
Exercise and Sport Recommendations: Tetralogy of Fallot



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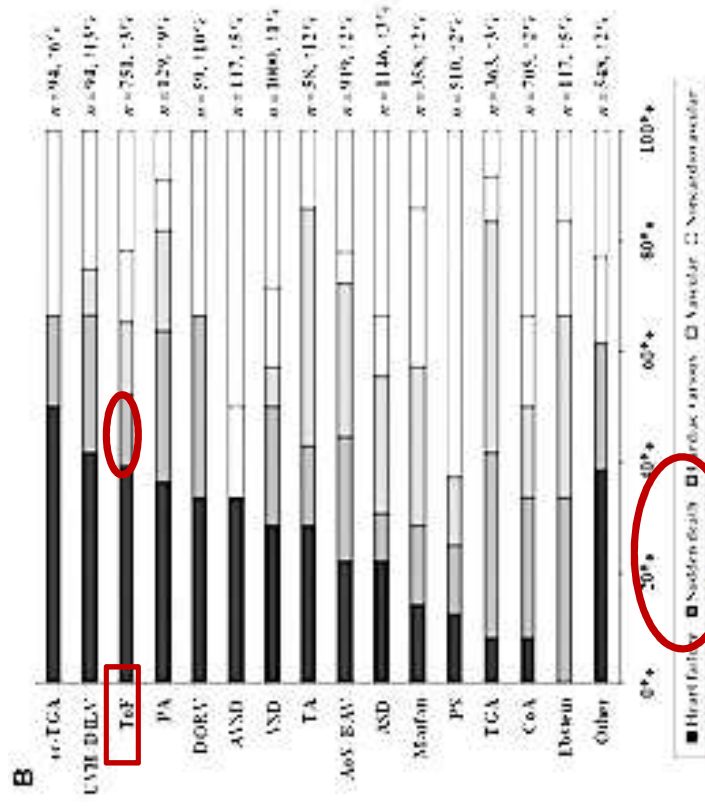
COI Declaration

- No conflicts to declare regarding content of this talk
- No off-label or unapproved use of any drug, device, or product will be discussed
- No commercial product will be highlighted or promoted
- Unrelated Industry associations
 - Biosense Webster (research funds.....small)
 - Up-to-Date (author honorarium.....small)
 - IAC Board for EP lab accreditation (no compensation)

? Activity Concerns in Repaired TOF ?

Rare acute
catastrophe

- Arrhythmias
 - VT
 - Rapidly conducted atrial flutter
- Rupture RVOT aneurysm ?
- Aortic dissection ?



John K. Triedman, and Jane W. Newburger Circulation.
2016;133:2716-2733

Variables	Importance Factor	
Era of Surgery	1960-1970's	1980-2000's
Symptoms (arrhythmic)	3	3
LV dysfunction	3	3
RV dysfunction	1	1
RV pressure load	2	1
RV volume load	2	1
Age at repair < 6.5 years	2	0
Shunt pre-repair	2	1
Type of repair		
- TAP repair	1	2
- Conduit	2	1
QRSd \geq 180 ms	1	1
Holter: VT or NSVT	1	1

Score	Risk Group
0-3	Low
4-6	Medium
7-9	High
>10	Very High

Walsh et al. Heart Rhythm 2013



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- Progressive RV deterioration with PR
- Worsening RA dilation from TR

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Shaun White: Repaired TOF



A teenager with tetralogy of fallot becomes a soccer player

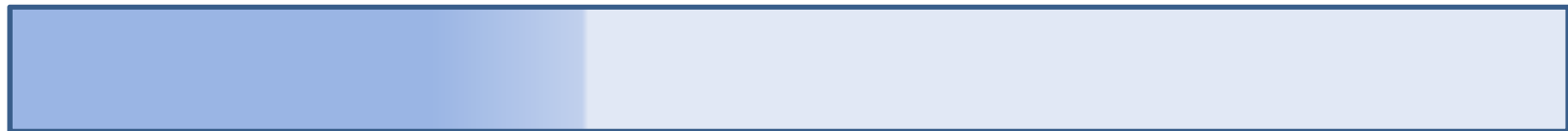
ACDE Massimo Bolognesi
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Authors' Contributions:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Most TOF Patients

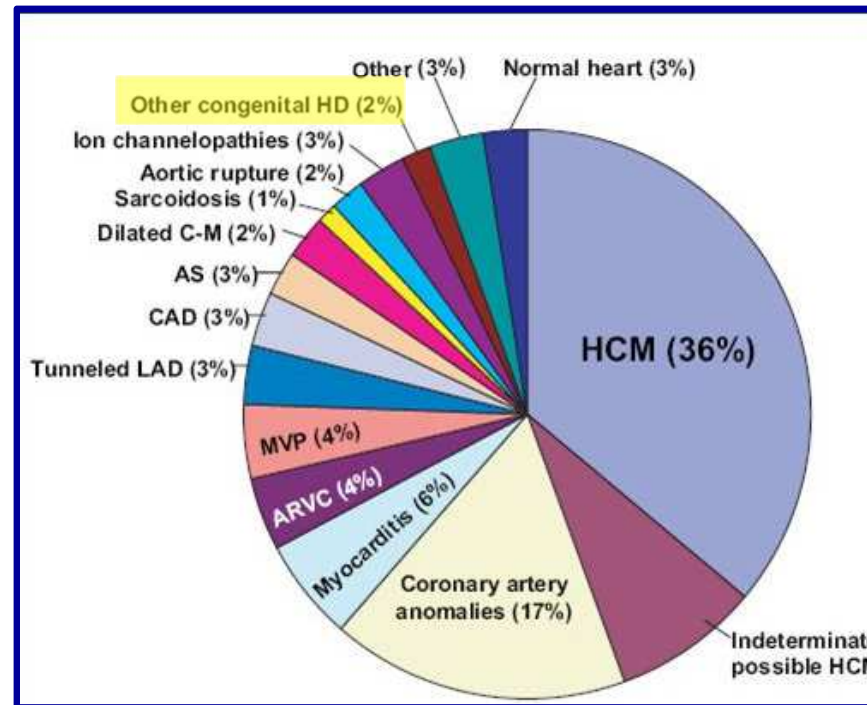


Rare catastrophe

Olympic athlete

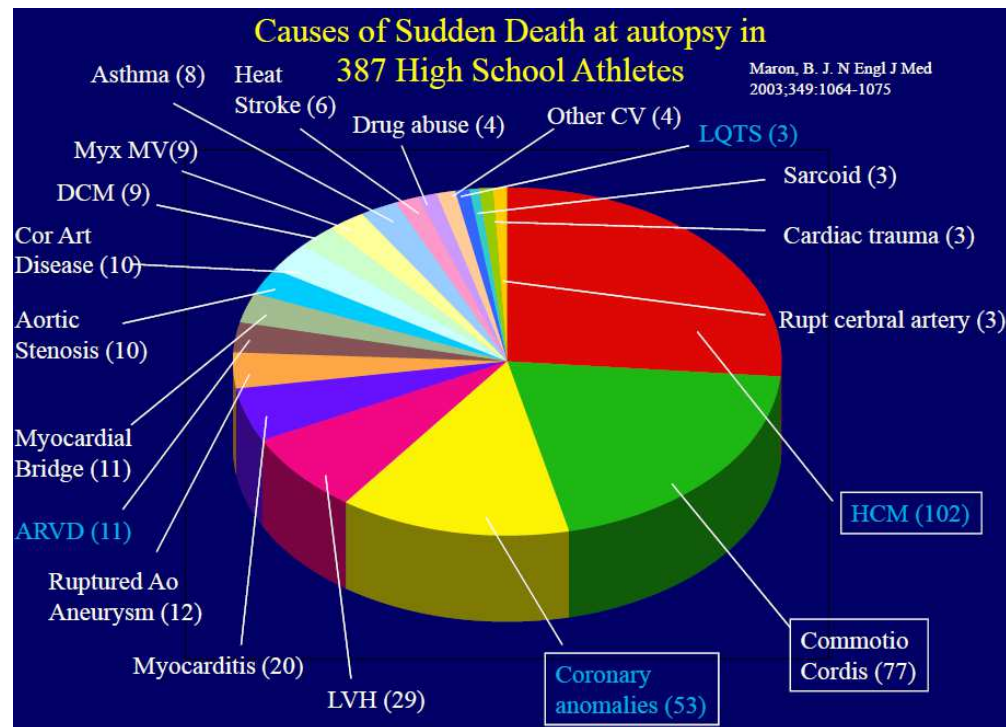
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1437 young
competitive athletes



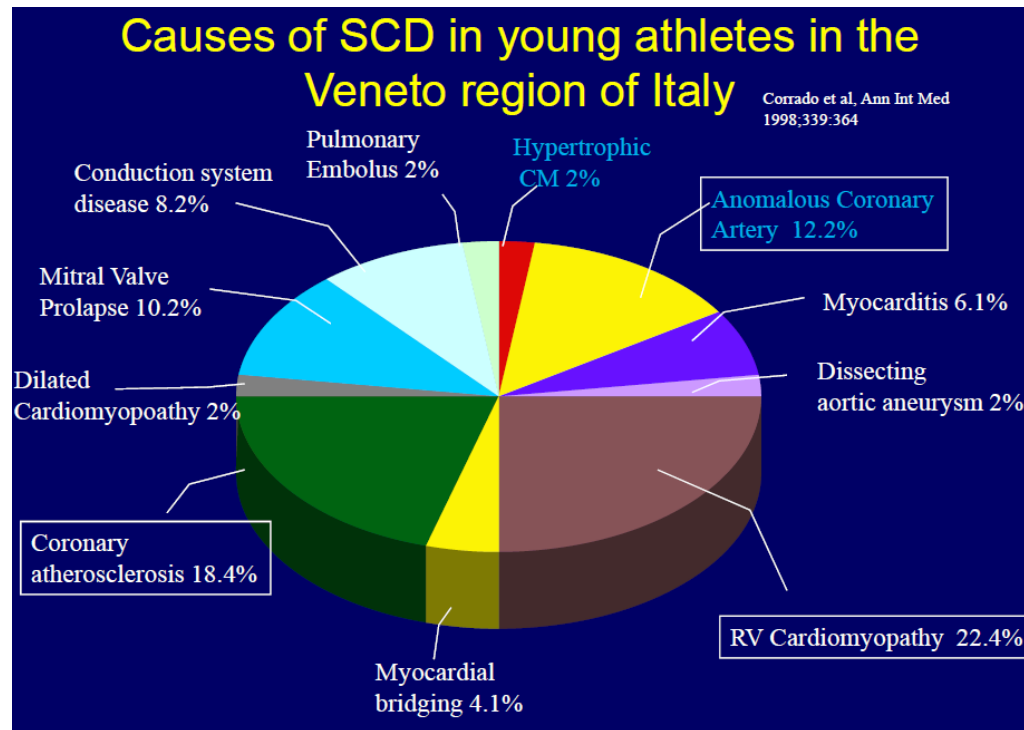
Maron JAMA 1996;276:199

? Activity Concerns in Repaired TOF ?



Maron NEJM 2003;349:1084

? Activity Concerns in Repaired TOF ?



Corrado Ann Int Med 1998: 339:364

? Activity Concerns in Repaired TOF ?

- ***Int J Cardiol 2016;219:218***
 - Structured exercise is **SAFE**, improves fitness, and may have a protective benefit against ventricular arrhythmias
- ***Cong Heart Dis 2015;10:169***
 - Athletics improves QOL, fitness, and lowers BMI
 - 30% of CHD patients are exercising at levels beyond 36th Bethesda guidelines
- ***Heart Vessel 2017;32:201***
 - No adverse effects of sports in 112 TOF patients

? Activity Concerns in Repaired TOF ?

- ***Am Heart J* 2015;170:9606**
 - Structured exercise in TOF improves exertional capacity and fitness
 - (Not so for Fontan)
- ***Int J Cardiol* 2018;255:37**
 - Both continuous and interval athletic training for TOF patients is safe
- ***J Peds* 2017;191:125**
 - Children with CHD are staying fit and active (rarely restricted)

? Activity Concerns in Repaired TOF ?



Rarely (if ever) a debate with patients / families

AHA/ACC Guidelines in TOF

Van Hare et al. Circulation 2015;132:e281

- All TOF should be screened with H&P, ECG, echo, and exercise testing
- Asymptomatic patients without ventricular dysfunction, arrhythmias, or outflow obstruction may participate in moderate – high level sports
- Serial evaluation during the period of sports participation

When to Worry / Restrict TOF from High Level Sports

- LVEF < 50%
- RVEDV > 180 cc/m²
- Moderate-severe TR
- Pulm HTN
- > 2/3 syst RV pressure
- RVOT aneurysm
- Ao diameter Z-score > 4
- **Attention to trends !!!**

- Syncope
 - Palpitations with dizziness
 - Atrial flutter
 - VT
 - ICD
-
- < 3 months after surgery or major cath intervention

? SCUBA Diving in Repaired TOF ?

Schleich et al. Arch CV Disease 2016;109:504

- Very high afterload at depth
- Positive intrathoracic pressure and shunting
- Criteria to permit SCUBA diving:
 - LVEF > 50%
 - RVEF > 45%
 - Normal PA pressure
 - Aortic gradient < 20 mmHg
 - Aortic size Z-score < 3
 - No more than trivial atrial level shunt (PFO)
 - Small L→R ventricular or PDA shunt OK
 - No active arrhythmias
 - Pacemaker OK up to 30 m depth
 - No ICD

Encourage Activity & Let them Play!!!

