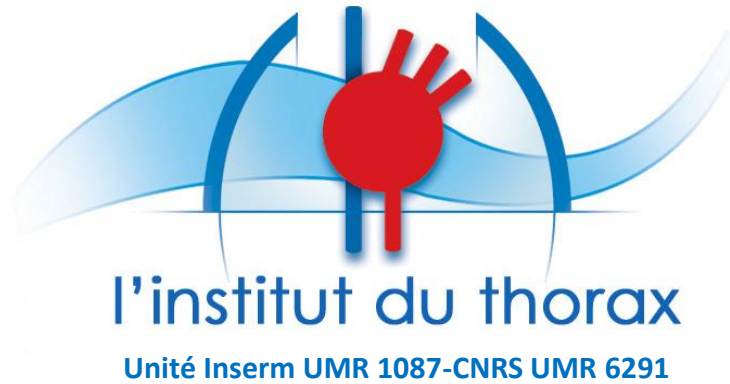


Channelopathies and sport



Vincent PROBST, MD, PhD

No disclosure

For most people, SCD during sport activities is that...



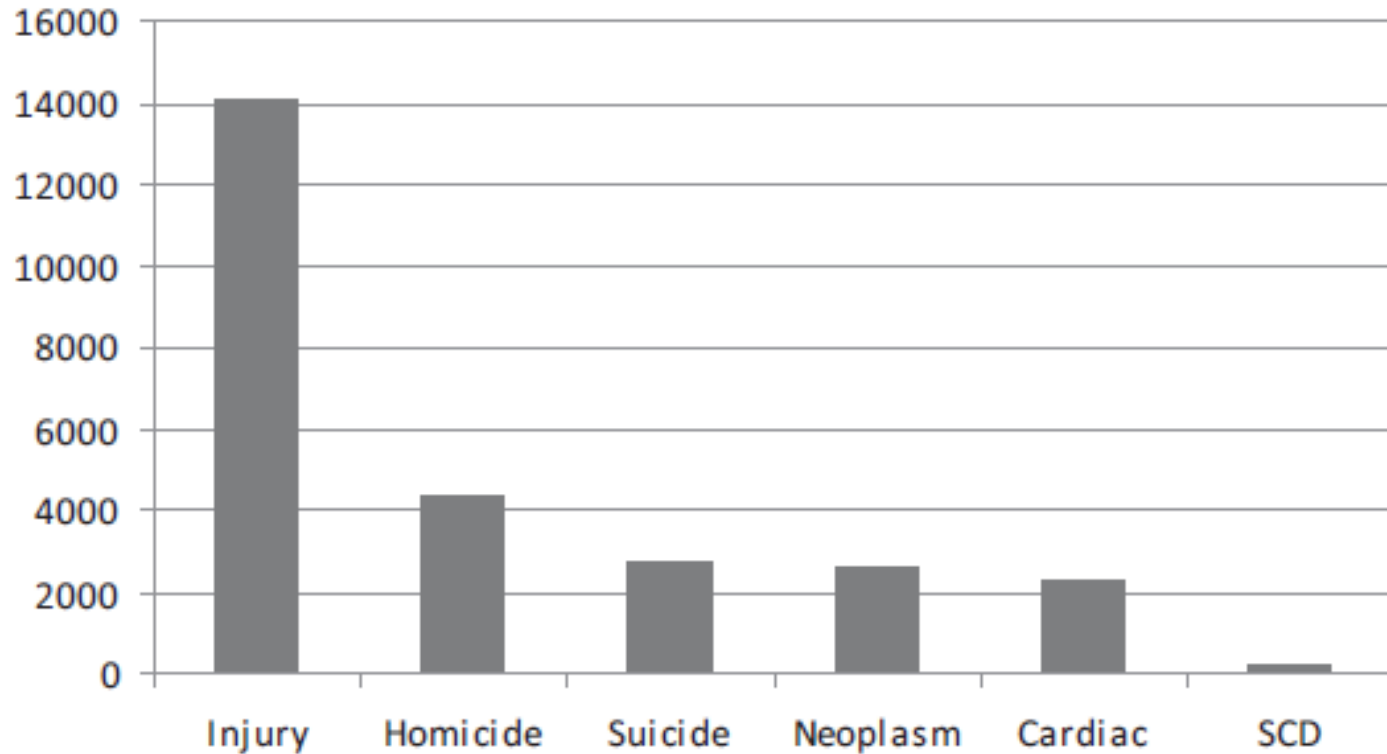
But in reality it is that...







What the true risk?

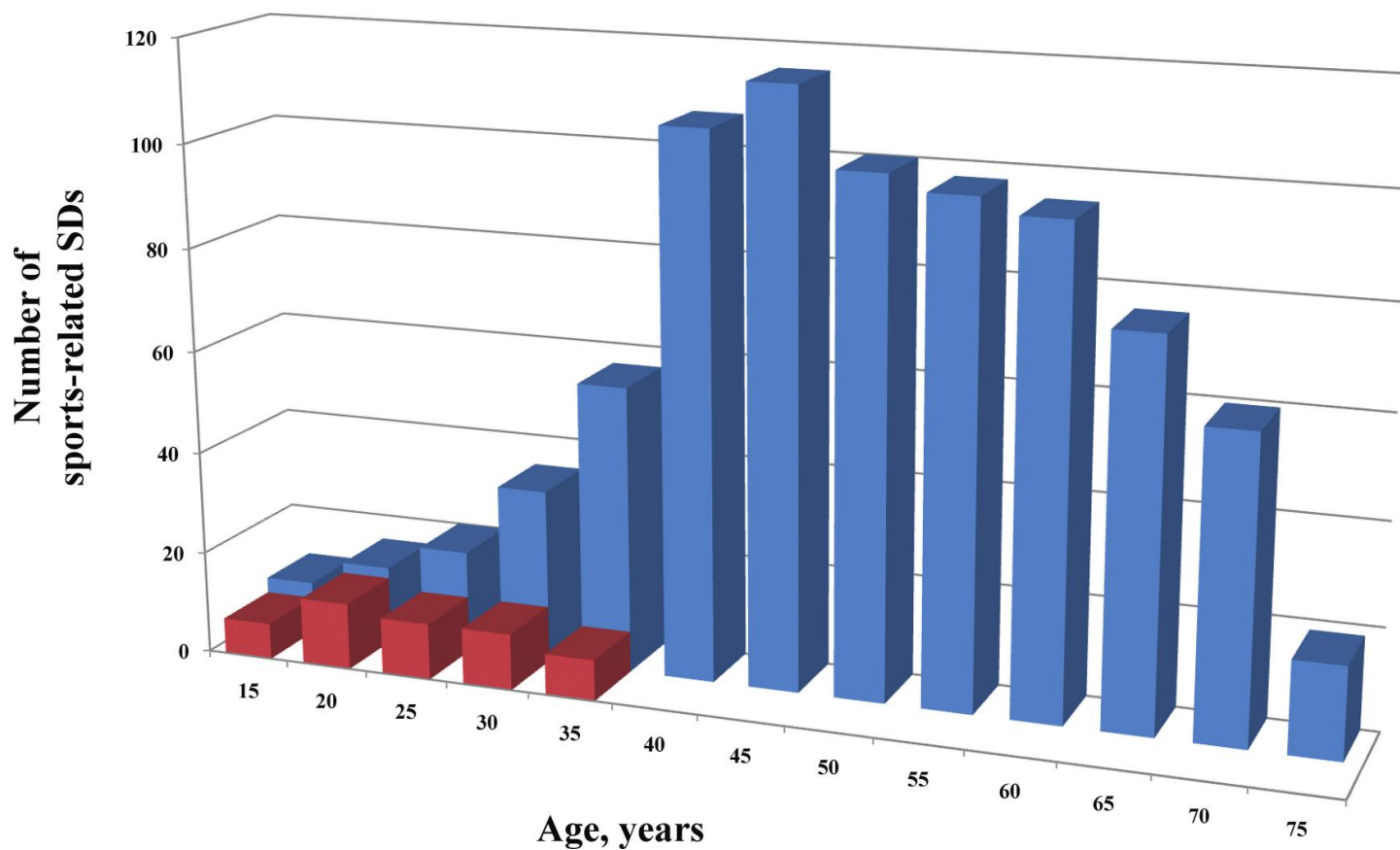


Causes of death in the US population aged 1 to 21

Adapted from Link M S, Circulation 2012; 125:2511-16

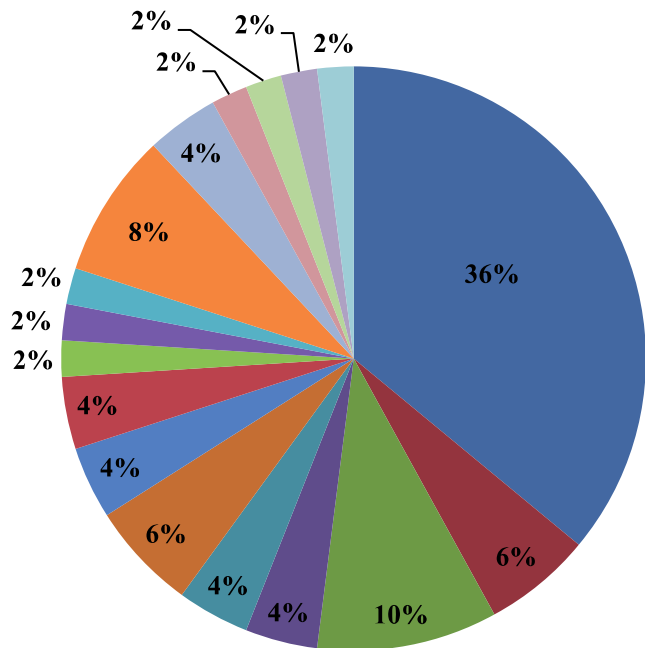
Incidence of SCD during sport activity in France

4.6/million per inhabitants per year

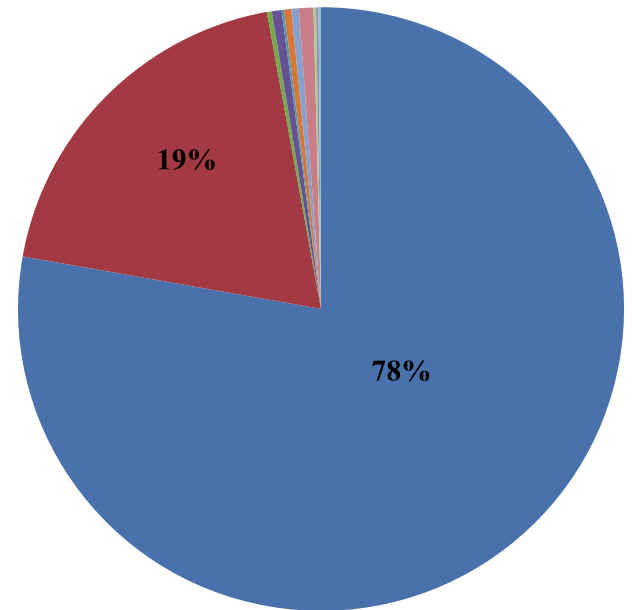


Etiologies of SCD

Young Competitive Athletes



General Population (except young competitive athletes)



What are the advantages of sport activities ?

- In trained patients cardiac stress in daily life is better tolerated
- Better acceptation of the disease and a better socialisation of the children at school
- A better cardiological follow-up of the patient and a better compliance to the beta blocker treatment
- A better knowledge of the reaction of the heart during activities (whatever you said the child will run....)
- A better life...

What are the disadvantages of sport activities ?

- Stimulation of the adrenergic system that can lead to ventricular arrhythmias and sudden cardiac death
- Involve the responsibility of the doctor

What are the different pathologies

- Brugada syndrome
- Early repolarisation
- Long QT syndrome
- CPVT
- ARVC

Long QT syndrome

Table 1 Current published guidelines regarding competitive sports and the athlete with LQTS

Recommendations for athletic disqualification

2005 Bethesda Conference guidelines

Patients who have a history of LQTS-related symptoms, have a QTc >470 ms (males) or >480 ms (females) or who have an ICD should be limited to Class IA sports

Asymptomatic genotype-positive/phenotype-negative patients are allowed to play, but are not at zero-risk*

2005 ESC guidelines

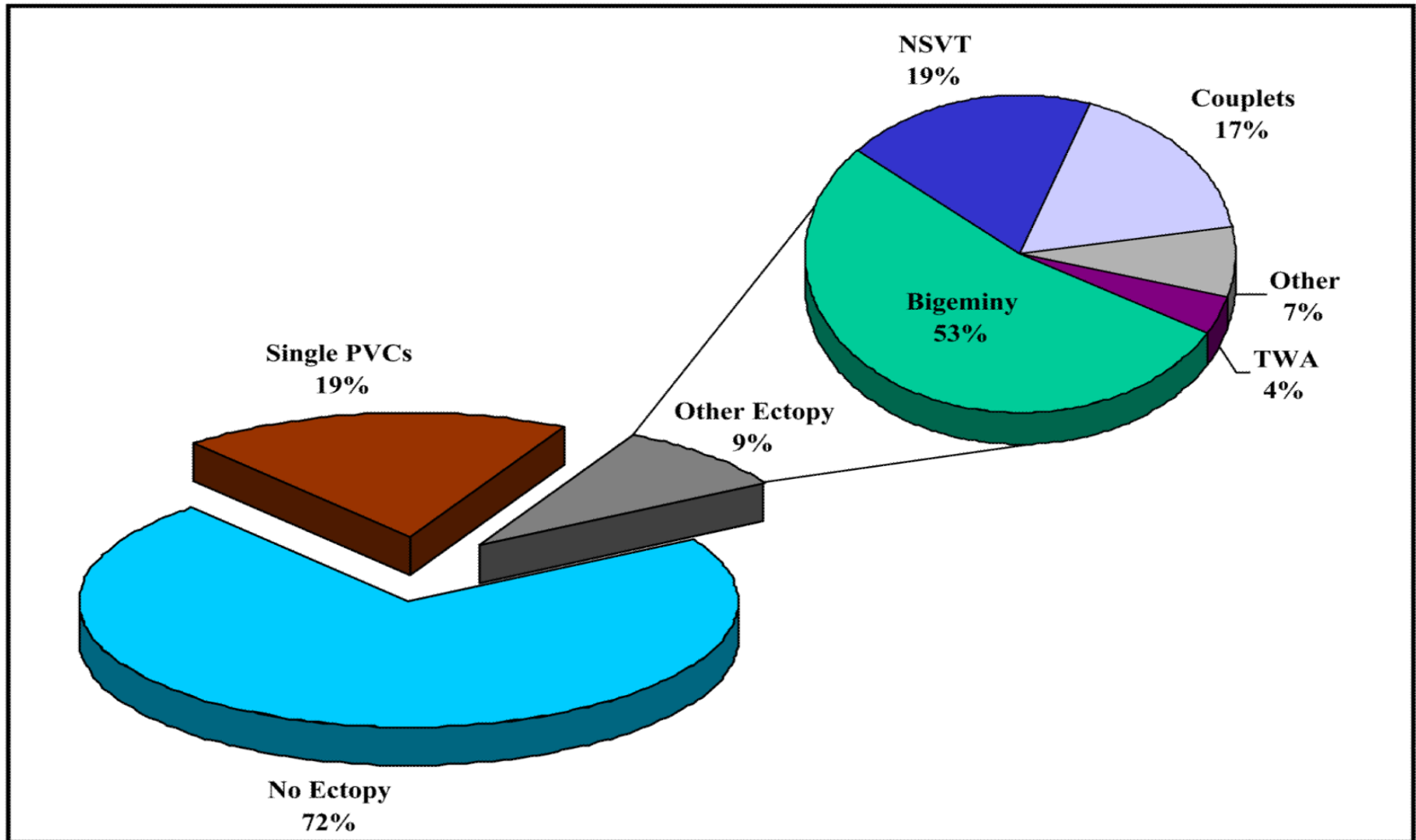
All patients who have LQTS, symptomatic or asymptomatic, are disqualified from all competitive sports

Recommended using QTc values of >440 ms (males) or >460 ms (females) as a trigger for further evaluation

*With the exception of LQT1 patients and swimming, as this is a known genotype-specific risk.

ESC, European Society of Cardiology; ICD, implantable cardioverter defibrillators; LQTS, long QT syndrome.

Frequency of ventricular arrhythmias during exercise stress test



Current guidelines for long QT syndrome: Competitive sport

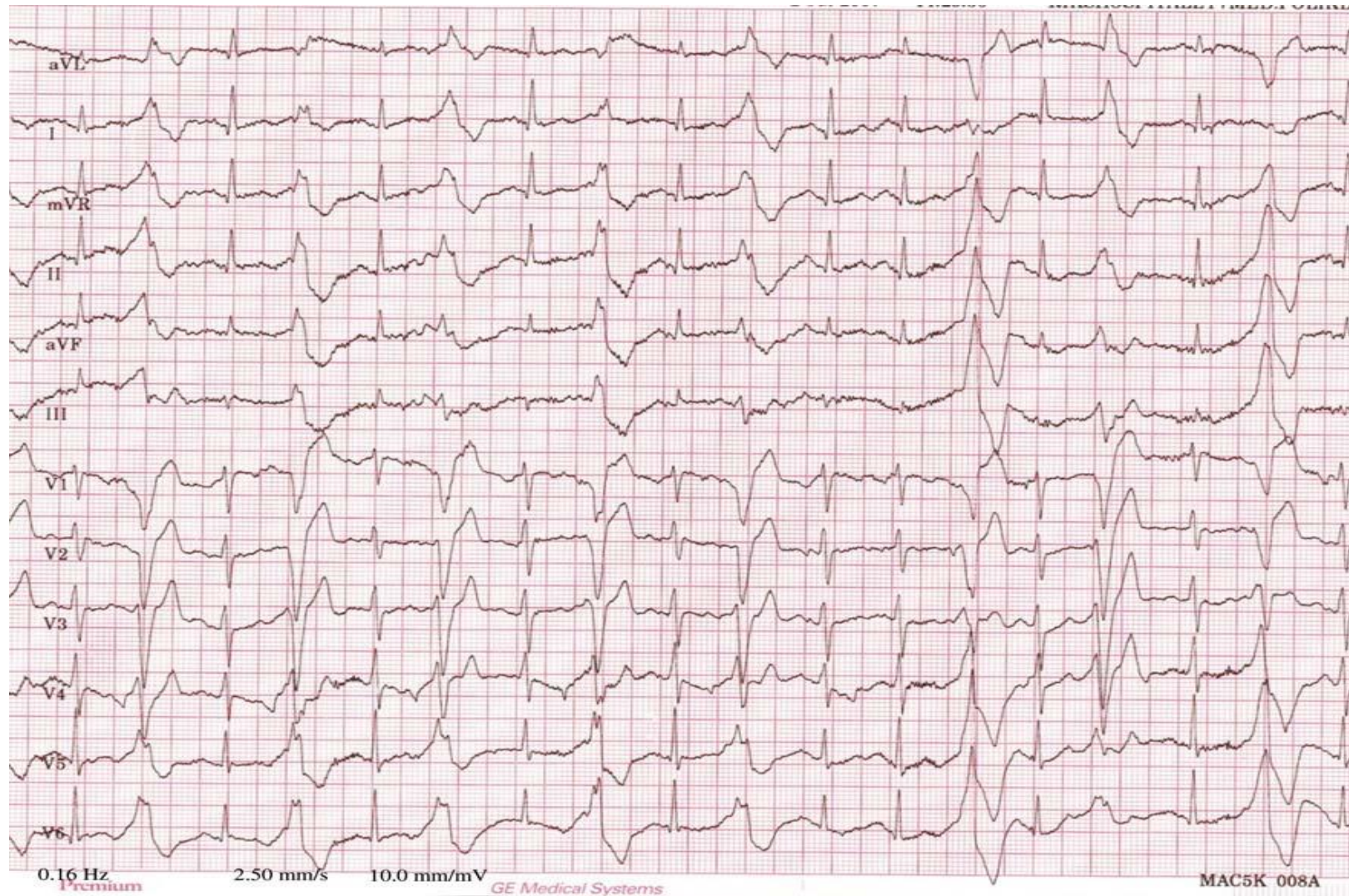
- In asymptomatic patients under beta blocker treatment, competitive sport should be authorized after the authorization of an expert
- Ackerman study demonstrating low rate of event during sport activities (Ackerman Br J Sport 2012)
- In my point of view: Authorized competitive sport without fighting spirit...
- In case of very competitive spirit propose sport without high risk (golf...)

Current guidelines for long QT syndrome:

Recreational sport

- Recreational sport should be authorized only if patient is treated with beta blocker with an exercise test demonstrating an efficient beta blockage (heart rate block under 70% of the maximal heart rate)
- Sport at school is authorized (except swimming)
- Take care of potential really competitive activities at school
- Perfect information of the school staff
- Better to have external defibrillator

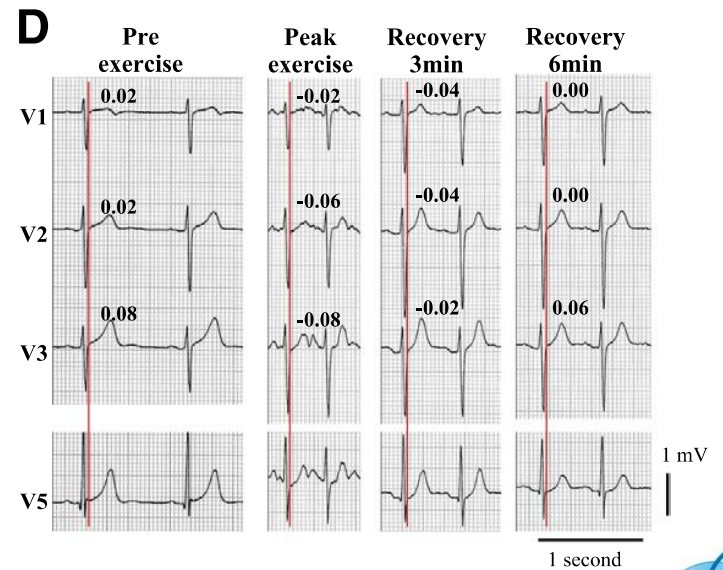
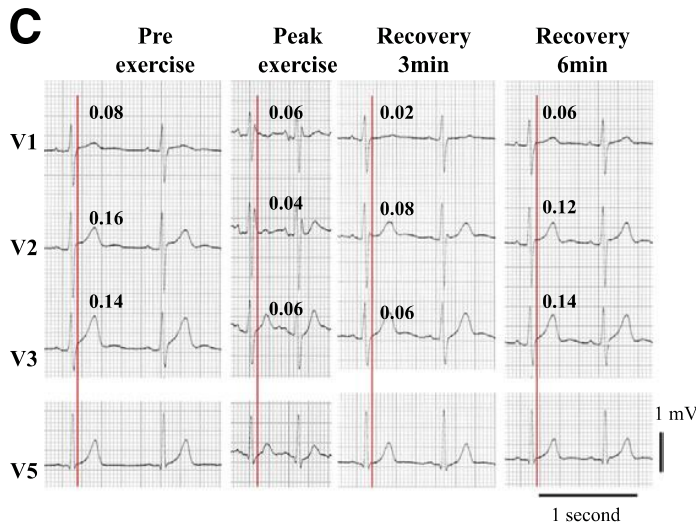
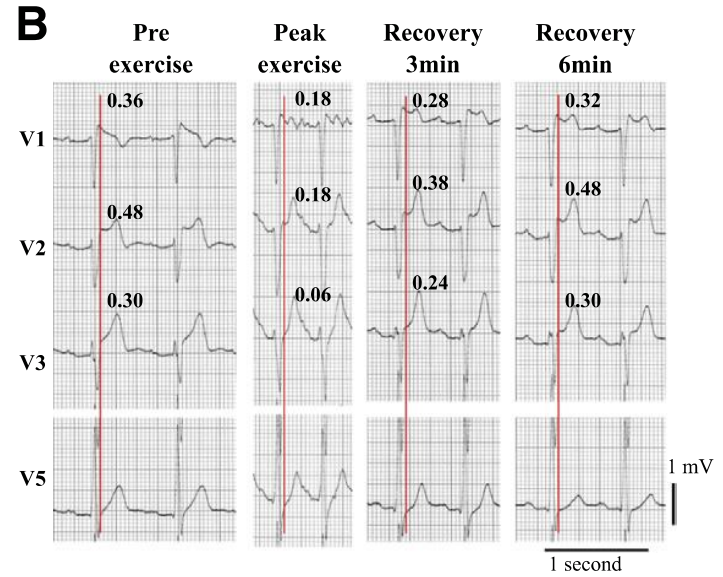
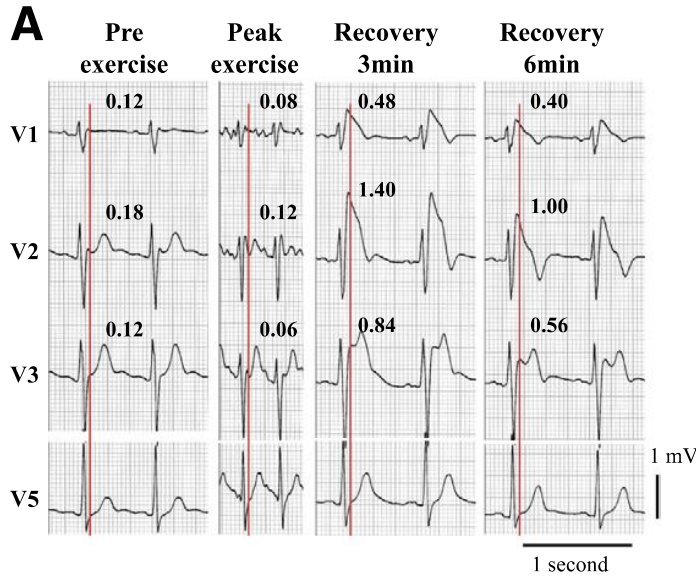
CPVT



CPVT

- Very high risk situation
- No competition
- No competitive sport should be discussed under efficient beta blocker treatment in asymptomatic patients
- After the assessment of the absence of VA during Holter recording and exercise test and the assessment of an efficient treatment
- Clear information of the parents and the staff responsible for the physical activities
- External defibrillator required

Brugada syndrome



Brugada syndrome

- Theoretical contra indication (Pellicia 2005), no recommandation in the international guideline (Priori 2013, Priori 2015) Authorized in Shanghai consensus.
- Nantes database: >1600 patients
 - No event during sport activities
 - Patients advise to decrease progressively their activities to avoid the post effort vagal tone
 - No sport in case of fever or in case of high external temperature
 - Good hydratation during sport
 - Contra indication for specific activities (diving...)

Early repolarization

- No specific recommendation
- No specific risk during sport activities
- More frequently identify in athletes

ARVC

- More frequent in athletes
- Two problems:
 - Risk of arrhythmias during activities: Same risk and same recommendations than for long QT syndrome
 - Risk of alteration of the right and left ejection fraction. Limitation of the sport activities for less than 3h00 per week.

Conclusion

- Athlete's sudden cardiac death remains rare even in case of channelopathies
- Need to balance the risk benefit ratio in every individual depending on the type of activities, the severity of the disease and the psychological profile of the patient
- In most patients moderate sport activities should be recommended to the patient
- Avoid sport in group (soccer...)
- More complex decision for competitive sport that need specific evaluation in expert centre