Wisconsin Healthcare-Associated Infections (HAIs)
in Long-Term Care Coalition

Infection Prevention and Control in Long-Term Care Conference
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Tracking and Using Antibiotic Utilization Data in NHs

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Objectives

• Why measurement is important
• Design principles
• Anticipated barriers
  – Ideas for making measurement more accessible in NHs
• Ideas for how these data might be used
  – Findings from research studies
Whack-A-Mole: A Predictable Result of Not Having a Plan

Adopting a Proactive Focus

- Reactive Focus: You focus the majority of your time and energy on external events and problems. You don’t take responsibility for your own situation.
- Change Your Focus: You begin focusing on the things within your control, and you start making a difference.
- Proactive Focus: You devote the majority of your time and energy to changing what is in your control. Your life improves and you stop blaming others.

Why Measurement Matters

To get started, you must have a destination.
Description of Current Process

- Great Man Theory: DON or ICP may be auditing prescribing events to assess their appropriateness

- There is no systematic way to look at overall prescribing patterns and processes that feed into the prescribing process
  - Interventions remain focused on the individual level
  - Facility decisions are guided by anecdote or the survey process

- Staff/Providers do not see the forest for the trees
  - At best: Not engaged in quality improvement process
  - At worst: Active resistors
Let’s Get Started

Measurement: Design Features

• Don’t collect data for data’s sake, data must be actionable

• Consistency and reliability are a must

• Helpful but potentially biased
  – Raw numbers (particularly when numerators are small)
  – Spot checks

• Better
  – Adjusted data (per 1,000 resident-days) are more meaningful and interpretable
  – Trending data over time
Measurement: Design Features

• Be careful about the round peg in the square hole phenomenon
  – Take advantage of existing sources of data but adapt if needed
  – Don’t be afraid to develop and trial your own collection instrument
  – Spend time getting your measures right

• Make sure your collection process is sustainable
  – Develop tools that allow you to outsource collection responsibilities
  – Develop tools that facilitate data entry
  – Develop training materials

Barriers to Measurement

• Antibiotic prescribing event is documented in many locations
  – Physician order
  – Resident health record
  – 24-hour report
  – MAR
  – Pharmacy database

• Documentation may be incomplete

• Charted in manner that is not amenable to quality improvement
Potential Solutions - 1

• Work with pharmacy to automate reports derived from pharmacy database

  – Data on new prescriptions is often obtainable
    • Days of therapy harder to get but potentially more useful
    • Defined daily dose may be more feasible and is better correlated with days of therapy

– Limitations
  • Not indication based
  • Does not address appropriateness
  • Duplications as result of dose changes (e.g., TMP/SMX DS two tabs → 1 tab) and class-switching (e.g., FQ → TMP/SMX) can result in over-estimate of utilization

Crnich et al. ID Week 2012. San Diego, CA
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**Potential Solutions - 2**

- Antibiotic order/event form
  
  - Standardizes the collection of data needed for quality improvement efforts
  
  - Order form can be completed by the prescribing provider, by the nurse taking the order, by the multi-disciplinary team reviewing the 24-hour report, by the consulting pharmacist
  
  - Limitations
    - Depends on others to complete the data
    - Requires secondary data entry (excel)
• Keep the form simple
• Design the form so it is quick and easy for staff to use
• Only collect the data you think you will need
• Educate staff on how to use the form, why the form is important, and leverage pharmacy support to develop quality assurance process (e.g., antibiotic filled by pharmacy but no antibiotic order/event form completed)
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<th>start</th>
<th>abx</th>
<th>class</th>
<th>indication</th>
<th>start</th>
<th>stop</th>
<th>days</th>
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<td>6/6/13</td>
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<td>1</td>
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<td>8/30/13</td>
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### Formulas:

- **Dropdown List**: Contents of this list are not specified in the image.
- **Sum**: `=G2 – F2` (sum of the difference between columns G and F).
- **Added at end of month**: This is a comment indicating that the values in columns G and F are added at the end of the month.

### Calculations:

- **Total Resident Days**: `=600.00`
- **Antibiotic Starts/1,000 res-days**: `=11.67` (results from division and multiplication as per cell formulas).
- **Proportion Appropriate**: `=0.57` (result of formula in cell).

The image also highlights cell formulas such as `=G2 – F2` and `=(B2/D13)*1000`, which are used to calculate various metrics related to antibiotic usage and patient days.
Potential Solution - 3

• Use infection control software solution
  – Few nursing home specific options exist (there is one being marketed in Wisconsin currently)
  – There may be an opportunity to leverage hospital EHRs/IC software for this purpose

Starting the Improvement Process

• Collect several months of data in a consistent manner before identifying goals
• Keep goals simple in the first year
• Pay attention to external influences (survey process) but don’t let them drive whole process
• It takes a village: get input from medical director, pharmacist, others
Choose Your Goal(s) Carefully

Pick the Right Measurement Tool

<table>
<thead>
<tr>
<th>Goal</th>
<th>Measure</th>
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<tbody>
<tr>
<td>Reduce unnecessary antibiotic use</td>
<td>Antibiotic Starts</td>
</tr>
<tr>
<td>Reduce days of antibiotic therapy</td>
<td>Days of Therapy</td>
</tr>
<tr>
<td>Reduce fluoroquinolone pressure</td>
<td>Antibiotic Starts / Days of Therapy</td>
</tr>
</tbody>
</table>
Pick the Right Measurement Tool: AS versus DOT

Diabetic Errors

- Poorly calibrated illness scripts
- Clinical uncertainty
- Poorly weighted risk aversion calculator
Diagnostic Errors

• Poorly calibrated illness scripts
  – Cognitive bias derived from an over-prioritization of signs/symptoms not supported by evidence
  – Counter-act with:
    • Passive: Interactive education (pre-, post-test)
    • Active: Clinical pathways

• Clinical uncertainty

• Poorly weighted risk aversion calculator
Diagnostic Errors

• Poorly calibrated illness scripts

• **Clinical uncertainty**
  – Clinical factors (non-modifiable)
  – Poor proxy assessments
  – Poor communication
  – Limited access to diagnostic testing

• Poorly weighted risk aversion calculator
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Standardized Assessment and Communication Tools (Modified INTERACT II?)

Loeb et al. JAMA 2006; 295(21): 2503-10
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Diagnostic Errors

- Poorly calibrated illness scripts

- **Clinical uncertainty**

- **Poorly weighted risk aversion calculator**
  - Over-estimation of patient/family dissatisfaction?
  - Biased estimates of resident susceptibility to adverse outcomes (i.e., hospitalization, death)?
  - Excessive discounting of consequences of antibiotic use (e.g., drug resistance, CDI, diarrhea)?
  - Absence of normative influences
Diagnostic Errors

• Poorly calibrated illness scripts
  • Clinical uncertainty

• Poorly weighted risk aversion calculator
  – Over-estimation of patient/family dissatisfaction?
  – Biased estimates of resident susceptibility to adverse outcomes (i.e., hospitalization, death)?
  – Concerns about consequences of antibiotic use (e.g., drug resistance, CDI, diarrhea) are overly discounted?
  – Absence of normative influences


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  – Concerns about consequences of antibiotic use (e.g., drug resistance, CDI, diarrhea) are overly discounted?
  – Absence of normative influences
    • Track and report back aggregate rates of antibiotic use for a variety of conditions (Abx for ASB, Abx for URTI, etc.)
    • Individual provider performance scorecards
Therapeutic Errors

① Inadequate spectrum during empiric phase of therapy
② Sub-optimal dosing
③ Sub-optimal duration
④ Failure to modify (expand or de-escalate)

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   a. Failure to account for facility patterns of resistance
   b. Failure to account for individual resident’s microbial and prescribing history
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Therapeutic Errors

① Inadequate spectrum during empiric phase of therapy
② Sub-optimal dosing
③ Sub-optimal duration
④ Failure to modify (expand or de-escalate)
   a) Mandatory 72-hour antibiotic/culture review
   b) Prospective audit & feedback

Doernberg et al. ID Week 2012; Abstract #765