Clinical Implications and Applications of Psychoneurology: translating neuroscience to the consulting room

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Article #1: Why Study Psychoneurology?

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There has been a virtual explosion of research in the area variously referred to as Psychoneurology, Psychoneurobiology, or 'brain research'. More and more in the syllabi of workshops or the jackets of newly released books, we see phrases like, "examine the underlying neurology," "investigate and integrate the new brain research" or "understand the brain-centers responsible for. . ." among the educational objectives.

In this first of three articles, we begin with the most basic question:
Why is the psychoneurology important and what, as a clinician, do I need to know?
The simplest answer is that this new brain research can give us a powerful way of understanding how therapy works, when it works, and understanding more about the symptoms that can bring any of us, (and have brought many of us), into our own psychotherapy.

The demarcations between the psychological and the neurological are melting. More and more the implications and clinical applications of the data are becoming clear.

The research is directing us to new, non-intuitive, but scientifically sound interventions and it is increasingly able to help us assess both the presenting symptomology, and the shifts in brain functioning that accompany healing. Someday, equipment as available and inexpensive as a laptop may allow us to assess our client's/patient's brain activity as part of our diagnostic interview, and to design outcome studies that measure the effectiveness of our clinical interventions.

Relevance for clinical practice today:
"But I'm not a researcher", you might object. **How does knowing more about the brain help me to become a better therapist?** That's the central question we'll explore in this online seminar. What practical difference does this explosion of research make to me, in my office, on an average afternoon?

One answer is that **what is going on in the room is going on in the brain** and, if you were so equipped, would show up on a **PET** scan or a functional MRI (**fMRI)**. They line up, what you see and hear and feel, and the silent neurology underneath.
Here, by way of preview and to whet your appetite, are some of the new findings emerging from the research literature (apologies for any unfamiliar terms; we'll do some a quick anatomy review in the days to come.)

1. There is a **new Anatomical theory of depression** based on the idea of **neuroplasticity** (neurons changing shape) and **neurogenesis** (the growth of new neurons later on in life.) For years we have heard about chemical imbalances; too little of neurotransmitters like serotonin. Now we're hearing about **cortisol** and other **glucocorticoids** secreted by the adrenal glands killing neurons in vital regulating centers of the brain, and, especially in the **hippocampus**, and about the

capacity of good psychotherapy to stimulate the growth of new neurons in these critical areas.

2. We're learning that the **flashbacks of PTSD** probably involve a dissociative shutting down of the hippocampus during acute trauma in those 15% to 25% or so of susceptible folks so that no explicit, autobiographical memories are being laid down to later ground the surges of implicit (sensory and emotional) memories, which can reactivate and overwhelm the person's consciousness. And since these implicit memories are encoded without language this may explain why verbal therapies don't always work so well with trauma; because we're dealing often with a "wordless or nameless kind of terror". We'll be looking at the work of Besel **van der Kolk** and his colleagues in the trauma field.
3. Obsessive compulsive disorder (**OCD**) appears to be caused by an improper filtering of stimuli by the caudate nucleus; such that other nearby centers lock, creating a hyper-metabolic state in parts of the frontal lobe.
4. If you have a client/patient who can't stay on task or focus, maybe he has **ADHD**. If so, there will be poor profusion in the frontal lobes.
5. We're learning **how addiction works neurologically** – that it's not the cocaine, for instance, that creates the experience of intense pleasure, that **drug rush**, but our own pleasure related neuro-chemical dopamine. Cocaine just floods into that gap between cells and fools the neuron into dumping a mass of dopamine, 2 or 3,000 times the normal amount, completely overwhelming the synaptic receptor sites.
6. And there is evidence for a **mirror neuron network**: an embedded neurocircuitry that may explain our capacity not just to know what someone is feeling, but to duplicate what they are feeling inside our own brains. It's what lets us see anger flash across the face of a client/patient and feel it in our own bodies. This is not simple recognition; recognition activates other areas of the brain. This is more behavioral interdependence. The neurons that fire in your brain in response to your angry client/patient are the same ones that activate when the anger originates in you, so it's a genuine brain-to-brain connecting that we do.
7. Want to increase feelings of **compassion** in your relentlessly self-critical client/patient**?** They have been recorded as rapid brain waves coursing in the left forehead of Tibetan Buddhist monks who have meditated intensely for decades.
8. During a **spiritual experience**, the brain's frontal and temporal lobes activate while activity in the brain's parietal lobe quiets down.
9. If you're anxious and saying more in a session than is optimal, unable perhaps to hold the silence and wait in a way that you know is therapeutic, your **left hemisphere is active and dampening excitation in the right;** that's why talking feels good when we're upset and why we use it to self-regulate.
10. If your couple has just erupted into a fight, it may help to know that their orbital frontal cortex (OFC) has gone dark right in front of you and they are, at points, engaging **amgydala to amgydala**.
11. On a more **societal scale,** the Supreme Court recently heard testimony from some eminent neurologists and neural psychiatrists questioning whether adolescents or even young people in their early 20s could be ethically tried as adults in crimes involving impulsivity and complex moral judgment because their prefrontal lobes, and thus their ability to reason and restrain, doesn't finish developing until the age of about 25. The court ruled several years back to raise the age of capitol punishment from 16 to 18 and, in the majority opinion, cited some of this neurological evidence.

Of course, you don't really need to know all this to do great work, not consciously at least. If you're skilled at listening to what is said, and what is not; if you can watch carefully, adjust and attune and mirror accurately, the details of the science may only reaffirm what you know intuitively, at least for now. But increasingly there are clinical pointers from the research. It is perhaps in the area of affect or emotional regulating that the science finds its more direct applicability today.

The **DSM** is full of descriptions of **affect regulation problems**, of what brain researchers refer to as neural dysregulation or dis-integration**.** These are:

- Robot-like **rigid states** that characterize certain **depressions;**
- the wild swings of **bipolarity;**
- the chaos of **panic** attacks or **rage**;
- the locking of energy into our bodies in **dissociative** and **somatoform** disorders; and
- the e**ating and substance** abuse disorders that serve to regulate affect externally.

A further and major challenge is that we are wired into one another and react automatically**.** Literally our brains are developed interpersonally. It begins at birth in our first attachment relationships which are almost exclusively a right-brain to right-brain affair. **Allen Schore's** contribution regarding the importance of the right hemisphere has been invaluable. This interpersonal sensitivity can be wonderful; emotionally attuned relationships have the capacity to calm and nurture us. But they have the opposite capacity as well.

Disregulated reactivity, the lack of neural integration, can make our bodies a difficult place in which to live and erode the closeness of our intimate relationships. It is this kind of blind reactive stuff we may need to help our clients/patients interrupt. It is the same reactivity we need to work on in ourselves as we hold the powerful transference reactions from our clients/patients, and contain our own countertransference reactivity.

In the online seminar, we'll define one goal of psychotherapy as improved affect regulation, increased coherency, or neural integration with its capacity (as **Daniel Siegel** says repeatedly) for "clarity, self-reflection and response flexibility**".** When we increase this kind of bio-integration, we are developing, among other centers, the orbital frontal cortex**,** the observing mind.

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