

# SPORTS AND EXERCISE ADVICE IN PATIENTS WITH ICD AND PPM



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# POSTULATED RISKS OF SPORTS PARTICIPATION WITH PPM OR ICD

- Increased likelihood of ventricular arrhythmias
- Inability of ICD to terminate ventricular arrhythmias during sports (high catechol, body temperature, etc)
- Risk of injury due to syncope or shock itself
- Damage to PPM or ICD system, leads or generator that could lead to device malfunction, failure to pace
- Inappropriate shocks

# GUIDELINES FOR SPORTS PARTICIPATION WITH A PACEMAKER (TASK FORCE 9)

- Athletic participation OK if no underlying structural heart disease or symptoms
- If completely pacemaker dependent, should avoid sports with high risk of collision
- If not pacemaker dependent, OK to participate in sports with collision risk if they accept risk of damage to pacemaker system
- Protective equipment should be considered for contact sports

# GUIDELINES FOR SPORT PARTICIPATION WITH AN ICD (TASK FORCE 9)

- ICD indications for competitive athletes should not differ from those applicable to general population (i.e. ICD should not be implanted solely to allow sports participation)
- Class 1A sports are reasonable if athletes are free of episodes of VF requiring device therapy for 3 months
- Participation in sports higher than class 1A can be considered if free of VF for 3 months, in line with recommendations for sports participation for the underlying diagnosis (i.e. HCM, ARVC, DCM, coronary disease, etc)

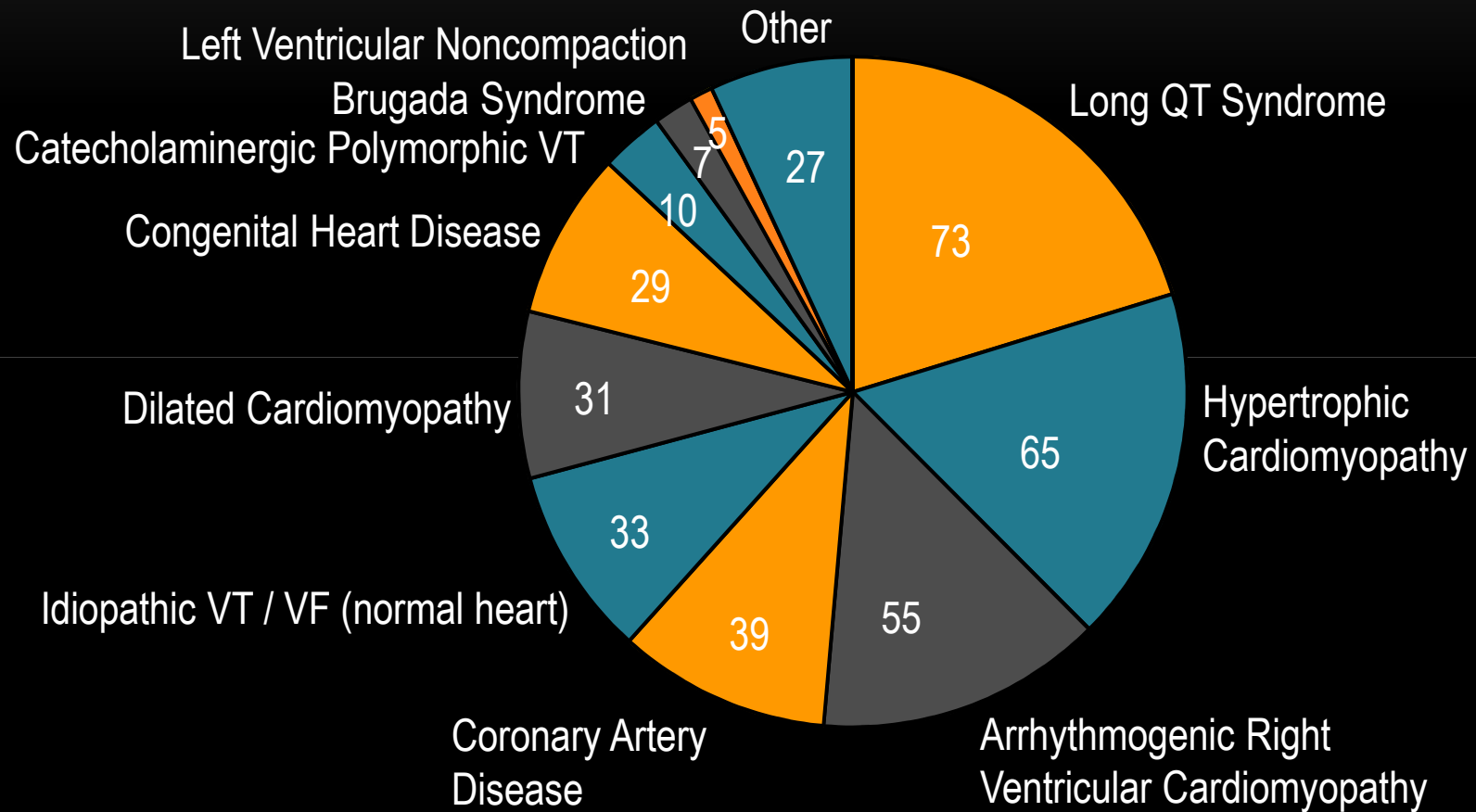


## SAFETY OF SPORTS FOR PATIENTS WITH IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS: A MULTICENTER REGISTRY

**Primary endpoint:** Tachyarrhythmic death or resuscitated arrest or shock-related or syncopal injury

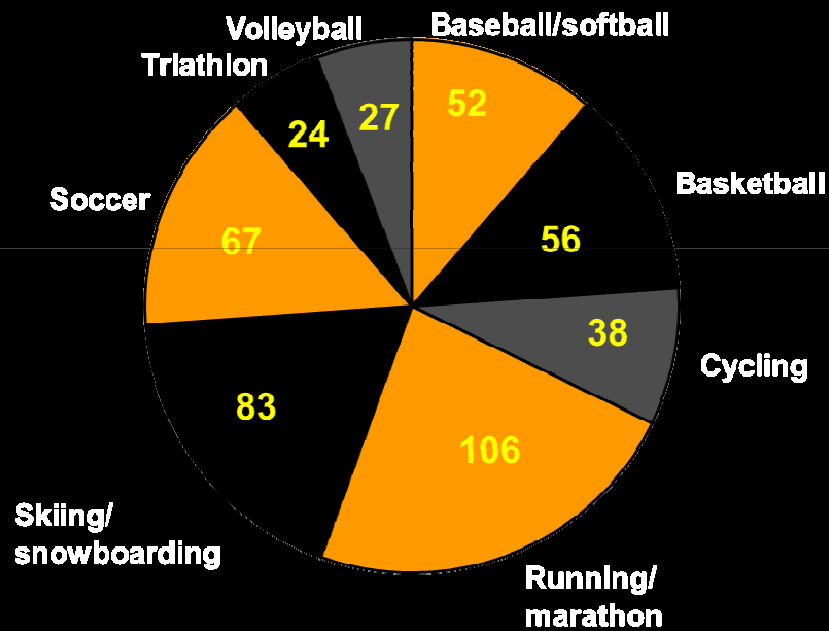
- 372 athletes > Class 1A (regular practices and competition)
  - 60 varsity, junior varsity, travel teams
- Ages 10-60, mean age 33, 89 athletes < 20 y/o
- Enrolled by participating sites (North American and European) or self-enrolled through Yale directly
- 31 month median follow-up

# CARDIAC DIAGNOSES IN ICD SPORTS REGISTRY



# BREAKDOWN OF INDIVIDUAL SPORTS

## All athletes

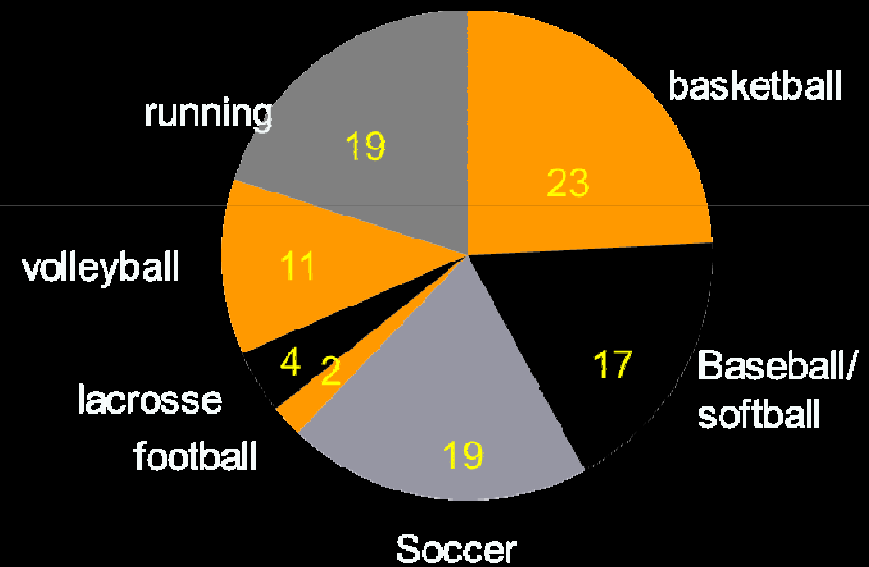


Median 5.1 hours/week

## Competitive subgroup

Varsity/ Junior varsity/Traveling teams

N=60



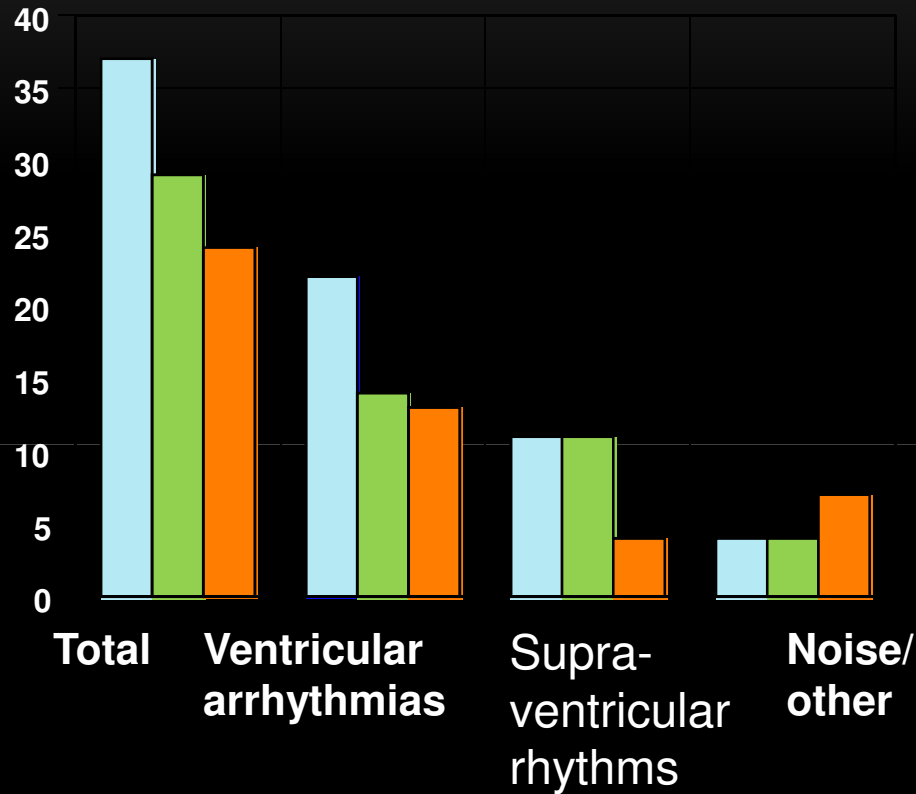
Median 13 hours/week

# Key results of ICD Sports Registry

- No occurrences of primary end point (CI 0-1.2%):
    - No deaths, resuscitated arrests or shock-related injuries
  - More shocks during physical activity than other times, but no difference between competition/practice and other recreational physical activity
  - Majority of athletes who experienced shocks during sports chose to continue to play
  - Rates of shocks in this population similar to those reported for less active, typical ICD populations
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# SHOCK COUNT IN ATHLETES



Competition\*  
Other Physical Activity  
Other/Rest

\*includes practice, post-competition/practice

More individuals received shocks during either sports or physical activity vs rest (16 vs 6%)

Idiopathic VT/VF and ARVC associated with more appropriate shocks

Appropriate shocks were more common during physical activity, competition and other activity, than at rest

DOES THIS MEAN, though, that these individuals would have fewer shocks if they did not exercise?

.....Maybe diagnosis dependent? Other factors?

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# PRACTICAL CONSIDERATIONS FOR ATHLETES WITH ICDS

- Programming of device therapies should attempt to limit the risk of inappropriate shocks (higher HR thresholds if possible)
  - Athletes should know their HR threshold for device therapy and consider wearing a heart rate monitor (chest strap most accurate) – keep HR 20 points below threshold
  - Athletes should stop if they receive an ICD shock even if they do not lose consciousness and not return until their device has been interrogated and they have been evaluated by their cardiologist.
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# TAKE HOME MESSAGES AND FUTURE DIRECTIONS

- Recommendations against sports participation in high dynamic sports for athletes with ICDs is being reevaluated based on new observational data alleviating some concerns over reliability of device therapy or lead damage/malfunction
  - However, ICDs should not be implanted for the sole purpose of allowing sports participation
  - Will arrhythmia burden or device therapies differ for athletes vs non-athletes? Larger registries, such as LIVE, will begin to answer
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