EMERGENCY EQUIPMENT REMOVAL

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When performed correctly, emergency equipment removal for contact sports is imperative to improve patient outcomes of suspected head and spinal injuries. Athletic trainers are specifically trained to provide care and remove equipment in these emergencies (Boergers et al. 2019). The most recent recommendations state that protective equipment should be removed at the venue or site while maintaining stabilization of the cervical spine before transportation (Prentice, 2021). 52.44% of medical personnel believe that on-field removal of athletic equipment will only result in less head/neck movement, whereas 64.08% believe that removal will expedite care and ultimately lead to better patient outcomes (Boergers et al. 2019). This is due to the lack of trained medical personnel at each event. Athletic trainers must work with local EMS and team physicians to practice equipment removal as often as possible before and during the sports season. Proper access to medical personnel in these events will ultimately lead to improved outcomes for the athlete.

Protective equipment may interfere with the ability to perform cardiopulmonary resuscitation (CPR) and apply AED pads in an emergency (Bowman et al., 2020). The thickness of the chest plates and shoulder pads can interfere with the depth and speed of compressions. Coaches, Athletic Trainers, and medically trained professionals should be aware of quick-release functions that may be available on the shoulder pads. Most manufacturers of football shoulder pads have created a quick-release system to allow for expedited and high-quality compressions (Bowman et al., 2020). Recent studies have shown no difference in CPR quality for lacrosse athletes with and without pads, which contradicts other authors whose studies focused on athletes' football pads. Football pads are much thicker than lacrosse pads, which may explain the discrepancy (Bowman et al., 2020).

All emergency equipment removal procedures should be outlined in the most recent EAP with all Athletic Trainers, EMS personnel, team physicians, and coaches. It is imperative that the medical team work together and have rehearsed procedures to ensure proper care of the injured athlete. At least three personnel from the medical team should be readily available to assist with all equipment removal. The following procedures are from the 17th edition of the *Principles of Athletic Training: A guide to evidence based clinical practice*, by William E. Prentice.

Face Mask Removal

The face mask is usually attached to the helmet by four fasteners. The two side fasteners should be removed first, followed by the two top fasteners. Newer helmets typically have quick-release fasteners that help with decreasing movement.

It is recommended that the face mask be removed using tools and techniques that require the least amount of movement of the cervical spine.

1. Electric screwdrivers
2. Anvil Pruner (cutting device)
3. FM Extractor (cutting device)

Helmet Removal

Two providers are required for proper helmet removal.

1. Provider 1 maintains stabilization of the cervical spine using the "head squeeze" technique or the "trap squeeze method"
2. Provider 2 cuts the front of the jersey in a T-pattern
3. Provider 2 cuts the right and left chest straps, as well as the front straps or strings
4. Provider 2 cuts the chin strap and removes the jaw pads from the helmet
5. Provider 2 reaches under the shoulder pads from the front and takes over cervical spine stabilization
6. Provider 1 removes the helmet, then resumes control of the cervical spine

Shoulder Pad Removal

There are three techniques available depending on the number of personnel in the medical team.

1. The Elevated Torso Technique is used when the shoulder pads have not been cut posteriorly
    a. Provider 2 reaches under shoulder pads from the front and assumes control of the cervical spine.
    b. Providers 3 and 4 tilt the athlete 30-45 degrees at the waist.
    c. Provider 1 removes shoulder pads axially (towards the head).
2. The Flat Torso Technique is used if the shoulder pads are cut anteriorly and posteriorly.
    a. Provider 2 reaches under shoulder pads from the front and assumes control of the cervical spine.
    b. Providers 1 and 3 remove the shoulder pads by sliding them laterally from underneath the athlete.
3. The 8-Person Lift
    a. Provider 1 maintains stabilization of the cervical spine while providing commands to Providers 2-7 to lift the athlete 1 foot off the ground.
    b. Provider 8 slides a spine board under the athlete.
    c. Provider 9 slides shoulder pads from underneath the athlete without disrupting Provider 1.
    d. Provider 1 commands the team to lower the athlete onto the spine board.

After all equipment removal procedures have been executed safely, administer a rigid cervical collar to the athlete before beginning transport to an emergency facility. The Athletic Trainer or team physician should stay with the athlete and monitor vitals until transportation is available or advanced medical professionals are ready to take full care of the athlete. Ensure you brief the medical team of the events up until the release of care.

Ensuring proper equipment removal by medical professionals; who are familiar with the indications and contraindications for equipment removal and equipped with the precise knowledge and skills (Boergers et al., 2019), is vital to improved outcomes of head/neck spinal injuries. Emergency department clinicians lack familiarity with protective equipment, which can lead to longer removal times (Boergers et al., 2019) and decrease immediate care of the athlete. In conclusion, Athletic Trainers need to revise emergency management guidelines for equipment-intensive sports, establishing procedures with the personnel that they have available to aid. Coaches are an important resource, who can be trained and proficient in assisting with equipment removal. With recurrent preparation, involving all personnel, effective on-field equipment removal in emergencies will ensure the best care of the athlete.

References

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