Addressing uncertainty in evidence-based practice with local evidence: A case study
Dr. Sheldrick has no financial relationships to disclose or other Conflicts of Interest (COIs) to resolve.
David Eddy, PhD: Evidence-based practice hero

- 1976: analysis of cancer screening; 1st Markov models in clinical medicine
- 1980: launched movement to develop clinical guidelines in medicine
- 1987: CAN*TROL model for WHO & NCI
- 1991- Archimedes model

"First, there must be good evidence that each test or procedure recommended is medically effective in reducing morbidity or mortality; 2nd, the medical benefits must outweigh the risks; 3rd, the cost of each test procedure must be reasonable compared to its expected benefits; & finally, the recommended actions must be practical & feasible."

“Uncertainty creeps into medical practice through every pore. Whether a physician is defining a disease, making a diagnosis, selecting a procedure, observing outcomes, assessing probabilities, assigning preferences, or putting it all together, [he or she] is walking on very slippery terrain. It is difficult for non-physicians, and for many physicians, to appreciate how complex these tasks are, how poorly we understand them, and how easy it is for honest people to come to different conclusions.”

Sources of uncertainty
Sources of uncertainty

Utility_{EBP|it succeeds} = \text{benefit}_{EBP} - \text{cost}_{EBP}

Utility_{EBP|it fails} = -\text{cost}_{EBP}

Utility_{Standard\ practice} = \text{benefit}_{SP} - \text{cost}_{SP}

Mitigating uncertainty with local evidence

Local evidence: A closer look

Addressing systemic health disparities in early ASD identification & treatment

Children ages 0-3 yrs in Early Intervention settings

Stage 1: Parent Questionnaire

Stage 2: Child Observation

Stage 3: Diagnostic testing

NIMH RO1MH104400
Methods to leverage local evidence

- Process mapping
- Statistical process control
- Qualitative interviews
How we do it: Process mapping
How we do it: Process mapping

Distributing Packets

- Create packet and distribute to Case Coordinators
- Thom Packet
- Harbor Packet

Completing Packets

- Fill out BITSEA/POSI
- Score BITSEA/POSI
- ABCD Received in UMB
- Patient leaves

Processing Stage I

- Concern over BITSEA/POSI?
- Screening log complete?
- Consent to STAT?
- Schedule STAT
- Conduct STAT, Score STAT

Scheduling STAT

- STAT concern?
- Complete STAT

Scheduling Development Visits

- Developmental evaluation
- Place in UMB
- Scan and file packet
- Exit

Key Process Performance Measures

1. Distribute packets
2. Complete packets
3. Processing stage
4. Schedule STAT

Tufts Medical Center
Floating Hospital for Children at Tufts Medical Center
How we do it: Statistical Process Control

**Site 1**

- Mean Time: 54.3 days
- Upper Control Limit (UCL): 147.7 days
- Lower Control Limit (LCL): 0

**Site 2**

- Mean Time: 60.8 days
- Upper Control Limit (UCL): 179.6 days
- Lower Control Limit (LCL): 0

Tests performed with unequal sample sizes
How we do it: Qualitative interviews
How we do it: Key concepts

- Independent assessment—yet closely engaged with decision-makers
- Triangulation of methods
- Diversity of perspectives
Providers don’t administer quantitative screening tools as they should. There are good reasons for this, but we can address them to add value to the process.

***Fidelity***
Key findings

- In addition to detecting new cases, the screening process:
  - Gives families pathway to care
  - Provides decision support for families

***Revised causal mechanisms***
Working assumptions...

There is no such thing as perfect evidence
→ Triangulate evidence & consider uncertainty

All implementation is local
→ Carefully attend to context & how local evidence is interpreted

Treat people as rational unless proven otherwise
→ Engage with stakeholders & remember that values are necessary for decision-making
Thank you

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