Tachycardia with a Pulse

Note:

- If the patient is experiencing chest pain, also refer to the *Acute Coronary Syndrome (STEMI) Guidelines*
- Although some wide complex tachycardias develop from supraventricular tachycardias, prehospital providers should always assume that wide complex rhythms are ventricular tachycardia (VT), particularly if the patient is unstable [1],[2].
- If sinus tachycardia is present, consider and treat underlying causes including: pain, dehydration, hypotension, shock, hypoglycemia, hypoxemia, anxiety, fever, sepsis, drug induced, recent heavy exertion, hyperthyroidism and anemia. Do not treat sinus tachycardia with medications or cardioversion.

Priorities	***Assessment Findings***
Chief Complaint	Palpitations, fast heart rate, shortness of breath, chest pain, weakness, syncope, poor feeding in infants
LOPQRST	Onset and duration, precipitating factors and circumstances, associated symptoms, stroke symptoms, nausea vomiting
AS/PN	Chest pain, shortness of breath, weakness, anxiety, leg swelling
AMPL	• Previous history, history of thyroid disease, CAD, cardiac medications • Obtain history of previous episodes of tachycardia, including diagnoses if known. Pay particular attention to whether there is an underlying history of pre-excitation, including the Wolff-Parkinson-White (WPW) Syndrome. • Obtain history of what medications have been used to treat previous arrhythmias, if known. • Obtain history of any previous complications from previous arrhythmia treatments, if known. • Obtain history of the duration of the current episode of tachycardia, if known.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	**Vitals Signs:** BP, HR, RR, Temp, SpO_2 **General Appearance:** Anxious? **Skin:** Cool, pale diaphoretic **Neck:** JVD? **Chest:** Labored breathing **Lungs:** Wheezes, rales, rhonchi? Decreased breath sounds? **Heart:** Regular, rate fast or slow, murmur **Legs:** Edema **Neuro:** ALOC? Signs of stroke?
Data	SpO_2, 12-lead EKG, Blood sugar if ALOC, $ETCO_2$
Goals of Therapy	Improve cardiovascular status; decrease rate; treat chest pain; treat CHF
Monitoring	Cardiac monitoring, SpO_2 and capnography

EMERGENCY MEDICAL RESPONDER/ EMERGENCY MEDICAL TECHNICIAN

- Routine Medical Care
- Administer oxygen 2 – 4 LPM per nasal cannula if SpO2 < 94%. Increase flow and consider non-rebreather mask to keep SpO2 > 94%
- If the patient is having difficulty breathing allow them to sit upright

Give a status report to the ambulance crew by radio ASAP.

ADVANCED EMERGENCY MEDICAL TECHNICIAN

- IV normal saline. An antecubital site is preferred for the administration of adenosine at the Intermediate/Paramedic level.
- If systolic BP < 100 mmHg give 500 mL (PEDS 20 mL/kg) fluid bolus, and then reassess
- Initiate EKG monitoring and obtain a 12-lead EKG and transmit to receiving facility. If transmission is not possible, may read monitor's interpretation to hospital

Contact Medical Control for the following:

- Additional fluid orders

INTERMEDIATE

- Interpret 12 Lead EKG
- If the patient is experiencing signs of cardiovascular instability related to the tachycardia (typically HR > 150 in ADULTS, > 180 in CHILDREN, > 220 in INFANTS), proceed to synchronized cardioversion (See *Cardioversion Procedure*)

Adult	• If rapid atrial fibrillation (RAF) is present and the patient does not have a history of atrial fibrillation, consider the potential causes that may have a bearing on prehospital care. Contact Medical Control for consultation on the management of RAF in these conditions: o Acute coronary syndromes (e.g. AMI) o Pulmonary embolism o Alcohol use o Stimulant drug abuse (e.g. cocaine and amphetamines)

- If the patient is hemodynamically and clinically stable, transport the patient to the hospital.

Contact Medical Control for the following:

- If the patient is hemodynamically stable but demonstrating mild to moderate signs or symptoms related to the tachycardia, assess the width of the QRS complex.
  - Wide complex (≥ 0.12 second)
    - Consider **adenosine** 6 mg (PEDS 0.1 mg/kg, max 6 mg) rapid IV push with saline flush (only if rhythm is regular and monomorphic). Second dose 12 mg (PEDS 0.2 mg/kg, max. 12 mg) if required.
    - Consider **amiodarone**[3] infusion, 150 mg over 10 minutes (PEDS 5 mg/kg over 20 – 60 minutes). Repeat as needed every 10 minutes for reoccurrence.
  - Narrow complex (< 0.12 second)
    - Vagal maneuvers
    - Consider **adenosine** 6 mg (PEDS 0.1 mg/kg, max 6 mg) rapid IV push with saline flush (only if rhythm is regular and monomorphic). Second dose 12 mg (PEDS 0.2 mg/kg, max. 12 mg) if required.

- Consider **amiodarone** infusion, 150 mg over 10 minutes (PEDS 5 mg/kg over 20 – 60 minutes). Repeat as needed every 10 minutes for reoccurrence.

- Orders to deactivate a malfunctioning automatic implantable cardioverter defibrillator (AICD). See *AICD Deactivation Procedure*.

PARAMEDIC

Contact Medical Control for the following:

Adult

- If rapid atrial fibrillation (RAF) is present, consider treatment with **diltiazem** to reduce rate.
  - Indications for prehospital treatment with diltiazem:
    - RAF is causing mild hypotension (SBP 80 – 100 mmHg) but no other serious signs or symptoms are present
    - RAF is causing an acute exacerbation of CHF and the SBP is normal to high
    - RAF is causing rate-related chest pain
  - If the patient is mildly hypotensive, give a bolus of normal saline 500 ml prior to treatment with diltiazem
    - Consider pre-medicating with calcium chloride[4] 100 – 200 mg (1 – 2 ml of 10% calcium chloride) to prevent the hypotensive effect of diltiazem
  - If the patient is experiencing CHF, also follow the *Congestive Heart Failure Guidelines*.
  - If the patient is experiencing rate-related chest pain without other serious signs or symptoms, treat with diltiazem to reduce the rate. Then re-assess the patient for symptoms of ongoing chest pain.
  - Diltiazem 10 – 20 mg IV slowly over 2 min.
    - May repeat diltiazem if response inadequate after 15 min. 10 – 20 mg IV slowly over 5 min. Hold for SBP < 100
    - Consider fluid challenge (250 – 500 ml normal saline IV) if significant or persistent.
    - Consider maintenance drip at 5 – 15 mg/hour
  - Prehospital use of diltiazem is not allowed in the presence of a wide complex tachycardia

- Failure to respond to adenosine or diltiazem

FOOTNOTES:

[1] Criteria for characterizing a patient as “unstable”

- Heart rate > 150 beats/min AND
- One or more of the following clinical criteria
  - Signs of shock (poor perfusion) are present, including

        - ALOC
        - Absent radial pulses
        - Pallor and diaphoresis
    - Signs of pulmonary edema are present, including
        - Labored breathing
        - Rales (wet lungs)
        - Hypoxia (SpO_2 < 90%)
    - The patient complains of chest pain

[2] Evaluating perfusion status in children

- Signs of compensated shock include:
    - Tachycardia
    - Cool extremities
    - Prolonged capillary refill (despite warm ambient temperature)
    - Weak peripheral pulses compared with central pulses
    - Normal blood pressure
- Signs of uncompensated shock in children include:
    - ALOC
    - Tachypnea
    - Weak central pulses
    - Hypotension

[3] Lidocaine may be substituted for amiodarone during a medication shortage. Lidocaine 1 – 1.5 mg/kg IO/IV repeat in 5 – 10 mins up to 3 mg/kg.

[4] Calcium gluconate 10% may be substituted for calcium chloride during a medication shortage. Calcium gluconate 10% 500 – 1000 mg IV slow.

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