# Kittitas County Prehospital EMS Protocols

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

**STANDARD**
Improve survival rates for all pre-hospital sudden cardiac arrest patients.

**PURPOSE**
The High-Performance CPR (HPCPR) guideline is built upon a common framework including: clearly identified roles, common terminology, interoperability between agencies, similar equipment, continually practiced skills, and a common goal of increased survival for cardiac arrest patients.

As a rural community with a significant and vital volunteer population, clarification for one-person HPCPR is provided.

**PROCEDURE**
Agencies are encouraged to create an in-house policy/procedure on how to best manage resources within their agency or with partnering agencies for the most effective and efficient response in the interest of overall patient care. Responders will train to do the best they can with the resources available. Agencies should develop practices to identify how they will fill the HPCPR common roles and how to best utilize their resources to achieve success. Agencies and responders should practice and reinforce their skills on a frequent and regular basis utilizing CPR training equipment capable of providing CPR quality feedback as much as possible.

**MAIN GOALS** -
✓Apply AED and analyze as soon as possible (ASAP).
✓ Begin continuous chest compressions (CCC)
✓ Push Hard (≥2 in.) Push Fast (> 100-120/min)
✓Starts POx (NC at 15 lpm)
✓Manage Airway
✓ Change compressors every 2 minutes
✓ Limit interruptions to <10 seconds

**HPCPR COMMON ROLES** – The common roles are listed in order of priority and should be filled in this order as resources allow. It is understood that these roles may be shared, combined, or rotated based on available resources and need to maintain effective HPCPR.

- Scout / Initial Compressor
- AED / Airway (SGA Placement) (roles may be separated when >2 responders)
- Timekeeper / Coordinator (orchestrate CPR train as resources arrive)
- Paramedic / Team Lead / ALS Care (ALS treatment protocols not included)

**HPCPR COMMON COMMUNICATIONS**

- “Stop CPR”, “Hover”
- “Clear”, “Analyzing”, “Rotate”
- “Clear”, “Shocking”
- “Start CPR”

# Kittitas County Prehospital EMS Protocols

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

**COMPRESSION / VENTILATION RATIO & COMPRESSION RATE & DEPTH – SEE TOOL FOR AGE GROUPS**

**AED PROGRAMING & COORDINATION (per manufacturer capability) –**

- Initiate analysis without delay for witnessed or unwitnessed cardiac arrest.
- Time 15 seconds for ~30 chest compressions while AED is charging.
- Two minutes of uninterrupted CPR between analyze/shock attempts.
- Minimize unnecessary communications or delays that increase time hands are off the chest.

A. **Adult HPCPR guidelines:**

1. **One person HPCPR (CCC)** –
   - If an AED is available, turn on the AED, apply AED pads and analyze ASAP (witnessed or unwitnessed arrest).
   - If shock advised, initiate chest compressions while AED is charging. Perform 30 compressions (~15 seconds) before shocking. Continue one-person HPCPR until additional resources arrive.
   - If available, apply passive oxygenation (NC at 15 lpm) during the first or second analyze/shock attempt.
   - If shock is not advised, initiate one-person HPCPR CCC for 2 min. until the next analysis or additional resources arrive.

2. **Team of ≥ 2 BLS Responders (10:1)** -
   - 1st Responder - Begin continuous chest compressions.
     - Push Hard (≥2 inches)
     - Push Fast (100-120/min) with full recoil.
       - 30 CC during AED charging (~ 15 seconds)
     - Change compressors every 2 minutes at analyze (sooner if not effective)
     - Limit all interruptions to compressions to <10 sec. This includes the use of a mechanical compression device.
   - 2nd Responder - Apply AED and analyze as soon as possible (ASAP).
   - 2nd or 3rd Responder – Start airway management.
     - Apply passive oxygenation (NC at 15 lpm) after first analyze/shock attempt or sooner if resources available (before Igel or BVM).
     - Passive oxygenation may be performed to a **maximum** of 6 minutes to allow prioritization of CPR and defibrillation. Once resources are on scene, to allow for non-compromised CPR and defibrillation, an Igel or BVM ventilations should be utilized ASAP.
     - Place Igel (if EMT SGA credentialed), if not available initiate BVM.
       - Switch passive oxygenation to Igel bag valve 15 lpm if only one O2 tank.
     - If BVM only, insert oropharyngeal airway (OPA permitted for EMRs)
     - Bag Valve size for adult ventilation - Use child BVM or small adult size bag (not >1000 ml = stroke volume 450-725 ml) with appropriate adult size mask. The target volume for full sized adults is 450 ml.

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

- Always prioritize the next AED analyze and shock attempt before ventilations.

**B. Pediatric HPCPR guidelines:**

2. **One person HPCPR (30:2)** –
   - If an AED is available, turn on the AED, apply AED pads and analyze ASAP (witnessed or unwitnessed arrest).
   - If shock advised, initiate chest compressions while AED is charging. Perform 30 compressions (~15 seconds) before shocking. Continue one-person HPCPR (30:2) until additional resources arrive.
   - Ventilate appropriately. If available, apply passive oxygenation (NC at 15 lpm) during the first or second analyze/shock attempt.
   - If shock is not advised, initiate one-person HPCPR (30:2) for 2 min., stopping for ventilations until the next analysis or additional resources arrive.

3. **Team of ≥ 2 BLS Responders (15:2)** -
   - 1st Responder - Begin continuous chest compressions.
     - Push Hard (≥ 1/3 diameter of chest)
     - Push Fast (100-120/min) with full recoil.
       - 30 CC during AED charging (~ 15 seconds)
     - Change compressors every 2 minutes at analyze (sooner if not effective)
     - Limit all interruptions to compressions to <10 sec.
   - 2nd Responder - Apply AED and analyze ASAP.
   - 2nd or 3rd Responder – Start airway management.
     - Initiate appropriate ventilations with supplemental O2.
     - If two O2 tanks are available, apply passive oxygenation (NC at 15 lpm) after first analyze/shock attempt or sooner if resources are available.
     - For advanced airway management with supraglottic airway device, see BLS Airway Management Protocol.

**D. Other General Guidelines**

- ALS procedures are reflected in the ALS specific protocols.
- BLS personnel should not wait for paramedic arrival to utilize AED.
- SGA Credentialed EMTs should not wait for paramedic arrival to place Igel.
- DO NOT STOP compressions for any procedures unless specifically instructed by paramedic. Confirm the need to stop, before stopping.
- Switch compressors every two minutes or sooner if compressor is losing effectiveness.
- Stop chest compressions for the first ventilation to assure patent airway (chest rise). Then do not stop CPR for ventilations unless cause.
- About one second per breath. Watch for visible chest rise on initial attempt, do not over ventilate. A manometer device on BV is recommended.
- Ventilations should be asynchronous with chest compressions.
- Use a metronome (when available) to ensure proper chest compression rates.

# Kittitas County Prehospital EMS Protocols

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

- **Mechanical Chest Compression Devices (MCD)** – MCD's (Lucas 2 or other MPD approved device) may be utilized only in the setting of MPD approved device used according to manufacturer's instructions, and in the absence of adequate personnel to perform adequate HPCPR, longer duration events, or due to safety issues, such as during transport.
  a. Follow the manufacturer's instructions regarding appropriate use. MCD's can be utilized for patients older than 12 years old and are appropriate for cardiac arrest of non-traumatic nature.
  b. Use of MCD's should not delay or significantly interrupt high quality chest compressions and should be implemented by highly trained and very proficient providers. Agencies and providers who utilize MCD 's should be prepared for possible device failure and have the necessary resources available to continue HPCPR without their use.
  c. The use of MCD's only replaces the task of High-Quality Chest Compressions (HQCC). All other elements of HPCPR shall be accomplished by responders.
  d. Continuously assess the location and application of the device on the patient. Readjust as needed.
  e. Delivery of the shock will always take priority over any MCD application steps.

- BLS Providers should not transport or rendezvous with a cardiac arrest patient unless a pulse is obtained ≥60 beats/min. If a pulse is detected during resuscitation but systolic blood pressure is < 60, resume CPR. If ALS is not in route or available, contact medical control for transport direction.
- If 3 consecutive "no shock" are advised and there is no pulse, continue CPR without interruption until ALS arrives. If ALS is not available, continue shock attempts every 2 minutes and contact medical control for directions.
- For other situations related to sudden cardiac arrest, follow ASHI/AHA BLS guidelines.
- Following completion of the cardiac arrest incident, providers should complete a thorough and complete patient care report, to include the WA Cardiac Arrest Registry to Enhance Survival (WACARES) data elements.

**REFERENCE TOOLS (included)**

- Kittitas County Prehospital Protocols: High Performance CPR Guidelines Reference Tool by Age Groups for Resuscitation Interventions
- Adult HPCPR Skill Check Sheet – BLS Continuous

# Kittitas County Prehospital EMS Protocols

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

**Kittitas County Prehospital Protocols: High Performance CPR Guidelines**
**Reference Tool by Age Group for Resuscitation Interventions (Revised 9-2025)**

| CPR/Rescue Breathing Maneuver | Adult and Older Child (Adolescent and older) | Child (1 year to adolescent) | Infant (<1 y old) | Newly Born (28 days neonate) |
|---|---|---|---|---|
| **Based on 911 activation** | | Kittitas County Prehospital High Performance CPR Guidelines | | |
| **CIRCULATION:** Initial pulse check or if movement (< 10 seconds) | **Simultaneously check pulse/obvious signs of life/breathing** Carotid (Can use femoral in child) | | **Same** Brachial or femoral | Umbilical/Stethoscope |
| **Compression landmarks** Minimize interruptions | Between nipples, just below nipple line (lower ½ sternum) | | Just below nipple line | Lower half of sternum (1 finger width below intermammary line) |
| **Compression method** Push hard and fast Allow complete recoil every time | **2 Hands:** Heel of one hand, other hand on top, lock fingers | **2 Hands:** Heel of one hand, other hand on top, lock fingers **1 Hand:** Heel of 1 hand | **1 or 2 rescuers:** 2 fingers or 2 thumb-encircling hands | 2 fingers or 2 thumb-encircling hands for 1-2-rescuer trained providers |
| **Compression depth** Minimize interruptions | **2-2.4in (5-6 cm) depth** | At least 1/3 diam. of chest **2 in (5-6 cm) depth** | At least 1/3 diam. of chest 1½ in. depth (4 cm) | =1/3 the depth of the chest for newly born |
| **Compression rate** Minimize interruptions | **100-120/min** (Each set of 30 compressions should take approximately **15-18 seconds**) | | | = 120 events/min (90 compressions/30 breaths) |
| **Compression: ventilation ratio Don't stop compressions for ventilations unless cause CCC=continuous chest comp.** | **10:1 (2 rescuers) CCC (1 rescuer)** | 15:2 (2 rescuers) 30:2 (1 rescuer) **If advanced airway, 1 breath every 2-3 seconds.** | | 3:1 (1 or 2 rescuers) **stop to ventilate** |
| **AED - Continue compressions while pads are applied and while AED is charging (~15 secs = 30 CC) AED ASAP** | **Use AED ASAP**, adult pads. Do not use child pads/child system. (same witnessed or unwitnessed) | **Use AED ASAP**. Use pediatric pads/ system for 1-8 years. If not available, use adult pads. | Manual defib is preferred. If PM not available, AED w/ped pads/system ASAP. If neither, use adult pads | N/A |
| **AIRWAY** Minimize CC interruptions. **Stop CC 1st ventilation only.** | Jaw Thrust to open airway whenever possible with 2 rescuers, especially trauma patients. (If jaw thrust not successful, head tilt-chin lift) | | Appropriate inline position. Padding under shoulders may be helpful if available. | |
| **Breaths/Ventilations: Adult is same for secured or unsecured airway (10:1)** **Ventilate on recoil/decompress unless advanced airway.** **Do not hyperventilate!** **Stop CC 1st ventilation only.** | **1 breath ~ 1 second (Start with compressions followed by 1 breath every 6 secs. /10 compressions)** **DO NOT OVER VENTILATE** Stop ventilation once you see chest rise or **per manometer**. | 2 breaths at 1 second/breath (Start with compressions followed by 2 breaths) **DO NOT OVER VENTILATE** Stop ventilation once you see chest rise or **per manometer**. Pediatric with advanced airway: 20-30 breaths/min. **(approx. 1 breath every 2-3 seconds)** | | 1 second/breath 30 to 60 breaths/min (approx.) **Stop w/chest rise** **(stop to ventilate w/o advanced airway)** |
| **Rescue breathing w/o chest compressions when pulse present:** Avoid excessive ventilations. | 8-10 breaths/min. (Approximately 1 breath every 6 seconds) | 20-30 breaths/min. (Approximately 1 breath every 2-3 seconds) | | |
| **Foreign-body airway obstruction** (No blind finger sweeps on any patient.) | **C**onscious Pts. -- Abdominal thrusts (standing or sitting) **UnC**onscious Pts. -- CPR w/FBAO check before ventilate | | **C** – 5 Back slaps and 5 chest thrusts **UC** -- CPR w/FBAO √ | **C** – 5 Back slaps and 5 chest thrusts **UC** -- CPR w/FBAO √ |

BLS/ALS

**SUBJECT: HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION (HPCPR)**

## *HP-CPR* Skill Check Sheet

(Kittitas County EMS Division)

**BLS Continuous**

| PRINT NAME | DNG # | Date: / / |
|---|---|---|

**Objective:** Given 2 or more providers, BLS/ALS equipment, and manikin: Demonstrate assessment and treatment for Cardiac Arrest as outlined in current: ***HP-CPR Guidelines.***

**PPE / SAFETY**

| ☐ Gloves | ☐ Eye Protection | ☐ AED Safety |
|---|---|---|

**COMPRESSION PERSON(S)** AT PT'S RIGHT SIDE (+ ADDITIONAL MANPOWER FOR CPR TRAIN)

| ☐ Confirm: ~~uncon~~ /unresp. | ☐ Pulse check *(no more than 10 sec.)* | ☐ Verbally ***counts*** compressions | ☐ Performs proper airway/breathing technique |
|---|---|---|---|

| | |
|---|---|
| ☐ Move patient to open area. | ☐ Switches every 2 minutes (< 5 seconds) |
| ☐ Remove clothing to start. | ☐ Femoral Pulse Check during CPR (by AED operator or other when ≥ 3 responders. |
| ☐ Immediately begins chest compressions (CC) with rate of 100-120 per minute (+ metronome) | ☐ **Proper "HOVER" position** |
| ☐ **Analyze as soon as possible.** | ☐ *Proper hand placement (center of chest) |
| ☐ **Compressions during AED charging for 15 secs ~ 30 CC.** | ☐ *Compress chest 2-2.4 inches (50-60mm) |
| ☐ Resume CC immediately after shock attempt | ☐ *Allow complete recoil between compressions |
| | * (per feedback device) if available during training |

**DEFIB TECHNICIAN** (POSITION AT THE HEAD IF ONLY TWO RESPONDERS)

**ANALYZE ASAP & Repeat every 2 MINUTES of HP-CPR** *(provides performance feedback as needed)

| **Shock Advised (No-Shock = "Start CPR")** | **Concise Communication** |
|---|---|
| ☐ Shock (no pulse check after) | ☐ "Stop CPR" & "Hover" |
| ☐ 2 Minutes of CPR | ☐ "Clear" + "Analyzing" + "Rotate" |
| ☐ Rotates in NEW ~~compressor~~ | ☐ "Start CPR" (during charging) |
| ☐ Analyze @ 2 mins. (post-shock) | ☐ "Clear" + "Shocking" (if applicable) |
| ☐ Femoral Pulse Check during CPR (by AED operator or other when ≥ 3 responders | ☐ "Start CPR" (2 mins.) |

**VENTILATION PERSON** (POSITION AT THE HEAD FOR ≥ 2 RESPONDERS)

☐ **Initiate passive oxygenation (NC @ 15 lpm).**

☐ **Attempt I-gel after first AED analysis or sooner if ≥ two responders available.**

☐ **Give 1 breath/10th comp./6 secs ~ 8-10/min (unsecured/secured airway) AND Does so on Recoil***

*Achieve chest rise ~ 450ml

**TIMEKEEPER** (OFFERS A "COUNTDOWN" APPROACH – 30 SECS, 15 SECS, ROTATE, ETC.)

☐ **Tracks** 2 min. intervals ☐ **Announces** time at **1:45** ☐ **Eliminates *ALL*** unnecessary interruptions

| CRITICAL FAIL CRITERIA | Must successfully perform *ALL ELEMENTS* |
|---|---|

| PASS | YES____ | NO____ | Evaluators name/signature: | Date: |
|---|---|---|---|---|