

PANDEMIC PREPAREDNESS IN NURSING HOMES: FROM RESEARCH TO POLICY AND PRACTICE

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COVID-19 IN OLDER ADULTS

Host:

- Age
- Medical Conditions
- Health disparities

Pathogen/Virus:

- Contagious
- Transmission dynamics

Settings:

- Congregate settings such as nursing homes
- Structural, process, staffing concerns within these settings

PANDEMIC PREPAREDNESS: 2007/8

RESEARCH LETTER

Preparedness for Pandemic Influenza in Nursing Homes: A 2-State Survey

To the Editor: An influenza pandemic would be expected to have major social and economic consequences. Hospital bed capacity may be quickly overwhelmed in an influenza pandemic,¹ and government plans are looking at alternate care sites.² Nursing homes care for a very vulnerable population and may be expected to help with hospital patient overflow.^{3,4} The extent of influenza pandemic preparedness in nursing homes is largely unknown.⁵

Methods. All 656 state health department-registered nursing homes were identified in 2 states chosen as a convenience sample: Nebraska (n=231) and Michigan (n=425). A questionnaire to assess their pandemic preparedness was developed with input from various stakeholders and mailed to the directors of nursing in June 2007 with a follow-up mailing in July 2007. The questionnaire was designed to gather demographic data and information on aspects of influenza preparedness. Data on antiviral medications and ownership status were collected only from Michigan nursing homes. Categorical data were compared between groups with a χ^2 test using SAS/STAT software (version 9.1.3; SAS Inc, Cary, North Carolina). A 2-sided *P* value of .05 was considered significant. The study was approved by the University of Nebraska Medical Center institutional review board.

Results. The overall response rate was 69% (Nebraska,

PROGRESS IN GERIATRICS

Pandemic Influenza Planning in Nursing Homes: Are We Prepared?

Lona Mody, MD, MSc,*† and Sandro Cinti, MD‡§

Avian influenza or Influenza A (H5N1) is caused by a viral strain that occurs naturally in wild birds, but to which humans are immunologically naïve. If an influenza pandemic occurs, it is expected to have dire consequences, including millions of

has developed any immunity and for which no disease-specific vaccine initially exists. Only influenza A can cause pandemics. Influenza can be transmitted directly by large-droplet spread (e.g., when infected people cough or sneeze

washingtonpost.com > Health > Latest News

Nursing Homes Unprepared for Pandemic Flu Fallout

Tuesday, July 22, 2008; 12:00 AM

TUESDAY, July 22 (HealthDay News) -- If an influenza pandemic swept through the United States, nursing homes might not be prepared to deal with patient overflow from hospitals, say researchers who looked at more than 400 nursing homes in Michigan and Nebraska to come to this conclusion.

Of those nursing homes, only 23 percent had a specific pandemic influenza plan, 23 percent had a pandemic response incorporated into an overall disaster response plan, and 52 percent had no pandemic plan.

TOOLBOX

Resize Print
E-mail Reprints

UTI PREVENTION: LOCALLY AND NATIONALLY (2005-)

Original Investigation

A Targeted Infection Prevention Intervention in Nursing Home Residents With Indwelling Devices A Randomized Clinical Trial

Lona Mody, MD; Sarah L. Krein, PhD; Sanjay K. Saint, MD; Lillian C. Min, MD; Ana Montoya, MD;
Bonnie Lansing, LPN; Sara E. McNamara, MPH; Kathleen Symons, BA; Jay Fisch, BS; Evonne Koo, MPH;
Ruth Anne Rye, BS; Andrzej Galecki, MD, PhD; Mohammed U. Kabeto, MS; James T. Fitzgerald, PhD;
Russell N. Olmsted, MPH; Carol A. Kauffman, MD; Suzanne F. Bradley, MD

IMPORTANCE Indwelling devices (eg, urinary catheters and feeding tubes) are often used in nursing homes (NHs). Inadequate care of residents with these devices contributes to high rates of multidrug-resistant organisms (MDROs) and device-related infections in NHs.

OBJECTIVE To test whether a multimodal targeted infection program (TIP) reduces the prevalence of MDROs and incident device-related infections.

DESIGN, SETTING, AND PARTICIPANTS Randomized clinical trial at 12 community-based NHs from May 2010 to April 2013. Participants were high-risk NH residents with urinary catheters, feeding tubes, or both.

INTERVENTIONS Multimodal, including preemptive barrier precautions, active surveillance for MDROs and infections, and NH staff education.

← Invited
+ Supplemental
materials

12 NHs
25% ↓ MDROs
40% ↓ Catheter
related UTIs

Infections are a leading cause of illness and death in nursing homes.

These infections include catheter-associated urinary tract infections (CAUTIs).

REMEMBER C.A.U.T.I. TO PREVENT CAUTI

C A U T I

Catheter Removal

Think about catheters in any of your residents. Are the catheters really necessary?

Remove the catheter if there is no good indication for it. (See below.)

Every resident deserves a chance to be catheter-free and infection-free.

Aseptic Insertion

Only trained personnel should insert catheters.

Use hand hygiene, and insert using aseptic technique.

Use the smallest catheter size that will work for the resident.

Avoid contamination of the catheter.

Use catheter securement devices.

Use Regular Assessments

Insert new urinary catheters only when there is a good indication.

Consider alternatives to using a urinary catheter.

Use a bladder ultrasound to guide management.

Implement a process to see whether residents need catheters.

Training for Catheter Care

Train staff, resident, AND family.

Maintain a closed drainage system, and maintain unobstructed urine flow.

Use routine hygiene. Do not clean the periurethral area with antiseptics.

Routine catheter changes, urinalysis, and cultures are not required.

Incontinence Care Planning

Consider alternatives to using a urinary catheter when developing individual resident care plans and behavioral interventions.

Consider timed and prompted voiding and use of a voiding diary.

Remember: No catheter means no CAUTI!

Appropriate Indications for a Urinary Catheter

To assist healing of stage III or stage IV perineal and sacral wounds in incontinent residents



Chronic and acute urinary retention or obstruction

Hospice or palliative care associated with intractable pain

Would you like to know more? Participation in the AHRQ Safety Program for Long-Term Care: CAUTI gives you access to informative resources and events such as educational webinars and state-level training sessions that will help you to provide safer care for your residents. Talk to the project lead in your facility, or visit www.ltcsafety.org (login and password: ltcsafety).

The AHRQ Safety Program for Long-Term Care: CAUTI

Funded by the Agency for Healthcare Research and Quality

Preventing Catheter-Associated Urinary Tract Infections (CAUTI) in Nursing Home Residents

INTERVENTION

CAUTI Bundle:
(training & tools)

- C** atheter removal
- A** septic insertion
- U** sing regular assessments
- T** raining for catheter care
- I** ncontinence care planning



404 Nursing Homes
across the nation

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OUTCOMES

Decreased
Infections



6.4 → 3.3

(Catheter-associated UTI/
1000 catheter-days; p=0.001)

54% Reduction

Decreased
Urine Cultures



3.5 → 3.1

(Urine cultures ordered/
1000 resident-days; p=0.001)

15% Reduction

Mody et al. *JAMA Intern Med* May 2017
doi:10.1001/jamainternmed.2017.1689

DESCRIBING SHORT STAY POPULATION & PATIENT HAND HYGIENE (2013-)

Longitudinal Assessment of Multidrug-Resistant Organisms in Newly Admitted Nursing Facility Patients: Implications for an Evolving Population

Lona Mody,^{1,2} Betsy Foxman,³ Suzanne Bradley,^{4,5} Sara McNamara,¹ Bonnie Lansing,¹ Kristen Gibson,¹ Marco Cassone,¹ Chelsie Armbruster,⁶ Julia Mantey,¹ and Lillian Min^{1,2}

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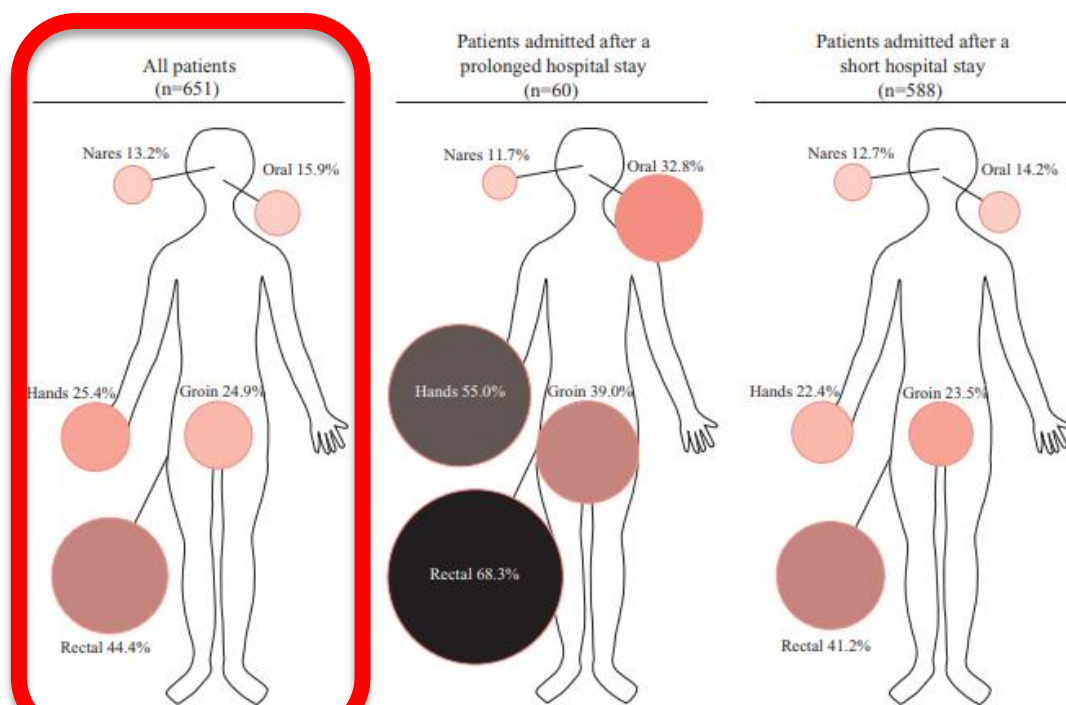
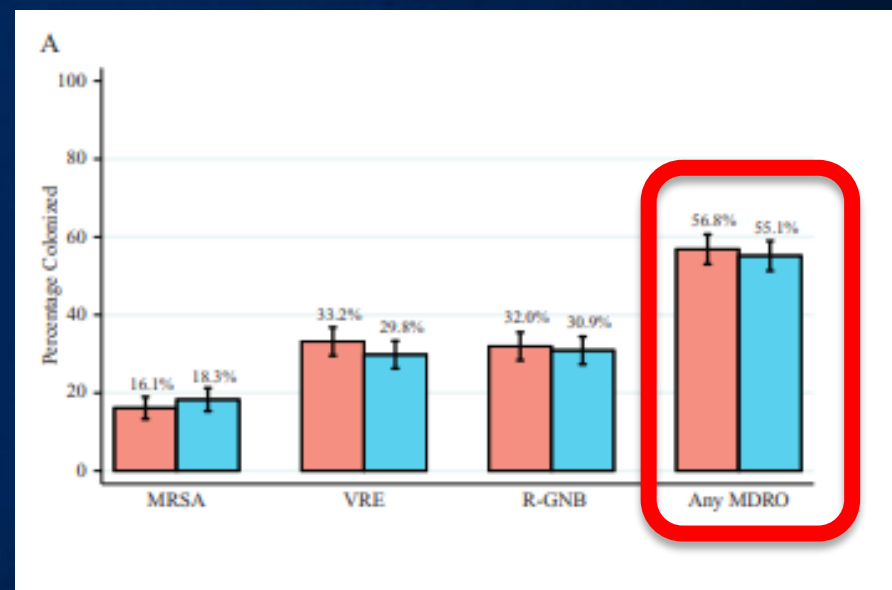


Figure 3. Colonization at sampled body sites on enrollment. Circles representing each body site are sized and shaded proportionately to colonization prevalence at that body site, using a multiplier of 1.5 to determine diameter and color saturation.



Multidrug-Resistant Organisms in Hospitals: What is on Patient Hands and in their Rooms?

Population



2 Hospitals

399 Patients

710 Patient Hand Cultures

4,269 Room Cultures

Findings

MDROs on Patient Hands



10% On Admission

6.2% New Acquisition

13.3% Anytime During Stay

Implications

MDROs on Patient Hands



MDROs on Room Surfaces

MDRO	Pt Hands (+) = Environ (+)	Pt Hands (-) = Environ (-)
MRSA	71%	94%
VRE	89%	92%
R-GNB	52%	88%

$P < 0.01$ for all MDROs

Mody L et al *CID*, April 2019

DOI: 10.1093/cid/ciz092

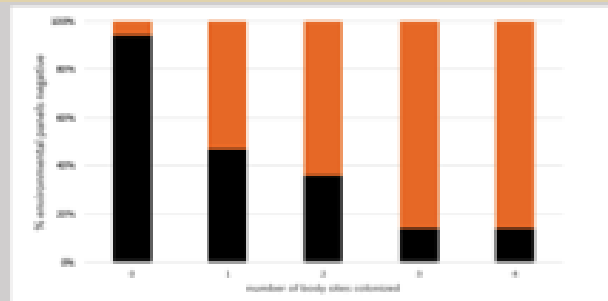
Environmental Panels Serve as a Proxy for Patient Colonization with MDROs

MRSA

Object	Negative Predictive Value (NPV, %)
TV Remote Control	89
Bed Rail	89
Nurse Call Button	87
Bed Controls	87
NPV (Panel of 4 Env. objects)	92

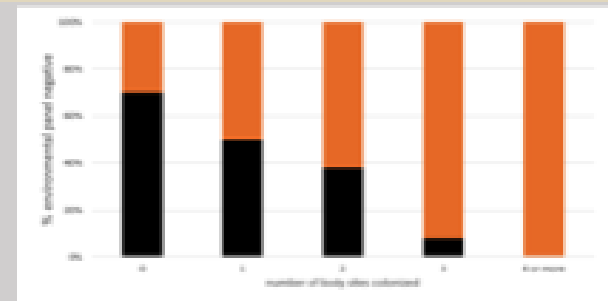
VRE

Object	Negative Predictive Value (NPV, %)
TV Remote Control	76
Toilet Seat	77
Bed Rail	74
Bed Controls	74
Side Table (Top)	73
NPV (Panel of 5 Env. objects)	82



Patient Colonization by Selected Environmental Objects Panel

- Negative Panel
- Positive Panel

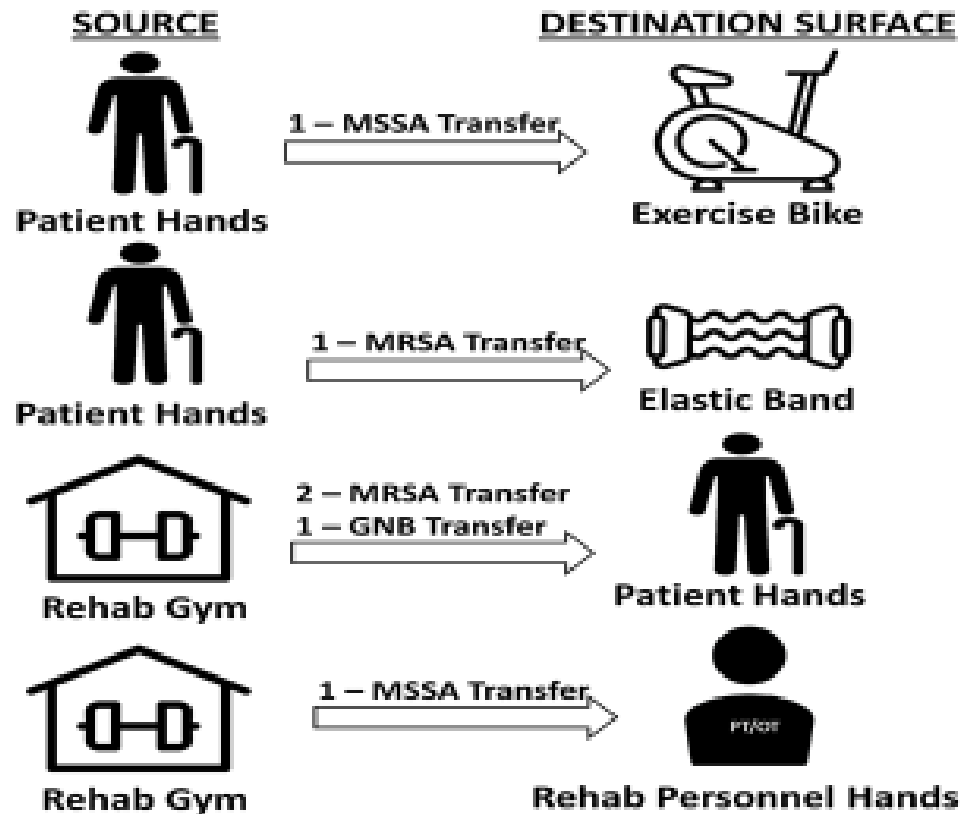


Cassone et al. *CID*. 2018.

Clinical Infectious Diseases

M MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

AIM 2: MDRO TRANSMISSION DURING REHAB



Followed 4 patients during 10 total rehab encounters with 35 transmission opportunities

Transmission occurred in:

- 50% of 10 total rehab encounters
- 6 of 35 (17%) opportunities

Genotyping necessary to verify common identity

COLLABORATIONS (2018-)

PRIISM BACKGROUND

- Studies indicate variation of IP practices (Mody, 2005; Flanagan, 2011; Montoya, 2013; Harrod, 2016)
- JAMA Viewpoint describes opportunities to enhance care delivery by coordinating work of hospitals and nursing homes (Mody, 2018)
- AHRQ-funded project to facilitate information-sharing, integration of IP practices in Southeast Michigan

VIEWPOINT

Can Infection Prevention Programs in Hospitals and Nursing Facilities Be Integrated? From Silos to Partners

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Dissemination and Implementation of evidence-based interventions have successfully reduced central line-associated bloodstream infections, surgical site infections, and *Clostridium difficile* in many acute care hospitals partly as a result of resourceful, diverse, and proficient hospital infection prevention teams. However, infection prevention programs in nursing facilities are less well developed.

Contemporary nursing facilities are composed of 2 distinct populations: patients who require skilled nursing and rehabilitation care after a hospital stay (postacute care) and long-term care residents who permanently reside at these facilities. Nursing facilities encounter many challenges in effectively implementing and maintaining infection prevention programs. First, both patients receiving postacute care and long-term residents frequently visit common areas including dining rooms, rehabilitation areas, and family visitation rooms, increasing the risk of pathogen transmission. Second, nursing facilities lack in-house diagnostic testing and rely on offsite physicians, leading to delays in the evaluation and management of individuals with acute infections. Third, the postacute care population has inherently more active medical problems, with more devices, wounds, recurrent hospital stays, and high antibiotic use compared with long-term care residents. Most important, nursing facilities lack adequate resources to support the increasingly complicated infection prevention mandates such as infection surveillance, staff education, and implementation of antimicrobial stewardship programs. However, we believe the transition toward integrated health care systems provides a unique oppor-

tunities returned to the hospital, resulting in additional costs, functional decline, and delayed recovery, contributing to a vicious spiral of morbidity and mortality. To deliver quality health care across the continuum of care for this rapidly growing population, an effective, well-funded, and adaptive infection prevention program is critical.

Evolution of Infection Prevention Programs

Hospital infection prevention programs developed in the 1960s and were subsequently shaped by the 1974 Study on the Efficacy of Nosocomial Infection Control. The study found a site-specific reduction in nosocomial infection ranging from 7% to 48% in hospitals with effective infection prevention programs that included 1 infection control nurse, 1 trained hospital epidemiologist, and data audits with feedback to surgeons.⁴ In 1976, the Joint Commission on Accreditation of Healthcare Organizations began requiring infection control programs for hospitals. The emergence of drug-resistant organisms and evidence-based standards spurred maturation of these programs. Contemporary hospital infection prevention teams now include epidemiologists, infection control practitioners, and quality improvement specialists that shape policy, conduct surveillance, and ensure compliance.

Mandates to create similar programs in nursing facilities soon followed. Recognition of major deficiencies in care led to the Nursing Home Reform Act, part of the Omnibus Budget Reconciliation Act of 1987 (OBRA), and required individualized infection control programs. The US Centers for Medicare & Medicaid Services (CMS) pay facilities for their services only if those facilities are certified to bring compliance with the OBRA

PRIISM GOALS

- Develop a model of integrated hospital & nursing home infection prevention practices
- Enhance communication between nursing homes & hospitals



Created by Adrien Coquet
from Noun Project



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from Noun Project

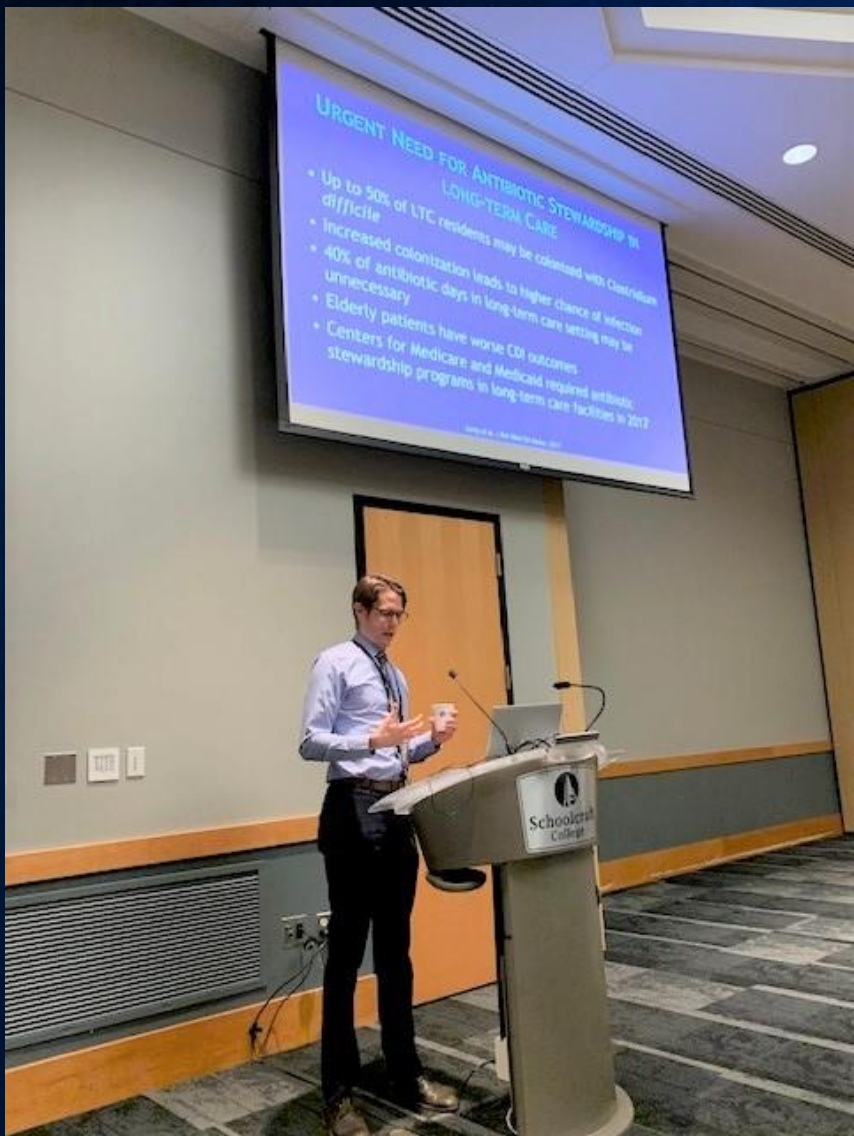
HOW DOES PRIISM HELP TO ACHIEVE THESE GOALS?

- It's a group project
 - Nursing home leaders & staff, hospital representatives, health department, UM Project Team
- It's face-to-face
 - In-person educational sessions
- We learn from subject matter experts
- We learn from each other

HOW CAN PRIISM HELP TO ACHIEVE THESE GOALS?

- Conferences & meetings
 - Education/resources/tools taken back & disseminated to staff
- Individualized nursing home assessment of infection prevention needs; on-site staff education; monthly feedback reports
- Guidance to develop & implement quality improvement project

CONFERENCES & MEETINGS



CONFERENCES & MEETINGS

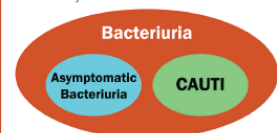


ON-SITE EDUCATION

4 Things You Should Know About Urine Cultures

1. Bacteria in the urine does not necessarily mean a catheter-associated urinary tract infection (CAUTI) is present.

Bacteriuria is the term used to describe a positive urine culture, the presence of bacteria in the urine. This could point to either asymptomatic bacteriuria or to CAUTI. People can have bacteria in the urine that do not cause symptoms or harm; asymptomatic bacteriuria is not a urinary tract infection.



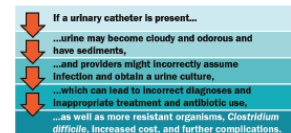
2. Chronically catheterized residents have bacteriuria 99% of the time.

Inappropriate triggers for urine cultures include—

- Urine color
- Urine smell
- Urine sediment
- Cloudy urine
- White blood cells in the urine
- Positive dipstick

* See CDC's January 2016 'Urinary Tract Infection (UTI) Event for Long-term Care Facilities,' listed below

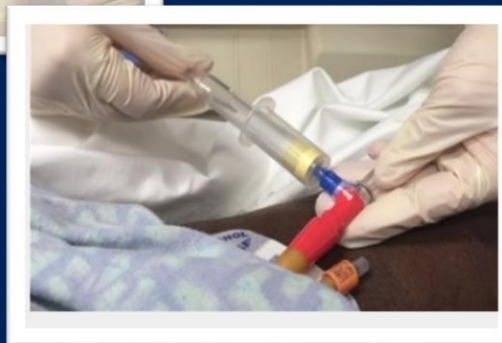
3. Urine culturing can actually harm residents who have no CAUTI symptoms.



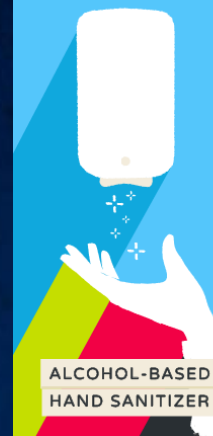
4. Urine cultures should only be ordered if one or more CAUTI symptoms are present.

The presence of cloudy, odorous urine with sediments does not alone indicate a CAUTI. CAUTI signs and symptoms are the following:

- Fever (even if the resident has another possible cause for the fever such as pneumonia)*
- Rigors
- New confusion or functional decline (with NO alternative diagnosis AND leukocytosis)
- New suprapubic pain or costovertebral angle pain or tenderness
- New, very low blood pressure (with no alternate noninfectious cause)
- Acute pain, swelling or tenderness of testes, epididymis, or prostate
- Pus around the catheter



TECHNIQUE MATTERS WHEN CLEANING YOUR HANDS



It only counts if you use the right amount, the right way.

- ▶ Use enough alcohol-based hand sanitizer to cover all surfaces of your hands.
- ▶ You might need more than one pump.
- ▶ For alcohol-based hand sanitizer, your hands should stay wet for around 20 seconds if you used the right amount.

ALCOHOL-BASED HAND SANITIZER



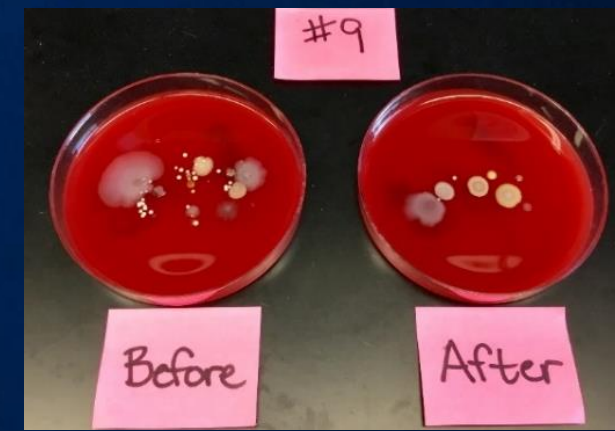
Protect Yourself. Protect Your Patients.

Who do your #CLEANHANDSCOUNT for?



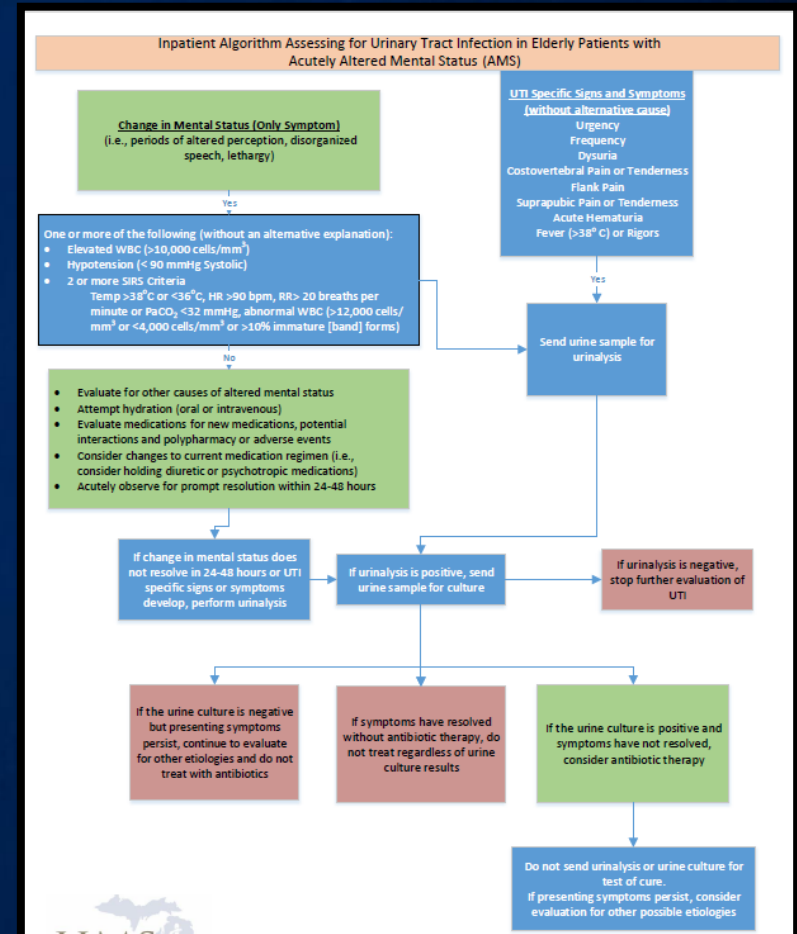
www.cdc.gov/HandHygiene

This material was developed by CDC. The Clean Hands Count Campaign is made possible by a partnership between the CDC Foundation and GOJO.



WEBSITE

- Educational materials, data collection/audit tools, resource links including those for CoV-19
- Educational videos for nursing staff
- Key research articles
- Open access at priism.med.umich.edu




PICCs in SNFs: An Overview





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Chief, Division of Hospital Medicine
Michigan Medicine

vineetc@umich.edu [@vineet_chopra](https://twitter.com/vineet_chopra) www.improvepicc.com

Urinary Incontinence & Hydration Practices in Skilled Nursing Facilities




Mirza Beg, MD
Division Head Geriatrics,
Department of Family Medicine,
Henry Ford Hospital, Detroit, Michigan



PRIISM: PREVENTING RESISTANCE AND INFECTIONS BY INTEGRATING SYSTEMS IN MICHIGAN

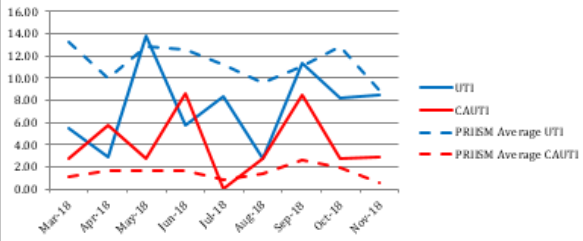
HOW IMPROVEMENTS ARE MEASURED

- Facility-acquired infections
 - Urinary tract infections (UTIs)
 - Catheter-associated UTIs (CAUTIs)
 - *C. diff* infections
 - MRSA infections
- Indwelling urinary catheter use
- Frequency of urine testing for possible infection (urine cultures & urinalyses)
- Data shared monthly


 Shady Pines, November 2018

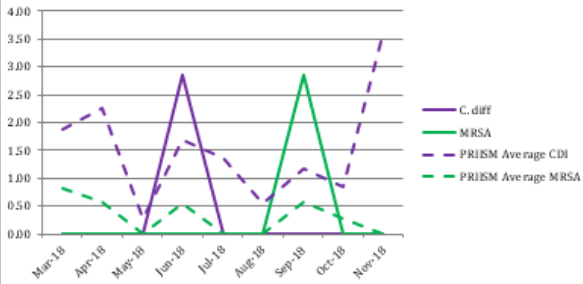
Infection Rates for Shady Pines

UTI and CAUTI Rates
(facility onset, per 10,000 patient days)



Month	UTI	CAUTI	PRIISM Ave rate UTI	PRIISM Ave rate CAUTI
Mar-18	6.00	4.00	10.00	2.00
Apr-18	4.00	6.00	10.00	2.00
May-18	13.00	4.00	10.00	2.00
Jun-18	8.00	9.00	10.00	2.00
Jul-18	9.00	0.00	10.00	2.00
Aug-18	4.00	4.00	10.00	2.00
Sep-18	11.00	9.00	10.00	2.00
Oct-18	9.00	3.00	10.00	2.00
Nov-18	9.00	3.00	10.00	2.00

MRSA and CDI Rates over time
(facility onset, per 10,000 patient days)



Month	C. diff	MRSA	PRIISM Ave rate CDI	PRIISM Ave rate MRSA
Mar-18	2.00	0.00	1.00	0.50
Apr-18	2.00	0.00	1.00	0.50
May-18	0.00	0.00	1.00	0.50
Jun-18	2.80	0.00	1.00	0.50
Jul-18	1.50	0.00	1.00	0.50
Aug-18	0.00	0.00	1.00	0.50
Sep-18	0.00	2.80	1.00	0.50
Oct-18	0.00	0.00	1.00	0.50
Nov-18	0.00	0.00	1.00	0.50

When one patient starts any of the following without antibiotic resistance:

1. Patient's respiratory distress
2. Incontinence, urine in mouth/nose
3. Confusion/delirium or weakness
4. Fever, rapid heart rate, white drainage (with leukocytes) (WBC > 10 x 10⁹/L), or leukopenia (WBC < 4,000)
5. New or changing wound drainage
6. New or changing urine output
7. New or changing bowel sounds
8. New or changing vital signs
9. New or changing mental status
10. New or changing vital signs

YES: Use antibiotic and Culture
 Prescribe antibiotic for pending urine culture
 Start empiric therapy (see order set)

NO: Do NOT start antibiotic
 Do NOT start urine testing

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PRIISM 2018
increased/began in your facility (but

compared to last month. Shady
falls below all PRIISM nursing homes

last month. Shady Pines' CAUTIs are
below the
than PRIISM NH average) and
below M NH average). Keep up the

to prevent these infections
we've created since last month and is

measures are only done when

with decision-making, such as the
is w/altered mental status -
resources

RESEARCH TO KEY POLICY IMPLICATIONS (PRE-COVID)

- Infection prevention in nursing homes is challenging
- Requires resources, dedication and external support
- 2009- population in NHs changed, more short-stay
- Patients carry a lot of pathogens on their hands
 - Who helps them with hand hygiene while in hospital or at nursing home?
- Common use areas are frequently contaminated
 - How good is the cleaning?
- Communication between hospitals and nursing homes can be improved

COVID-19 (2020)

COVID-19 PREPAREDNESS AND RESPONSE: 2020

March 10-11, 2020

- Better prepared in 2020 than in 2007
- More likely to have a staff person assigned to lead pandemic preparedness
- Begun stockpiling some supplies
- Provided Immediate staff education
- Better communication lines with local hospitals, public health officials
- Better access to laboratory facilities
- Worried about staff and PPE shortages

April 10-12, 2020

- Daily occupancy dropped significantly
- Multiple and often confusing guidance
- Testing a major issue
- Hospital transfers challenging
- Communications with local hospitals, public health officials inadequate
- Staff and PPE shortages
- Concerns about visitation policies
- Difficult to send patients for outpatient appointments, dialysis

COVID-19 RESPONSE IN MICHIGAN NURSING HOMES (MAY 2020)

- 74% had a LOWER occupancy rate since the COVID-19 pandemic began
- The COVID-19 response plan addressed all or most issues at 95% of NHs responding
- 35% had at least one COVID-19 positive resident at the time of the survey
- Designated COVID-19 unit or wing at 78% NHs responding

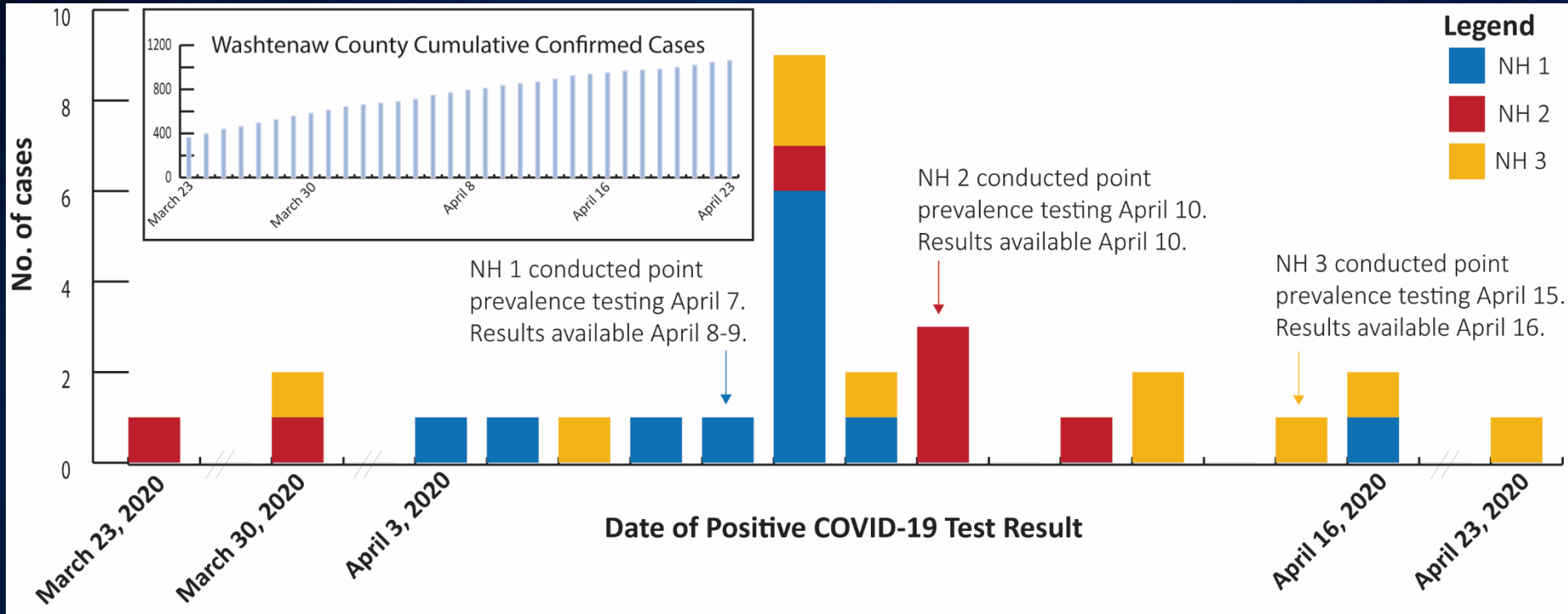
COVID-19 RESPONSE IN MICHIGAN NURSING HOMES (MAY 2020)

- 66% reported supply shortages. Who helped with these shortages?
 - Corporate (57%)
 - State and local health department (52%)
 - Community (48%)
- 55% experienced staff shortages. How were these vacancies filled?
 - Staff volunteering to work extra shifts (79%)
 - Non-clinical staff filling different roles (61%)
 - Staff mandated to work extra shifts (47%)

COVID-19 RESPONSE IN MICHIGAN NURSING HOMES (MAY 2020)

- 90% of NHs conducted therapies (physical, occupational, speech) as 1-on-1, in-room
- Telemedicine was used at 71% NHs reporting, with 61% using it for the first time
- NHs used creative methods for residents to stay connected to loved ones
 - 98% used telephone calls, 96% videoconferencing
 - 81% window visits
 - Also social media pages, snail mail

COVID-19: IMPACT OF COLLABORATIONS



- ✓ Proactive, coordinated steps by NH medical directors & administrators with engagement from referral hospitals and their laboratories, local public health officials to rapidly respond to the outbreak limited the transmission of COVID-19 within facilities
- ✓ This coordinated approach may be an effective measure to save lives, minimize the burden to the healthcare system, and save healthcare costs

COVID-19: UPCOMING PROJECTS

- Local:** Transmission of SARS-CoV-2 on environmental surfaces in Nursing homes (NIA)
- State:** Keeping nursing home residents safe and advancing health in light of COVID-19: recommendations to State of Michigan (MI Health Endowment Funds)
- National:** Developing a sweeping research agenda
Clinical Trials Infrastructure
- Veterans:** Virtual Infection Prevention-Educator (VIP-E)
- Arts:** Resiliency during Pandemics (Medical Arts Program)
- Mentorship:** Preparing the next generation (NIH Training Grant)