NHS
Worcestershire
Acute Hospitals
NHS Trust

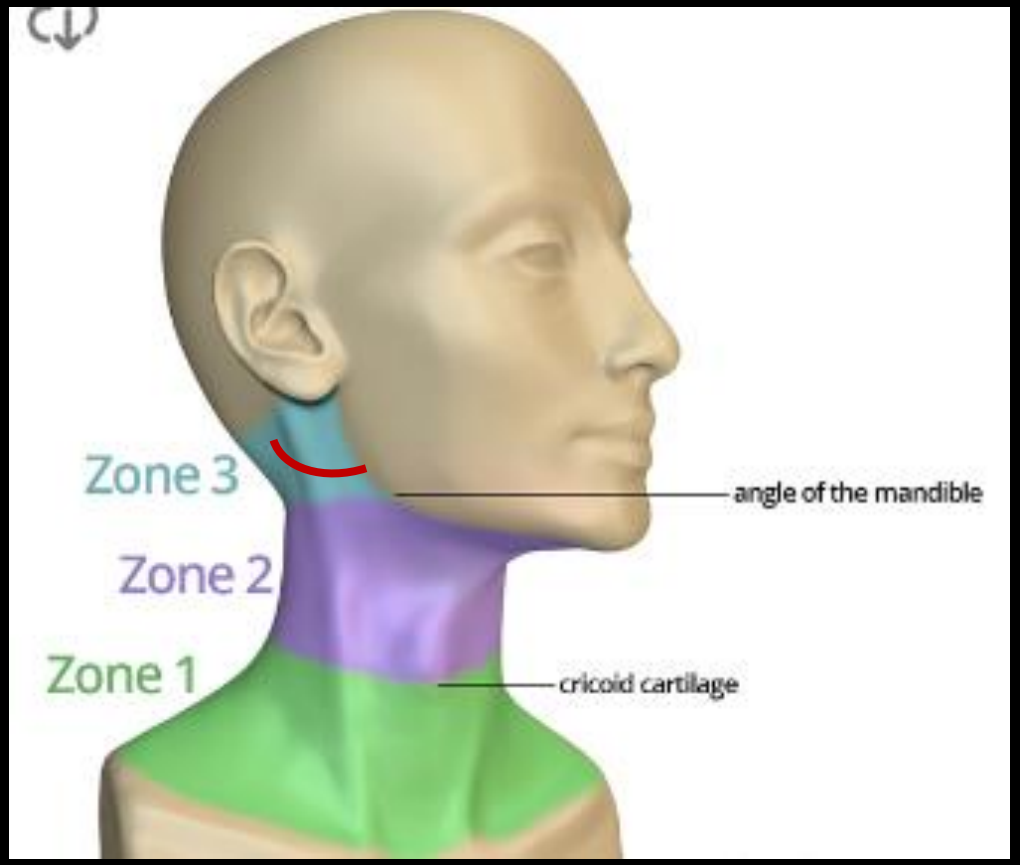
LESSONS FROM LONDON: PENETRATING TRAUMA

Laura Kocierz

OVERVIEW

- Penetrating trauma
- Bleeding and bleeding mimics

WHAT WOULD YOU WANT TO KNOW FOR NECK LACERATION?



WHAT WOULD YOU WANT TO KNOW FOR NECK LACERATIONS?

- Any change in voice
- Any difficulty breathing
- Any difficulty swallowing
- Can they protrude their tongue?

ARE YOU MORE CONCERNED IF WOUND IS ACTIVELY BLEEDING?

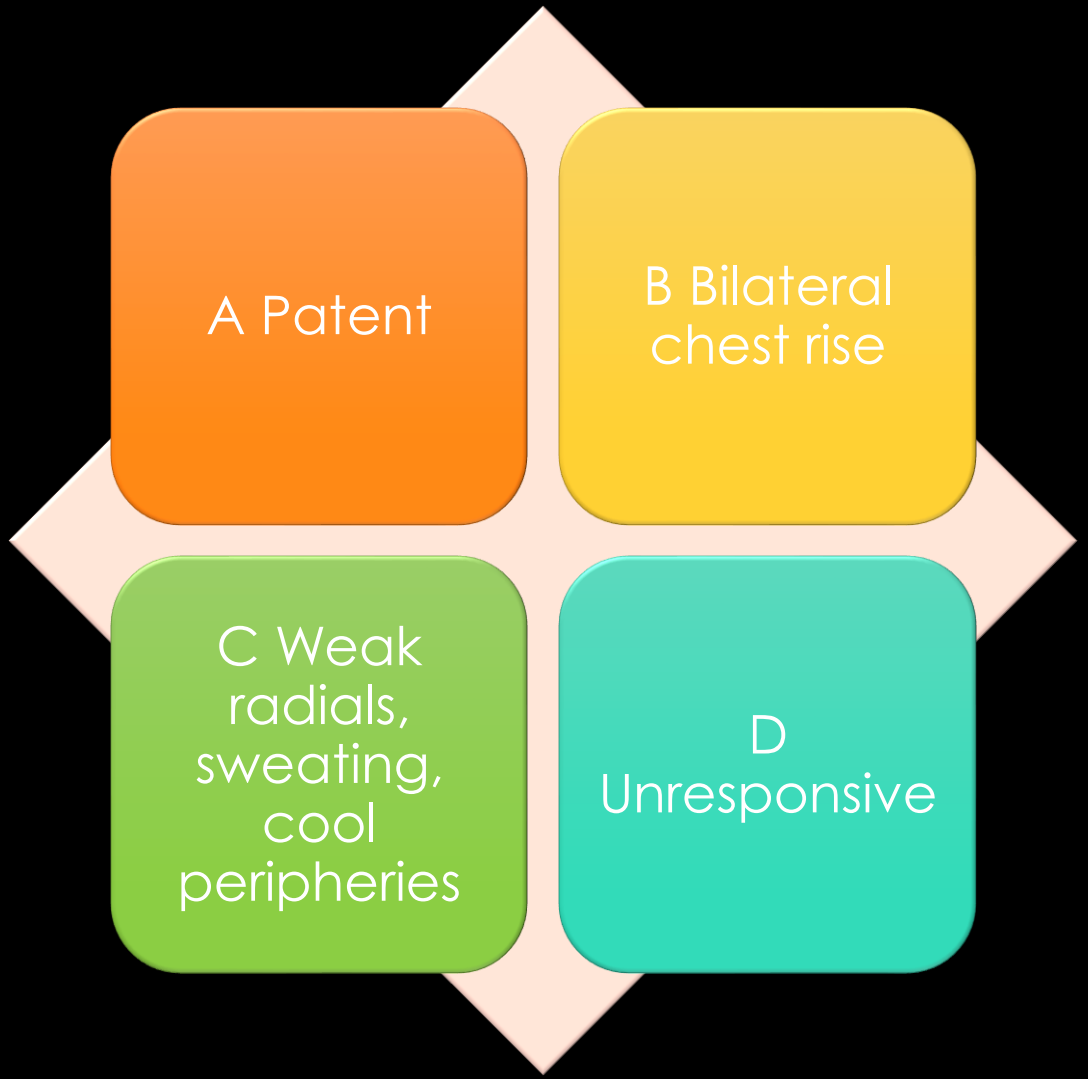
Yes

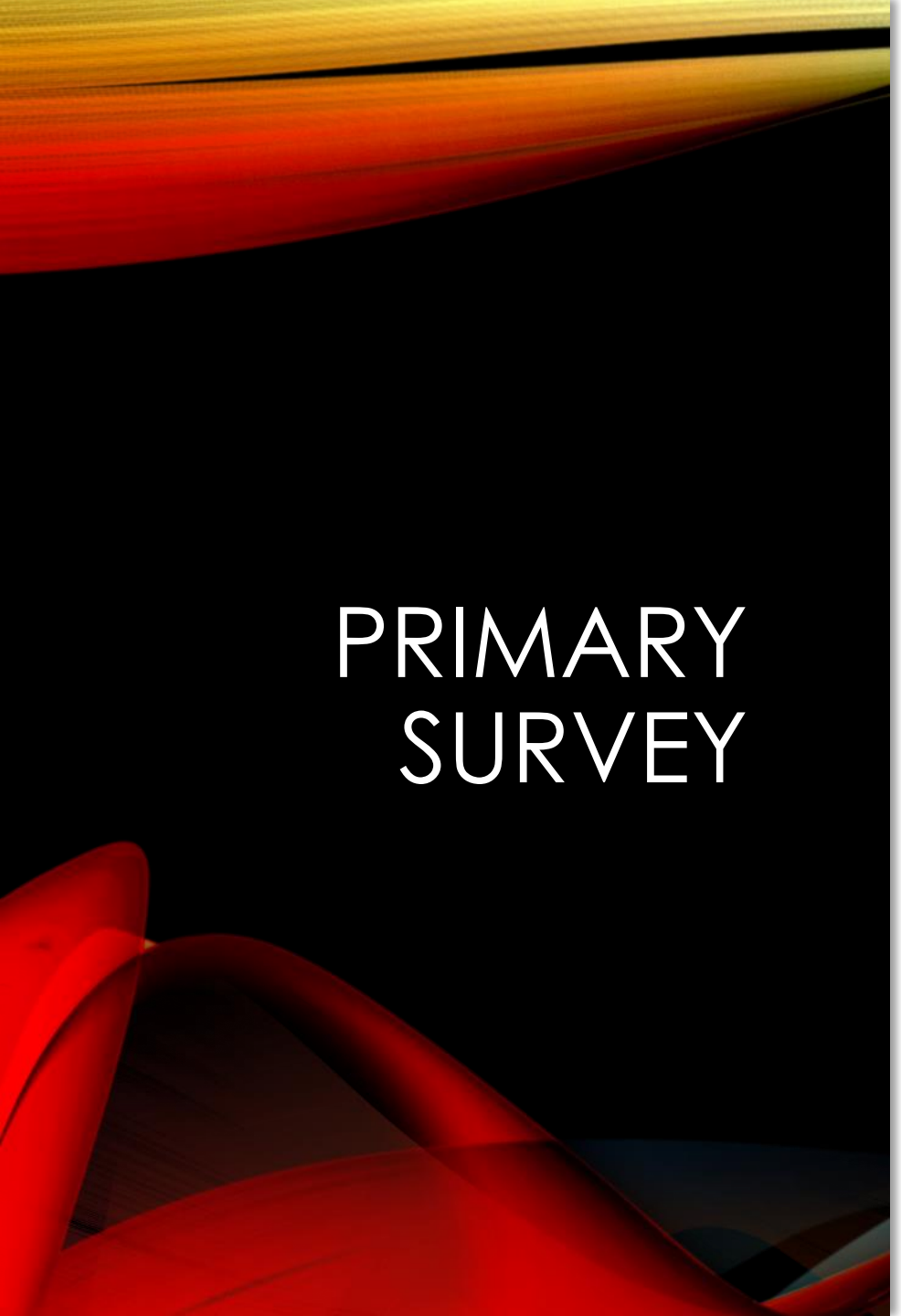
No

- Surgical emphysema left anterior neck
- Haematoma with contrast blush, left parapharyngeal space
- Source of bleeding- facial artery
- Mass effect with partial compression of airway

STABBING IN WORCESTER…

END OF THE BED…





PRIMARY SURVEY

A-Patent

B Bilateral air entry, RR 28, Sats 98% on 15L

C Palpable carotid 60s

- Cool, diaphoretic, no visible veins
- 10cm incisional wound to abdomen with visible bowel and omentum

D GCS E4 V1 M1

No other injuries

IMPRESSION

What do you think is going on?

Communicate primary survey findings and management plan with team

IMPRESSION

Single penetrating abdominal laceration

? Associated abdominal visceral injury

Bleeding

Bleeding mimic

INTERVENTIONS

COMA	Wide bore IV access	TXA
Analgesia	Imaging?	Blood

BLEEDING +/- MIMICS

Assume bleeding

Primary haemorrhage control

CVNF

Review post analgesia

Patient has not got the time for you to waste

VITAL SIGNS AND BLOOD LOSS

Traumatic shock is not always accompanied by tachycardia

Healthy patients with blood loss 1L rarely have HR >100

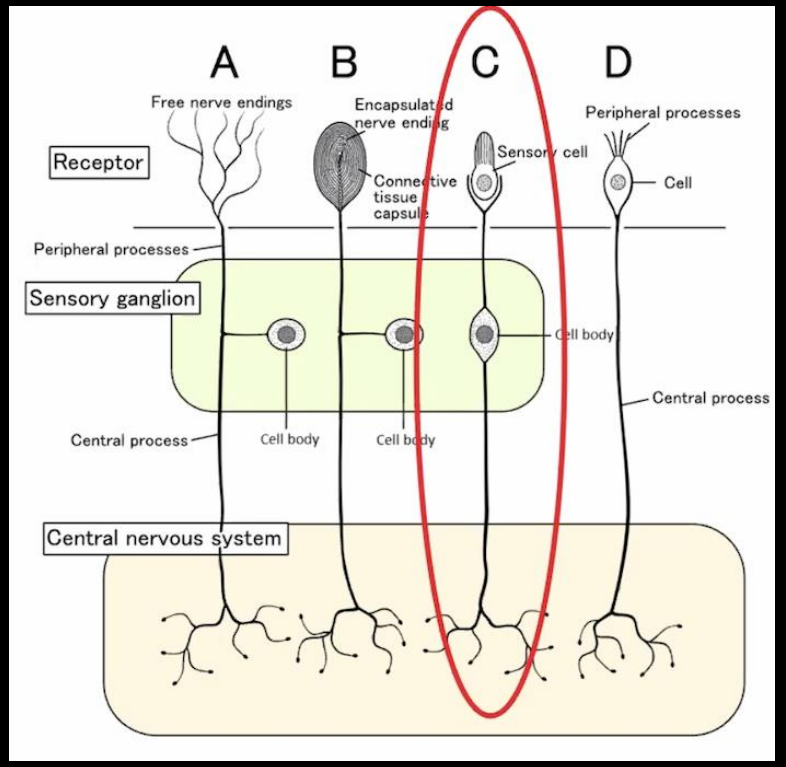
BP as a measure of intravascular volume is unreliable

- Only 1/3 shocked patients are hypotensive and tachycardic

Patients with severe shock could have HR <60

HAEMORRHAGE REFLEXES

- **Cardiac C Fibres**
- LV myocardial receptors protect heart from over activity during coronary perfusion
- Activated by circulating prostaglandins and mechanical changes of under filled heart
  - → Profound vagal bradycardia and fall in SVR

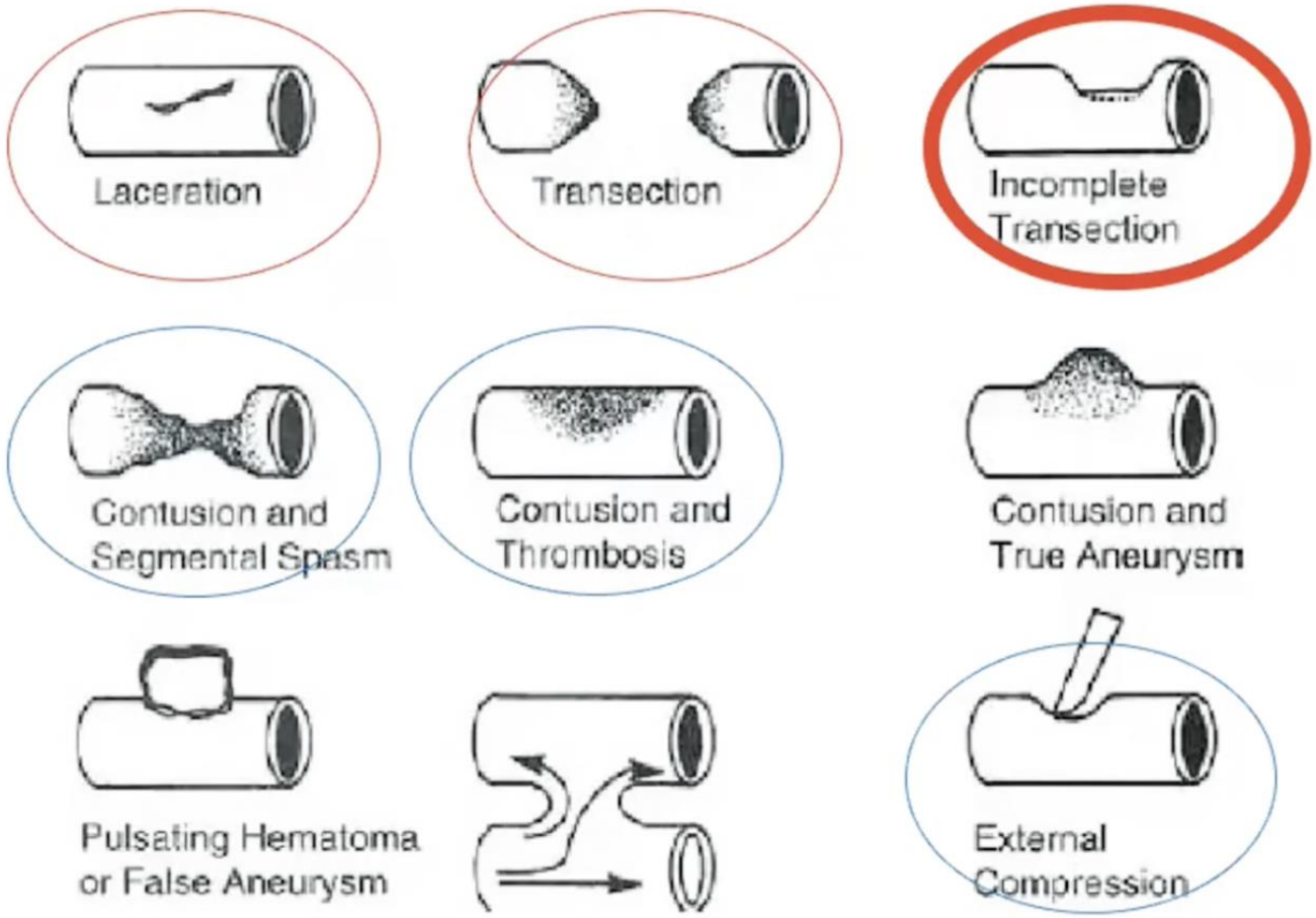


PENETRATING TRAUMA

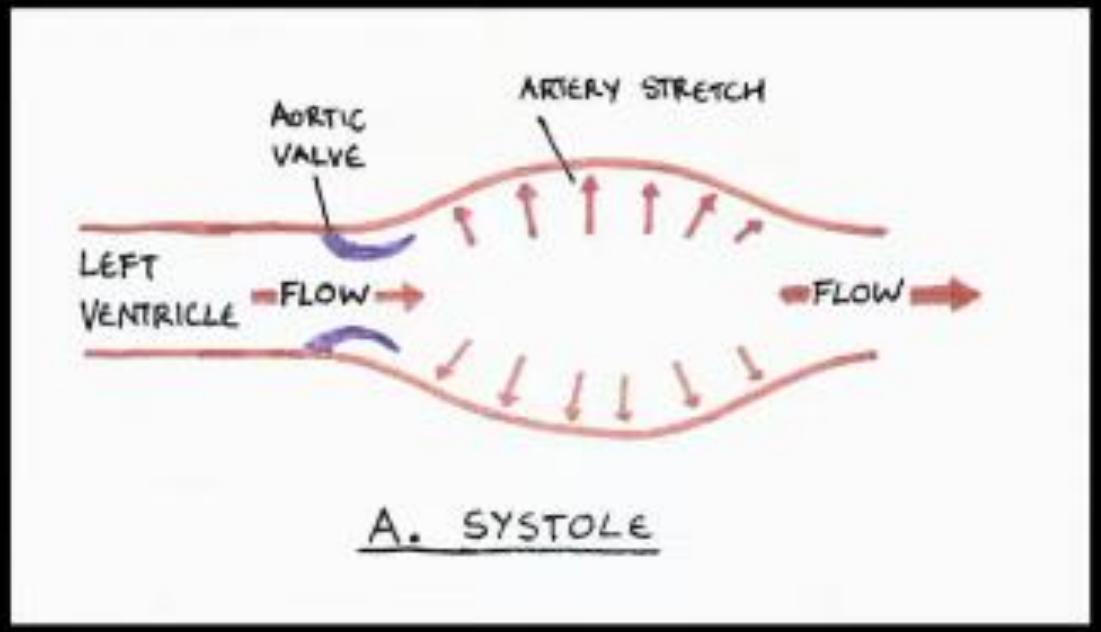
- Blunt trauma more ‘traditional’ shock physiology

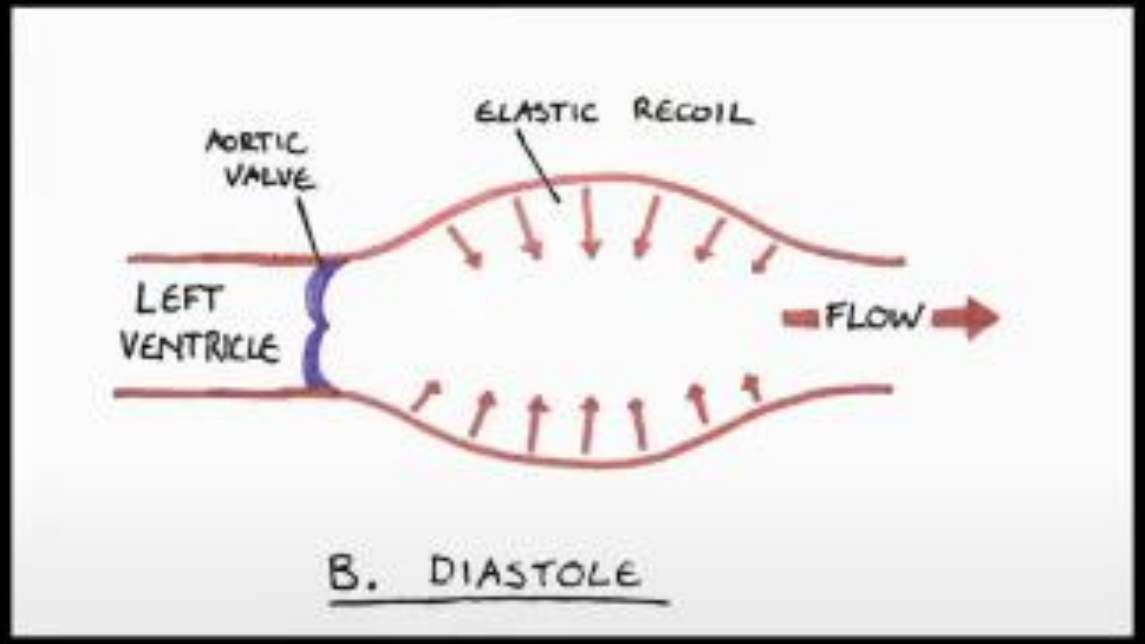
By Contrast

- Penetrating trauma: Time critical because physiology can be misleading
- High incidence of arterial injury
- Biphasic HR and SVR response
- Confounders
  - Young
  - Prodromal activity
  - Toxicology
- ‘Arterial Injury shock’


Laceration
Transection
Incomplete Transection
Contusion and Segmental Spasm
Contusion and Thrombosis
Contusion and True Aneurysm
Pulsating Hematoma or False Aneurysm
External Compression

ARTERIAL PRESSURE RESERVOIR





ARTERIAL INJURY SHOCK

- Widened pulse pressure

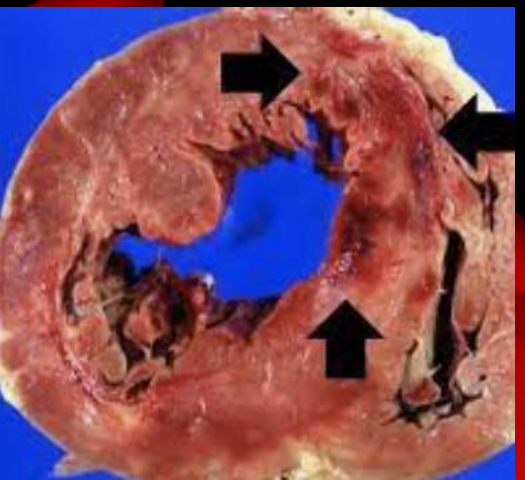
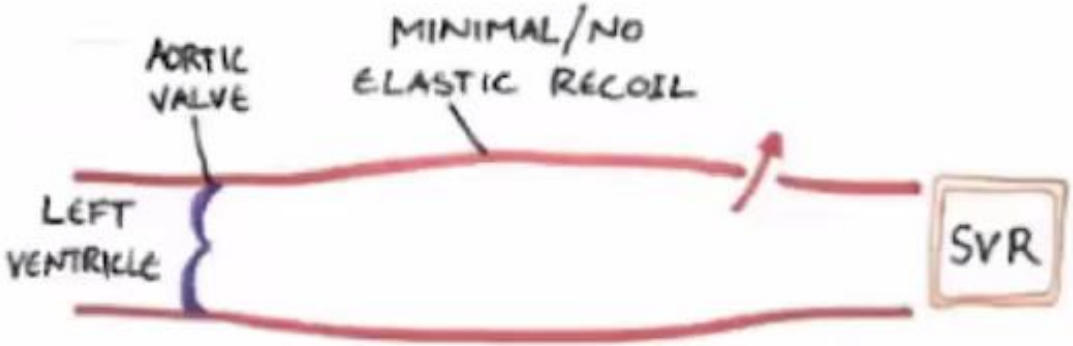
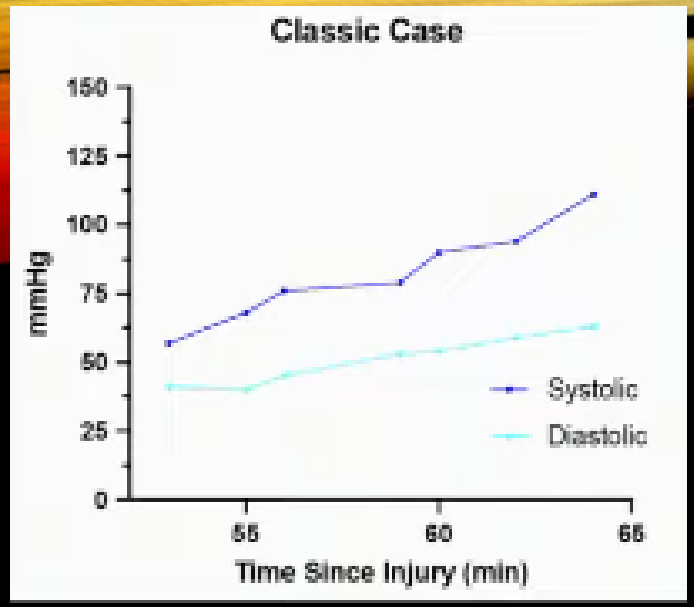


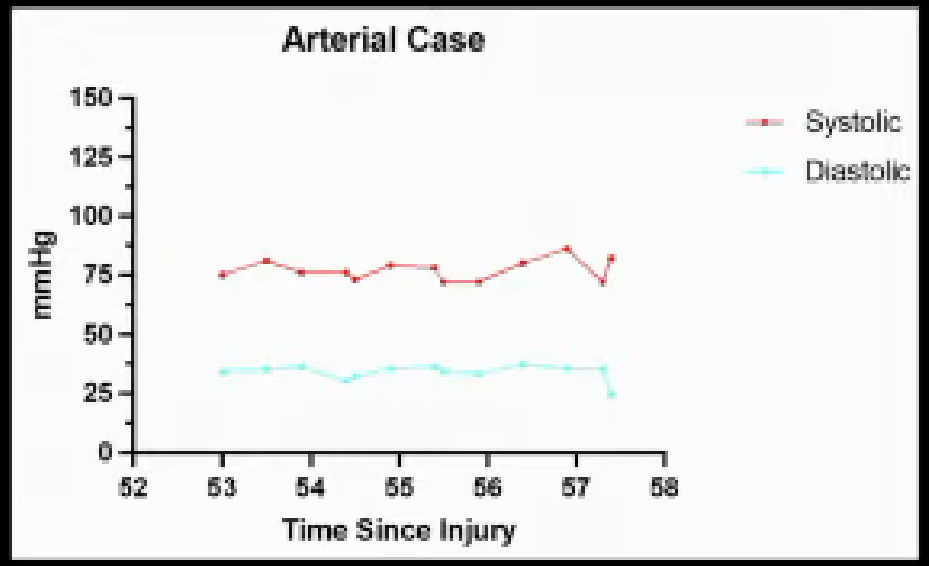
FIGURE: ARTERIAL INJURY DISRUPTS PRESSURE RESERVOIR & DRIVING FORCE FOR BLOOD FLOW DURING DIASTOLE.

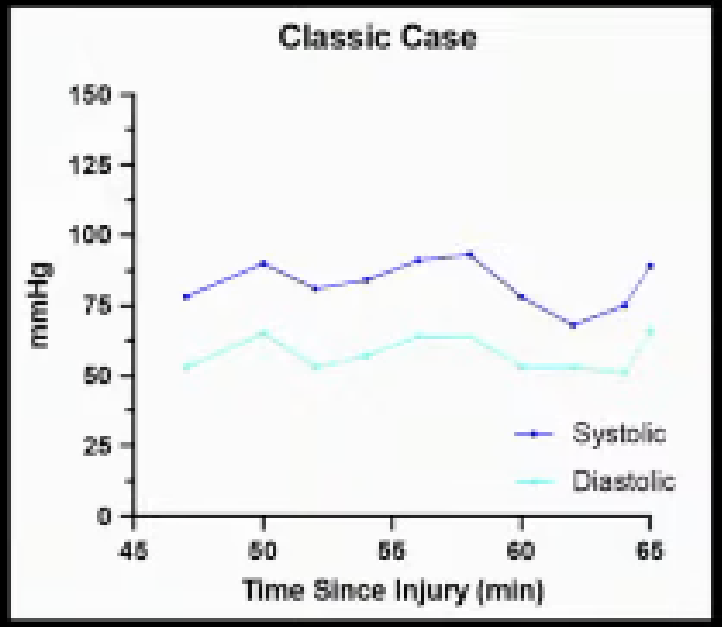
A. SYSTOLE



B. DIASTOLE


Classic Case
150
125
100
75
50
25
0
mmHg
55
60
65
Time Since Injury (min)
Systolic
Diastolic


Arterial Case
150
125
100
75
50
25
0
mmHg
52
53
54
55
56
57
58
Time Since Injury
Systolic
Diastolic


Classic Case
150
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Time Since Injury (min)
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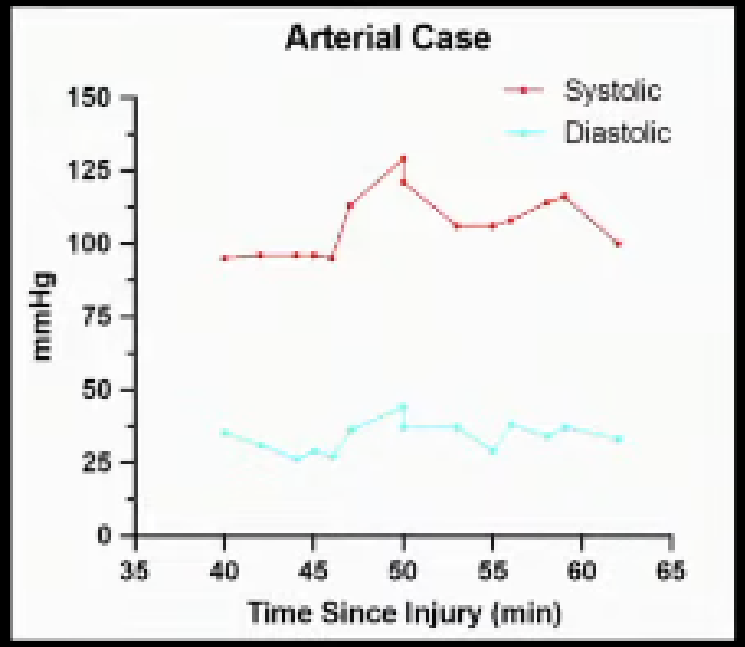
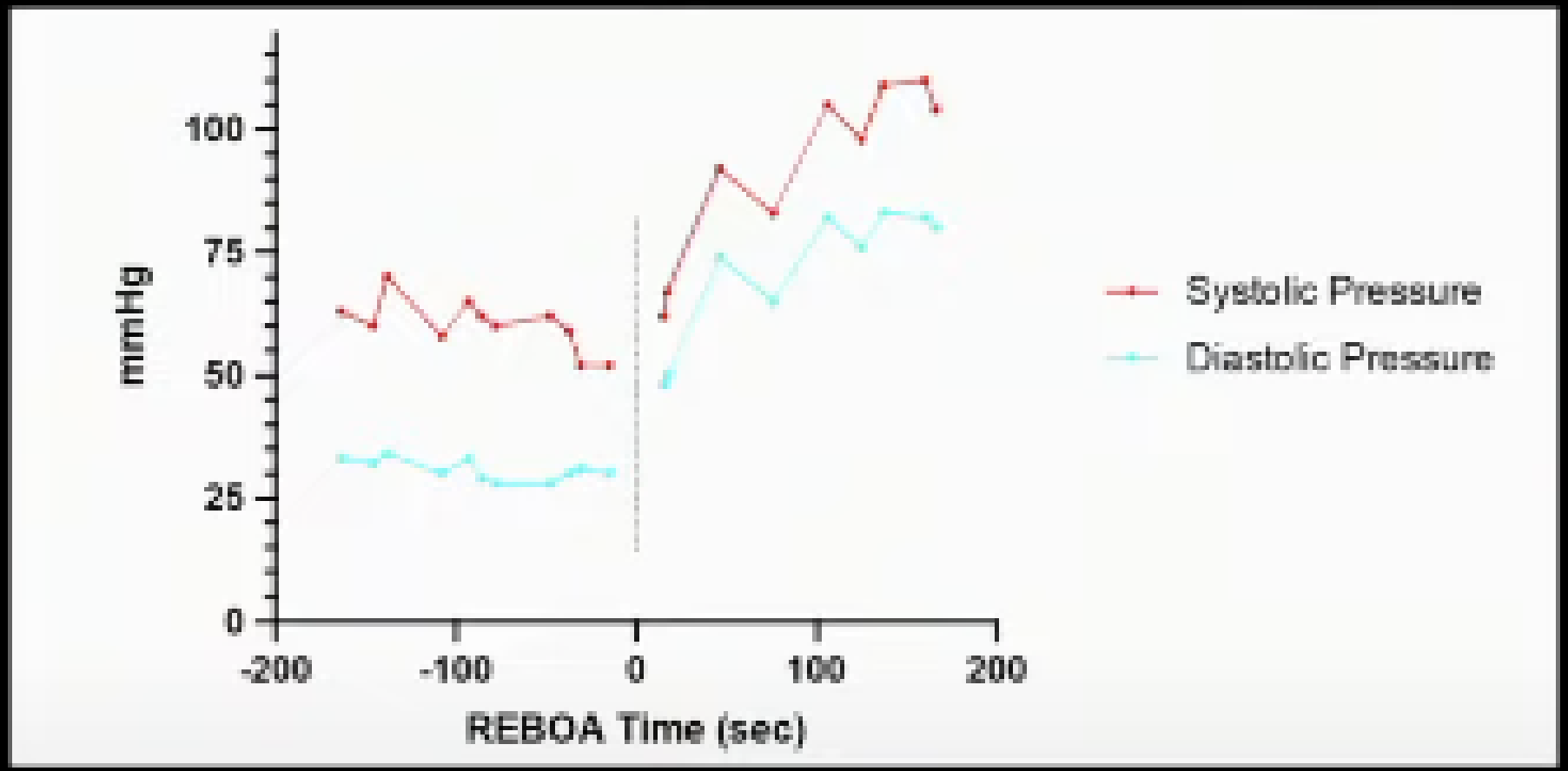
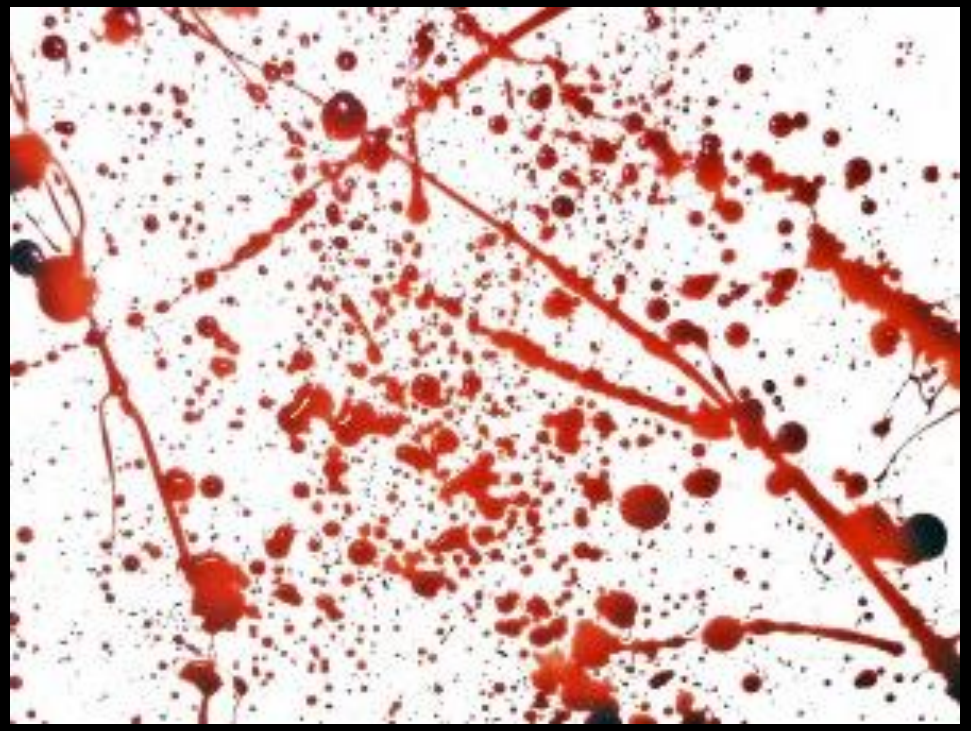

Arterial Case
150
125
100
75
50
25
0
mmHg
35
40
45
50
55
60
65
Time Since Injury (min)
Systolic
Diastolic

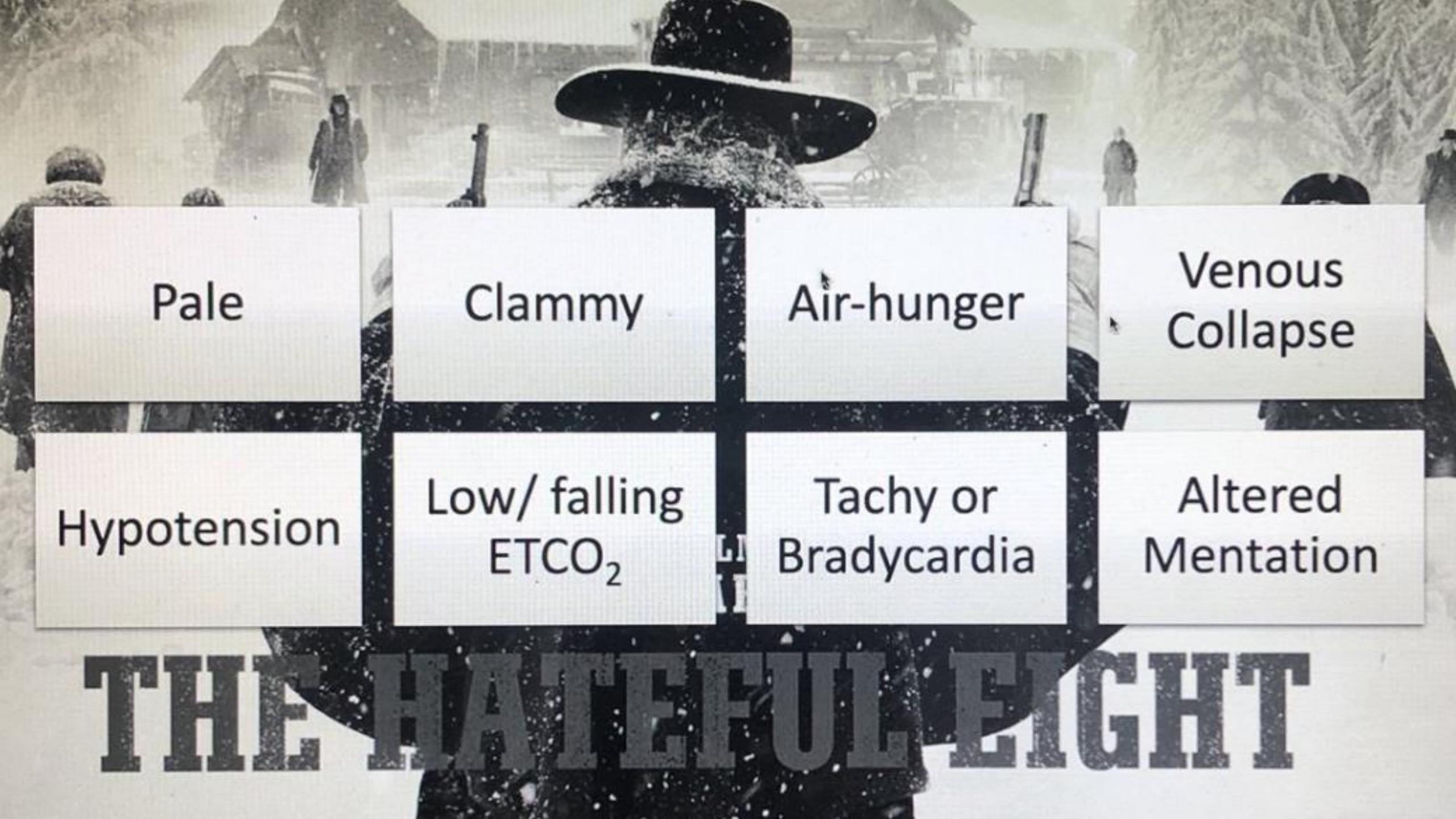
RESUSCITATIVE OCCLUSION OF AORTA



IMMINENT EXSANGUINATION

- Mechanism consistent with serious injury
- Injuries on examination compatible with major haemorrhage
- Physiology evolving over an appropriate time scale
- Hateful 8* and bleeding mimics*




Pale
Clammy
Air-hunger
Venous Collapse
Hypotension
Low/ falling $ETCO_2$
Tachy or Bradycardia
Altered Mentation
THE HATEFUL EIGHT

ANY QUESTIONS?

SUMMARY

RAPID THOROUGH ASSESSMENT

SYSTEMATIC REVIEW

UTILISE RESOURCES