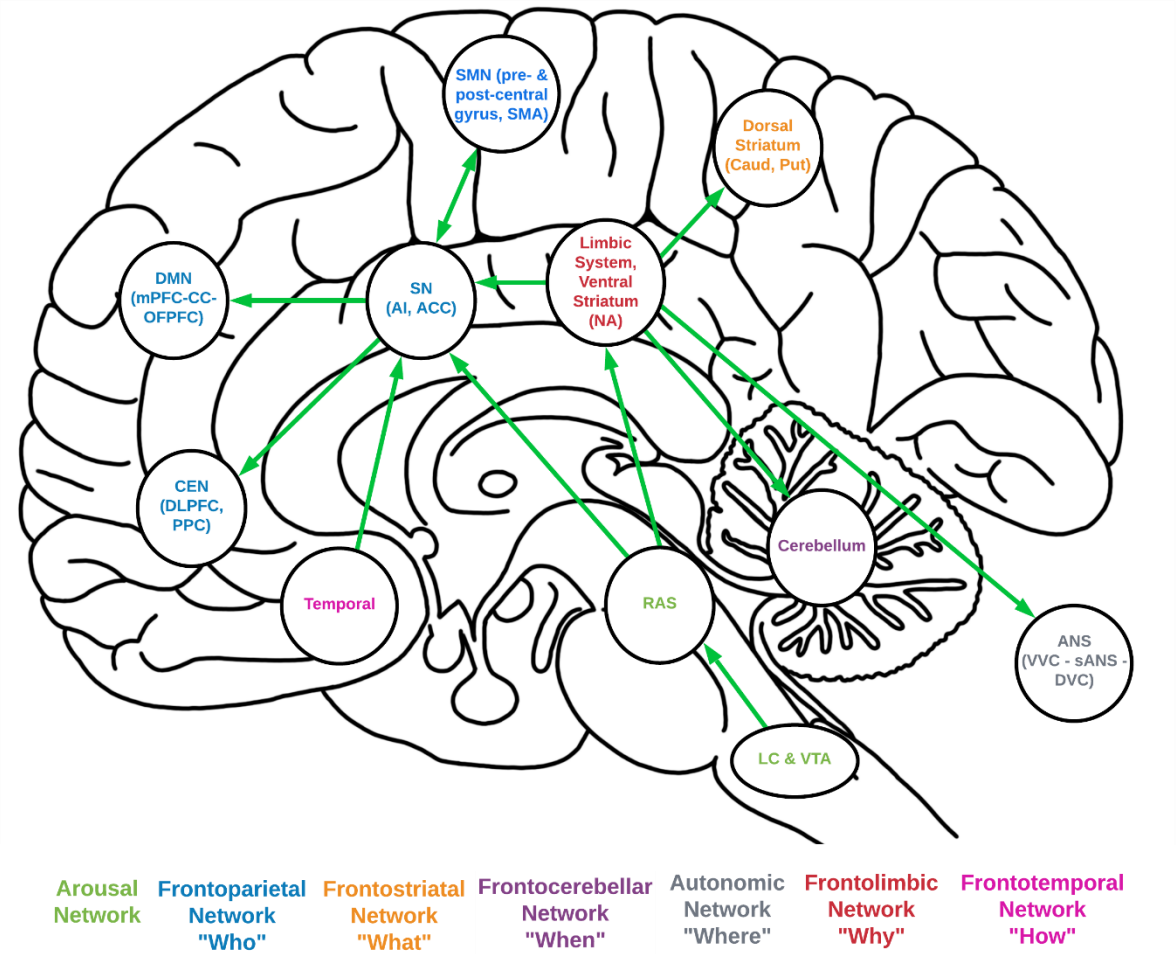
Introduction to Psychiatric Syndromes

Dr. Nicholas Hatcher, DNP

In this section we will synthesize the material in each of the prior sections into a meaningful plan of care in the context of syndromic presentations. In this brief introduction, we will explore some of the foundational elements as well as the general organization of each of the upcoming lectures. Areas explored for each syndrome are as follows.

Macroscopic Neurobiology

On a larger scale, psychiatric syndromes can be understood as dysfunctions in neural networking. I've condensed some of the major networks implicated in various syndromes in the following image:



Arousal Network: The starting place for central nervous system arousal and activation. Involves the locus coeruleus (LC) and association norepinephrine activity, ventral tegmental area (VTA) and associated dopaminergic activity, and the reticular activating system (RAS).

Frontoparietal Network: This captures the "who" behind the experience. This large network includes:

> **Default Mode Network** (**DMN**): Responsible for internally oriented cognition. When at rest, driving on autopilot, or daydreaming the DMN is highly active. Involved in self-concept, social evaluations, and narrative or life story comprehension. Includes the medial prefrontal cortex (mPFC), posterior cingulate cortex (PCC), angular gyrus (AG), and lateral parietal cortex (LPC).
>
> **Central Executive Network** (**CEN**): Responsible for externally oriented cognition and behavior. The CEN is the executive that converts thought into action. Involved in goal-oriented tasks, reasoning, problem-solving, and top-down control of negative thoughts and emotions. Includes the dorsolateral prefrontal cortex (DLPFC), anterior cingulate cortex (ACC), and posterior parietal cortex (PPC).
>
> **Sensorimotor Network (SMN)**: Governs psychomotricity. Activated during motor tasks and prepares the brain when planning and executing coordinated motor movements. Includes the pre- and post-central gyrus and supplementary motor areas (SMA).
>
> **Salience Network** (**SN**): Involved in switching between internally oriented states (e.g., DMN) and externally oriented states (e.g., CEN, SMN). Includes the anterior insula (AI) and anterior cingulate cortex (ACC). Activated by the arousal network, limbic system, and temporal lobe.

Frontostriatal Network: This network aids in predicting "what" outcome may occur in a given context. This network is involved in determining and controlling the responses we give to a stimulus in a given situation. It is made up of the dorsal striatum with frontal projections. The dorsal striatum can be divided into two key regions: the caudate and putamen. The caudate drives automatic thought and the putamen drives automatic movement. This network becomes a key player in the cortico-striato-thamao-cortical (CSTC) loop.

Frontocerebellar Network: Involved in predicting "when" an outcome may occur in a given context. The cerebellum is the neural learning machine and is critical in the development and execution of procedural learning by creation and error-driven modification of internal models of behavior. This system is essentially responsible for the storage and operation of contingencies as a part of operant conditioning.

Autonomic Network: This is "where" an individual experiences the things the brain EMITS (emotions, memories, images, thoughts, and sensations). The autonomic nervous system is divided into the sympathetic and parasympathetic nervous systems. The sympathetic nervous system is predominantly responsible for the "fight and flight" responses. The parasympathetic nervous system, through ventral vagal and dorsal vagal activity, governs social engagement, rest and digest, and the freeze, immobilization, or submission responses.

Frontolimbic Network: Informs the "why" behind an experience, adding emotional content to the aforementioned systems. Without the fuel of the "why", motivation is diminished. This system conditions behavior, adding a degree of reinforcement or avoidance to a given behavioral sequence. In addition to the amygdala and hippocampus, the frontolimbic system includes the ventral striatum

(nucleus accumbens), which is especially important in reward and motivation. Two key subsystems include:

> **Emotional Network**: Involved in emotional thinking and affective bias. Includes the anterior cingulate cortex, orbitofrontal prefrontal cortex, amygdala, hippocampus, and insula.
>
> **Reward Network**: Involved in interest, motivation, and pleasure. Includes the prefrontal cortex, caudate, and nucleus accumbens.

Frontotemporal Network: This informs "how" information is processed. The temporal lobe processes language, auditory, and visual information. It is also involved in memory formation. This system projects to the salience network (among other networks), modulating it's activity.

Microscopic Neurobiology

Neurocytological and neurochemical alterations will be discussed as they relate to each syndrome. However, it's important to note that neurochemical alterations do not infer a "cause". Although we tend to correlate successful treatment with agents that modify specific neurotransmitter activity, to conclude that from this correlation we can derive causation would be logically fallacious. Because of this, the integrative specialist is encouraged to look deeper into the underlying mechanisms.

Differential Diagnosis based on Syndromic Features

Where relevant, we will explore a differential diagnosis based on the syndromic features associated with the psychiatric condition we are looking at. These are conditions that should be considered that may better explain OR clarify the syndrome, having implications for the appropriate construction of a plan of care. In these sections I may deviate from conventional DSM constructs as I think they lack specificity and oftentimes reliability. Inter-rater reliability (the agreement upon diagnoses from clinician to clinician) in psychiatry is very poor in many cases, therefore it may be beneficial to amend our diagnostic system. Even the system I am proposing will likely benefit from revision.

Whole Body Considerations

In this section the focus will be on baseline laboratory and diagnostic analysis as it relates to a root cause analysis, incorporating major converging body systems and influencing factors. These include vitamin and micronutrient deficiencies, mitochondrial dysfunction, immune-brain axis, gut-brain axis, detoxification, dysmethylation, HPA axis, trauma and stress, HPT axis, and psychogenetics. Implications for each of these will be explored in the context of the syndrome under discussion.

Lifestyle Considerations

Each lifestyle domain under the WELLNESS model will be explored as it relates to the syndrome under discussion. This will include implications for the syndrome as well as potential management considerations. This, in many ways, is an extension of the root cause analysis as derangements here may function as a cause or contribution to the ultimate neurobiological alterations seen in the context of the syndrome under discussion.

Additional Information

In some sections we will explore more detail on phenotypic variants and associated management considerations. In each section, we will explore biologic (pharmacologic and nutraceutical) and psychotherapeutic and lifestyle interventions relevant to the syndrome. Expanded details on options will be provided as necessary, but for the most part it will be narrowed down to the particular option as each option was covered in detail in the pharmacologic and nutraceutical treatment section.

Reminder of the Model

As this is a synthesis of the material, it may help to recall the integrative psychiatry model I provided in the introductory lecture to the course. As integrative psychiatric providers, we consider the whole person in front of us, assisting in the construction of a personalized approach based on the individual's experiences, needs, and interests.