SHARING CURRENT TRENDS & BEST PRACTICES IN CARDIAC REHABILITATION

Erleena Boey Ghod Chee
Manager
Physiotherapy Dept
IJN
OUTLINE

• Evolution of Cardiac Rehabilitation in IJN
• IJN Experience
  ✓ Transition of CR in IJN
  ✓ Pre-op education
  ✓ Rehabilitation in Transplantation/VAD
  ✓ CR Referrals
  ✓ Maintenance Phase/CRP III
• Conclusion
HISTORY & EVOLUTION OF CARDIAC REHABILITATION

1930s
1940s
1950s
1960s
1970s
1980s
1990s

Journal of Cardiopul Rehab & Prevention 2011
THEN to NOW…

6 weeks bed rest (1930s)

Multidisciplinary & lifestyle modification

Journal of Cardiopulmonary Rehab & Prevention 2011
TRANSITION OF CR from HKL to IJN

Late 1980s

HKL

1992

- CRP 1
- Inpts

1996

- CRP 11
- Outpts

1998

- CRP 11
- Outpts
- Group Exs

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Cardiac Rehabilitation in HKL

- Late 1980s in HKL
  - Cardiac rehabilitation in the ward - mainly cardiothoracic cases
  - Outside ward in corridor
    - Individual/Group exercise
    - Music
    - All age group
EVOLUTION OF CR from HKL to IJN

1992 (Inception of IJN)

- CRP 1
- Inpts

Late 1980s HKL
• Done in the ICU/Ward post-surgery (individual/group)
• Breathing exercises
• Active exercises
• Ambulation
• Home Exercise Program
• Inpatient recovery program (CRP 1): admission to discharge
• Mostly post-surgical cases (auto referral)-services provide equitable access to all patient groups (different socioeconomic status)
• Cardiology cases need referrals

• J Cardiopulm Rehabil Prev 2012 Jan-Feb
• As soon as possible after admission (for surgery)
• Pre-op physiotherapy education (patient & family member)
  ➢ Basic information and reassurance
  ➢ Expectations after surgery:
    1. Mobilisation
    2. Family involvement
    3. Outpatient Cardiac Rehabilitation
Basic Information & Reassurance

• Reassurance and brief explanation of cardiac condition, treatment and procedure
  ❖ Surgical incision
  ❖ Pain-Support (drugs/ non-drug)
  ❖ Effects of anesthesia on the respiratory system
  ❖ Breathing exercises
  ❖ Sleeping positions
  ❖ Getting in and out of bed
Inpatient CR

• Inpatient activity (mobilisation) program
• Wound care
• Integrating information provision, reassurance and support for patient and family as part of routine daily care …together with other disciplinary team members
• Mobilisation program:
  ➢ Active exs in bed (ICU & Wards): prevent Deep vein thrombosis & Pulmonary embolus
RESPIRATORY THERAPY

Incentive Spirometry

Breathing exercises

Steam Inhalation

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- Ambulation- in icu/ward
- Active exs out of bed
- Stair-climbing
- Diet counseling
- Prescribed exs before discharge
ROLE OF SPOUSES & FAMILY MEMBERS

- Ability to cope with initial crisis and subsequent recovery period have positive/negative influence.
- At worst spouses hamper progress and create dependency.
- At best they enhance rehab. and can influence successful adaptation to new active lifestyle.
- To be considered and involved at all stages of rehabilitation.

Skelton & Dominian – 1973
Bramwell & Whall – 1986
Hilbert – 1993
FAMILY INVOLVEMENT IN CR

Significant aspect in patient rehabilitation

▪ Encourage and support family participation
▪ Establish open and honest communication

Family Education

Objective: Ensure next of kin does not feel ‘being left out of the picture’ or solely responsible for patient’s care

Scand J Caring Sci 2012
Physiother Res Int 1996
IMPACT ON THE CAREGIVER

• Period of grief due to loss or temporary loss of function
• Change of family roles – breadwinner
• Adjust work schedule
• Financial problems
• Living arrangements
Assisting the Caregiver

Aim: Reduce adverse effects of ‘disability’ on the family

- ‘Buy-in’ to rehabilitation program
  1. Educate on cause and effect of the illness; lifestyle modification
  2. How to recognize and prevent potential complications
  3. Medications, side effects and functions (e.g. on exs)
  4. Exercise program and its progression
  5. Diet counseling
  6. ‘Best Fit’ Nursing- ‘nature’, ‘being available’, ‘being attuned to patient’s individual needs’ (J Adv Nurs 2012)
Increased physical activity, education and counseling of the child and family and reduction of morbidity and mortality are major goals of a comprehensive rehabilitation programme for children.

(\textit{WHO Technical Report Series :831 pg. 37})
EVOLUTION OF CR from HKL to IJN

1996
- CRP 11
- Outpts

Late 1980s
HKL
CR IN 1996-1998

- Inpatient and outpatient
  - Individual basis
  - Ward- cubicles, lounge, roof top
  - Gym
Patients with Implantable Cardioverter-Defibrillator

- Seen in the ward briefly
- Limit shoulder abduction and flexion to 90 degrees for 4-6 weeks

Rehabilitation /Supervised Exercise Program
1. Improve physical fitness
2. Establish a ‘confidence to exert’ without the impending fear of possible shock or delayed professional intervention

Lewin et al Heart 2009
Belardinelli et al European Journal of Cardiovascular Prevention & Rehabilitation 2006
Vanhees et al European Heart Journal 2004
A Fitchet et al Heart 2003
F. Sarah et al J of Cardiopul Rehab & Prevention 2009
Work-up – Heart Failure

• Pre-transplant
  ❖ Lung Function Test
  ❖ 6 minute walk test
  ❖ Home Exercise program
  ❖ Expectations from patient: importance & compliance to exercise post transplant
  ✓ Respiratory
  ✓ Physical
TRANSITION OF CR from HKL to IJN

1998
- CRP 11
- Outpts
- Group Exs
Closely Based on WHO recommendations

- Integral component of the long-term comprehensive care of cardiac patients
- Available to all patients with cardiovascular disease, both children and adults
- Provided by trained health professional
- Integrated into existing health care system at modest cost
- Run by designated health professional and responsible to a physician

- Low Cost, Low Technology, Multifactorial program of exercise, education and support
1st CRP Phase II

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Cardiac Rehab Phase II in IJN Today
Benefits

- Improving exercise capacity in lung transplant recipients *(J of Heart & Lung Transplantation, May, 2010)*
- Improved emotional well-being, lower anxiety rates in VAD patients *(J of Heart & Lung Transplantation, Nov 2001)*
- Restoring BMD in heart transplant recipients *(J of Heart & Lung Transplantation, Oct 2003)*
Cardiac Rehabilitation Phase II

- Interval training
- A few stations
- Monitoring of Heart Rate/Exertion Level

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• Post-surgical cases e.g. CABG, valve op,
• Percutaneous Coronary Interventions
• Myocardial Infarct
• Heart Failure (listed for transplant)
## Daily Activities - Lifting

<table>
<thead>
<tr>
<th></th>
<th>HEART ATTACK</th>
<th>CARDIAC SURGERY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAN</strong></td>
<td>Up to 4 weeks: 5 – 10 kg</td>
<td>1 – 6 weeks: 1 – 5 kg</td>
</tr>
<tr>
<td></td>
<td>4 – 6 weeks: 10 – 15 kg</td>
<td>6 – 12 weeks: maximum 15 kg</td>
</tr>
<tr>
<td></td>
<td>&gt; 6 weeks: 15 kg or more if comfortable</td>
<td>4 – 6 months: gradually back to heavy manual job</td>
</tr>
<tr>
<td><strong>WOMAN</strong></td>
<td>Up to 4 weeks: 3 - 5 kg</td>
<td>1 – 6 weeks: 1 – 3 kg</td>
</tr>
<tr>
<td></td>
<td>4 – 6 weeks: 5 – 7 kg</td>
<td>6 – 12 weeks: maximum 10 kg</td>
</tr>
<tr>
<td></td>
<td>&gt; 6 weeks: 10 - 15 kg or more if comfortable</td>
<td>4 – 6 months: gradually back to heavy manual job</td>
</tr>
<tr>
<td></td>
<td>Pushing an object: 3 X weight of object patient is allowed to carry</td>
<td>Pushing an object: 3 X weight of object patient is allowed to carry</td>
</tr>
</tbody>
</table>
BRIDGE TO TRANSPLANTATION - VAD

Cardio workout on treadmill

Resistance training

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PATIENT ON VAD

Resistance exercises for lower limbs

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Ventricular Assist Device
Exercise rehabilitation initiated early after transplantation increases capacity for physical activity and hence quality of life.


Squires, R.W. (1990) – Exercise training can improve maximal oxygen uptake and physical work capacity
HEART & LUNG TRANSPLANT

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Aim: To increase muscular mass and bone density (the loss as a result of pre-transplant deconditioned state and the use of immunosuppressant drugs).

Braith, R.W. et al 1997 - Resistance exercise is Osteogenic and should be initiated early after heart transplantation
Braith, R.W. et al 2000 – Resistance exercise training can restore bone mass density in HTR
HEART TRANSPLANT
What do we want to achieve?

Malaysian Transplant Games

Nancy, France 2004

World Transplant Games

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PATIENT EDUCATION

- Cardiologist
- Psychologist (Visiting)
- Physiotherapist/Exercise Physiologist
- Cardiac Nurse
- Dietician
- Pharmacist
- Diabetic Counselor
- Quit Smoking Counselor
CARDIAC REHABILITATION

PHASE II

- Modern Comprehensive Care plan
- Group Activity
- Education
- Behavioral modification
CORE COMPONENTS OF CR PROGRAM

- Diabetes management
- Patient assessment
- Psychosocial management
- Weight management
- Blood pressure management
- Nutritional counseling
- Exercise Training
- Tobacco cessation
- Physical Activity counseling
- Lipid management
BENEFITS OF CR

- CR after PCI Lowers Mortality
  - Message: “PCI is not a cure for CAD. Rehabilitation is important and provides significant benefits
    - Goel K. et al., Circulation 2011

- Cardiac Rehabilitation Outcomes. Impact of Comorbidities and Age
  - Listerman J. et al, Journal of Cardiopulmonary Rehabilitation and Prevention

- Effects of Exercise Training on Health Status in Patients with Chronic heart Failure (HF-ACTION Randomized Controlled Trial)
  - Flynn K.E. et al, JAMA 2009
Can a 4 week CRP Improve Fitness and Functional Capacity?

- 6 Minute Walk Test Distance Before and upon completion of Program
- Max Heart Rate method used to calculate Target Heart Rate
- Exs prescription set at a maximum of approx. 75%
- Results of the 6 MWT converted to estimated MET’s for analysis
## Study Results

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cardiology n= 21</th>
<th>Cardiothoracic n= 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>54 +/-2</td>
<td>56 +/-2</td>
</tr>
<tr>
<td>% Male</td>
<td>18 (86%)</td>
<td>17 (81%)</td>
</tr>
<tr>
<td>Mean body wt</td>
<td>83.8kg</td>
<td>65.4kg</td>
</tr>
<tr>
<td>Mean distance difference from pre &amp; post CRP II</td>
<td>85 meter</td>
<td>85 meter</td>
</tr>
<tr>
<td>Mean estimated MET difference from pre &amp; post CRP II</td>
<td>0.55 MET</td>
<td>0.65 MET</td>
</tr>
</tbody>
</table>
Change in 6MWT after a 4 week CR program in IJN?

Mean
Pre=432m
Post=531m
Estimated METs Pre & Post CRP

Mean METs
Pre=4.0
Post=4.6
Cardiac Rehabilitation can reduce Heart Disease mortality by 40-50%. Despite its proven benefits, cardiac rehabilitation programs are substantially underutilized........
LOW REFERRALS FOR CR

• Global issue
• Poor physician endorsement despite well-established benefits of CR

➢ Patients more likely to listen to a doctor: need to believe and reinforce the value of CR, hence higher attendance and adherence rate.

➢ Cost/Insurance
➢ Transportation

Heartwire 2011
Factors Influencing Enrollment in a CR Program

- No suitable CRP nearby: 72.4%
- Job commitments: 51.7%
- Lack of Interest: 37.1%
- Health not good enough: 42.2%
- Lack of encouragement: 40.5%
- Dislike classes/hospital: 35.3%
- Too old: 30.2%
- Depression: 28.4%
- Too fat: 25.9%
- Too shy/embarassed: 21.6%
- Disability prevent enrollment: 19%
- Not the sporty type: 17.2%
- May not enjoy: 16.4%
- Fear of getting injured: 10.3%
- Reluctance to change in lifestyle: 2.6%

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# Impact of CR by Healthcare Providers on Patients

<table>
<thead>
<tr>
<th>Perception towards CRP Team</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Role of CRP:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have been explained</td>
<td>62</td>
<td>53.4</td>
</tr>
<tr>
<td>Not been explained</td>
<td>54</td>
<td>46.6</td>
</tr>
<tr>
<td><strong>Explained by:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>12</td>
<td>0.3</td>
</tr>
<tr>
<td>Cardiac nurse</td>
<td>10</td>
<td>8.6</td>
</tr>
<tr>
<td>Dietician</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Psychologist</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>36</td>
<td>31.1</td>
</tr>
<tr>
<td>Has most positive impact:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>42</td>
<td>36.2</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>15</td>
<td>12.9</td>
</tr>
<tr>
<td>Cardiac nurse</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>Dietician</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Psychologist</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
RECRUITMENT OF PATIENTS

IJNI Physio Dept., (Jan-June 2012)

85%

6%

9%

- Physiotherapists
- Doctors
- Cardiac Rehab Nurses

No. of new referrals: 85
No. of Patients Recruited for CRPII in IJN

- 1998: 61 patients
- 2000: 91 patients
- 2002: 37 patients
- 2004: 55 patients
- 2006: 110 patients
- 2008: 184 patients
- 2010: 169 patients
- 2012: 220 patients

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Patients enrolled for CRP II from Jan-June 2012

- CABG: 38
- Post Angiogram/Angioplasty: 4
- Valve: 2
- Others: 41
No. of Post-CABG Patients Recruited for CRP II (Jan-June 2012)

- Total No. of CABGs done: 622
- No. of pts recruited: 38 (6%)
Percentage of Cases referred for CRP II against Number of Operations

Physio Dept., IJN (Jan-June 2012)

- 90% of Total CABG, Valves, Combined (n=992)
- 9% of Total No of cases referred (n=85)

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ADHERENCE RATES FOR CR in IJN (Jan – June 2012)

No. of Sessions

No. of Patients

Percentage

Sessions

74%

63

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Women vs Men
Referrals for CR

• Women less likely to be referred & less likely to attend
  ➢ Married females < married males
  ➢ Old age
  ➢ Obesity
  ➢ Family obligations
  ➢ Greater co-morbidity
  ➢ Less available social support
  ➢ Lower initial exercise capacity

• Journal of the American College of Cardiology 2008
  • Heart 2005
PERCENTAGE OF MEN/WOMEN RECRUITED FOR CR IN IJN (Jan-June 2012)

GENDER DISTRIBUTION

- Male (n=75)
  - 11.70%
- Female
  - 88.20%
Completion of Program

Number of Males: 75
Number of Females: 10

Completed Males: 20
Completed Females: 10
IS THIS THE BEST PRACTICE?

• Currently no national guidelines
• Guided by evidence-based practice
• Structured to WHO recommendations
  ❖ Integral component of a long-term comprehensive care of cardiac patients
  ❖ Available to all patients with CVD, both children and adults
  ❖ Provided by trained health professionals
  ❖ Participation by patients and families
  ❖ Integrated into existing health care system at modest cost
….we (IJN) have taken one extra step…..
• Introduced in 2011
• Target population
  ✓ Established heart disease with an event & hospitalization or intervention
  ✓ With risk factors: high cholesterol, hypertension, diabetes, obesity, sedentary, smokers but who have not yet been diagnosed with cardiovascular disease
Entrance Standards (CFP)

- Physician referred
- Medical screening and assessment
- Risk stratification to determine high or low risk
- Consultation/Counseling
CFP - RISK STRATIFICATION

Counseling on Exercise

6 Minute-Walk Test

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CARDIO FITNESS PROGRAM

CUSTOMIZED PERSONAL TRAINING

03/11/2012
Tailored to Personal Functional Capacity
CONCLUSIONS & FUTURE CHALLENGES OF CR

- CR /secondary prevention programs have proven to be instrumental at reducing morbidity and mortality and enhancing the physical and emotional well-being in individuals with CHD. CR is an integral component of cardiovascular care.
Increase CR utilization - encouragement by physicians and healthcare providers. Advocate change in lifestyle

Optimal duration of rehabilitation

Taking the program beyond hospital set-ups – access ‘hard-to-reach’ patients
THANK YOU