THE NEUROMATRIX OF PAIN

The Cartesian Model of pain states that the pain is produced because tissue gets damaged and the signal of that damage gets sent to the brain via the peripheral nervous system and then central nervous system. In this scenario the central nervous system (the brain and spinal cord) are *the passive recipients* of the signal from the damaged tissues in the ankle. The pain signal will subside when the damage to the tissue is repaired. In this model the generator of pain is the structures of the ankle.

According to the **The Neuromatrix of Pain** (pioneered by R. Melzack), the experience of pain is a result of different parts of the brain working together. The neuromatrix includes the spinal cord and various parts of the brain that generate sensory, emotional, cognitive, motor, behavioral, and conscious responses to the trigger.

SENSORY	EMOTION PROCESSING	EMERGENCY STRESS RESPONSE	GOAL AND CONFLICT ASSESSMENT	MOTIVATIONAL
To identify the location of pain *"What is happening and where?"*	To trigger emotional reactions *"How do I feel about this?"*	To deal with immediate danger ⇣	To focus attention and solve the issue *"How do I deal with this?"*	To motivate to act *"I need to act now"*

SYMPATHETIC ACTIVATION: Fight-or-flight, mobilization of energy, analgesia (dulling of pain), increased alertness
ENDOCRINE RESPONSE: Adrenalin release to amplify sympathetic activation
IMMUNE RESPONSE: Increased inflammation to heal any wounds and to fight toxic invaders

⇣

RECUPERATION

To promote tissue repair. May be accompanied by immobility, decreased social interaction, increase in sleep, change in endocrine functions, depressed mood, changes in behavior, fatigue and hyperalgesia (increased sensitivity to pain).

LEARNING FROM EXPERIENCE

To protect the organism and avoid similar threats in the future. Can include replaying the event in one's head, talking about it, analyzing what happened. The body and brain become hyper vigilant about similar threats in the future.

While gathering all this information about different aspects of the injury, the brain needs to decide how worried it should be about each incident. Recent studies also show that the intensity and duration of pain response will depend on how much attention you pay to it, your emotional state, the social context, your prior learning about pain and other factors.