

A photograph of three children in a park. In the foreground, a young girl with green eyes and a pink shirt smiles. Behind her, another girl in a blue shirt and a boy in a red shirt are also smiling. The background is a sunlit forest with tall trees.

Physical Activity in Children with and without Esophageal Atresia

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WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR



infants



1-2 years



3-4 years



5-17 years



Applies to children and adolescents with chronic conditions!

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infants



1-2 years



3-4 years

of which
at least **60** minutes
moderate to vigorous



5-17 years



Applies to children and adolescents with chronic conditions!

WHO GUIDELINES ON **PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR**



GOOD PRACTICE STATEMENTS

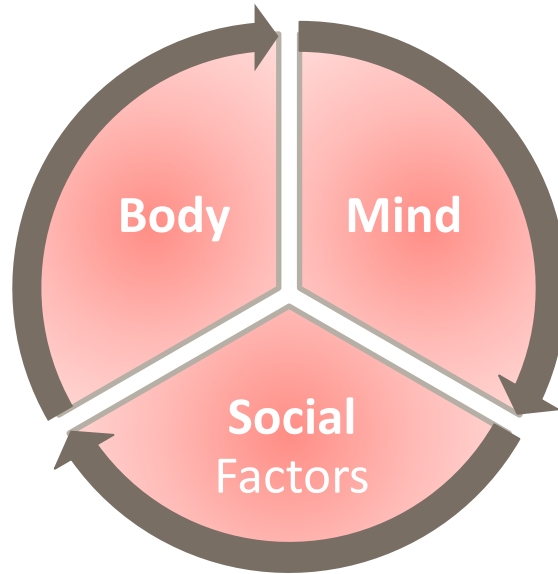
- Doing some physical activity is better than doing none.
- If children and adolescents are not meeting the recommendations, doing some physical activity will benefit their health.
- Children and adolescents should start by doing small amounts of physical activity, and gradually increase the frequency, intensity and duration over time.
- It is important to provide all children and adolescents with safe and equitable opportunities, and encouragement, to participate in physical activities that are enjoyable, offer variety, and are appropriate for their age and ability.



Physical Activity

Improves

- Focus
- Performance in school
- Mental capacity
- Social interaction/ friendships
- Bone health
- Strength
- Motor development
- Sleep
- Self-efficacy
- Lungfunction/-capacity
- ...

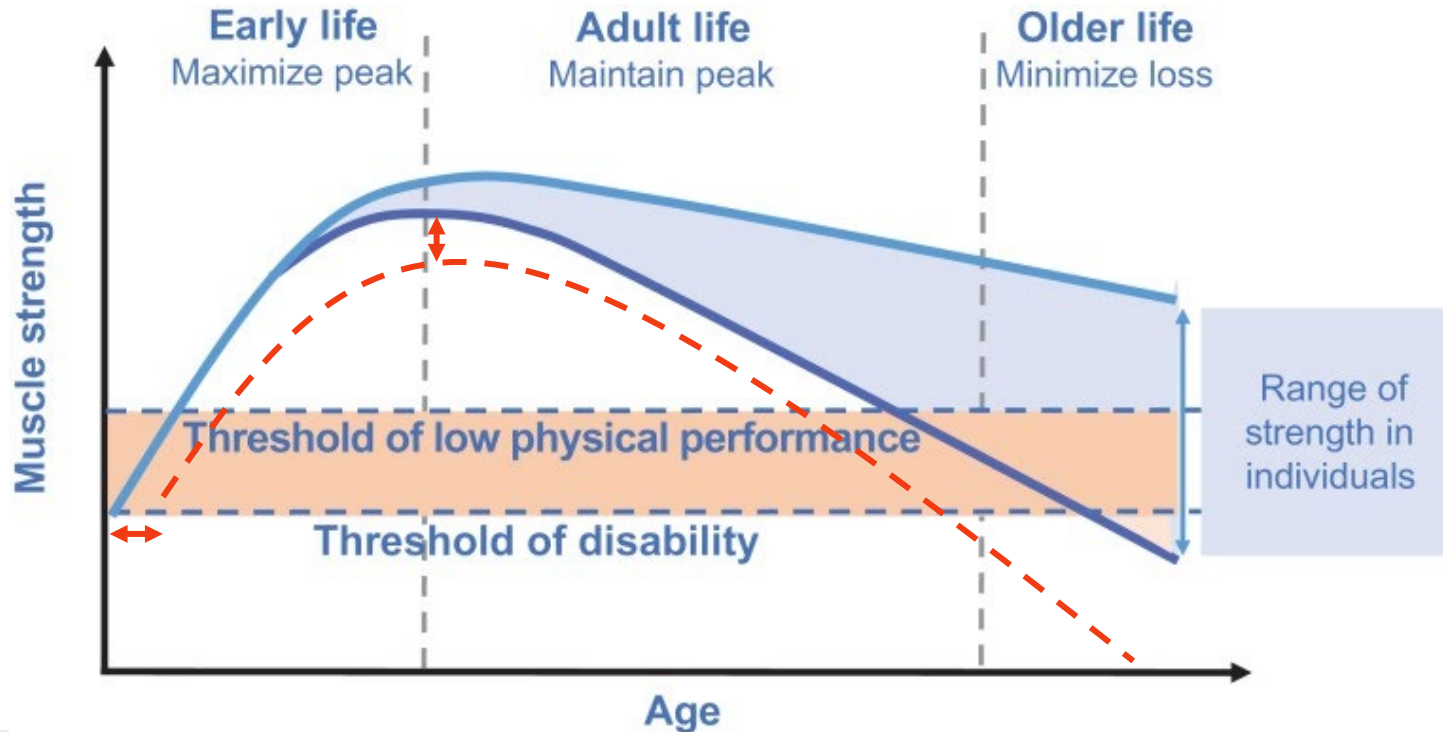


Reduces

- Cardiovascular risk
- Metabolic risk
- Body fat
- Depression and anxiety
- Addiction
- Accidents
- Cancer
- Osteoporosis
- Musculoskeletal pain
- ...

Sitting is the new smoking!

Start early!



Why might esophageal atresia be a problem at all?

- Frequent hospital stays at a young age [Quiroz HJ et al. 2020]
- Developmental delay [Harmsen et al. 2017]
- Respiratory problems (20% during exercise) [König et al. 2023]
- Impaired lung function and exercise capacity [Arneits et al. 2021]
- Gastro-esophageal reflux (5.8% during exercise) [König et al. 2023]
- Low body weight and height [König et al. 2023]
- Associated malformation



Foto: Ljupco Smokovski/stock.adobe.com

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Physical Fitness in Esophageal Atresia

Younger children

n=11, 4-11 years

Deutscher Motorik Test/ Kinderturntest

- All mean test scores **below average**
- Very low body weight and height
- **Standing long-jump** had **significantly lower** results
- **Respiratory symptoms** limit activity
- Patients, who **never** suffered from **bronchial obstruction** had **the best results**
- **Most** symptoms during **sprinting** and **exertion**
- **NO** symptoms during **fun activities**

Teenagers

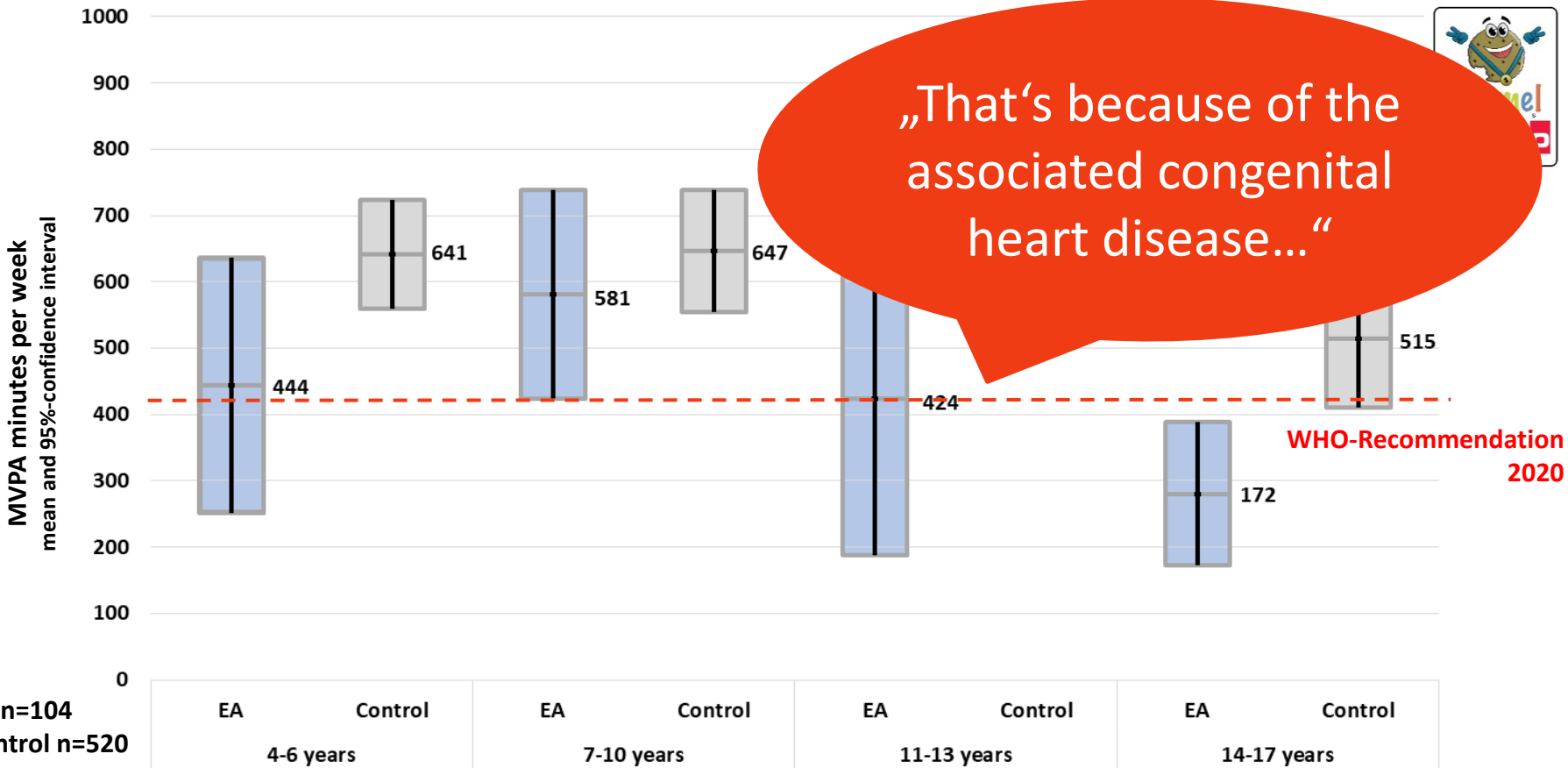
n=10, 12-16 years

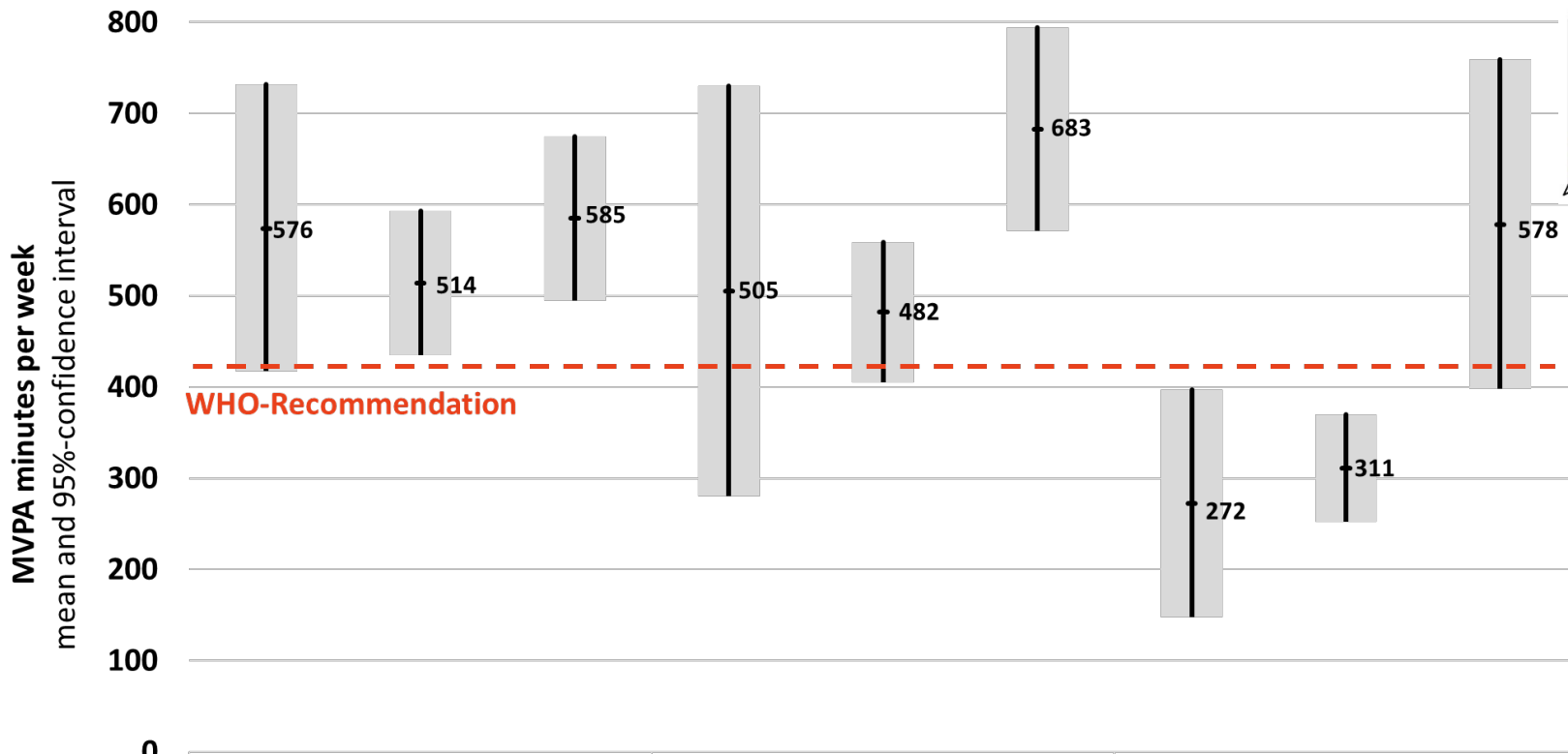
Dordel-Koch-Test (DKT), Shuttle-Run-Test

- Mean **average performance** with **great variance** in DKT
- Sit-Ups and especially **push-ups below average** in most subjects
- Respiratory symptoms during maximum anaerobic exertion
- **Normal average exercise capacity** (median $VO_2\text{max}$ 53th percentile, range 10th-95th percentile)
- **Shuttle-Run-Test** is feasible and valid as **screening outside the hospital setting**

Sports Participation

- Most EA patients (**96%**) participated in **regular school sports** (general population 89%, CHD 93%)
 - Any restrictions were unrelated to esophageal atresia
- Most EA patients (**58%**) were **members of a sports club** (general population 62%, CHD 63%)
 - EA patients participated at lower intensities
 - A total of 40% participated in sports competitions (general population 63%, CHD 56%)
- More than half EA patients (**55%**) never do chores at home (general population 12%)





WHO-Recommendation

EA n=69
CHD n= 276
Control n=276

EA	CHD	control	EA	CHD	control	EA	CHD	control
6-9 years			10-13 years			14-17 years		

Determinants of Physical Activity

MoMo

General

Esophageal Atresia



Younger age
Active family and friends
Higher socioeconomic status
Environment
Better physical self-concept



Female gender
Teenagers
Cultural background
Environment



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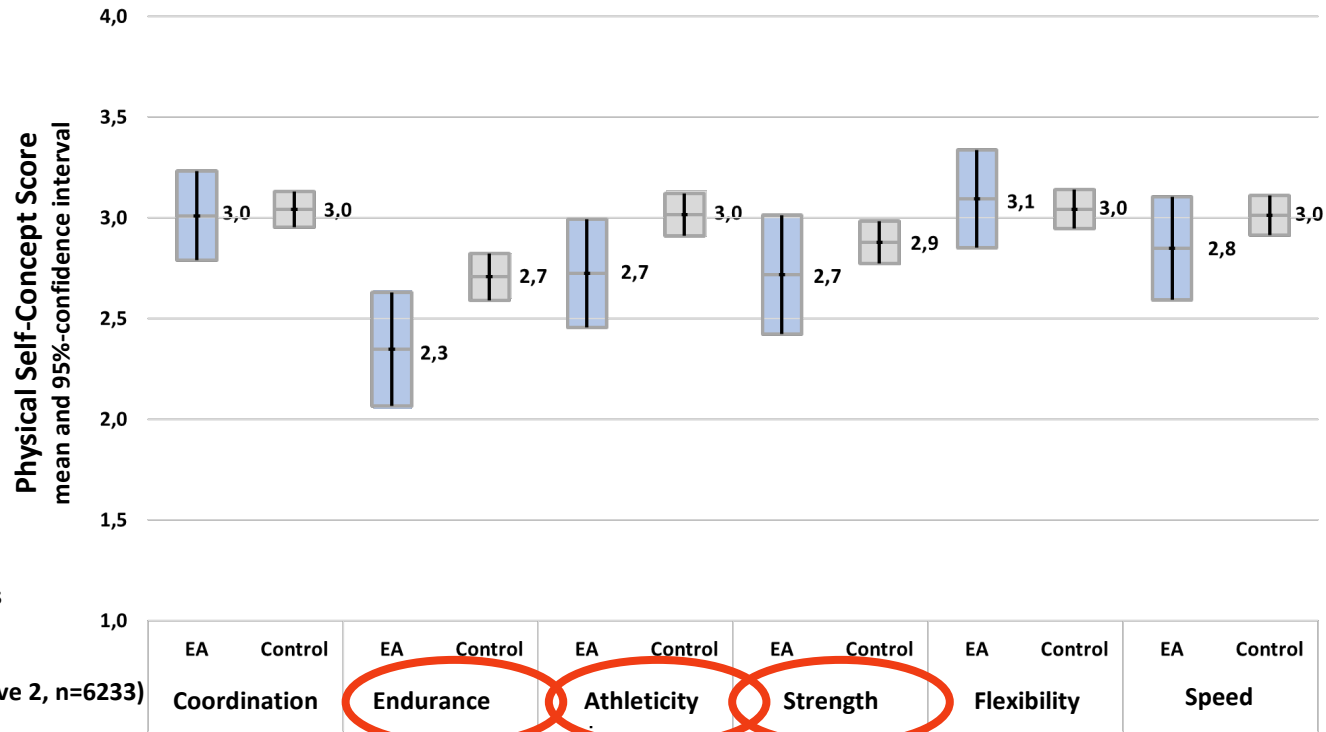


Siblings in a sports club

Low body-weight/ height
Anorectal malformation
Urogenital malformation

Type of esophageal atresia
Type of surgical repair
Symptom load
Scapula alata
Congenital heart disease
Number of general anaesthesia

Physical Self-Concept



Mean age 13.8 years

EA n=32

Control n=160

(Motorik-Modul Wave 2, n=6233)

What can we do?

- Be aware.
- Be kind! Any activity is better than none!
- It's in your hands! Establish an active family lifestyle from the start.
- Be creative! Create an environment with opportunities for activity.
- Be deliberate! Set an example.
- Be persistent! Choose the right sport.
- Compromise! Give individualized recommendations for school sports (if necessary).
- Never give up! ...looking for ways to improve symptom control.
- Get to know your personal limits!
- Be patient.



Find the right activity for every body!



Wolf Wigo
1,89 m/88 kg
Der US-Wasserballer war dreimal bei Olympischen Spielen



Gary Hall Jr.
2,01 m/84 kg
Schwimmer mit Gardemaß und zweimal Olympiasieger



Dan O'Brien
1,89 m/84 kg
Multitalent: Der Zehnkampf-Star brauchte Kraft und Ausdauer



Terrence Trammell
1,89 m/79 kg
Elegant und sprunghaft wirkt der Körper des US-Hürdenläufers



Ron Warren
1,65 m/52 kg
Klein und kompakt muss ein Jockey sein - Warren hat also Idealmaße



Emanuel Yarbrough
2,07 m/318 kg
Sportart? Klar: Sumo. Der US-Koloss ist laut Guinness Buch schwerster Athlet der Welt



Tony González
1,95 m/112 kg
Das American-Football-Idol braucht Kraft, um seinen Weg freizuräumen



Adam Nelson
1,83 m/116 kg
Der Kugelstößer muss Wucht in seine Stöße legen, braucht deswegen Gewicht und Reichweite



Carlos Delgado
1,92 m/102 kg
473 Homeruns schaffte der Baseballer aus Puerto Rico in der MLB



Bob Kennedy
1,83 m/66 kg
Diese Windhund-Figur kann nur einem Langstreckenläufer gehören



Brandon Slay
1,77 m/76 kg
Kraft und Wendigkeit brauchte der Ringen-Olympiasieger



Hannover Medical School



**Thank you
for your attention!**

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