Error Analysis of a Forensic Controlled Substance Case

Heather L. Harris, MFS, JD, D-ABC
Forensic Chemistry Consultant
Philadelphia, PA
Error Rates and the Law

• *Daubert v. Merrell Dow Pharmaceuticals, Inc.*
  • 509 US 579 (1993)

• “Many considerations will bear on the inquiry, including...*its known or potential error rate...*”
24.4% unforced errors in women’s matches round of 16 through final at 2013 Wimbledon
How do we assess these errors?

- Re-testing cases
- Proficiency test reports

But, the real question is...

Can we generate an error rate for qualitative tasks?
Measureable Tasks

- Measurement of weight of evidence
- Proper generation, management and correlation of testing aliquots
- Proper transcription of testing aliquot information into data systems
- False positive and false negative identification rates
Error Rates Associated with Use of Equipment

- Reading a gauge incorrectly
- Interpreting indicator on lamp
- Reading an analog meter
- Turning control in wrong direction under extreme stress

- 0.5%
- 0.1%
- 0.3%
- 50.0%
Error Rates Associated with Mental Tasks

- Errors per dose of medication
- Multi-part calculations with calculator and table look-up tasks
- Respond to flash on display screen
  - 1.6%
  - 1.5%
  - 0.6%
Error Rates Associated with Data Entry

- Entering mail codes
- Expert typists’ keystrokes
- Bank machine operators
- Entering information into aircraft flight management system
  - Error rate higher under heavy workload
  - 0.5%
  - 1.0-4.0%
  - 0.03%
  - 10.0%
MITIGATION AREA
DO NOT DISTURB
THIS ONE CONCerns ME.