

## Innovation in Delivery of Cardiac Rehabilitation Services

Anne M Gavic, MPA, FAACVPR  
Evanston Northwestern  
Healthcare

## History of CR services

- Exercise conditioning - reversal of de-conditioning
- Telemetry monitoring - added safety - esp in the community setting
- Education regarding CVD
- ?Risk factor assessment and education

Exercise Training

+

Risk Factor and CVD Education

+

? Individualized Assessment,  
Goal setting, Intervention, Follow up

## Benefits of Cardiac Rehab

### Physiological

↑ Exercise tolerance  
↑ Muscle Strength  
↓ Symptoms of angina  
↓ Myocardial Ischemia  
↓ Morbidity / Mortality

Improved:

Body weight  
Lipid profile  
Exercise habits  
Smoking habits

### Psychosocial

↑ Return to Work  
↓ Depression  
↓ Anxiety  
↑ Psychological Well being  
↑ Quality of Life

### Economic

Cost effective?



## Contemporary Cardiac Rehab



- Multifaceted
  - Exercise training
  - Education
  - Counseling
- Multidisciplined
- "...essential component of the contemporary management of patients with multiple presentations of CHD and with heart failure"

Exercise Training

+

Education

+

Individualized Assessment,  
Goal setting, Intervention, Follow up  
(Secondary Prevention)

+

Risk Stratification, Individualized Coaching /  
Counseling to meet goals  
(Case Management)

## Comprehensive CR Program

U.S. Public Health Service definition

Cardiac rehabilitation services are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk factor modification, education, and counseling. These programs are designed to limit the physiologic and psychological effects of cardiac illness, reduce the risk for sudden death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients.\*

U.S. Public Health Service

## Current Health Care Conundrum

- Aging population
- Shift from Acute to Chronic Disease
- Shrinking Health Care Dollars
- Inequity of Access to Care
- Transparency in Health Care Cost and Quality

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## Aging Population

US trends:

- Population  $\geq 65$  will increase from 35 million in 2000 (12.4%) to 71 million in 2030 (19.6%)
- Population  $\geq 80$  will increase from 9.3 million in 2000 to 19.5 million in 2030

## Aging Population

Australian Trends:

- The population of those  $\geq 65$  and over is projected to grow from 2.7 million in 2005 (13%) to over 6.2 million in 2035 (23 %) and to 7.5 million in 2055 (26 %)
- Over the next 20 years the number of Australians who are 70 and over will grow at a rate 3.3 times faster than the total population
- In 2005 1.9 million people were aged 70 and over (9%) This will be over 4.7 million in 30 years (18%)
- In 2005 312,000 people were 85 and over (1.5 %) this will be over 1.6 million in 50 years (65%)

## Aging Population

Impact on Healthcare

- Health care costs for those  $\geq 65$  is 3-5x greater than for those  $< 65$
- Significant pressure on health care and long-term care spending (est. at  $\geq 20\%$  increase)
- *These increases can be off-set if public health interventions decrease disability and prevent disease*

## The Aging Population and Health

In Australia...

### Disability

- A large proportion of the aging population live a healthy life without diseases and disability.
- The prevalence of diseases and disability increases with age.
- The 2003 Survey of Disability, Ageing and Careers:
  - over 81% of those aged 70 and older reported living with a disability vs. 20% for the population as a whole.
- In 2003-04, people aged 70 and older
  - 9 per cent of the population
  - over 27 per cent of hospital separations
  - almost 42 per cent of hospital patient days.

### Public health

- For those Australians 65 years and over, 7 per cent were current smokers; 8 per cent had risky or high alcohol intake; 75 per cent were sedentary or had low exercise levels; 35 per cent had one or less serves of fruit per day, and 82 per cent had 4 or less serves of vegetables per day.
- Being overweight or obese was highest in older Australians between 55 and 64 years of age, compared to all other age groups, at 72 per cent for men and 58 per cent for of women.

## Current Health Care Conundrum

Aging population

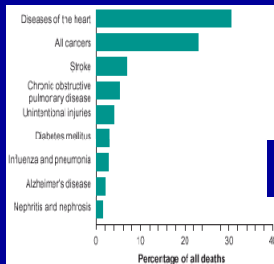
Shift from Acute to Chronic Disease

Shrinking Health Care Dollars

Inequity of Access to Care

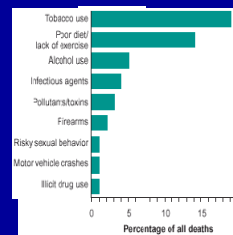
Transparency in Health Care Cost and Quality

## Chronic Disease Prevalence



- Seven of every 10 Americans who die each year, or more than 1.7 million people, die of a chronic disease

## Chronic Disease



- Lifestyle factors contributing to chronic disease

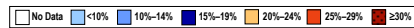
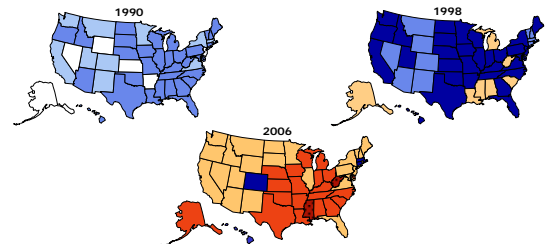
## Poor Dietary Habits Prompts US Surgeon General to Name New Disease!



## Obesity Trends\* Among U.S. Adults

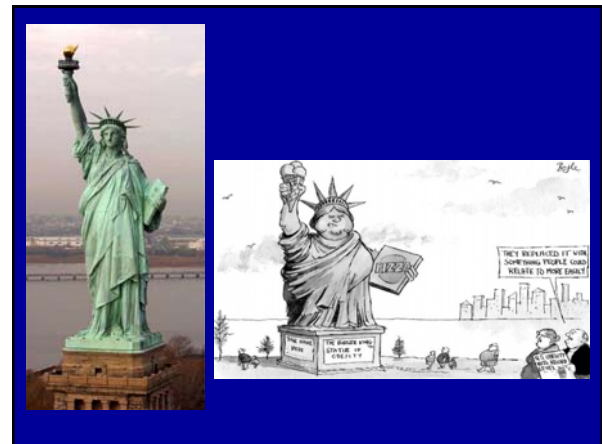
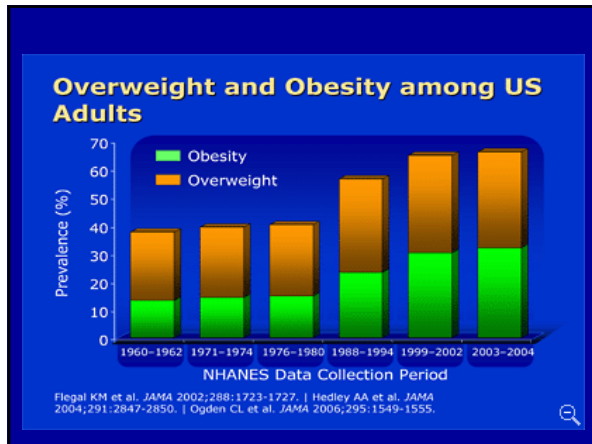
BRFSS, 1990, 1998, 2006

(\* BMI ≥30, or about 30 lbs. overweight for 5'4" person)



Source: CDC Behavioral Risk Factor Surveillance System.





### A Global Crisis

- The increase in overweight and obesity incidence rates in Australia in the past 10 years is distressing. Results of the National Heart Foundations National Risk Factor Prevalence Study showed that in Australia 52% of adult males and 36% of adult females were either overweight or obese in 1998.
- By 2000, the Australian Diabetes, Obesity and Lifestyle study showed that these rates had increased to 68% for males, and 53% for females. That represents a combined increase of over 30%.

### Disease Management

**Definition:**  
Disease Management is a system of coordinated healthcare interventions and communications for populations with conditions in which patient self-care efforts are significant.

From the Disease Management Association of America (DMAA)  
[www.dmaa.org](http://www.dmaa.org)

### Disease Management

Components Include:

1. Population Identification
2. Evidence-based practice guidelines
3. Collaborative practice models to include physician and support-service providers
4. Patient self- management education
5. Process and outcomes measurement, evaluation and management
6. Routine reporting / feedback loop

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## Cost of Chronic Disease

The United States cannot effectively address escalating health care costs without addressing the problem of chronic diseases:

- Chronic diseases account for 70% of all deaths in the United States.
- The medical care costs of people with chronic diseases account for more than 75% of the nation's \$1.4 trillion medical care costs.
- The estimated direct and indirect costs associated with smoking exceed \$75 billion annually.
- In 2001, approximately \$300 billion was spent on all cardiovascular diseases.
- The direct medical costs associated with physical inactivity was nearly \$76.6 billion in 2000.

## Shrinking Healthcare Dollars

- US - In 2005 total national health care expenditures was \$2 TRILLION (16% GDP)
- Expected to reach \$4 trillion (20% GDP) by 2015
- Nearly 47 million uninsured - although greater % GDP spent on health care than countries that provide health care to all of their citizens
- In Australia Health care accounts for 9.5% GDP

## Transparency in Healthcare Costs and Quality

System of performance measures and outcome reports accessible to everyone (payers, public)

Includes:

- Morbidity and mortality rates
- Physician compliance with standards of care
- Charges and reimbursement rates

## Transparency in Healthcare Costs and Quality

- Goal to increase quality and decrease unnecessary costs
- Initiative to promote best practice in caring for patients with chronic illness
- Development of performance indicators which reflect highest quality of care (per diagnosis)
- Reporting loop which shows compliance with performance indicators
- Providers (physicians / hospitals) are incentivized for compliance with performance indicators
- Pay for Performance (P4P)

## Transparency in Healthcare Costs and Quality

- Help providers improve by measuring their performance against others
- Help patients make informed choices
- Encourage payers to reward quality and efficiency (Pay 4 Performance)

## Performance Measures for Treatment of Patients with MI

- ASA at arrival / at discharge
  - Beta blocker at arrival / at discharge
  - ACE or ARB for LV dysfunction
  - Smoking Cessation counseling
  - PCI w/in 90 min of arrival at hospital
  - LDL assessment
  - Lipid-lowering meds at discharge
  - Inpatient Mortality
- ?? CR

ACC/AHA Clinical Performance Measures for Adults With ST-Elevation and Non-ST-Elevation Myocardial Infarction  
JACC 2006;47(1):236-265

## Challenges to CR

- Align with the Disease Management Model
- Maximize participation
- Maintain Cost Effectiveness
- Optimize Quality and Clinical Effectiveness

## Disease Management

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Boone County Health Center  
Atlan, Nebraska



Boone County Health Center  
for Disease Management

Stand Out Feature: Small hospital, rural area...found a niche.

Provide lifestyle counseling to patients outside of CR with CVD risk factors

Success: Added staff to handle volume. Expanding to 4 satellite clinics to make services more accessible



**Stand-out feature: Large academic medical center with Wellness Center: Expanded services to capitalize on CR resources.**

Incorporated CVD risk management - primary and secondary prevention

Case management model with extended follow up

Successes:

Expanded to offer risk screening and intervention to employees

Mobile unit for community screening and follow up'

Church-based community health education via internet

UW Health

### Active Living and Learning Program to Prevent Diabetes

Stand out feature: Intense management of a selected population (Metabolic Syndrome)

Partnered with HMO

Carefully selected patients for optimal success

Contracting for wt loss and exercise goals

Exercise, education, counseling, group support

Successes: Significant improvement in all measured outcomes



Stand out feature:

Project to improve the health of the county  
Multiple partners throughout the community

Simple goals - easy to understand

•5 servings of fruits and / or vegetables / day,

Choose lean meats and low-fat dairy

•30 min of physical activity most / all days

•Tobacco-free lifestyle / zero exposure to

environmental tobacco smoke

•Total chol <200 (LDL <100 if CVD)

•BP <130/85

Simple implementation -easy to achieve

•Choose fresh fruits / veg over fried foods

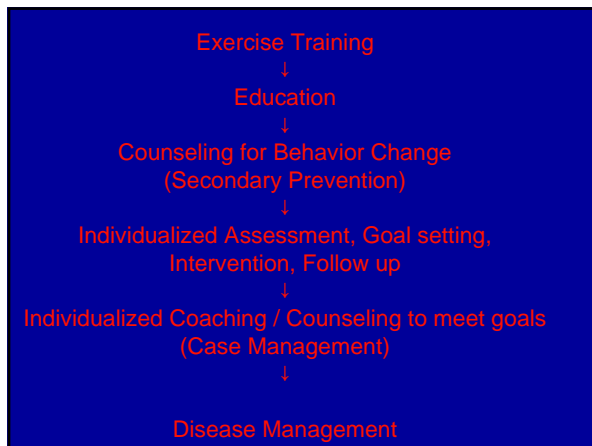
•Take a 30 min walk after dinner

•When you make a dinner reservation,

•Ask if they are smoke-free

•Monitor your cholesterol and BP

<http://cardiovision.org/>



## Challenges to CR

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## Referral to Cardiac Rehabilitation in the US

- Over 1 million survivors of MI and 7 million individuals with angina or revascularization are candidates for Cardiac Rehab
- Only 11-38% participate in Cardiac Rehabilitation
- This does not include the almost 5 million heart failure patients who could benefit from CR participation
- Study of 19 states and the District of Columbia revealed 29.5% overall participation rate

## Referral Rates in England

Only 1 in 7 heart patients receive Cardiac Rehab

Lowest rates 14% SW London  
Highest rates 73% Greater Manchester

3 of 5 patients do not have access to it

2000 British Government target : 85%

## Referral Rates in Australia

Despite the evidence for the benefits of cardiac rehabilitation and ongoing prevention, existing services are under utilised. This reflects both a lack of initial referral and a failure of patients to attend despite having been referred. Referrals should be offered to all patients and the individual needs of each patient, and their family and community, need to be considered.

Cardiac Rehabilitation †04 National Heart Foundation of Australia & Australian Cardiac Rehabilitation Association Recommended Framework for

## Cardiac Rehabilitation Performance Measure Sets for Referral to and Delivery of Cardiac Rehabilitation Program Services

AACVPR/ACC/AHA Cardiac Rehabilitation Performance Measure Sets Writing Committee

Marjorie King, MD, FACC, FAACVPR  
 Karen Lui, RN, C, MS, FAACVPR  
 Neil Oldridge, PhD, FAACVPR  
 Ileana L. Pina, MD, FACC  
 John Spertus, MD, MPH, FACC  
 Randal J. Thomas, MD, MS, FAHA, FACP, Chair

## CR Performance Measures

- Encourage systematic and innovative referral system
- Incorporate CR Performance Measures into other existing Performance Measures (i.e., PM for MI patients)
- Hold physicians responsible for these measures

## CR Performance Measures

### Recommendations:

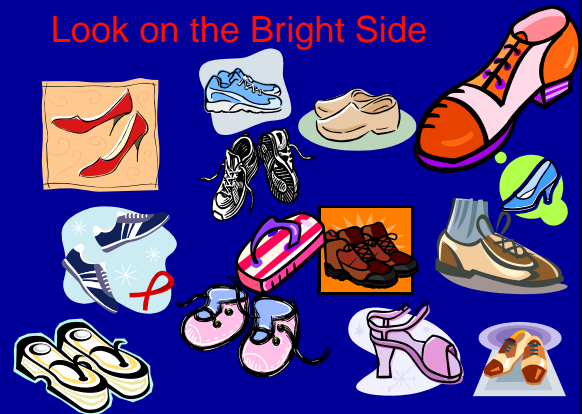
"... all hospitalized patients with a qualifying CVD event are referred to an outpatient CR program by their healthcare provider prior to hospital discharge"

"All outpatients with a qualifying diagnosis who have not already participated...are referred to an outpatient CR program...within that year."

## Enhancing Referrals and Enrollment

- Educate the patients
- Educate the physicians and health care professionals
- Streamline the process
- Increase accountability

## Look on the Bright Side



## Cardiac Rehab Enrollment

- Of those eligible for CR services estimated that < 30% attend
- Reasons
  - Inequity in referral – esp women, minorities, elderly
  - Inaccessible – distance, lack of transport
  - Work conflicts
  - Cost
  - Motivation

## NON-TRADITIONAL DELIVERY

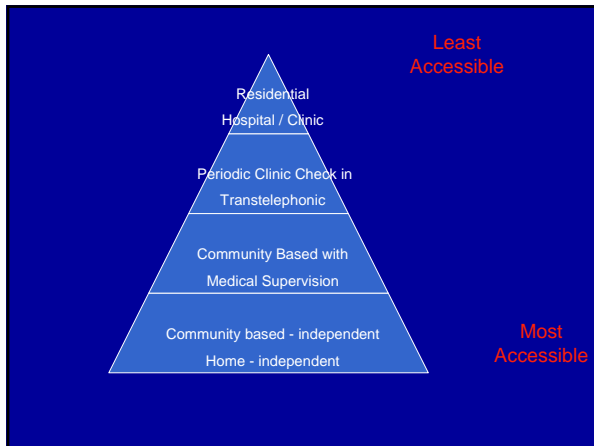
### EXERCISE TRAINING

Independent - Home  
 Community Fitness Center  
 Independent Supervised  
 Transtelephonic  
 Periodic Clinic Checks  
 Hospital / Clinic based  
 Residential

### EDUCATION / COUNSELING

Self-Directed  
 Assigned Educational Modules  
 Self Directed  
 Periodic Scheduled Educational Sessions at Clinic  
 Assigned Modules  
 Internet, Audiovisual  
 With Telephone Counseling  
 Regularly Scheduled Lecture / Discussion at Clinic  
 1:1 Coaching (face to face)





## Considerations for Determining Program Model

<u>Clinical</u>	<u>Physical</u>
Risk Level	Distance
Co-morbidities	Transportation
Severity of risk factors	
<u>Psychosocial</u>	<u>Socio-economic</u>
Motivation	Education level
Self efficacy	Program cost
Level of support	Cultural issues

## Challenges to CR

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## Cost Effectiveness of CR

- Affordable to Patients
- Positive contribution to business
- Evidence of cost savings

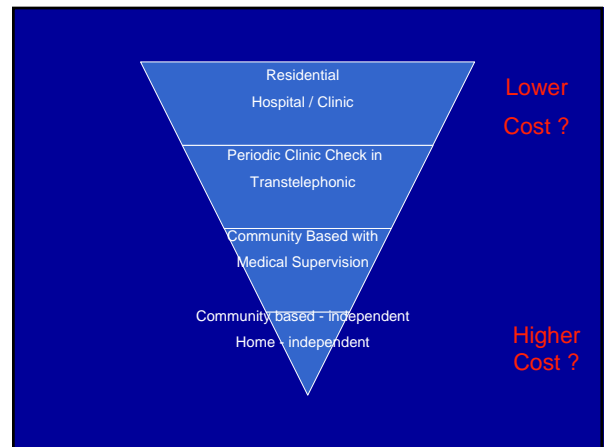
## Cost Benefit of CR

Swedish Study:

- ↓ Hospitalizations
- ↑ Return to work
- ↓ Cost for sick leave

Cost savings at 5 yrs of \$12,000 (US) / year

Cost savings of \$9,200 (US) / LYS (Oldridge)  
\$4,950 (US) / LYS (Ades)



## Challenges to CR

- Align with the Disease Management Model
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## Evidence of program quality and effectiveness

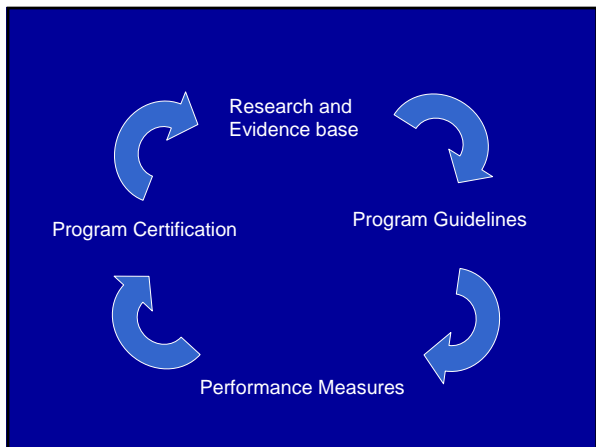
- Quality clinical research
- Evidence-based guidelines
- Benchmark against best practice
- Patient and program outcomes

## Standards and Guidelines

- 1998 - Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The National Heart, Lung, and Blood Institute
- 1999 - AACVPR Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs (3<sup>rd</sup> ed)
- 2000 - AHA Dietary Guidelines Revision 2000: A Statement for Healthcare Professionals From the Nutrition Committee of the American Heart Association  
*Circulation*. 2000; c103:430-435(102)
- 2004 - AACVPR Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs (4<sup>th</sup> ed)
- 2005 - Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure Hypertension. 2003 Dec;42(8):1206-52
- 2005 - Report from the Adult Treatment Panel III Guidelines for the National Cholesterol Education Program  
*Circulation*. 2004;110:227-239
- 2005 - Cardiac Rehabilitation and Secondary Prevention of Coronary Heart Disease: An AHA Scientific Statement in Collaboration With the AACVPR  
*Circulation* January 25, 2005
- 2006 - AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update  
*Circulation*. 2006;113:2363-2372
- 2007 - Core Components of Cardiac Rehabilitation/Secondary Prevention Programs.2007 Update: A Scientific Statement From the AHA in conjunction with AACVPR  
*Circulation* May 22, 2007
- 2007 - Performance Measures for Cardiac Rehabilitation  
*JCRP and Circulation*

## Program effectiveness – Outcomes

- What to measure
- How to measure
- How does it compare to the standard
- How to Improve measures – best practice



## The Challenge

- Cost
- Quality
- Efficacy
- Access
- Innovation

It's all about change

