An Introduction to Clinical Decision Making

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Overview

- Intro to clinical decision making (CDM)
- The five second rule: a case based CDM challenge
- How do we think and make decisions?
- What affects our CDM?
- How can we improve CDM and enhance patient safety?
- Next?

CDM and non-technical skills

- Team working
- Decision making
- Situation awareness
- Task management

- Diagnosis
- Prognosis

CDM exercise 1

- Think about your choice of speciality, profession, job
- What influenced you in that decision making?

CDM exercise 2

Look at the next slide and ask yourself:

- “Which beach would I rather be on?”

A or B ?

CDM in the acutely ill

- 21 year old with known asthma
- In respiratory ward
- Phone call
- Decisions

- Recognition

The five second rule

CDM in the acutely ill

- In the ward
- Assessment and management

- Looks….
- Obs….
- Actions

System 1 thinking: (intuitive)

Cognitive style	Heuristic
Cognitive awareness	Low
Cost	Low
Automaticity	High
Rate	Fast
Reliability	Low
Errors	Usually
Effort	Low
Predictive power	Low
Emotional component	High
Scientific rigour	Low

Importance of CDM in managing sick patients

- Patients still die from ‘simple’ things either missed, delayed or done sub-optimally
- Decisions including diagnosis
- Approx 80% of clinical time spent in the cognitive domain

THE FOUR KEY DOMAINS OF EMERGENCY CARE

1.

Acute assessment + stabilisation with immediate investigations and support.

Targeted secondary exam

2.

Monitors: reassess

Surface

Invasive

Real time or Delayed

Illness severity

3.

CDM

Team work

Task Mx

Situation Awareness

Critical Thinking

4.

Differential diagnosis/ definitive diagnosis

Immediate, medium term and long term treatment

1. Advanced First Aid

ASSESSMENT

- Hello, how are you ?
- Response
- Airway: patent ?
- Breathing

ACTION

- Look: obstruction
- Listen: ? noise
- Clear or secure: headtilt/chin lift or jaw thrust? Airway: oral or nasal?
- High conc^{n} oxygen: mask type? Flow?

1. Advanced First Aid

ASSESSMENT

- Sounds ?
- Common 3 are ?
- Causes are ?

ACTION

- Clear and keep open
- Get help 2222?
- Advanced airway management required? Tracheal tube? Size? Cut to what length? Are drugs needed for anaesthesia and intubation? If yes, which?

1. Advanced First Aid

ASSESSMENT

Sounds

- Nil: complete obstruction or not breathing
- Snoring/gurgling: reduced GCS, foreign material
- Stridor: anaphylaxis, burns/thermal; tumour; abscess/infection

For each ask 'what is the diagnosis?'

ACTION

- Clear and keep open
- Get help 2222
- Positioning
- Advanced airway management required

1. Advanced First Aid plus 2.

OBSERVE

- Rate
- Volume
- Symmetry
- Character
- Work of breathing
- Compromise

Ix & MONITOR

- CXR, PEFR, ABGs
- Repeat observations
- Pulse oximetry

- **TREAT**

- Oxygen
- Nebulisers

1. Advanced First Aid

ASSESS

- Pulse: which pulse?
- Skin: cap refill time, temperature
- BP: where? Which method?

PHYSIOLOGY

- MAP = CO x SVR
- CO = HR x SV
- Low BP = decompensation

1. Advanced First Aid

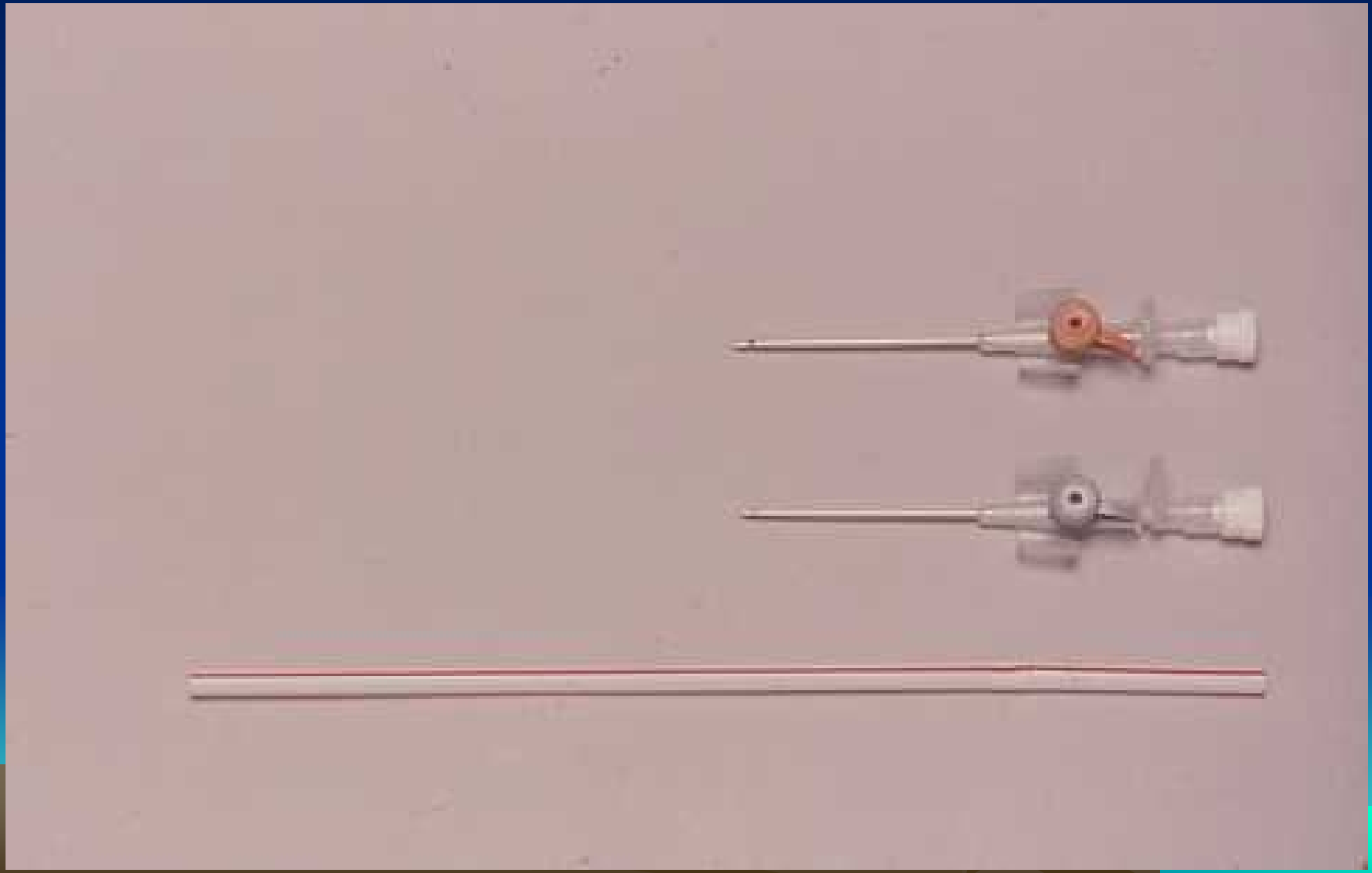
iv access

- Site
- Size
- Blood sampling

iv access

- Upper limb
  Femoral
- High flow: short and thick
- Fluids
- Drugs

Wide bore peripheral cannulae



1. Advanced First Aid

- Disability ?
- Conscious level, focal neurology
- DEFG
- Difficult bit

IMMEDIATE INVESTIGATIONS

- Arterial blood gases: O_2, CO_2, acid-base
- Potassium
- Glucose
- Haemoglobin

can all be done on a blood gas sample

- 12 lead ECG
- CXR
- Targeted investigations

- What should we do having analysed this information?

1. Advanced First Aid

- Evidence
- Environment: context
- Targeted secondary Examination
- Explanation

- Everything else…

Advanced First Aid=Phase 1:abcde

- abcde, treating as you go
- Repeated assessment and continuous monitoring: patient better or worse ?
- Do we need enhanced abcde ?
- Targeted secondary examination

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Illness Severity Assessment

- Speed of action needed
- Level & type of expertise: resuscitation; diagnostic; therapeutic
- Where should the patient be ? Nursing intensity, monitoring, medical input?
- Definitive treatment: speed ?

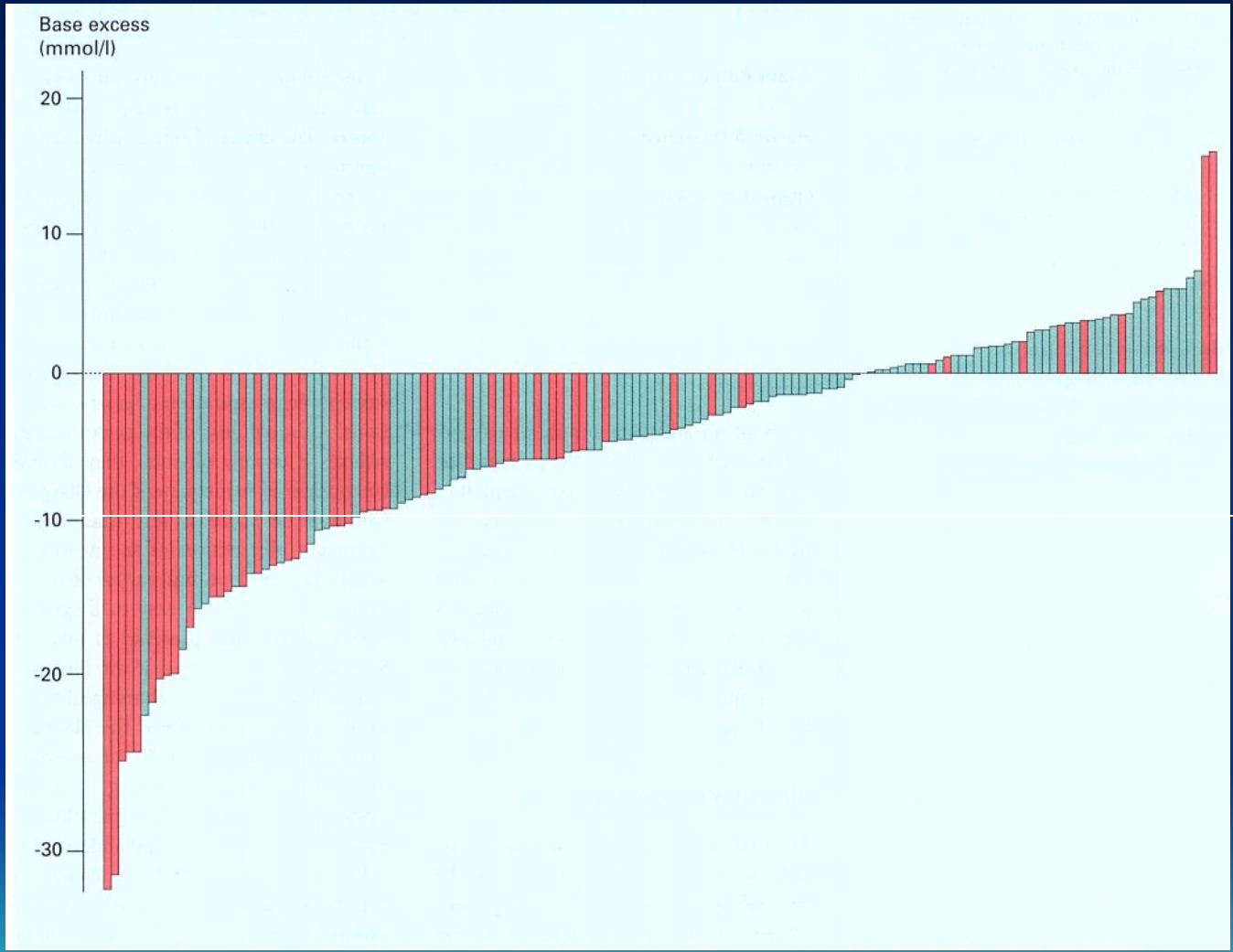
SEVERITY SCORING 1:CLINICAL

ABNORMAL PHYSIOLOGY	OBSERVATIONS
• Airway compromised	• Bad
• Resp rate	• <10 or >30
• Pulse rate	• <45 or >120
• SBP	• <100 (110) or >200
• GCS	• Fall of 2 points, <15

SEVERITY SCORING 2: INVESTIGATIONS

ABNORMAL INVESTIGATIONS	RESULTS
• Hypoxaemia	
• Hypercarbia	
• Potassium	• <3 or >6 (ECG)
• Glucose	• <3 or >20
• H^+	• >50 or <30
• Base excess	• < -5 or > +10
• Lactate	• Diagnosis ?

Relationship between base excess and mortality in ICU



Base Excess and Mortality Red = Dead Green = survivor

ICM 2001;27:74-83

SEVERITY SCORING 3: organ failures

- Clinical: cardiovascular (shock)
- CNS reduced conscious level
- Urea and creatinine: renal
- ABGs: respiratory (oxygenation+/or CO_2 clearance)
- Clotting: coagulation
- WBC: bone marrow
- Gut/liver: glucose; lactate; clinical

4. Differential Diagnosis, ultimate diagnosis and definitive treatment

- Get more history
- Trachea
- Chest

- JVP and heart
- Abdomen
- Skin, CNS

- GP, family, SAS
- Deviation
- Lateralising signs, wheeze, crackles
- HS III or IV, murmurs
- Swelling, pulsation
- Rashes, neck stiffness, lateralising signs

ASSESSMENT

- A clinical
  +
- B investigations
  +
- C organ failures
  +
- D diagnosis

Decision making

- Diagnosis (and treatment)
- Is the diagnosis correct (complete) ?
- Prognosis
- Admit ?
- Discharge ?
- Stop ?
- Distributed

Diagnostic Error

- Ranked 2nd cause of adverse events (Harvard study, 1991)
- Diagnostic failure highest in EM, GP, Gen Med
- Passing on to specialists in wards, ICU
- 2/3 of claims against UK GPs are for diagnostic failure

Type 2 thinking (analytical)

Cognitive style	Systematic
Cognitive awareness	High
Cost	High
Automaticity	Low
Rate	Low
Reliability	High
Errors	Few
Effort	High
Predictive power	High
Emotional component	Low
Scientific rigour	High

Diagnosis

- History: full
- Examination: complete
- Investigations
- Differential Dx
- Treatment
- Refine diagnosis

Categorising Clinical Decision Making

- Cognitive theory: traditional

- Technical
- Professional
- Distributed

Traditional cognitive taxonomy
or
“how you think it”

- Problem solving
- Pattern recognition
- Decision analysis theory
- Hypothetico-deductive reasoning

CDM: a universal model of diagnostic reasoning

Intuitive

- Experiential-inductive
- Bounded rationality
- Heuristic
- Pattern recognition
- Hard wired response
- Thin slicing
- Unconscious thinking theory

Analytical

- Hypothetico-deductive
- Unbounded rationality
- Normative reasoning
- Robust CDM
- Acquired, critical, logical thought
- Multiple branching/arborisation
- Deliberate, purposeful thinking

A or B ?

CDM

What affects clinical decision making ?

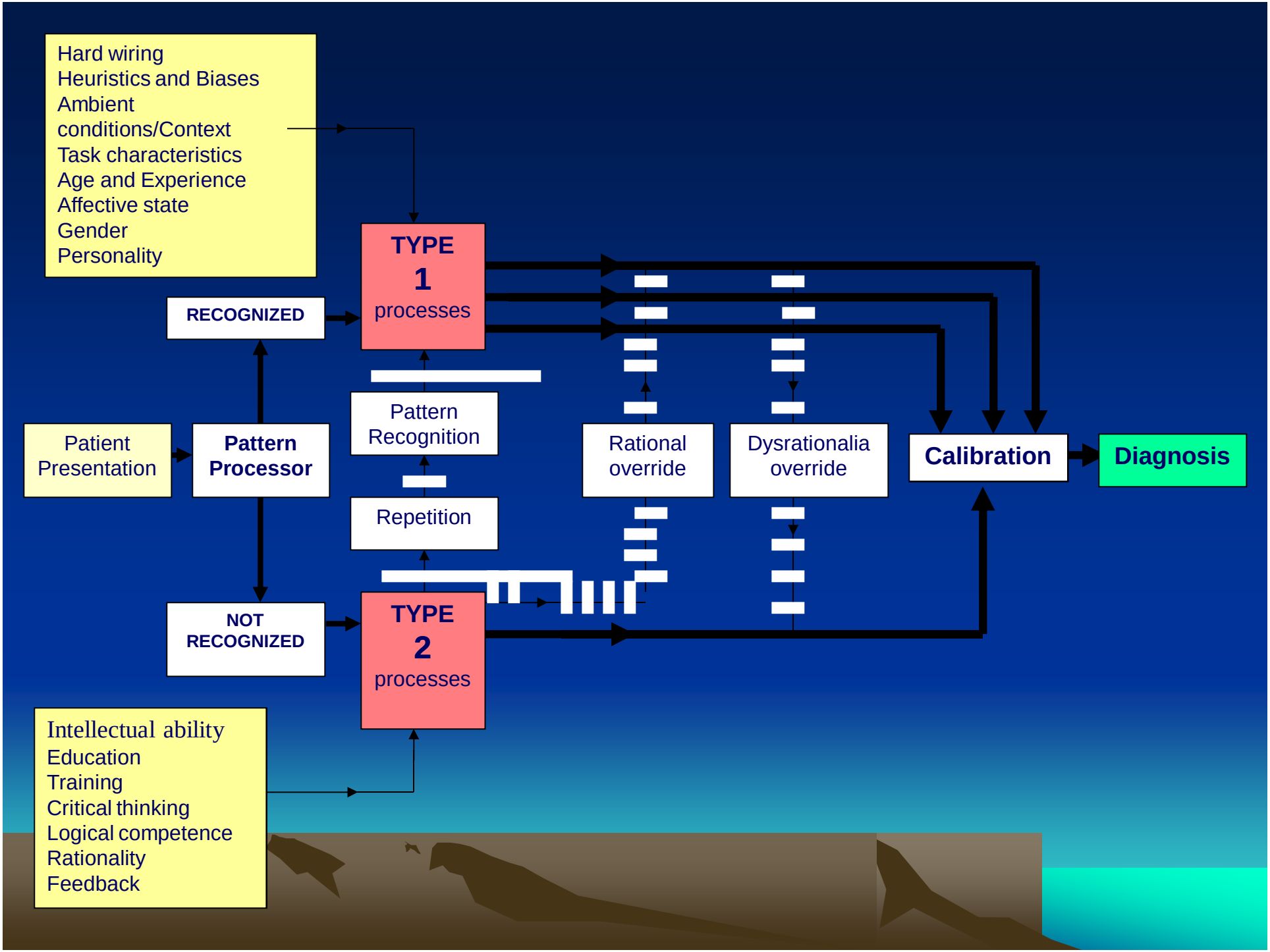
- Knowledge and skills
- Behaviours: attitude (multiple selves), emotions (affect: self, family, patients, relatives, colleagues), values.

What affects clinical decision making ?

- Context
- Values
- Affect
- Knowledge
- Critical thinking
- Interruptions
- Clinical reasoning
- Words
- Non-technical Skills
- Physical factors
- Stress and Fatigue
- Ergonomics
- Experience
- What we hear
- What we think
- Cognitive biases
- Heuristics
- Epiphanies
- Geography

30 Cognitive Errors after Croskerry

Aggregate bias	Gender bias	Psych-Out Errors
Anchoring	Hindsight bias	Representativeness
Ascertainment bias	Multip.Alternatives	Search satisficing
Availability	Omission bias	Sutton's Slip
Base rate neglect	Order effects	Triage-Cueing
Commission bias	Outcome bias	Unpacking principle
Confirmation bias	Overconfidence	Vertical line failure
Diagnostic creep	Playing the odds	Visceral bias
Attribution error	Posterior prob.	Ying-Yang Out
Gambler's Fallacy	Premature closure	Zebra retreat


Hard wiring
Heuristics and Biases
Ambient conditions/Context
Task characteristics
Age and Experience
Affective state
Gender
Personality
TYPE 1 processes
RECOGNIZED
Patient Presentation
Pattern Processor
Pattern Recognition
Repetition
Rational override
Dysrationalia override
Calibration
Diagnosis
NOT RECOGNIZED
TYPE 2 processes
Intellectual ability
Education
Training
Critical thinking
Logical competence
Rationality
Feedback

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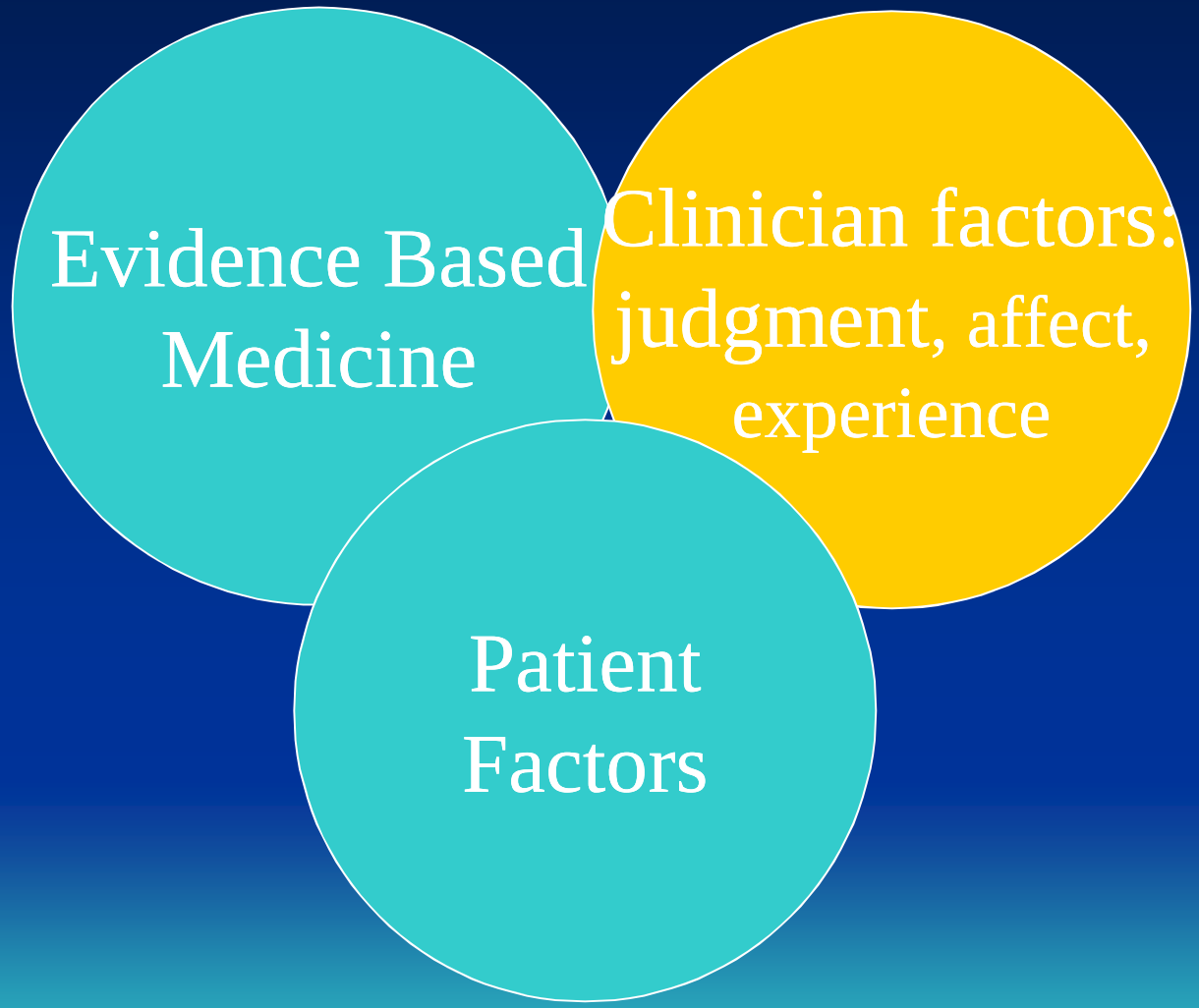
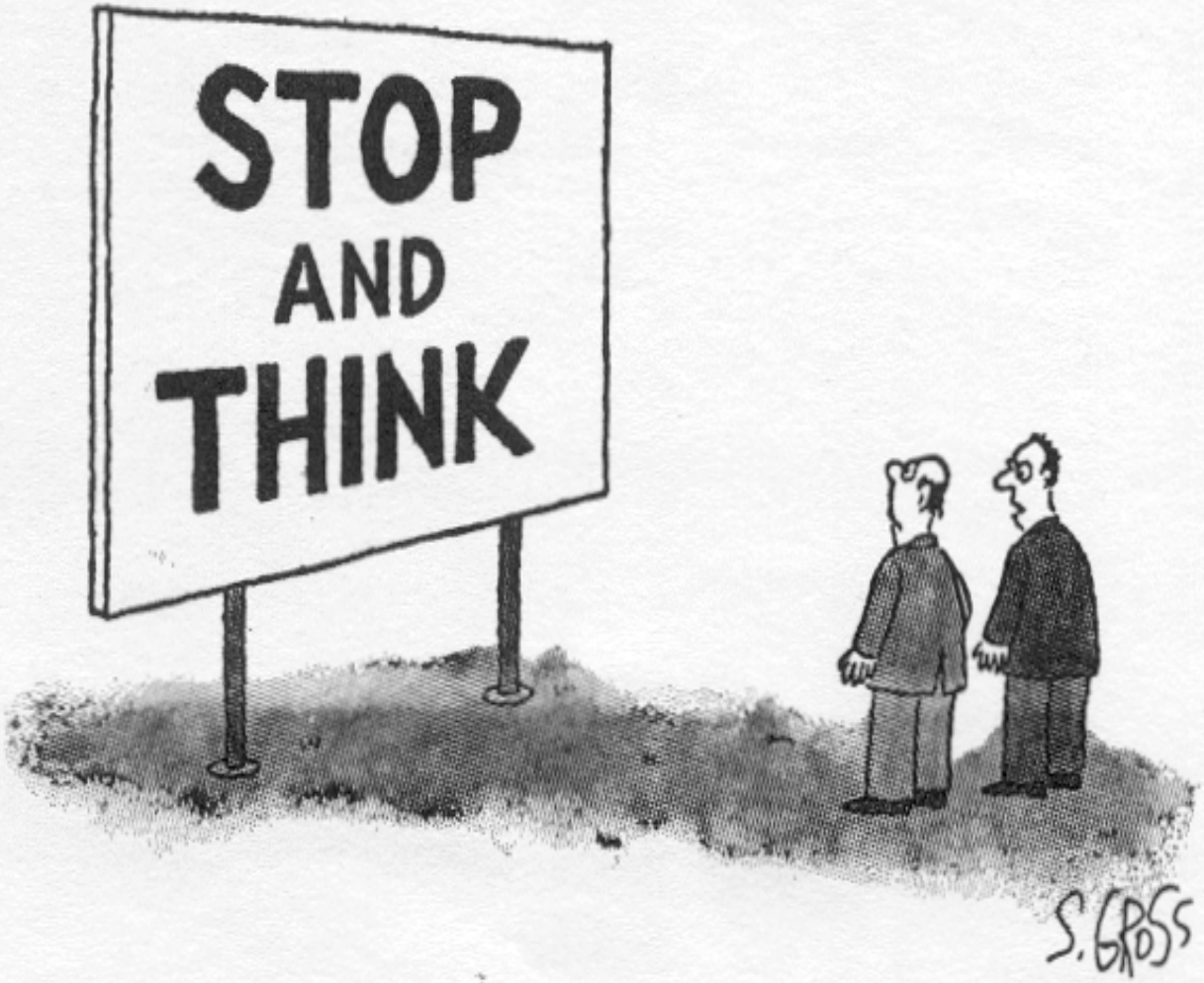

Evidence Based Medicine
Clinician factors: judgment, affect, experience
Patient Factors

Solutions

- Training in critical thinking
- Training in major cognitive and affective biases
- Training in logical thought
- Awareness of self and metacognition
- Timely feedback
- Training in cognitive forcing strategies



"It sort of makes you stop and think, doesn't it."