



# GUNSHOT WOUND OF EXTREMITY PEDIATRIC ER MANAGEMENT

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# CASE # 1

- 14 y/o AAM presents to ED via EMS for penetrating wound of the right forearm. Adolescent was involved in altercation and injury is suspected to have been sustained from a handgun.
- Vitals: T 37.8, HR 111, RR 18, BP 113/72
- ABCs are stable with controlled bleeding  
Pulse is intact. Exam pertinent for 2 cm penetrating wound on ventral forearm and 1 cm wound on dorsal forearm.



## QUESTION # 1

Which bedside evaluation should be promptly performed to ensure optimal functional outcome?

- A) Wound Cleaning
- B) Motor/Sensory Exam
- C) Wound Exploration for Foreign Body
- D) Bilateral Arm BP measurement



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Which bedside evaluation should be promptly performed next to ensure management of optimal functional outcome?

A) Wound Cleaning

**B) Motor/Sensory Exam**

C) Wound Exploration for Foreign Body

D) Bilateral Arm BP measurement



## RATIONALE

- Nerve injuries from gunshots are particularly challenging because they are time sensitive. Prompt treatment is necessary for optimal outcomes.
- Unfortunately, prompt treatment is not always provided since they are either unrecognized, considered untreatable or referred late.
- Outcomes from motor nerve injuries decline sharply with increasing denervation time.



## RATIONALE

- In penetrating extremity injuries, vascular and nervous systems are common targets.
- Critical primary survey elements include circulation and disability.
- First step is a thorough assessment of distal and peripheral pulses, with control of bleeding. Then, a detailed neurologic examination and functional assessment should be performed.



## RATIONALE

- Management priority is thorough decontamination of the wound and surrounding skin.
- Radiographs of the extremity will help to determine if a foreign body is present and if there is any bony involvement. U/S can be helpful for vascular injury.



## CASE # 2

- 10 y/o urban Hispanic Male presents to ED via EMS for penetrating wound of the left lower leg. The child is thought to have shot himself while playing with his father's handgun. Bullet was retrieved.
- Vitals are stable. Pulses are intact, exam is pertinent for 1.5 cm penetrating wound on dorsal-medial aspect of the lower leg with 1 cm exit wound on posterior. Motor/Sensory Exam is pertinent for suspected impairment of dorsiflexion of ankle and posterior numbness but exam is limited due to child's pain and poor cooperation.



## QUESTION # 2

Which is the best management step?

- A) Extremity pressure evaluation for compartment syndrome.
- B) X-Ray of extremity for evaluation of fracture
- C) Prompt Consultation of Pediatric Surgery
- D) Closure of wound and observation



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# RATIONALE

- Nerve injuries in young children are different from those in adults. Nerve grafting may yield better results in children because they are smaller, and therefore the distance from proximal stump to motor end plate is shorter.
- Children are also thought to have a greater degree of central nervous system plasticity. It is worthwhile to undertake major nerve reconstructions in children compared with adults.



# RATIONALE

- Previous studies have concluded that nerve injuries in pediatric missile wounds are rare, and a period of observation of 3 weeks to 3 months had been advocated. However, because outcomes from motor nerve injuries decline sharply with increasing denervation time, early exploration should be undertaken in cases where transection is likely to have occurred.
- Follow-up is poor in urban population, treatment should be prompt and thorough.



## REFERENCES

- Amick, L. Penetrating trauma in the pediatric patient. *Clinical Pediatric Emergency Medicine* Vol 2, Issue 1, March 2001, Pages 63–70.
- Stoebner, AA et al. Upper and lower extremity nerve injuries in pediatric missile wounds: a selective approach to management. *27(6):635–41*. June 2011.

