

Difficulties with Exercise Prescription in ACHD



Lynda Shaughnessy
Clinical Nurse Specialist in
ACHD/Transition

Physicians in Ancient Times

“eating alone will not keep a man well; he must also take exercise” *Hippocrates (460-370BC)*



Air; Food and Drink; Sleep & Waking; Motion & Rest; Excretions & Retentions; Passions of the Mind. These 6 things performed in moderation would keep a man healthy. *Galen (129-210AD)*



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Exercise Prescription

Exercise prescription in adults with congenital heart disease: a long way to go

L. Swan, W. S. Hillis

99 patients 57 men 42 women with ACHD

44% assumed all exercise safe

30% given prohibited advise on exercise

19% encouraged to perform exercise

61% involved in some exercise

Barriers:

32% Symptoms

24% Lack of interest

16% Health fears



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Exercise Knowledge

A simple screening method of determining knowledge of the appropriate levels of activity and risk behaviour in young people with congenital cardiac conditions

Kendall, L., Parsons, L., Sloman, O., Lewis, P. Cardiologists in the

253/258 (98%) studied by questionnaire:

47% incorrect in their belief about advised level of exercise

6.7% potentially dangerous overestimation of exercise

Asked if they wanted advice about exercise:

37% Yes

17% Maybe

46% No



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Exercise Physiology

Exercise Intolerance in Adult Congenital Heart Disease

Comparative Severity, Correlates, and Prognostic Implication

ACHD subgroups were categorised by condition:

- Exercised capacity depressed in ACHD pts (even in asymptomatic patients)
- As well as cardiac anatomy, lack of HR response to exercise, PAH, impaired pulmonary function are important correlates of exercise capacity
- Impaired exercise capacity is associated with increased risk of hospitalisation or death.

Peak Oxygen consumption (VO_2) should be part of the routine assesment of ACHD patients.



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Congenital Heart Disease

Abnormal Ventilatory Response to Exercise in Adults With Congenital Heart Disease Relates to Cyanosis and Predicts Survival

- Abnormal ventilatory response to exercise was seen across all ACHD cohort and was the strongest exercise predictor of death in non-cyanotic patients.

Previously ACHD pts have not been encouraged to take regular physical activity and as a result many led a sedentary lifestyle.

Lower exercise capacity in otherwise healthy subjects is known to predict poor outcomes.

In acquired heart disease it is known that regular exercise can improve the ventilatory response to exercise on CPEX.

Therefore the authors hypothesise that low-grade physical activity should be discussed and encouraged with ACHD patients.



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Exercise Prescription

Exercise Testing and Prescription in Patients with Congenital Heart Disease

Chronotropic incompetence is related to higher NYHA class

77% of ACHD pt in NYHA Class I

100% of ACHD pt in NYHA Class III & IV

Fail to achieve the National guidelines for physical activity in the Netherlands

Exercise training should be adapted to the specific lesion and to functional result on CPEX

2-3 x per week exercise regimes with intensity of between 60-80% of Peak HR has been shown to improve exercise ability.

Also improved self esteem, behavioural & emotional state.



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3.4.2 Exercise and sports

Recommendations for exercise and sports need to be based on: patient's ability, the impact on underlying haemodynamics, and the risk of acute decompensation and arrhythmias.

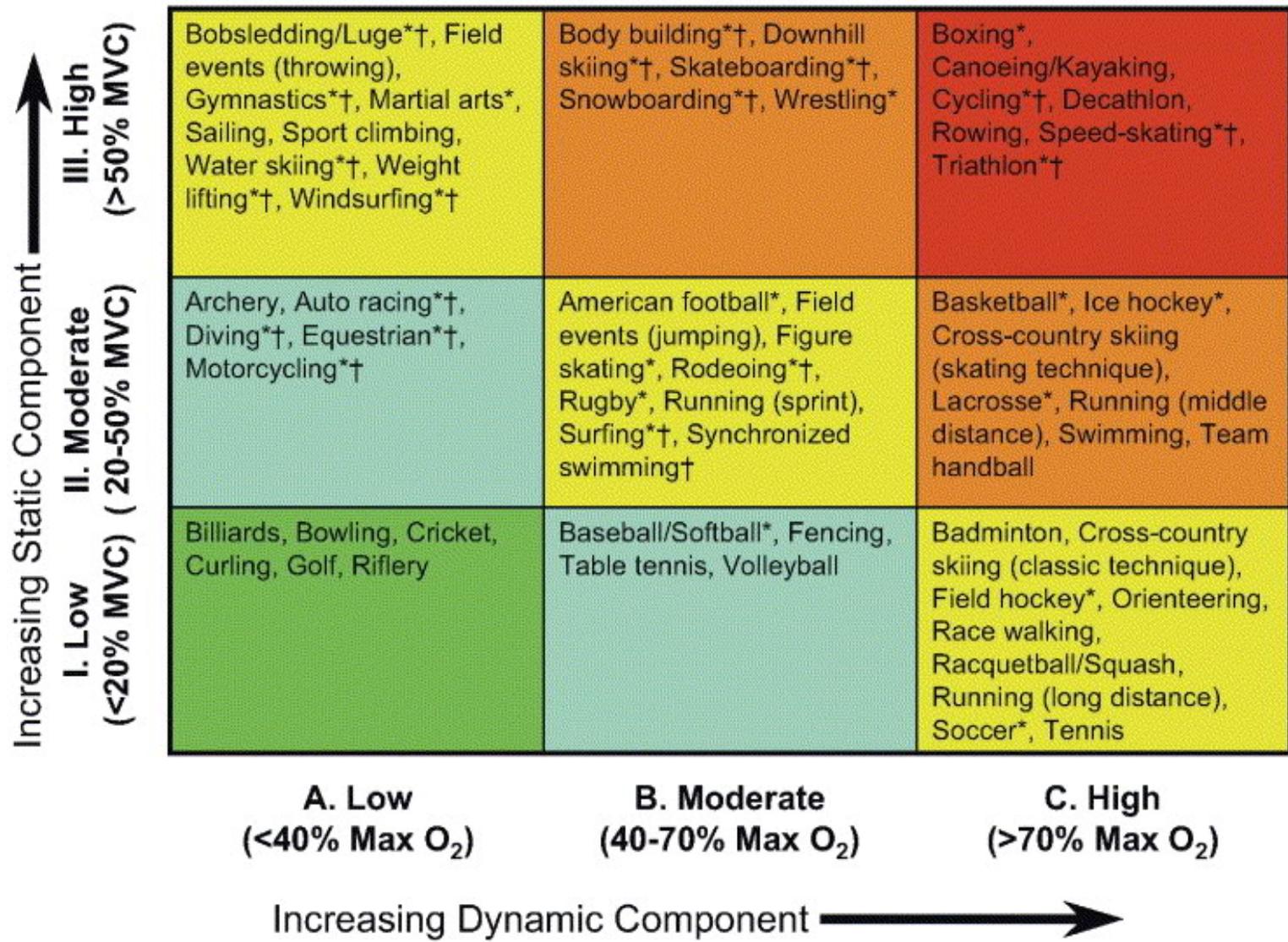
Counselling should be based on the type of sport and the anticipated effort levels.

Formal testing is invaluable and, in general, physicians have been over-conservative in their advice. Participation in regular exercise has a well documented benefit for fitness, psychological well-being, and social interaction, as well as having a positive effect on the future risk of acquired heart disease.

As a general recommendation, dynamic exercise is more suitable than static exercise. In patients with known cardiac conditions, sudden death during exercise is very rare.

Some lesions are not compatible with competitive sports, due to their morphological severity/complexity and tendency to serious arrhythmias, including Eisenmenger syndrome, PAH, UVH, coronary artery anomalies, Ebstein's anomaly, and ccTGA and TGA repaired by atrial switch or Rastelli procedure.





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Task Force 2: Congenital Heart Disease

Untreated ASDs:

- Small ASD – Normal Right Heart Volumes – No PAH – Can do all competitive sports
- Large ASD – Normal PAP – Can do all competitive Sports
- ASD – mild PAH – Can do low intensity sports
- Cyanotic with right to left shunt – No competitive sports
- Symptomatic atrial/ventricular tachyarrhythmia / Mod to severe MR – should have formal exercise screening to aid advise.

ASDs closed by Interventional Catheter:

- 3-6 months after the procedure patients can participate in all sports unless the following are present:
 1. PAH
 2. Symptomatic atrial/ventricular tachyarrhythmias / 2nd or 3rd degree heart block
 3. Evidence of myocardial dysfunction.



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Task Force 2: Congenital Heart Disease

Thomas P. Graham, JR, MD, FACC, *Chair*

Postoperative arterial switch for TGA Only limited exercise data are available.

1. Athletes with normal ventricular function, normal exercise test, and no atrial or ventricular tachyarrhythmias can participate in all sports.
2. Athletes with more than mild hemodynamic abnormalities or ventricular dysfunction can participate in low and moderate static/low dynamic competitive sports, provided that their exercise test is normal.



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Task Force 2: Congenital Heart Disease

Thomas B. Graham, Jr. MD, FACC, Chair

Postoperative Fontan operation

Although many patients improve clinically after the Fontan operation, they usually have limited exercise capacity and reduced cardiac output at rest and during exercise.

Recommendations:

1. Athletes can participate in low-intensity competitive sports.
2. Athletes can engage in moderate-intensity sports if they have normal ventricular function and oxygen saturation



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The recommendations presented are intended to provide broad guidelines for patients with congenital heart defects. When questions about the safety of sports participation arise, there is no substitute for a comprehensive evaluation by a knowledgeable and experienced physician. Exercise testing can be useful, particularly if symptoms, the electrocardiogram (ECG), and blood pressure are monitored during conditions that simulate the sport in question. Arrhythmias discussed in this Task Force are usually identified by exercise testing or some form of long-term monitoring (including ambulatory Holter and event recording). Serial evaluations may be required because of changing hemodynamic status with time.



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Evidence-Based Public Health Policy and Practice

Randomised controlled trial of home-based walking programmes at and below current recommended levels of exercise in sedentary adults

Cohort of otherwise healthy individuals were placed into 3 groups; Control group; 3-day group; 5-day group

Participants allocated to the 3-day and 5-day group were asked to walk briskly (faster than normal resulting in mild SOB) for 30 mins per session. They could either perform the walk in a single bout or shorter bouts of at least 10 mins. They were given a pedometer and a diary and asked to record their steps.

- In both treatment groups an average of 3500 steps were completed on each study day.
- Functional capacity increased in both treatment groups with no change in the control group (using a 10m shuttle walk test).



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Sport and Exercise Science

Effects of an 18 week walking program on cardiac function in previously sedentary or relatively inactive adults

The participants were placed in the treatment group or control group. The treatment group embarked on an 18 week walking program starting at 60mins in the 1st week, increasing to 200mins by the end.

After 18 weeks:

No change in control group

Treatment group showed an improvement in aerobic capacity, and an increase in the velocity of relaxation of the longitudinal myocardial fibres of the LV.



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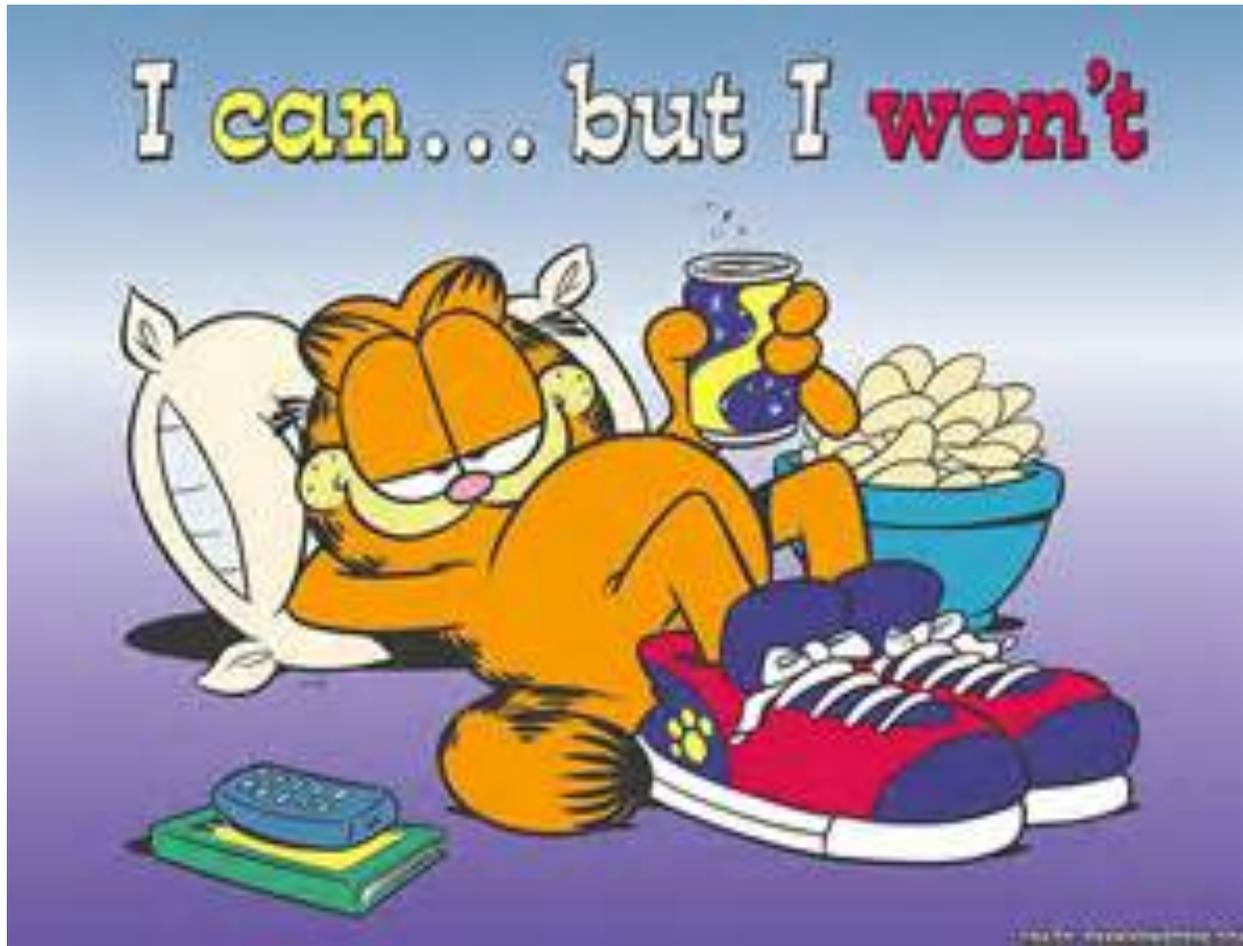
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What Does this mean for us?

- Honesty
- Regular consultation including exercise advice
- Regular CPEX
- Individual programs



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Start Active, Stay Active

A report on physical activity for health from the four home countries' Chief Medical Officers

DHSSPS
Department of Health, Social Services and Public Safety

The Scottish Government

Welsh Government

DH Department of Health

FACTSHEET 4

Physical activity guidelines for ADULTS (19-64 YEARS)

- Adults should aim to be active daily. Over a week, activity should add up to at least 150 minutes (2½ hours) of moderate intensity activity in bouts of 10 minutes or more – one way to approach this is to do 30 minutes on at least 5 days a week.
- Alternatively, comparable benefits can be achieved through 75 minutes of vigorous intensity activity spread across the week or combinations of moderate and vigorous intensity activity.
- Adults should also undertake physical activity to improve muscle strength on at least two days a week.
- All adults should minimise the amount of time spent being sedentary (sitting for extended periods).

Individual physical and mental capabilities should be considered when interpreting the guidelines.

Examples of physical activity that meet the guidelines:

Moderate intensity physical activities will cause adults to get warmer and breathe harder and their hearts to beat faster, but they should still be able to carry on a conversation. Examples include:

- Brisk walking
- Cycling

Vigorous intensity physical activities will cause adults to get warmer and breathe much harder and their hearts to beat rapidly, making it more difficult to carry on a conversation. Examples include:

- Running
- Sports such as swimming or football

Physical activities that strengthen muscles involve using body weight or working against a resistance. This should involve using all the major muscle groups. Examples include:

- Exercising with weights
- Carrying or moving heavy loads such as groceries

Minimising sedentary behaviour may include:

- Reducing time spent watching TV, using the computer or playing video games
- Taking regular breaks at work
- Breaking up sedentary time such as swapping a long bus or car journey for walking part of the way

What are the benefits of being active daily?

- Reduces risk of a range of diseases, e.g. coronary heart disease, stroke, type 2 diabetes
- Helps maintain a healthy weight
- Helps maintain ability to perform everyday tasks with ease
- Improves self-esteem
- Reduces symptoms of depression and anxiety

For further information: *Start Active, Stay Active: A report on physical activity for health from the four home countries' Chief Medical Officers* (2011)

DHSSPS
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Exercise

- Everyone can take part in some form of exercise



- The secret is to choose something they enjoy!



- It is easier to build exercise in to a daily routine when younger rather than try to start from scratch when older.



- Remember exercise is an investment in the future – work in acquired heart disease shows exercise does reduce the risks of coronary artery disease.



How to start

- Start off slowly and build up
- Never push through dizziness
- Set realistic goals
- Build exercise in to the day
 - Plan some time in the day
 - Every 10 mins counts!



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- Look at alternatives in every day life
Take the stairs instead of the lift/escalator



- Get off the bus 1 stop earlier than usual



What is not Advisable



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My Research Study

- Aims to look at the effects of low levels of exercise and evaluate if this can be performed safely and still have a positive benefit on the patient's perceived quality of life and exercise ability
 - 100 ACHD patients performing a pedometer-based walking program
 - Exercise ability recorded using CPEX testing



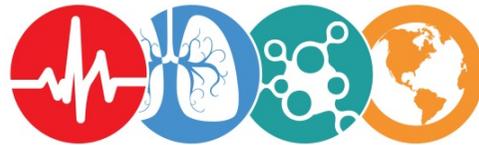
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The End





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