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Tachycardia

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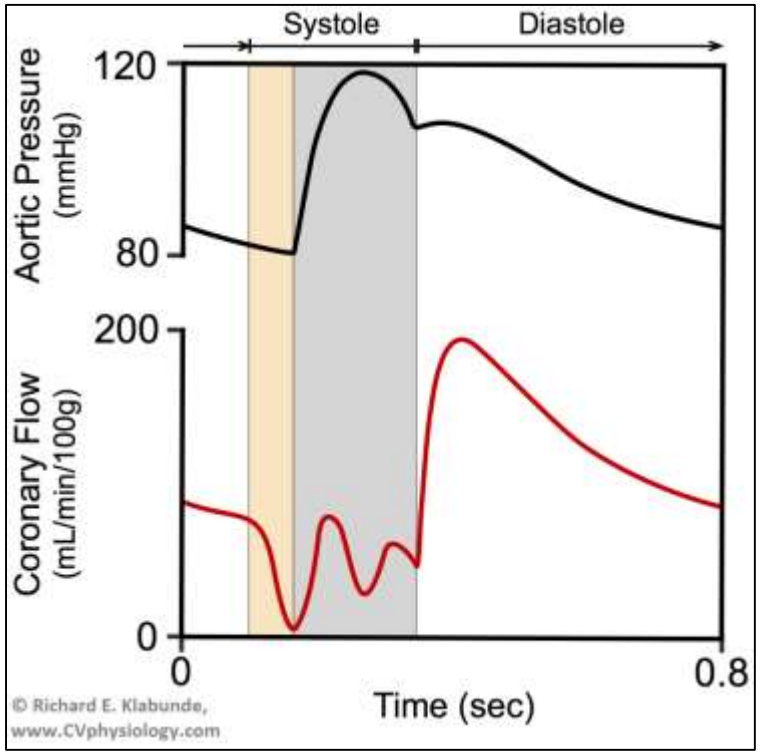
Goals

- students can define tachycardia and understand elementary pathophysiology of associated risks

- students understand basic principles and methods of tachycardia treatment according to ERC Guidelines

Basic principles

HR above 100/min is **tachycardia**



- systole:diastole = 1:2 at 60 bpm, 1:1 at 100 bpm
- tachycardia may lead to
  - insufficient ventricular filling
  - myocardial ischaemia
- max. HR estimate: 220-age
- clinical consequences
  - (pre)syncope
  - cardiogenic shock
  - cardiac arrest

require immediate treatment guidelines knowledge crucial

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Tachycardia Algorithm

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- Assess using the ABCDE approach
- Give oxygen if appropriate and obtain IV access
- Monitor ECG, BP, SpO_2, record 12 lead ECG
- Identify and treat reversible causes (e.g. electrolyte abnormalities)

Assess for evidence of adverse signs

1. Shock
2. Syncope
3. Myocardial ischaemia
4. Heart failure

Airways
Breathing
Circulation
Disability
ECG, **E**lectrolytes &
„**E**verything **E**lse“

REMEMBER!
Haemodynamic (un)stability of the patient **determines urgency** and modes of treatment in all arrhytmias

Tachycardia Algorithm („unstable“)

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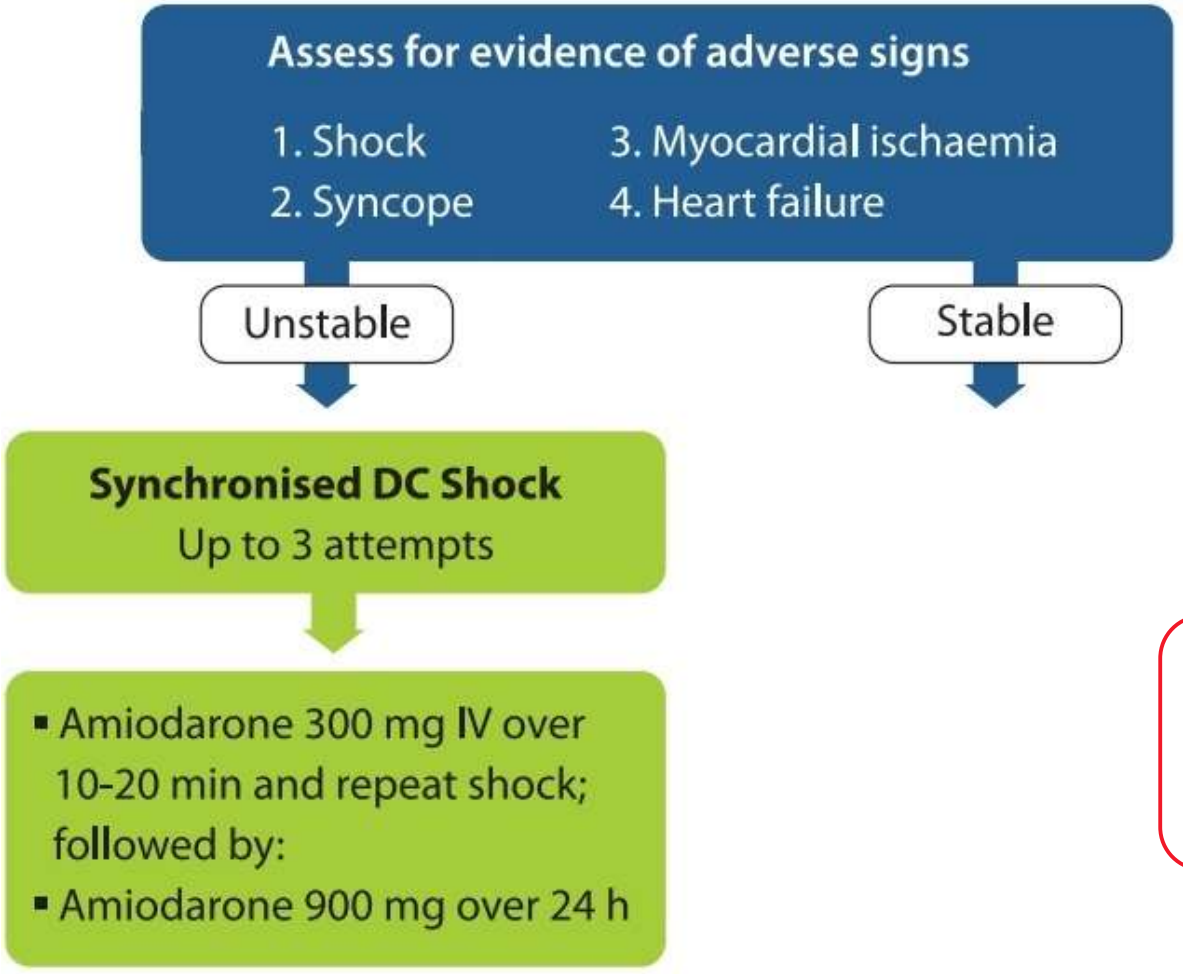

Tachycardia may be treated with:
- **pharmacotherapy**: antiarrhytmics
- **electrotherapy**: cardioversion

REMEMBER!
Immediate treatment with **electrotherapy** is recomended in an **unstable** patient with tachycardia

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Tachycardia Algorithm („unstable“)

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Synchronised DC Shock
Up to 3 attempts

DC **cardioversion** is an electrotherapy method of delivering a controlled and synchronised DC shock to the heart in order to restore sinus rhytm

Unlike defibrillation (cardiac arrest), cardioversion is performed in patients that still have a pulse, but are hemodynamically unstable.

Myocardium is electrically vulnerable during cardiac repolarization (ECG T wave).
Delivering a DC shock during repolarization may induce ventricular fibrillation.

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Tachycardia Algorithm („unstable“)

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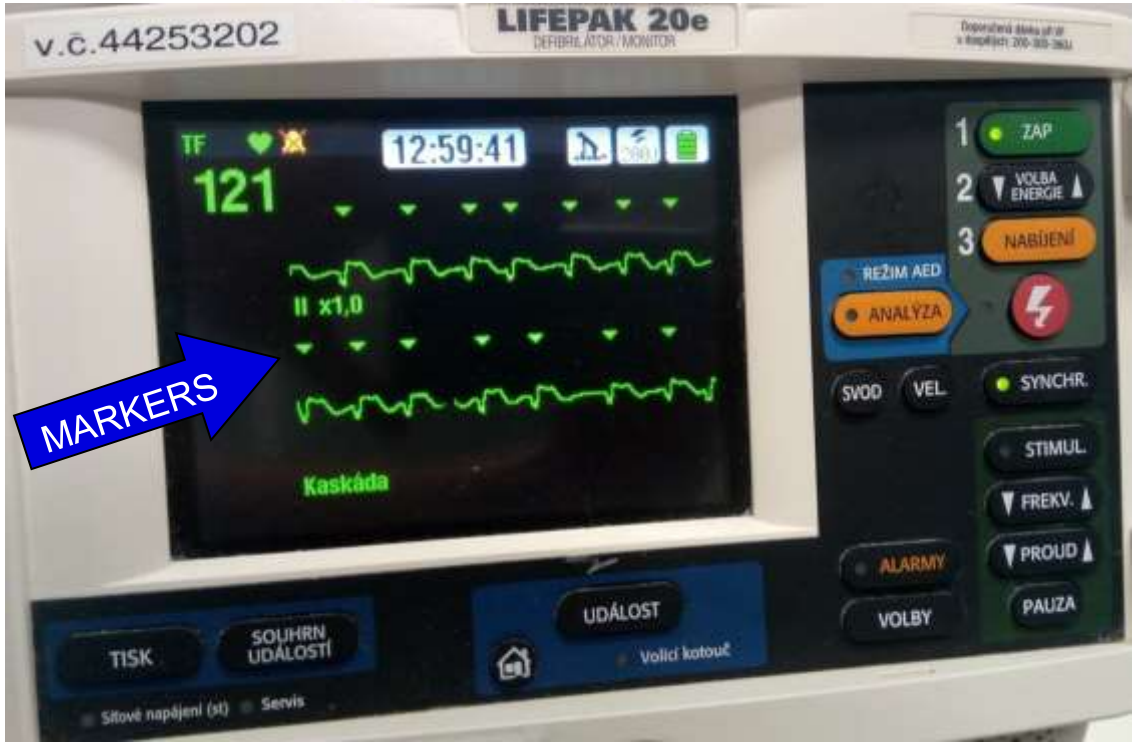
Synchronised DC Shock
Up to 3 attempts



Once ECG attached, verify quality of ECG trace and look for **synchronizing markers**
– QRS detection by the defibrillator

REMEMBER!
DC shock has to be synchronised with QRS

- Amiodarone 300 mg IV over 10-20 min and repeat shock; followed by:
- Amiodarone 900 mg over 24 h

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Amiodarone

- class III antiarrhytmic (blocks potassium currents) with a unique profile
- most widely used in intensive care with the potential to treat both atrial and ventricular arrhythmias
- **prolongs QT interval**
- **may cause hypotension and bradycardia**
- 300 mg over 10 min, max. 2 g per day, usuall dose 900 mg per day
- in 5% dextrose

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Tachycardia Algorithm („stable“)

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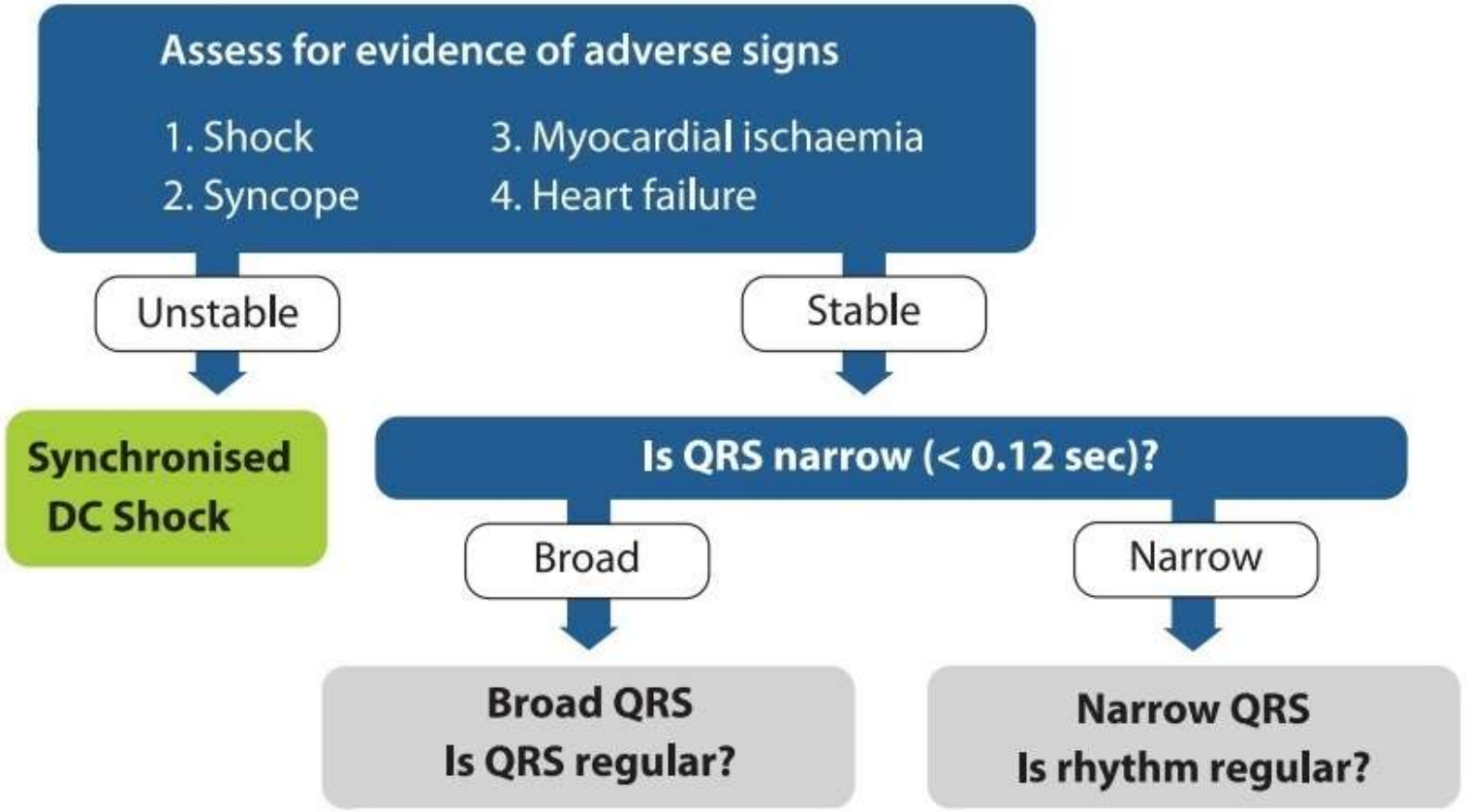

Narrow QRS suggests supraventricular origin of arrhytmia...

REMEMBER!
Atrial fibrillation carries a risk of **thrombembolic complications**

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Tachycardia Algorithm („stable“)

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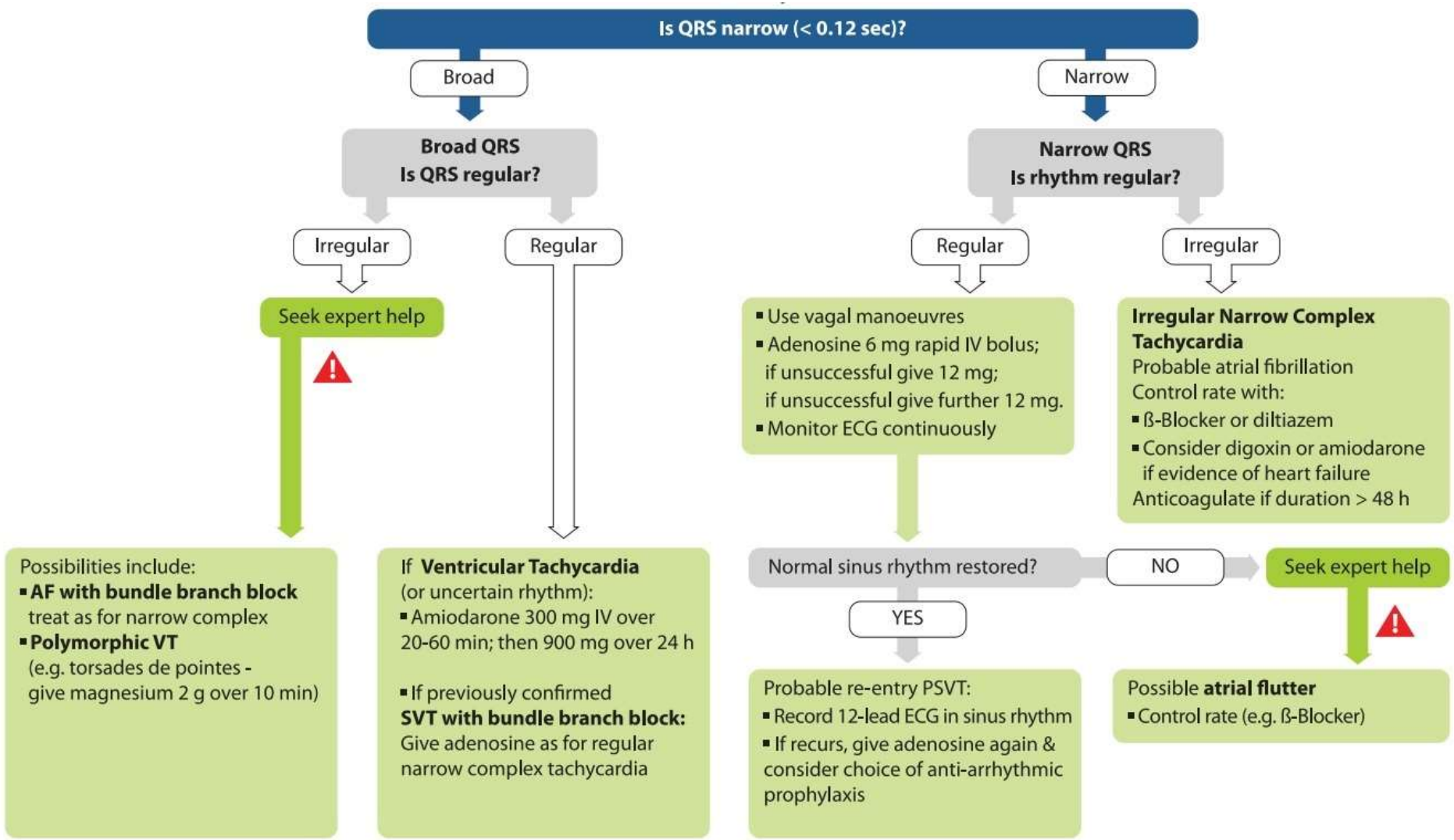

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Take home message

- tachycardia may lead to myocardial ischaemia and/or insufficient ventricular filling
- immediate cardioversion is recommended in an unstable patient with tachycardia
- cardioversion: DC shock has to be synchronised with QRS
- amiodarone has the potential to treat both atrial and ventricular arrhythmias, but prolongs QT interval and may cause hypotension and bradycardia
- atrial fibrillation carries a risk of thrombembolic complications
- European Resuscitation Council Guidelines:
  „Executive summary“ 2021 and 2015

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