

Case Report : Asan Medical Center Cardiac Rehabilitation

AACVPR (<http://www.aacvpr.org/>)
KACVPR (<http://www.kacvpr.com/>)



Backgrounds

PCI

2,395 consecutive patients in Minnesota (Mayo Clinic)

Between 1994 and 2008

Propensity score-matched analysis

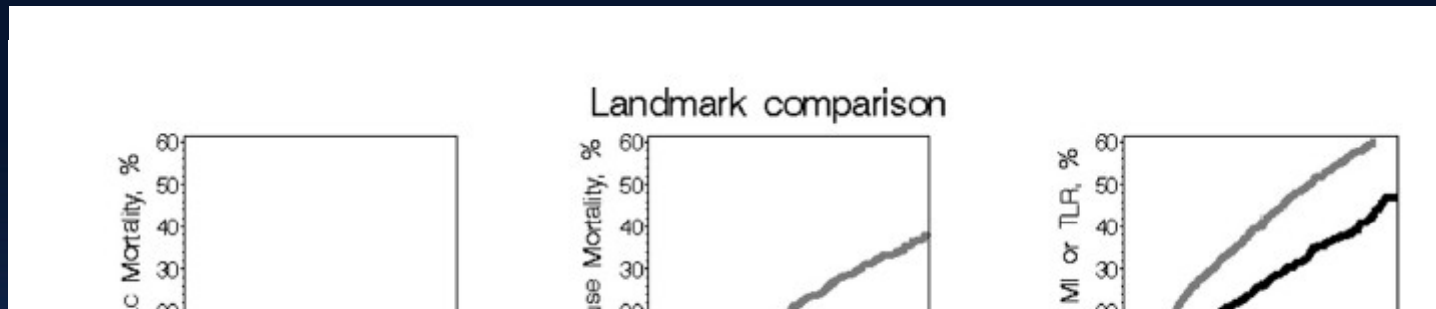
Propensity score stratification

Regression adjustment with propensity score in a 3-month landmark analysis

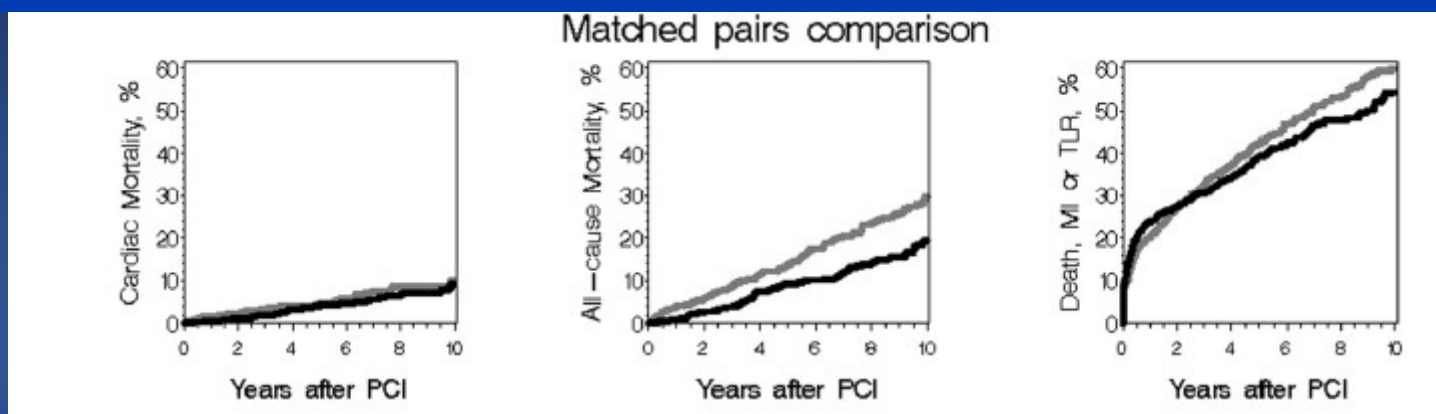
Median 6.3 years

CR participation : 40% of patients

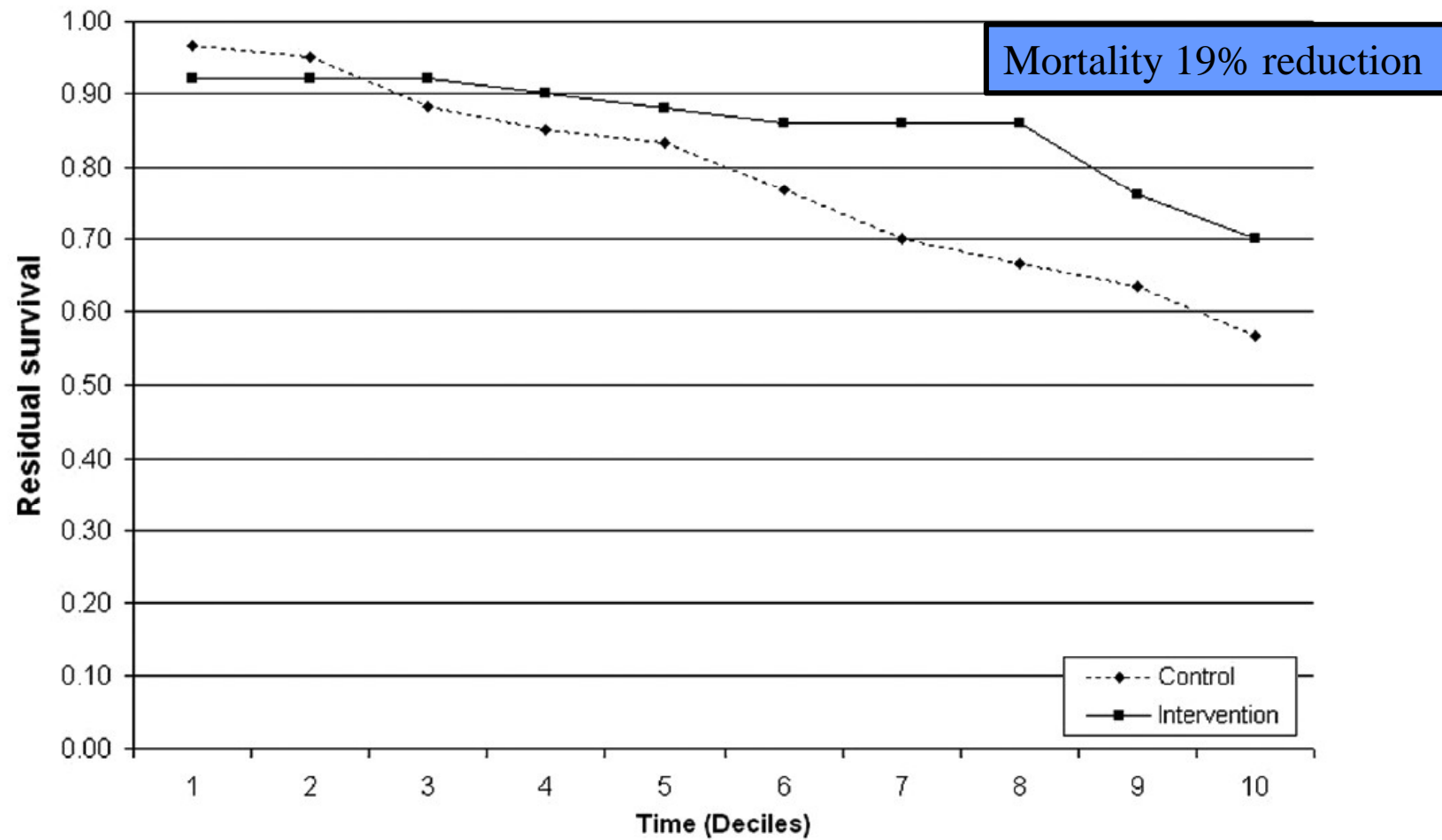
PCI



Relative mortality reduction
(47%)

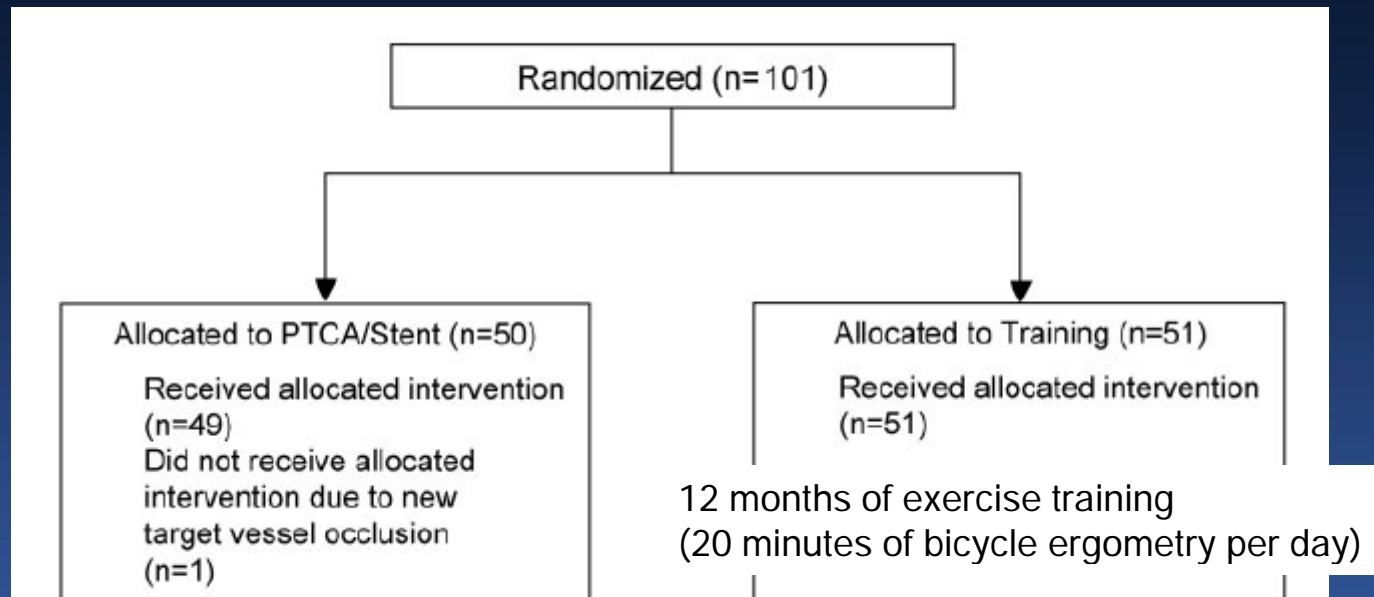


CABG



Stable Coronary Artery Disease

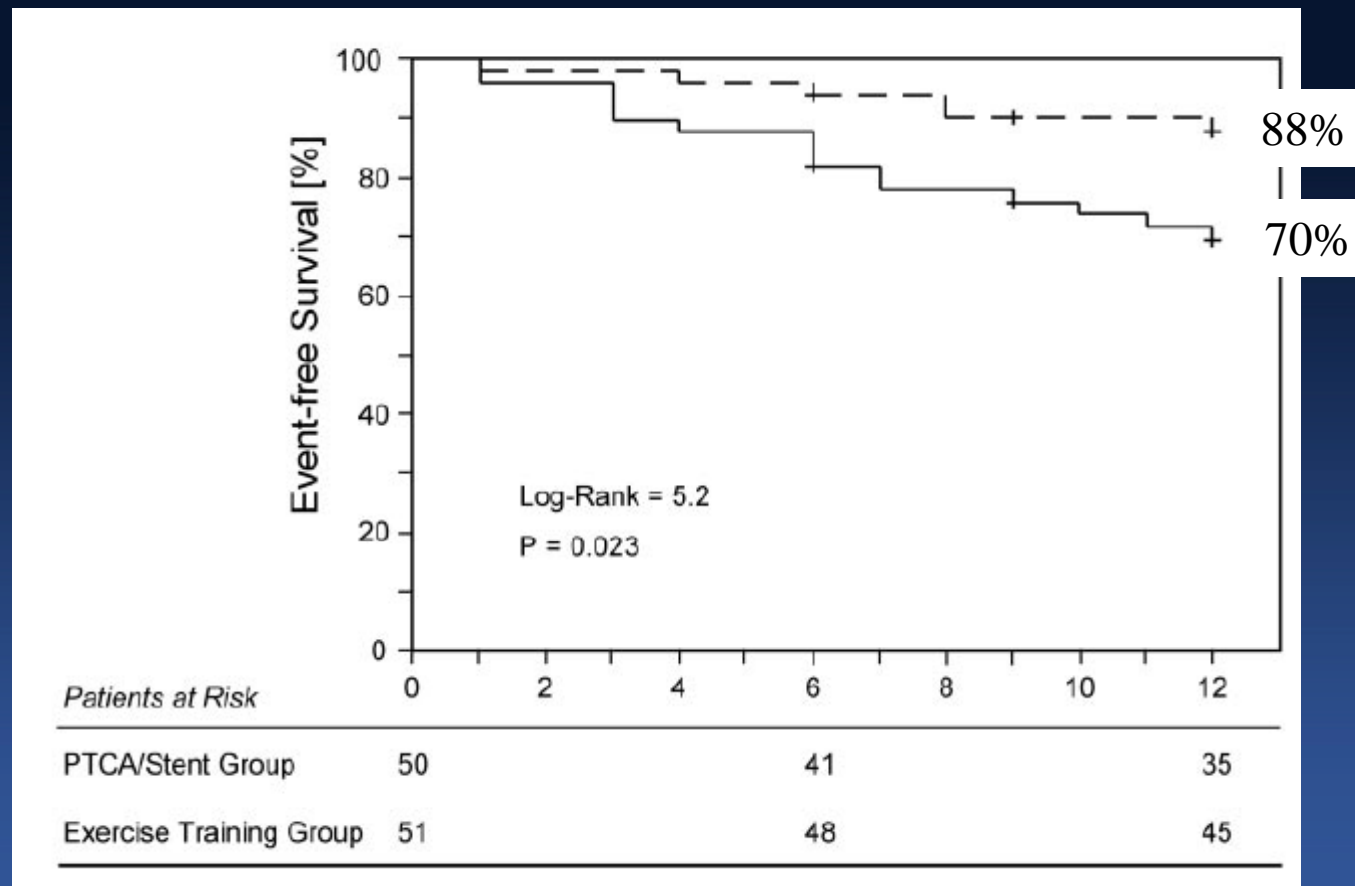
1 native coronary artery stenosis of 75% by visual assessment amenable to PCI



Stable Coronary Artery Disease

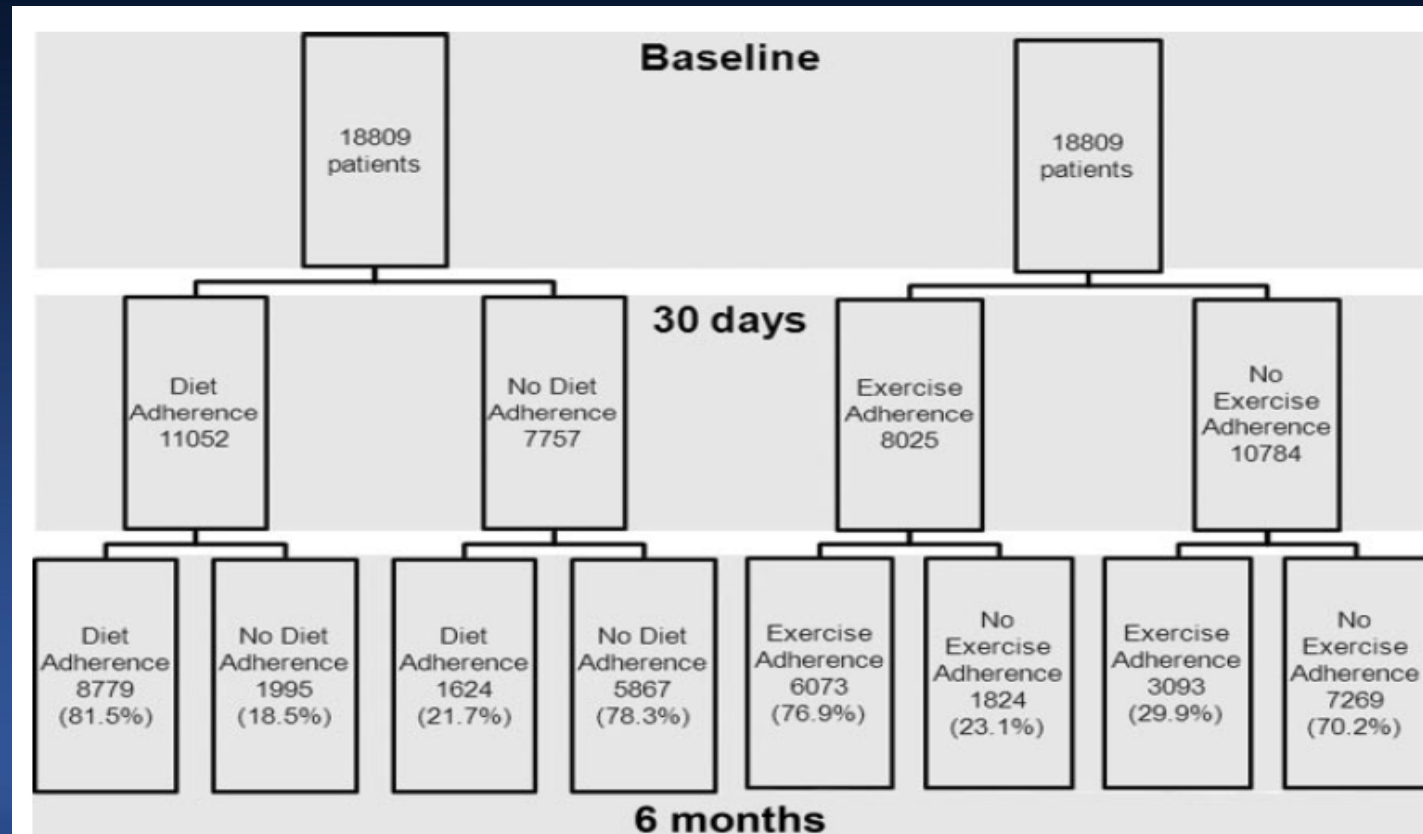
Clinical events

(stroke, target vessel revascularization, PCI of a de novo lesion, or CABG)

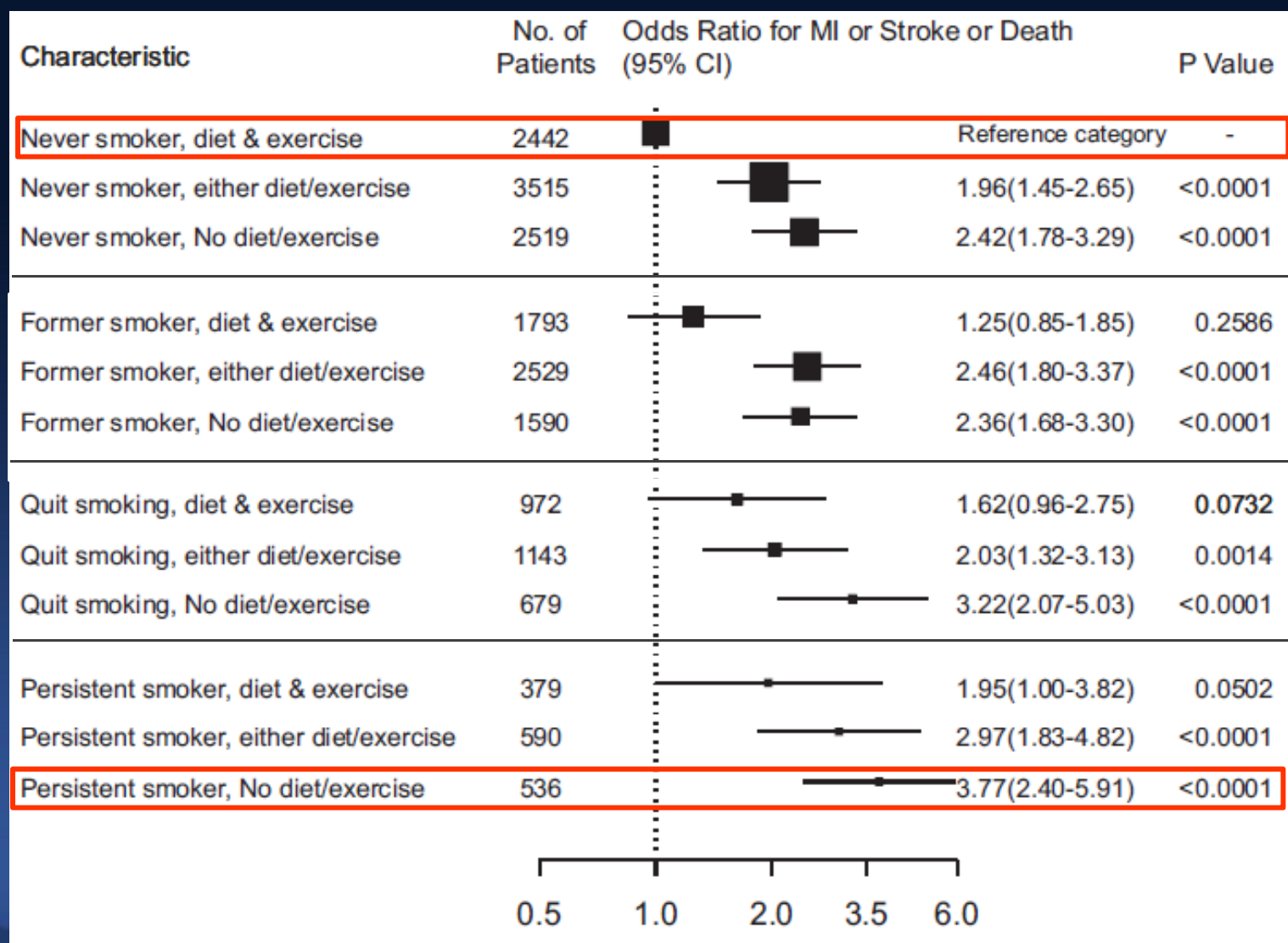


Acute Coronary Syndrome

- 18,809 patients
- OASIS 5 randomized trial

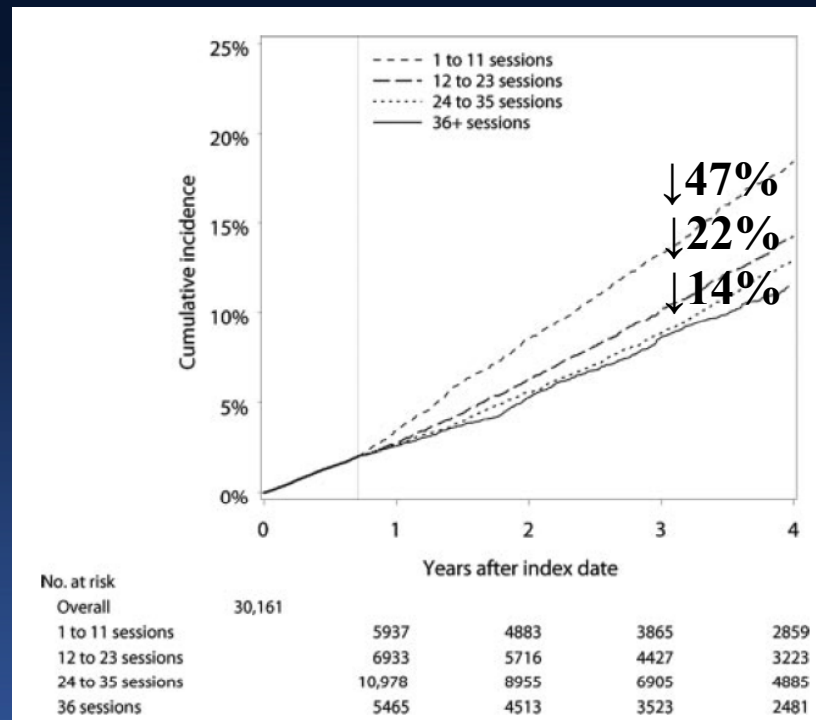


Acute Coronary Syndrome

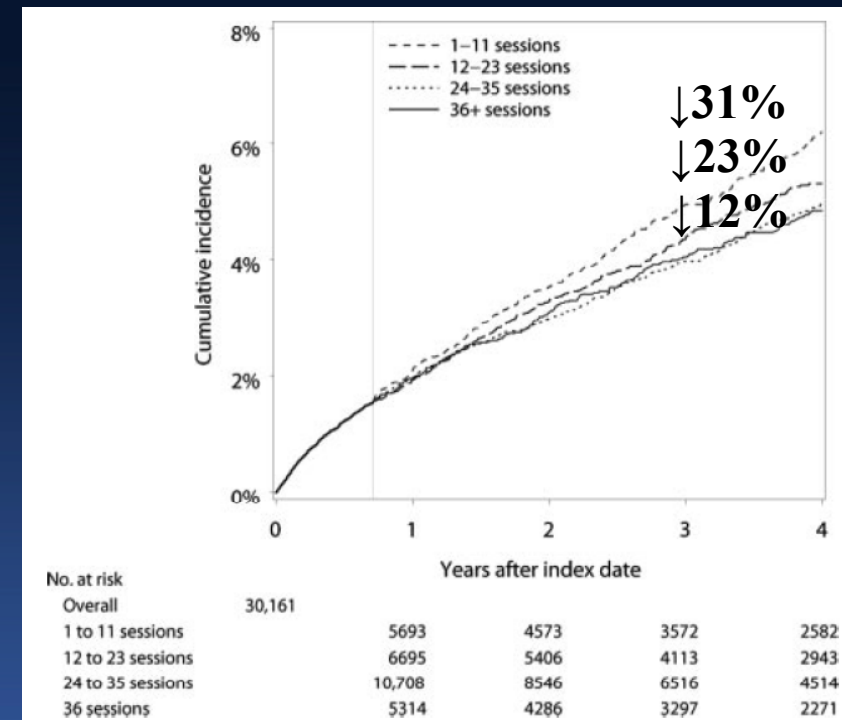


The “dose” of cardiac rehabilitation

Death



MI



Dose-response relationship !!

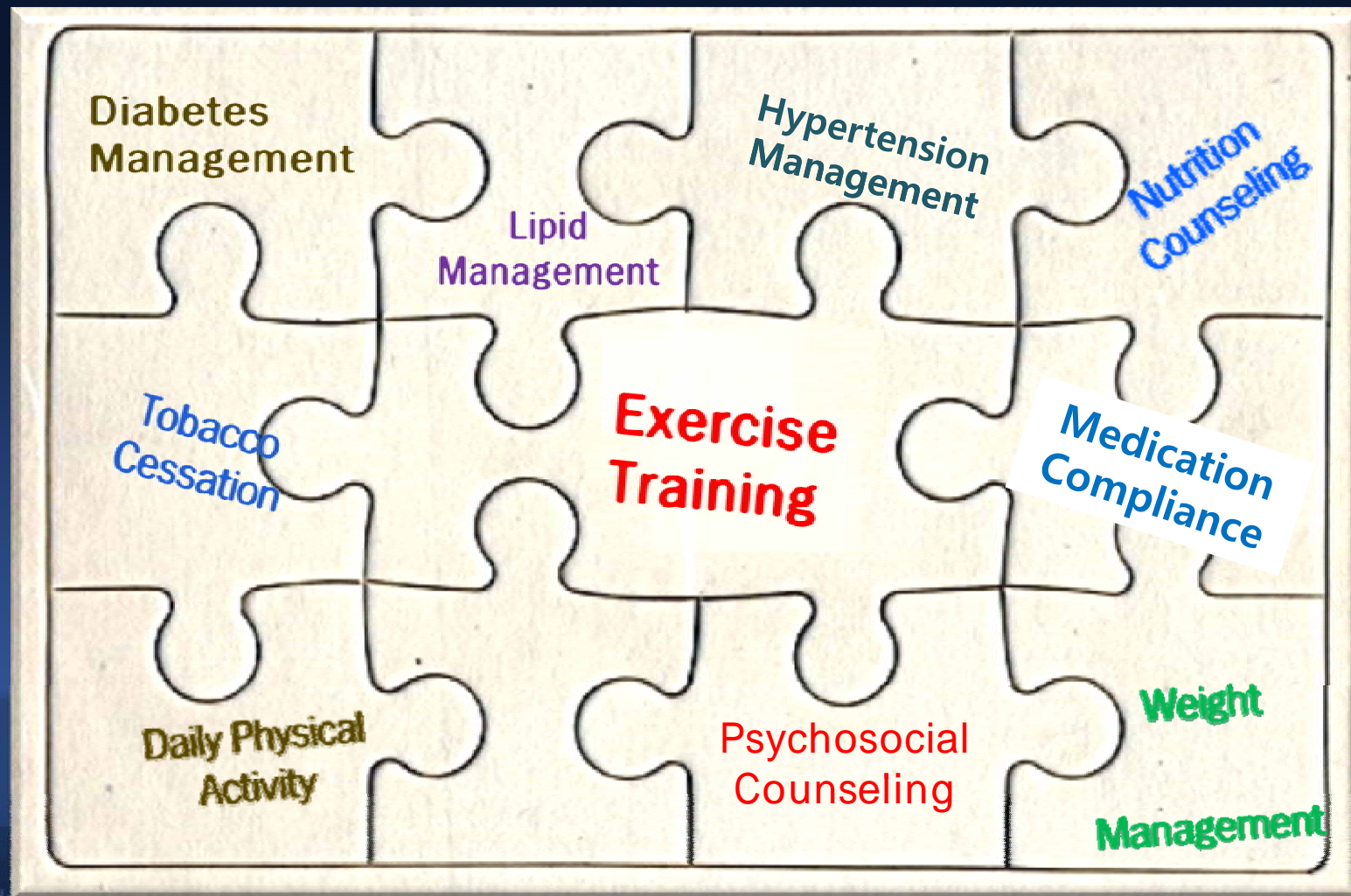
Peripheral Artery Disease

Supervised Exercise Versus Primary Stenting for Claudication Resulting From Aortoiliac Peripheral Artery Disease: Six-Month Outcomes From the Claudication: Exercise Versus Endoluminal Revascularization (CLEVER) Study

| | | | | | | |
|--|---|---|---|----------------------------|----------------------------|----------------------------|
| | <div>Optimal Medical Care N=22</div> | <div>Supervised Exercise (SE) N=43</div> | <div>Stenting (ST) N=46</div> | <div>SE + ST N=8</div> | | |
| | <div>• Withdrawn = 1 • Exited (other) = 1</div> | <div>• Withdrawn = 3 • Exited (other) = 1 • Lost to follow-up = 1</div> | <div>• Withdrawn = 2 • Exited (illness) = 1 • Lost to follow-up = 2</div> | <div>• Withdrawn = 1</div> | | |
| | OMC (n=20) | SE+OMC (n=38) | ST+OMC (n=41) | SE vs OMC [95% CI] (P) | ST vs OMC [95% CI] (P) | SE vs ST [95% CI] (P) |
| Primary end point | | | | | | |
| Change of PWT from baseline to 6 mo, mins | 1.2±2.6 (−4.1, 8.6) | 5.8±4.6 (−0.4, 16.9) | 3.7±4.9 (−4.7, 14.6) | 4.6 [2.7–6.5] (<0.0001)* | 2.5 [0.6–4.4] (0.021)* | 2.1 [0.0–4.2] (0.042) |
| P, nonparametric analysis | | | | <0.001* | 0.019* | 0.002 |
| Multiple imputation analysis | 1.0±2.8 (−9.5, 8.60) | 6.1±4.6 (−0.4, 16.9) | 3.6±4.9 (−4.7, 14.6) | 5.1 [4.5–5.7] (<0.001)* | 2.6 [2.0–3.2] (0.017)* | 2.5 [1.9–3.1] (0.028) |
| Secondary end points | | | | | | |
| Change in COT from baseline to 6 mo, min | 0.7±1.1 (−0.6, 3.3) | 3.0±2.9 (−0.8, 10.7) | 3.6±4.2 (−0.3, 17.9) | 2.2 [1.2–3.3] (0.003) | 2.9 [1.5–4.3] (0.006) | 0.7 [0.9–2.3] (0.425) |
| Change in hourly free-living steps from baseline to 6 mo, n† | −5.6±109.4 (−268.2, 168.9) | 72.6±138.7 (−185.2, 425.7) | 114.3±273.9 (−192.6, 976.4) | 78.3 [0.7–157.2] (0.0625) | 120.0 [3.5–236.5] (0.1024) | 41.7 [73.4–156.8] (0.4661) |
| Change in ABI from baseline to 6 mo | 0.01±0.10 (19) (−0.24, 0.12) | 0.03±0.11 (36) (−0.23, 0.37) | 0.29±0.33 (40) (−0.12, 1.59) | 0.0 [0.0–0.1] (0.578) | 0.3 [0.2–0.4] (<0.001) | 0.3 [0.2–0.4] (<0.001) |

Practice

PCI or CABG without comprehensive risk factor modifications is a **sub-optimal therapeutic strategy.**



Ideal Member

Program Director - Medical Director

당뇨 전문의

심장내과 전문의

임상 영양사

금연 클리닉
전문가

심장재활 전문의

운동 처방 전문가

전담 간호사

비만 클리닉
전문가

Members



Target Population

ALL suitable CHD patient

Stable angina

ACS (UA, STEMI or NSTEMI following medical or surgical management.)

Before and After revascularisation.

Stable heart failure and cardiomyopathy

Peripheral vascular disease

Following valve surgery or ICD insertion

High risk patients for primary prevention

Components

- Lifestyle - Physical activity and Exercise
 - Diet and Weight management
 - Smoking Cessation
- Education
- Exercise & fitness
- Risk Factor Management
 - Hypertension
 - Diabetes
 - Dyslipidemia
 - Smoking
 - Obesity
- Psychosocial stress management
- Cardio-protective drug therapy
- Long Term Management

Credibility

AMERICAN ASSOCIATION OF CARDIOVASCULAR AND PULMONARY REHABILITATION

Certifies that the

**Cardiac Rehabilitation Program
of
Asan Medical Center Heart Institute
86 Asanbyeongwon-gil, Songpa-gu
Seoul, South Korea**

has met the strict standards and been awarded certification through the
American Association of Cardiovascular and Pulmonary Rehabilitation

This certificate shall expire on **August 31, 2014.**



Bonnie K. Sanderson, RN, PhD, FAACVPR
AACVPR President 2010-2011

AACVPR

American Association of Cardiovascular
and Pulmonary Rehabilitation

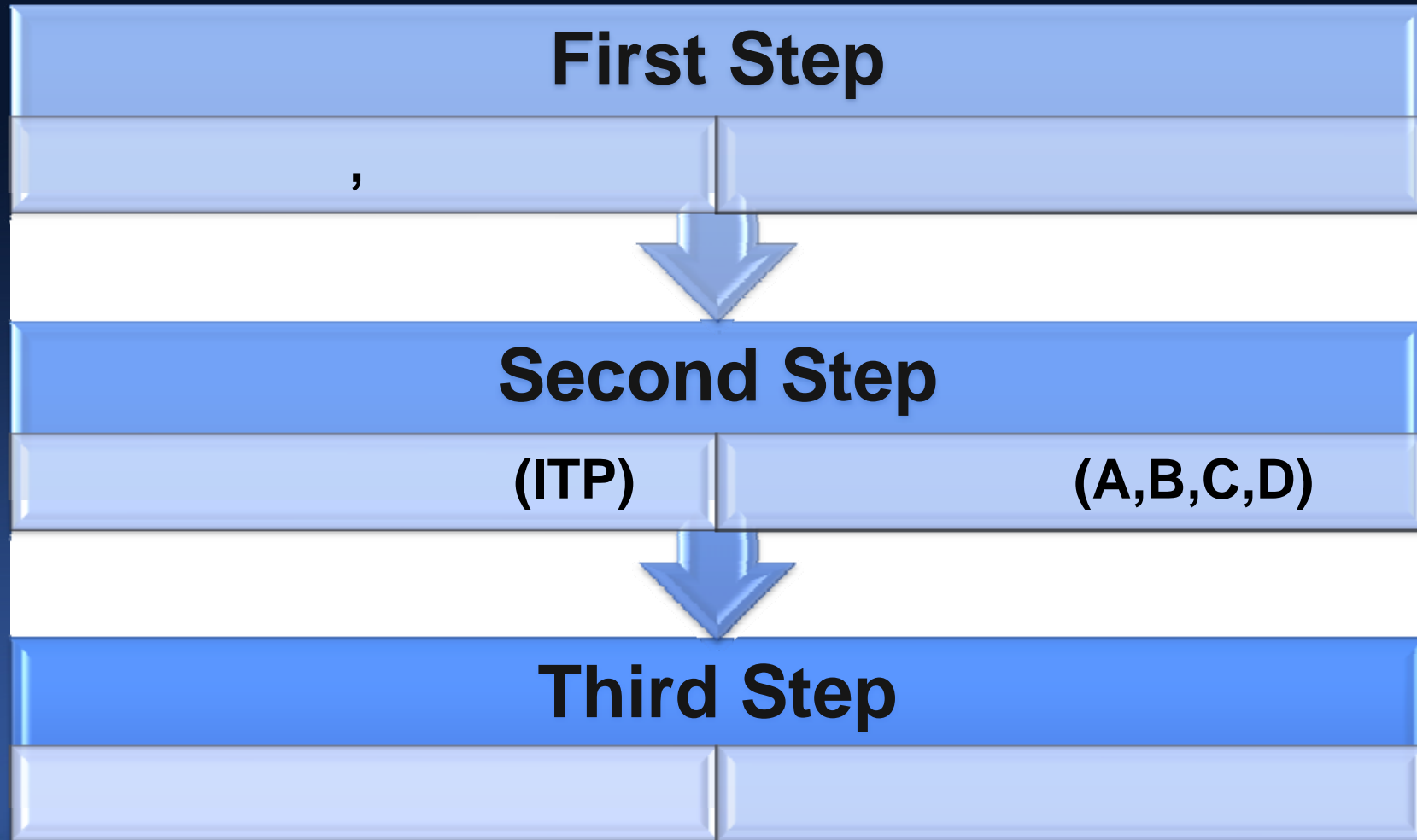
Promoting Health & Preventing Disease

Certified Program

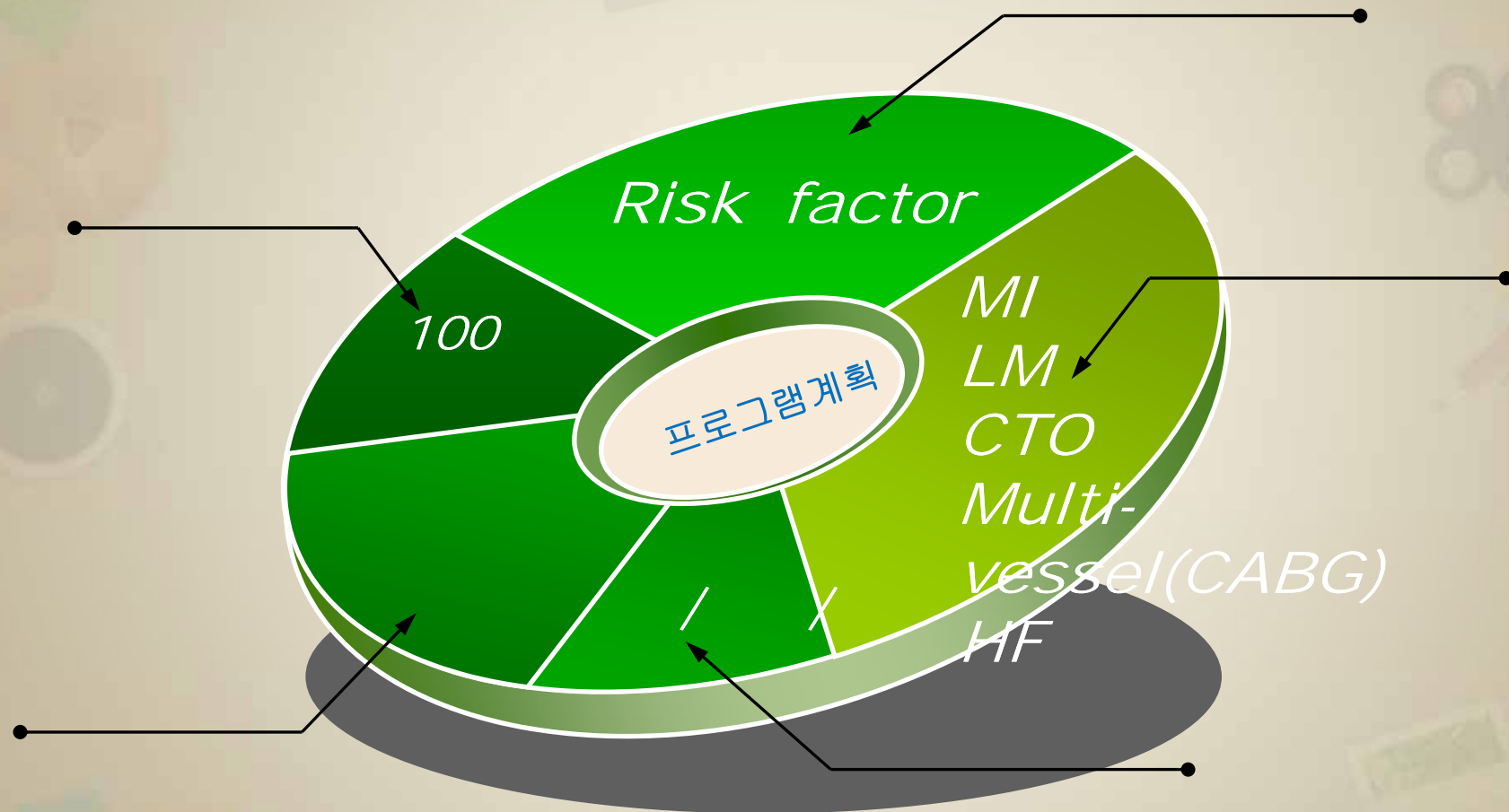


Gayla Oakley, RN, FAACVPR
Program Certification Committee Chair

Flow



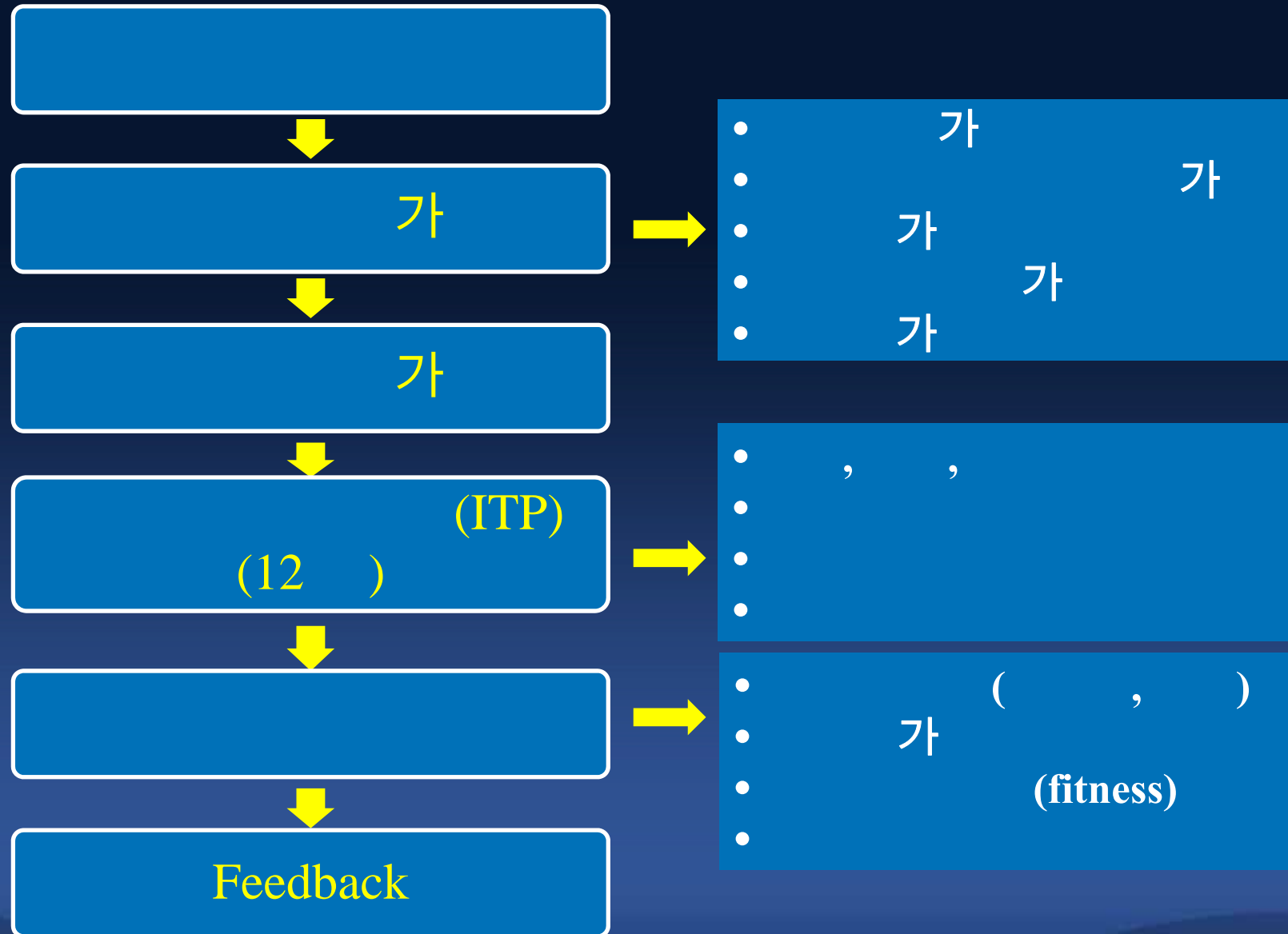
Determinating factor



Basic Program Flow

| | | | | F/U |
|----|-----------------------|----------------------------|-----------|-----------------------------|
| CV | (1 st) | 2 | A~D Model | 14 |
| CS | (1 st CS) | 4 (2 nd CS) | A~D Model | 16 (3 rd CS) |
| HF | (1 st HF) | 4 (2 nd HF) | A~D Model | 16 (3 rd HF) |
| | | | | |

Flow



<

>

| | A model | B model | C model |
|--|---|-----------------------|--------------------|
| | 1. (, , , ,) 2. CAD 가 가 3. 가 4. 5. 가 | 1. , 2. 가 , , 가 | 1. 2. 3. 가 가 |
| | (PCI , ,) | | |
| | 가 (, Stroke / / amputation / /) | | |
| | 12 | 4 (1) 가 | 1 가 |
| | / / / 가 , 가 1 () () 1 - 가 가 , | | |

Classification

| | | | | |
|--------------------------|-----------------------|------------------|------------------|------------------|
| | (12) | | | |
| | A | B | C | D |
| | 24-36 (1 3) | 12 (1 1) | 3 (1 1) | |
| Uncontrolled Risk factor | Very high risk factor | High risk factor | High risk factor | High risk factor |
| PCI / CABG | LM/CTO/Multi-vessel | | | |
| MI | Post MI | | | |
| | , | , | | |
| | | | / | |
| | | , | | / |
| | , | . | - | - |

| | 1 | 2 | | | 3 |
|--|----------------------|----------------|---|--------|---|
| | | 3 | | | |
| | / | 2 ~1 | 2 | 3 | 3 |
| | : 9 ~10 : | | | | |
| | : | , , , | | | |
| | : : : :,PPT | , , , | , | , , , | 가 |
| | | | | 가 | 가 |
| | / | | | | 가 |
| | / | / | / | / | 가 |
| | | | | | |
| | | | | 가 가 | |
| | / | Life Corder | 가 | | |
| | 가 --> | Telemetry , | | | |
| | | , 가 ,1 | | | |

Education



Education and Consulting



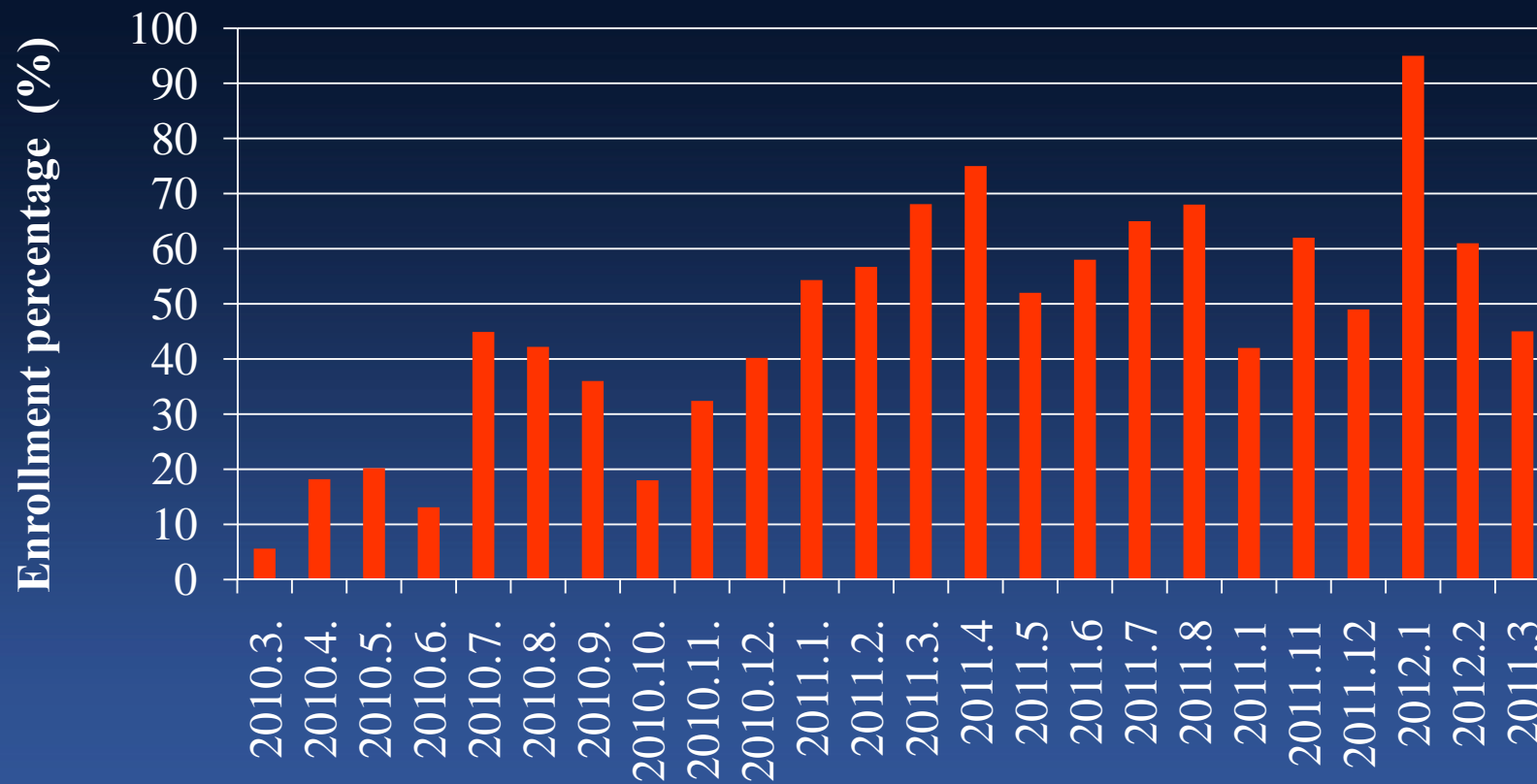
Exercise



ITP

| | <input type="checkbox"/> Low | <input type="checkbox"/> Moderate | <input type="checkbox"/> High |
|--|------------------------------|-----------------------------------|-------------------------------|
| <div> <div> <div>의사기록</div> <div>기본항 환자</div> <div>내메뉴</div> <div>환자명단</div> <div>기록조회</div> <div>전체새로고침</div> </div> <div> <div>Exercise test findings</div> <div> <input type="checkbox"/> No complex ventricular arrhythmias <input type="checkbox"/> No angina or significant symptoms <input type="checkbox"/> Normal hemodynamics <input type="checkbox"/> FC \geq 7METs </div> <div>Non-Exercise test finding</div> <div> <input type="checkbox"/> EF \geq 50% <input type="checkbox"/> Uncomplicated MI / revascularization proc <input type="checkbox"/> No complicated ventricular arrhythmia at rest <input type="checkbox"/> No CHF <input type="checkbox"/> No signs / symptoms <input type="checkbox"/> Absence of clinical de </div> </div> </div> <div> <div>Risk Stratification</div> <div>ITP_Exercise</div> <div>ITP_Nutrition</div> <div>ITP_Education</div> <div>ITP_Psychosocial</div> <div>Exercise Prescription</div> <div>Exercise Log</div> <div>Outcome Assessment</div> <div>Physician Feedback</div> <div>Energy Balance</div> </div> <div> <div>Exercise test findings</div> <div> <input type="checkbox"/> of complex ventricular ia <input type="checkbox"/> of angina or significant at low level of exertion <input type="checkbox"/> el of silent ischemia <input type="checkbox"/> hemodynamics <input type="checkbox"/> sing BP with increasing WR <input type="checkbox"/> exercise hypotension <input type="checkbox"/> e test findings </div> <div> <input type="checkbox"/> of Cardiac arrest eath <input type="checkbox"/> arrhythmia at rest <input type="checkbox"/> ted MI / revascularization e <input type="checkbox"/> of CHF </div> <div> <input type="checkbox"/> Presence of signs / symptoms at rest <input type="checkbox"/> 3vessel or Left main disease <input type="checkbox"/> Clinically significant depression </div> </div> | | | |

Participation



Factors influencing a patient's decision

- Main reasons

distance to the CR center

patient's belief they could handle their own problems

lack of time

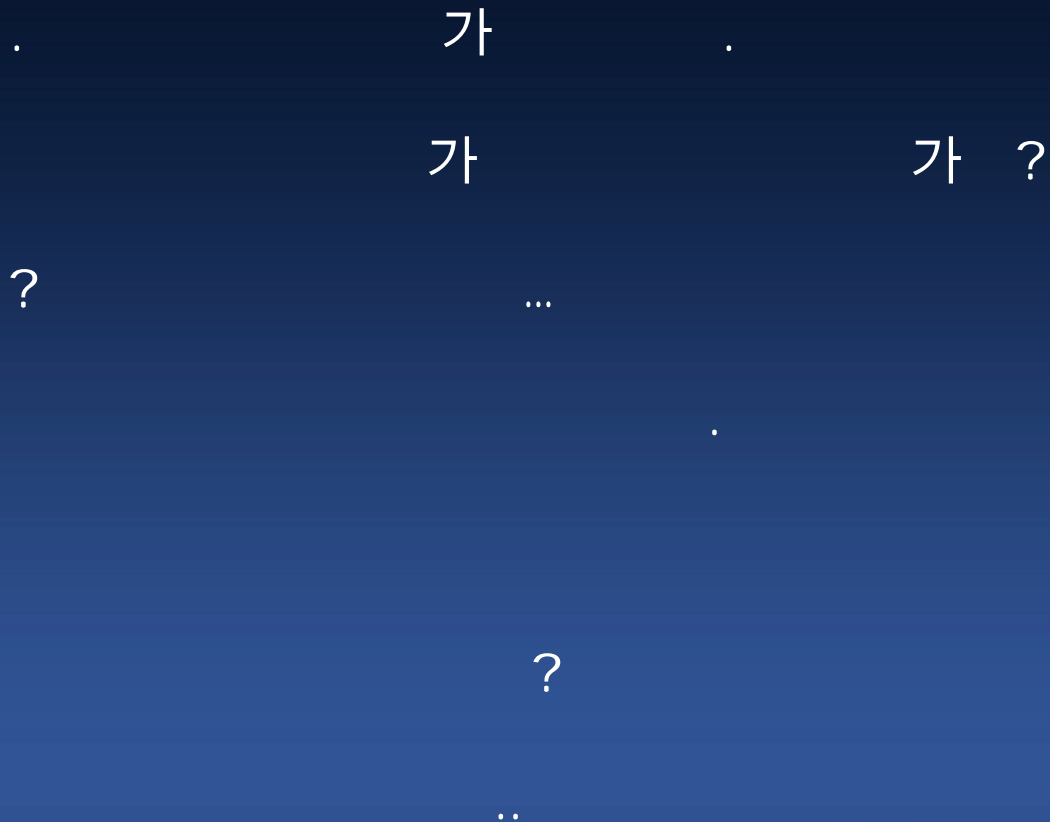
cost of rehabilitation

deficient belief of health providers

- Importance of raising patients' belief they could

Factors influencing a patient's decision

- Asan Medical Center's Experience



Real Achievement Rate

| | CV | | |
|----|-----|-----|-----|
| | A | B | C |
| | 122 | 207 | 596 |
| FU | 93 | 129 | 403 |
| | 76% | 62% | 68% |

| | CS | | |
|----|-----|-----|------|
| | A | B | C |
| | 12 | 6 | 3 |
| FU | 6 | 3 | 3 |
| | 50% | 50% | 100% |

| | HF |
|----|-----|
| | 46 |
| FU | 28 |
| | 61% |

| | Flow | | | |
|------------------|---------------------------------|------|----------------------|--------------------------|
| 2 | Referral | CAG | | -> |
| | Early Assessment | | CR - RN | |
| 3 | Education | PCI | CR - RN | |
| | | | | |
| | | | RN | |
| 5 | Discharge | | | CR |
| | | | RN | |
| 2 | Initial F/U | 2 4 | 4 CES/RN RN | /6 Life corder () |
| | | 1 | CR MD | / |
| 3 ~ | CR Intervention (Ex session) | | CR - RN PD CES | (EMR) |
| | | 3 4 | CR - RN CES RD | |
| | | | | |
| Initial F/U 3 | Second F/U | 12 1 | CR MD | |

Case Report

- M/45
- Present illness :

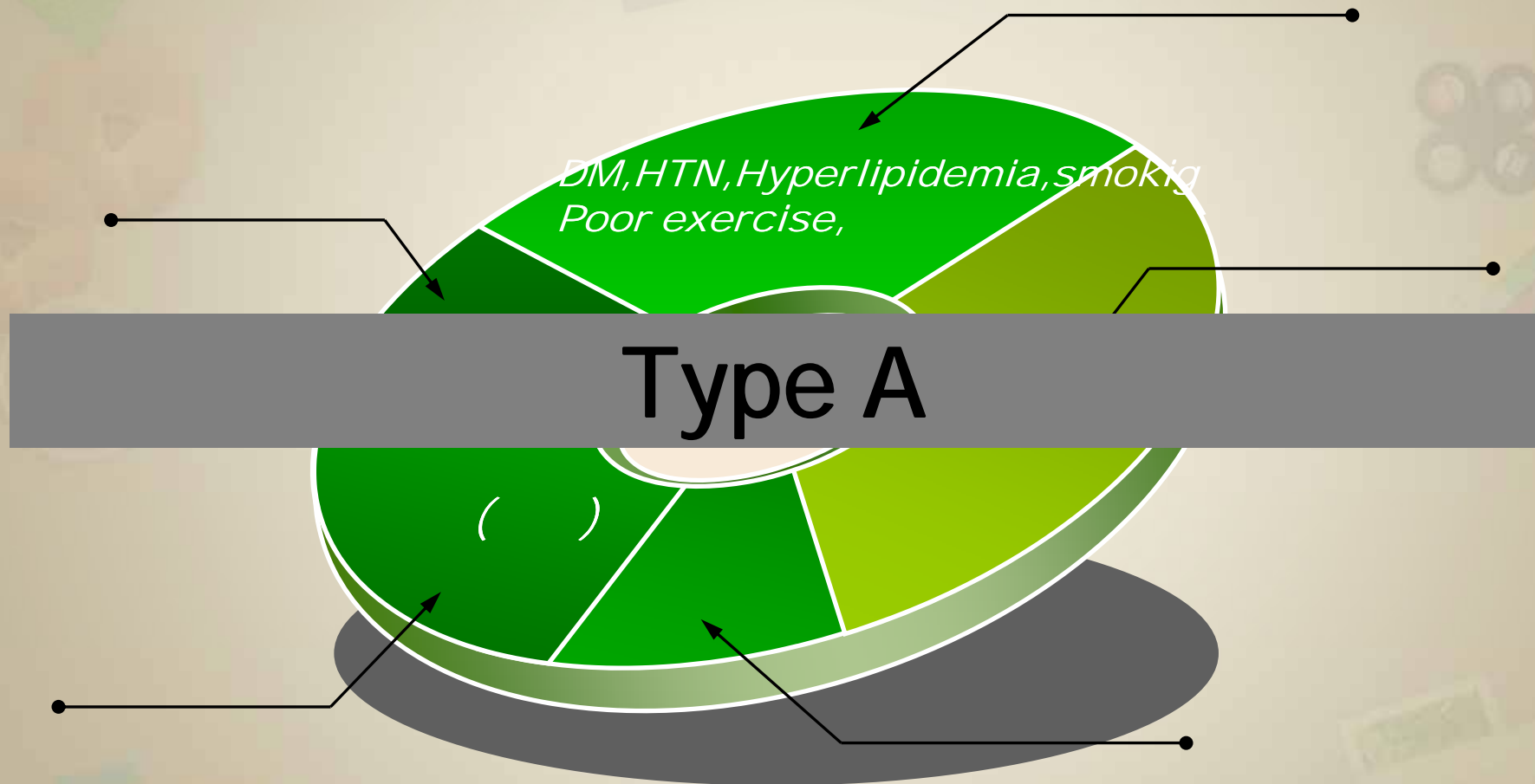
10 1~2 prolonged chest pain
119 cardiac arrest
CPCR STEMI
primary PCI at pLAD with POBA CCU
1 chest pain CAG POBA
site restenosis 7 bare-metal stent (Jo stent
2.5X16) 1
stent site POBA
4 POBA
10

- Risk Factor : DM/HTN/Hyperlipidemia/smoking
Obesity (91Kg 173cm)/Sedentary life ()

Case Report



Determinating factor



Case Report (Outcome)

| Variables | Before | After |
|------------------|---------|---------|
| VO2 max (ml/min) | 1632 | 2742 |
| Body Weight | 91Kg | 72.4 Kg |
| HbA1C | 9.2% | 6.0% |
| T-chol/LDL | 235/128 | 154/79 |
| BDI | 15 | 2 |
| WHOQOL | 67 | 88 |
| Symptom | + | never |

Summary

- Inevitable new wave in Korea
- Really, valuable and necessary action for disease control
- Individualized Treatment Plan (ITP)
- Multidisciplinary team approach
- Shed a light on what we will do for patient
- Just Do It !!!
- Needs enormous effort, dedication, and commitment, but in the end, its benefits are well worth the struggle.