

# Infection Surveillance in LTC

## Purpose of Surveillance:

- Identify Individuals with Infection Syndromes

- Apply Appropriate Isolation

## Precautions

uncontained wound drainage, absent hygiene- MODIFIED CONTACT

seasonal influenza- DROPLET

- Consider a Wider Transmission Risk

# Situations that Require Institutional Investigation/Response

Single confirmed case of highly transmissible infection- Influenza, TB, GI [Norovirus, Salmonella], acute hepatitis, scabies, legionella Carbapenem R --Isolate individual, Identify more cases in contacts

Clinical Cases Clustered in Time/Space

Isolates with identical/related PFGE [Genetics], epidemiologically linked

# Case Definitions Not Completely Sensitive

**Influenza: Culture Proven may be afebrile** JAGS 2002;  
50:1416-1420, Clinical Infectious Diseases 2010; 51:1033–1041

**UTI Without Catheter: In dementia urosepsis may  
present as Systemic Infectious Illness with no  
localizing S/S** JAGS 2011 59:567-8

**Bacteremia/Sepsis may be afebrile in elderly  
[?hypotension]** JAGS 1995;43:230-5, CID 2002;35:1484-90

**Failure to Meet McGeer Criteria does not  
Completely R/O Symptomatic UTI or Influenza  
Need Monitoring**

## New McGeer Paper ICHE 2012 33:965

**Presentations of infection in LTC may be atypical. These surveillance definitions may not be adequate for real-time case finding, diagnosis, or antibiotic initiation.**

# Regulatory Requirements for Surveillance

- **F44 I Guideline for Infection Prevention: under Documentation:**

Facilities may use various approaches to gather, document, and list surveillance data.

# WDQA Guidance for Surveillance Based on Current Standards of Practice

- Weekly Review of Surveillance Data--  
minimum
- Surveillance Case Definitions

McGeer and/or Loeb Criteria [similar]

- APIC, CDC and SHEA recommend targeted surveillance based on a RISK ASSESSMENT.

ICHE 2008;29: 785-814, Am J Infect Control 2007;35:427-40

# What do you Track? Opposing Principals

- You don't improve what you don't measure
- Don't waste your time measuring what you don't improve

Surveillance Should be Linked to CQI

# New McGeer Paper

- Given limited resources, surveillance may need to be targeted to infections with the most potential for prevention
- Transmissible Highly Virulent—Esp.  
**EXPLOSIVE VIRAL OUTBREAKS**  
“World Series” of Infection Control

Other candidates: Device Assoc., MDRO

ICHE 2012 33:965

# How to Target Surveillance Activity: My Experience

- Determine an area in need of QI based on risk assessment, prior problems, motivation [?survey crisis]
- Then maintain separate line list of cases before : after intervention to measure efficacy
- Build on pre-existing data system

# Surveillance

- May utilize pre-existing Pharmacy Data / Antibiotic Starts
- ICP may review 24 Hour report and designate infections on that document

# Outbreaks: World Series of Infection Control

- Clinical outbreaks of GI or respiratory illness may present on nights or weekends. Monthly tabulation *is not* adequate to identify explosive outbreaks
- Frontline staff must be trained to rapidly identify clustered clinical cases [or initial cases when influenza / norovirus circulating]
- Initiate Isolation, Start line listing

- **Outbreak identification facilitated by review of on-line WDPH updates on outbreak pathogens in the state**

# Disclaimer

“Listeners should verify all information before employing practices described in this educational activity”

My Opinions

# Veteran's Home Experience Pattern Recognition Will Help Surveillance

**Non Influenza Respiratory Viruses May be  
Deadly with Outbreaks During Non  
Influenza Season-Therefore Universal  
Respiratory Hygiene/Cough Etiquette**

**Important** Infect Control Hosp Epidemiol 1999, 20:812-815.

J Am Geriatr Soc 2000; 48:1216-1218.

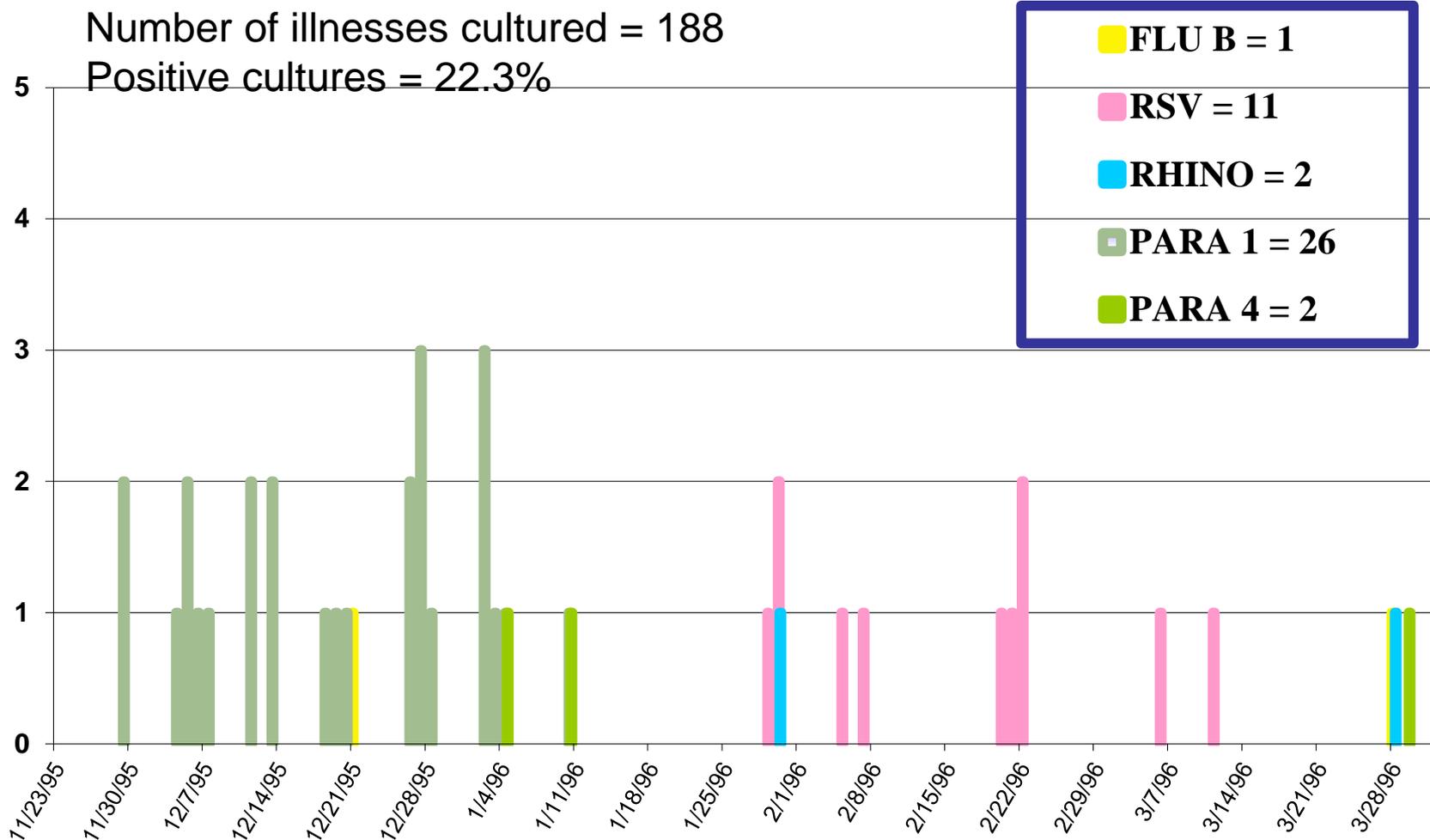


# Universal Respiratory Hygiene / Cough Etiquette is Part of Standard Precautions

- Early application of precautions based on Syndrome Identification; crucial step in containment. Ideally identify the first case
- Infectious respiratory secretions must be contained with “spatial separation”, tissues, or masks---may prevent outbreak
- Standard precautions extensive CDC Isolation Gdl



# 26 parainfluenza 1 isolates over 43 days Later 11 RSV cases



# Additional Experiences: Active Surveillance with Resp. Viral Cultures [WVH]

- **Can Not Differentiate Influenza vs. Non Influenza  
Based on Individual Clinical Presentation  
Lab Confirmation Optimal**

J Am Geriatr Soc 43:170-174, 1995.

Ann Intern Med 123:588-593, 1995.

J Am Geriatr Soc 1999, 47:1087-1093

- **Roommate of Influenza Positive Case at 3X Risk:  
prophylaxis**

Inf Control Hosp Epidemiol 2003, 24:872-874.

Inf Control Hosp Epidemiol, 2004, 25:95-96.

J Am Geriatr Soc, 2005; 53:1437-1449.

# Identification of Clustered Genetically Identical Isolates on Units Using PFGE--Transmission

Drinka J Am Geriatr Soc 52:1373–1377, 2004

- Based on Review Clinical Bacteriology Database, 2 Months of Clinical Isolates were listed for each **unit**
- Identified 24 "clusters" [at least 2] identical species and antibiotic sensitivity
- 14 [58%] included genetically identical isolates consistent with transmission.
- The identification of clustered genetically identical bacteria prompts staff to review secretion precautions. If Bacteria **NOT** related; **NOT** consistent transmission in facility

# Investigation Of ‘Cluster’ With Identical PFGE

- 1. Do the residents have direct contact (socializing, activities, meals, etc.)
- 2. Do the residents share space/environment
- 3. Do the residents share equipment
- 4. Rate the amount of staff contact / assistance in ADLs--measure of 2-way contamination
- 5. At what level do residents share staff [RN, LPN, NAs]

# Clustered Genetically Identical Bacteria

*E. faecalis* [Wound Care Cart or Nurse Scissor]

2/07 D 330 Wound

2/27 D 332 Wound

*S. pneumoniae* [Resident with Bronchiectasis in Lounge]

1/20 A 536 Sputum

3/07 A 505 Sputum

*K. pneumoniae* share *Pseudomonas* [Urinary Caths]

11/08 D 302 Urine

12/14 D 352 Urine

*P. mirabilis* [Feeding Assistance at Same table]

8/17 C227 Wound

8/29 C220 Urine

10/24 C236 Urine

# Distribution of 26 INITIAL MRSA type A isolates on 14 units over 83 months (# is the Month of isolation)

<b>Bldg:</b>	<b>AA</b>				<b>BB</b>				<b>CC</b>		<b>DD</b>			
<b>Unit:</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Month Isolated</b>														
(1-17)					14	11, 12, 14, 15, 17			7	1, 5,				8
(25-51)						38, 42, 46				29, 37, 51	25, 34,			40
(62-83)				62	73	83	--	--		73				66

# 5 Clustered Identical Clinical MRSA Isolates on a Unit over 6 Months--- Response

Screened Residents

Offer Screening to Staff

2 LPNs with Nasal Colonization/Sinusitis –  
Treated

- Universal Gloving + Contact Isolation for Known Carriers JAGS 2004;52:2003–2009.
- No New case 21 Months

# Challenges to detecting clusters of endemic MRSA from clinical cultures

- MRSA may cause Pneumonia, SSTI, UTI

EVIDENCE TRANSMISSION MAY EVOLVE SLOWLY  
“2 HITS”

1) COLONIZING EVENT

2) ASPIRATION EVENT OR CELLULITIS DEVELOPS IN  
NECROTIC WOUND

THEN A CULTURE PERFORMED WEEKS LATER

“LONG CLINICAL INCUBATION” MAY BE HARD TO  
CONNECT CASES BASED ON CLINICAL CULTURES

Drinka ICHE, 2005, 26:215-218.

# Clinical Bacteriology Database: Clusters of Transmission

- All MRSAs Listed together, Sorted by nursing unit, and date of initial isolation; Allow identification of clustering of NH acquired MRSA in Time/Space
- F441: *“Determining site of transmission helps identify residents who developed infections in the facility”*  
*Mentioned 3X in F441*
- Isolates obtained first 3 days following transfer to ER or hospital: Considered NH ACQUIRED if no PMH of that MDRO in individual—You may have more cases acquired in your NH than you think

## Construct Antibigram, :

Example: % Quinolone R (levoflox, cipro)

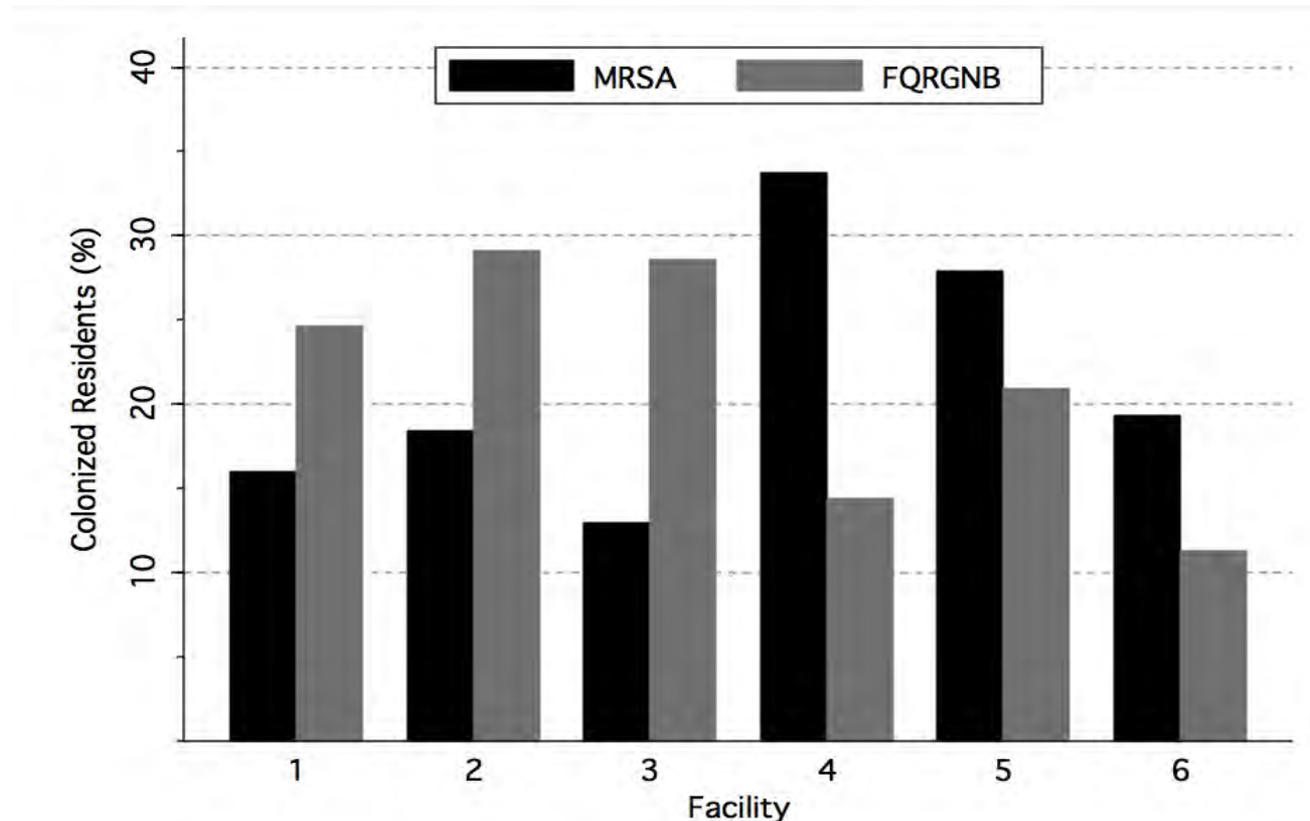
Urinary isolates esp. catheter related

- Include 1 isolate of given type species/sensitivity per resident
- Serial Analysis: Will Determine Efficacy Antibiotic Stewardship Program
- Assist selection empiric therapy
- 2008-51% E. coli urinary isolates Quinolone R-North Eastern NHs

# Clinical Cultures Will NOT ID all MDRO Carriers

6 WISC. NHs: 22% colonized MRSA  
21% colonized Quinolone R Gram Neg BT

Crnich/Drinka ICHE 2012 33:



# Environment Surveillance in Facilities with 24% point prevalence MRSA similar Crnich

- 16% of 500 High Touch Objects Grew MRSA [tables, handrail, doorknobs]
- Only 22% ultraviolet marks removed during routine cleaning JAGS 2012 60:1012

# MDROs Identified by Clinical Culture; “Tip of the Iceberg”

- Emphasize Known MRSA Carriers
- Unknown Carriers; More Common, >Risk Transmission
- Often Ignore MDRO Gram Negative Carriers
- Potential Solution: More Emphasis on Unknown Carriers and STANDARD PRECAUTIONS
- Make your Standard Precautions good enough to care for MRSA carrier DRINKA JAMDA, 2005; 6:132-136. Calif LTC ARO GDL
- [cdph.ca.gov/pubsforms/Guidelines/Documents/armgdepp1999.pdf](http://cdph.ca.gov/pubsforms/Guidelines/Documents/armgdepp1999.pdf)

# How to Prevent Transmission Unknown MDRO

## CORNERSTONE: STANDARD

precautions : Review CDC Isolation

Guideline: STANDARD precautions are  
EXTENSIVE

STD precautions include gloves during

care resident with uncontained

secretions when contact with

POTENTIALLY CONTAMINATED

INTACT SKIN anticipated P70,79-81

- Includes residents uncontained wound drainage/incontinent/absent hygiene
- Aspects of “Contact Precautions” recommended based on clinical assessment of secretion containment without culture p94,106
- In Many Facilities Nursing Asst. don Gloves/Gowns providing hygiene assistance for Dependent Residents (hands, forearms (JHI 2010;76:264), torso contaminated)

- Dressing, transferring, bathing, incontinence care, complete PE  
NOT casual contacts
- ?? Start with universal gloving/gowns for NA care of residents with devices (Foley, G-tube) + Chronic Wounds CID 2011;52:654

# Identification of Infected Residents

- Demands sensitive approach
  - Infection may present with nonspecific S/S (falls, functional decline, confusion)
  - fever may be absent
- **HOWEVER** do not assume that cause of deterioration is infection (UTI) without considering
  - drug toxicity
  - hypoxia
  - metabolic derangement
- Generally like to see localizing S/S to make a Dx of a specific Infection

# Over diagnosis of UTI

- If McGeer or Loeb criteria used: Respiratory Infection more common than UTI Penn. Data-AJIC June 2011 pE162, ICHE 2005;26:231-8
- If resident with positive urine culture eating and drinking poorly secondary to bacterial pneumonia or adverse drug reaction, attributing status change to UTI may result in failure to detect *real problem*

# Over diagnosis of UTI

We don't do sputum culture if no Resp. S/S

We don't attribute status change to Resp. Illness without localizing S/S

We do urine cultures in residents without Urinary S/S all the time JAMDA 2009;10:516-519

And culture reports return after hours

# Antibiotics select Resistant Bacteria

## Unnecessary Antibiotic Script:

- Antibiotic Resistant “Time Bomb” set to explode 1-2 months later if:
- INDIVIDULE develops serious infection
- Approx. 25% (ICU) developed resistance to targeted bacteria JAMDA 11; 537-5 2010, 12: 321-325 2011
- TMP-Sulfa prophylaxis for 1 mo: R E coli stool: increased 20 to 85%

Retrospective Report: 200 NH residents:  
had C+S within 1 MO of previous  
antibiotic - 2/3 BT: R to that antibiotic

AJIC 2000;28:8

Quinolone script within 1 Month Increased Risk:  
Resistant Symptomatic UTI 27 X

J Hosp

Infec 2010 76: 324

In young women, Rx of Asymptomatic BTU  
increases risk subsequent symptomatic UTI

3X CID 2012 55:771 Hosp Infec 2010 76: 324

# Loeb Minimum Criteria Ordering UA- Initiating Antibiotic

also see new McGeer

## Without Catheter

Dysuria alone

OR two of the following:

- Fever
- Shaking chills CID 2008;2009:149
- Gross hematuria
- Flank Pain
- Suprapubic pain
- New Frequency,
- New Urgency
- New Incontinence

## With catheter

One or more of the  
following:

- Fever
- New onset delirium
- Rigors
- New CVA tenderness

# Loeb Criteria Initiating Antibiotic Urinary Indication: Supported Cluster Randomized Controlled Trial-Intense Educational Intervention

**31% reduction in scripts for UTI, No adverse  
events** BMJ 2005; 331:669-672

- **UA, C+S ONLY OBTAINED IF CLINICAL INDICATION FOR ANTIBIOTIC RX**
- **Antibiotics stopped If no pyuria or culture negative**
- **MDs not forced to follow protocol**

# LTC Fever Criteria: IDSA Guideline Evaluation Infection

- **> 100F, >2F baseline, repeated >99F  
CID 2008;2009:149–171**

# IDSA Guideline Evaluation Infection LTC: Potential Criteria for Withholding Antibiotics

- Consensus statement: In the absence of fever, LEUCOCYTOSIS / L SHIFT, or focal manifestations of clinical infection, additional diagnostic tests may not be indicated, because of low potential yield. Nonbacterial infections can't be excluded.

My Bottom Line

NO FEVER, LEUCOCYTOSIS / L SHIFT, FOCAL FINDINGS [Stable VSs], -SERIOUS BT INFECTION UNLIKELY--OBSERVE

SINCE ANTIBIOTICS MAY BE  
HARMFUL + NO CRITERIA TO DX  
INFECTION COMPLETELY SENSITIVE

Need protocols to monitor for evolving  
condition if no specific indication for  
antibiotic

Patient, family, staff might be reassured  
when antibiotics are withheld if resident  
is formally monitored for evolving  
condition

## Revised McGeer--New Criteria

- Fever OR Leukocytosis/L Shift ( $>14,000$  or bands  $>6\%$  or  $1500$ ) (? WBC  $>11,000$ )
- Delirium OR Acute Functional Decline as defined by MDS 3.0
- Scrotal/Prostate Tenderness/Swelling
- Purulent urethral drainage
- Recent Catheter Trauma (rip mucosa) / Obstruction (blow BT up ureter) can Trigger Urosepsis
- **CHANGE IN CHARACTER OF URINE NOT INCLUDED**

# My Opinion

- Develop Minimum Criteria for Starting Antibiotics using New McGeer / Loeb Criteria
- Input from Staff to get buy-in
- Use Same Criteria To Start Antibiotics AND to Count Infections

# Surveillance Staff/Visitors

- Facilities must prohibit employees with transmissible infections + infected skin lesions from direct contact with residents and food [separate federal std. food service]
- LTC facilities should implement active screening programs to identify infected staff / visitors, esp. during community outbreaks of Respiratory or GI illness
- Screening staff and visitors:
  - prominent component of programs to prevent introduction of pandemic influenza

# Staff Surveillance

- Staff should be trained to
  - monitor themselves for S/S of infection
  - exclude themselves from work, or report to employee health
  - I teach this during new employee physical

Response to High Rates Infections  
Triggered Primarily by Abnormal  
Function / Anatomy Rather than  
Transmission of Virulent Bacteria

- **If excess rates of Pneumonia:  
Prevention may be possible:  
dental hygiene, tapering  
sedatives, mobilization,  
elevating head of bed if  
regurgitation/aspiration  
(studies from ICU)**

**DRINKA JAMDA 2010;11:70-7, JAMDA 2010;11:465-7**

- **If excess rates of Skin and Soft Tissue Infection: Prevention may be possible : pressure relief, wound care, debriding devitalized tissue, Rx Foot fungus to prevent cellulitis**

# Prevention Excess UTI Indwelling Urinary Catheters

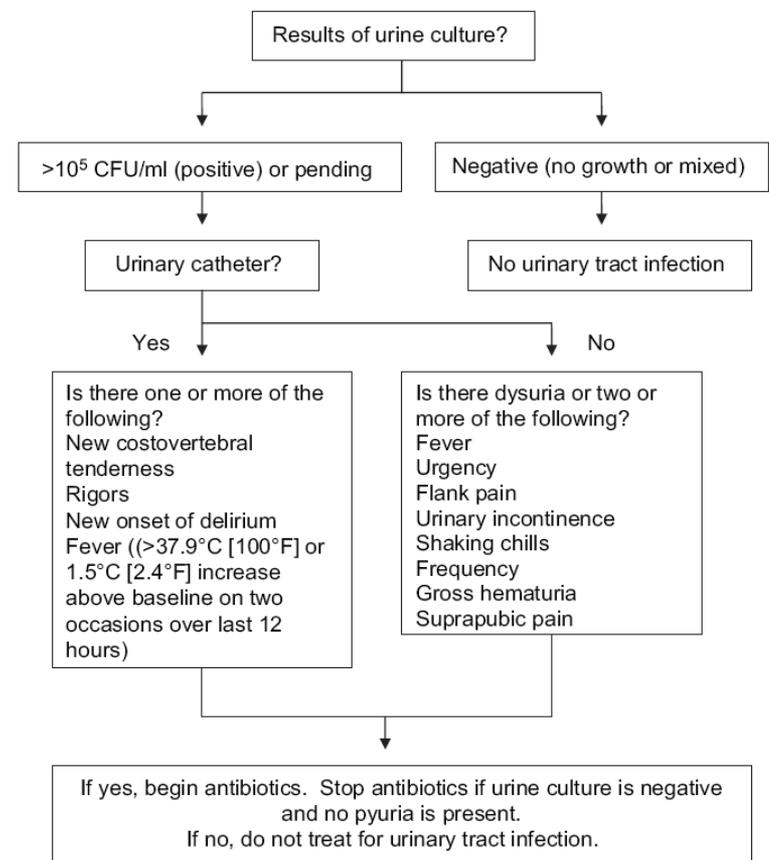
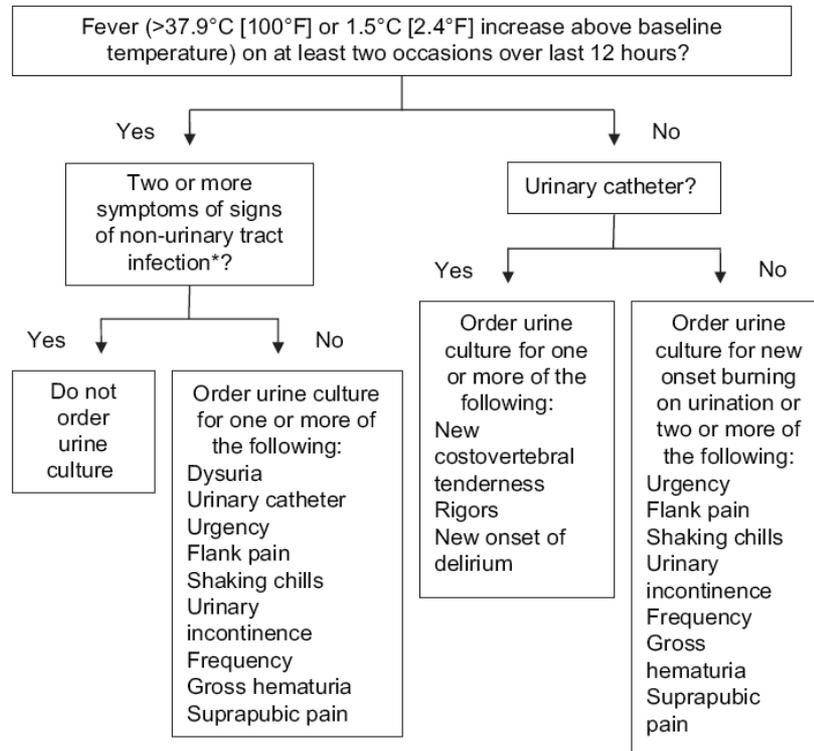
Drinka Complications of chronic indwelling urinary catheters. JAMDA, 2006; 7:388-392

- Insertion-Aseptic
- Maintain Flow---Avoid Obstruction-from Thigh Pressure, Kink, Concretions
- Avoid Traction (pressure necrosis)---Maintain slack
- Avoid Pistoning (? sand paper), Avoid Trauma, Attach to Thigh, Use small cath as possible
- Avoid Introducing New Bacteria; Touch Drainage Spigot to contaminated emptying container, Open Tubing [or disinfect junctions], Don't Raise Bag above Bladder

# If you have questions about your program

- Consult with State Public Health Officials who specialize in LTC Infection control
- Provide good information and medico-legal support if your practices questioned
- References:
  - <http://patientsafetyauthority.org/pages/bbtresults.aspx?Filter|Field=Care%20Setting&Filter|Value=Nursing%20Home>

# Reducing Inappropriate Antibiotic Use for UTI



\* Respiratory symptoms include increased shortness of breath, increased cough, increased sputum production, and new pleuritic chest pain. Gastrointestinal symptoms include nausea or vomiting, new abdominal pain, and new onset of diarrhea. Skin and soft tissue symptoms include new redness, warmth, swelling, and purulent drainage.