

## C04: Wide Complex Tachycardia

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### Introduction

Wide complex tachycardias (WCT) are characterized by QRS widths greater than 0.12 s on an ECG. They are often, but not always, synonymous with ventricular tachycardia (VT), which is a period of three or more ventricular originated beats at a rate  $\geq 100$ /minute. VT can be either monomorphic or polymorphic in nature.

### Essentials

- The objective of care is the rapid termination of life-threatening ventricular tachycardia. Electrical cardioversion is the safest, most reliable mechanism to convert VT into a stable perfusing rhythm.
- Although WCT can develop primarily, it is often a sign of an underlying clinical condition, such as ischemia, hypoxia, hyperkalemia, or increased sympathetic tone. A thorough history should be performed prior to formulating a management plan and any underlying conditions should be considered and addressed concurrently with the tachycardia.
- Consider as unstable any patient with WCT and any of:
  - Altered or rapidly falling level of consciousness
  - Systolic blood pressure  $< 90$  mmHg
  - Ischemic chest pain
  - Significant shortness of breath or signs of cardiogenic pulmonary edema

### Additional Treatment Information

- Patients with a WCT who are clinically stable can be managed with supportive care alone. However, these patients can deteriorate quickly, so preparatory measure should be taken (IV access, therapy electrodes placed and attached). For longer conveyance times ( $> 20$  minutes), infusion of amiodarone can be considered in consultation with CliniCall (required; see ACP interventions below).
- Unstable patients should be cardioverted as soon as possible. Sedation will generally be required.
  - Synchronized cardioversion is the preferred choice in monomorphic WCT. Begin at 100J, escalating by 100J increments to a maximum of 360J. If cardioversion fails, consider switching to the alternate pad placement (e.g., if positioned anterior-lateral, place new pads anterior-posterior). Consultation with CliniCall for refractory VT is recommended (see ACP interventions below). When performing a synchronized cardioversion, ensure that the shock button is pressed and held until the energy is delivered.
  - For unstable polymorphic ventricular tachycardia, unsynchronized cardioversion is the preferred choice. Begin at 200J and follow the standard energy escalation protocol.
- Stable polymorphic WCT can be managed with magnesium sulfate. Unstable polymorphic WCT should be defibrillated (unsynchronized cardioversion) beginning at 200J.

### General Information

- WCTs are generally regular. Some irregularity can be normal in ventricular tachycardia, but consistently irregular wide complex rhythms should prompt consideration of a rhythm that is atrial in origin, usually atrial fibrillation, in conjunction with a bundle branch block.
  - Note that this must be distinguished from polymorphic WCT or torsades de pointes (TdP), where the morphology of each QRS complex is different and the R-R interval continues to change
- A small percentage of regular, WCTs are actually supraventricular in origin and result from an aberrantly conducted electrical impulse. However, the vast majority are, and should be managed as, ventricular tachycardia.

### Interventions

**First Responder**

- Keep the patient warm and protect from further heat loss
- Place the patient in a position of comfort, as permitted by clinical condition; in general, limit patient movement
- Provide supplemental oxygen where indicated
  - → [A07: Oxygen Administration](#)
- Conduct ongoing assessment and gather collateral information, such as medications and identification documents
- Establish ingress and egress routes from the patient's location
- Communicate patient deterioration to follow-on responders
- Monitor patient closely; consider potential for sudden deterioration
- An AED must be ready and available; be prepared to perform chest compressions
  - → [PR06: High-performance CPR](#)

**Emergency Medical Responder – All FR interventions, plus:**

- Supplemental oxygen as required to maintain  $SpO_2 \geq 94\%$ 
  - → [A07: Oxygen Administration](#)
- Convey early
- Consider intercept with additional resources

**Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:**

- Obtain and interpret 12-lead ECG
  - → [PR16: 12-Lead ECG](#)
- Attach therapy electrodes
- Obtain vascular access
  - → [D03: Vascular Access](#)
- For stable, monomorphic Wide Complex Tachycardia (WCT)
  - [Amiodarone](#) infusion is indicated for recurrent sustained episodes (>30 secs)
  - Consider cardioversion if patient becomes symptomatic
    - **Clinical/EPOS consult recommended**
- For symptomatic sustained runs of monomorphic WCT:
  - [Amiodarone](#) infusion
- For stable Torsades de Pointes (TdP)
  - [Magnesium Sulfate](#)
- Symptomatic monomorphic WCT or TdP
  - Procedural sedation as required
  - Synchronized cardioversion (100J-200J-300J-360J)
    - R wave flagging for synchronized cardioversion in polymorphic WCT may not be possible; provide unsynchronized defibrillation
  - Consider vector change if cardioversion fails
  - [Amiodarone](#) for WCT OR [Magnesium Sulfate](#) for TdP if refractory to cardioversion

**Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:**

- Consider sodium channel blockade
  - May consider [procainamide](#)
  - May consider [lidocaine](#)
- May consider potassium blockade
  - [Amiodarone](#)

**Evidence Based Practice**

**Stable Wide Complex Tachycardia****Supportive**

- [Antiarrhythmic - Class III \(K+ channel blockers\)](#)
- [Antiarrhythmic - Class I \(Na+ channel blockers\)](#)
- [Electrical Cardioversion](#)

**Neutral**

- [Adenosine](#)

**Against****Unstable Tachycardia (Wide or Narrow Complex)****Supportive**

- [Electrical Cardioversion](#)

**Neutral**

- [Vagal Maneuvers](#)

**Against****References**

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3. Lexicomp. (2021). Copyright 1978-2021 Lexicomp, Inc. Lidocaine: Drug information. UpToDate. 2020.
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