# *C. difficile* prevention and the SPARC Collaborative

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# SPARC: The Basics

- Statewide Prevention and Reduction of *C. difficile* (SPARC)
- What: A statewide collaborative quality improvement project among public health, academics, and acute care hospitals working together to prevent and reduce *C. difficile* infections (CDI)

- Who:
  1) Maryland Department of Health (MDH)
  2) Johns Hopkins Hospital
  3) University of Maryland Medical System (UMMS)
  4) Maryland acute care hospitals
  5) NORC at the University of Chicago – collaborative implementation contractor

# SPARC Collaborative Process

- Obtain hospital commitment to participate
- Identify key hospital stakeholders and leaders
- Complete pre-site visit gap assessment to identify strengths and opportunities for improvement
- Perform site visit with focus on information collected in gap assessment
  1. Environmental cleaning
  2. Diagnostic stewardship for common (non-CDI) infections
  3. Antibiotic stewardship
  4. CDI diagnostic stewardship
  5. Contact precautions and isolation

  "5 Domains"
- Tailored interventions based on gap assessment and site visit findings
  - Might include recommended changes to EHR
- Data collection and analysis
- Webinars, office hours, collaborative meeting(s)

# Diagnostic Stewardship

- Will the test result change how the patient is managed?
- How common is the disease in the population?
  - Positive predictive value
  - Negative predictive value
- What are the odds and consequences of a false positive?
- What are the odds and risks of a missed diagnosis?

# *C. difficile* colonization

- May represent a non-toxigenic strain
- Some toxigenic strains may also cause asymptomatic colonization
- Unclear clinical and infection control implication
- Colonization rates are very high
  - 18-90% of infants under 1 are positive for C difficile
  - 0-15% of healthy adults
  - 4-29% of hospitalized patients
  - 0-50% nursing home residents

# *C. difficile* diagnostic stewardship

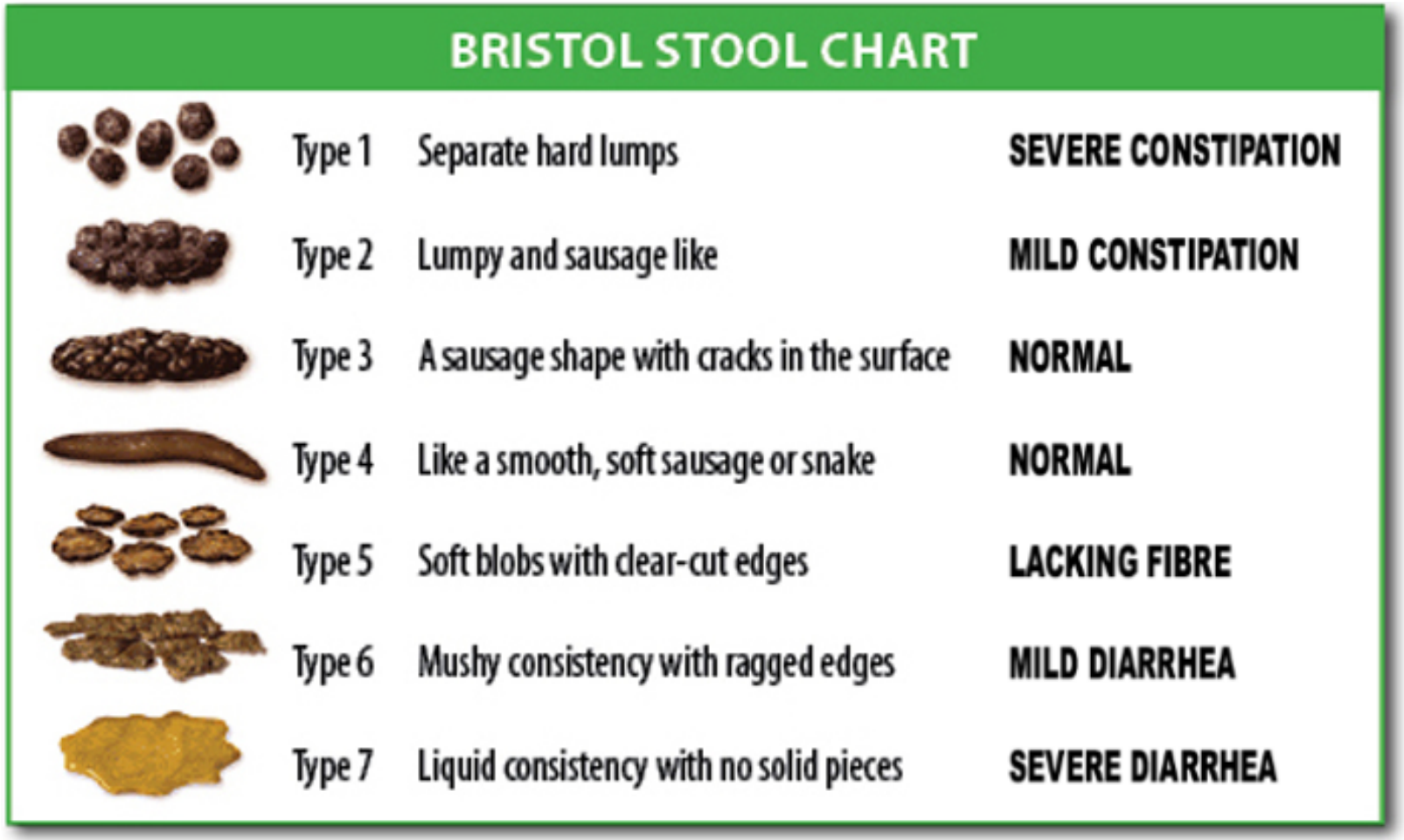
- PCR/NAAT testing for *C. difficile* is very sensitive (94-99%)
  - Repeat testing after a negative test is unnecessary
- PCR also may detect non-toxigenic strains/ colonized patients
  - Use of a toxin EIA as a confirmatory test for PCR positives
- Many things can cause diarrhea
  - Only test people who have diarrhea without other causes
- People without diarrhea may still test positive
  - Only test patients with diarrhea

# When to order a *C. difficile* test?

- New onset of diarrhea
  - 3 or more liquid stools in a 24 hour period WITHOUT other causes or:
  - Increase in stool production over baseline (in patients with chronic diarrhea/colostomy)

  - Other causes may include:
    - Laxative use
    - Tube feed
    - Chronic conditions
    - Other GI pathogens

# Bristol Stool Chart: Only test the 7s



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# Strategies for Stewardship

- Laboratory rejection criteria
  - Lab will not test solid stool
  - Lab rejects multiple stools for the same patient within given time frame
- Built in tools in the electronic health record
  - Hard stop or best practices alert when ordering a C. difficile test
- Education and front line champions
  - Ensure that team ordering tests understands the criteria for C difficile infection versus colonization
  - Emphasize risks of inappropriate treatment

# Risks of over-treatment

- Causes more *C. difficile* disease
  - Oral vancomycin or metronidazole can precipitate a *C. difficile* diarrheal illness
- Pressure for drug resistant bacteria in the gut
- Risks of adverse drug reactions to antibiotics
- Increased resources for patient isolation and contact precautions
- (not to mention that it makes your rates look high)

# References


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# Preventing C. diff with Antibiotic Stewardship

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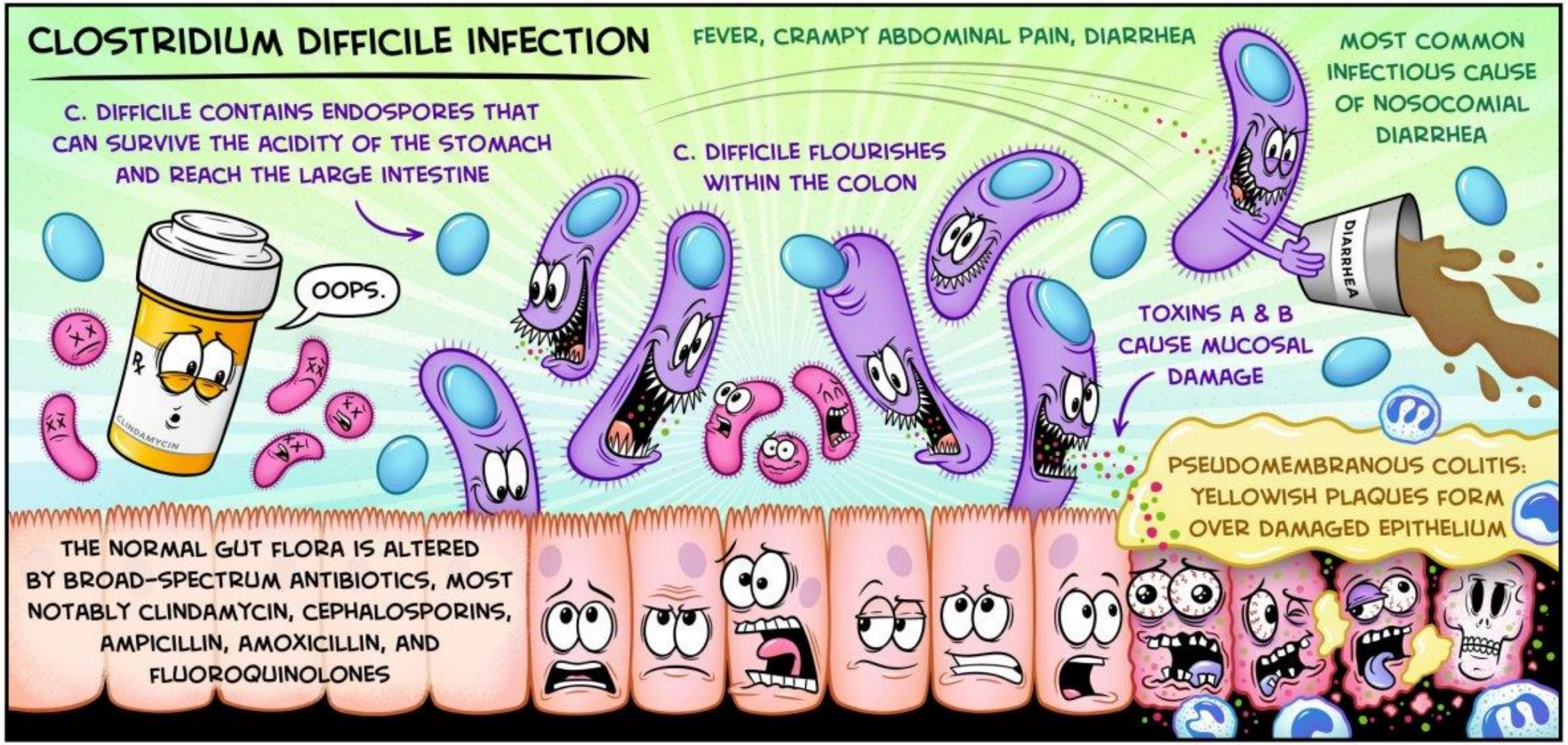
# Antibiotic Stewardship - the Basics

Medicaid- and Medicaid-certified nursing homes must have an antibiotic stewardship program that includes antibiotic-use protocols and a system to monitor antibiotic use

Stepping stones to compliance[7]

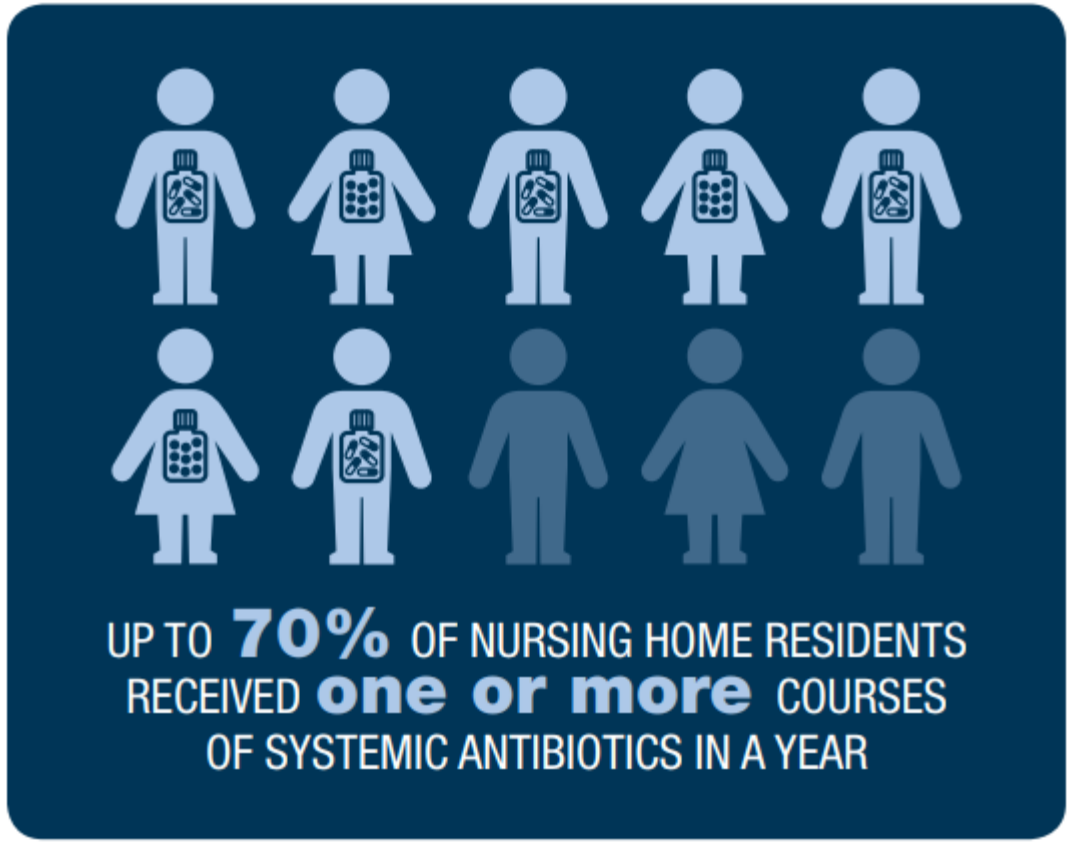
1. Seek out expertise
2. Focus on teamwork
3. Assess
4. Multidisciplinary task-force
5. Improve monitoring

# Why Stewardship?



# Why Stewardship?

**40-75% of antibiotics prescribes in nursing homes**
**May be unnecessary or inappropriate**




**Stewardship Works!**

**2005-2006** 683-bed hospital

Antibiotic use ↓ 54%.

C. diff ↓ 60%

**2003-2005** 834-bed hospital

Fluoroquinolone use ↓ 54%

C. diff infections ↓ from 7.2 per 1000 to 3 per 1000.



Reference: https://www.cdc.gov/antibiotic-use/healthcare/evidence/asp-int-cdiff.html

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# Getting practical

## 1. Implement the 7 Core elements of Antibiotic Stewardship for LTC

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



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# Getting practical

## 2. Assess the use of antibiotics that pose the highest risk for CDI

**Evaluate antibiotic treatment for common infections**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Name | Room # | Source | Organism | Cx Date | Date of sx onset | ABX | ABX Start Date | Urinary Catheter? | Catheter Placement Date | Catheter Placement Location | Placed by? | |
| 2 | Joe Schmo | 1 | Urine | e. coli | 11/19/2018 | 11/19/2018 | Cipro | 11/19/2018 | *Yes* | 11/15/2018 | Onsite | GNA | |
| 3 | Ada Laid | 12 | Urine | e. coli | 11/24/2018 | 11/23/2018 | CIpro | 11/24/2018 | *Yes* | 11/20/2018 | Onsite | GNA | |
| 4 | Fanny Mae | 29 | Urine | e. faecalis | 12/31/2018 | 12/31/2018 | Gentamycin | 12/31/2018 | *No* | N/A | N/A | N/A | |
| 5 | Al Swell | 16 | Urine | K. pneumoniae | 12/29/2018 | 12/28/2018 | Cipro | 12/29/2018 | *Yes* | 12/25/2018 | Onsite | GNA | |
| 6 | Millie Illy | 5 | Urine | e. coli | 1/8/2019 | 1/6/2019 | Cipro | 1/8/2019 | *Yes* | 1/3/2019 | Onsite | GNA | |
| 7 | Charles Run | 23 | Urine | e. faecalis | 1/20/2019 | 1/19/2019 | Macrobid | 1/20/2019 | *Yes* | 1/15/2019 | Onsite | GNA | |
| 8 | | | | | | | | | | | | | |

**What does this line list tell us about antibiotic treatment for UTIs**

# Getting practical

## 3. Develop and implement facility-specific treatment recommendations

### Minimum Criteria for Initiation of Antibiotics in Long-Term Care Residents

#### Suspected Lower Respiratory Tract Infection

- Fever >38.9°C [102°F]
  *and at least one* of the following:
  - Respiratory rate >25
  - Productive cough

*or*

- Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature, but ≤38.9°C [102°F])
  *and* cough
  *and* at least one of the following:
  - Pulse >100
  - Rigors
  - Delirium
  - Respiratory rate >25

*or*

- Afebrile resident with COPD and >65 years
  *and* new or increased cough with purulent sputum production

*or*

- Afebrile resident without COPD and new cough with purulent sputum production
  *and at least one* of the following:
  - Respiratory rate >25
  - Delirium

*or*

- New infiltrate on chest X-ray thought to represent pneumonia
  *and at least one* of the following:
  - Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature)
  - Respiratory rate >25
  - Productive cough

Chest X-ray and complete cell count with differential is reasonable for residents with fever, cough, and at least one of the following: pulse >100, worsening mental status, rigors.

#### Fever with Unknown Focus of Infection

- Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature)
  *and at least one* of the following:
  - New onset delirium
  - Rigors

Note: fever + mental status changes that do not meet delirium criteria (e.g. reduced functional

#### Suspected Urinary Tract Infection

**NO indwelling catheter:**

- Acute dysuria

*or*

- Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature)
  *and at least one* of the following:
  New or worsening:
  - Urgency
  - Frequency
  - Suprapubic pain
  - Gross hematuria
  - Costovertebral angle tenderness
  - Urinary incontinence

**WITH indwelling catheter (Foley or suprapubic):**

- *At least one* of the following:
  - Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature)
  - New costovertebral tenderness
  - Rigors
  - New onset of delirium

Note: Foul smelling or cloudy urine is not a valid indication for initiating antibiotics. Asymptomatic bacteriuria should not be treated with antibiotics.

#### Suspected Skin and Soft-tissue Infection

- New or increasing purulent drainage at a wound, skin, or soft-tissue site

*or*

- *At least 2* of the following:
  - Fever (>37.9°C [100°F] or a 1.5°C [2.4°F] increase above baseline temperature)
  - Redness
  - Tenderness
  - Warmth
  - New or increasing swelling

- Include first and second line antibiotics in treatment recommendations.
- Use Facility or Regional antibiograms to help prescribers select the most appropriate therapy.

Maryland Regional Antibiogram

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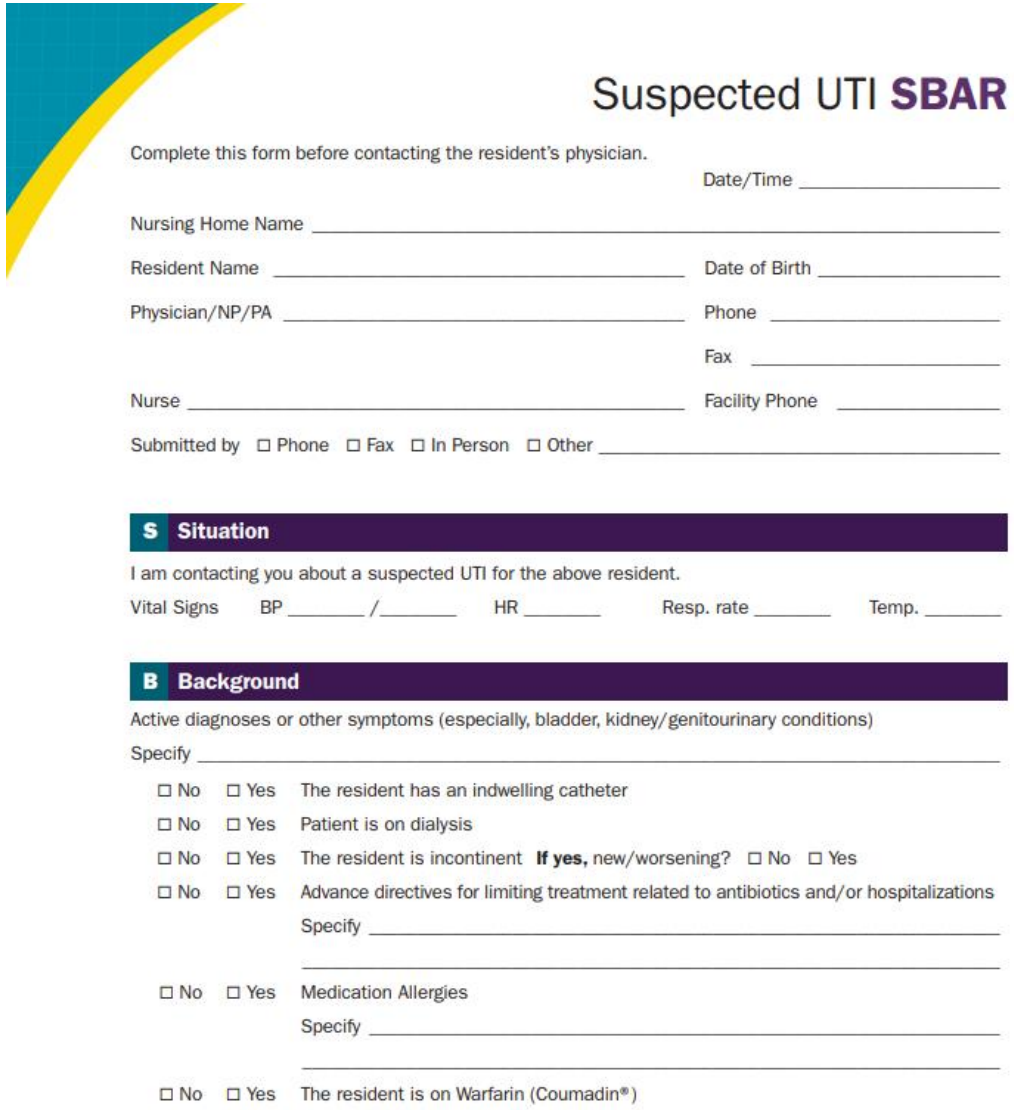
# Getting practical

## 4. Use an SBAR to improve communication of suspected infections



### Suspected UTI **SBAR**

Complete this form before contacting the resident's physician.

Date/Time _____

Nursing Home Name _____

Resident Name _____ Date of Birth _____

Physician/NP/PA _____ Phone _____

Fax _____

Nurse _____ Facility Phone _____

Submitted by ☐ Phone ☐ Fax ☐ In Person ☐ Other _____

**S Situation**

I am contacting you about a suspected UTI for the above resident.

Vital Signs BP _____/_____ HR _____ Resp. rate _____ Temp. _____

**B Background**

Active diagnoses or other symptoms (especially, bladder, kidney/genitourinary conditions)

Specify _____

☐ No ☐ Yes The resident has an indwelling catheter

☐ No ☐ Yes Patient is on dialysis

☐ No ☐ Yes The resident is incontinent **If yes,** new/worsening? ☐ No ☐ Yes

☐ No ☐ Yes Advance directives for limiting treatment related to antibiotics and/or hospitalizations

Specify _____

_____

☐ No ☐ Yes Medication Allergies

Specify _____

_____

☐ No ☐ Yes The resident is on Warfarin (Coumadin®)

Require nurses to complete an SBAR before contacting providers.

AHRQs Suspected UTI SBAR Toolkit



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# Overcoming the Opposition

- **EDUCATE**
- Gain leadership support
- Appoint multi-disciplinary front-line stewardship champions
- Change the culture
- Use a systems approach
- Give them an antibiogram
- Implement multi-disciplinary developed facility policies

"This is how I've always done it"

"But mom *needs* an antibiotic"

"This antibiotic has always worked for me"



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