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MOOC 1 – Unit 3 **Stress responses:** biopsychosocial perspective

# **Chapter 2 Acute Stress Phase**

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**Chapter 2 : Acute Stress Phase** 

Introduction 2.1 Neuropsychology of acute stress phase 2.2 Immediate reactions 2.3 Complex reactions

**Chapter 2: Acute Stress Phase** 

### Introduction

In the acute phase (lasting hours, days), SAM provides a rapid physiological adaptation, which provides short-lasting responses, such as alertness, vigilance, and appraisal of the situation, enabling making strategic decisions to face the challenge in the initial phase of stress.

→ Production of adrenaline and noradrenaline is increased.

These two catecholamines affect body visceral responses:

- 1. Sympathetic system activation leads to activation of signaling pathways that evoke changes in blood vessels, glands, visceral organs, and smooth muscles;
- The parasympathetic component of the ANS regulates the action and duration of the autonomic responses by the vagal tone of the cardiac and respiratory systems.
- At the same time, cortisol (HPA axis), which inhibits or halts the alarm reaction, begins to be secreted from the adrenal cortex (Godoy et al., 2018).





### **Chapter 2: Acute Stress Phase**

# 2.1 Neuropsychology of acute stress phase

Activation of stress response during the acute stress phase leads to activation of mainly these brain regions:

- →The hypothalamus
- →Limbic stress circuits
- →Locus coeruleus
- → Orbitofrontal cortex

**Psychological Early Intervention** 

Activation of these brain regions leads to several immediate and complex reactions

### **Chapter 2: Acute Stress Phase**

# 2.1 Neuropsychology of acute stress phase

### The hypothalamus

→ affects the response of both sympathetic and parasympathetic ANS arms. In acute stress, the hypothalamus is fundamental, both to drive "fight-or-flight" responses through stress mediators release, or to inhibit the acute response.

### Limbic stress circuits

→ involve the amygdala, hippocampus, and prefrontal cortex (PFC). The amygdala-PFC pathway plays a major role in memory consolidation and stress response. This connection is key in emotional learning, fear-related responses, anxiety-like behaviours, and social interaction. The hippocampus has inhibitory control over the HPA axis.

#### Locus coeruleus

→ in the response to acute stress, acting as an "alarm system" in attention, excitation, and defensive responses. It is the basis for the locus coeruleus-norepinephrine system, which in communication with HPA determines the structural basis for emotional arousal, facilitates cognition, and promotes flexible behavioural response to stress.

### **Orbitofrontal** cortex

→ is important in decision-making and expectation, especially in signaling the expected rewards/punishments of an action given the particular details of a situation (Kringelbach, 2005; Schoenbaum et al., 2011).



**Chapter 2 : Acute Stress Phase** 

### 2.2 Immediate reactions

Complex response of the stress system (consists of the abovementioned brain regions) manifests itself in a specific physiological, behavioural, emotional, and cognitive response (Steckler, 2005) known as a **freezing/fight/flight/submit** reaction.





### **Chapter 2 : Acute Stress Phase**

# 2.2 Immediate reactions

### During a FIGHT or FLIGHT reaction:

→ a person experiences high arousal, SAM and HPA axis are activated. Feelings of anxiety and rage and a man's approach threat prevail in the fight. Feelings of anxiety and fear and man avoid threat predominate in flight (Hope, 2013). Stress-enhanced arousal should serve to narrow attention to central details of the stressful situation, while other cognitive functions are enhanced so that the individual remembers the details of the threat to maximise the likelihood of future survival (Steckler, 2005). These reactions allow the individual to deal effectively with the source of the danger and return to a state of safety (Goldstein, 2010).

### In a FREEZE reaction:

→ a sympathetic, as well as parasympathetic system, is activated at the same time, which leads to the situation when the body is highly activated and aware of the threat but also immobile while deciding what to do.

#### In a SUBMIT reaction:

→ primitive unmyelinated vegetative vagus of the parasympathetic system is activated which shuts down the active defense (physiologically, blood pressure and heart rate are lowered). The body also produces endogenous opioids that mediate our perception of pain and alternate our sense of time, place, and reality (Hope, 2013).



### Schauer & Elbert (2010) "defence cascade":

different immediate defense reactions symptoms of organism followed by with specific reactions during acute stress. MOOC 1 – Unit 3 Stress Responses: Biopsychosocial Perspective

#### **Chapter 2 : Acute Stress Phase**

### 2.2 Immediate reactions



#### Increasing dissociation during cascade progression

Redraw from: Schauer, M., & Elbert, T. (2010). Dissociation following traumatic stress: Etiology and treatment. *Zeitschrift für Psychologie/Journal of Psychology, 218*(2), 109–127. and Mantini, A., & Smyle, J. (2016). Trauma and Grief. https://www.aboriginallegal.ca/assets/mmiw\_workshop\_js.10.19.pdf



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# 2.2 Immediate reactions

These are the most common reactions (symptoms) during the acute stress phase:

a) emotional reactions: Numbness and detachment; Anxiety or severe fear; Guilt (including survivor guilt); Exhilaration as a result of surviving; Anger; Sadness; Helplessness; Feeling unreal; Depersonalization (e.g., feeling as if you are watching yourself); Disorientation; Feeling out of control; Denial; Constriction of feelings; Feeling overwhelmed.

**b) physical reactions:** Nausea and/or gastrointestinal distress; Sweating or shivering; Faintness; Muscle tremors or uncontrollable shaking; Elevated heartbeat, respiration, and blood pressure; Extreme fatigue or exhaustion; Greater startle responses.

SAMHSA - Substance Abuse and Mental Health Services Administration. (2014). Trauma-Informed Care in Behavioral Health Services. Treatment Improvement Protocol (TIP) Series 57. HHS Publication No. (SMA) 13-4801.



**Chapter 2 : Acute Stress Phase** 

# 2.2 Immediate reactions

These are the most common reactions (symptoms) during the acute stress phase:

c) cognitive reactions: Difficulty concentrating; Rumination or racing thoughts (e.g., replaying; the traumatic event over and over again) Distortion of time and space (e.g., a traumatic event may be perceived as if it was happening in slow motion, or a few seconds can be perceived as minutes); Memory problems (e.g., not being able to recall important aspects of the trauma); Strong identification with victims.

d) behavioural reactions: Startled reaction; Restlessness; Sleep and appetite disturbances; Difficulty expressing oneself; Argumentative behaviour; Increased use of alcohol, drugs, and tobacco; Withdrawal and apathy; Avoidant behaviours

e) existential reactions: Intense use of prayer; Restoration of faith in the goodness of others (e.g., receiving help from others); Loss of self-efficacy; Despair about humanity, particularly if the event was intentional; Immediate disruption of life assumptions (e.g., fairness, safety, goodness, predictability of life).

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### **Chapter 2 : Acute Stress Phase**

### 2.2 Immediate reactions

Knowledge about neuro-psycho-physiology of acute stress phase and their related reactions and symptoms are necessary and useful for helpers for several reasons:

- → help understand the situation also without hearing certain descriptions by words from the victims (by observation symptoms);
- knowledge about various symptoms due to these brain-body stress reactions can help to helper be more empathetic to victims;
- help to guess the intensity and duration of stressor;
- → help to increase the feeling of competence of helpers (be more prepared and more flexible during helping);
- → is useful in the psychoeducation of victims (e.g., during the debriefing phase and also in the process of forgiveness).



#### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

The abovementioned immediate symptoms (reactions) tend to be clustered in complex reactions.

The most prevalent complex reactions in the acute phase are:

- →acute stress reaction
- →acute stress disorder
- $\rightarrow$  panic attack
- → dissociation

**Early** Intervention



#### **Chapter 2 : Acute Stress Phase**

### 2.3 Complex reactions

Acute stress reaction (ASR)

→ a transient normal reaction to traumatic stress and is not a DSM-5 diagnosis, although symptoms may be temporarily debilitating. Various symptoms are present, e.g., depressed mood, fatigue, anxiety (NCPTSD, 2017).

#### Acute stress disorder (ASD)

- → is a mental disorder represented by 14 symptoms that are sorted into 5 clusters: 1. Intrusion symptoms (e.g., recurrent, involuntary, and intrusive distressing memories of the traumatic event; flashbacks); 2.
  Negative mood (e.g., persistent inability to experience positive emotions); 3. Dissociative symptoms (e.g., altered sense of the reality of one's surroundings or oneself); 4. Avoidance (e.g., efforts to avoid external reminders); 5. Arousal Symptoms (e.g., hypervigilance).
- → Symptoms must last at least three days but less than one month after exposure to the traumatic event for an individual to be eligible for this diagnosis (NCPTSD, 2017).



**Panic attacks** 

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### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

→ are episodes of intense fear or apprehension. Sufferers often report thinking that they might be dying, choking, or going crazy. They may also feel like they are experiencing a heart attack or about to blackout. These episodes usually begin abruptly, reach their peak within 10 minutes and end within half an hour (Li, 2011). According to DSM-5, a panic attack is characterized by four or more of the following symptoms (APA, 2013): 1. Palpitations, pounding heart, or accelerated heart rate; 2. Sweating; 3. Trembling or shaking; 4. Sensations of shortness of breath or smothering; 5. A feeling of choking; 6. Chest pain or discomfort; 7. Nausea or abdominal distress; 8. Feeling dizzy, unsteady, lightheaded, or faint; 9. Feelings of unreality (derealization) or being detached from oneself (depersonalization); 10. Fear of losing control or going crazy; 10. Fear of dying; 11. Numbness or tingling sensations (paresthesias); 12. Chills or hot flushes.

#### **Dissociation**

→ is typically defined as the lack of normal integration of thoughts, feelings, and experiences into consciousness and memory (Giesbrecht et al., 2008). People may feel a sense of unreality and lose their connection to time, place, and identity. Dissociation disrupts four areas of personal functioning that usually operate together smoothly, automatically, and with few or no problems: 1. Consciousness; 2. Identity; 3. Memory; 4. Self-awareness and awareness of surroundings (Seligman, & Kirmayer, 2008).



### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

#### Acute stress reaction (ASR)

- → Assessment of ASR: Identification of a patient with ASR symptoms is based on observation of behaviour and function as well as clinical assessments since there is insufficient evidence to recommend a specific screening tool. If ASR continues beyond three days with persistent limitations of functioning, it is necessary to monitor for the possible development of ASD. In addition to ASR symptoms, it is useful also to assess the history of trauma; medical, mental status, functional, psychosocial status; occupational performance (NCPTSD, 2017).
- → Immediate needs: survival, safety, and security; food, hydration, shelter, clothing; sleep; medical care (first aid); stabilization (if needed); orientation; communication with family/unit, friends, and community; education and normalization (NCPTSD, 2017).

#### Acute stress disorder (ASD)

- → Assessment of ASD: similar to ASR with screening for ASD symptoms, e.g., with Acute Stress Disorder Interview (ASDI; Bryant, Harvey, Dang, & Sackville, 1998), also a self-report version is available (Acute Stress Disorder Scale – ASDS; Bryant et al., 2000), or in questionnaire form - Stanford Acute Stress Reaction Questionnaire (SASRQ; Cardeña et al., 2000).
- → Immediate needs: similar to ASR.



#### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

#### Panic attacks

- → Assessment of panic: Symptoms can be assessed with Panic Attack Questionnaire-IV (Norton et al., 2008) or with an older version of Panic Attack Symptoms Questionnaire (PASQ) and the Panic Attack Cognitions Questionnaire (PACQ) (Clum et al., 1990).
- → Immediate needs: calming down and stabilization.

#### **Dissociation**

- → Assessment of dissociation: Dissociative Symptoms Scale (DSS; Carlson et al., 2016) Dissociative Experiences Scale (DES) and Dissociation Questionnaire (DIS-Q) (Bernstein et al., 2001), Multidimensional Inventory of Dissociation (MID; Dell, 2006).
- $\rightarrow$  **Immediate needs**: orientation, contact with reality.



### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

#### **Acute stress reaction (ASR)**

→ Intervention for ASR: In most cases, symptoms will resolve rapidly with simple interventions, such as reassurance, rest, and ensuring safety. It is useful to provide acute symptoms management; education and normalization; social support. It's necessary to avoid psychological debriefing (NCPTSD, 2017).

### Acute stress disorder (ASD)

→ Intervention for ASD: similar to ASR. Should also include brief sessions of individual, manualized trauma-focused psychotherapies that have the primary component of exposure and/or cognitive restructuring (NCPTSD, 2017). Trauma-focused psychological therapy (cognitive behavioural therapy or eye movement desensitization and reprocessing in addition to in vivo exposure) is the most effective treatment for ASD and PTSD – Posttraumatic Stress Disorder (Forbes et al., 2007). Trauma-focused cognitive-behavioural therapy (CBT) seems to be the most effective for ASD (e.g., Bisson et al., 2010; Bryant, Harvey, Dang et al., 1998; Forneris et al., 2013).



### **Chapter 2: Acute Stress Phase**

# 2.3 Complex reactions

#### Panic attacks

→ Intervention for panic: exposure, relaxation training, and breathing retraining, the inclusion of homework during the intervention, and a follow-up program after it has finished (Sánchez-Meca et al., 2010). Cognitive-behavioural therapy (especially face-to-face and interoceptive exposure components) seems to be the most effective (Pompoli et al., 2018; Cuijpers et al., 2016).

#### **Dissociation**

→ Intervention for dissociation: there is no exact recommendation for specific interventions for the treatment of dissociative symptoms, perhaps also because dissociation represents a complex of different reactions and different types of dissociation have different psychological mechanisms (Brown, 2006). From the available information, it appears that CBT procedures in combination with sleep adjustment could be effective (van der Kloet et al., 2012; Farrelly et al., 2016).



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# 2.3 Complex reactions

Most common complex reactions in the acute stress phase share 4 basic immediate needs: Safety, Control, Present time, Reality.

It is necessary to stabilize the body and increase contact with reality in present time.

Expect for complex intervention, these approaches are useful to apply:

- 1. Controlled healthy breathing;
- 2. Grounding (mental, physical, soothing);
- **3. Other stabilization techniques** 
  - (e.g., Butterfly Hug)



