UNC-School of Social Work Clinical Lecture Series

Differential Diagnosis for Depressive Disorders: A Step-by-Step Assessment of a Complex Case

February 2, 2015

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USA

Disclosures

- NIH R01 MH066647 (PI: E. Youngstrom)
- NIH R01 MH073967 (PI: R.L. Findling)
- OMDH Grant for CBT (PI: J.K. Youngstrom)
- NC TraCS Grant (PI: Melissa Jenkins)
- E. Youngstrom consults with Lundbeck and Otsuka about neurocognitive and mood assessment
- No speakers bureaus, pharma supported talks, stock ownership, test sales….

Objectives

- Learn base rates in different settings, such as public schools, outpatient services, forensic settings, and inpatient units; and how to use these benchmarks to evaluate efficiently
- Use assessment procedures to aid in differential diagnosis and measuring response to treatment
- Apply new methods for interpreting test results, including methods taking into account clinical settings where we work

Objectives

Shortcuts to work faster!

Be more accurate!

Get better results!

Handout

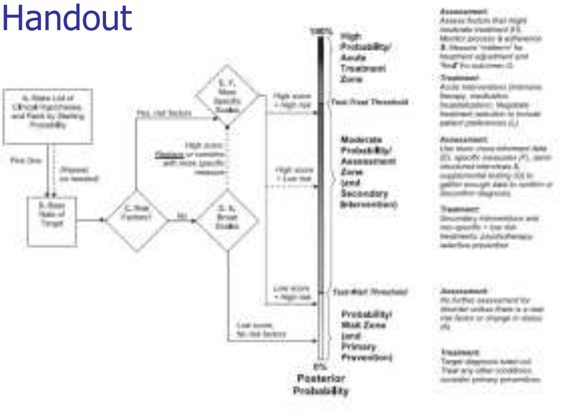
100%
High Probability/ Acute Treatment Zone
Test-Treat Threshold
Moderate Probability/ Assessment Zone (and Secondary Intervention)
Test-Wait Threshold
Probability/ Wait Zone (and Primary Prevention)
0%
Posterior Probability

Figure 1. Mapping Assessment Results Onto Clinical Decision Making. Note. Letters refer to assessment step in Table 1.

Lea

- 18 yo WF
- Middle of senior year
- Coming to outpatient clinic
- Presenting problem:
  - Trouble with attention
    - Can’t stay focused
    - Grades dropping
  - Getting anxious and stressed about graduating (and **if** she’ll graduate)

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What do you think is going on?

- Diagnosis?
- What's your assessment plan?
- Treatment options?

Detective Work:
Evidence-Based Assessment

EBA

Expanding number of diagnoses

DSM-II
DSM-III-R
DSM-IV
DSM-IV-TR
DSM-5

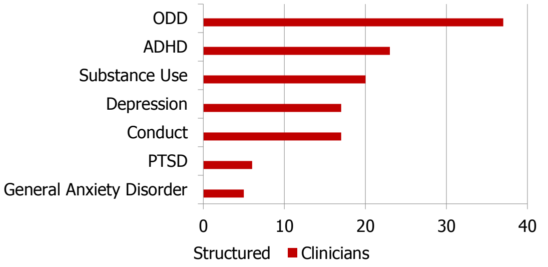
More than 365 diagnoses –
One for every day of the year!

How long would it take to consider ***all*** *of them?*

Pareto's 80:20 Law
"Law of the vital few"

- 20% of diagnoses will cover more than 80% of the cases we see
- Concentrate on the common problems
- Have a good plan for assessing, treating them

Rates of common diagnoses



Rettew et al., 2009

Probabilities:
Thinking like the weather forecast

44°
49°
44°
47°
49°

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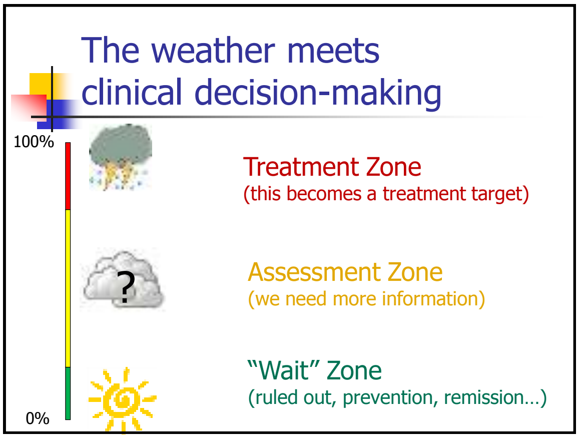
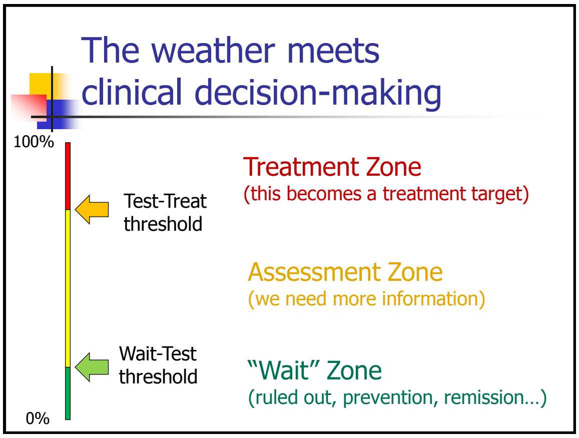


The weather meets clinical decision-making

Treatment Zone
(this becomes a treatment target)

Assessment Zone
(we need more information)

"Wait" Zone
(ruled out, prevention, remission…)



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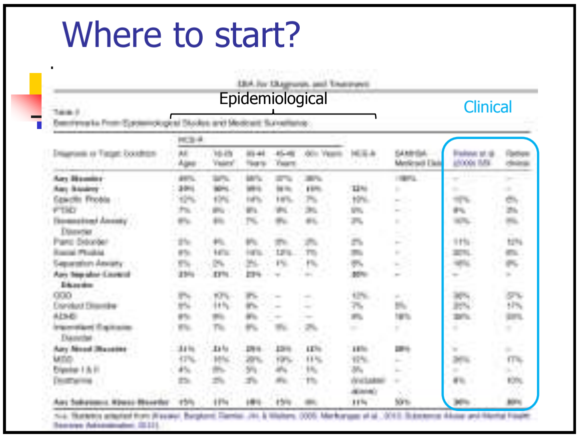
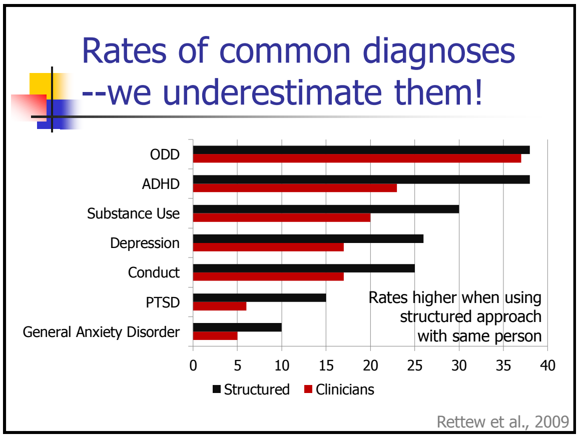


Where to start?

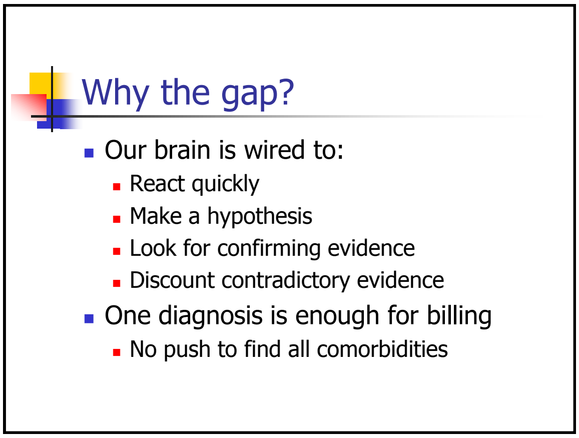
Epidemiological
Clinical



Rates of common diagnoses --we underestimate them!

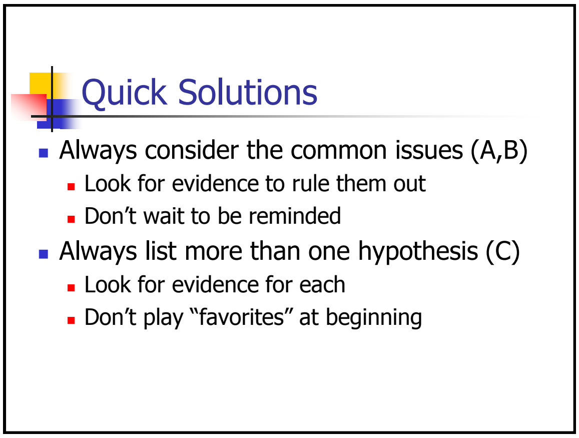
Rates higher when using structured approach with same person

Rettew et al., 2009



Why the gap?

- Our brain is wired to:
  - React quickly
  - Make a hypothesis
  - Look for confirming evidence
  - Discount contradictory evidence
- One diagnosis is enough for billing
  - No push to find all comorbidities



Quick Solutions

- Always consider the common issues (A,B)
  - Look for evidence to rule them out
  - Don't wait to be reminded
- Always list more than one hypothesis (C)
  - Look for evidence for each
  - Don't play "favorites" at beginning

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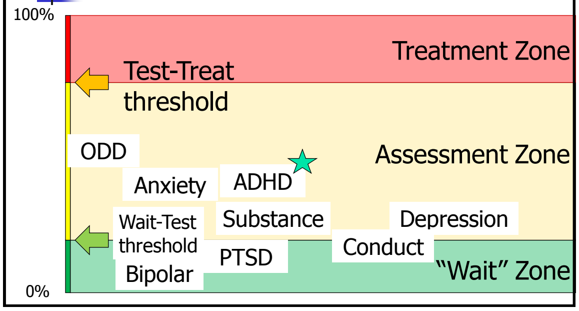
Think about where you are working ("Bet the base rate")



Treatment Zone

Test-Treat threshold

ODD

Anxiety

ADHD

Assessment Zone

Wait-Test threshold

Substance

Depression

Conduct

PTSD

Bipolar

"Wait" Zone

Learn good thinking habits

- Debiasing strategies:
  - Competing hypotheses
  - Look for disconfirming evidence
  - Don't call off search when find one plausible suspect

Cognitive Strategies vs. Diagnosis As Usual

- Randomized control trial, 2-arm
- *N* = 137 clinician participants
- Case vignette methodology
- Web administration via Qualtrics software
  - Randomized:
    - Treatment or Control group
    - Race/ethnicity of vignette characters

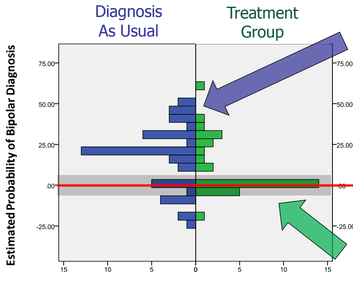
Jenkins (2012)

Intervention

- 20 minutes
- Web tutorial
- Four cognitive debiasing strategies
- Treatment group more accurate across all four vignettes:
  - Accuracy $F = 10.37$, $p < .0005$, $R^2 = .22$
  - Fewer Errors $F = 10.86$, $p < .0005$, $R^2 = .23$

Jenkins (2012)

Cognitive de-biasing increases accuracy



Diagnosis As Usual over-estimates bipolar risk

Accurate Estimate

Treatment group more accurate

Jenkins (2012)

Applying these to Lea

- Presenting problem: Attention, grades, stress
  - Sounds like ADHD?
- Common conditions at clinic (Pareto 80:20):
  - ODD, Anxiety, **ADHD**, Depression, Substance
- Could these other diagnoses also explain presenting problem?
- …Better check all of them!
  - What would help rule them out?

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Another Solution: Checklists

- Checklists as a simple way of eliminating human error
- Used in medicine, engineering, arena rock, other complex endeavors
- Atul Gawande – *The Checklist Manifesto*

ATUL GAWANDE

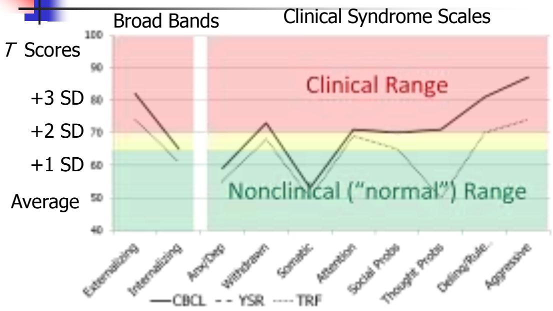
Possible Checklists

- DSM Diagnostic Criteria
- Rule-outs or other diagnoses to consider
  - General medical condition
  - Medication induced
  - Due to some other disorder
  - Environmental factors
  - Cultural factors
- Side effects, treatment response
- Could be "notes to self" about treatment planning

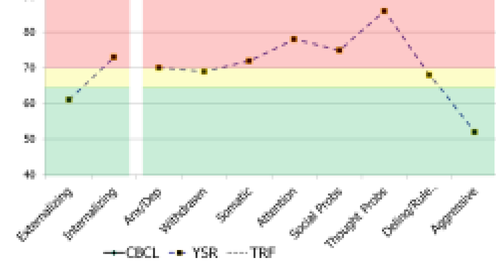
Use a broad measure to get data about several issues quickly

- Achenbach System of Empirically Based Assessment (ASEBA)
  - Youth Self Report – How does Lea's report compare to 11-18 year old females?
  - Child Behavior Checklist – caregiver report
- Strengths & Difficulties Questionnaire (SDQ)
  - Free alternative

Reading the Achenbach



Lea's Youth Self Report scores



Check the details & probes

(Drotar, Stein, & Perrin, 1995)

YSR

Sleep problems – bipolar clue?

Substance issues

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The tool is only as good as the way we use it

- Illustrate with a second case
- We can look at our audience participation compared to 610 clinicians in USA and Canada
- Handout step (d) –
  synthesize info to revise probabilities

DeShawn

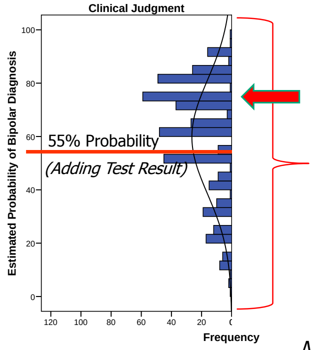
- 7 year old black male
- referred because of extreme aggression and distractibility,
  motor agitation at school
- Dad has been diagnosed with Bipolar I and treated for several years with lithium and divalproex.

What's you diagnostic hypothesis at this point?
Chances of bipolar?

Add a Test

- Mom completes CBCL, and he earns an Externalizing *T* = 84
- What do you think likelihood is of bipolar now?

Wide Range of Clinical Opinion



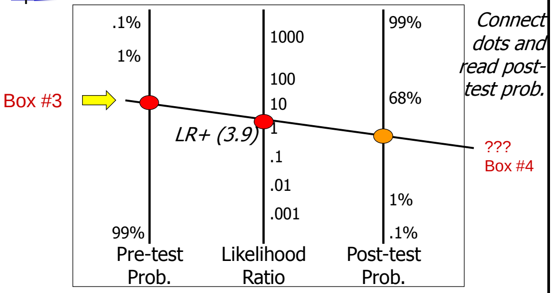
Most tend to overdiagnose

Still extreme range of opinion

N = 610 clinicians, 13 sites

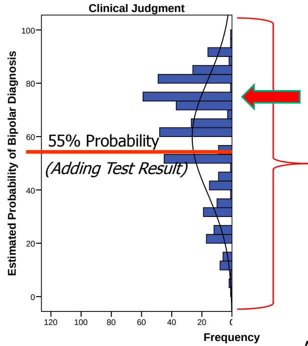
Using a Nomogram

Add a CBCL Test Result



Connect dots and read post-test prob.

Is the Nomogram Worth Using?



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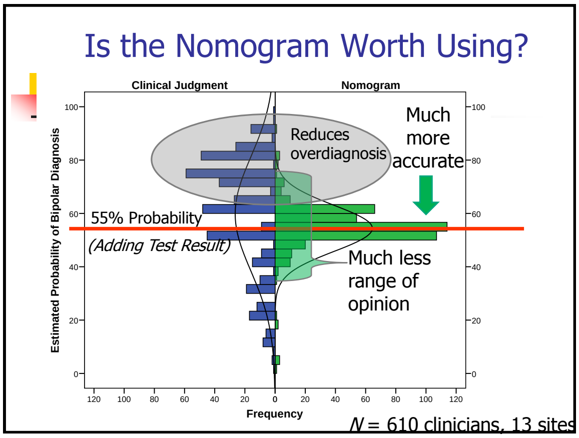

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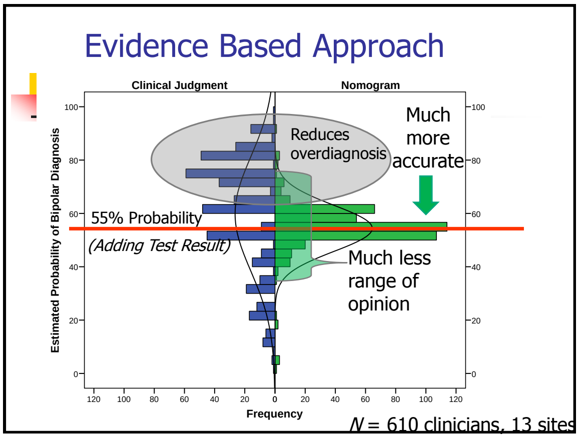
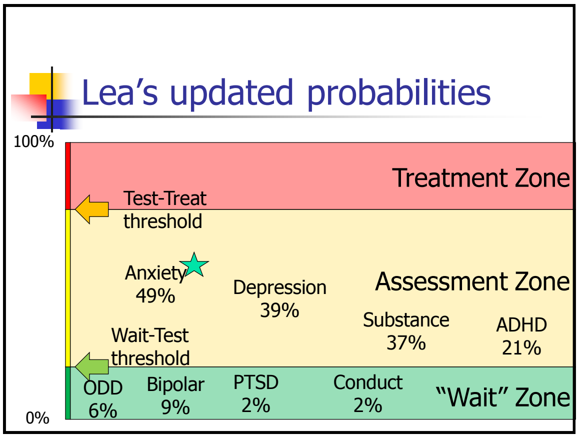


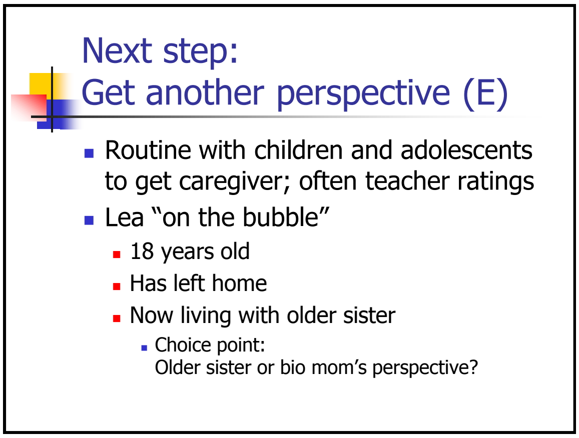
Evidence Based Approach

N = 610 clinicians, 13 sites



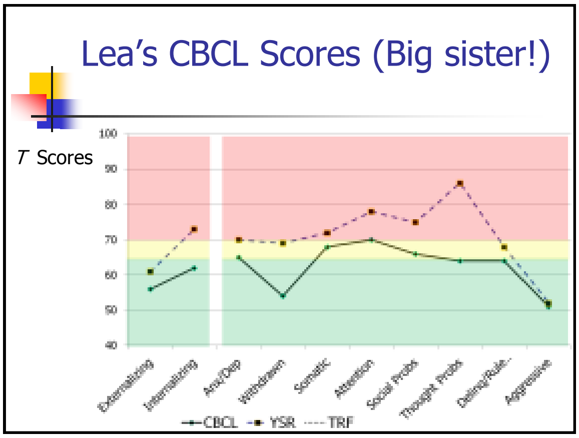
Lea’s updated probabilities

100%
0%
Treatment Zone
Test-Treat threshold
Anxiety 49%
Depression 39%
Assessment Zone
Substance 37%
ADHD 21%
Wait-Test threshold
ODD 6%
Bipolar 9%
PTSD 2%
Conduct 2%
“Wait” Zone

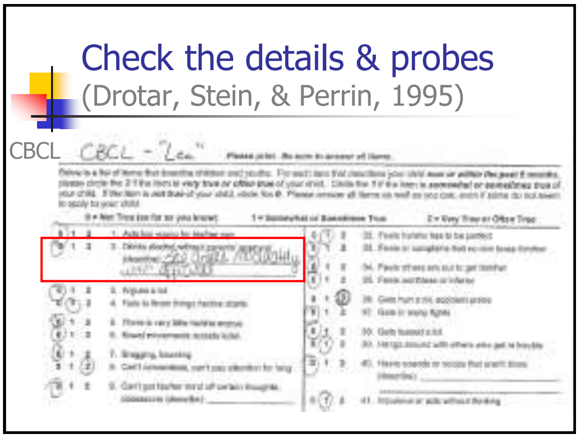


Next step:
Get another perspective (E)

- Routine with children and adolescents to get caregiver; often teacher ratings
- Lea “on the bubble”
  - 18 years old
  - Has left home
  - Now living with older sister
    - Choice point:
      Older sister or bio mom’s perspective?



Lea’s CBCL Scores (Big sister!)



Check the details & probes

(Drotar, Stein, & Perrin, 1995)

CBCL - "Lea"

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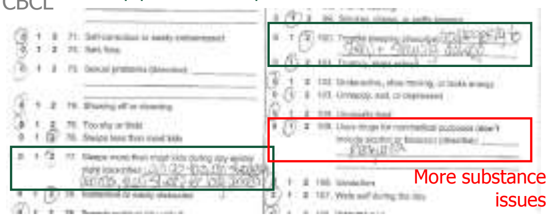
Check the details & probes
(Drotar, Stein, & Perrin, 1995)

CBCL

Sleep problems – bipolar clue?

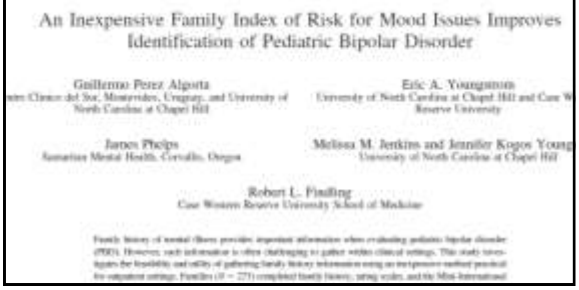


More substance issues

Another Step: Ask about risk factors (c)

- Why did Lea move in with sister?

Family Index of Risk for Mood (FIRM)



An Inexpensive Family Index of Risk for Mood Issues Improves Identification of Pediatric Bipolar Disorder

Guillermo Perez Algorta

Eric A. Youngstrom

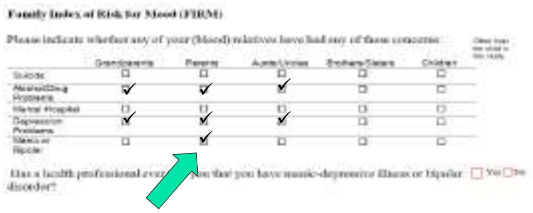
James Phelps

Melissa M. Jenkins and Jennifer Kogos Young

Robert L. Findling

Case Western Reserve University School of Medicine

Lea's FIRM



Family Index of Risk for Mood (FIRM)

Please indicate whether any of your (blood) relatives have had any of these concerns:

	Grandparents	Parents	Aunts/Uncles	Brothers/Sisters	Children
Suicide	☐	☐	☐	☐	☐
Alcohol/Drug Problems	✓	✓	✓	☐	☐
Mental Hospital	☐	☐	☐	☐	☐
Depression Problems	✓	✓	✓	☐	☐
Mania or Bipolar	☐	✓	☐	☐	☐

Has a health professional ever told you that you have manic-depressive illness or bipolar disorder? ☐ Yes ☐ No

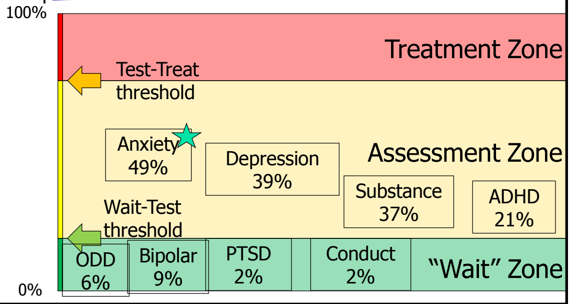
Lea's dad has bipolar disorder, inconsistent with treatment; Drinking heavily

Perez Algorta et al., 2012, *Psych Assess*

Another Step: Ask about risk factors

- Why did Lea move in with sister?
- Dad has bipolar and history of substance problems
  - Bipolar is highly heritable
    - How much does this change Lea's risk?
    - First degree relative – **5x more risk**
  - Any other bipolar risk factors?
    - Early onset depression – 1/3 becomes bipolar
    - Sleep disturbance

Lea's re-updated probabilities



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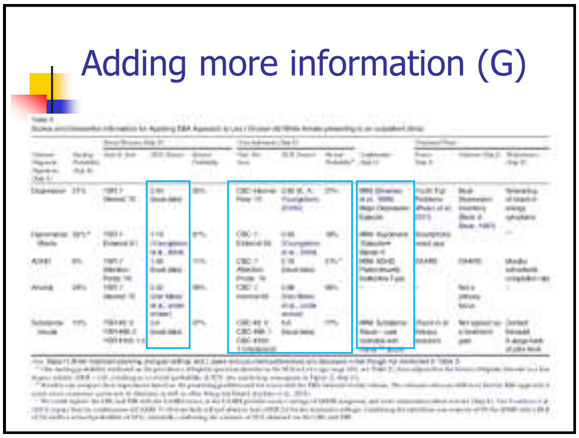
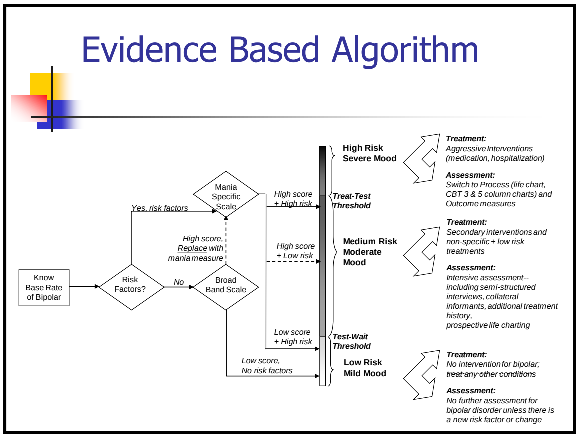


Adding more information (G)



Evidence Based Algorithm

Know Base Rate of Bipolar
Risk Factors?
Yes, risk factors
No
Mania Specific Scale
Broad Band Scale
High score, Replace with mania measure
High score + High risk
High score + Low risk
Low score + High risk
Low score, No risk factors
High Risk Severe Mood
Treat-Test Threshold
Medium Risk Moderate Mood
Test-Wait Threshold
Low Risk Mild Mood

Treatment: *Aggressive Interventions (medication, hospitalization)*

Assessment: *Switch to Process (life chart, CBT 3 & 5 column charts) and Outcome measures*

Treatment: *Secondary interventions and non-specific + low risk treatments*

Assessment: *Intensive assessment--including semi-structured interviews, collateral informants, additional treatment history, prospective life charting*

Treatment: *No intervention for bipolar; treat any other conditions*

Assessment: *No further assessment for bipolar disorder unless there is a new risk factor or change*

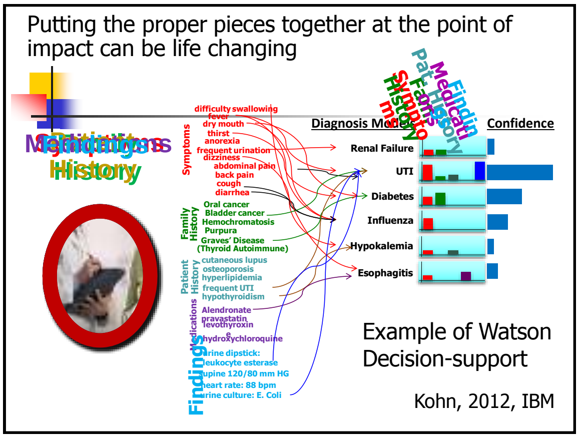
Time and costs so far:

- Could use checklists (YSR, CBCL, FIRM) as part of intake
  - 0 min in session to complete; 0-10 min to discuss
  - Achenbach costs $1.25; free alternatives
- Base rates: Know ahead of time
  - 0 session minutes; 0 cost
- Debiasing strategies
  - 0 added session minutes, 0 cost

IBM Watson wins on *Jeopardy!*

- **Natural language, unlike chess**
- Largest *Jeopardy!* in 5 years
  - 34.5M *Jeopardy!* Viewers
  - 1.3B+ web impressions
- Over 10,000 Media Stories
- 11,000 attend watch events
- 2.5M+ Videos Views
- 12,582 Twitter
- 25,763 Facebook Fans

14 February, 2011



Putting the proper pieces together at the point of impact can be life changing

Symptoms
difficulty swallowing
fever
dry mouth
thirst
anorexia
frequent urination
dizziness
abdominal pain
back pain
cough
diarrhea
Family History
Oral cancer
Bladder cancer
Hemochromatosis
Purpura
Graves' Disease (Thyroid Autoimmune)
Patient History
cutaneous lupus
osteoporosis
hyperlipidemia
frequent UTI
hypothyroidism
Medications
Alendronate
pravastatin
levothyroxine
hydroxychloroquine
Findings
urine dipstick: leukocyte esterase
supine 120/80 mm HG
heart rate: 88 bpm
urine culture: E. Coli
Diagnosis Models
Confidence
Renal Failure
UTI
Diabetes
Influenza
Hypokalemia
Esophagitis

Example of Watson Decision-support

Kohn, 2012, IBM

Next step:
Semi-structured diagnostic interview

- Structured: Make sure you cover the key symptoms, and the contending hypotheses
- Semi:
  - Use language you and client understand
  - Scratch & sniff
- Options: MINI, SCID, KSADS...

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Practical issues with semi-structured

- Hurt rapport?
  - No, patients prefer them (Bruchmuller et al., 2011)
- Take long?
  - Not if targeted, or use skip outs
- Not reimbursed
  - MedicAid, insurance will pay if show "medical necessity"
  - Working earlier steps counts as "yes"!

Lea after MINI

- Bipolar II (depression + hypomania)
- Substance abuse
- ADHD Predominantly inattentive

What is bipolar II?

- Major depression + hypomania *"Moodquakes"*
  - Could be mixed depression, mixed hypomania
- How different from ordinary depression?
  - Poor response to antidepressants
  - Higher risk of suicide and NSSI
  - Higher risk of substance misuse
  - Often more atypical features
    - Hypersomnia, increased appetite
- Changes prognosis, and treatment

Pick treatment goals

- Lea not on board with substance as focus of treatment
  - Would fight "diagnosis" (Step L!)
- Lea agreed with depression as focus of treatment
  - Bipolar II as a way of describing type of depression
  - Focusing on **stability** versus **activation**
  - Agreed to be honest about substance use, see if it changed as depression went down

Setting Goals (H)

- Severity measures can help define goals
  - Some have norms
  - Benchmarks for comparison
- Get client input (L)
  - Goals should be motivating
  - Measurable

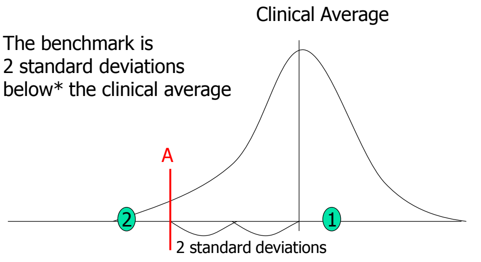
Clinically significant change

- (1) showing reliable change (RCI)
- (2) passing a benchmark that indicates a change in functioning
  - Away - Leaving clinical range
  - Back - Entering nonclinical range
  - Crossing Closer – Moving closer to nonclinical than clinical

Three Benchmarks: The ABCs of Change

- Away from the Clinical distribution of scores
- Back into the nonclinical range of scores
- Crossing closer to the nonclinical than the clinical range of scores

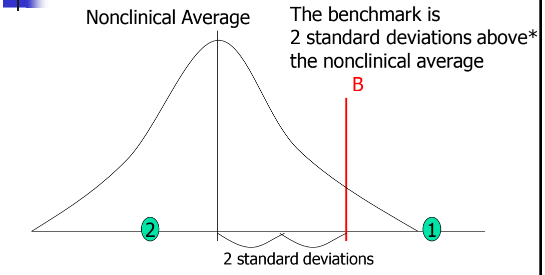
Away from the Clinical



The benchmark is
2 standard deviations
below* the clinical average

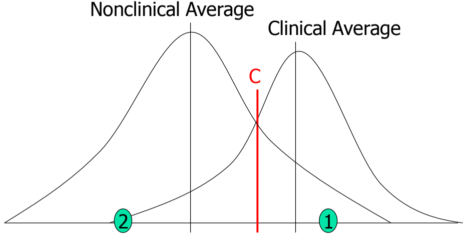
**Assuming that higher scores show more impairment*

Back into the Nonclinical Range



The benchmark is
2 standard deviations above*
the nonclinical average

Crossing closer to the nonclinical than clinical



The benchmark is crossing the weighted average of the two means

Defining goals with YSR (J)

- High scores:
  - Thought problems
    - Some discussion and normalization reduced score immediately
  - Internalizing
    - This could be a good "midterm" & "final" exam
    - Improving: 8 points (73 – 8 = 65 as target)
    - ABCs: Back= 70, Closer= 54, Away= 36
  - Attention: See if it improves with stress reduction (& decreased substances…)

Progress measures (I,J)

- Need to be short (asking client to repeat them)
- Focus on goals
- Can check progress quickly
  - Like bathroom scale for diet

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Progress measures for Lea

- Mood: Smartphone mood app (daily use; $3.99 at App Store)
- Attention problems: CAARS or other rating scale, every other session
- Substance: ask about drinks and tokes each session (brief and low key; just charting trends)

Typical improvement?

- Treatment as usual: *d* ~.2
- Tracking progress: *d* ~.4-.6
  - Imagine going on a diet where you never stepped on a scale?!
  - Measuring more than doubles the outcome

Evidence Based Assessment is fast and frugal

- Time added per patient:
  - < 5 minutes for first 6 steps
  - Remaining steps may already be part of typical assessment or treatment
  - No delay in initiating "Green" or "Yellow" zone treatments
- Expense added:
  - $5 if use life charting app on smartphone
  - All else in public domain, and billable time

Youngstrom et al. (2012) *Israel J Psychiatry*

Evidence Based Assessment produces large effects

- Increased consistency & accuracy of diagnoses
- Greater agreement about next action
- Avoids cultural biases
- Need not reduce clinical control of treatment
- Makes it possible to treat more specifically and use lower "doses" of intervention

For Lea, EBA…

- Found a problem she didn't know she had
  - (limitation of describing the presenting problem)
- Caught a diagnosis not on our radar
- Developed a plan for treatment goals
  - And how to tell if treatment was helping
- Working faster
  - Using base rates, cognitive debiasing
  - Checklists & focused interviewing
- More accurate, and better outcomes

Your next client

- Circle the steps you are confident you'll be able to use – twice
- Circle the "stretch goals" once
- Ask supervisor for support
  - What are common diagnoses?
  - What tools are available to assess?
- Commit to try one step this week…
- Share with your team! (many hands…)s

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Slides, records, or supervisor

FIRM

Have some go-to checklists (& know what results mean at your clinic)

Semi-structured interview

Progress, outcome tools & benchmarks

Keep talking with client!

Coda: Rating Scales Available in Multiple Languages (inc. Spanish)

- Hypomanic Checklist (HCL)
- Mood Disorders Questionnaire (MDQ)*
- Bipolar Spectrum Disorders Scale (BSDS)
- General Behavior Inventory (GBI)*

•Also validated in some languages as parent report about youth mood and behavior

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HCL-32 in 31 language versions

Arab (Egypt)
Arab (Lebanon)
Arab (Morocco)
Bosnian
Bulgarian
Chinese
Chinese (Taiwan)
Croatian
Czech
Dutch
English
Flemish
French
Georgian
German
Greek
Hungarian
Italian
Iranian
Korean
Macedonian
Polish
Portuguese (Brazil)
Portuguese (Portugal
Russian
Slovak
Spanish
Swedish
Turkish
Urdu
Vietnamese

ICG en Español

INVENTARIO DE COMPORTAMIENTO GENERAL

Transcultural stability

- Factor structure more or less identical in all languages analysed so far
- Symptom profiles, too, are very similar

Measures work

- Differences in levels of symptoms
- Big differences in caregiver awareness
  - Very important:
    - Others notice hypomania first
    - Caregivers drive referrals for mania (in youth and adults)

Reveal key clinical, cultural differences

Translation Rubric (3/5/2014)

- A++. EAY: Replication of good psychometrics in second independent Sample
- A+. EAY: Data collected and psychometrics compared
- A. EAY: Locked & Data collected
- B. WHO: Final version
- C. WHO: Pre-testing and cognitive interviewing (C+ would be evaluating data and blessing or making revisions based on focus group)
- D. WHO: Expert panel Back translation
- E. WHO: Forward Translation
- F. Not claimed; no forward translation in progress

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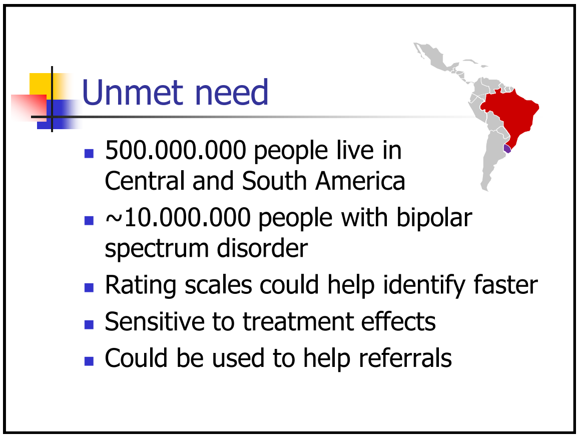
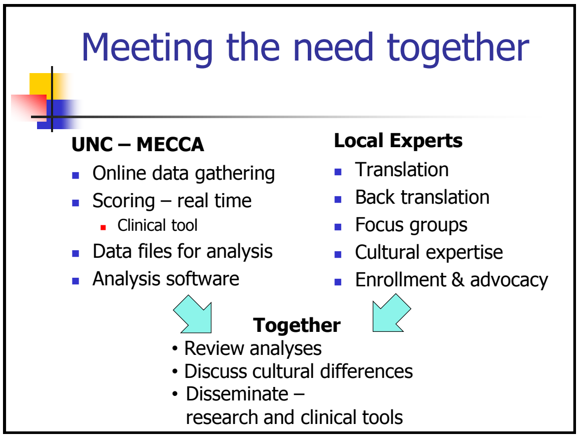


Unmet need

- 500.000.000 people live in Central and South America
- ~10.000.000 people with bipolar spectrum disorder
- Rating scales could help identify faster
- Sensitive to treatment effects
- Could be used to help referrals



Meeting the need together

UNC – MECCA

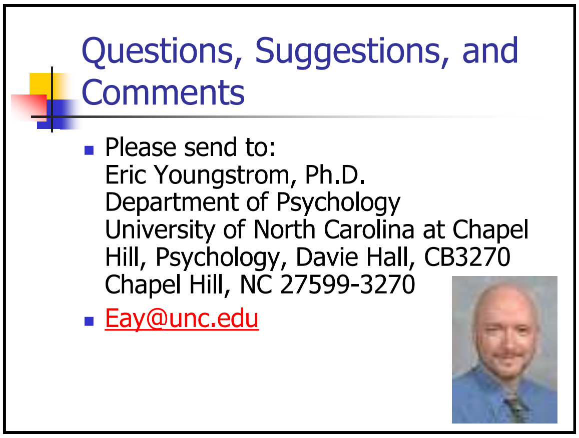
- Online data gathering
- Scoring – real time
  - Clinical tool
- Data files for analysis
- Analysis software

Local Experts

- Translation
- Back translation
- Focus groups
- Cultural expertise
- Enrollment & advocacy

Together

- Review analyses
- Discuss cultural differences
- Disseminate – research and clinical tools



Questions, Suggestions, and Comments

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