iStewardship, Do you?
*Leveraging Technology to Enhance Stewardship*

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Disclosure

Nothing to Disclose

Objectives
- Review antimicrobial stewardship requirements and methods
- Identify and target key stewardship interventions
- Employ technology to facilitate/enhance stewardship activities
- Recognize the role of technology in stewardship sustainability
- Describe available resources for antimicrobial stewardship

Requirements
- California Department of Public Health
- Joint Commission Requirements (SCIP/Pneumonia)
- Veterans Health Administration (VHA) Directive
- Presidential Executive Order (Antibiotic-Resistance)
- Center for Medicaid Services (CMS) considering adding to infection control requirements (endorsed by CDC)

Hardware and Operating Systems

Necessary Hardware
- Infectious diseases provider
- Pharmacist trained in infectious diseases
- Infection control member/epidemiologist
- Microbiology laboratory member
- Informatics specialist
- Support of hospital leadership
Operating Systems

<table>
<thead>
<tr>
<th>Prospective Audit and Feedback</th>
<th>Restriction/Prior-authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Retro&quot;spective</td>
<td>Prospective</td>
</tr>
<tr>
<td>Gradual decline in usage</td>
<td>Immediate decline in usage</td>
</tr>
<tr>
<td>More durable</td>
<td>Less durable</td>
</tr>
<tr>
<td>Less collateral usage potential</td>
<td>More collateral usage potential</td>
</tr>
</tbody>
</table>

Task Manager

- Clinical decision support/ordering forms (firmware)
- Targeted interventions (software)
  - IV to PO
  - Dose optimization
  - Streamlining/duration of therapy
- Stewardship and antimicrobial education (upgrades)

Firmware should (be)....

- Simplified
- Non-interruptive to end user
- Designed to complement workflow
- Minimize manual data entry
- Avoid therapy delays
- Support auxiliary needs (e.g. laboratory tests)
- Maximize compliance with local and national guidelines

Example Clinical Decision Support Targets

- Pneumonia
- Febrile neutropenia
- Clostridium difficile
- Urinary tract infection
- Sepsis
- Surgical prophylaxis

Strongly Consider Committee Approval
Order Forms

- Guide appropriate antimicrobial prescribing
- Dose/route/frequency limitations
- Automatic dose calculation/dose range checking*
- Preselection of items in sets/menus

- Include mandatory fields that enhance/facilitate stewardship
- Indication
- Stop date/time
- Restrictions
Clinical Reminders
- Alerts that fire based upon a clinical event such as:
  - Duration of an intervention
  - Laboratory/culture results
  - Demographics
- Provide a diversified audience
  - Providers
  - Nursing
  - Infection Control
  - Pharmacy

Urinary catheter duration
Antimicrobial duration
Isolation precautions
Immunizations

Other Tactics
- Limit ordering to desired form or menu/set
- Embed ordering pathway into other sets/menus
- Remove antimicrobial(s) from the general order browse
- Pop-ups or dialogue boxes in ordering pathways

Firmware Limitations
- Require significant planning and development time
- Testing is required in advance of rollout
- Routine updates and maintenance required to prevent breaks
- Provider resistance to adoption/usage
Software

Software should (be)....
- Simplified
- Designed to compliment workflow (but will probably disrupt it)
- Minimize manual data entry
- Interfaced with or part of the order entry/chart system
- Target specific interventions in “real time”
- Support documentation of actions

Example Software Targets
- Targeted drug audits
- IV to PO
- Dose optimization
- Streamlining
- Bug-drug mismatches
- Infection control flags
- Intervention tracking
- Antimicrobial consumption

Local System Features: Patient Lists
- User defined and locally created
- Ability to target one or multiple agents
- Automatically populate based upon pharmacy orders
- Do not require active intervention (can be used “PRN”)
  *May be cumbersome to build*

Local System Features: Automatic Consults
- Available in some systems – integrated into pharmacy module
- Identify and facilitate documentation of interventions
  - IV to PO
  - Renal Dosing
  *May result in alert fatigue*

Local System Features: Reporting
- Queried on demand or automatically
- Display added features (start/stop time; ordering provider; DOT)
- Can often be exported to excel
  *May require special build by informatics*
  *May require significant manipulation*
Integrated Support Systems

- Extract data from sections of the chart
- Identify interventionsalerts for specific patients
- Can be tailored to reviewing personnel
- Frequently web-based with unique user access
- Multiple layers of user access and local administrators

Example Integrated Support Systems

- MedMined
- QC Pathfinder
- SafetySurveillor
- Senti7
- Theradoc
- Vigilanz

Special Feature: Alert Complexity

- Multiple, specific targets
  - Demographic
  - Renal/hepatic function change
  - Class/coverage duplications
  - Microbiology and therapy
  - Resistant organisms
- Unique alert mechanisms
  - Email
  - Pager
  - Text?
- Facilitation of consumption tracking with available reports

Software Limitations

- May require additional systems at a price (and contracts)
- Often manual processes
- Interface requires validation and patching
- Can disrupt workflow and be inefficient

Upgrades

Toolbars

- Local guidelines
- Criteria for use documents
- Dosing charts
- Calculators
- Regulatory documents
**Stewardship Websites**

- Educational resources
- Guidelines
- Pocket cards/algorithms
- Antibigram(s)
- News feeds/memos
- Stewardship team members

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**Applications**

- Over 12,000 medical apps exist
- Range in category and practitioner focus
- Many are free
- Unique categories other than dosing and drug information

**Caution:** may not be accurate/reliable or developed by a healthcare provider

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**App Examples**

- **Education**
  - idPodcast
  - Blausen Human Atlas Life
- **News and References**
  - Journal Articles
  - MedPage
- **Epidemiology**
  - iScrubLite
  - HealthMap: Outbreaks Near Me
- **Diagnosis**
  - Isabel
Social Media
- Dissemination of ID/stewardship literature and information
- Outbreak and clinically significant disease tracking in real time
- Institution specific educational materials
- Connect with ID colleagues internationally
  - Individuals, institutional and/or organizational/society

Caution: Patient Privacy Violations

Marketing and Branding
- Pens/pencils
- Buttons
- Lanyards
- Pocket cards

The future: patient simulation technology?

Other Resources
- Isabel Symptom Checker (differential diagnosis teaching)
- Joint Commission Antimicrobial Stewardship Toolkit
- CDC Core Elements for Hospital Antimicrobial Stewardship Programs
- California Department of Public Health Stewardship Program Toolkit

Conclusions
- Be kind to informatics – you will need them
- Technology should be used to compliment stewardship activities
- Multiple simultaneous modalities may be needed
- Fully scrutinize all initiatives through multiple levels
- Do not discount the power of social media

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