Update on Hospital Medicine

ACP TN Scientific Meeting 2019

Chase J. Webber, DO
Assistant Professor Clinical Medicine
Vanderbilt University Medical Center
Section of Hospital Medicine
@chasejwebber
• I have no actual or potential conflict of interest in relation to this presentation.
Thinking about Hospital Medicine
Thinking about Hospital Medicine
Where we are, where we’re going, we’re we’ve been
1994 “Before the Titans, TV shows and pedal taverns”
Zero to 50,000 — The 20th Anniversary of the Hospitalist

Robert M. Wachter, MD & Lee Goldman, MD, MPH

UCSF School of Medicine
Columbia University Medical Center

Article · September 9, 2016
Old standards. New hits...
Timeless Pearls!
2018-2019 Updates

1. Best Practices in Medication Reconciliation
2. Antibiotic Stewardship
3. Delirium management
4. Discharge AMA
5. Discharge Pearls***
Best Practices – Medication Reconciliation
CHAOS MEDICATION TRANSITION
Clinical question

– Which Med Rec intervention is most effective at reducing inpatient medication discrepancies?

Study design

– Mentored, Quality Improvement study

Setting

– 791 patients in 5 hospitals over 25 months
## Interventions and Results

<table>
<thead>
<tr>
<th>Intervention Component</th>
<th>Adjusted Incidence Rate Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained existing staff to take best possible medication histories</td>
<td>1.38 (1.21 to 1.57)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hired additional staff to take best possible medication histories</td>
<td>0.98 (0.58 to 1.65)</td>
<td>.94</td>
</tr>
<tr>
<td>Trained existing staff to perform discharge medication reconciliation and patient counseling</td>
<td>0.64 (0.46 to 0.89)</td>
<td>.007</td>
</tr>
<tr>
<td>Hired additional staff to perform discharge medication reconciliation and patient counseling</td>
<td>0.48 (0.31 to 0.77)</td>
<td>.002</td>
</tr>
<tr>
<td>Clearly defined roles and responsibilities and communicating this with clinical staff</td>
<td>0.53 (0.32 to 0.87)</td>
<td>.01</td>
</tr>
<tr>
<td>Performed high-intensity interventions on high-risk patients</td>
<td>1.28 (0.89 to 1.85)</td>
<td>.18</td>
</tr>
<tr>
<td>Implemented a new electronic medical record</td>
<td>2.21 (1.64 to 2.97)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Made improvements to existing medication reconciliation health information technology</td>
<td>0.82 (0.51 to 1.30)</td>
<td>.40</td>
</tr>
<tr>
<td>Improved access to pre-admission medication sources</td>
<td>1.42 (0.46 to 4.38)</td>
<td>.54</td>
</tr>
</tbody>
</table>

*Adjusted for patient age, service, insurance, marital status, number of prior admissions, number of high-risk medications, Elixhauser comorbidity score, diagnosis-related group (DRG) weight, median income by zip code, season, and study site

*95% confidence interval
What stands out?

**Sources:** need at least 2

- Interdisciplinary input

- Diverse mix
  - carried over
  - OTC
  - vitamins
  - supplements
  - nonhelpful or harmful

<table>
<thead>
<tr>
<th>HOME MEDICATION (WRITE LEGIBLY)</th>
<th>DOSE</th>
<th>ROUTE</th>
<th>FREQUENCY</th>
<th>LAST DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ASA</td>
<td>81 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Calcium carbonate</td>
<td>600 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ciclopirox o-ttl. get</td>
<td>1 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rosuvastatin</td>
<td>5 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Valsartan</td>
<td>120 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Flaxseed oil</td>
<td>1200 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Furosemide</td>
<td>40 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Isosorbide mononitrate ER</td>
<td>60 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Metoprolol tartrate</td>
<td>200 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Nitroglycerin</td>
<td>0.4 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Esomeprazole</td>
<td>20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

?Potential for ADEs

?Omitted medications

?Handwritten vs. EMR
• QR code to access Marquis/SHM resources portal
# Medication Reconciliation Order Form (MROF)

**Allergies:** Statins (Joint pain, tolerates rosuvastatin)

**Pediatric patients only:** Height (cm) _________ Weight (kg) _________

**SOURCE OF HOME MEDICATION LIST** (Check at least one of the following):
- [ ] Patient medication list
- [X] Patient/Family recall
- [ ] Pharmacy:
- [ ] Primary care physician list / medical record: Allscripts
- [ ] Previous discharge paperwork
- [ ] Medication Administration Record from facility
- [ ] Other:

**Check All That Apply:**
- [ ] Patient is NOT on home medications
- [ ] Patient is pregnant
- [ ] Patient is breastfeeding
- [ ] This is an addendum to a previously completed MROF*  
  *If an addendum, use for documentation only; NOT a physician order form. 
  See instructions item 2f.

**LIST RECORDED BY** (print name legibly): Tim McMath, PharmD  6/18/17  Date: 6/18/17  Time: 21:05

This form is used for inpatient admissions and ambulatory patients being discharged home. In modified medication reconciliation settings, only the "HOME MEDICATION" column is used. For detailed instructions, see reverse.

<table>
<thead>
<tr>
<th>HOME MEDICATION (WRITE LEGIBLY)</th>
<th>DOSE</th>
<th>ROUTE</th>
<th>FREQUENCY</th>
<th>LAST DOSE</th>
<th>DATE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ASA</td>
<td>81 mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
<td>/ /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Calcium carbonate</td>
<td>600 mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
<td>/ /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ciclopirox q-tid, gel</td>
<td>1mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
<td>/ /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rosuvastatin</td>
<td>5mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
<td>/ /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Valsartan</td>
<td>320 mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
<td>/ /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Flaxseed oil</td>
<td>1200 mg</td>
<td>By mouth</td>
<td>Twice Daily</td>
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<td>7. Furosemide</td>
<td>40 mg</td>
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</tr>
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<td>8. Nicosorbide moninitrate ER</td>
<td>600 mg</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**PHYSICIAN ORDER**

- [C] C to continue  
- [DC] DC to discontinue

---

**VANDERB**

**M**

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Timeless Pearls

• Seek to obtain a Best Possible Medication History (BPMH) on admission.

• Specially trained Pharmacy staff and support: essential. Advocate for evidence-based resources.

• There may be unintended consequences to implementation of new systems (ie EHR).
Antibiotic Stewardship
78 year old female PMH dCHF, severe aortic stenosis, presented to MICU with septic shock (gram negative bacteremia) due to acute cholecystitis.

- IR consulted and placed percutaneous cholecystostomy
- Weaned off pressors and now stable for transfer to floor
- By day 4, still on IV Piperacillin-tazobactam, but now ready for discharge...
- What will we do with the antibiotics?
Duration – how long to treat?
The Medicine team discusses on rounds...

Point: “Continue antibiotics for as long as drain in place.”

Counterpoint: “6 weeks? Really?”

Surgery intern (In August): “I have no idea.”

Surgery resident: “Not sure, but I know what to do: let’s ask our chief.”
Meanwhile, the surgery team asks the chief... flinches & hold their breath, waiting for an answer:

“We want to sign off. What should we write for how long to treat?”

(...)

Surgery chief: “Ask the Hospitalist.”

(This takes place in 2020)
Why We Should Care

Hospital Medicine Goals

– Not only high quality of care
– Opportunity for leadership in this area

45 randomized controlled trials showing non-inferiority of shorter antibiotic regimens
45 randomized controlled trials showing non-inferiority of shorter antibiotic regimens

<table>
<thead>
<tr>
<th>Disease</th>
<th>Short Course Studied (days)</th>
<th>Long Course Studied (days)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute bacterial sinusitis</td>
<td>5</td>
<td>10</td>
<td>Equal</td>
</tr>
<tr>
<td>Acute exacerbation of chronic bronchitis and obstructive pulmonary disease</td>
<td>≤5</td>
<td>≥7</td>
<td>Equal</td>
</tr>
<tr>
<td>Intraabdominal infection</td>
<td>4</td>
<td>10</td>
<td>Equal</td>
</tr>
<tr>
<td>Osteomyelitis</td>
<td>42</td>
<td>84</td>
<td>Equal</td>
</tr>
<tr>
<td>Pneumonia, community-acquired</td>
<td>3-5</td>
<td>7-10</td>
<td>Equal</td>
</tr>
<tr>
<td>Pneumonia, nosocomial (including ventilator-associated)</td>
<td>≤8</td>
<td>10-15</td>
<td>Equal</td>
</tr>
<tr>
<td>Pyelonephritis</td>
<td>5-7</td>
<td>10-14</td>
<td>Equal</td>
</tr>
<tr>
<td>Skin infections (cellulitis, major abscesses, wound infections)</td>
<td>5-6</td>
<td>10-14</td>
<td>Equal</td>
</tr>
</tbody>
</table>

FIND SOME 2019 STUDY

• Belabor the results of the prior table in specifics .. CAP, etc
“…The overuse of antibiotics is not a knowledge problem or a diagnostic problem; it is largely a psychological problem.”
Clinical question
– What are the predictors and outcomes associated with excess duration of antibiotic treatment?

Study design
– Retrospective cohort

Setting
– 43 hospitals, Michigan Hospital Safety Consortium
Included

– Adult inpatients with CAP or HC-associated PNA
– Treatment ≥4 days and within first 2 days

Key Exclusions

– Patients who received insufficient duration (≥2 days less than shortest guideline)
– MICU or ventilator need, other infection, pregnant or severe immunocompromise, bacteremia

Outcomes

– 1° Rate??? (specify) of excess antibiotic treatment duration (how common is this practice)
– 2° Death, readmission, ED visit, Abx-associated ADE
Primary outcome

- Patients with excess antibiotic treatment duration
  - 67.8% of patients: abx longer than indicated

Each excess day abx = 5% increased odds of ADE

-
Secondary Outcomes

• Longer duration did not improve mortality, reduce readmissions or re-visits to ED

• Increased Odds of pt-reported side effects. Its not fun to be on abx (nausea, GI)

We believe the study; even more it gives us clues as to how to improve our individual practice?

Factors Associated with Excess Treatment

- Sputum culture – negative (2.5 d) or positive (3.2 d)
- No end date documented (2.9d)
Factors Associated with Excess Treatment

1) 93.2% excess therapy = prescribed at discharge.
2) Sputum culture – negative (2.5 d) or positive (3.2 d)
3) No end date documented (2.9d)
In AD 321, Roman Emperor Constantine the Great codified that there would be 7 days in a week. Even in the modern era of evidence-based-medicine, this 1695-year-old decree remains a primary reference for duration of antibiotic therapy: it leads physicians to treat infections in intervals of 7 days. Thus, it is gratifying when clinical trials challenge the standard antibiotic duration of 7 to 14 days.
SIDE NOTE! Sometimes the right duration might even be ZERO

**Screening for Asymptomatic Bacteriuria**

Bacteria in the urinary tract are more common in women than in men. For those who are not pregnant and have no symptoms of infection, it is generally not a health concern. Pregnant women have a higher risk of developing more serious kidney infections as a result of asymptomatic bacteriuria.

<table>
<thead>
<tr>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults who have no signs or symptoms of a urinary tract infection, as well as pregnant women of any age</td>
</tr>
</tbody>
</table>

**USPSTF recommendation**

- **B**
  - The USPSTF recommends screening for asymptomatic bacteriuria in pregnant women with urine culture.

- **D**
  - The USPSTF recommends against screening for asymptomatic bacteriuria in nonpregnant adults.

**Exceptions**

1) Pregnancy
2) 1 month post renal transplant
3) Pre-urologic procedure with mucosal trauma

* IDSA 2019

Timeless Pearls

• Evidence and common sense together support shorter course of antibiotics for PNA.
• Use discharge as an opportunity to narrow and shorten duration.
• Don’t test for or treat nonpregnant adults for asymptomatic bacteriuria
• Constantine is dead, long live Stewardship!
Delirium
“The I.C.U. setting itself can feel sinister to patients, as if lifted from “The Twilight Zone.” The eerie, sleep-indifferent lights. The cacophony of machines and alarms.”
2019 or recent article on B-CAM or whatever relating to DIAGNOSIS
B-CAM & CAM-ICU

• These are great and easy, the more you use them, the more hypoactive you will find
Work-up: need a systematic approach

• Old Standard
  – How about a self-referential mnemonic? NEJM

• New hit
  – Clinical Problem Solvers
Table 3. Evaluation and Management of Delirium.

<table>
<thead>
<tr>
<th>Step and Key Issues</th>
<th>Proposed Evaluation and Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate and treat common modifiable contributors to delirium*</td>
<td>Consider the etiologic role of newly initiated drugs, increased doses, interactions, over-the-counter drugs, and alcohol; consider especially the role of high-risk drugs: lower the dose, discontinue the drug, or substitute a less psychoactive medication</td>
</tr>
<tr>
<td>Drugs</td>
<td></td>
</tr>
<tr>
<td>Electrolyte disturbances</td>
<td>Assess for and treat, especially dehydration, sodium imbalance, and thyroid abnormalities</td>
</tr>
<tr>
<td>Lack of drugs</td>
<td>Assess possible symptoms of withdrawal from long-term use of sedatives, including alcohol and sleeping pills; assess for and treat poorly controlled pain (lack of analgesia): use local measures and scheduled treatment regimens that minimize the use of opioids (avoid meperidine)</td>
</tr>
<tr>
<td>Infection</td>
<td>Evaluate and treat, especially urinary tract, respiratory tract, and soft-tissue infections</td>
</tr>
<tr>
<td>Reduced sensory input</td>
<td>Address issues involving vision (e.g., encourage use of eyeglasses) and hearing (e.g., encourage use of hearing aids or a portable amplifier)</td>
</tr>
<tr>
<td>Intracranial disorders</td>
<td>Consider such disorders (e.g., infection, hemorrhage, stroke, or tumor) if there are new focal neurologic findings or a suggestive history or if diagnostic evaluation for causes outside the central nervous system is unrevealing</td>
</tr>
<tr>
<td>Urinary and fecal disorders</td>
<td>Assess for and treat urinary retention (so-called cystocerebral syndrome) and fecal impaction</td>
</tr>
<tr>
<td>Myocardial and pulmonary disorders</td>
<td>Assess for and treat myocardial infarction, arrhythmia, heart failure, hypotension, severe anemia, exacerbation of chronic obstructive pulmonary disease, hypoxia, and hypercarbia</td>
</tr>
</tbody>
</table>
Altered Mental Status 2.0

Mimic
- Aphasia
- Dysarthria

Metabolic
- BMP
- Ca↑

Organ Dysfunction
1. Lung - ↑CO₂, ↓O₂
2. Cardiac - ACS
3. Liver - Hepatic Encephalopathy
4. Endocrine - ↑TSH, ↓Cortisol

A/VBG, EKG, CMP, Coags, TSH

Other
- Vitamin B1, B12
- Urinary Retention
- Constipation
  - Bladder Scan
  - Empiric Rx - IV thiamine

Infection
- Extra-CNS
  - PNA
  - UTI
  - Other
    - OXR/UA
  - CNS
    - Meningitis
    - Encephalitis
  - LP

Structural
- Subdural Hemorrhage
  - CT

Toxin

Rx > Dx

- ↓Glucose → DSO
- ↑Opiate → Naloxone
- ↓Airway protection → Intubate

Rx
- Anti-Cholinergic
- Opiates

Utox
- Benzo Withdrawal
- Methanol

Med Rec Utox
Clinical question
– What are the effects of haloperidol or ziprasidone, as compared with placebo, on delirium in ICU patients?

Study design
– Randomized, double-blind, placebo-controlled

Setting
– 16 medical centers, MIND-USA
Included

- Age > 18 years, MICU or SICU patients, CAM-ICU + delirium
- Shock or respiratory failure

Excluded

- Severe cognitive impairment, pregnancy, history of torsades/QT prolongation/NMS

Treatment arms

1) IV Haldol <20mg/d     2) IV ziprasidone <40mg/d

Outcomes or placebo

- 1° Days alive without delirium or coma
- 2° Duration of delirium, time to extubation, times to: final successful ICU d/c, hospital d/c, 30d and 90d survival

Results

A Days Alive without Delirium or Coma

- Ziprasidone
- Haloperidol
- Placebo

B Days with Delirium

- Ziprasidone
- Haloperidol
- Placebo

C Days with Coma

- Ziprasidone
- Haloperidol
- Placebo

Adjusted Median Days (95% CI)
Of the 87 patients who met the study inclusion criteria, 23 (26%) were continued on antipsychotic therapy after their transfer from the MICU to the medical ward. Of the 23 patients continued on antipsychotic therapy, 9 (39%) were discharged from the hospital with an antipsychotic.
Quick Take: Use Apps to Help!
160 | Screening For ICU Delirium

Background: Delirium is an acute, fluctuating change in mental status, accompanied by sleep/wake cycle disruption.

1 | Diagnosis And Treatment Of Terminal Delirium

Background: Some degree of loss of cognitive function occurs in most patients in the week or two before death. T...

60 | Pharmacologic Management Of Delirium: Update On Newer Agents

Background: Delirium is a common psychiatric disorder in the terminally ill (See Fast Fact #1). Delirium can deeply dis...

315 | Olanzapine For Nausea, Delirium, Anxiety, Insomnia, and Cachexia

Olanzapine is a second-generation atypical antipsychotic that has shown off-label efficacy for the treatment of naus...

306 | The Role of Melatonin in Palliative Care
Screening For ICU Delirium

**Authors:** Richard Altman MD, Eric Milbrandt MD, MPH, Robert M Arnold MD

**Category:** ICU, Critical Care

**Background:** Delirium is an acute, fluctuating change in mental status, accompanied by sleep/wake cycle disruption, inattention, and altered perceptions (hallucinations/delusions) (see Fast Fact #1, Fast Fact #60). Delirium can be hypoactive or hyperactive. Patients with hypoactive delirium are calm, but inattentive and manifest decreased mobility. Patients with hyperactive delirium are agitated and combative, and also lack the ability to maintain attention to complete tasks. Delirium can be considered a marker of acute brain dysfunction, much like shock is evidence for dysfunction of the cardiovascular system (1).

**ICU Delirium** Delirium occurring in the ICU is associated with an increased length of hospitalization, increased need for institutionalization, and higher short and long-term mortality (2). In the ICU, delirium occurs in as many as 80% of patients, but is often overlooked or misdiagnosed because of the difficulty of assessing mental states in intubated patients. Three assessment tools have
Timeless Pearls

• Compared to placebo, neither drug made a difference in delirium duration, ICU time or mortality

• Despite lack of benefit, both drugs were well-tolerated

• Only use in uncontrolled agitation, otherwise: treating ourselves > patient
AMA Discharges
In the Literature – October 2019
Jessica Burke, MD; Chase Webber, DO; Kevin Liu, MD; Russell Ledford, MD; Krista Suojanen, MD; Derek Kruse, MD; Kevin Hageman, DO; Kelly Sponsler, MD
Section of Hospital Medicine, Vanderbilt University Medical Center

AMA discharge linked to increased readmission rate, discontinuity of care

Clinical question: What is the impact of discharge against medical advice (AMA) on 30-day readmission rates and outcomes on subsequent hospitalization?

Background: AMA discharges are common (1-2% of all US discharges) and disproportionately affect vulnerable patient populations, specifically those of lower socioeconomic status and the uninsured. Previous studies have been insufficiently powered to assess the effects of AMA discharge on 30-day readmission rates at a national level.

Study design: Retrospective cohort
AMA Discharges – Fast Take

- Common: 1-2% of all discharges
- Risky: 20.2% unplanned readmission vs. 10.1% routinely discharged
- AMA begets AMA: 20x odds of repeat AMA on readmit
• So then why are we writing AMA discharges?

• Thoughts include:
  • To persuade our patients to stay (perhaps with $ implications)
  • Legal protection for the physician or hospital
  • Reputation (I didn’t think this dc was smart)
CONCLUSIONS: Contrary to popular belief, we found no evidence that insurance denied payment for patients leaving AMA. Residency programs and hospitals should ensure that patients are not misinformed.

KEY WORDS: patient discharge; financial responsibility; hospital reimbursement.

J Gen Intern Med 27(7):825–30
DOI: 10.1007/s11606-012-1984-x
© Society of General Internal Medicine 2012
Legal mythbuster
Against Medical Advice (AMA) Discharges

CHOOSING WISELY®: Things We Do For No Reason

Why AMA Discharges are thought to be helpful

- AMA formally distances practitioner from patients’ request for non-standard DC plan – deflecting potential blame for any poor outcome

Why AMA Discharges add no value to patient care

- 25% of patients discharged AMA report not wanting to return for follow-up care
- Breeds Distrust
- Does NOT provide liability protection

What you should do instead

- Use Shared-Decision Making to provide harm-reducing discharge options that, while suboptimal, may not be substandard

Alfandre D et al. October 2017
Timeless pearls

• Discharges AMA: common, fraught with risk, may threaten the patient-physician relationship

• Patients financially responsible for AMA discharge

• Remain an ally, don’t misinform.

• Move from AMA to SDM!
Discharge
Targeted approaches at discharge

- Multi-disciplinary approach to continuation and stopping unnecessary meds (med rec)
- Opportunity to be good stewards (abx duration)
- Discontinue new anti-psychotics (delirium)
- Shared decision making (in place of AMA)
What is your experience?

Let’s continue this conversation:

@chasejwebber

#MedTwitter
References


20. Fast Facts iPhone app (Palliative Care Network of Wisconsin), Dr David Weissman, Dr Sean Marks MD.


MOC Questions

Question 1
Which of the follow represents the most common antibiotic-associated adverse event reported by patients after 30 days?

A. Pruritis
B. C difficile infection
C. Diarrhea
D. Oral candidiasis
Answer: C Diarrhea

Rationale: Gastrointestinal distress and GI symptoms represent the most common antibiotic-associated adverse event reported by patients. This is particularly true in patients treated with excess antibiotic therapy, where each excess day of treatment accounts for a 5% increase in odds of ADE.

Question 2

According to recently updated (June 2019) IDSA guidelines, asymptomatic bacteriuria should be treated in which of the following clinical scenarios?

A. Patients with spinal cord injury
B. Patients undergoing joint arthroplasty
C. Patients with indwelling foley catheters
D. Patients undergoing urologic procedures
Answer: D Patients undergoing urologic procedures

Rationale: IDSA guidelines recommend against screening or treating most nonpregnant adults for asymptomatic bacteriuria. Few exceptions to this rule include patients undergoing urologic procedures with expected mucosal trauma, as well as following recent renal transplant (first 1-3 months post transplant).