Creating Quality Assessment in EEG and cEEG

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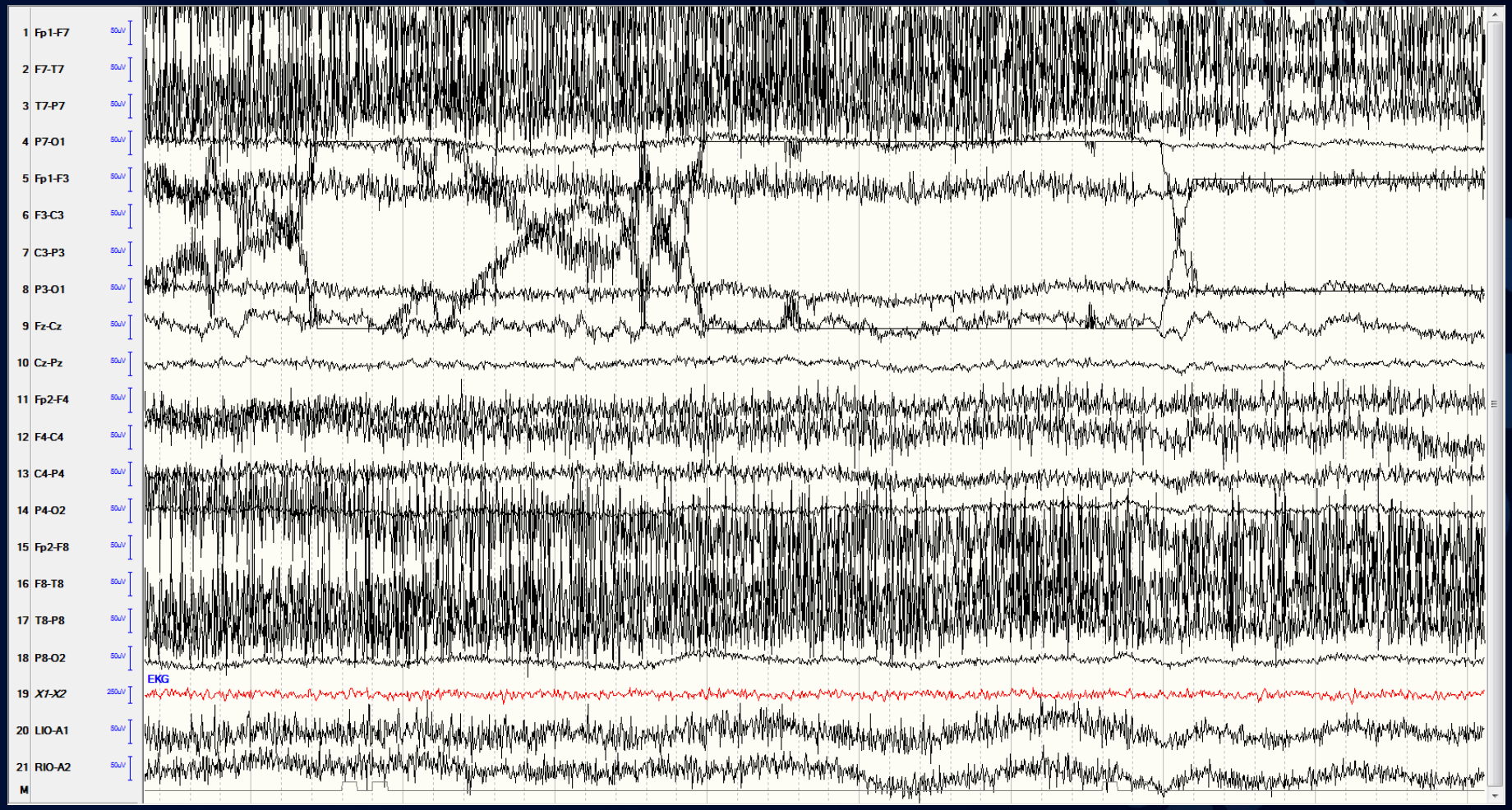
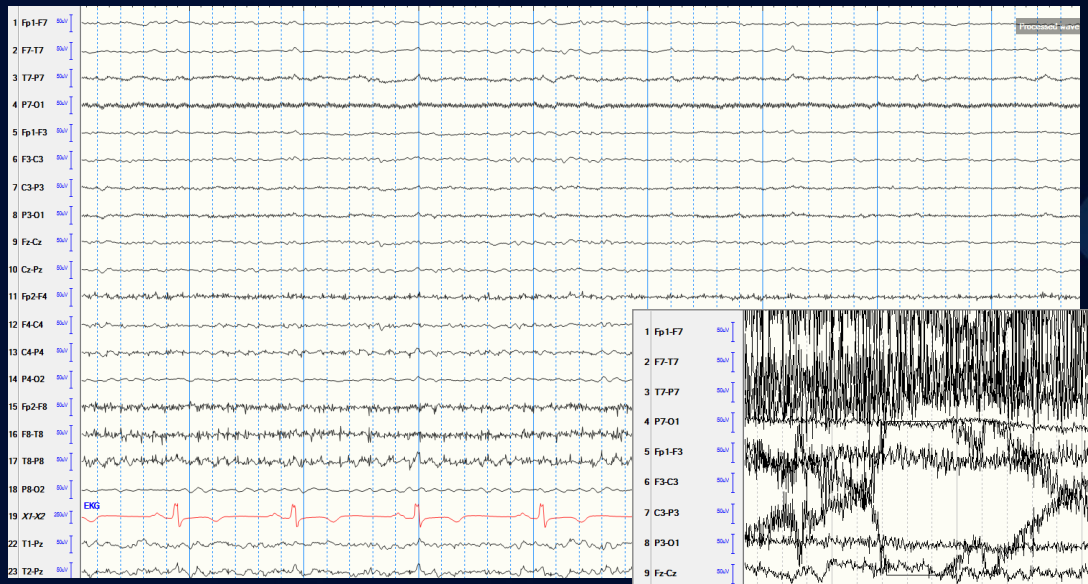
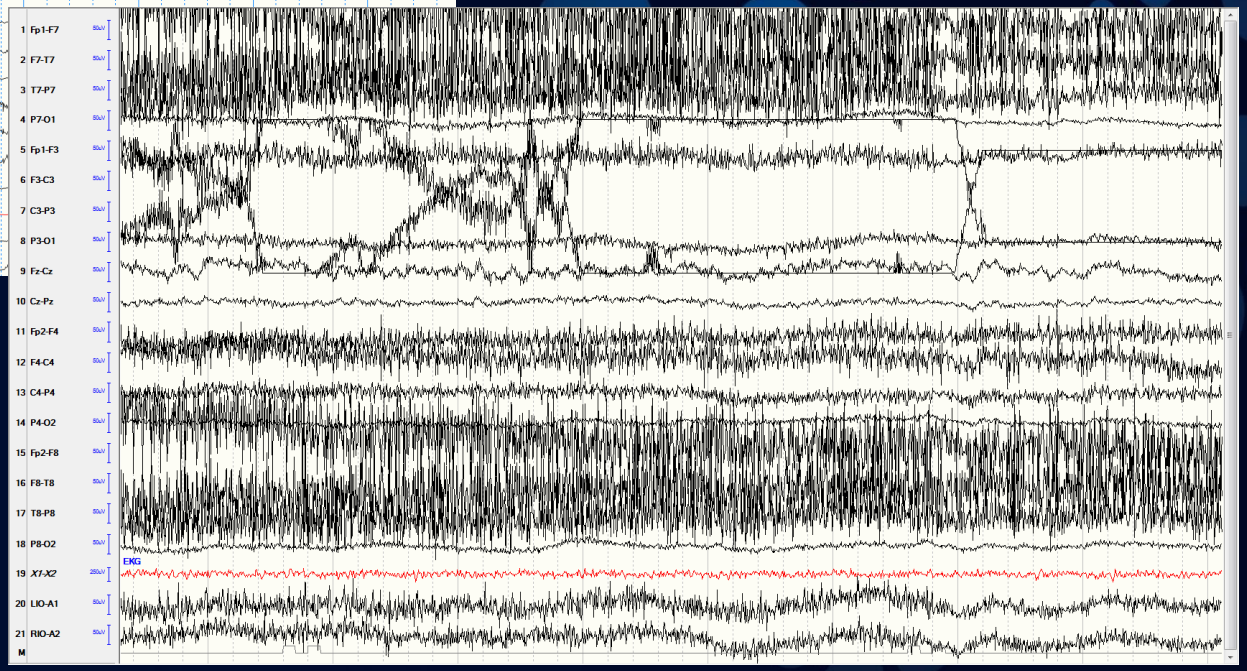
Technically Sound?

How about this sample?



What's the whole story though…

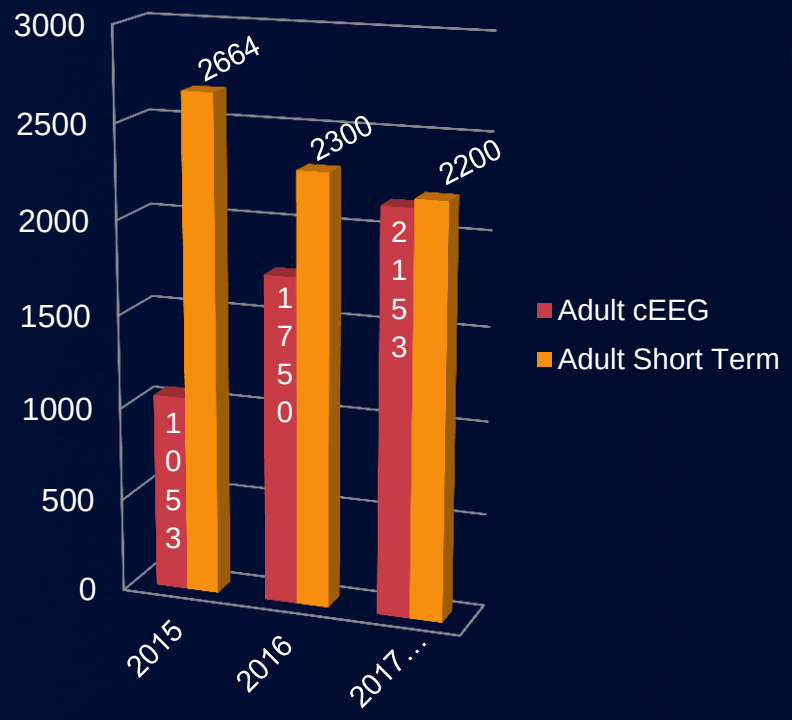




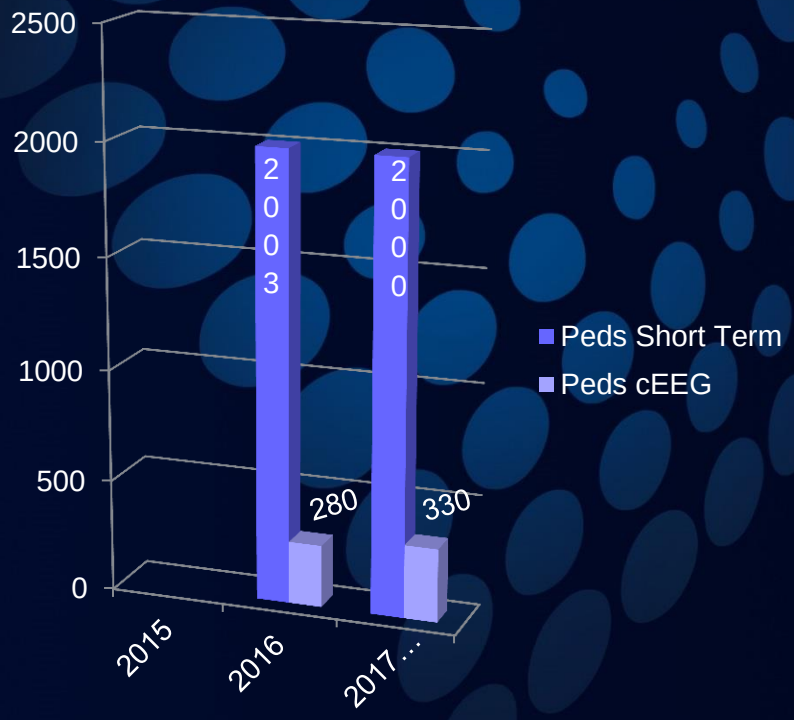
Spectrum Health EEG by the Numbers

Techs on Staff: 55 Total (60% R. EEG T. or CNIM)

Adult Studies

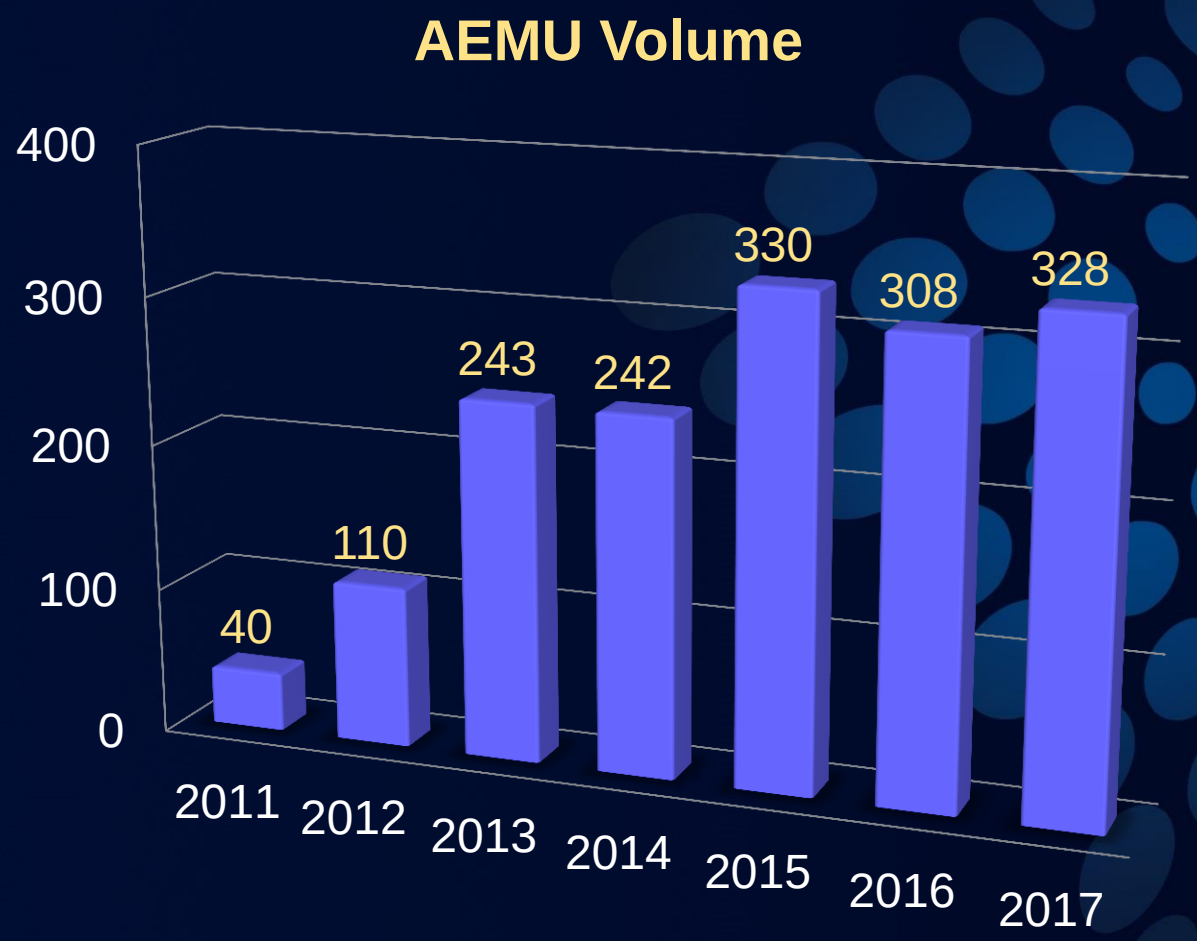


Pediatric Studies



*2017 statistics are projected totals based on patient studies performed to date

Spectrum Health by the Numbers



Establishing Quality Metrics – Early 2016

1. Identify Key Performance Indicators (KPI)
   A. Technical components of EEGs
      i. Increased technical proficiency = Increased diagnostic yield
   B. Quantifiable
   C. Adhere to national and health system standards
   D. Difference in short term studies and cEEG/LTM studies

2. Establish a Benchmark
   A. Review 2015 studies against KPI
   B. Sample size to be statistically significant against the total population of studies
   C. Objectivity!!

3. Present results to staff and set goals

Key Performance Indicators (KPI) Identified

Short Term EEG (6 hours or less):

1. Square Wave & Biological Cal (10 seconds each)
2. Eyes Open/Eyes Closed x2 (20 seconds each beginning & end)
3. Photic Completed (Reason given if unable to complete)
4. Hyperventilation Completed (Contraindication given if unable to complete)
5. Check A/V during study
6. 3 Required Montages (Long. Bipolar, Transverse, Ref)
7. 3 Impedance Checks (Beginning, Middle, End)
8. End study in Longitudinal Bipolar Montage
9. At least 20 minutes of brainwave activity recorded
10. Square Wave Calibration to end (10 seconds)

Key Performance Indicators (KPI) Identified

Short Term EEG (6 hours or less):

ACNS guidelines

1. Square Wave & Biological Cal (10 seconds each)
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Key Performance Indicators (KPI) Identified

LTM/cEEG:

1. Square Wave & Biological Cal (10 seconds each)
2. Begin Study in Longitudinal Bipolar Montage
3. Impedance Check at Beginning of Study
4. Test A/V during beginning of study
5. Eyes Open/Eyes Closed x2 (20 seconds each at beginning)
6. Photic Completed (Reason given if unable to complete)
7. Hyperventilation Completed (Contraindication given if unable to complete)
8. Test Event Marker
9. Impedance Check before leaving the room
10. Phone numbers entered (RN, Attending, and AP if available)

Key Performance Indicators (KPI) Identified

LTM/cEEG:

ACNS guidelines

1. Square Wave & Biological Cal (10 seconds each)
2. Begin Study in Longitudinal Bipolar Montage
3. Impedance Check at Beginning of Study
4. Test A/V during beginning of study
5. Eyes Open/Eyes Closed x2 (20 seconds each at beginning)
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2015 Review of Studies – Method

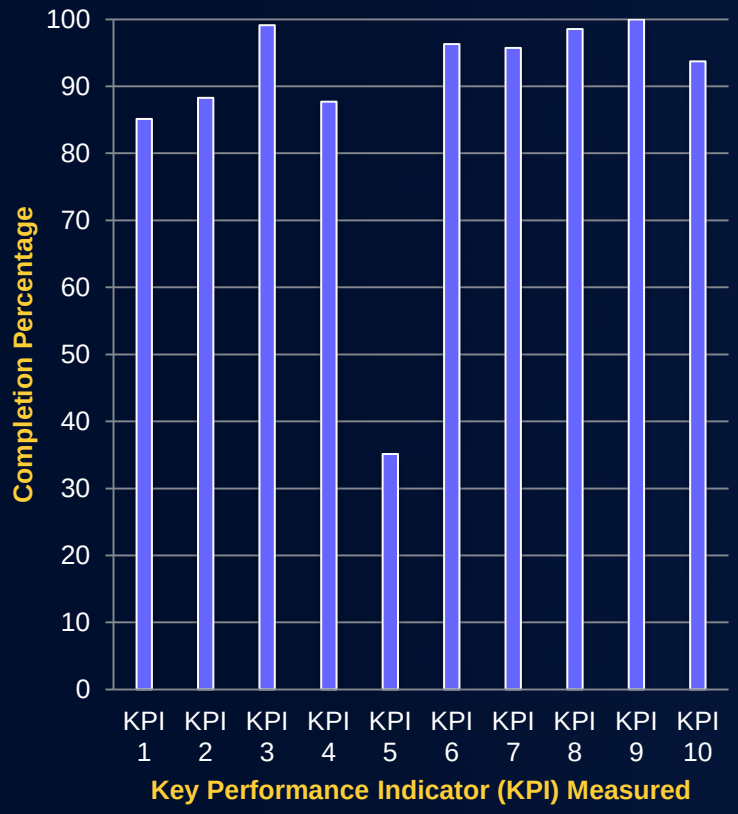
- Take all applicable studies from NK → Export to Excel and arrange randomly to give each study a number
- Use Sample Size online calculator[1] to determine appropriate sample size based on population for each study type
  - Aiming for 95% Confidence Level with 5% or smaller Confidence Interval
- Use Research Randomizer online tool[2] to determine which studies to review
- Review studies objectively
  - Analyze results
    - Department
    - Individual

1. MACORR [Internet]. Toronto(ON): MACORR Research Solutions Online; c2003-2017. [cited 2017 August]. Available from: http://www.macorr.com/sample-size-calculator.htm
2. Urbaniak, G. C., & Plous, S. (2015). Research Randomizer (Version 4.0) [Computer software]. Retrieved on August 1, 2017, from http://www.randomizer.org/

2015 Review of Studies - Results

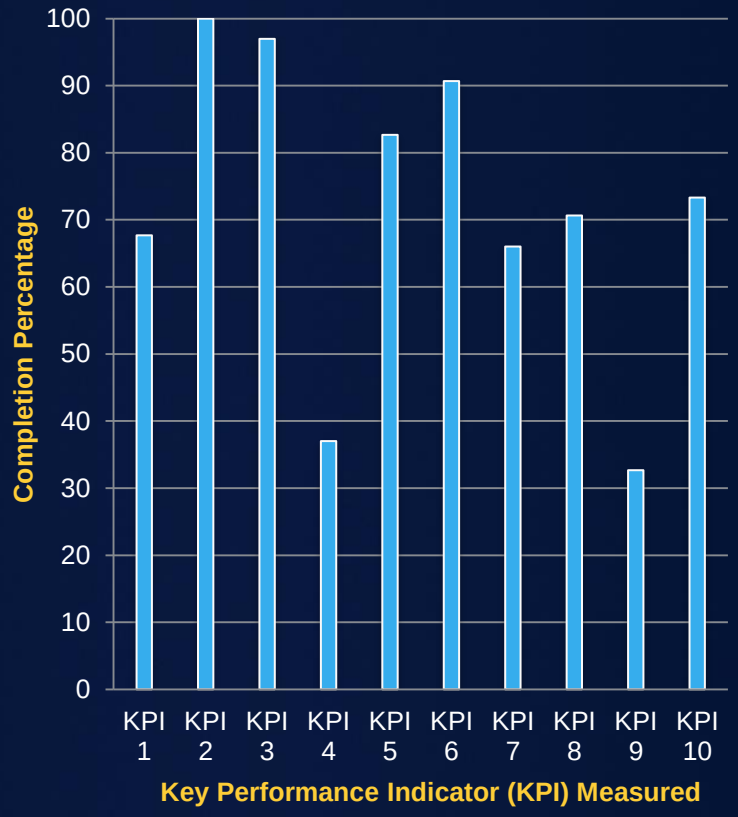
Short Term Studies: 88.0% Overall

350 out of 2664



LTM/cEEG: 71.8% Overall

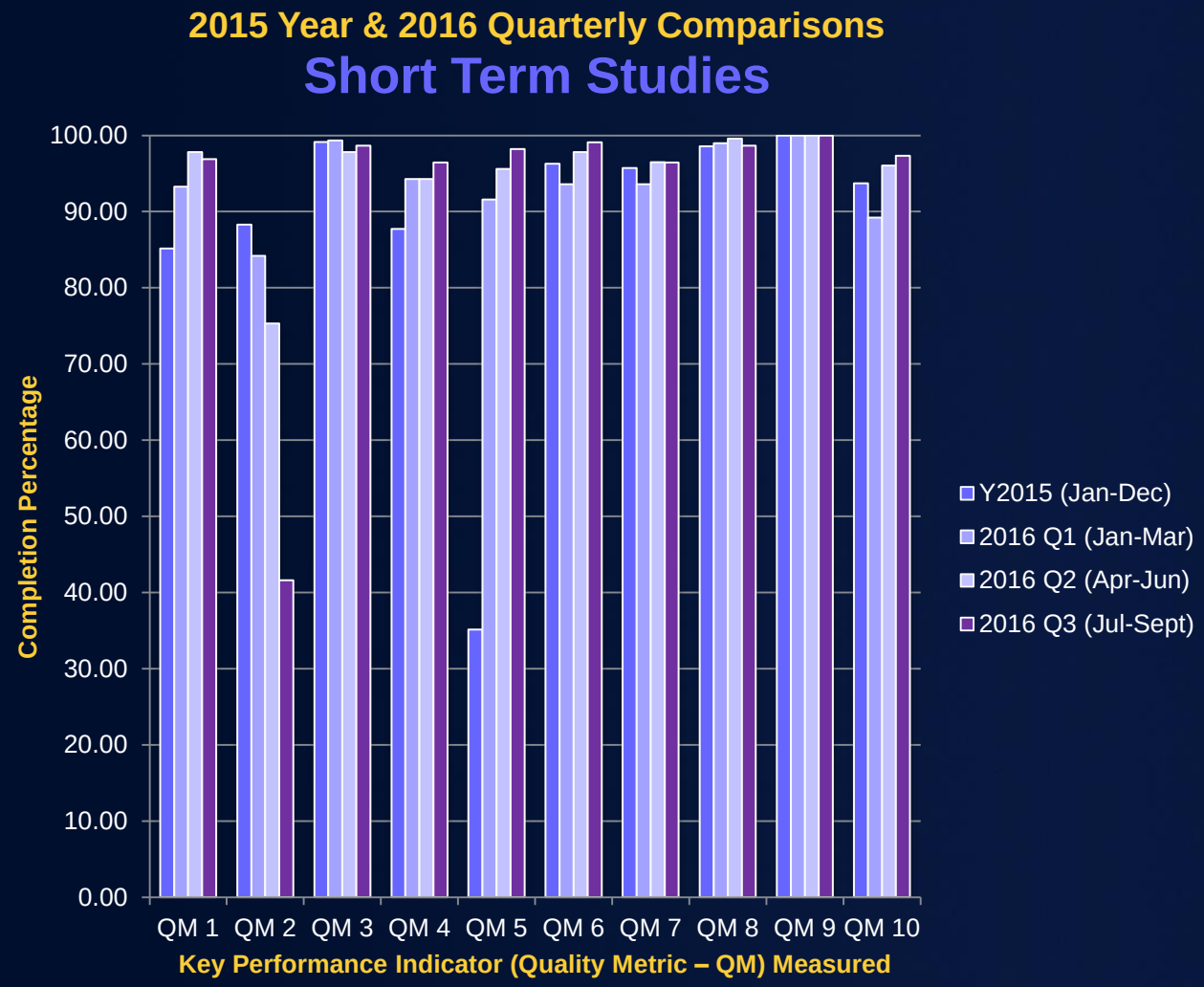
300 out of 1053 studies



Goal Setting

- Short Term Studies: 88.0% in 2015
  - Target Goal: 90%
- LTM/cEEG: 71.8% in 2015
  - Target Goal: 80%
- Review and Reassess every Quarter of 2016
- *Apply for & Achieve ABRET Lab Accreditation*

2016 Quarterly Results



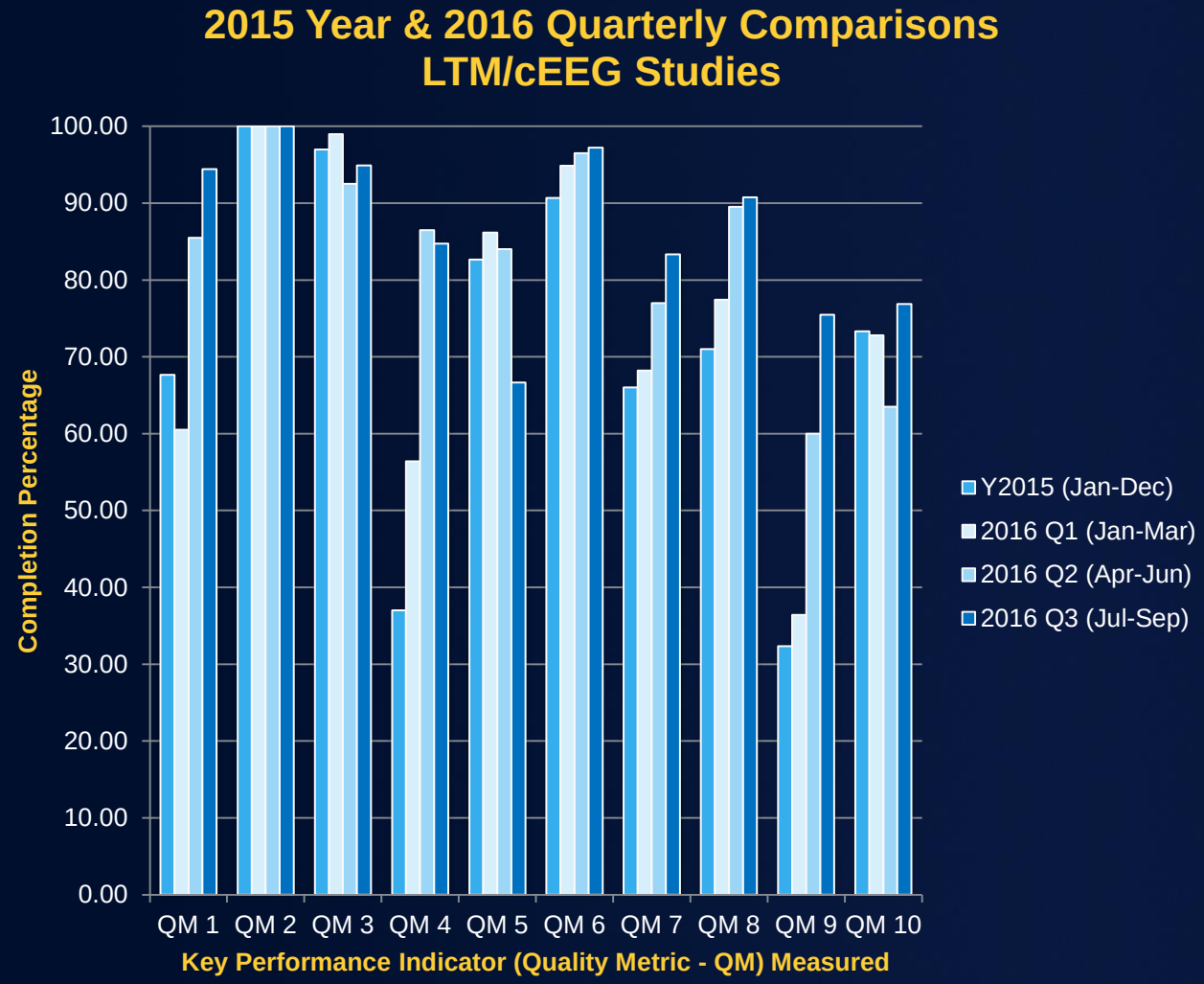
2015: 88.0%
Goal: 90%

2016 Q1: 93.8%
(n=298, N=553)
Goal: 95%

2016 Q2: 95.1%
(n=227, N=546)
Goal: 96%

2016 Q3: 92.3%
(n=226, N=535)
Goal: 96%

2016 Quarterly Results



2015: 71.8%
Goal: 80%

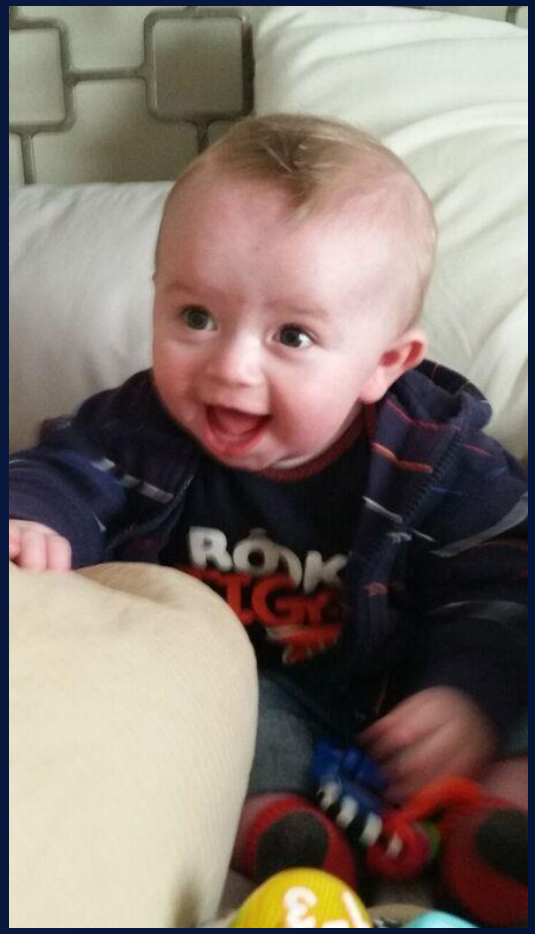
2016 Q1: 75.2%
(n=195, N=401)
Goal: 80%

2016 Q2: 83.5%
(n=200, N=400)
Goal: 85%

2016 Q3: 86.4%
(n=216, N=484)
Goal: 90%

2016 Quarterly Results – Q4???

2016 Quarterly Results – Q4???



How has this data affected our team

- Knowledge of KPIs and goal setting = RESULTS!
  - Team and individual “buy-in” was wonderful and key to success
- Increased morale and ownership of individual *and* team results
  - Core Values emphasized – Excellence, Teamwork, Accountability
- Incorporated individual results as performance review tool
  - Expectation of 85% completion percentage over all study types
- Bringing on new Ancillary hospitals into our system
  - Can assess differences in studies being performed at other facilities to stress need for standardization across our health system and for importance of EEG Tech run studies

How has this data affected our team

- Analyze results even further:
  - Month to month trends and explore correlations
  - Registered vs. non-registered
  - Years of experience & education
  - Days & Night Shifts
  - Inpatient & Outpatient studies
  - EEG Tech vs. RT/Cardio Techs
- Gained ABRET Lab Accreditation!!
  - LTM Accreditation is next!!
- Continued commitment to excellence in our field and most importantly to our patients!!

THANK YOU!