

If I could give you a pill that would

- Lower your risk of
 - Depression
 - Diabetes
 - Angina and heart attack
 - Stroke
 - Dementia
 - Cancer
- Costs very little money and takes a bit of time

Would you take it?

Benefits and Risks of Exercise in Congenital Heart Disease

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UHW and CHfW

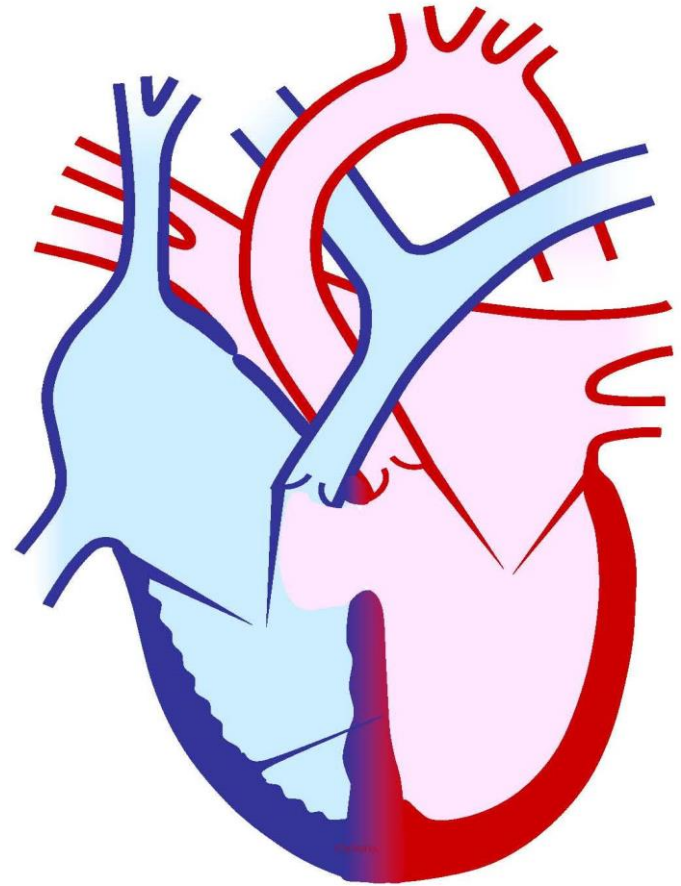


In the next ½ hour...

- Definitions
- Look at general exercise advice
- Benefits of exercise
- Relate this to individuals with CHD
- Exercise prescription

Definitions

- Congenital heart disease
 - An abnormality of cardiovascular development leading to problems with heart structure (and often function) that can affect the individual at any stage from fetal to adult life
 - The most common congenital abnormality – affects ~1% of live births



Definitions

- Exercise
 - Any bodily activity that enhances or maintains physical fitness and overall health and wellbeing
- Competitive sport
 - An activity involving physical exertion and skill in which an individual or team competes against another (with the intention of winning!)
 - High intensity physical training
- Contact sport
 - A sport in which the participants necessarily come into bodily contact with one another
 - NB Deliberate vs accidental



Definitions

- Dynamic exercise
 - Joints moving using relatively small forces within the muscle
 - Examples include walking, swimming, easy cycling
- Static exercise
 - Relatively large muscle forces with little joint movement



Definitions

- Moderate activity
 - Raises your heart rate and makes you sweat
 - You can still talk, but you cannot sing the words to a song
- Vigorous activity
 - Makes you breathe hard and fast
 - If you are working at this level, you will not be able to say more than a few words without pausing for a breath



What this means

Moderate		Vigorous	
<i>5-18 year old</i>	<i>Adult</i>	<i>5-18 year old</i>	<i>Adult</i>
Walking to school	Brisk walking	Playing chase	Jogging/running
Playing in the playground	Water aerobics	Energetic dancing	Swimming fast
Riding a scooter	Doubles tennis	Swimming	Singles tennis
Skateboarding	Skateboarding, Rollerblading	Running	Skipping rope
Rollerblading	Hiking	Gymnastics	Aerobics
Walking the dog	Pushing a lawn mower	Football, Rugby	Football, Rugby
Cycling on level ground or ground with gentle hills	Cycling on level ground or ground with gentle hills	Cycling fast or on hilly terrain	Cycling fast or on hilly terrain
Netball, Basketball	Volleyball, Basketball	Martial arts	Martial arts

One minute of vigorous activity provides the same health benefits as two minutes of moderate activity

Benefits of Exercise

- Being physically active can help you lead a healthier and happier life
 - Lower risk of
 - Ischaemic heart disease
 - Type 2 diabetes
 - Stroke
 - Some cancers



Benefits of Exercise

- Improves
 - Self-esteem
 - Mood
 - Sleep quality
 - Energy levels
- Reduces
 - Stress levels
 - Depression
 - Risk of dementia / Alzheimer's disease



From NHS Choices

It's medically proven that people who do regular physical activity have:

- up to a 35% lower risk of coronary heart disease and stroke
- up to a 50% lower risk of type 2 diabetes
- up to a 50% lower risk of colon cancer
- up to a 20% lower risk of breast cancer
- a 30% lower risk of early death
- up to an 83% lower risk of osteoarthritis
- up to a 68% lower risk of hip fracture
- a 30% lower risk of falls (among older adults)
- up to a 30% lower risk of depression
- up to a 30% lower risk of dementia

General advice about exercise

- 5 to 18 year olds: To maintain a basic level of health, children and young people need to do:
 - At least 60 minutes of physical activity every day – a mixture of [moderate activity](#) and [vigorous activity](#) is best
 - On three days a week, these activities should involve [exercises for strong muscles](#), such as push-ups, and [exercises for strong bones](#), such as jumping and running
- Screen time <2 hours per day

Adults 19-64 Years Should Do

- At least 150 minutes of moderate aerobic activity such as cycling or brisk walking every week, **and**
- Strength exercises on two or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms)

OR

- 75 minutes of vigorous aerobic activity, such as running or a game of singles tennis every week, **and**
- Strength exercises on two or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms)

Strengthening Exercises

- Lifting weights
- Working with resistance bands
- Doing exercises that use your own body weight, such as push-ups and sit-ups
- Heavy gardening, such as digging and shovelling
- Yoga



And...

- All adults should also break up long periods of sitting with light activity.
- Studies have linked excessive sitting with
 - Being overweight and obese
 - Type 2 diabetes
 - Some types of cancer
 - Early death
- Sitting for long periods is thought to slow the metabolism – affects the body's ability to regulate
 - Blood sugar
 - Blood pressure
 - Break down body fat



But hang on....

I have a heart condition!

Fears

- I might damage my heart
- I might provoke a heart rhythm problem
- I might die

Reassurance

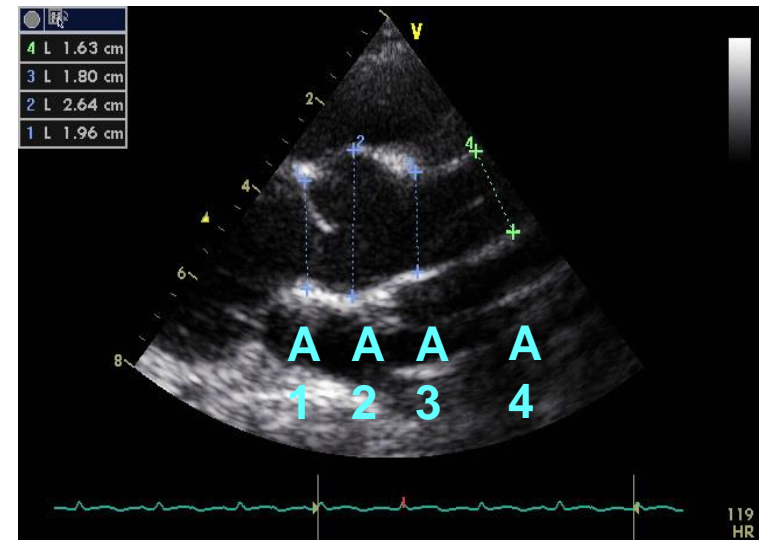
- Studies have shown that there is a negligible risk of sudden death due to physical activity in children or adults with CHD
- Of (competitive) sports-related deaths, only 3 in 100 are due to congenital heart disease

Considerations

- Some individuals will have a higher risk of an exercise-related problem than others
 - Known heart rhythm problems, particularly VT
 - Known poor function of the main pumping chamber
 - Pulmonary hypertension
 - Known severe aortic enlargement
 - Known severe valve narrowing (stenosis)
 - Known exertion-related syncope (black out)
 - Low oxygen saturation levels
 - On anticoagulants (warfarin or similar)
 - Pacemaker / ICD patients

Medical Assessment of Risk

- History and examination
- ECG
- Echocardiography and other imaging
- Cardiopulmonary exercise testing



Specific Advice

- Severely reduced heart function – AHA recommends...
 - Enjoy a wide range of recreational sport and
 - physical activity opportunities
 - Limiting involvement in competitive sport

AHA Scientific Statement

Promotion of Physical Activity for Children and Adults With Congenital Heart Disease

A Scientific Statement From the American Heart Association

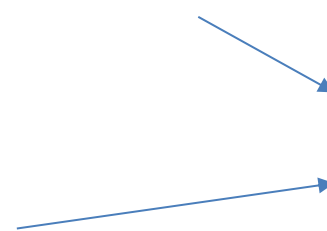
Patricia E. Longmuir, PhD; Julie A. Brothers, MD; Sarah D. de Ferranti, MD, MPH;
Laura L. Hayman, PhD, RN, FAHA; George F. Van Hare, MD; G. Paul Matherne, MD, MBA, FAHA;
Christopher K. Davis, MD, PhD; Elizabeth A. Joy, MD, MPH, FACSM;
Brian W. McCrindle, MD, MPH, FAHA, Chair; on behalf of the American Heart Association
Atherosclerosis, Hypertension and Obesity in Youth Committee of the Council on Cardiovascular
Disease in the Young

The American Heart Association recognizes the importance of physically active lifestyles to the health and well-being of children and adults with congenital heart defects. Counseling of patients with congenital heart defects should emphasize the importance of daily physical activity and

changes in measures of cardiorespiratory or musculoskeletal fitness. As such, it is important to recognize that this scientific statement clearly distinguishes physical activity from exercise or fitness. Physical activity is a broader concept that incorporates all types of physical movement, not solely those

May 2013

Specific Advice

- Important pulmonary hypertension
 - Severe valve obstruction to participate
- Should participate in non-competitive activities that have low to moderate dynamic and static components
- 
- Two blue arrows originate from the text. One arrow starts at the end of the first bullet point and points to the word 'competitive' in the activity description. The second arrow starts at the end of the second bullet point and points to the word 'dynamic' in the activity description.

Curling
Baseball/softball
Golf
Tai chi
Walking
Bowling or bowls
Cricket
Bocce

Specific Advice

- Enlarged aorta
 - Certain forms of CHD (ToF, truncus, after Ross operation, BAV)
 - Inherited, e.g. Marfan syndrome and related conditions
- Activities of moderate intensity are generally safe
- Resistance/static-type exercises such as weight lifting can be done but not to the point where you have to hold your breath and strain – light repetitions is better

Recent Evidence

- Aortic growth in Marfan syndrome and AAA is slower in patients taking regular exercise

Patients with Hypoxia

- Context:
 - Complex “palliated” disease, e.g. single ventricle, e.g. fenestrated Fontan
 - Eisenmenger syndrome (high resistance in lung blood vessels)
- Effort may lead to increasing cyanosis
- Exertion-related hypoxia generally does not require activity restriction, because the increasing hypoxia will usually restrict activity to an appropriate level.
- Individuals with cyanosis should be physically active within comfortable limits – they should “listen to their body” and realise when to slow or stop
- The “talk test” (ie, activity at an intensity that permits easy conversation with others) may be a helpful tool for individuals to guide their own activity intensity
- Think about altitude and take it easier if visiting mountainous areas

Syncope (Blackouts)

- Causes should be investigated thoroughly and treated, where necessary
- Individuals with a history of syncope (or who are at high risk) should be encouraged to participate in activities such as
 - Walking
 - Racquet sports
 - Football
 - Cricket
 - Table tennis
 - Dancing
 - Tai chi
 - Yoga
 - Bowls or bowling
- Caution
 - Swimming
 - Cycling
 - Ice skating
 - Skiing
- Avoid
 - Horseback riding
 - Gymnastics
 - Rock climbing
 - Scuba diving

Always have a plan about

- First aid provision
- Who to contact
- Informing the health care team if symptoms worsen

Anticoagulation

- Anticoagulation poses a small risk of bleeding injury with activity
- Activities with low risk of impact should be encouraged
 - Walking
 - Jogging
 - Swimming
 - Cross-country(level ground!)
- Slightly riskier, but still OK are
 - Skiing
 - Bike riding
 - Volleyball
 - Basketball
 - Netball
 - Cricket with adequate protection
- Avoid activities in which body impacts are an intentional aspect of the sport
 - Tackle rugby
 - Combative martial arts
 - Boxing
 - Ice hockey
 - Competitive football (I know some patients who do 5-a-side, or who play in goal)

Device

- Pacemaker, ICD
- Consideration: Protection of the device from forceful impact
- Beware
 - Rugby
 - Cricket
 - Football
 - Ice hockey



Exercise Prescription

Try it!

- Find something that you enjoy and make time for it
- Convert car to cycling or walking for some journeys
- Have exercise breaks if you have an office job (or exercise at your desk)
- See <https://www.nhs.uk/livewell/fitness/Pages/Fitnesshome.aspx> (search “NHS exercise”)

Target

- 2 -2½ hours of moderate physical activity per week
- 3 days a week do some
 - Sit-ups
 - Push-ups
 - Thrusts
- The more you do, the more you can do
- You will be happier and live longer



Questions?