Linking PBRN Research and Big Data: The DARTNet Experience

Wilson D. Pace, MD, FAAFP
Director, AAFP National Research Network
CEO, DARTNet Institute
Disclosure Statement

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- Research Grants: Sanofi US, Shire, Mallinckrodt, Genova Diagnostics, Pfizer
- Stock: Pfizer, Novartis, GSK, Novo-Nordisk, Sanofi US, Merck
- No off label medication use will be discussed.
What is DARTNet?

- DARTNet is a collaboration of Practice-based Research Networks utilizing electronic health record data, claims data and patient reported outcome data from multiple organizations
  - Facilitates data collection/ aggregation using multiple constructs
    - Point of care from office staff/providers/patients
    - Ancillary data to the PCMH – fulfillment data, claims data, patient reported outcomes
DARTNet’s Mission

- To improve health and healthcare through data driven practice-based inquiry and collaborative learning
Data Leading the Way

- Research informed by local data
- Guides the study question
- Guides the study methods
- Guides the site selection
- Guides study assignment
- Guides implementation

- Changes the game!
Management of Patients with Skin and Soft Tissue Infections
AHRQ Contract # HHSA290 2007 10008

- Study goal: develop and test sustainable, guideline-consistent treatment strategies for CA-MRSA
- Data sources: EHR, Clinician Decision Making, Manual Chart Audit, Patient Outcomes (Specialty visit, ED visit, hospitalization) and Provider Evaluations
- All data sources linked for analysis
Demonstrated ability to study/improve acute problems

- Tracked 100% of soft tissue infections
- 3112 SSTI cases observed during the pre-intervention period (12 months/28 practices)
- 1406 cases during the intervention (8 months/16 practices)
- Increased use of MRSA antibiotics
- No change in outcomes
Provider Decision Making

- Interested in guideline related decisions
- Clinicians invited to evaluate certain SSTI cases via email
- Email links to internal website which displays patient information
- Internal website links to Online Evaluation
- Online Evaluation data linked back to de-identified EHR data
Provider Evaluation Overview

- 16 different clinical scenarios for clinicians to evaluate via “card” study
  - Child (yes or no)
  - Culture done (yes or no)
  - Procedure done (yes or no)
  - Antibiotics prescribed (yes or no)
- Nightly data feed allowed patient and clinician sorting and avoided collecting information already in EHR
Nuanced Decision Making

- Directed Chart Audit for antibiotic use post drainage
  - Procedures tracked
  - Antibiotics tracked
- Central chart audit for antibiotic indications following drainage
- Quickly able to collect data with single chart auditor across 16 practices in two states
Patient Outcomes

- All patients called on behalf of practice at 2 weeks
  - Other physicians seen for SSTI
  - Additional procedures (outside system)
  - ED visits
  - Hospitalizations
- Claims data could be used
  - 30 to 90+ days behind
- Clearly demonstrated limited impact of guidelines
Taking Research to Scale

- Kidney Disease Outcomes Quality Initiative (KDOQI) are a mixture of evidence based information and expert opinion
- Reproducibility of efficacy studies has been variable
- No trials that look at impact of implementing the entire set of guidelines
Cluster randomized trial to implement KDOQI guidelines in 40 primary practices through clinical decision support versus full TRANSLATE model

- Tracking all outcomes through EHR and claims data
- Currently just over 28,000 patients with CKD in the study expect ~35-40K
What Does Big Data Bring?

- Randomization done using baseline practice performance and characteristics
- Able to balance multiple criteria at once even with small groups of practices
- Historical data allows tailoring of academic detailing to each site if needed
  - Focus on diagnosis if not many F/U tests done
  - Focus on screening if low
  - Focus on interventions if Dx data available
Information Systems Support

- Clinical decision support at point of care
  - Adjust recommendations to new information or nuanced situations – high K⁺ and ACE/ARB
- Registries are highly desired
- Feedback reports at practice and clinician level
  - Missed opportunities reports work better than traditional quality metrics
Broad Array of Outcomes

- Intermediate outcomes
  - Increased screening
  - Improved diagnosis (less under and over)
  - Change in eGFR
  - Change in ACR

- Patient outcomes that matter
  - ESRD
  - Death – linkage to NDI
Adverse Outcomes

- Adverse effects
  - Number of individuals who develop hyperkalemia
  - Rate of Hip, forearm or clavicle fractures on and off ACE/ARB
  - Instances of acute renal failure
Cost Analysis

- Link claims data to clinical data
  - Difficult to obtain for full population
  - Can be costly depending on payer
  - May improve pick up for adverse events

- All of these outcomes require no additional data collection from patients or clinicians!
Enhanced PBRN Approaches

- Re-usable research laboratory
- Close working relationship between practicing clinicians and researchers
- Non-disruptive or minimally disruptive to clinical care data collection
- Point of care or near point of care data collection that can explore decision making at the patient level – requires communication method
Contact Information

- Wilson Pace, MD, FAAFP
  University of Colorado Denver
  Director, AAFP National Research Network
  CEO, DARTNet Institute
  Wilson.Pace@dartnet.info

- Deborah Graham, MSPH
  COO, DARTNet
  Debbie.Graham@dartnet.info