



How to Predict and How to Prevent Heart Disease



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It Takes a Long Time to Train a Cardiologist...

☀ Medical School 6 yrs

☀ Postgraduate Medical Training

☀ Internal Medicine Residency

3 years

☀ Cardiology Fellowship

3 years

Cardiology Subspecialty

☀ Noninvasive Imaging

☀ Interventional

☀ Electrophysiology

☀ Heart Failure

Transplant


☀ Congenital Heart Disease



Since I Graduated from Medical School...

Noninvasive Cardiac Imaging

 Echocardiography

 Nuclear Cardiology

 CT Angiography

 Cardiac MRI

When you come to your cardiologist...

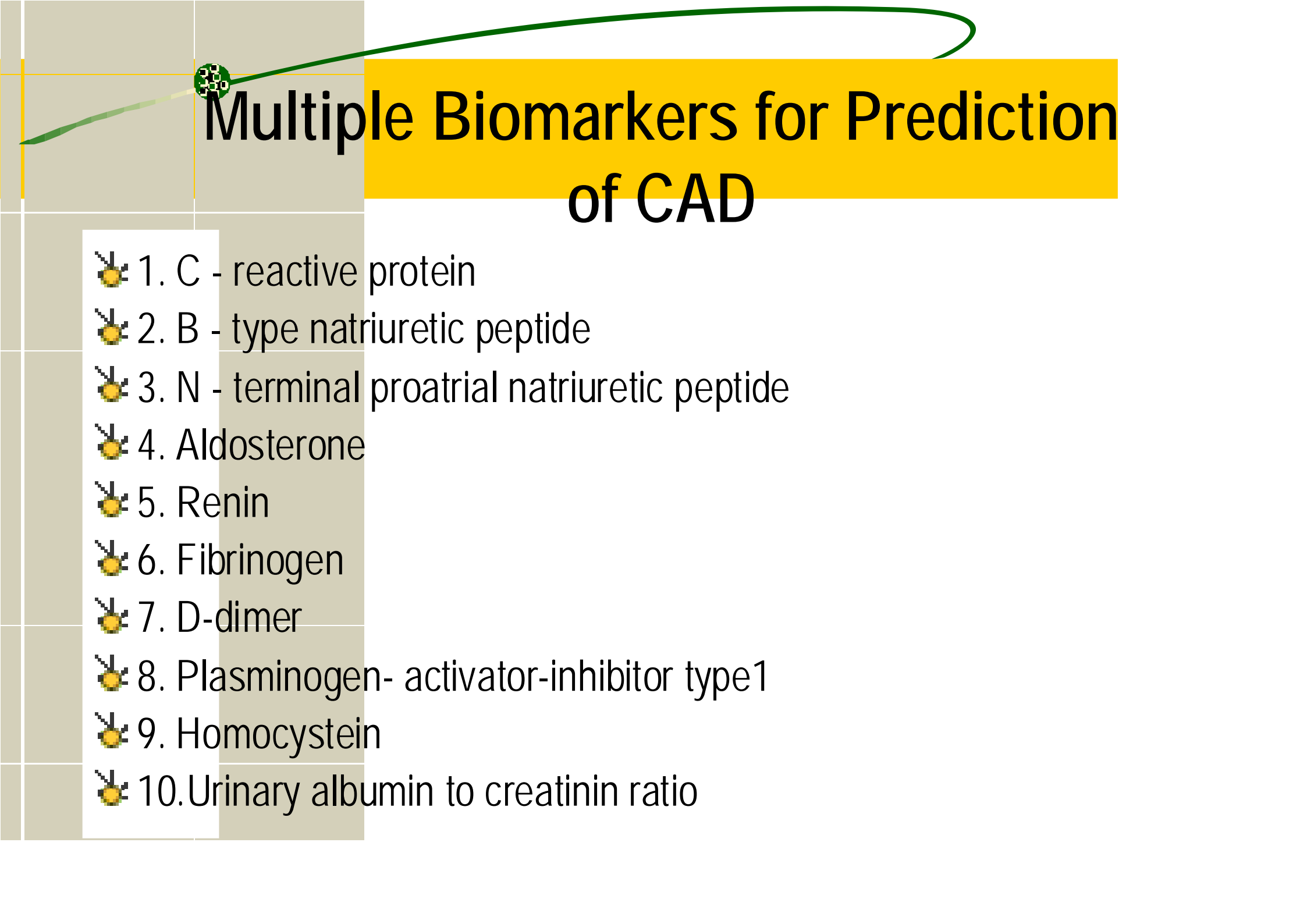
- ☀ 1. EKG
- ☀ 2. EKG monitor-Holter
- ☀ 3. Echocardiography
- ☀ TTE
- ☀ TEE
- ☀ Stress Echo
- ☀ 3. Nuclear study
- ☀ Exercise Stress
- ☀ Pharmacologic Stress

- ☀ 4. EBCT – electron beam computed tomography/calcium score/
- ☀ 5. CT angiography
- ☀ 6. Cardiac MRI
- ☀ 7. Angiography
- ☀ 8. Electrophysiology



Standard Risk Factors for CAD

- ✦ Triglycerides < 150
- ✦ Total cholesterol < 200
- ✦ HDL > 40
- ✦ LDL < 100



Multiple Biomarkers for Prediction of CAD

1. C - reactive protein
2. B - type natriuretic peptide
3. N - terminal proatrial natriuretic peptide
4. Aldosterone
5. Renin
6. Fibrinogen
7. D-dimer
8. Plasminogen- activator-inhibitor type 1
9. Homocystein
10. Urinary albumin to creatinin ratio

The Numbers You Have to Know...



1. **Family**
Genetic info, Environmental Factors
2. **Age**
3. **BMI**
/ height, weight /
4. **Physical fitness**
/ HR, BP/
5. **Smoking**
/ how many years,
how many cigarettes/

The Numbers You Have to Know...

☀️ 6. Lipid Panel

☀️ Triglycerides

☀️ Total cholesterol

☀️ HDL

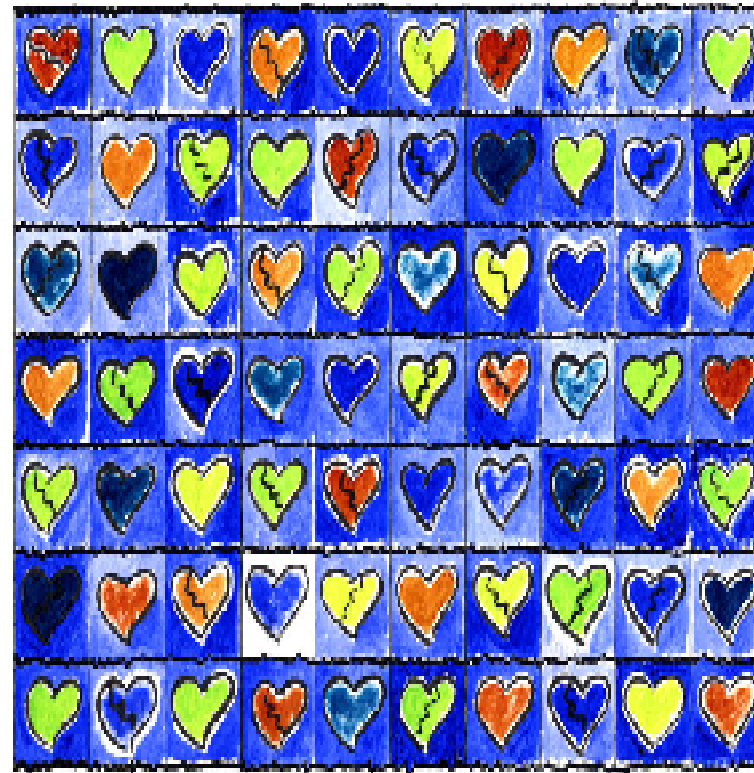
☀️ LDL

☀️ 7. DM

☀️ Blood sugar

☀️ Hemoglobin A1C

☀️ 8. Waist circumference



	Normal					Overweight					Obese					Extreme Obesity																					
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
Height (inches)	Body Weight (pounds)																																				
50	91	96	102	105	110	115	118	124	129	134	139	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210	215	220	224	229	234	238	244	249	253	259	
59	94	99	104	109	114	119	124	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	261	266	271	277
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	277	
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285	291
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295	301
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254	259	265	270	276	282	287	293	299	304	310
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314	320
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330
66	118	124	130	136	142	148	155	161	167	173	179	185	192	198	204	210	216	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334	340
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344	350
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	275	282	288	295	301	308	315	322	328	335	341	348	354	360
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365	371
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	375	382
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	300	308	315	322	329	336	343	351	358	365	372	379	386	393
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397	404
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	409	416
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420	428
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431	439
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443	451



Over 50 millions Americans have
it!

✦ What is it ?

✦ METABOLIC SYNDROME



Metabolic Syndrome

- ☀ 1. Abdominal Obesity
- ☀ 2. Atherogenic Dyslipidemia
- ☀ 3. Elevated BP
- ☀ 4. Insulin Resistance or Glucose Intolerance
- ☀ 5. Protrombotic state (high fibrinogen or plasminogen activator -1 in the blood)
- ☀ 6. Proinflammatory state (elevated hsCRP in the blood)



Metabolic Syndrome - Diagnosis

- ☀ 1. Elevated waist circumference
 - Men \geq 40 inches (102 cm)
 - Women \geq 35 inches (88 cm)
- ☀ 2. Elevated triglycerides > 150mg/dl
- ☀ 3. Reduced good cholesterol
 - Men < 40 mg/dl
 - Women < 50 mg/dl
- ☀ 4. Elevated BP >130/85 mmHg
- ☀ 5. Elevated fasting glucose > 100 mg/dl



Life Style Interventions Include

- ✦ 1. To achieve desirable weight: BMI < 25 kg/m²
- ✦ 2. Increase physical activity: 30 minutes daily
- ✦ 3. Healthy eating habits: reduce intake of saturated fat, trans fat, cholesterol



CHANGE YOUR DIET!

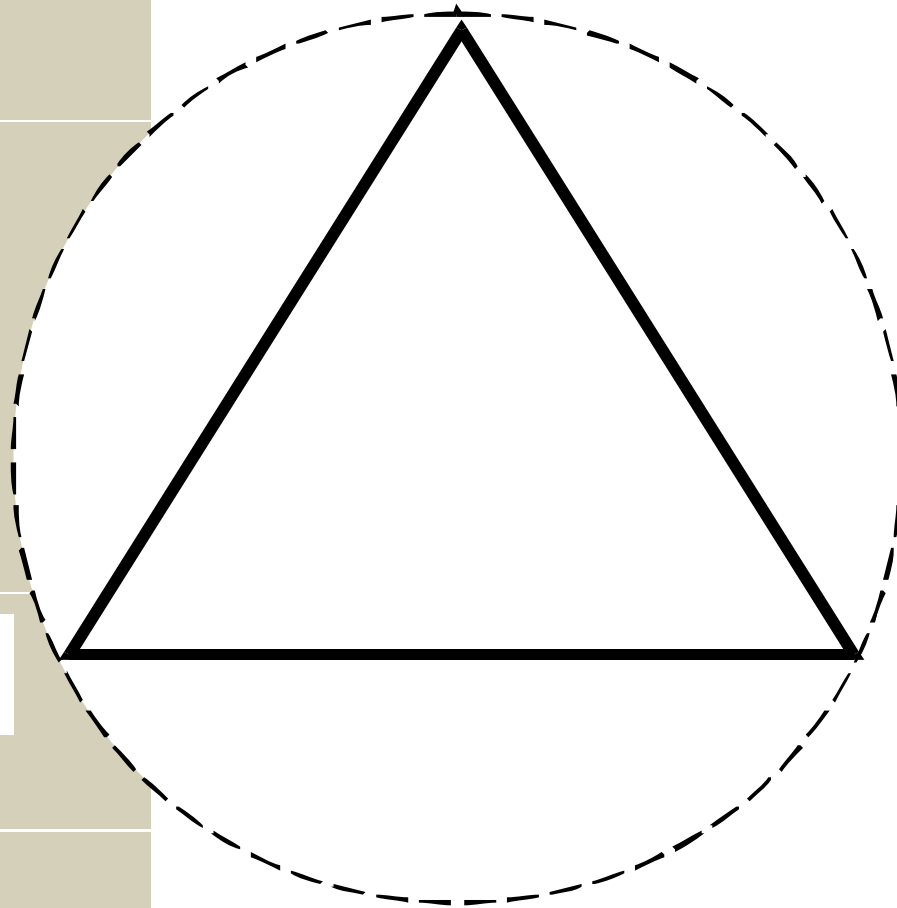
- ✂ 1. Total Fat <30%
- ✂ -Saturated Fat <10% / day
- ✂ 2. Cholesterol <300 mg / day
- ✂ 3. Salt (NaCl) <2,300 mg / day

CHANGE YOUR DIET!!

FISH

FRUITS

VEGETABLES





CHANGE YOUR DIET!!!



50%
DIET

'ABC' Approach to Metabolic Syndrome

- ☀ "A" Antiplatelet agents, ACE inhibitor or ARB
- ☀ "B" BP control
- ☀ "C" Cholesterol Management & Cessation of Cigarette Smoking
- ☀ "D" Dietary Changes & Diabetes/Prediabetes Management
- ☀ "E" Exercise & Education