

LTC Antibiotic Stewardship: Preventing a 'Harms' Race



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Objectives

1. Describe the infection preventionist role with antibiotic stewardship.
2. Discuss how nursing can augment antibiotic stewardship efforts.
3. Analyze the antibiotic ordering process in the nursing home setting.
4. Recognize the importance of accurate information during care transitions.

Disclosures



APIC/SHEA/SIDP Antimicrobial Stewardship Position Paper
 Antimicrobial stewardship and infection prevention—leveraging the synergy: A position paper update 

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Patient Fears

1. Infection
2. Incompetence
3. Death
4. Cost
5. Mix-ups
6. Needles
7. Rude doctors and nurses
8. Germs

APIC/CDC POSITION PAPER

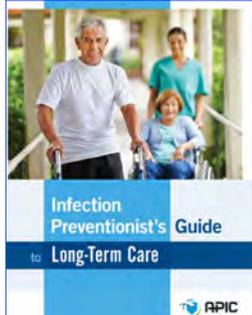
Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria

Nimalee D. Shiao, MD¹, Mohammad A. Ashraf, MD², Jennifer Calder, PhD³, Christopher J. Crank, MD⁴, Kate Conahan, MD⁵, Paul E. Dinkins, MD⁶, Corinne V. Gonsky, MD⁷, Marlene Johnson-Deeken, MD⁸, Edith Lamberth, MD⁹, Mark Lusk, MD¹⁰, Teresita MacCarrilli, PhD¹¹, Florio N. Matali, MD¹², Lisa Maib, MD¹³, Joseph M. Seltman, MD¹⁴, Lindsay E. Nicolle, MD¹⁵, Mary-Clare Waghman, MD¹⁶, Steven J. Schweon, MSN¹⁷, Andrew S. Jones, MD¹⁸, Philip W. Smith, MD¹⁹, Kurt B. Stevenson, MD²⁰, Suzanne J. Bradley, MD²¹

¹ for the Society for Healthcare Epidemiology Long Term Care Special Interest Group²

(Use the commentary by Shiao, on pages 170-180.)
 Infection surveillance definitions for long-term care facilities (ie, the McGeer Criteria) have not been updated since 1991. An expert consensus panel modified these definitions on the basis of a systematic review of the literature. Significant changes were made to the criteria defining urinary tract and respiratory tract infections. New definitions were added for nosocomial gastroenteritis and Clostridium difficile infections.

JAMA General Intern Med. 2012;38(10):665-671.





Background



- Daily, 10,000 people turn 65 years of age¹
- 15.6 million nursing homes; 70% for profit²
- 1.7 million licensed beds; 1.4 million residents (2014)²

1. AMDA News, March 2, 2018

2. CDC. Nursing Home Care. <https://www.cdc.gov/nchs/fastats/nursing-home-care.htm>

Background



- Over 1.5 million residents live in the 16,000 nursing homes in the U.S.
- Approximately 2 million infections per year
- UTI/respiratory/skin and soft tissues infxs most common
- Infection point prevalence: 0% to 32.4%

Montoya A and Mody L. Common infections in nursing homes: A review of current issues and challenges. *Aging Health*. December 2011.

Background



- Infections¹:
 - Elevated rates of morbidity and mortality
 - Re-hospitalization
 - Extended hospital stay
 - Substantial healthcare costs
- Each resident will average 1-3 infections per year²

1. Montoya A and Mody L. Common infections in nursing homes: A review of current issues and challenges. *Aging Health*. December 2011.

2. Zimmerman S et al. Nursing home facility risk factors for infection and hospitalization: Importance of registered nurse turnover, administration, and social factors. *Journal American Geriatric Society* 50:1987-1996, 2002

Background



- Infection risk factors:
 - Indwelling devices
 - Recent acute care facility admission
 - Functional impairment
 - Multiple comorbidities e.g. DM, cardiac, pulmonary, etc.

Montoya A and Mody L. Common infections in nursing homes: A review of current issues and challenges. *Aging Health*. December 2011.

Background



- Emotional stress for the resident and family
- Potential heavier work burden for nursing, pharmacy
- Elevated infection rates with unfavorable public perception

Background



- 22% Medicare beneficiaries in a post-acute SNF had at least one adverse event during their stay
- Adverse event = harm as a result of medical care.
- Polypharmacy is associated with adverse drug events

DHHS. Adverse events in Skilled Nursing Facilities. 2011. <https://oig.hhs.gov/oas/reports/oei-06-11-00370.pdf>

Background



- Infection represented 26% of the adverse events:
 - Aspiration pneumonia (10%)
 - Surgical site infection associated with wound care (5%)
 - CAUTI (3%)
 - *C. difficile* (3%)
 - Other infection events (5%)

DHHS. Adverse events in Skilled Nursing Facilities. 2011. <https://oig.hhs.gov/oas/reports/oei-06-11-00370.pdf>

CMS Manual System	Department of Health & Human Services (DHHS)
Pub. 100-07 State Operations	Centers for Medicare & Medicaid Services (CMS)
Provider Certification	Date:
Transmittal 169- Advanced	Copy:

F881
§483.80(a) Infection prevention and control program.
The facility must establish an infection prevention and control program (IPCP) that must include, at a minimum, the following elements:

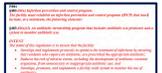
§483.80(a)(3) An antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use.

INTENT
The intent of this regulation is to ensure that the facility:

- Develops and implements protocols to optimize the treatment of infections by ensuring that residents who require an antibiotic, are prescribed the appropriate antibiotic;
- Reduces the risk of adverse events, including the development of antibiotic-resistant organisms, from unnecessary or inappropriate antibiotic use; and
- Develops, promotes, and implements a facility-wide system to monitor the use of antibiotics.

Effective November, 2017

Gap Analysis



F-tag 881	Current process	Improvement opportunities
The antibiotic stewardship program protocols shall describe how the program will be implemented and antibiotic use will be monitored, consequently protocols must:		
Be incorporated in the overall infection prevention and control program;		
Be reviewed on an annual basis and as needed;		
Contain a system of reports related to monitoring antibiotic usage and resistance data. Examples may include the following:		

Background



- Antibiotics are among the most frequently prescribed medications in LTCFs.¹
- Up to 70% of LTC facility residents will receive an antibiotic every year¹; 40-75% may be inappropriate² (used for clinical changes *not* due to infection)



¹ CDC. The core elements of antibiotic stewardship for nursing homes. 2015.
² CDC. Antibiotic use in nursing homes. Available from <http://www.cdc.gov/getsmart/healthcare/learn-from-others/facilities/nursing-homes.html>. Accessed March 24, 2014.

Antibiotics



- A BP medication does not impact the other residents
- Antibiotics are the only medication that impact other residents:
 - Potential for transmitting antibiotic resistant organisms to others
 - *C. difficile* environmental contamination and transmission

Background



- Prescribers, pharmacist may not be consistently available onsite.
- Nursing has a strong impact with prescribing.
- Families and residents play a key role with decision making.
- Limited access to technology, ID expertise.
- Residents may be complex, difficult to assess

Background

- Diagnosis may be incorrect
- Antibiotic agent may not be agent of choice
- Dosing may be incorrect
- Duration of therapy is prolonged
- Abxs not adjusted based on clinical condition, laboratory results
- Incomplete prescriber documentation e.g. the 3 am telephone order

Harms



- Potential risk for unnecessary harms:
 - Anaphylaxis e.g. Penicillin
 - Side effects e.g. nausea, vomiting, *C. difficile* diarrhea
 - Adverse drug interactions e.g. Levofloxacin/warfarin

Harms



- Potential risk for unnecessary harms:
 - Neurotoxicity e.g. seizures, encephalopathy
 - Microbiome changes leading to *C. difficile*; (Collection of cells, genes from bacteria, viruses that provides vitamins, protects against pathogens, stimulates immune system).

The Bug Problem in Nursing Homes

Elderly residents are 'especially susceptible' to drug-resistant infections, researchers say.

By Lucette Lagnado

Updated May 15, 2017 11:41 a.m. ET

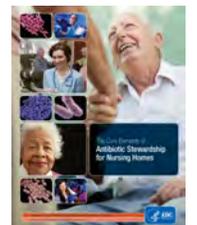
There's a bug problem in some nursing homes, and it's not what you think.

Residents of long-term care facilities are vulnerable to drug-resistant infections known as superbugs and can easily spread the deadly germs to others.

Between 11% and 59% of nursing-home residents have been "colonized" with certain types of superbugs, putting them at more



What is Antibiotic Stewardship?



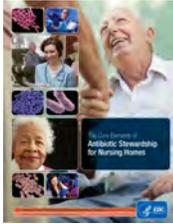
"...refers to a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use."

<https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html>

What is Antibiotic Stewardship?

- Leadership commitment
- Accountability
- Drug expertise
- Action
- Tracking Reporting
- Education

<https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html>



Antibiotic Stewardship

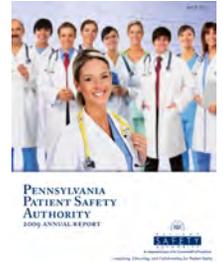
- Improve safety, reducing harm by:
 - Increasing infection cure rates/less treatment failures, less additional abxs
 - Reducing treatment failures
 - Correctly prescribing for therapy e.g. duration
 - Decreasing diagnostic, laboratory testing
 - Placing onus on optimal resident outcomes

Antibiotic Stewardship

- Improve safety by:
 - Reducing *C. difficile* infection rates
 - Promoting an antibiotic timeout after 48-72 hours
 - Saving money

Antibiotic Stewardship

- Public perception of nursing homes with increased infection rates.



Antibiotic Stewardship: Prescriber Perspective

- Large number of antibiotic options
- Can be difficult to choose due to medication and infection complexity
- Potential for minimal antibiotic education, beyond the pharmaceutical sales representative
- Not able to be onsite and assess

Antibiotic Stewardship: Prescriber Perspective

- Antibiotic reasons:
 - Predicated on the nurses' description e.g. 'the story'
 - Better safe than sorry/just in case e.g. frail resident
 - May not trust nursing care e.g. agency nurse, or diagnostics

Antibiotic Stewardship: Prescriber Perspective

- Antibiotic reasons:
 - Controversial for end of life, hospice care; despite “comfort care” abxs prescribed¹
 - Relieve physician suffering e.g. need to do something
 - No infectious diseases physician support
 - Placate a demanding family/nursing home staff-
fear of litigation

1. Thompson et al. Antimicrobial use at the end of life among hospitalized patients with advanced cancer. Am J Hosp Palliat Care 2012;29:599-603

Antibiotic Stewardship: Prescriber Perspective

- Antibiotic reasons:
 - Lack of rapid lab and radiology support
 - Not trusting lab results e.g. false negatives
 - Avoid a nursing home visit

Antibiotic Stewardship: Prescriber Perspective

- “Prescribing etiquette”¹:
 - Exempt from following policy/guidelines due to autonomy, experience
 - Prescribers adjust to prevailing practice e.g. physician extenders following their attending
 - Noninterference; will not interfere with colleague prescribing

1. Charan E et al. CID. 2013;57

Proton Pump Inhibitor (PPI) Stewardship

Use of Proton Pump Inhibitors and Other Acid Suppressive Medications in Newly Admitted Nursing Facility Patients

Chahene M. Glew, BM, BS, CMD, and Russell J. Rander, MD

Introduction: Many patients are not only prescribed proton pump inhibitors (PPIs) or other acid-suppressive medications (ASMs) during their hospital stay, but are discharged to the nursing facility on these medications. We wanted to quantify the amount of acid-suppressive prescription in new admissions, and how many patients had diagnoses that would justify their use.

Methods: A chart review of 98 admissions to a 128-bed for-profit nursing facility in Pennsylvania was performed to assess how many patients were transferred

ist, totaling 64.3% prescribed acid suppression therapy. Only 30 patients (50%) had an appropriate diagnosis in their medical record justifying prescription of an ASM based on our criteria. In addition, 3 (3.1%) of 98 patients had a qualifying diagnosis in their medical records, but were not on PPI or H₂ receptor antagonists on admission to the SNF.

Conclusion: Many patients admitted to an SNF may be prescribed acid-suppressive therapy with no clear indication. Inappropriate use of PPI therapy should be

Barriers

- Generally, people don't like to be told:
 - Their diagnosis is wrong
 - Their treatment choice is wrong
 - They must re-assess the resident after 48-72 hours
 - Their assessment skills and documentation needs to be updated
 - Just do it because it's a mandate

Barriers

- May lack necessary personnel
- Funding
- Few published studies addressing optimal LTC abx stewardship
- Multiple competing priorities

Barriers

- Social belief e.g. abx stewardship not valued as important
- Disagreement, lack of confidence with guidelines/expert opinion; past experience, expertise are more meaningful

WHITE PAPER



**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

Antibiotic Stewardship: Nursing Implications



- Administering antibiotics on time
- Monitoring the resident's condition while on therapy
- Notifying the medical team of culture and laboratory results
- Continuum of care and accurate communication

Antibiotic Stewardship: Nursing Implications



- Resident and family education



Antibiotic Stewardship: Nursing Implications



- Resident and family education
- Antibiotic prevention:
 - Practicing infection prevention
 - Avoiding catheters, invasive devices
 - Promoting immunization
 - Preventing skin breakdown



Antibiotic Stewardship: Nursing Implications

- Assessing for abx allergy
- Identifying a Multi-drug resistant organism (MDRO) hx/Initiating isolation precautions
- Timely obtaining cultures/antibiotic matching with the sensitivity
- "Watchful waiting"... "Careful observation"... "Active monitoring"

Active Monitoring

Residents with non-specific or mild symptoms, due to multifactorial etiology, who don't meet criteria for abx therapy:

- Hydration
- Medication review
- Restful sleep
- Repositioning
- Incontinence assessment

Active Monitoring

Residents with non-specific or mild symptoms, due to multifactorial etiology, who don't meet criteria for abx therapy:

- Evaluate for cardiac, renal, metabolic problems
- Depression assessment
- Carefully monitor vital signs

Communicate with resident and family!

Template for an Antibiotic Stewardship Policy for Post-Acute and Long-Term Care Settings

Robin L.P. Jump MD, PhD^{a,b,*}, Swati Gaur MD, MBA, CMD^c, Morgan J. Katz MD^d, Christopher J. Crnich MD, PhD^{e,f}, Ghinwa Dumyati MD^g, Muhammad S. Ashraf MBBS^h, Elizabeth Frentzel MPHⁱ, Steven J. Schweon RN, MPH, MSN, CIC, HEM^j, Philip Sloane MD, MPH^k, David Nace MD, MPH, CMD^l on behalf of the Infection Advisory Committee for AMDA—The Society of Post-Acute and Long-Term Care Medicine

^a Geriatric Research Education and Clinical Center (GRECC), Specialty Care Center of Innovation and Infectious Disease Section, Louis Stokes Cleveland Veterans Affairs Medical Center (VAMC), Cleveland, OH

^b Division of Infectious Diseases and HIV Medicine, Department of Medicine and Department of Population and Quantitative Health Sciences, Case

One-stop shopping for your policy needs!

Suspected UTI SBAR

Complete this form before contacting the resident's physician: Date/Time _____

Nursing Home Name _____
Resident Name _____ Date of Birth _____

A. Assessment Input (check all boxes that apply)

<p>Resident WITH indwelling catheter: The criteria are met to initiate antibiotics, if one of the below are indicated:</p> <p>No Yes</p> <p><input type="checkbox"/> Fever of 100°F (38°C) or repeated temperatures of 99°F (37°C)*</p> <p><input type="checkbox"/> New back or flank pain</p> <p><input type="checkbox"/> Acute pain</p> <p><input type="checkbox"/> Rigors / shaking chills</p> <p><input type="checkbox"/> New dramatic change in mental status</p> <p><input type="checkbox"/> Hypotension (significant change from baseline BP or a systolic BP <90)</p>	<p>Resident WITHOUT indwelling catheter: (Criteria are met if any of the three situations are met.)</p> <p>No Yes</p> <p><input type="checkbox"/> OR</p> <p><input type="checkbox"/> 1. Acute dysuria (score _____)</p> <p><input type="checkbox"/> 2. Single temperature of 100°F (38°C) and at least one new or worsening of the following:</p> <table border="0"> <tr> <td><input type="checkbox"/> urgency</td> <td><input type="checkbox"/> suprapubic pain</td> </tr> <tr> <td><input type="checkbox"/> frequency</td> <td><input type="checkbox"/> gross hematuria</td> </tr> <tr> <td><input type="checkbox"/> back or flank pain</td> <td><input type="checkbox"/> urinary incontinence</td> </tr> </table> <p><input type="checkbox"/> OR</p> <p><input type="checkbox"/> 3. No fever, but two or more of the following symptoms:</p> <table border="0"> <tr> <td><input type="checkbox"/> urgency</td> <td><input type="checkbox"/> suprapubic pain</td> </tr> <tr> <td><input type="checkbox"/> frequency</td> <td><input type="checkbox"/> gross hematuria</td> </tr> <tr> <td><input type="checkbox"/> incontinence</td> <td></td> </tr> </table>	<input type="checkbox"/> urgency	<input type="checkbox"/> suprapubic pain	<input type="checkbox"/> frequency	<input type="checkbox"/> gross hematuria	<input type="checkbox"/> back or flank pain	<input type="checkbox"/> urinary incontinence	<input type="checkbox"/> urgency	<input type="checkbox"/> suprapubic pain	<input type="checkbox"/> frequency	<input type="checkbox"/> gross hematuria	<input type="checkbox"/> incontinence	
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<input type="checkbox"/> incontinence													

Nurses: Please check box to indicate whether or not criteria are met

Nursing home protocol criteria are met. Resident may require UA with C&S or an antibiotic.†

Nursing home protocol criteria are NOT met. The resident does NOT need an immediate prescription for an antibiotic, but may need additional observation.††

R. Request for Physician/NP/PA Orders

Orders were provided by clinician through: Phone Fax In Person Other _____

Order UA

Urine culture: _____

Encourage _____ ounces of liquid intake _____ times daily until urine is light yellow in color.

A national initiative to stop inappropriate antibiotic use for asymptomatic bacteriuria in long-term care residents.

Une initiative nationale pour réduire l'usage inapproprié des antibiotiques chez les résidents des centres hospitaliers de soins de longue durée (CHSLD) présentant une bactériurie asymptomatique.

#SymptomFreeLetItBe • #LesAntibiotiquesNousConcernent

Typical Hospital Antibigram

You can see by looking at this example, the % of *Escherichia coli* that is susceptible to Ampicillin is 46%. That means that less than half caused by *E. coli* were Sensitive to Ampicillin.

Now look at Levofloxacin – the percentage 77%. This means that 3 out of 4 infections caused by *Escherichia coli* bacteria could be treated effectively with Levofloxacin.

TOTAL	Ampicillin	Aztreonam	Cefazolin	Cefepime	Ceftazidime	Ceftiozone	Colistin	Imipenem	Levofloxacin	Piperacillin	Ticarcillin	% ESBL	
Acinetobacter baumannii	47	0	4	0	66	38	0	81	87	57	72	*	
Citrobacter freundii	65	0	80	0	100	77	78	98	91	100	91	*	
Citrobacter koseri	50	0	100	100	100	100	100	98	100	94	100	96	
Enterobacter aerogenes	10	0	88	0	98	87	86	99	98	99	98	*	
Enterobacter cloacae	156	0	72	0	98	69	75	97	92	100	89	83	
Escherichia coli	3029	46	95	89	95	94	95	100	88	100	77	99	68

Keys to Success

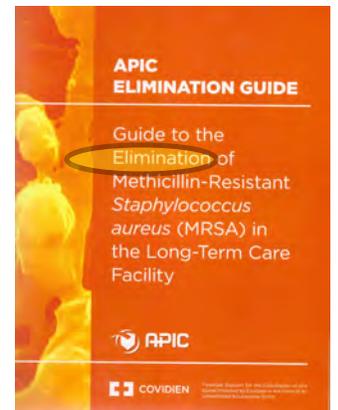
- Administrative commitment
- Medical, nursing, infection preventionist, and pharmacy buy-in
- Education e.g. staff, residents, family council; use your Quality Improvement Organizations
- Allocating time for tracking the program
- Standing committee agenda item

Keys to Success

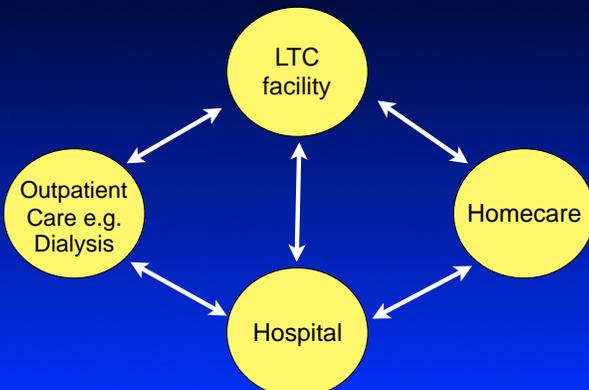
- Leveraging expert sources
- Ongoing feedback to staff
- Starting small; additional examples:
 - Restricted antibiotics e.g. overused, expensive abxs
 - IV to po conversion

"Yard by yard it's hard, inch by inch it's a cinch"

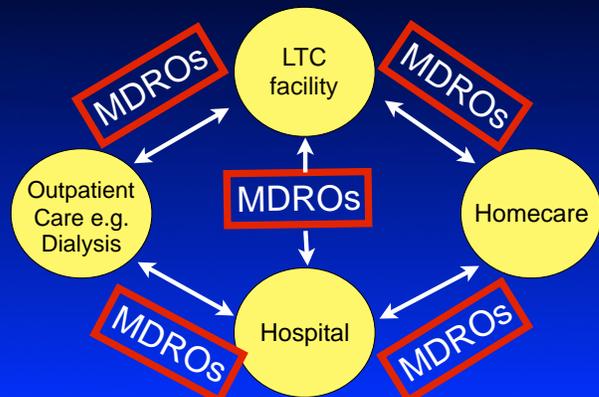
Prevent...or Eliminate?



Continuum of Care



Continuum of Care



Care Transitions

- Residents may be transferred/moved to acute care, dialysis, ambulatory surgery center, specialist, etc.; their MDROs transfer with them.
- 25% newly admitted LTC residents were hospitalized within the first year¹
- Ensure continuity of care with communicating key clinical information e.g. abx therapy, MDRO hx
- Goals are to prevent adverse events and spread of antibiotic resistance.

¹ Tanuseputro et al. Hospitalization and mortality rates in long-term care facilities. Does for-profit status matter? J Am Med Dir Assoc 2015; 16:874-883

Care Transitions

Miscommunication may result in harm:

- Isolation precautions delay due to colonization
- Lack of *C. difficile* history awareness
- Missed antibiotic doses
- Incorrect antibiotic selection

Care Transitions

Miscommunication may result in harm:

- Dosage errors
- Delay with IV to po conversion
- Duration errors i.e. when to discontinue
- Allergic reactions, anaphylaxis

Care Transitions

Miscommunication may result in harm:

- Resident safety; 80% serious medical errors due to miscommunication during hand-off.¹
- Wasted healthcare resources e.g. unnecessary laboratory testing
- Frustrated resident and family members

¹ The Joint Commission. Transition of Care. The need for a more effective approach to continuing patient care.

Care Transitions

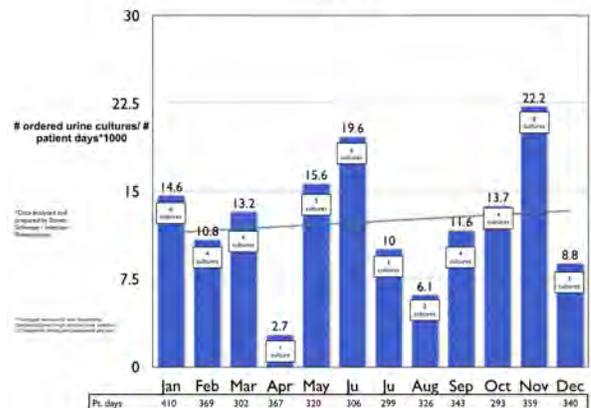
Goal: Complete and clear communication

The form is titled "Inter-facility Infection Control Transfer Form" and includes sections for:

- Header: Facility Name, Date of Birth, Transfer Date, Transfer Reason.
- Transfer Information: From Facility, To Facility, Transfer Date, Transfer Time.
- Transfer Type: Contact, Droplet, Airborne, Other.
- Antibiotic Use: Current, Recent, None.
- MDROs: List of Multidrug-Resistant Organisms.
- Other Infections: HIV, Hepatitis, etc.
- Other Information: Allergies, Immunizations, etc.

<https://www.cdc.gov/nipd/tools/infectionControl/transferForm/Example1.pdf>

Monthly Total Urine Cultures Ordered** 2017



Clean-Catch Urine and the Elderly

- Advantages; less likely contaminated specimen
- Disadvantages;
 - Challenging to understand instructions
 - Instructor may not understand process
 - Physical and cognitive limitations

Additional LTC Infection Preventionist Duties

- Meaningful surveillance for prevention, risk assessment
- Infection prevention environmental rounds
- Assessing care practices of residents with invasive devices.



Additional LTC Infection Preventionist Duties

- Joining the AS team
- Education, education, education
- Promoting removal of invasive devices
- Supporting all vaccination efforts
- Promoting adherence to best practices e.g. bundles

Additional LTC Infection Preventionist Duties

- Being a role model
- Vigilance with understanding the nuances with abx ordering process
- Understanding the impact of turnover with care¹

	2012 Median Turnover Rate
All Employees	43.9%
Direct Care Staff	50.0%
RNs	50.0%
LPNs/LVNs	36.4%
CNAs	51.5%

¹ https://www.abimcc.org/education-and-training/Documents/2012_Staffing_Report.pdf, Accessed April 5, 2016.

CDC CAMPAIGN TO PREVENT ANTIMICROBIAL RESISTANCE IN HEALTHCARE SETTINGS

12 Steps to Prevent Antimicrobial Resistance Among Long-term Care Residents

Prevent Infection

1. Vaccinate
2. Prevent conditions leading to infx e.g. aspiration
3. Get unnecessary devices out
4. Use established criteria for infection diagnosis

CDC CAMPAIGN TO PREVENT ANTIMICROBIAL RESISTANCE IN HEALTHCARE SETTINGS

12 Steps to Prevent Antimicrobial Resistance Among Long-term Care Residents

Prevent Infection

5. Use local resources e.g. ID experts, antibiogram
6. Know when to say no to abxs
7. Treat infx, not colonization, contamination
8. Stop abxs when not needed
9. Isolate the pathogen e.g. contact precautions

CDC CAMPAIGN TO PREVENT ANTIMICROBIAL RESISTANCE IN HEALTHCARE SETTINGS

12 Steps to Prevent Antimicrobial Resistance Among Long-term Care Residents

Prevent Infection

- 10. Break the chain of infection e.g. respiratory etiquette
- 11. Hand hygiene
- 12. Identify residents with MDROs

“The prescriber is under great pressure to prescribe the newest, best, broadest antibiotic preparation, prescribe it for any complaint whatever, quickly, and preferably without worrying too much about specific etiologic diagnosis or proper indication of the drug.”

Jawetz 1956

http://www.fda.gov/oc/Content/Document/Accessories/Nicotin%20d%20patches/Principles_of_AB_stewardship.pdf Accessed July 1, 2017.

“Stopping By Woods on a Snowy Evening”

The woods are lovely, dark and deep
But I have promises to keep
And miles to go before I sleep
And miles to go before I sleep

Robert Frost

Oral Care Reduces Pneumonia in Older Patients in Nursing Homes

Takeyoshi Yoneyama, DDS, PhD, Mitsuyoshi Yoshida, DDS, PhD, Takashi Ohrui, MD, PhD, Hideki Mukaiyama, DDS, Hiroshi Okamoto, DDS, PhD, Kanji Hoshiba, DDS, PhD, Shinichi Ihara, DDS, Shozo Yanagisawa, DDS, Shiro Ariumi, DDS, Tomonori Morita, DDS, Yasuro Mizuno, DDS, Takayuki Ohsawa, DDS, PhD, Yasumasa Akagawa, DDS, PhD, Kenji Hashimoto, DDS, MD, PhD, Hidetada Sasaki, MD, PhD, and Members of the Oral Care Working Group

Oral Health is Cost-Effective to Maintain but Costly to Ignore

Yoneyama et al.¹ have demonstrated the role of a familiar, straightforward intervention—providing regular oral hygiene care—on reducing the incidence of pulmo- age. The National Center for Health Statistics reported in 1957 that 68% of Americans aged 75 and older were edentulous (had no remaining natural teeth),¹⁷ but the Na-

Thank you!



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