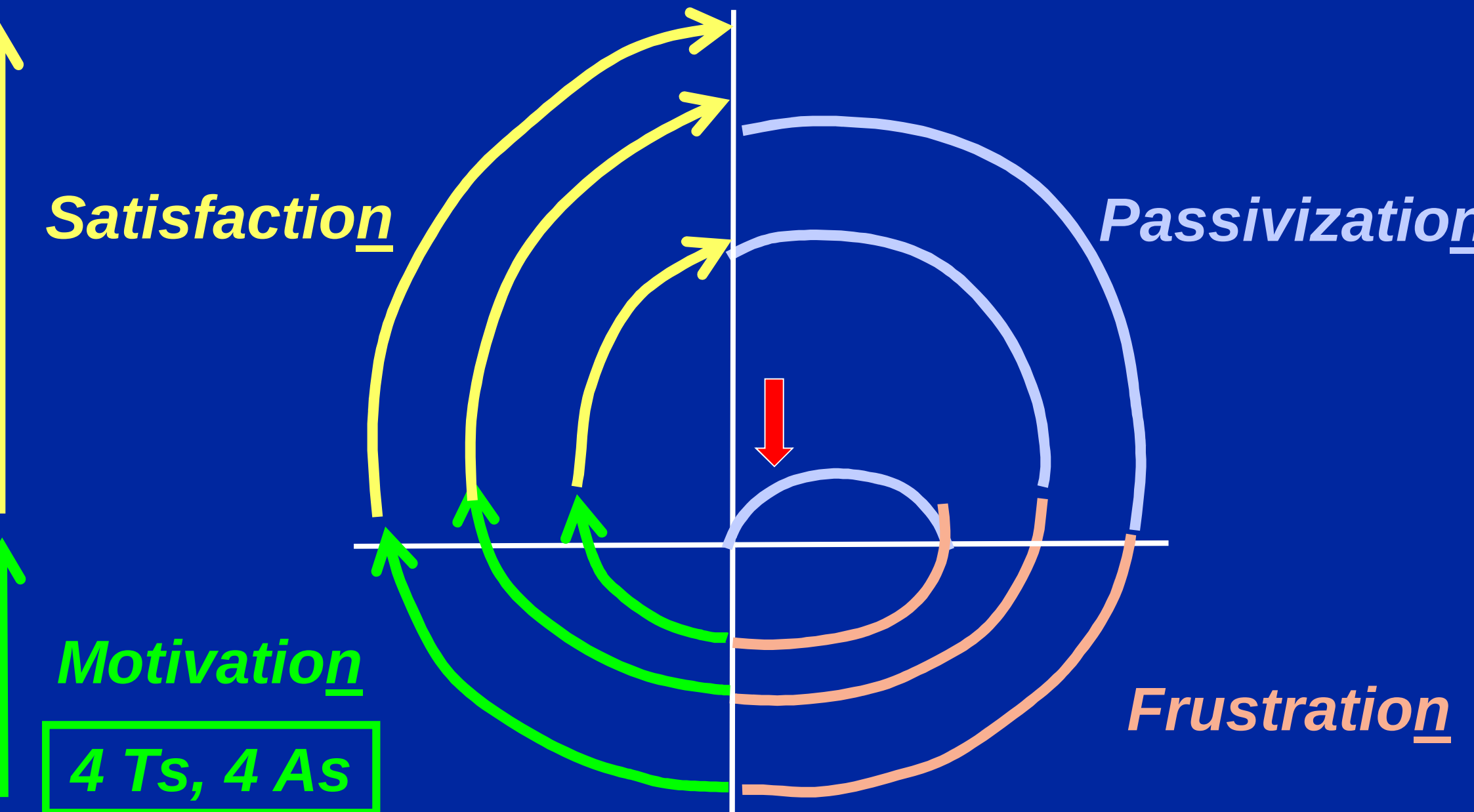


1. V Novak, I Hajjar. *Nat. Rev. Cardiol.* **2010**;7:686(HMS)

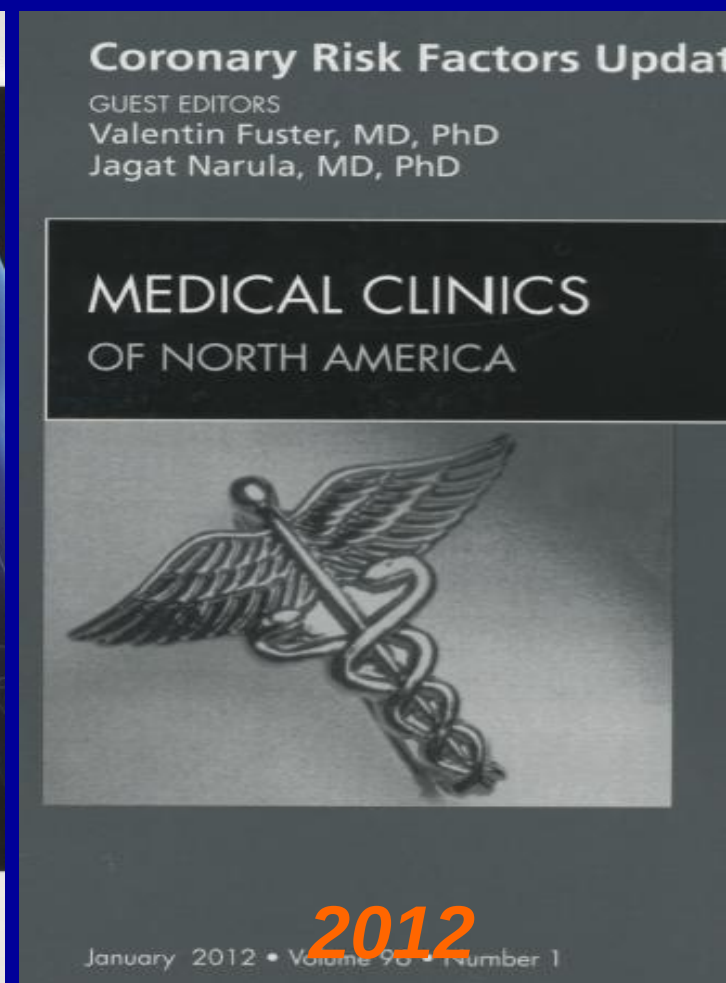
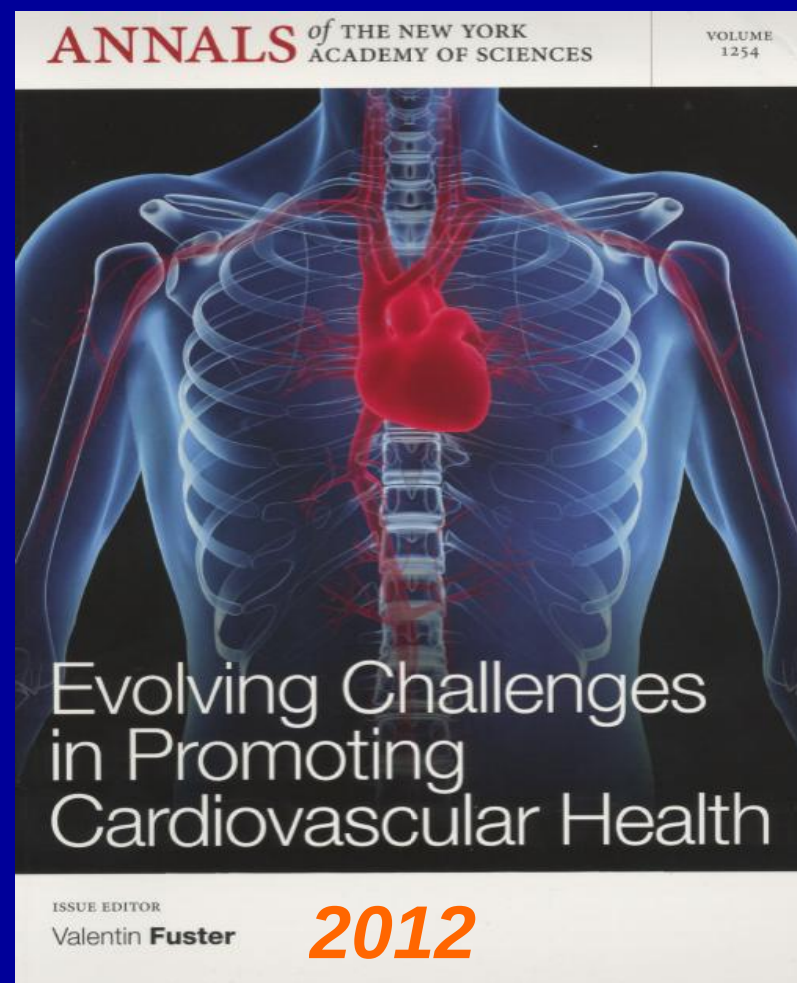
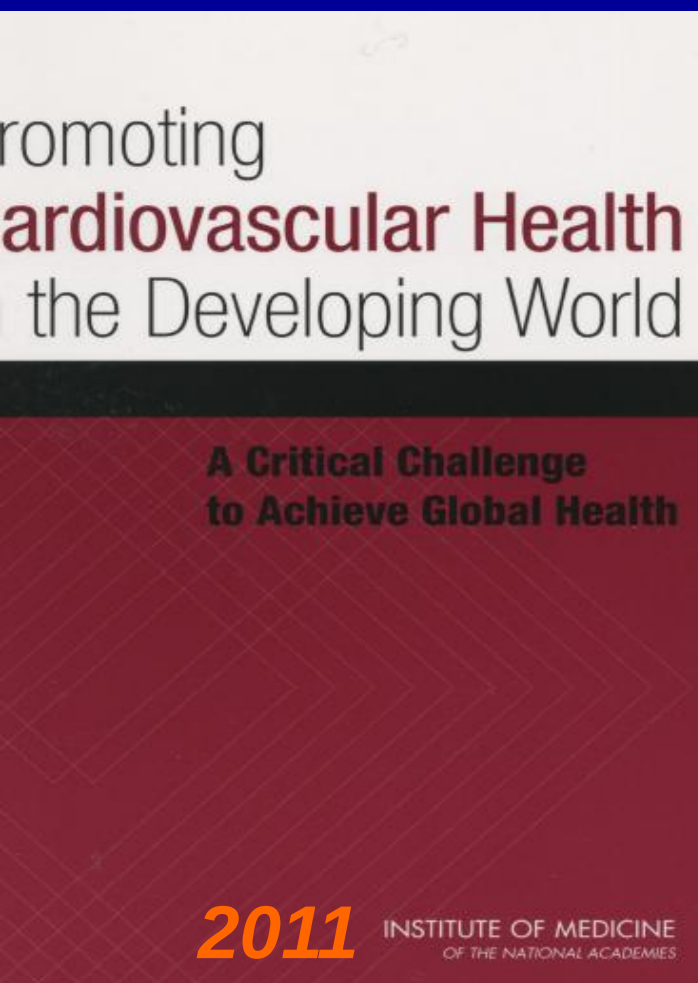
2. HW Querfurth, FM LaFerla. *NEJM* **2010**; 362:329

Ischemia affects 60 to 90% of patients with Alzheimer's

2. THE CIRCLE OF LIFE



1. Promoting CV Health



Circ. 2011;123:1671

2012 RECOMMENDATIONS:

a. Behavior Risk, b. Lack of Policy NCD,
c. No Intersectorial, d. Mixt Health Delivery

Scientific America 2013

2.

EDUCATION!



4 Ts, 4 As

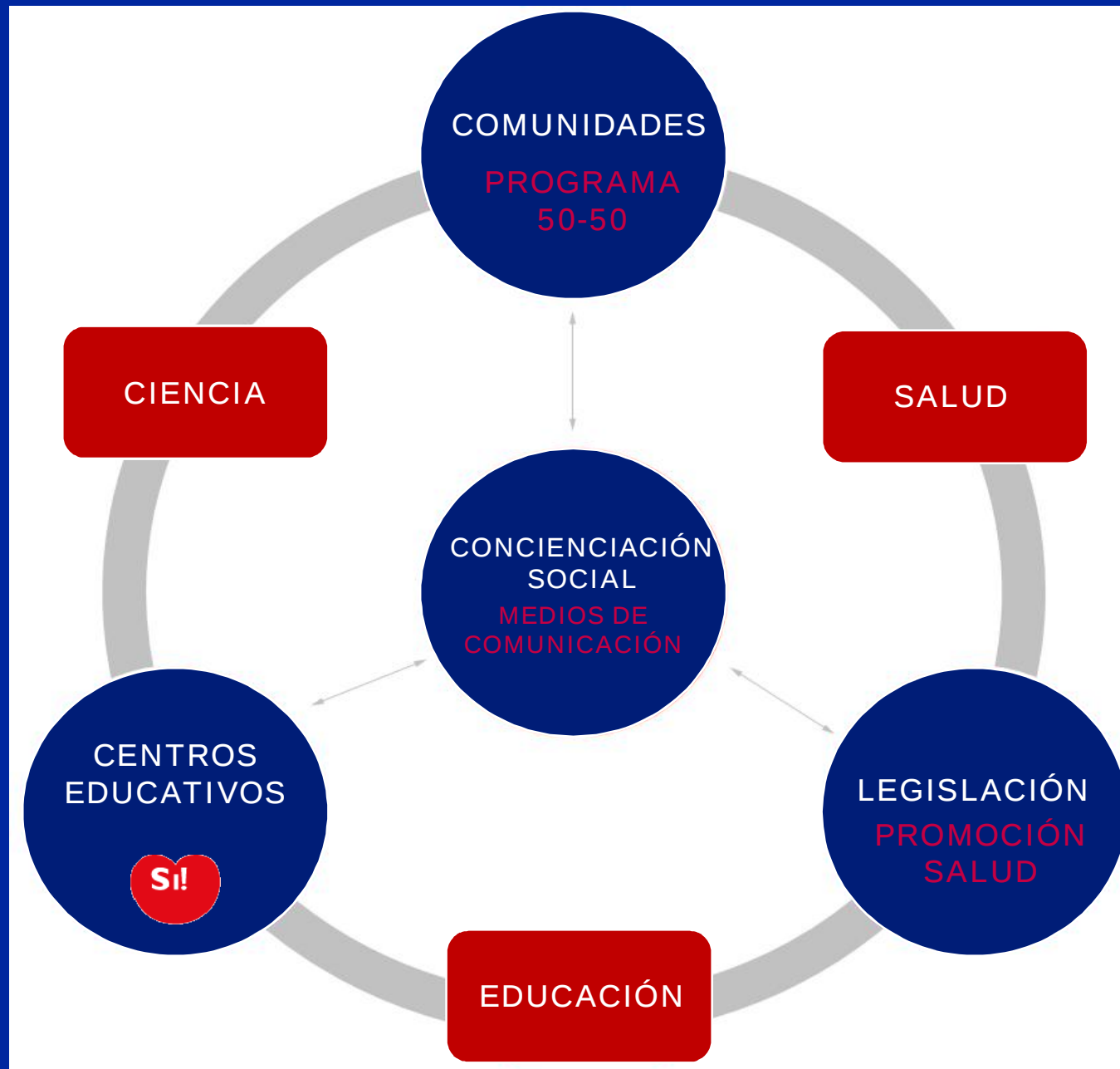
2. SHE, Community, All Ages

The Circle of Leadership



Valentín Carulla
President Barcelona University (1913-23)

3. Observatorio de la Nutrición Y de la Obesidad



MINISTERIO
DE SANIDAD, SERVICIOS SOCIALES
E IGUALDAD



agencia
española de
seguridad
alimentaria y
nutrición



Pilar Farjas
Presidenta AESA



estrategia
naos

¡come sano y muévete!



Teresa Roble
NAOS