Quantifying Mental Health Issues and Thoughts on How to Integrate Wearable Diagnostic Devices

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Why bother?
Why bother?

Psychiatric illness is common causes significant misery imposes a huge financial burden contributes to shortened lives
Impediments
Someone from the Gyna colleges called. They said the Pabst beer is normal.

I didn’t even know you liked beer.
Impediments

1. “soft” diagnoses
   a. time
   b. severity of symptoms
Impediments

2. diagnoses are heterogeneous
Impediments

2. diagnoses are heterogenous

3. no valid, highly sensitive and specific biologic markers
Response to Open Request
MOSES !!!
Cut the bullshit and take your bath!

MOSES...
His first years.
Response to Open Request

Hi Van,

A significant problem across diagnostic disorders is physiologic arousal. **Biofeedback** paired with a variety of relaxation, cognitive, interpersonal, etc. strategies has proven effectiveness but few people have ongoing access to biofeedback machines. While not a specific “biomarker”, a **wearable device that could track HR, RR, BP and skin conductance** would be extremely useful in implementing treatment. (If it could also assess **cortisol**, it would have biomarker potential as well.)

Kind regards,

Judy

Judith A. Cohen, M.D.
Van,

There is an emerging prospect for use of Actigraph in assessment of mood disorders including depression and seasonal affective disorder on the basis of some preliminary research. This device is used primarily to evaluate circadian rhythm disorders in sleep clinics. I wonder if an application can be developed to combine the objective movement/sleep data from the Actigraph with what Judy has described below then it may be used as a tool for assessment, treatment monitoring and even early detection of recurrence of mood disorders in conjunction with our subjective assessments.

Thanks,

Amit
Response to Open Request

--SLEEP AND SLEEP DISORDERS (snoring, limb movement, myoclonus, O2 sats, nocturnal arousals, sleep latency, eye movement as a REM marker, sleep walking, behavioral events),
Response to Open Request

--SYMPTOM TRACKING—mood, anxiety, satisfaction, calmness, optimism/pessimism, automatic negative thoughts, etc. (I read about a phone-based app that prompts users at pre-set or random intervals to answer certain questions, take pulse or BP, complete a brief mood/thought/anxiety/avoidance/pleasure-mastery/other symptom related checklist then generates user-friendly data that can be downloaded and printed).
Response to Open Request

--Any technologies related to **SMOKING CESSATION, BEDWETTING, ENCOPRESIS, OTHER HABITS/HABIT DISORDERS, CRAVINGS, O-C SYMPTOMS, PAIN CONTROL, ANTICIPATORY ANXIETY/PANIC---BOTH FOR TRACKING and for BEHAVIORAL/AUTONOMIC TRAINING PURPOSES**
Response to Open Request

--ANYTHING RELATED TO ADHD FOR KIDS, TEENS, ADULTS— for tracking and skill building, preferably with graphic data output for feedback and reinforcement purposes that can be shared by pt and therapist, parent/SO, life coach, etc; for time management training, learning to more accurately estimate the passage of time and developing an intuitive “feel” for how long certain routine tasks take, reminders to start winding down with a project, start getting ready for the next event, remembering to take travel time/traffic into account, pill reminders...
Response to Open Request

...literally anything that makes it easier to visually “see” and keep track of progress or lack thereof when it comes to staying true to a daily plan, using time effectively, starting and stopping new tasks or activities more efficiently and with less wasted effort, identifying and using real time feedback to reduce susceptibility to distractions, over-focusing on low priority but inherently more interesting aspects of tasks with deadlines...etc,etc...
Response to Open Request

--ANYTHING RELEVANT TO AUTISM/DEVELOPMENTAL DISABILITIES OR OTHER CONDITIONS WHERE SOCIAL/INTERACTIONAL SKILLS TRAINING IS CRITICAL
--ANY BIOFEEDBACK DEVICES/APPLICATIONS—for headache, back, GI/GU, neuropathic, fibromyalgia and/or chronic pain, temper control, hypertension, addictive /compulsive behaviors and habits, panic/anxiety or for any/all interventions based on relaxation or autonomic retraining, learning to reliably identify and gain volitional control over symptoms that are highly autonomic or have autonomic/visceral triggers that first require biofeedback-assisted learning before they can be reliably identified, isolated from other background noise, then modified.
Response to Open Request

--MEMORY AND/OR PHYSICAL ACTIVITY ENHANCING DEVICES
Response to Open Request

-- WEIGHT/EATING RELATED MONITORING, PROMPTING AND/OR FEEDBACK DEVICES—metabolic syndrome, overeating in depression, compulsive and binge eating...would probably draw the line at actual eating disorders that require dedicated subspecialty care
Markers
Markers

Major Depression

1. shortened latency to REM
Markers

Major Depression

1. *shortened latency to REM*
2. non-suppression of cortisol to dexamethasone
Markers

Schizophrenia

1. abnormal saccades
Markers

Schizophrenia

1. abnormal saccades
2. abnormal auditory evoked potentials
Markers

Schizophrenia

1. *abnormal saccades*
2. *abnormal auditory evoked potentials*
3. *abnormal tests of executive function*
Markers

Heart Rate Variability (HRV)

- marker of vagal tone
- greater variability reflects increased health
- reduced variability ➔ increased mortality in patients S/P MI with MDD
Potential Approaches

Screening for specific disorders
Screening for increased risk for specific disorders
Measuring change (improvement) with treatment
Measuring change predictive of recurrence
Transcutaneous therapeutic drug monitoring
  quantitative drug levels - e.g., Li, VPA, TCA’s
  qualitative drug levels – i.e., taking it or not
Questions, comments, other ideas?