How to Improve Compliance of Patients with Cardiac Rehabilitation

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The Influence of Cardiovascular Disease

• Heart diseases remain as a first cause of mortality in the world.

• Cardiovascular diseases (CVDs) account for >17 million deaths globally each year (30% of all deaths), 80% of which occur in low-income and middle-income countries, and this figure is expected to grow to 23.6 million by 2030.

Medicines: Take medicines as doctors order.

Exercise: Doing exercise as the exercise prescription suggested.

Diet: Low energy, low fat, low salt, and low cholesterol.

Psychosocial: Stress management.

Behavior: Living with a good behavior.
Cardiac rehabilitation (CR), including drug therapy, exercise, risk factor management and behavior intervention, can significantly
- Reduce cardiac symptoms
- Improve functional capacity
- Enhance psychological well-being
- Decrease the risk of further cardiac events

However, the participation rate of CR is very low, especially in hospital-based CR programs.

Uptake of Cardiac Rehabilitation

• In New Zealand, uptake of CR is only 20% with high levels of dropout after enrolment.

• International data show that adherence with exercise recommendations is low; between 10% and 36% of individuals dropout of supervised exercise programs.

• Long-term exercise adherence is worse, with up to 50% of people not participating in regular exercise at 6 and 18-months.

Barriers of Cardiac Rehabilitation

Introduction

Barriers to adherence to a CR program can be classified as three categories.

1. Time conflicts
2. Lack of motivation
3. Reluctance to change lifestyle
4. Depression
5. Transportation
6. Lack of support from the family

1. Fewer referral from cardiologists
2. Fewer well-trained CR staff
3. Heavy workload of doctors

1. Difficulties with accessibility of programs
2. Little insurance coverage

Alternatives of Cardiac Rehabilitation

Many alternatives can offer different choices and encourage participation.

Cardiac Rehabilitation Process

Cardiac Rehabilitation Centre

- Treadmill test, CPET
- Exercise, diet, Risk factors...

Assessment

- Medical files
- Individualized treatment
- Real-time monitoring
- Data analysis

Rehabilitation

Out-patient rehab

- Remote communication
- Remote direction

Home-based CR

Cardiac Units

Patients

Cardiologist

Doctors

APP for Patients

Remote monitoring

2016/11/3
# Rehabilitation Protocol

<table>
<thead>
<tr>
<th>PHASE</th>
<th>PRE-OP</th>
<th>PHASE 1</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
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<tbody>
<tr>
<td>STAGE</td>
<td>Pre-rehab</td>
<td>Acute</td>
<td>Recovery 1</td>
<td>Recovery 2</td>
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<tr>
<td>FACILITY</td>
<td>Ward</td>
<td>ICU</td>
<td>Ward</td>
<td>Ward or clinic</td>
</tr>
<tr>
<td>GOAL</td>
<td>Evaluate and increase functional condition</td>
<td>Pulling up breathing tube earlier, out of bed, increase ADL</td>
<td>Prevent poor posture, increase exercise capacity, improve ADL and prepare to return to society</td>
<td>Increase cardiopulmonary function, improve quality of life</td>
</tr>
<tr>
<td>MAIN CONTENTS</td>
<td>Pre-op evaluation, function training, education</td>
<td>Post-op evaluation, pain/airway/complications management, breathing training, Passive/assisted/active activity, ADL training, 15-20m/day walking</td>
<td>Clinical &amp; function &amp; psychical evaluation, posture adjustment, resistance training, ADL, 50-200m/day walking</td>
<td>Clinical &amp; function &amp; psychical evaluation, exercise testing, exercise prescription, health education, risk factors, medication, diet direction</td>
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Education

• Education should be set as the first step of CR program and carried out throughout the entire process.

• The courses include
  • Brief introduction of disease
  • Drug therapy
  • Risk factor management
  • The benefits and potential risks of CR

• Patients, family members, care givers and healthcare professionals are candidates of those courses.

Pre-op Education
(Breathing and coughing techniques)

Breathing training

Cough training
Pre-op Education
(Introduction of ICU circumstances)

Solution 2

- Swan - Ganz catheter
- CVP
- iv
- Arterial BP monitor
- Intubation
- Temperature
- HR, BP, SaO₂
- Chest tube
- Urinary catheter
- Pace maker
- Psychological support

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Pre-op Education (Introduction of heart disease)
Solution 2

Post-op Education
(Introduction of anticoagulation management)

關注抗凝，關心心脏
掌握人生的每一步
-----瓣膜置换术健康指南

广东省人民医院
心脏康复区
What is included in the CR manuals?
In order to increase the referral from cardiologists, it is necessary to teach cardiologists about the associated knowledge of CR, such as its benefit, mechanisms, indications, contents and so on.

Referral by a cardiologist has been shown to improve uptake.
Counseling Programs

• Counseling programs can serve to those patients
  ✓ Who have any questions during the CR program
  ✓ Who don't have knowledge of CR but want to attend.

• It helps patients have better understanding of CR and increase the compliance.
• People, who are living in groups, are more likely to do work in a group.
• During the group training, patients tend to
  ✓ Discuss about benefits of CR program
  ✓ Increase the motivation of CR participation
• Therefore, group training is considered as a good way to increase patients' compliance.
Solution 4

Group Training
Home-based CR Programs

• Home-based CR programs overcome the drawbacks of center-based CR programs.

Home/community-based CR VS. center-based CR

✓ Modifiable coronary risk factors: no difference
✓ Mortality (cardiac and overall): no significant difference
✓ Cardiac events: no difference
✓ Withdrawal rate: home-based CR < center-based CR
✓ Adherence to CR: no obvious difference
✓ Cost and health service use: Community-based CR < Centre-based CR

• With the application of remote devices, portable tools and internet, home-based CR programs become safer and more popular.

Abell B. Open Heart 2016: 3(1):e000374.
Remotely Delivered Exercise-Based CR

Solution 5

Remote Monitoring Device Enhances Safety

Heart rate and other ECG signal monitoring equipment
Follow up

- Community and long-term follow up is also essential.
- CR team should tell patients to continue the CR program after discharge, and connect them to the community or social service.
  - Cardiologists follow-up clinic
  - Physical/occupational therapy counseling
  - Dietitian/psychologist counseling
  - Regular monitoring of exercise capacity, quality of life and other parameters
Patients with cardiovascular disease can benefit from CR, but the compliance of patients with CR is very low. There are several reasons for the low participant rate and high dropout rate. Alternatives to improve compliance of patients with CR include education, CR manual, counseling programs, group training, and home-based CR programs.
Thank you
Q & A

Our Team @ 2016