How to Make Data Work For You No Matter What!

Curtis Kennedy, MD, PhD
Asst. Prof. Of Pediatrics - Critical Care
Baylor College of Medicine / Texas Children's Hospital
Houston, TX

Topics

- Data, Information, Knowledge, Wisdom
- Ignorance, Blindness, Awareness
- Cognitive Dysfunctions
- Big Data / Real Data

- The Job
- Teams
- **TECHNOLOGY**

DIKW

- Data
  - Symbols   92 ^oF No value
- Information:
  - Add context   Human   Meaning
- Knowledge:
  - Add experience   Bypass / ER Visit   Utility
- Wisdom:
  - Extrapolate   Therapeutic Hypothermia

Spectrum of Awareness

- Ignorant
  - Don't know it
- Blind
  - Didn't see it
  - ***Saw it but didn't recognize it***
- **Aware**
  - Saw it, recognized it
  - ***Only state where thinking occurs***

Cognitive Dysfunctions

- Perception
- Attention
- Memory
- Knowledge representation
- Thinking
- Language

Big Data

- Before we go there…
  - Why are we here?
  - What do we need? / What's missing?
  - What would we ask of a genie? (that's germane)

- What is Big Data?
  - EMR, EHR, CDC, Genomics, Proteomics, …

Big vs. Real Data

- Big Data ~ stuff we **can't** see
  - Computer dependent
  - Knowledge discovery (ignorance problem)

- Real Data ~ stuff we **should** see
  - Computer facilitated
  - Decision support (blindness problem)

Real Data

- Still overwhelming & feels like Big Data:
  - Fundamental medical knowledge explosion
  - Lab results increasingly complex
  - Drugs & biologics with specific constraints
  - Sophisticated diagnostic imaging modalities
  - Patient monitoring technology
  - Multiple therapeutic options

The Job

- START:

    Acquire the right data

    Be aware it at the right time

    Interpret it in the right way

    Make the right decision

    Execute the right action

- GOTO START:

Teams

- Multiple opportunities to "do The Job wrong"
- Puts patients at RISK
- Teams mitigate *some* risk
  - Different clinical roles / specialties / redundancy
  - Design best practice protocols
- Teams do not mitigate *all* risk
  - Human factors: different skills, cognition, fatigue
  - System factors: fragmented care / assumptions

TECHNOLOGY

- Make data work for you (…and your patients)
- Like teams, can mitigate some risk, but not all
- OK. So, HOW?
  - 1. What do you need?
  - 2. What do you have?
  - 3. What can you do?
  - **4. Do it.***
- ***YOU MUST START IT ALONE**
- ***YOU CANNOT FINISH IT ALONE**

Helpful Tips

- If you really want to do something, you'll find a way. If you don't, you'll find an excuse. – Jim Rohn

- Committee: a group of men who individually can do nothing but as a group can decide that nothing can be done. – Fred Allen

- I've had a lot of worries in my life, most of which never happened. – Mark Twain

My Personal Experience

- Invigilence
  - Home grown clinical decision support system
  - **What we need**:
    contemporary data, automated calculations, high-level visualization, automated data entry
  - **What we have:**
    Epic EMR, MS SQL Server DB, Dev. Workstation, Internet connection, open source software

My Personal Experience

- Invigilence
  - **What we did:**

    1. Data Acquisition: AutoHotKey (AHK) scripts to copy data from Epic
    2. Preprocess: AHK scripts to transform text data to comma-delimited flat file
    3. Import: Move data into MS SQL database
    4. Modules: Query database / assemble output autopopulate VPS data into web interface, generate web pages, emails, SMS alerts, and pager alerts

Discussion / Q&A

Thank You for Being Here

Special Thanks to:

Warren Sandberg, MD, PhD

Brian Rothman, MD

Julian Goldman, MD

Marie Marinello