Nurse Prescribing: Key Principles and Developments

Elissa Ladd, PhD, FNP-BC
MGH Institute of Health Professions
Boston, Massachusetts
USA
No disclosures to report
Objectives:

1) To provide an overview of rational (appropriate) prescribing

2) To analyze key factors that support rational prescribing

3) To apply rational prescribing principles via case study

4) To provide an overview of new findings related to nurse prescribing
Rational Prescribing

Definition:

The rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, and at the lowest cost to them and their community.

WHO conference of experts Nairobi 1985
Factors that Influence the Use of Medicines/
Rational Prescribing

Adapted from: Weerasuriya (2012). WHO: Essential Medicines and Health Products
Drug Information: Evidence Based vs. Non Evidence Based

Not all information sources are reliable!!

Evidence Based Information:

But do we have the time and expertise to evaluate the information that we use?
Evidence Based Sources of Information (pre-appraised)

1) Cochrane Library

- Over 4000 drug reviews
- Objective: to improve healthcare decision-making globally, through systematic reviews of the effects of healthcare interventions
- Relies on grants and does not take “conflicted funding”
- **FREE**
Evidence Based Sources of Information (pre-appraised)

NICE National Institute for Health and Care Excellence

NPS MedicineWise

DynaMed

UpToDate

Lexicomp

MICROMEDEX Drug Information

NATIONAL GUIDELINE CLEARINGHOUSE

BMJ Best Practice

FREE
Non-Evidence Based Sources of Information

• Google
• Wikipedia
• Drug company information

• Pharmaceutical sales representatives
  • Rarely inform of adverse side effects (Mintzes et al., 2013)
  • Encouraged less adherence to scientific guidelines (Muijrs et al., 2005)
  • Associated with lower prescribing quality (Spurling et al., 2010)(systematic review)

May reveal relevant information but the prescriber will need to know how to detect bias (Day, 2016)*

1 in 3 prescriptions for antibiotics in the US are unnecessary (CDC, 2016)

Erik Dunham, NPR/U.S. Food and Drug Administration
Global antibiotic consumption: 2015

Eili Y. Klein et al. PNAS 2018;115:15:E3463-E3470
http://www.pnas.org/content/115/15/E3463/tab-figures-data
Change in Defined Daily Dose/Day: 2000-2015

Eili Y. Klein et al. PNAS 2018;115:15:E3463-E3470
http://www.pnas.org/content/115/15/E3463/tab-figures-data
Human Consumption of Antibiotics (OECD)

![Graph showing antibiotic consumption levels for various countries]

**Antibiotic consumption level 2014**
Defined daily dose per 1000 inhabitants per day

**Antibiotic consumption level 2005**
Defined daily dose per 1000 inhabitants per day

Note: Antibiotic consumption levels measured in defined daily dose (DDD) per 1000 inhabitants per day. The DDD is defined as the assumed average maintenance dose per day for a drug used on its main indication in adults.

Data from 2014 (or latest available data) and 2005.

*Includes hospital data

Source: Unless specified the data is from the EARS-Net database.
*Data direct from country

OECD, 2016.
NP and MD Prescribing of Antibiotics

• Advanced practice clinicians (NPs, PAs): 15% more likely to prescribe an ABX than a physician for common upper respiratory infections (Schmidt, Spencer, & Davidson, 2018)

• NPs and PAs prescribed more ABX than MDs for acute upper respiratory infections (61% vs 54%)(Sanchez et al., 2016)

• NPs/PAs and MDs provided equivalent number of inappropriate ABX prescriptions (Mafi, Wee, Davis, & Landon, 2016)

• NPs rate of prescribing ABX for acute upper respiratory infections was equivalent to that of MDs (aprx. 50%) (Ladd, 2005)
Rates remain high for inappropriate prescribing of antibiotics

Share of patients diagnosed with upper respiratory infection who were given an antibiotic prescription. Nurse practitioners are slightly less likely than physicians to prescribe inappropriately.

Source: athenahealth
Sample: Roughly 1.5 million primary care appointments in 2014 – 2017 with a primary or secondary diagnosis of upper respiratory infection deemed inappropriate for antibiotics, for 1 million patients, seen by 4,700 providers in departments active on the athenahealth network since 2013.
Do you think that it is the responsibility of the physician to reduce unnecessary antibiotic use?

**CROSS-COUNTRY ANALYSIS**

93% of the healthcare professionals surveyed in the **UK, Germany, France, Spain, and Italy** think that it is the responsibility of the physician to reduce unnecessary antibiotic use. Spanish and Italian respondents, at 95%, are the most supportive of this view. Conversely, with 85% in favour, French doctors are the least supportive.

Source: Information extracted from an internal survey conducted amongst 7,899 M3 members in the UK, France, Italy, Spain, and Germany.

[https://m3globalresearch.blog/tag/canada/](https://m3globalresearch.blog/tag/canada/)
Antibiotic Stewardship

- Coordinated interventions designed to improve and measure the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration.

Infectious Disease Society of America (IDSA)
Key Elements of Antibiotic Stewardship

**Commitment**
Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.

**Action for policy and practice**
Implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed.

**Tracking and reporting**
Monitor antibiotic prescribing practices and offer regular feedback to clinicians, or have clinicians assess their own antibiotic prescribing practices themselves.

**Education and expertise**
Provide educational resources to clinicians and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.

CDC (2018)
https://www.cdc.gov/antibiotic-use/community/improving-prescribing/core-elements/core-outpatient-stewardship.html
Clinician Checklist

**COMMITMENT**
1. Can you demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety related to antibiotics?
   - Yes
   - No
   - If yes, indicate which of the following are in place (select all that apply):
     - Write and display public commitments in support of antibiotic stewardship.

**ACTION**
2. Have you implemented at least one practice to improve antibiotic prescribing?
   - Yes
   - No
   - If yes, indicate which practices you use. (Select all that apply.)
     - Use evidence-based diagnostic criteria and treatment recommendations.
     - Use delayed prescribing practices or watchful waiting, when appropriate.

**TRACKING AND REPORTING**
3. Do you monitor at least one aspect of antibiotic prescribing?
   - Yes
   - No
   - If yes, indicate which of the following are being tracked. (Select all that apply.)
     - Self-evaluate antibiotic prescribing practices.
     - Participate in continuing medical education and quality improvement activities to track and improve antibiotic prescribing.

**EDUCATION AND EXPERTISE**
4. Do you provide education to patients and seek out continuing education on antibiotic prescribing?
   - Yes
   - No
   - If yes, indicate how you provide antibiotic stewardship education. (Select all that apply.)
     - Use effective communications strategies to educate patients about when antibiotics are and are not needed.
     - Educate about the potential harms of antibiotic treatment.
     - Provide patient education materials.

CDC (2018)
Out-Patient Facility Checklist

CDC (2018)
https://www.cdc.gov/antibiotic-use/community/improving-prescribing/core-elements/core-outpatient-stewardship.html
OECD Policies

<table>
<thead>
<tr>
<th>Policy Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid diagnostic tests available nationwide</td>
<td>40 %</td>
</tr>
<tr>
<td>Guidelines on the rational use of antimicrobials for prophylaxis nationwide</td>
<td>60 %</td>
</tr>
<tr>
<td>Strategies to rationalise the use of antimicrobials</td>
<td>60 %</td>
</tr>
<tr>
<td>Guidelines on the rational use of antimicrobials for treatment nationwide</td>
<td>73 %</td>
</tr>
<tr>
<td>Implemented antimicrobial stewardship programmes</td>
<td>84 %</td>
</tr>
<tr>
<td>Monitoring system in place for antimicrobial consumption</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Note: 29 OECD countries responded to the questionnaire.
Nursing and Antibiotic Stewardship

Redefining the Antibiotic Stewardship Team:
Recommendations from the American Nurses Association/Centers for Disease Control and Prevention Workgroup on the Role of Registered Nurses in Hospital Antibiotic Stewardship Practices
Effective Date: 2017

https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf
Good Nursing Is Good Antibiotic Stewardship

Successful stewardship depends on nurses’ ongoing vigilance.

ABSTRACT
Resistance to antibiotics has increased dramatically in the United States, with serious associated medical, social, and economic consequences. The most promising approach to this national crisis is a new understanding of the need for the careful and responsible use of antibiotics, both for the benefit of society and for the optimal care of each patient. This multidisciplinary approach, called antimicrobial stewardship, has typically involved specialists but not necessarily nurses, who perform numerous antibiotic-related activities daily and should be an integral part of antimicrobial stewardship programs. In this article, we use patient examples to review several stewardship activities and illustrate how nurses are essential to the appropriate use of antibiotics.

Keywords: antibiotic resistance, antimicrobial stewardship, infectious disease, nursing stewardship

Case Study:

Mrs. Silva : 67 yr. old female
CC: “My urine is burning for the past 2 days”
HPI: c/o burning, frequency for 2 days with overall sense of malaise. Denies fever or abdominal pain.
PMH: Type II DM, HTN, recent hx of bronchitis(treated with a fluoroquinolone (4\textsuperscript{th} gen.). She finished her medication 14 days ago.
Meds: metformin 500 mg BID, lisinopril 20 mg QD.
NKDA
Objective:
PE non-contributory

Labs: urine: leukocyte esterase +, nitrite +

Dx: Acute UTI
1) Was her treatment with a quinolone antibiotic appropriate?

2) What risk factors for additional disease would you consider for Mrs. Silva?

3) What class of antibiotic would you prescribe for Mrs. Silva?
FluoroquinoloneWarnings:

- Tendon rupture
- Hypoglycemia (leading to coma)
- Mental health SE: attention, agitation, confusion, memory impairment, delirium
- Irreversible peripheral neuropathy
- QT prolongation

Risks outweigh the benefits for uncomplicated infections (FDA, 2018)
Trends in Nurse Prescribing

Trends in Nurse Prescribing

- LAC: Columbia, Brazil, Mexico – post basic prescribing

- Europe: Spain 2017: Royal Decree of 2015 was clarified and nurse prescribing to move forward.

- Africa: Nurse Initiated and Managed Antiretroviral Therapy (NIMART)

- Singapore: APNs received prescriptive authority (+ pharmacists)- Collaborative Prescribing Practitioners program (CPP)
Thank you!!