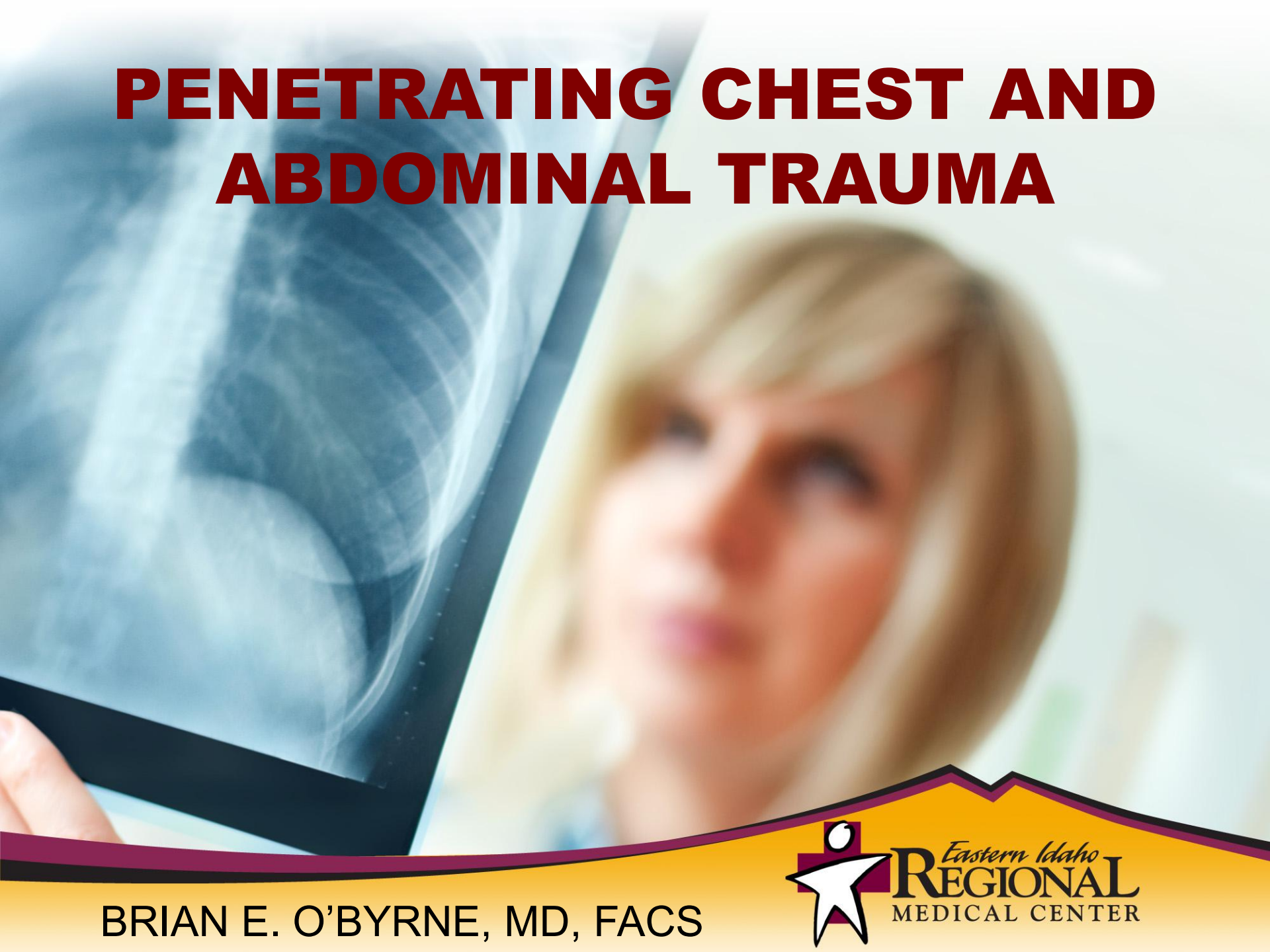


# PENETRATING CHEST AND ABDOMINAL TRAUMA

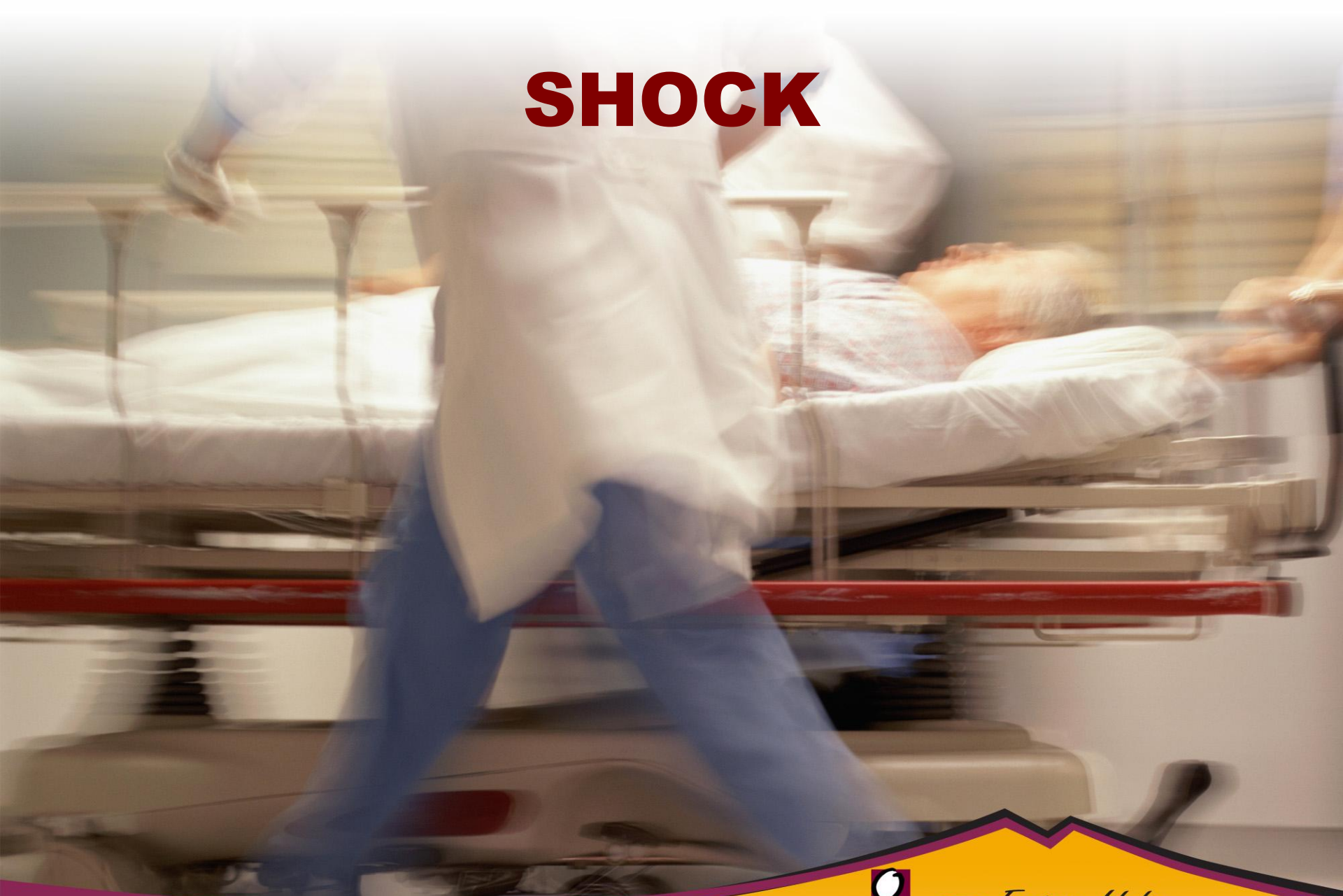


BRIAN E. O'BYRNE, MD, FACS



*Eastern Idaho*  
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# SHOCK



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# SHOCK

- IN THE VAST MAJORITY OF TRAUMA PATIENTS, SHOCK IS DUE TO BLOOD LOSS

# GENERALIZED STATE OF HYPOPERFUSION

- INADEQUATE OXYGEN DELIVERY
- CATECHOLAMINE RESPONSE
- ANAEROBIC METABOLISM
- CELLULAR DYSFUNCTION
- CELL DEATH

# CHARACTERISTICS OF SHOCK

- ALTERATION IN LEVEL OF CONSCIOUSNESS
- ANXIETY
- COLD, DIAPHORETIC SKIN
- TACHYCARDIA
- TACHYPNEA, SHALLOW RESPIRATIONS
- HYPOTENSION
- DECREASED URINARY OUTPUT

# **CLASS I HEMORRHAGE**

## **750 ml 15% Blood Vol 1.5 units**

- SLIGHTLY ANXIOUS
- NORMAL BLOOD PRESSURE
- HEART RATE < 100 / MIN
- RESPIRATIONS 14-20 / MIN
  
- CRYSTALLOID (SALINE OR RINGERS LACT)

# **CLASS II HEMORRHAGE**

**750-1500 15-30% 1.5-3.0 units**

- ANXIOUS
- NORMAL BLOOD PRESSURE
- HEART RATE  $> 100$  / MIN
- DECREASED PULSE PRESSURE
- RESPIRATIONS 20-30 / MIN
  
- CRYSTALLOID (SALINE OR RINGERS LACT)

# **CLASS III HEMORRHAGE**

**1500-2000 ml 30-40% 3-4 units**

- CONFUSED, ANXIOUS
- DECREASED BLOOD PRESSURE
- HEART RATE > 120 / MIN
- DECREASED PULSE PRESSURE
- RESPIRATIONS 30-40 / MIN
  
- CRYSTALLOID PLUS BLOOD



# **CLASS IV HEMORRHAGE**

**> 2000 ml > 40 % > 4 units**

- CONFUSED, LETHARGIC
- HYPOTENSION
- HEART RATE > 140 / MIN
- DECREASED PULSE PRESSURE
- RESPIRATIONS > 35 / MIN
  
- CRYSTALLOID PLUS BLOOD
- DEFINITIVE CONTROL URGENT

# PENETRATING TRAUMA



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# CHARACTER OF INJURY

- HIGH VELOCITY (cavitation, tumble, fragments)
- LOW VELOCITY
- BLAST INJURY
- MULTIPLE PENETRATORS

# ASSESSMENT

- INSPECTION
- AUSCULTATION
- PERCUSSION
- PALPATION

# FACTORS THAT COMPROMISE THE EXAM

- ALCOHOL AND OTHER DRUGS
- INJURY TO BRAIN, SPINAL CORD
- INJURY TO RIBS, SPINE, PELVIS, EXTREMITIES

# FAST EXAM

- Focused Assessment with Sonography for Trauma

# PENETRATING ABDOMINAL TRAUMA



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# ANATOMY OF ABDOMEN

- EXTERNAL ANATOMY
- INTRAPERITONEAL SPACE
- EXTRAPERITONEAL SPACE
- DIAPHRAGM



# RED LIST

- LIVER
- SPLEEN
- GREAT VESSELS
- KIDNEY

# GREEN LIST

- STOMACH
- SMALL BOWEL
- COLON
- GALLBLADDER

# WHO REQUIRES OPERATION

- IMPALED FOREIGN OBJECT
- PENETRATING GUNSHOT WOUND
- HEMODYNAMIC INSTABILITY
- PERITONITIS
- EVISCERATION

# PENETRATING CHEST TRAUMA



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# PENETRATING CHEST TRAUMA

- 15% - 30% REQUIRE OPERATION
- 70% - 85% WILL NOT !!!
- MAJORITY REQUIRE SIMPLE PROCEDURES

# IMMEDIATELY LIFE-THREATENING INJURIES

- LARYNGEOTRACHEAL INJ / AIRWAY OBSTR
- TENSION PNEUMOTHORAX
- OPEN PNEUMOTHORAX
- FLAIL CHEST AND PULMONARY CONTUSION
- MASSIVE HEMOTHORAX
- CARDIAC TAMPONADE
  
- CARDIAC AND GREAT VESSEL INJURY

# PATHOPHYSIOLOGIC CONSEQUENCES

- HYPOXIA
- HYPOVENTILATION
- ACIDOSIS (RESPIRATORY AND METABOLIC)
- INADEQUATE TISSUE PERFUSION

# LARYNGEOTRACHEAL INJURY

- HOARSENESS
- SUBCUTANEOUS EMPHYSEMA
- INTUBATE CAUTIOUSLY
- MAY BE BEST MANAGED WITH AWAKE INTUBATION IN OPERATING ROOM SETTING



# TENSION PNEUMOTHORAX

- RESPIRATORY DISTRESS
- SHOCK
- DISTENDED NECK VEINS
- DECREASE IN BREATH SOUNDS
- HYPERRESONANCE
  
- IMMEDIATE DECOMPRESSION  
(NEEDLE, CHEST TUBE)

# OPEN PNEUMOTHORAX

- 3-SIDED COVER OVER DEFECT
- CHEST TUBE

# FLAIL CHEST AND PULMONARY CONTUSION

- OXYGEN
- INTUBATE AS INDICATED
- JUDICIOUS FLUIDS
- ANALGESIA

# MASSIVE HEMOTHORAX

- MAJOR VESSEL DISRUPTION
- > 1500 ml BLOOD LOSS (> 3 UNITS)
- FLAT VS DISTENDED NECK VEINS
- SHOCK WITH NO BREATH SOUNDS
- PERCUSSION DULLNESS
  
- RAPID VOLUME RESTORATION  
(CRYSTALLOID PLUS BLOOD)

# CARDIAC TAMPONADE

- DECREASED ARTERIAL PRESSURE
- DISTENDED NECK VEINS
- MUFFLED HEART SOUNDS
- PULSELESS ELECTRICAL ACTIVITY
  
- RESUSCIATION ABC'S
- FAST EXAM
- DECOMPRESSION

# POTENTIALLY LIFE-THREATENING INJURIES

- TRACHEOBRONCHIAL TREE INJURY
- SIMPLE PNEUMOTHORAX
- PULMONARY CONTUSION
- HEMOTHORAX
- ESOPHAGEAL INJURY
- DIAPHRAGMATIC INJURY

# RESUSCITATIVE THORACOTOMY

- PATIENTS WITH SELECTIVE PENETRATING THORACIC INJURY ARRIVING WITH PULSELESS ELECTRICAL ACTIVITY (PEA) MAY BE A CANDIDATE
- ED THORACOTOMY NOT INDICATED IN BLUNT TRAUMA WITH PEA



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