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Autonomic Nervous System Functioning as a Correlate to Health and Recovery

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Autonomic Nervous System

The autonomic nervous system (ANS) functions at a subconscious level and is responsible for maintaining bodily homeostasis.

Two divisions of ANS: the **sympathetic nervous system** maintains vital functions and allows the body to respond to a stress and threats and the **parasympathetic nervous system** that conserves our energy and maintains organ function during minimal activity.

Stress can activate the sympathetic nervous system to elicit one or both of our primary stress response systems: the **sympathetic adrenomedullay** (SAM) or the **hypothalamic pituitary adrenocortical** (HPA) systems.

SAM activation releases epinephrine and norepinephrine while HPA releases cortisol.

Excessive SAM activation has been shown to suppress cellular immune function, increase chronic blood pressure and heart rate, disrupt normal heart rate variations, and development of psychiatric illnesses.

Excessive HPA activation has been shown to lead to hippocampal pathology, decrease sensitivity to insulin, increase risk of steroid induced diabetes, hypertension, hyperlipidemia, obesity, hypercholesterolemia, arterial disease, amenorrhea, impairment of growth and tissue repair, and immunosuppression.

Evidence Based Practice

AOTA's Centennial Vision:
"We envision that occupational therapy is a powerful, widely recognized, science-driven, and **evidence-based profession** with a globally connected and diverse workforce meeting society's occupational needs."

OT practitioners and researchers can develop evidence that supports practice by using a combination of biomarkers and select questionnaires.

Biomarkers are measurements of normal biological processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention.

Biomarkers are used in medical, pharmacological, and behavioral research that seek to better understand physiological phenomena in relation to a behavior of interest.

Measuring the Autonomic Nervous System

OT Practitioner

BIOMARKERS

- **Blood Pressure**
- **Body Temperature**
- **Excessive Sweating**
- **Heart Rate**
- **Pulse Oximeter**
- **Pulse Rate**
- **Pupillary Changes**
- **Respiration Rate**

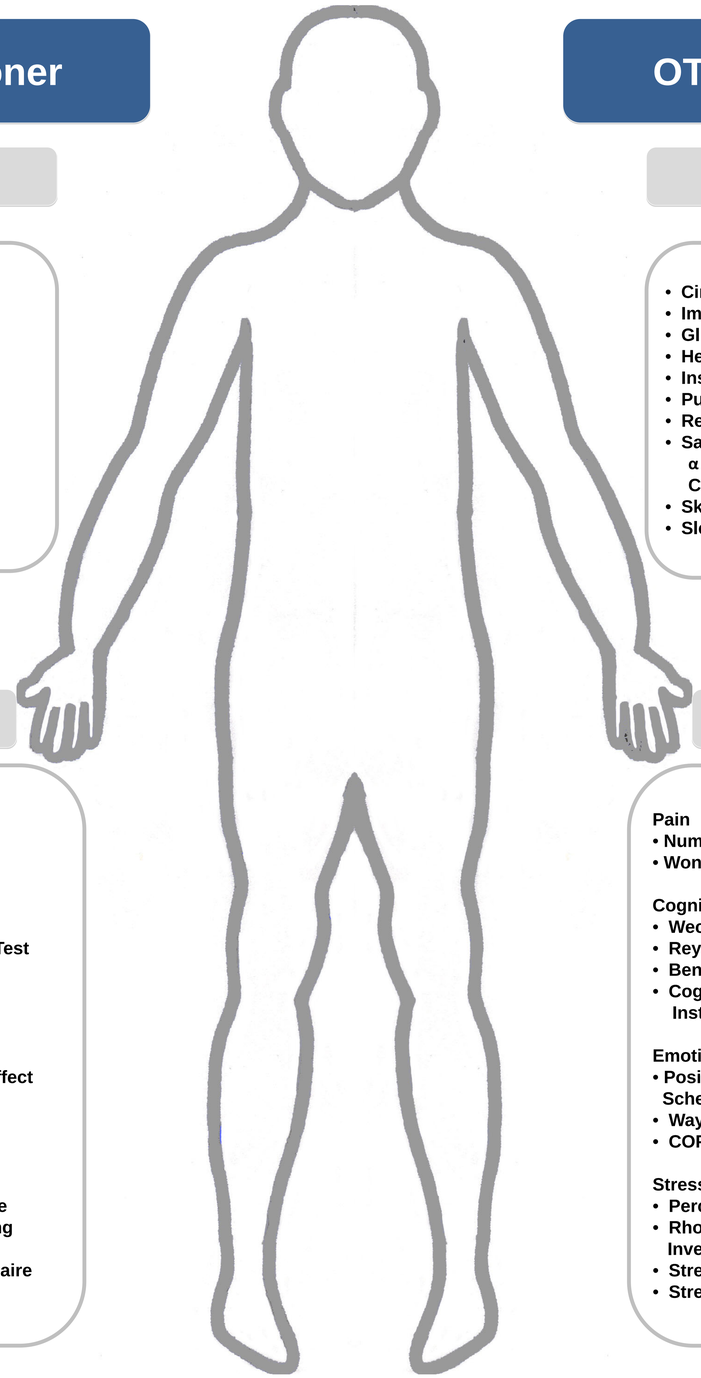
QUESTIONNAIRES

Pain
- **Numeric Pain Scale**
- **Wong-Baker Pain Scale**

Cognition
- **Wechsler Memory Scale**
- **Rey Auditory-Verbal Learning Test**
- **Benton Visual Retention Test**
- **Cognitive Abilities Screening Instrument**

Emotional/Behavioral
- **Positive Affect and Negative Affect Schedule**
- **Ways of Coping Questionnaire**
- **COPE Scale**

Stress
- **Perceived Stress Questionnaire**
- **Rhode Island Stress and Coping Inventory**
- **Stress Management Questionnaire**
- **Stress Profile**



OT Researcher

BIOMARKERS

- **Circadian Rhythm (EEG)**
- **Immune Function**
- **Glucose Levels**
- **Heart Rate Variability**
- **Insulin Sensitivity**
- **Pupillary Changes**
- **Respiratory Variability**
- **Salivary immunoassay kits**
  - **α Amylase**
  - **Cortisol**
- **Skin Conduction**
- **Sleep (polysomnograph)**

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OT Significance

- Our interventions can influence client ANS health states; positively or negatively.
- ANS health influences client occupational behavior.
- Understanding a client's ANS can provide important clues to how well a client's body, emotions, and behaviors are both regulated and self-regulated in context.
- Allows practitioners to understand how client ANS health is related to his or her functional independence.
- Stress levels directly influence ANS health, which can influence occupational performance and participation.
- OT is not conducting sufficient biomarker research and needs to in order to link occupation to biological/physiological processes

Research Progress

Proposal phase of study "**Understanding adult inpatient rehabilitation outcomes by linking occupational participation, environmental influences, and autonomic nervous system health**"

Repeated measures design that will measure participant:
- ANS health (ANX 3.0)
- Self-efficacy
- Perceived physical and social environment support and constraint
- Occupational performance

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