

HORMONES AS BIOMARKERS OF UNCONTROLLED, SEVERE PAIN

**CHAPTER 1
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BRINGING A NEW DIMENSION TO PAIN CARE

Information presented here is a public service for health practitioners. It is provided by the Tennant Foundation.

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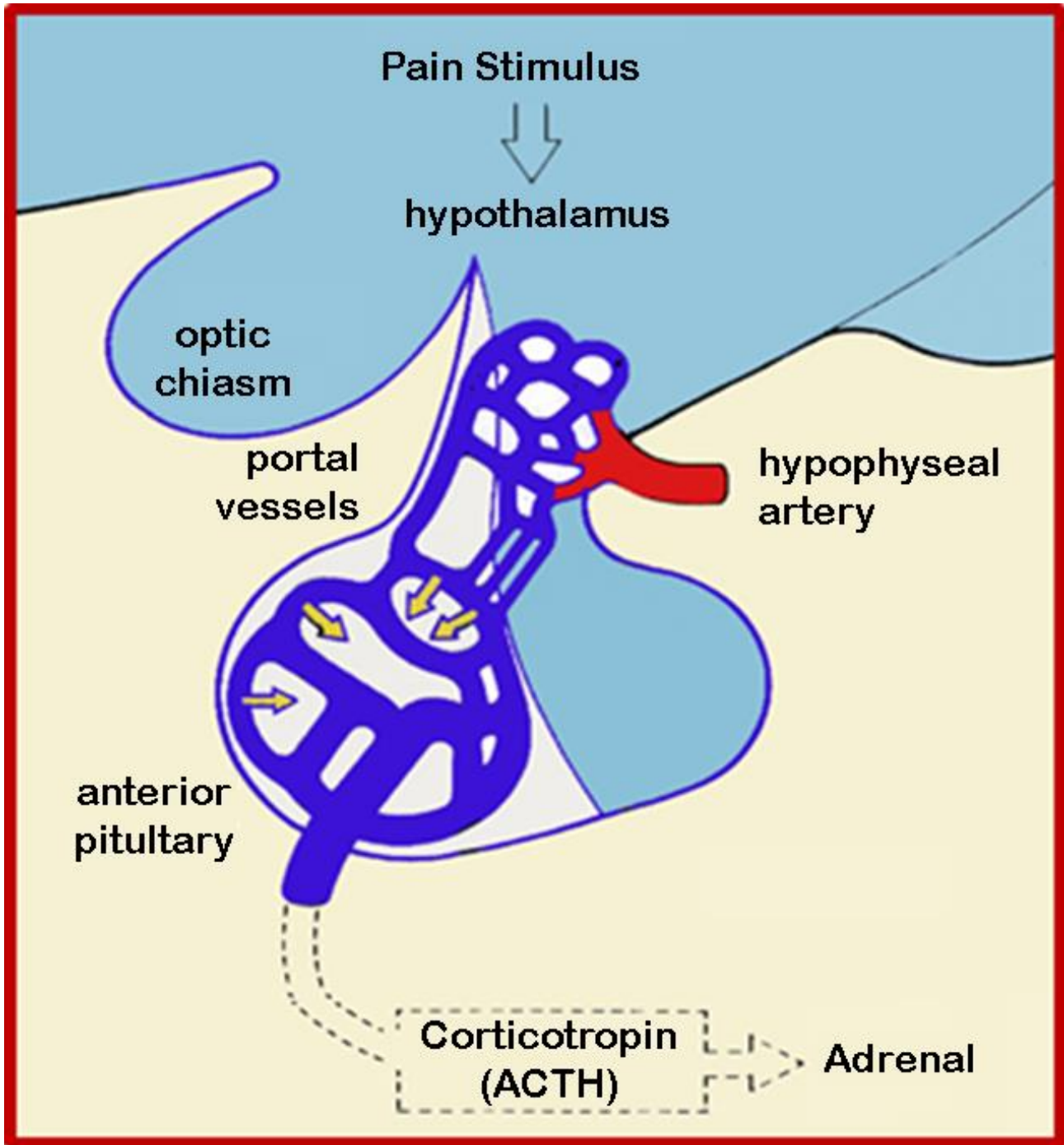
BIOLOGIC STRESSOR

**PAIN IS A SEVERE,
BIOLOGIC STRESSOR
THAT STIMULATES THE
HYPOTHALAMUS-
PITUITARY-ADRENAL-
GONADAL AXIS**



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HOW PAIN STIMULATES THE PITUITARY AND ADRENAL



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HISTORY AND REFERENCES

- **Serum cortisol testing was first developed in 1954 (Silber- Porter) making it possible to determine if pain alters serum levels.**
- **The seminal study was published in 1964 by H.A. Shenkin who found that 87% of hospitalized, pain patients compared to only 16% of non-pain patients had elevated cortisol levels and abnormal diurnal variation.**
- **Multiple studies have subsequently confirmed Shenkin's findings.**

Shenkin HA. The effect of pain on the diurnal patterns of plasma corticoid levels. Neurology 1964;14:1112.



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EFFECT OF PAIN ON SERUM HORMONES

- **Pain initially causes serum elevation of a number of hormones including adrenocorticotropin (ACTH), cortisol, pregnenolone, and testosterone.**
- **If severe pain goes on unabated over time, the hypothalamus, pituitary, adrenals and gonads may deplete their normal reserve and/or impair synthesis and lower serum hormones.**



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WHY DETERMINE ABNORMAL SERUM HORMONES

- ✓ **Validate the presence of severe pain and need for enhanced treatment.**
- ✓ **Determine if hormone replacement is needed.**
- ✓ **Provide an objective measure of treatment success.**



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BIOMARKERS OF SEVERE PAIN

- **Serum levels of pituitary, adrenal, and gonadal hormones are the best, objective biomarkers of severe uncontrolled pain.**
- **This blood panel is recommended as a biomarker profile for uncontrolled, severe pain.**
 - **Adrenocorticotropin (ACTH)**
 - **Cortisol**
 - **Pregnenolone**
 - **Testosterone**



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WHO SHOULD BE SCREENED FOR HORMONE ABNORMALITIES

- **Any patient who requires daily opioids.**
- **Patients who complain that their current treatment regimen is not effective.**
- **Patients who take long acting opioids.**



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CAVEAT

AN ABNORMAL HORMONE TEST RESULT CAN BE CAUSED BY PSYCOGENIC OR NON-PAIN REASONS.

AN ABNORMAL HORMONE TEST SHOULD ONLY BE CONSIDERED TO BE PAIN-RELATED WHEN THERE IS HISTORICAL AND PHYSICAL EVIDENCE THAT PAIN IS PRESENT.



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