



# **MANAGEMENT OF GUNSHOT HEAD INJURIES**

## **Essay**

Submitted for Fulfillment of Master Degree in  
**General surgery**

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بسم الله الرحمن الرحيم

﴿ يرفع الله الذين آمنوا منكم والذين أوتوا العلم درجات ﴾

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**DEDICATED**

***TO MY PARENTS  
FOR THEIR ENCOURAGEMENT,***

***TO MY DEAR BROTHERS AND  
SISTER,***

***TO MY WIFE FOR HER SUPPORT,  
AND TO MY LOVELY DAUGHTER  
SALMA.***

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## **LIST OF ABBREVIATIONS**

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<b>ABCDE</b>	Airway, Breathing, Circulation, Disability And Exposure.
<b>ACP</b>	Automatic Colt Pistol.
<b>AP</b>	Antero-posterior.
<b>BP</b>	Blood Pressure.
<b>CBF</b>	Cerebral Blood Flow.
<b>CNS</b>	Central Nervous System.
<b>CPP</b>	Cerebral Perfusion Pressure.
<b>CSF</b>	Cerebrospinal Fluid.
<b>CT</b>	Computed Tomography.
<b>DAI</b>	Diffuse Axonal Injury.
<b>dL</b>	DeciLiter
<b>E</b>	Eye Opening
<b>ED</b>	Emergency Department
<b>e.g.</b>	For example.
<b>EAC</b>	External Auditory Canal.
<b>g</b>	Gram(s).
<b>Fig.</b>	Figure
<b>FMJ</b>	Full Metal Jacketed
<b>GCS</b>	Glasgow Coma Scale.
<b>GOS</b>	Glasgow Outcome Scale.
<b>GSW(s)</b>	Gunshot wound(s).
<b>GSWH</b>	Gunshot wound to the head
<b>hrs</b>	Hours
<b>i.e.</b>	that is.
<b>ICH</b>	Intra Cranial Heamorrhage.
<b>IC-HTN</b>	Intracranial Hypertension.
<b>ICP</b>	Intracranial Pressure.
<b>ICS</b>	Inter Costal Space.
<b>ICU</b>	Intensive Care Unit.
<b>IV</b>	Intra Venous.
<b>KE</b>	Kinetic Energy.
<b>Kg</b>	Kilogram(s).
<b>L</b>	Liter.
<b>LOC</b>	Loss of Consciousness.
<b>M</b>	Motor Response.
<b>m</b>	Mass

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<b>M<sub>1</sub></b>	Motor Area Number 1
<b>M<sub>2</sub></b>	Motor Area Number 2
<b>MAP</b>	Mean Arterial Pressure.
<b>MAX</b>	Maximum.
<b>MCL</b>	Mid Clavicular Line.
<b>Mg</b>	Milligram
<b>µg</b>	Microgram
<b>min</b>	Minute
<b>mL</b>	Milliliter(s).
<b>mm</b>	Millimeter(s).
<b>mmHg</b>	Millimeter Mercury.
<b>mOsm</b>	Milliosmole.
<b>MRI</b>	Magnetic Resonance Imaging.
<b>OR</b>	Operating Room.
<b>P CO<sub>2</sub></b>	Partial Pressure of Carbon dioxide.
<b>ped</b>	Pediatrics.
<b>PBI</b>	Penetrating Brain Injury (-ies).
<b>PEEP</b>	Positive End Expiratory Pressure.
<b>PGCS</b>	Pediatric Glasgow Coma Scale.
<b>PNS</b>	Peripheral Nervous System.
<b>PTA</b>	Post traumatic Amnesia.
<b>PTE</b>	Post traumatic epilepsy.
<b>RBCs</b>	Red Blood Cells.
<b>SAH</b>	Subarachnoid Hemorrhage.
<b>SAP</b>	Systemic Arterial Pressure.
<b>T</b>	Tube
<b>TBI</b>	Traumatic Brain Injury (-ies).
<b>TICA</b>	Traumatic Intracranial Aneurysms.
<b>US</b>	United States
<b>V</b>	Verbal Response
<b>Vs</b>	Versus.
<b>VTE</b>	Venous Thrombo Embolism.
<b>V</b>	Velocity.

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## **ABSTRACT**

Gunshot wounds to the head account for the majority of penetrating brain injuries, and are the most lethal , it is rare but increasing in incidence in the developing world , and Traditional shooting with guns often occurs and leads to unwanted gunshot injuries in areas where celebrations are held .

A penetrating wound results when the bullet's energy is depleted on penetrating the skull but still has sufficient amount of kinetic energy to enable partial penetration of the bullet through the brain substance. Bullets are more likely to penetrate the skull when they strike more perpendicular than tangentially which result in primary injuries and complications such as localized brain contusions, lacerations, hematomas, pseudo aneurysms or arteriovenous fistulae depending on the trajectory of the bullet.

### **KEYWORDS:**

Gunshot  
Brain injuries  
Bullet

## INTRODUCTION

Gunshot wounds to the head account for the majority of penetrating brain injuries, and are the most lethal. It is rare but increasing in incidence in the developing world, and Traditional shooting with guns often occurs and leads to unwanted gunshot injuries in areas where celebrations are held (**Muhammad et al., 2014**).

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Civilian gunshot wounds to the head (GSWH) are often deadly, but some patients with open cranial wounds need medical and surgical management and are potentially good candidates for acceptable functional recovery (**Bizhan et al., 2014**).

Optimum management of penetrating brain injuries (PBI) requires adequate comprehension of mechanism and pathophysiology of injury. Based on current evidence, we recommend computed tomography scanning as the neuroradiologic modality of choice for penetrating brain injury (PBI) patients. Cerebral angiography is recommended in patients with penetrating brain injuries (PBI), where there is a high suspicion of vascular injury. It is still debatable whether craniectomy or craniotomy is the best approach in penetrating brain injury (PBI) patients. The recent trend is toward a less aggressive debridement of deep-seated bone and missile fragments and a more aggressive antibiotic prophylaxis in an effort to improve outcomes. Cerebrospinal fluid (CSF) leaks are common in PBI patients and surgical correction is recommended for those which do not close spontaneously or are refractory to CSF diversion through a ventricular or lumbar drain. The risk of post-traumatic epilepsy after PBI is high, and therefore, the use of prophylactic anticonvulsants is recommended (Syed et al., 2014).

## **AIM OF THE WORK**

The aim of this essay is to through some light on the recent modalities in management of gunshot head injuries.

## **ANATOMICAL CONSIDERATIONS**

### **Overview**

Nothing in the world can compare with the human brain. This mysterious three pound organ controls all necessary functions of the body, receives and interprets information from the outside world, and embodies the essence of the mind and soul. Intelligence, creativity, emotion, and memories are a few of the many things governed by the brain. The brain receives information through our five senses: sight, smell, touch, taste, and hearing. It assembles the messages in a way that has meaning for us, and can store that information in our memory. The brain controls our thoughts, memory and speech, movement of the arms and legs, and the function of many organs within our body. It also determines how we respond to stressful situations (such as taking a test, losing a job, or suffering an illness) by regulating our heart and breathing rate (**Bryn, 2011**).