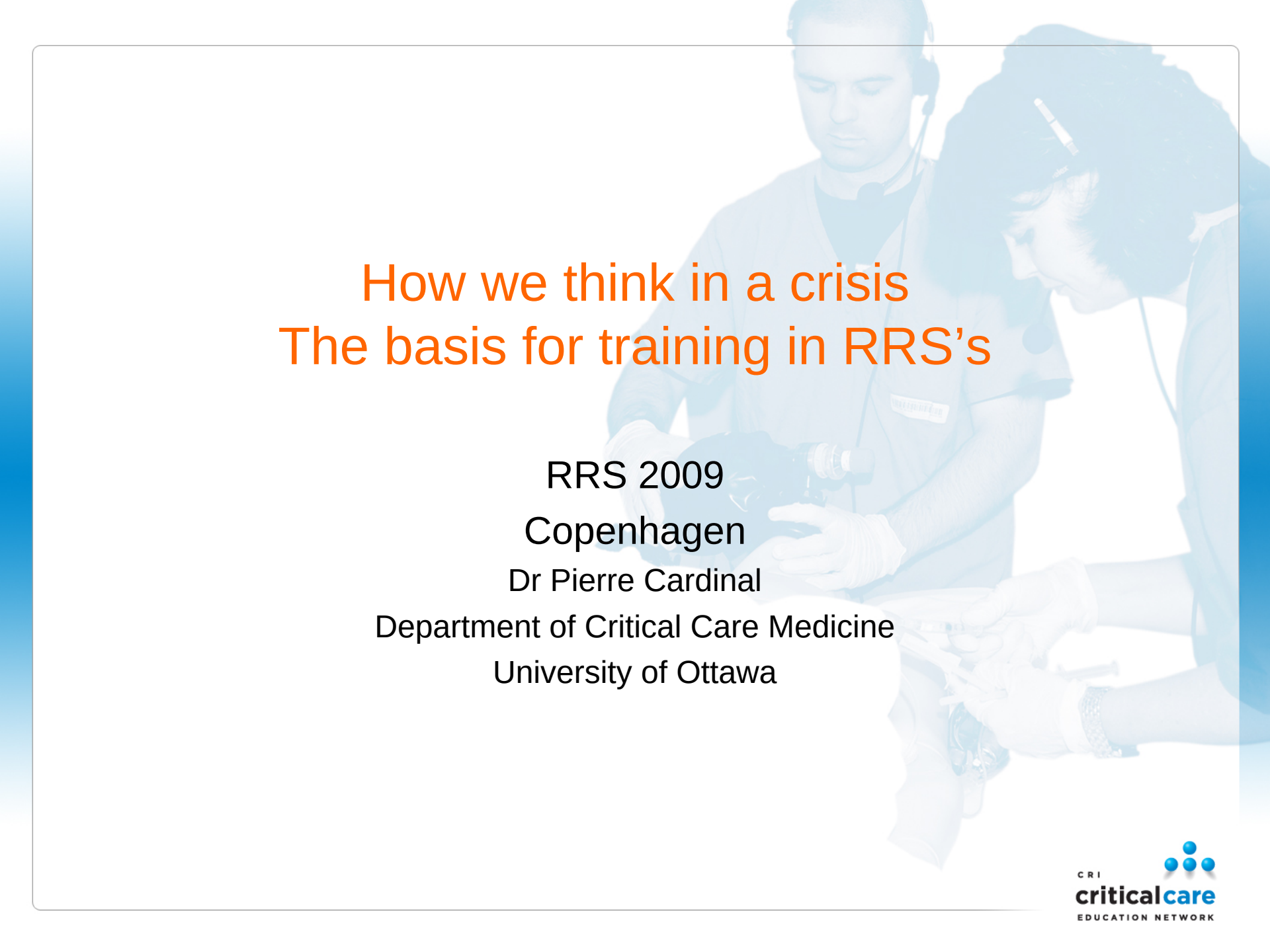

How we think in a crisis
The basis for training in RRS's

RRS 2009

Copenhagen

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Department of Critical Care Medicine

University of Ottawa

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Learning Objectives

- To briefly review how we think

- To propose strategies to improve our thinking in times of crisis

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Human Brain

- One of the most complex system in the universe
- 100 billions neurons, 100 trillions connections
- As many neurons as we have stars in our galaxy
- We understand very little about it still

How do we think?

1. Pattern recognition
2. Schema induction
3. Hypothetico-deductive reasoning

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Pattern recognition

- Appears effortless, even mindless
- It's how the expert think
- But expert thinking is limited to the area of specialty

…but how accurate is our brain?

Perception

- Objects are incompletely scanned
- Hypothesis with the highest probability of success is generated
- An expectation is formed about what ought to be seen

Pattern recognition

- Our brain excel at it
- However, we sacrifice accuracy over efficiency
- Our brain
  - Incompletely scan a perception (visual or other)
  - Construct an image based on rules in order to give it a meaning
  - Fills the blanks

Case

- 82 year old lady with multiple myeloma admitted with hypercalcemia and renal failure
- Ready to be discharged but falls and brakes a vertebra
- Three days later
  - Found to have decreased LOC
- On arrival of RRT
  - ABC OK
- Ward nurse informs you that
  - Gaze top left
  - Incontinent of urine
  - Woke up within 5 to 10 minutes
- Thinking processes
  - Listen for clues – Schema induction
  - Recognize that patient looks well but is hypotensive – Pattern recognition

Hypothetico-deductive reasoning

Patient's sign and symptoms	Metabolic/toxic/ systemic	Structural	Seizure
Decreased level of consciousness	+	+	+
Gaze to the left	-	+	+
Incontinent of urine	+/-	+/-	+
Rapid improvement	-	-	+

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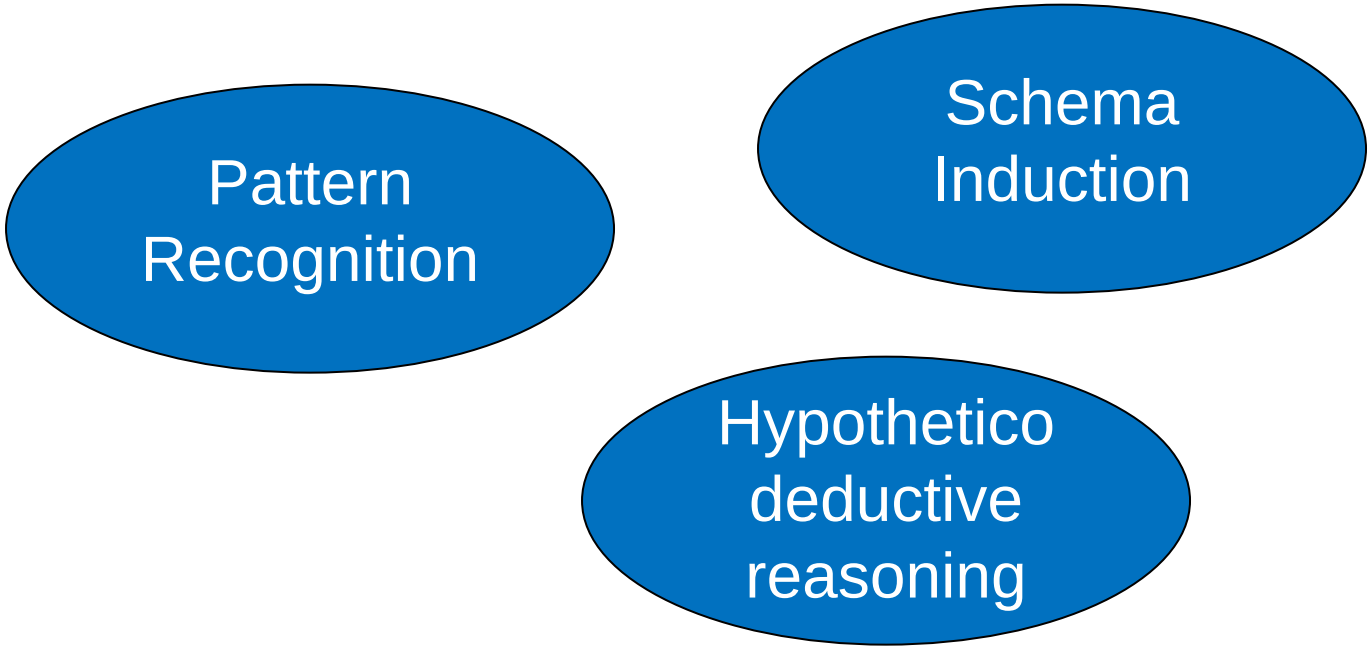
Which one is the best?



We probably need to use all three in most situations

Stress – Physiological effects

- Catecholamine are flowing
- Can’t think straight
- Fight or flight response

…bad form to fight with patient or run away

Case 1

- 44 year old female
- Admitted to floor with a mild pneumonia
- Confused and combative
- Respiratory distress
- Pale and diaphoretic
- HR 110 bpm BP 85/45 RR 36

Case 1

- Multiple Issues:
  - Respiratory distress
  - Cardiovascular compromise
  - Limited assistance / multiple tasks
  - Lot of emotions

Management of Patient

- Traditional Approach (sequential)

- History $\Rightarrow$ Physical $\Rightarrow$ Investigations $\Rightarrow$ Therapy

Challenges in Times of Crisis

- Multiple problems occurring at the same time
- Each problem potentially lethal
- Lack of information
- Interventions are short-acting and not definitive
- Hard to know what to do first
- Emotions and stress clouds your thinking

Early versus on-going resuscitation

- Early Resuscitation – Undifferentiated patient
  - Goal is to support the patient
  - Must deal with multiple problems
  - No time nor need for deep thinking
  - Challenge is managing a situation that evolves rapidly and optimizing your use of resources

- On-going Resuscitation – ABCs have been done
  - Goals are to:
    - understand the cause(s) of the crisis
    - get more information and think
    - institute definitive therapy

Crisis Resource Management (CRM)

Essential Components

1. Problem-solving
2. Situational awareness
3. Resource utilization
4. Communication
5. Leadership

Strategy #1 – Use time-honored shortcuts

- No time for deep thinking
- Once a problem is identified, treat
- Examples:
  - Patient appears to be in respiratory distress, apply O_2 by non-re-breathing mask at 100%
  - Apply O_2 sat monitor
  - Oxygen saturation remains low, start bagging
  - Oxygen saturation still low, add PEEP valve

Strategy #2 - Re-assess & re-evaluate

- Patient condition changes rapidly
- Interventions not definitive
- Interventions short-acting…
- Therefore, you need to re-assess your patient and re-evaluate therapy
- Background check

On-going resuscitation

- For the expert
  - Easy – mostly all pattern recognition and quick and dirty classification
  - If a procedure needs to be done
    - Effortlessly
    - Smoothly
- For the non-expert
  - More difficult
  - May resort to hypothetico-deductive reasoning
  - Use of schema
  - Use of checklists
  - Call for help

Avoid premature closure

Strategy #3

- Keep your mind opened
  - whether you are an expert or a novice
  - especially if you are an expert
- Review all facts carefully trying to prove your self wrong

Scientific theories are falsifiable

Summary

- Our brains are wonderful
- Cognitive processes
  - Pattern recognition
  - Schema induction
  - Hypothetico-deductive reasoning
- Use all of these processes when you see a patient
- Use them wisely
  - Right time
  - Be aware of their associated biases
    - Premature closure
- These principles were used to develop our courses

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- For Physicians

- Crisis resource management (CRM)
- Technical skills workshops
- Manage a patient in respiratory failure
- Assess, diagnose, & manage shock
- High-fidelity simulation training

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- Develop care plans
- Ethics

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Calendar

<< <<< May 2009 >>> >>

S	M	T	W	T	F	S
26	27	28	29	30	1	2
3	4	5	6	7	8	9
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

2009 Alan Blizzard Award Recipients

2009-04-09

Patti O'Brien, Tim Willett and Brad Genereaux are members of the collaborative team receiving the STLHE award

THANK YOU

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