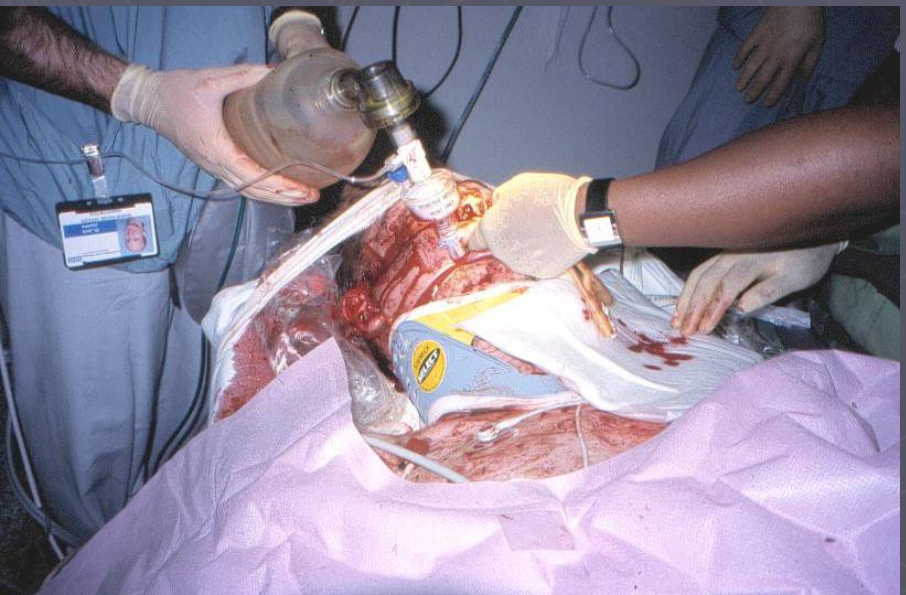
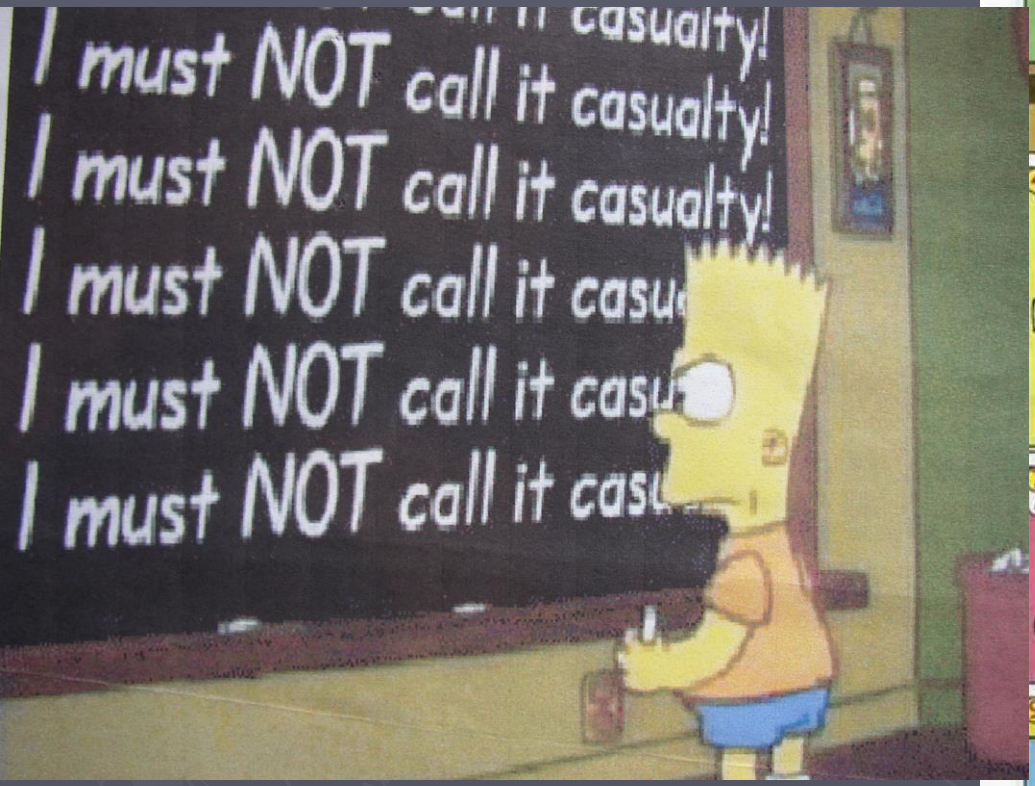
The College of Emergency Medicine

The changing face of Accident and Emergency Medicine – a new interface with Anaesthesia and ITU

Jim Connolly
Newcastle General




I must NOT call it casualty!
I must NOT call it casualty!
I must NOT call it casualty!
I must NOT call it casualty!
I must NOT call it casualty!


BBC
CASUALTY
100% OFFICIAL!
Guest starring Lil' Chris
1 LIL' CHRIS IS TRYING TO REACH THE BISCUITS...
JUST...A...LITTLE ...BIT...MORE...
2 THINGS AREN'T ANY BETTER IN THE CLOTHES SHOP...
NEARLY GOT IT. WHOAH!
3
I'LL TAKE THE LOT!
4 BRILLIANT. I'VE SPENT £300 ON A LOAD OF IDENTICAL JUMPERS IN ALL DIFFERENT SIZES.
BURGER BAR ↑ FLOOR 5
MAN, I NEED A BURGER!
5 BUT...
OH, THIS IS RIDICULOUS!
I HAVE GOT TO DO SOMETHING ABOUT MY HEIGHT!
6 LIL' CHRIS CONFIDES IN DR COLDWELL
THERE MUST BE SOME GROWTH TABLETS I CAN TAKE -
OR MAYBE I COULD GET A LEG STRETCHING OPERATION?
CHRIS, YOU'RE STILL ONLY 16. YOU'VE GOT A LOT OF GROWING TO DO YET.
7 BUT IT'S SO FRUSTRATING, DOCTOR. I CAN PLAY A LIVE GIG IN FRONT OF THOUSANDS OF SCREAMING GIRLS, BUT I CAN'T HELP MYSELF TO A CHOCOLATE BISCUIT WITHOUT STANDING ON A STOOL!
JUST GIVE IT TIME.
8 SORRY, BUT UNLESS YOU'RE AT DEATH'S DOOR, WE NEED THE BED. WE'VE GOT A WHOLE CIRCUS TROOP COMING IN.
THE FIRE-EATER GOT INDIGESTION DURING REHEARSAL AND WHEN HE FINALLY BURPED, THE WHOLE BIG TOP WENT UP IN FLAMES!
9 CHRIS SPOTS SOMETHING VERY EXCITING!
RECEPTIONS
WOW! THIS COULD BE THE ANSWER TO ALL MY PROBLEMS!
10 OI...COUGH...COME BACK...SPLUTTER! THEY'RE NOT YOURS, THEY'RE BONZO'S!
CASUALTY
I'VE GOTTA GET ME A PAIR OF THESE - I'M ON TOP OF THE WORLD!
Catch Casualty every Saturday night on BBC One
WORDS KELLY WILKS ▼ ILLUSTRATION SEAN LONGCROFT ▼ PIC SIMON DUNCAN

UP THE MACKEMS ???

???????????

Anaesthetics Sucks!!!


Accident and emergency
No Smoking
Automatic Door
No Smoking


Terminal 5
No Smoking
Automatic Door
No Smoking

Entente Cordial

Entente Formidable!!!!!

History of A&E as a specialty

- 1967 Casualty Surgeons Association
- 1972 30 further Cons appoint
- 1977 first SpRs
- 1990 First Professor of A&E
- 1993 Faculty formed
- 1996 First Fellowship exam
- 2005 CEM formed
- 2008 Royal ascent

The Intensive Care Society

The College of Emergency Medicine

Objectives

- Major recent developments in ED that are of interest to ITU
- Interface working in Major Incident
- The future need for closer interfaces

Major developments as they may impact at interface

- Trauma Damage Control
- Occult Pneumothorax
- Ultrasound Scanning
- Penetrating Neck
- Pelvic fractures

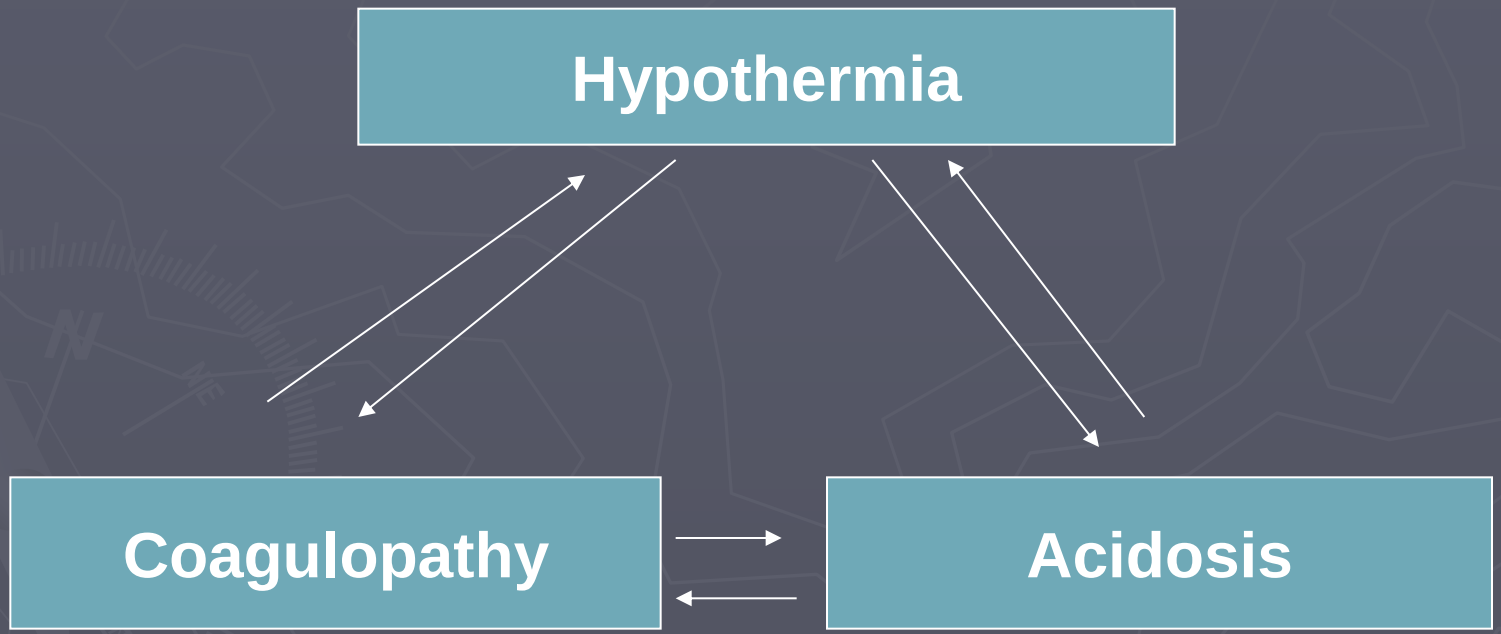
- Training

Damage Control Principles

Historically (!!!) all problems to be corrected in one sitting!!

Usually the operation was a complete success but ……..

Damage control – the triangle of death



Damage Control starts in Resus!

- DC 0 Resuscitation phase
- DC 1 Theatre
- DC2 ITU
- DC 3 Theatre
- DC 4 Closure

DC O Resuscitation Phase

- Recognise need for damage control

- Multiple penetrating
- High Energy Blunt
- Multi-system trauma
- Profound shock on arrival

- < C > ABC
- Lines above diaphragm
- Blood and Massive Transfusion Policy ? Cell saver
- Assess status - acidosis / temp etc
- Theatre with a time plan / bail out point

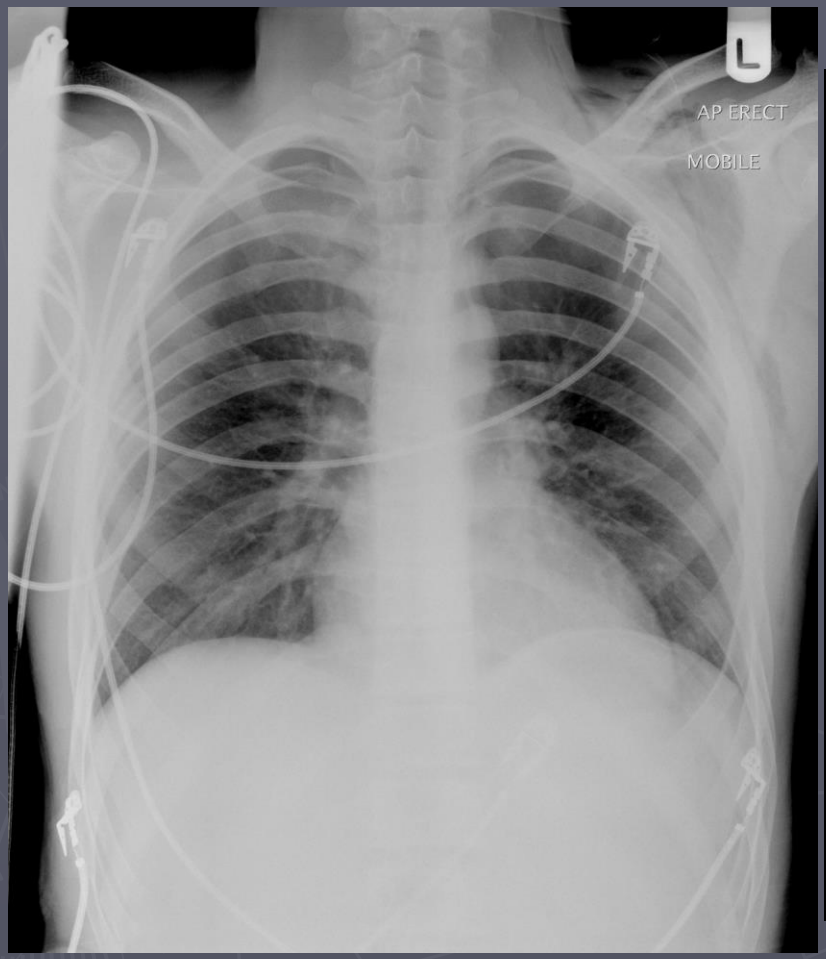
DC 1 First trip

- Control haemorrhage
  - clamp
  - stenting
  - packing
- Stop contamination
  - clamping
  - Tie off
  - extrusion

Back to ITU to work your magic

Predefined goals for Coagulation / acidosis/ temp

Occult Pneumothorax - management



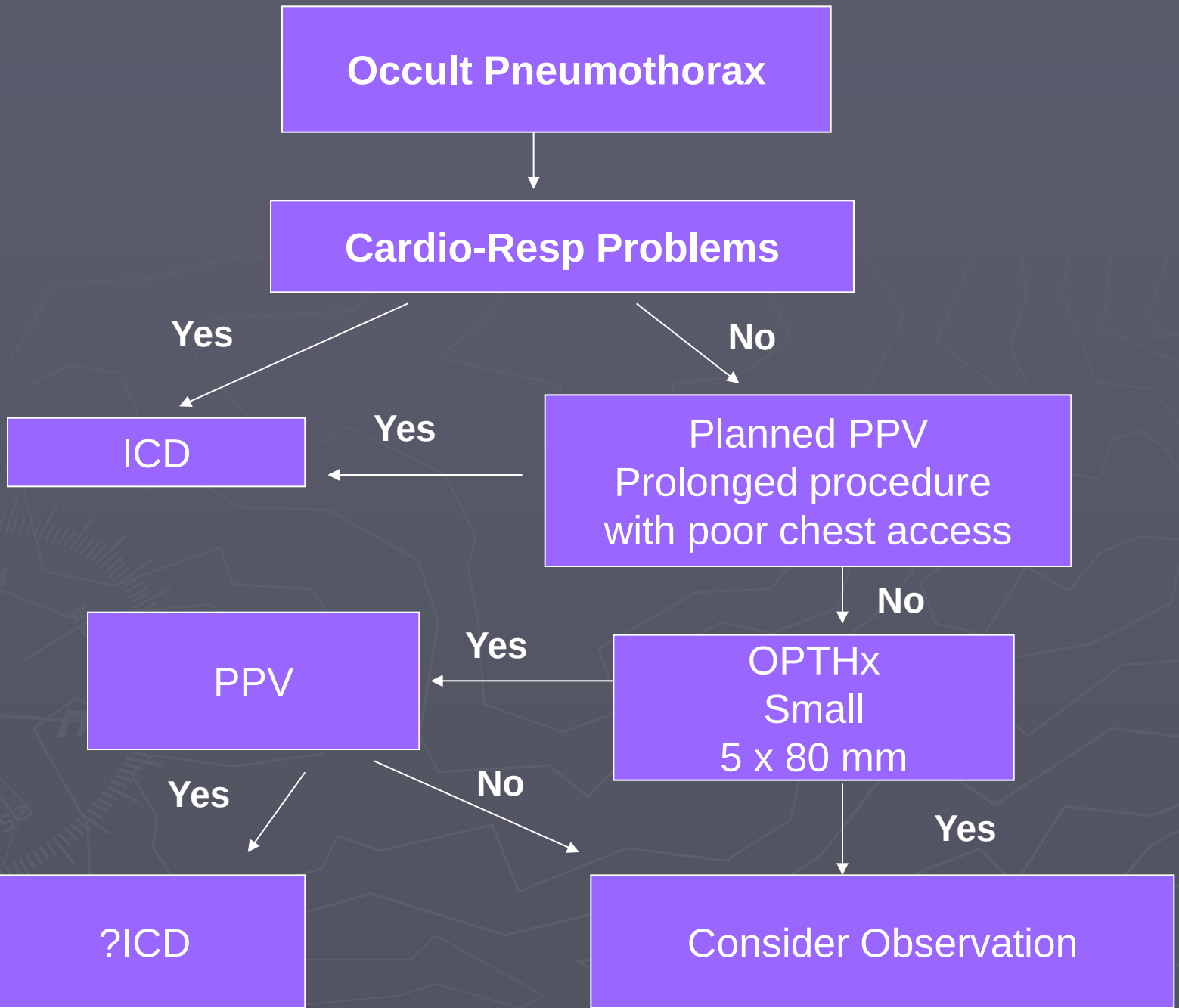
Evidence

- Brasel

No correlation between PPV and PTHx progression

Enderson significant risk of progression

Lot of observational studies show no increase with PPV


Occult Pneumothorax
Cardio-Resp Problems
Yes
No
ICD
Yes
Planned PPV
Prolonged procedure
with poor chest access
No
PPV
Yes
OPTHx
Small
5 x 80 mm
Yes
No
Yes
?ICD
Consider Observation

Penetrating neck

Traditional Approach

Zone 1

- Panendoscopy + Ba swallow + 4 vessel angio

Zone 2

- Mandatory exploration of all structures
- (or Panendoscopy +Ba swallow +4 vessel angio)

Zone 3

- Panendoscopy + Ba swallow + 4 vessel angio

- Mandatory exploration carries a non therapeutic operative rate of 33 – 63%
- Mandatory exploration causes longer stay
- No difference in mortality / morbidity in 2 groups

Modern approach to stable patient

- Irrespective of Zonal Injury
- Stable with no hard signs of vascular or aerodigestive injury

CXR

FAST

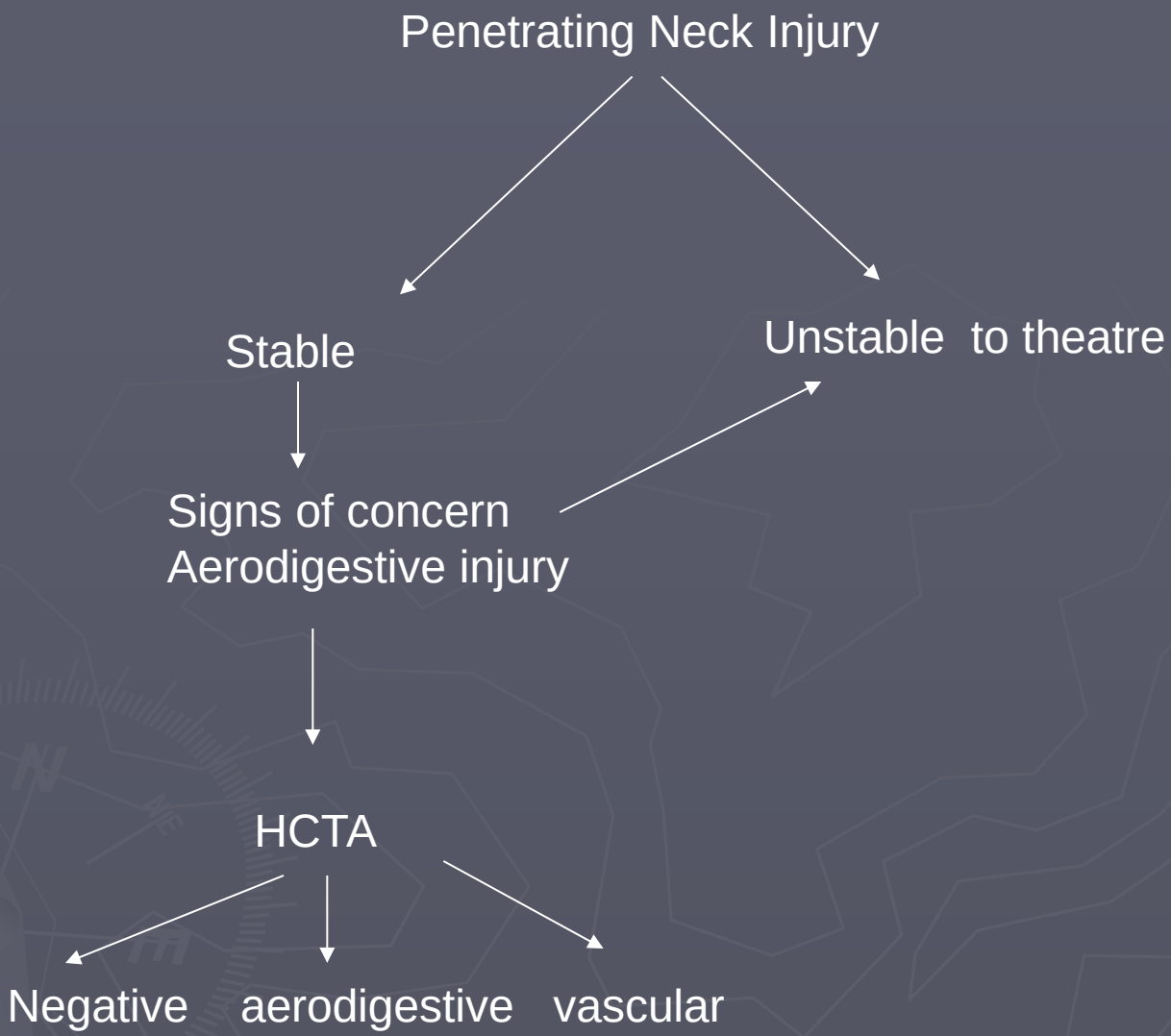
CT angio and selective BA /endoscopy /angio

Reasons to go to theatre

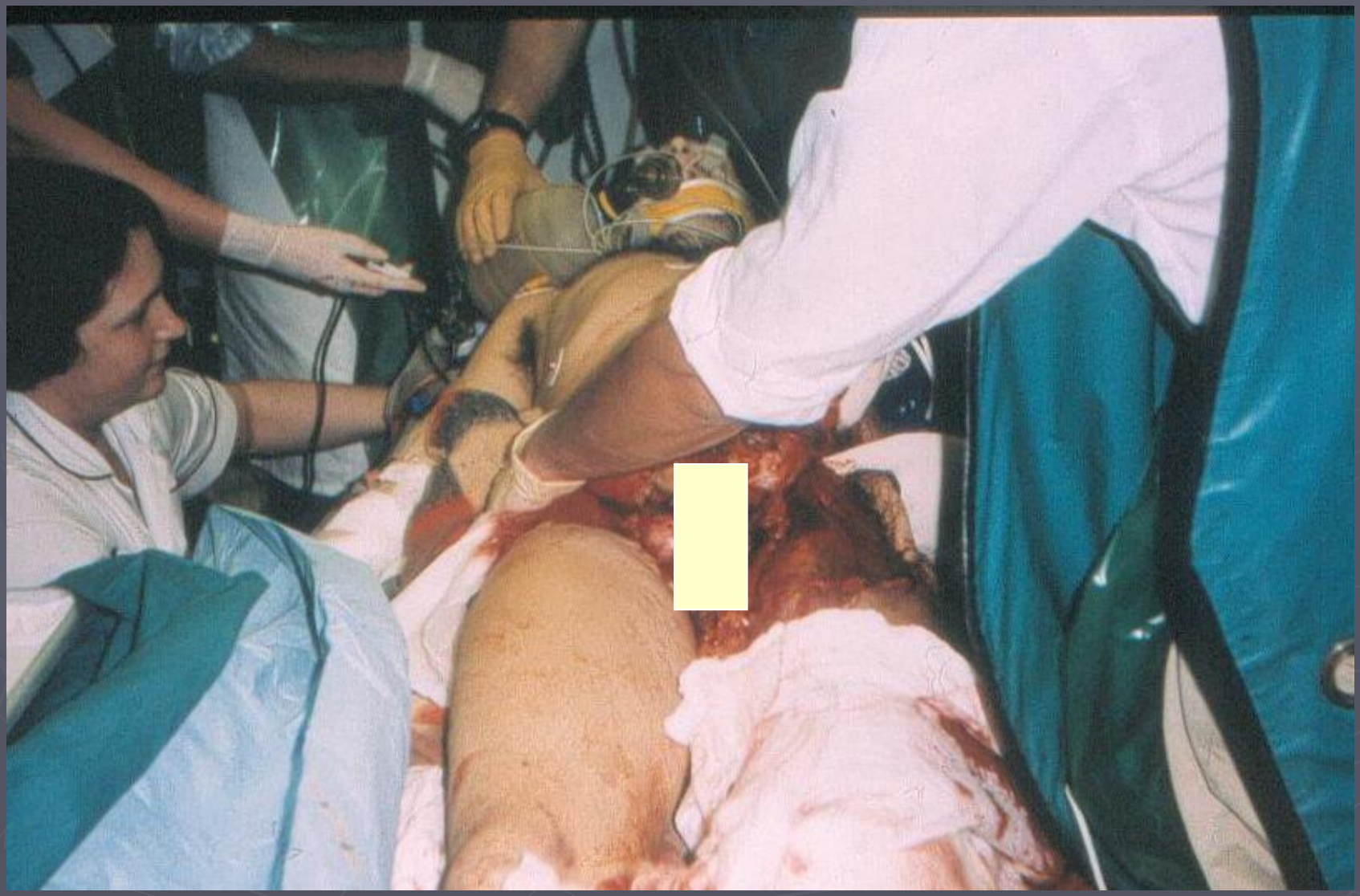
- Continued Haemodynamic Instability
- Expanding haematoma
- Ongoing Bleeding

- Airway problems / breach
- Surgical Emphysema
- Voice change
- Haemoptysis / Haematemesis

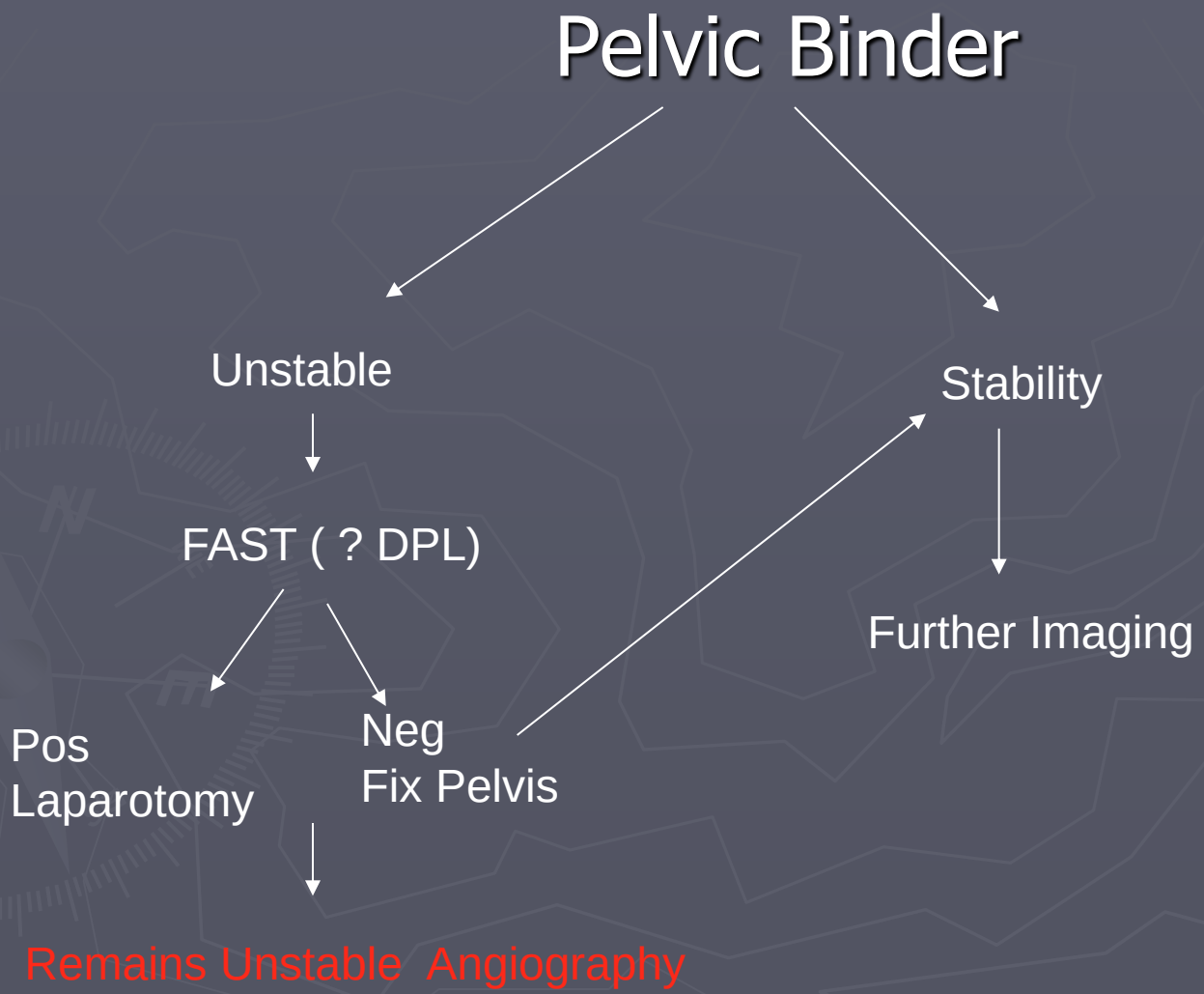
- Developing Neurology


Penetrating Neck Injury
Stable
Unstable to theatre
Signs of concern
Aerodigestive injury
HCTA
Negative
aerodigestive
vascular

Pelvic Trauma



Algorithm for Pelvis (haemodynamic instability)




T POD
T POD
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T POD
T POD
T POD

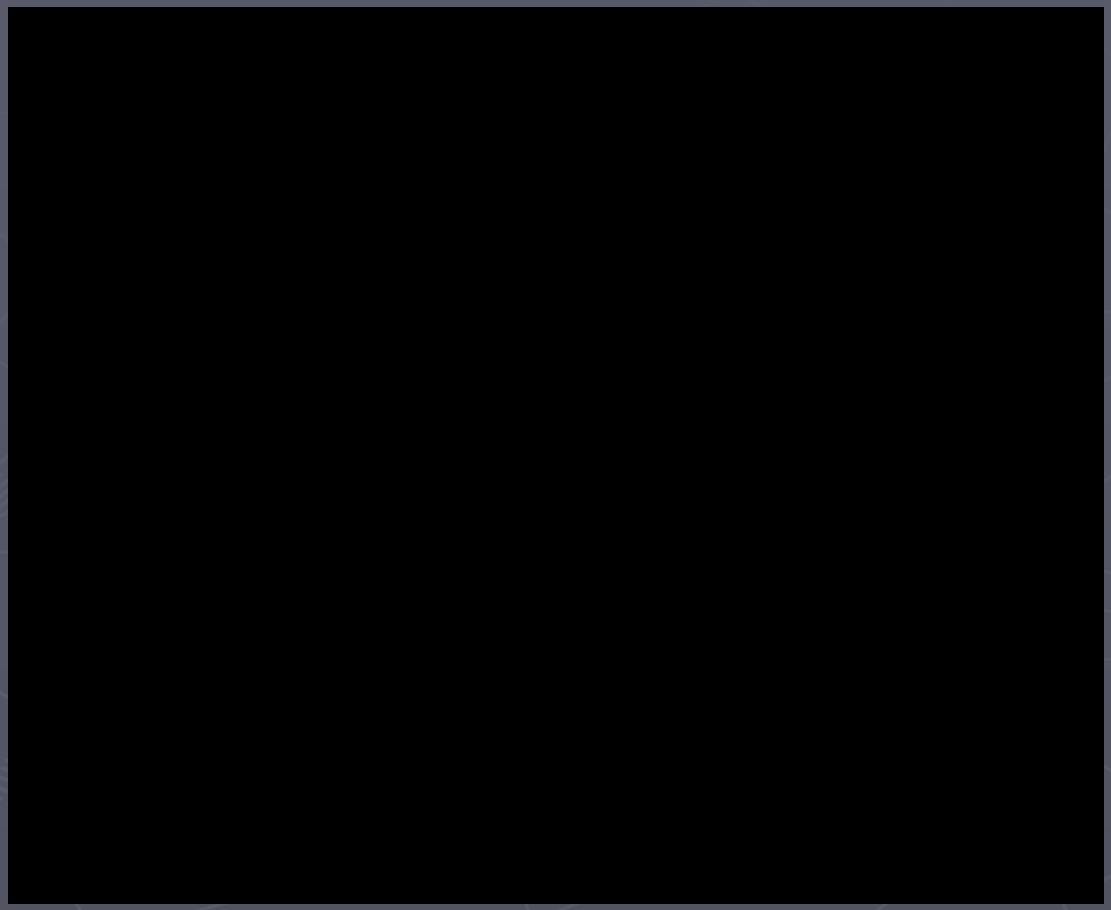
Scanning in Trauma

- FAST has replaced DPL
- High accuracies for PTHx scan

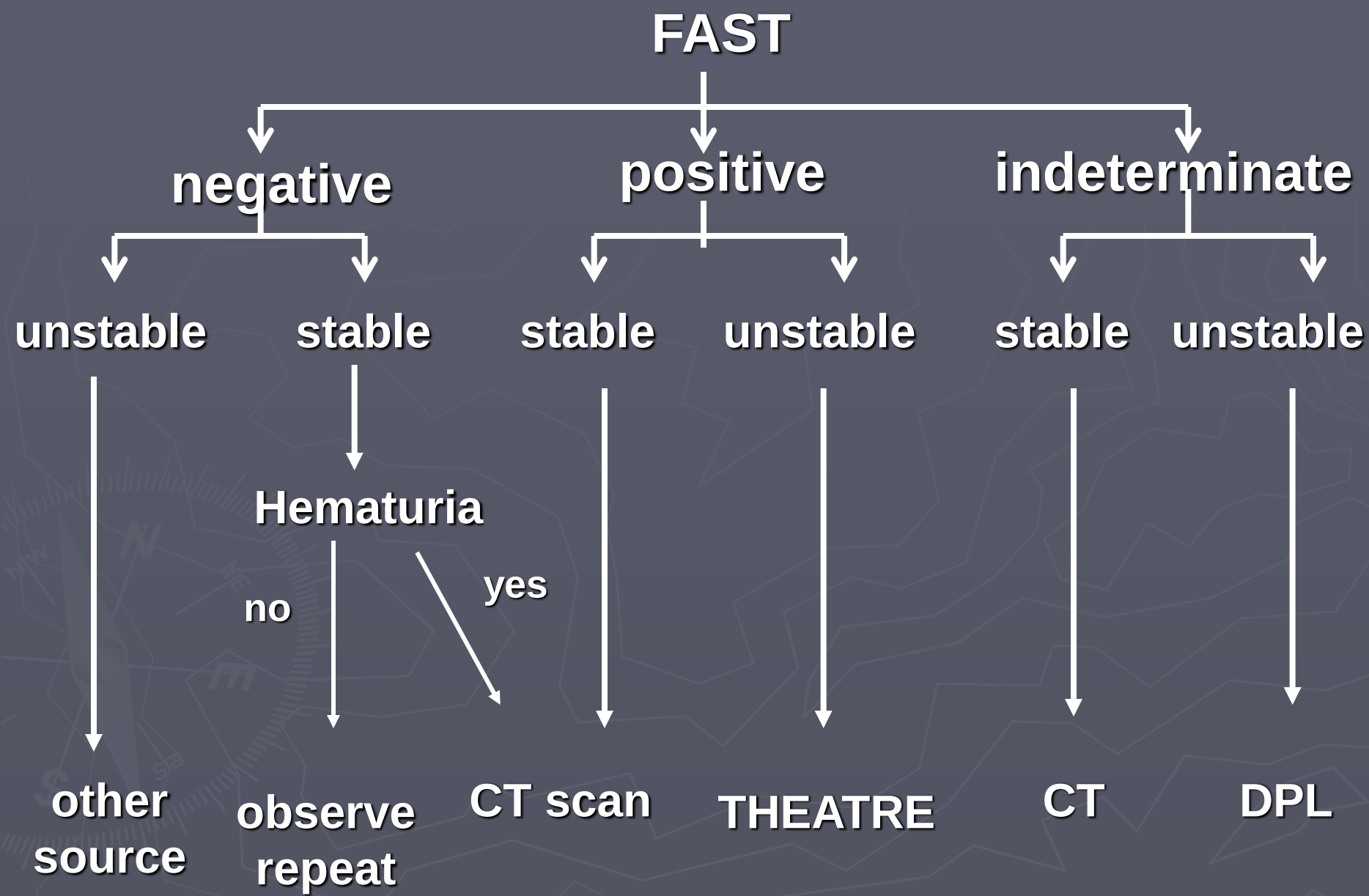
Sensitivity & Specificity of FAST

	Year	Patients	Sensitivity %	Specificity %
Dolich	2001	2576	86	90
Healey	1996	745	88	98
McKenney	1996	1000	88	99
Rozycki	1995	371	81	99
Boulanger	1995	206	81	98

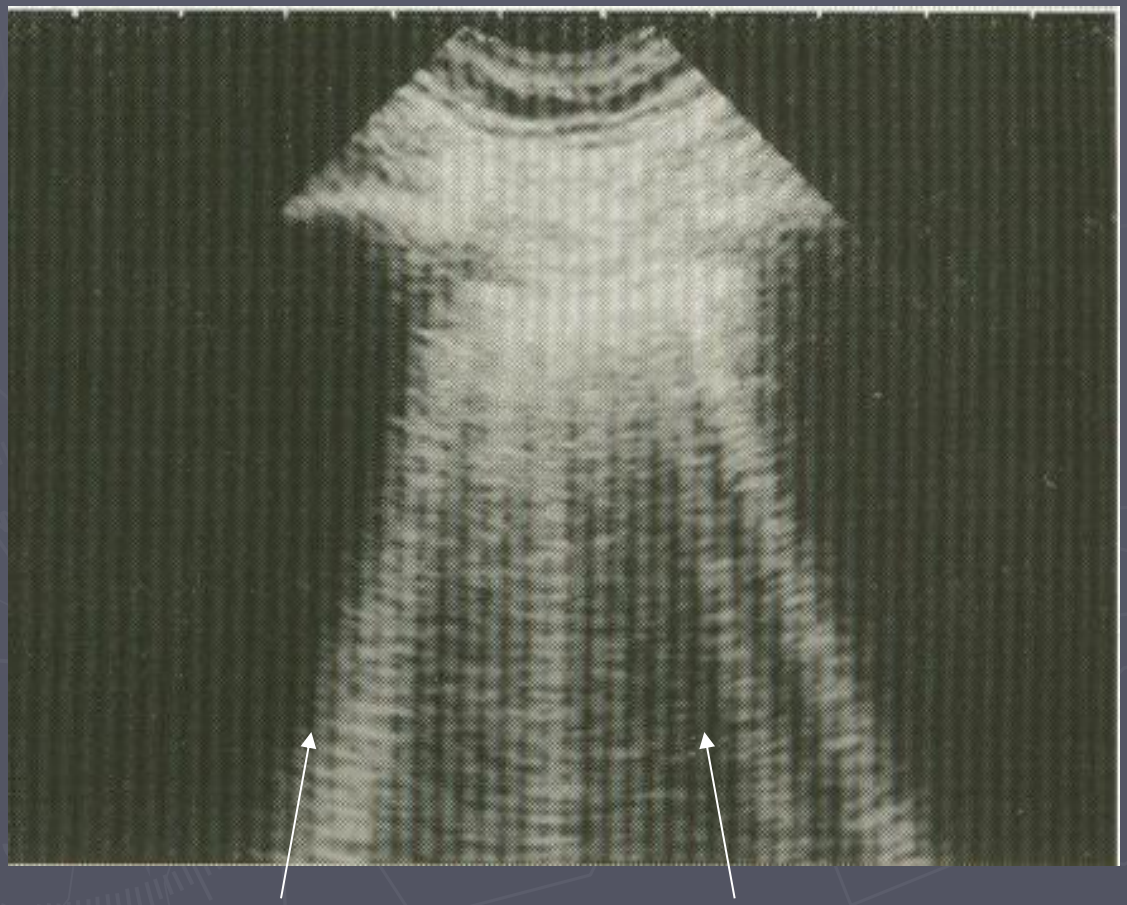
Dynamic Video of positive



Possible Trauma Algorithm



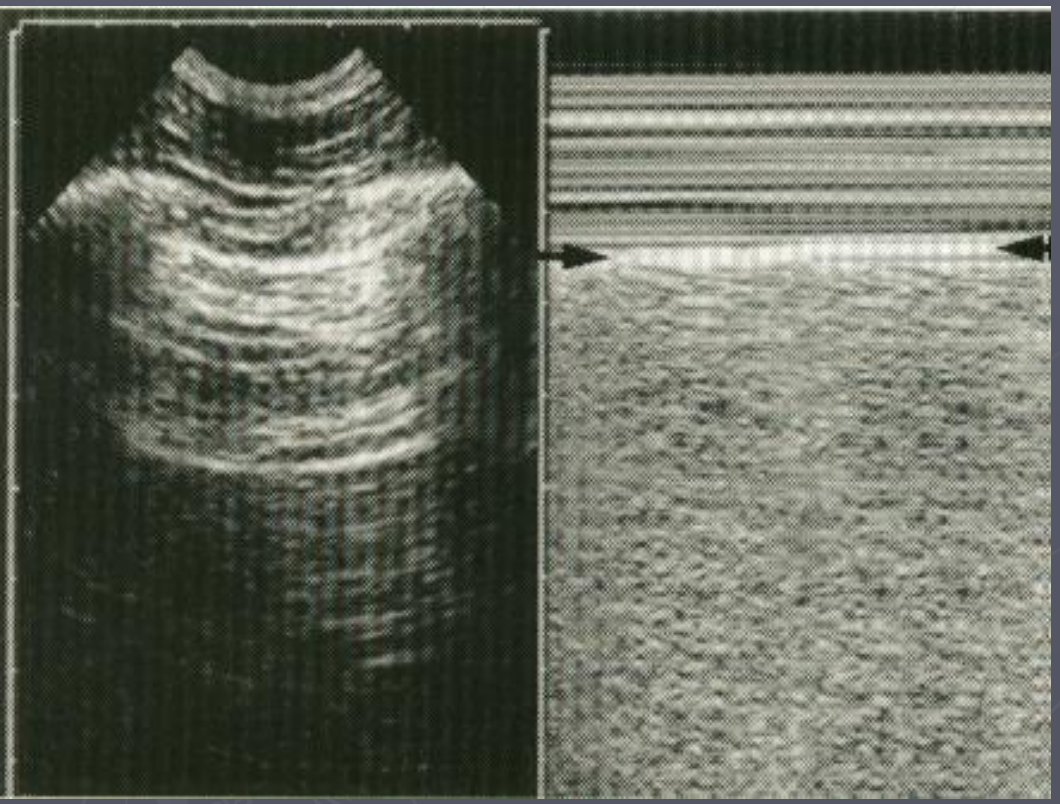
Normal US Pattern: Static signs



- B line –

  "comet-tail" artifact

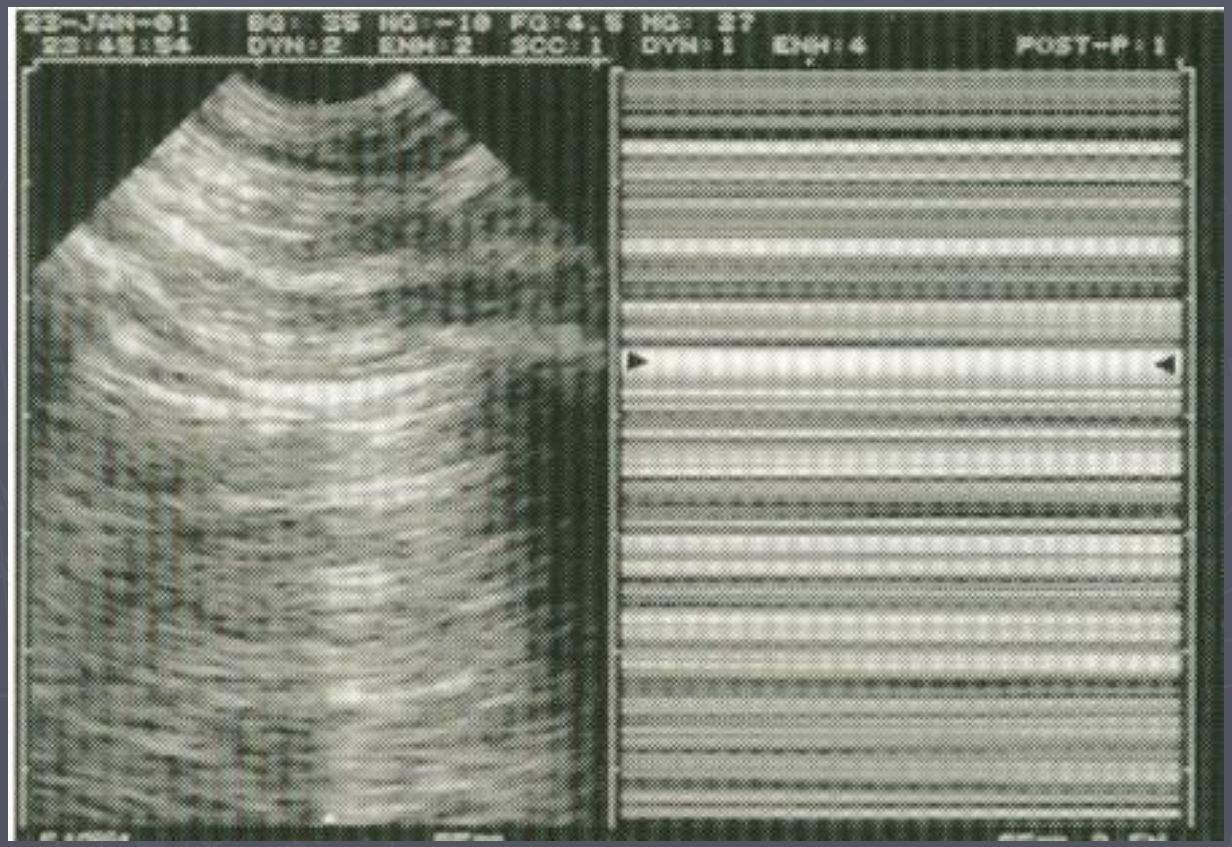
Normal US Pattern: Dynamic signs



- The seashore sign –

  M-mode sign

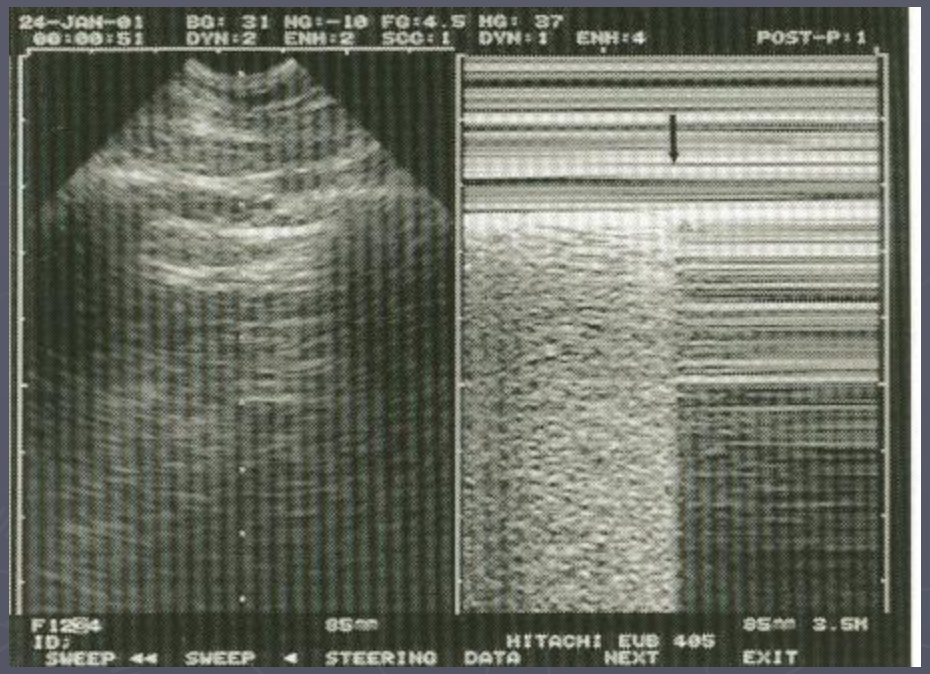
US Diagnosis of Pneumothorax



- No seashore sign –

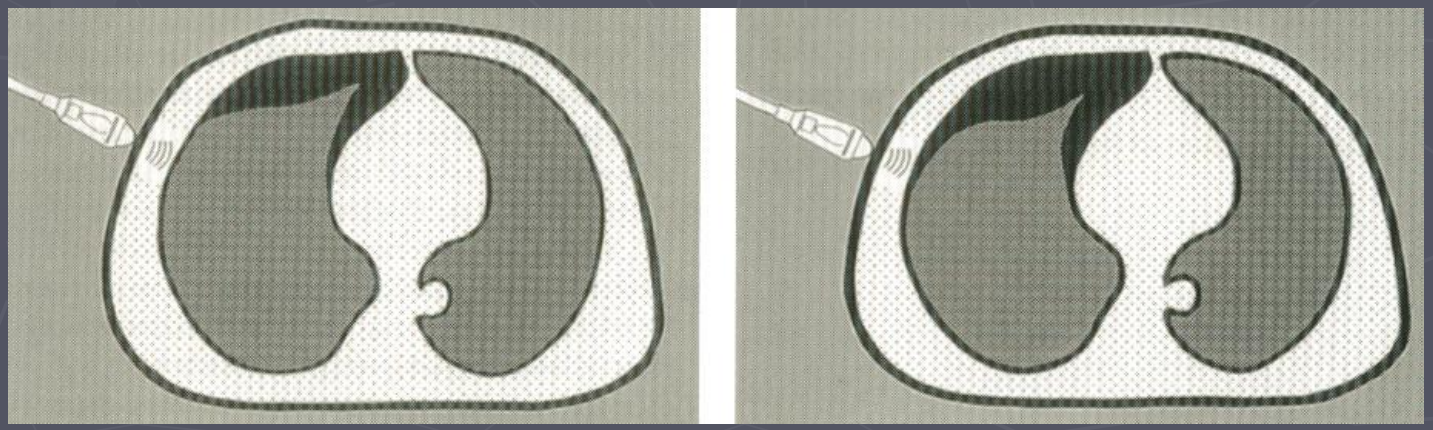
  no lung pulse

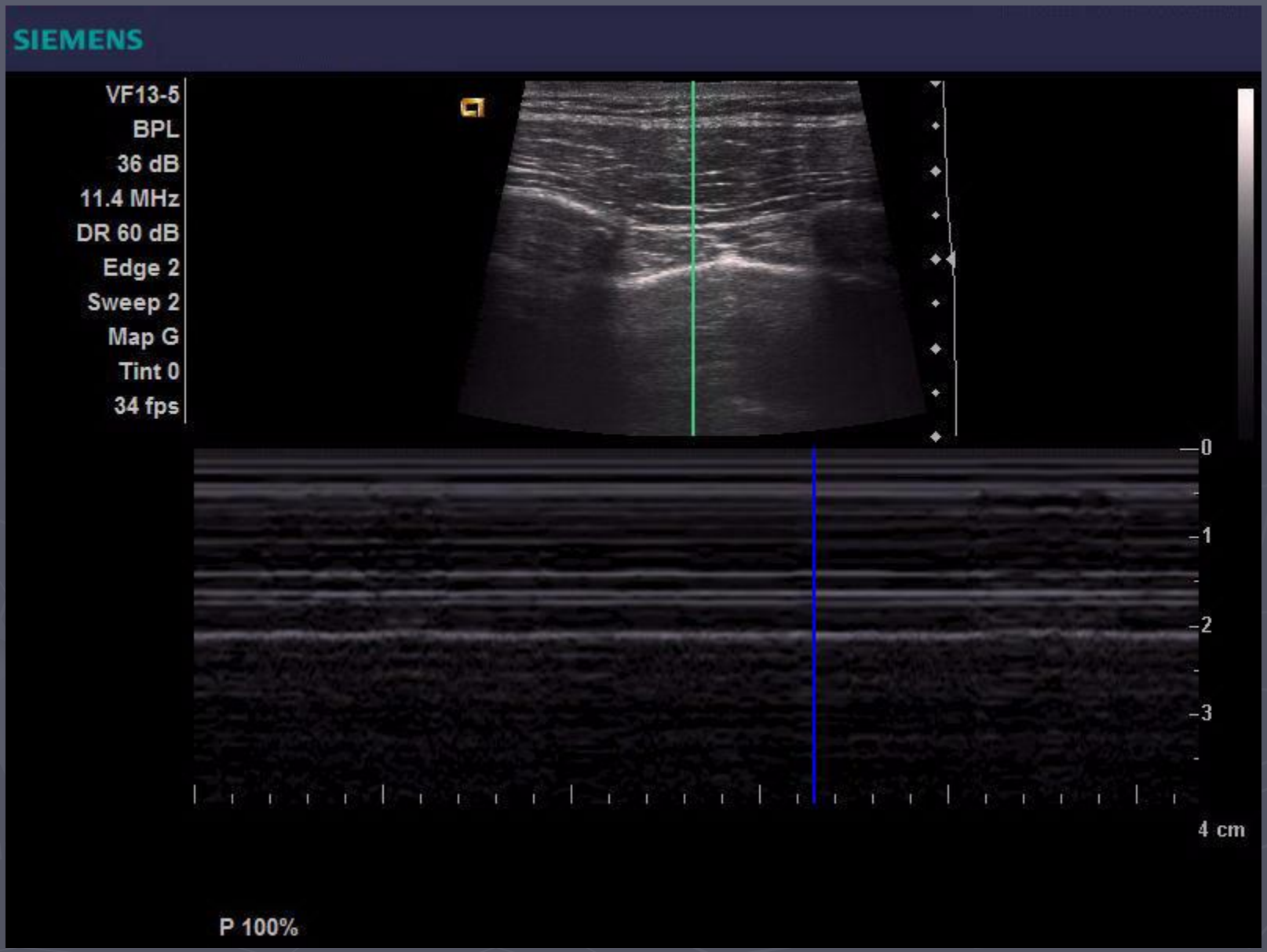
US Diagnosis of Pneumothorax



- The lung point –

  specific sign




SIEMENS
VF13-5
BPL
36 dB
11.4 MHz
DR 60 dB
Edge 2
Sweep 2
Map G
Tint 0
34 fps
0
1
2
3
4 cm
P 100%

Randomised Controlled Trial of Immediate versus delayed Goal directed Ultrasound to Identify the aetiology of Non traumatic Hypotension in ED patients

Jones A Vivek S Acad Emerg 2004 Med 11(5) 445-6

Carolinas Medical Centre

All adults with SBP < 100 or Shock Index >1

Non trauma - 184 included

Scan at either 0 minutes or plus 15 to 30 mins

(Cardiac and Torso views)

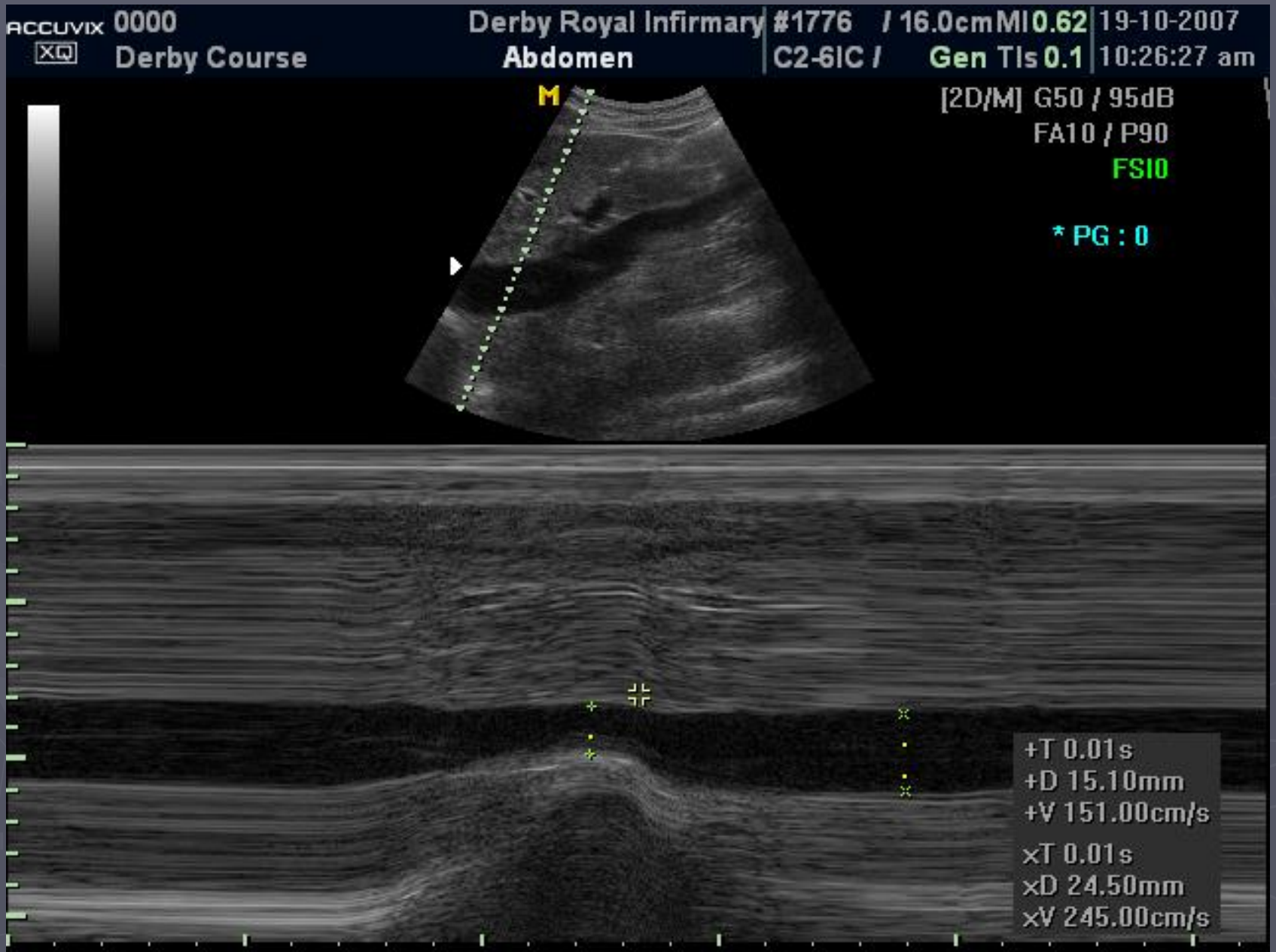
	Viable diagnoses at 15 minutes	Accuracy of final diagnosis at 15 mins
Group 1 Immediate scan	Median 4	80%
Group 2 Delayed scan	Median 9	50%

IVC COLLAPSE INDEX

During forced Expiration and Inspiration

$$= \frac{\text{IVC Diameter EXP} - \text{IVC D INSP}}{\textbf{IVC EXP}}$$

All at end Diastole should be > 40%


ACCUVIX 0000
XQ
Derby Course
Derby Royal Infirmary
Abdomen
#1776 / 16.0cm MI 0.62
C2-6IC / Gen TIs 0.1
19-10-2007
10:26:27 am
M
[2D/M] G50 / 95dB
FA10 / P90
FSI0
* PG : 0
+T 0.01s
+D 15.10mm
+V 151.00cm/s
xT 0.01s
xD 24.50mm
xV 245.00cm/s

Causes of cardiac dysfunction

- Pericardial effusion
- Overall contractility problem
- Focal wall motion problem
- Valve dysfunction

Cardiac Arrest
the role of ultrasound scanning

The potential role for thrombolysis in the future

Adding information to the process

Termination of cardiac arrest

Blaivas Fox Acad Em Med 2001 8(6) 616-21

0/136 with no activity survived

Which Horse to back!!!!!!!

Major Incident

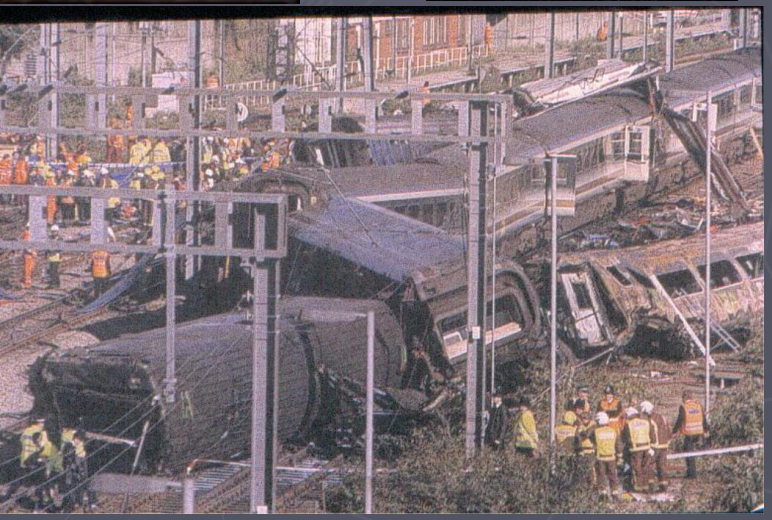
…. an event that requires extraordinary measures


Terminal 5
No Smoking
Automatic Door
No Smoking

Major Incident Planning
What is your role?

Potential

- *First at scene*
- Part of resuscitation team
- In ITU / Theatre
- Mobile team
- Co-ordinating Critical Care response



Kegworth
47 Dead 79 Injured

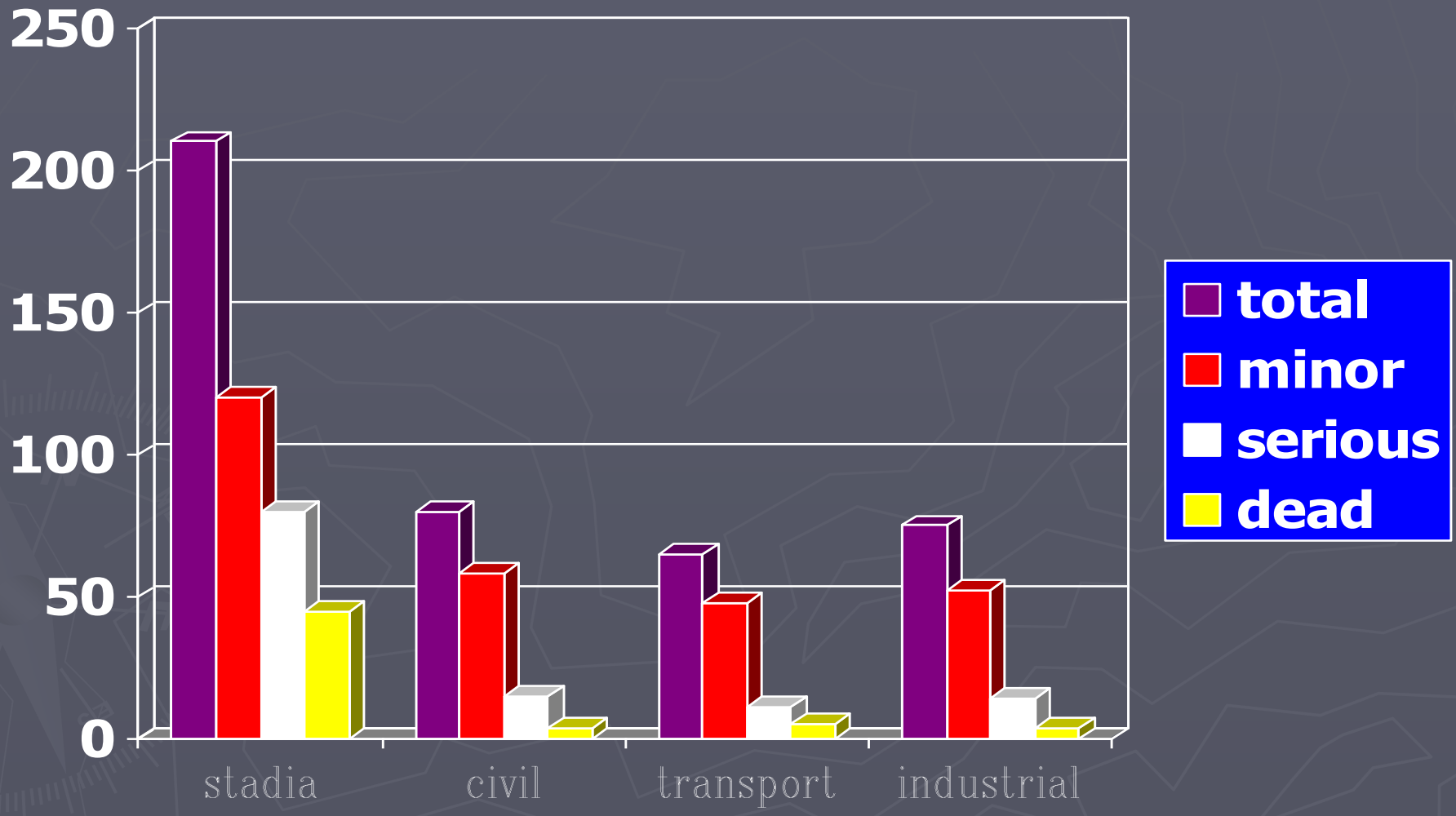
Kings Cross
31 Dead 61 Injured

Paddington
41 Dead 400 injured

Bradford
1995
56 Died
265 Injured

Hillsborough
96 Dead
200 Injured

What scale will it be?



How often will it happen?

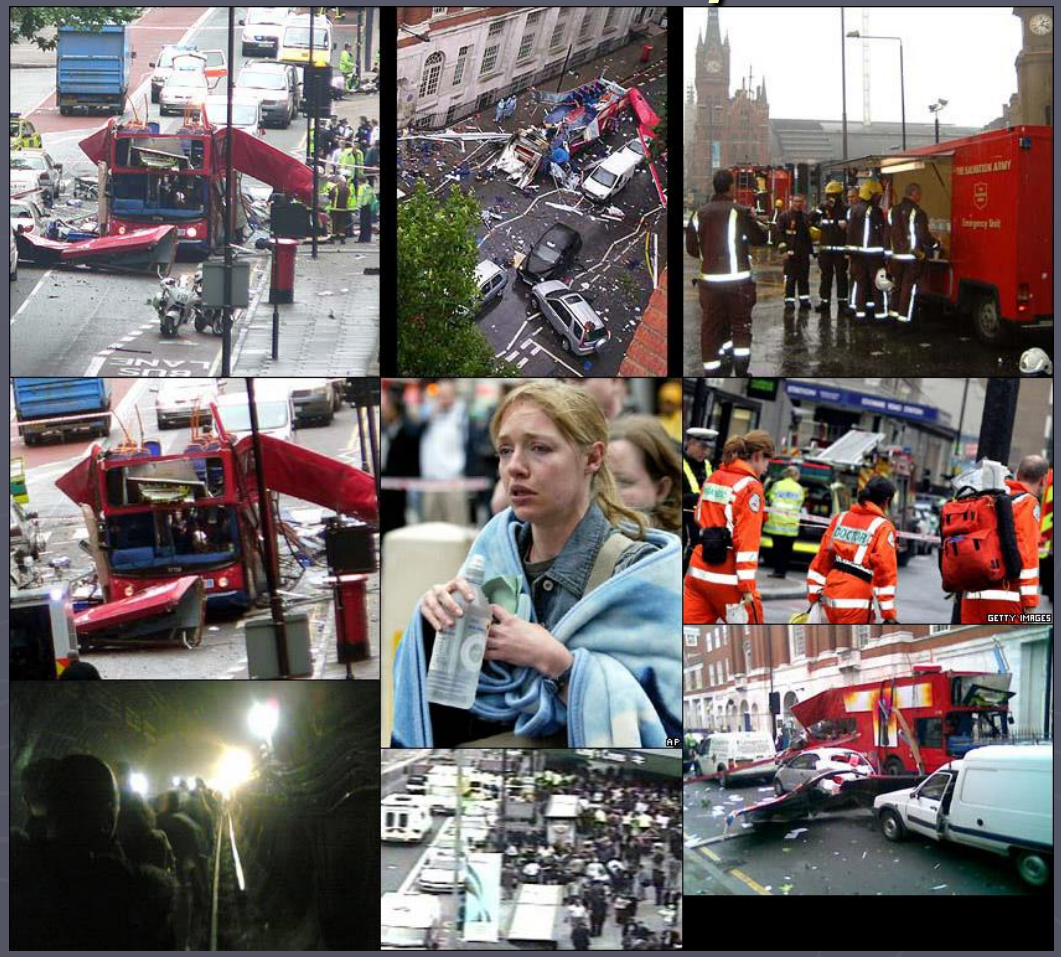
Recorded events between 1968-99 115
involving 25 patients or more or 6 majors

200 A&E departments in UK

Therefore once every 20 to 30 years
(however role of Mutual aid)

The world has changed

London 07/07



56 Dead 700+ injured

Tsunami

Over 250,000 dead

Avian Flu

Modelling Health service contacts assuming 25% attack rate 0.4% mortality

Per 100.000 population there will be

25,000 health service contacts

2,500 GP contacts

1,250 ED contacts

140 Hospitalisations

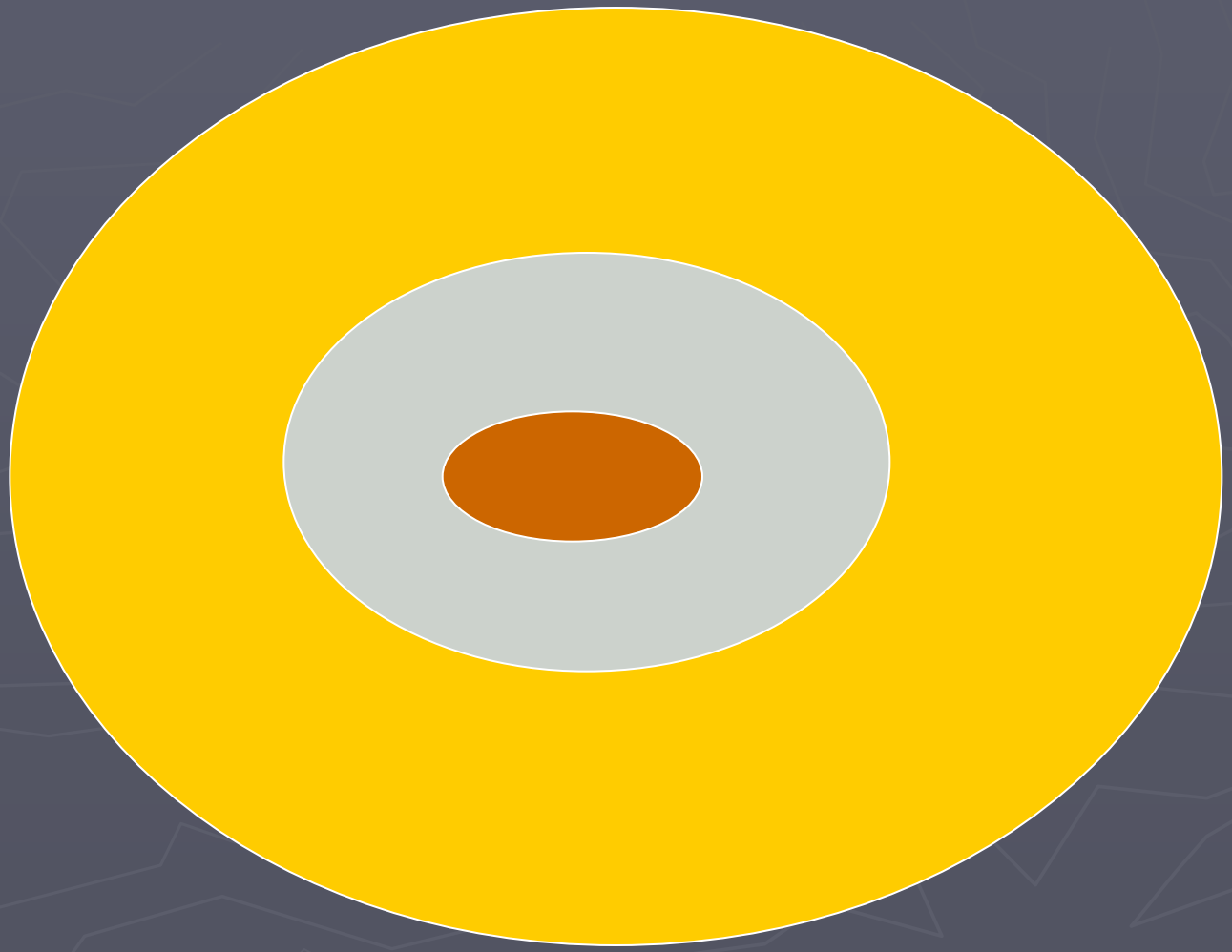
90 excess deaths

Priorities?

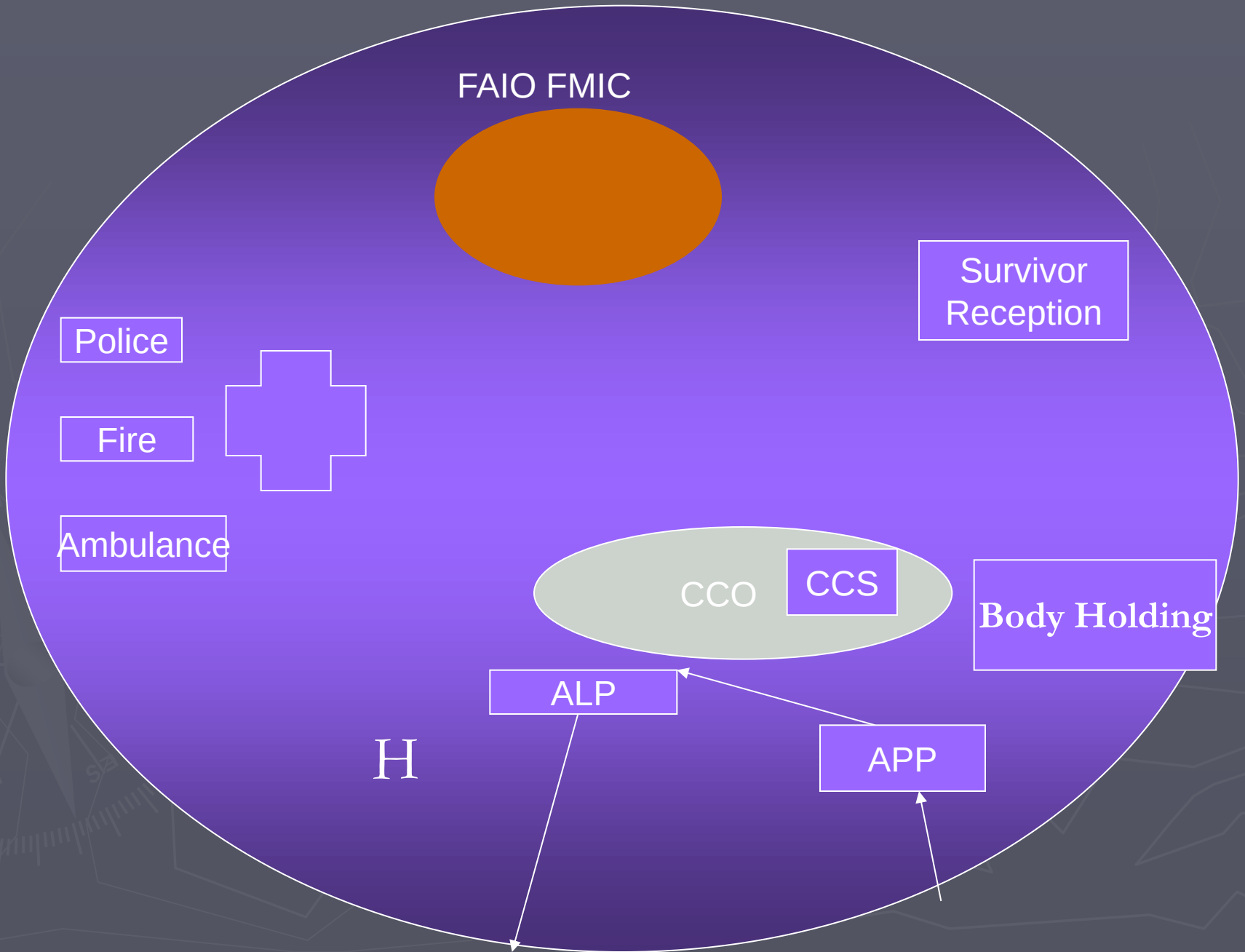
What are priorities? MIMMS

- **Command**
- **Safety 123**
- **Communication**
- **Assessment**
- **Triage**
- **Treatment**
- **Transport**

Gold Silver Bronze



silver


FAIO FMIC
Survivor Reception
Police
Fire
Ambulance
CCO
CCS
Body Holding
ALP
APP
H

Access to Site

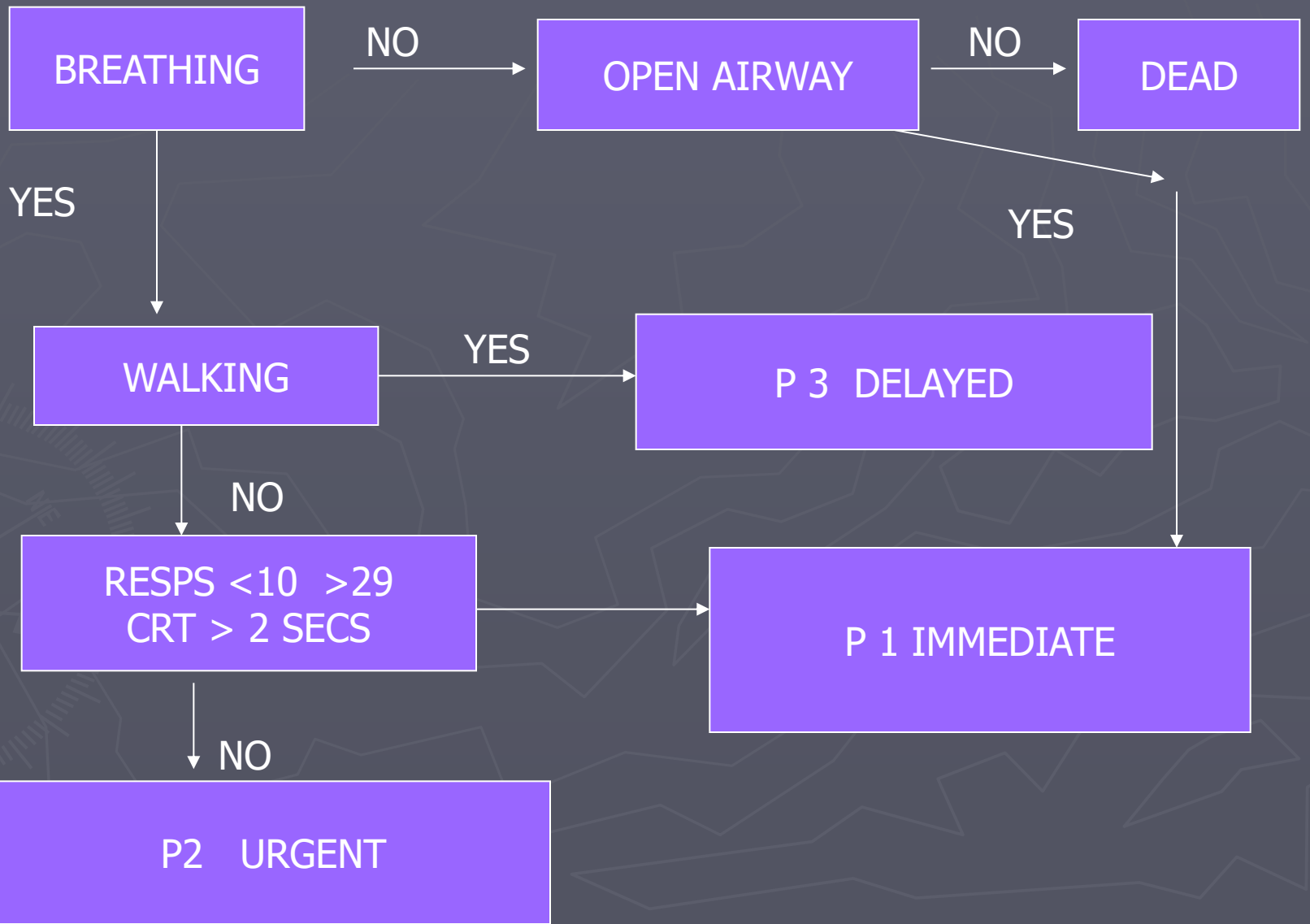
- Who is in command?
- Access only with PPE and ID badge
- Set up contact with MIC / Gold or Silver control etc - the only flashing blue light
- Report always to them!!!!

Triage

- "Do the most for the most"
- Comes before any treatment

You need to understand total need at scene before deploying skills as allocating major resources to a single unsalvageable casualty will lead to many deaths.

IMMEDIATE TRIAGE - SIEVE



Triage Sort

Based on RTS

- Blood Pressure
- GCS
- Respiratory rate

- Present on Triage cards

What is happening in hospital

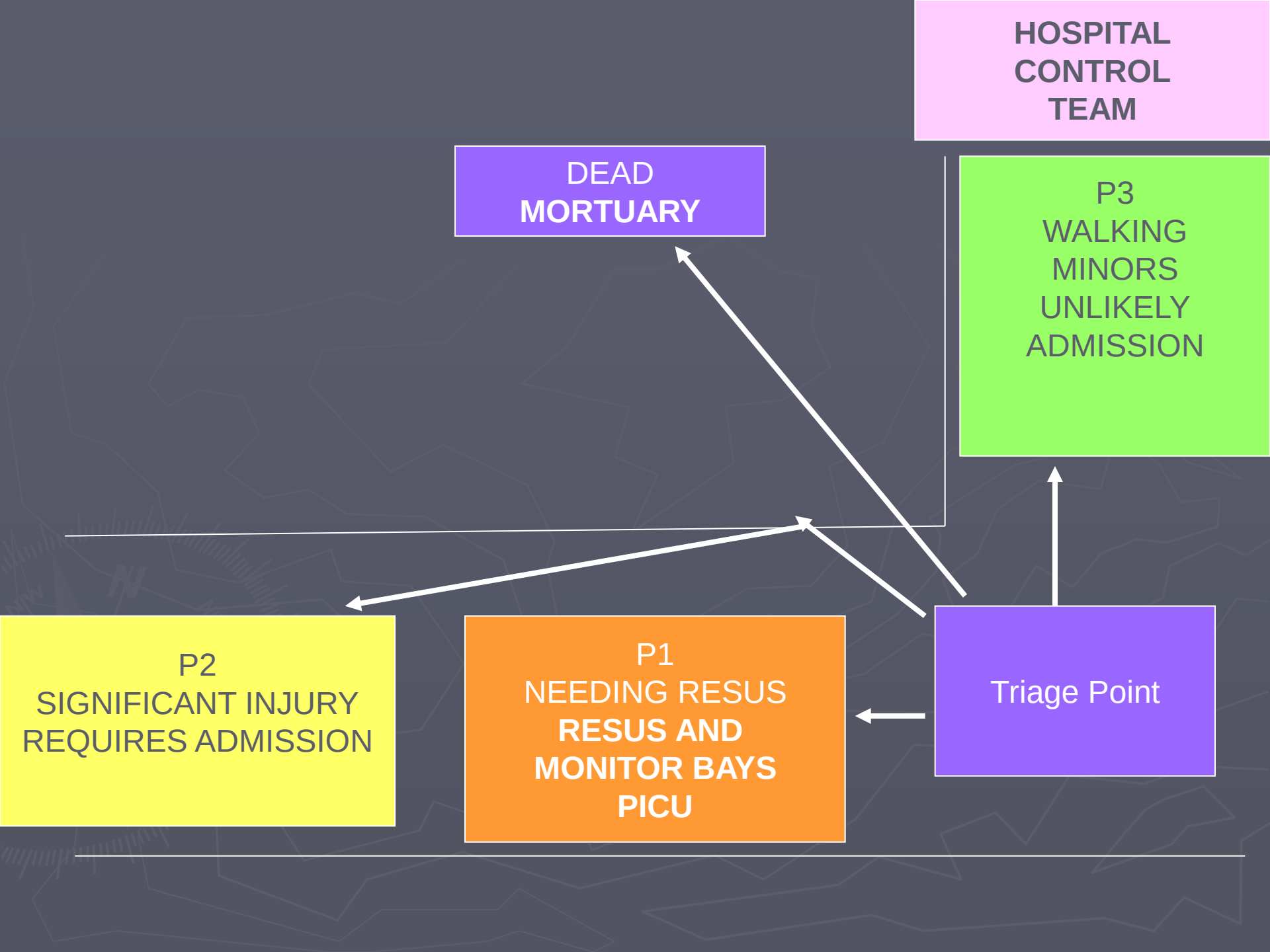
- Clearing as many patients out as possible
- Deflecting non incident patients

- Forming Initial control team
- Getting resus teams ready

- Start callout cascade

Phases of incident

- Preparation
- Reception Phase
- Definitive care phase
- Recovery Phase


HOSPITAL CONTROL TEAM
DEAD
MORTUARY
P3
WALKING
MINORS
UNLIKELY
ADMISSION
P2
SIGNIFICANT INJURY
REQUIRES ADMISSION
P1
NEEDING RESUS
RESUS AND
MONITOR BAYS
PICU
Triage Point

The reception phase

- What is happening now?
- Can the current workload be reduced?
- Define areas (including triage)
- Allocate staff to specific areas
- Is there enough equipment

Critical Care Coordination

Overall responsibility to prioritise and decide appropriate usage of

Theatres
Radiology
Blood Products

Don't send them too early
Priorities in Surgery
Don't allow too much radiology!!!

Definitive care - Surgical

- Co-ordinated by Senior Surgeon
- Priorities
  - Triage
  - Initial treatment/ resuscitation
  - Surgery
  - Post operative management

  - Do the most for the most
  - Damage Control

Definitive Care – non-surgical

- Co-ordinated by Senior Physician +/- Intensivists
- Priorities
  - Triage
  - Initial assessment and resuscitation
  - Allocation to appropriate area
  - Definitive management

Major Messages from previous exercises and previous incidents

- Blood transfusion - use ID labels and move transfusion to bedside
- Lots of information may not be available!!!- don't feed the information beast
- Simple Stupid works

- Tracking of patients is difficult
- Information sharing need low tech solutions e.g."Gofors"
- The coordination / triage of theatres is critical
- Have decision maker at front end and someone in theatre making it happen
- Don't overuse radiology

Idiots Guide when its going bad!

Do not just try to do more of the same !!

It won't work!!!!!

e.g. Radiology

Survival Guide

- Stay Calm
- Where do you report to?
- Clear Space
- Set up beds with equipment and staff to receive patients
- Make sure you know who reports to you and who you report to and that communications work
- If overwhelmed don't try to do more of the same - it wont work!!!

Future

Interface Working

Need to continue to adapt and collaborate

- Population changes
- Skill mix change
- Need to increase access to more advanced management

The problem

- Increasing elderly population
- Potential for Mass Incident / Pandemic
- Increasing expectation
- Decreasing skills / experience of trainees

Changes in ED attendance 1990 - 2004

- Total increases of 54%
- Aged over 70 increase 198%
- Aged over 90 increase 671%

What will this mean for A&E Attendances

In 1986 Dr Dove (BMJ) showed the following attendance rates

70 - 74 years	**92 per 1000**
Over 85 years	**203 per 1000**

Evidence this is higher

Trauma: Who cares?

A report of the National Confidential Enquiry into Patient Outcome and Death (2007)

NCEPOD

Airway

A report of the National Confidential Enquiry into Patient Outcome and Death (2007)

NCEPOD

Airway / Breathing

- 1 in 8 patients arrive at hospital with partial or complete obstruction of airway
- Management of the airway unsatisfactory in 7%
- Prehospital intubation failed in 13%

Already moving to front door

- RSI in EDs
- CPAP and BiPAP
- Dual accreditation

RSI evidence

- *Graham Beard EMJ 2003 20 3-5*
- **2 year observational study across 7 departments**
  735 RSIs roughly 50:50 split

- **Anaesthetics initially higher success rate**
  92% vs 84% (p< 0.04)
  Trend towards higher complication in ED
  12.7% vs 8.7% not significant

ED intubated more physiologically disturbed and within 15 minutes

NIV in EDs

- ***Browning Atwood EMJ 2006 23 920-1***
- **Out of 133 EDs seeing > 25,000**

- **148 using NIV**
- **Only 48 had protocols**

- **Of those instituted by**
- **ED 78**
- **Crit Care 21**
- **Multi 27**
- **Medicine / physio etc**

Other skills that may be appropriate in ED

- Arterial line monitoring
- Invasive monitoring
- Early institution of Sepsis Bundle
- Early GDT
- Hypothermia post arrest

The future – my opinion!!

More Work + Junior Trainees =

You are not likely to live to 50!!!!!

But

- This will always be by mutual agreement
- It will vary from institution to institution
- Must be with appropriate training and governance

Questions

Insults

Entente Cordial

Will send a postcard!!!!!