



Antibiotic Stewardship in Acute Care Surgery

Zahra Kassamali Escobar, PharmD, BCIDP

UW Medicine | Valley Medical Center

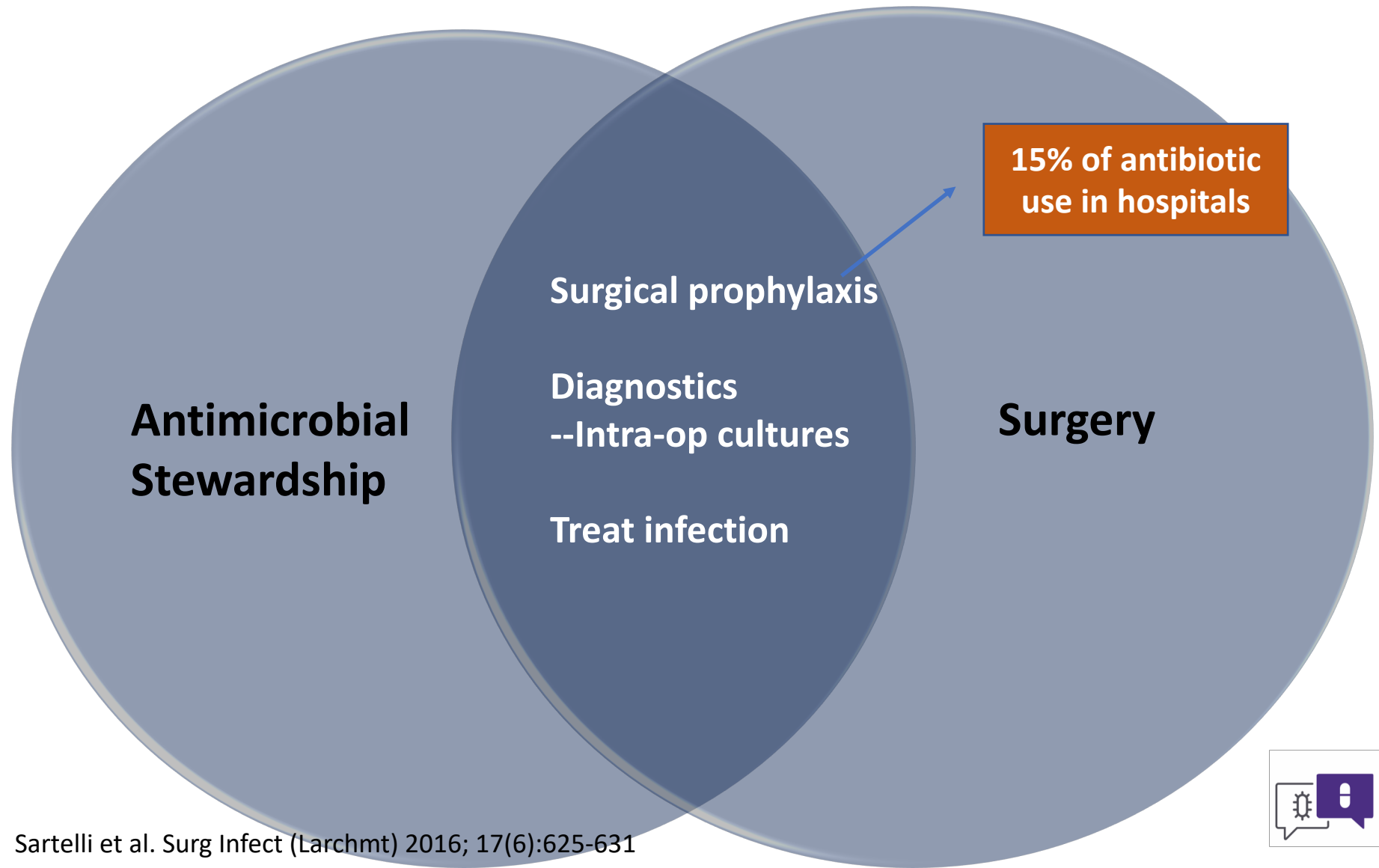
zescobar@uw.edu

Acute Care Surgery, defined

Textbook Definition (Canadian)	ZKE Definition
<i>...The urgent assessment and treatment of nontrauma general surgical emergencies involving adults.</i> <i>More specifically, this model of health care delivery surrounds the optimal treatment of intra-abdominal surgical crises</i>	Inpatient surgery that is: -NOT orthopedic surgery -NOT neurosurgery -NOT trauma surgery -NOT elective surgery



Antibiotic Stewardship in Acute Care Surgery



Getting started with ASP in ACS

- **Optimizing antibiotics in order sets**
- **Removing incorrect penicillin allergies**
- **Intra-operative cultures**
- **Appropriately narrowing antibiotics**
- **Post-op antibiotic treatment**



A 52 y.o. male presents to your hospital with perforated cholecystitis

**Surgery is consulted, antibiotics will be started.
Which of the following antibiotics would you recommend empirically:**

- (a) Ampicillin/sulbactam**
- (b) Ceftriaxone/metronidazole**
- (c) Ertapenem**
- (d) Levofloxacin/metronidazole**
- (e) Piperacillin/tazobactam**



IDSA Intra-abdominal infection guidelines (2010)

Antibiotic Regimen	Adults	
	Mild-Moderate Severity	High Severity
Single Agent	Cefoxitin Ertapenem Moxifloxacin Tigecycline Ticarcillin-clavulanate	Imipenem Meropenem Doripenem Piperacillin-tazobactam
Combo Therapy	Cefazolin Cefuroxime Ceftriaxone Cefotaxime Ciprofloxacin Levofloxacin	Cefepime Ceftazidime Ciprofloxacin Levofloxacin
	+ Metronidazole	



Antibiotic Selection: Focus on *E. coli*

Organism	No. of Isolates	Ampicillin	Ampicillin/Sulbactam	Aztreonam	Cefazolin	Ceftriaxone	Gentamicin	Levofloxacin	Nitrofurantoin	Piperacillin/tazo	Trimethoprim/Sulfa	Cefepime	Ertapenem	Meropenem	Minocycline
Escherichia coli	7032	56	63	95	89*	92	93	81	97	97	78		100		

Community-Acquired Infection of Mild-to-Moderate Severity in Adults

31. Ampicillin-sulbactam is not recommended for use because of high rates of resistance to this agent among community-acquired *E. coli* (B-II).



The Impact of a Reported Penicillin Allergy on Surgical Site Infection Risk

Kimberly G. Blumenthal,^{1,2,3,4} Erin E. Ryan,^{5,6} Yu Li,^{1,2} Hang Lee,^{4,7} James L. Kuhlen,⁸ and Erica S. Shenoy^{2,4,5,6}

¹Division of Rheumatology, Allergy, and Immunology, Department of Medicine, ²Medical Practice Evaluation Center, and ³Edward P. Lawrence Center for Quality and Safety, Massachusetts General Hospital, Boston, ⁴Harvard Medical School, Boston, ⁵Division of Infectious Disease, Department of Medicine, ⁶Infection Control Unit, and ⁷Biostatistics Center, Massachusetts General Hospital, Boston; and ⁸Acadia Allergy and Immunology, Department of Medicine, University of South Carolina School of Medicine, Greenville, South Carolina

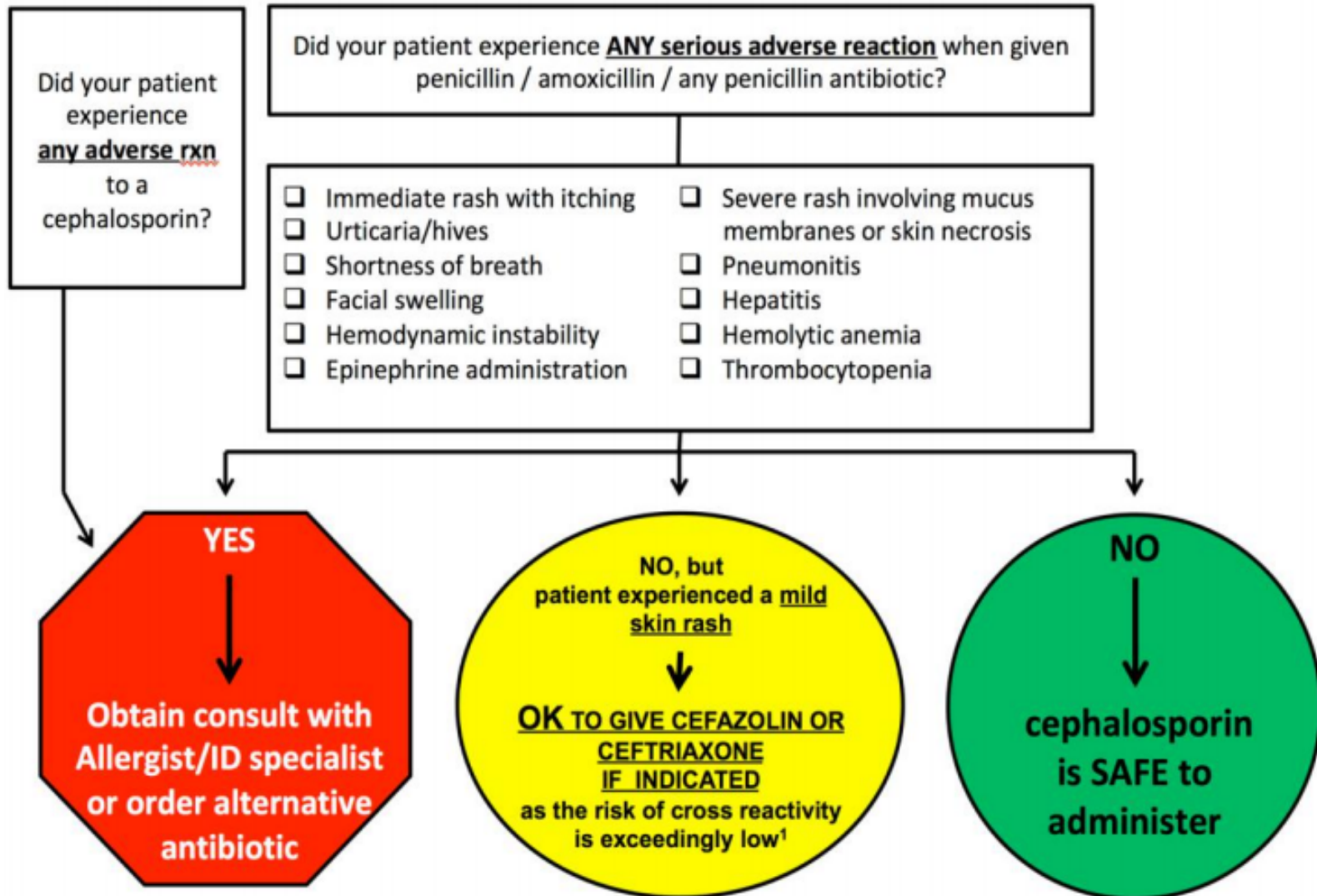
Patients with a reported penicillin allergy had a 50% increased odds of SSI



The effect of penicillin allergy reporting on SSI development was entirely mediated through receipt of a beta-lactam alternative antibiotic



Assessing Penicillin Allergies Pre-Op



Intra-Op Cultures

- **Barriers:**
- **Not part of workflow**
- **Not perceived as clinically necessary**
(e.g. if it's contaminated, it's contaminated)
- **Concerns for waste**
not relevant to get a culture in ALL cases
 - **Focus on perforated**
cholecystitis/appendicitis/diverticulitis
- **Concerns for inappropriate narrowing**



The Surgical Infection Society Revised Guidelines on the Management of Intra-Abdominal Infection

John E. Mazuski,¹ Jeffrey M. Tessier,² Addison K. May,³ Robert G. Sawyer,⁴ Evan P. Nadler,⁵
Matthew R. Rosengart,⁶ Phillip K. Chang,⁷ Patrick J. O'Neill,⁸ Kevin P. Mollen,⁹
Jared M. Huston,¹⁰ Jose J. Diaz, Jr.,¹¹ and Jose M. Prince¹²

3. *Microbiologic evaluation*

Microbiologic evaluation may be useful in selected patients, but is **not necessary in most**. Specific recommendations include:

- Do not routinely obtain peritoneal fluid cultures in lower-risk patients with CA-IAI for purposes of guiding antimicrobial therapy (Grade 1-B).
- Obtain cultures of peritoneal fluid or infected tissue in higher-risk patients with CA-IAI and in patients with HA-IAI to identify potential resistant or opportunistic pathogens (Grade 1-C).
- Consider obtaining cultures in all patients with IAI for epidemiologic purposes if adequate resources are available to aggregate and analyze the data and the information can be used to guide empiric antimicrobial therapy (Grade 2-C).



Pt now s/p source control on ceftriaxone + metronidazole. How long to treat?

- 5 days
- 10 days
- Pt specific: continue antibiotics until 2 days after resolution of fever, leukocytosis and ileus



Randomized controlled trial, STOP-IT: May 2015

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

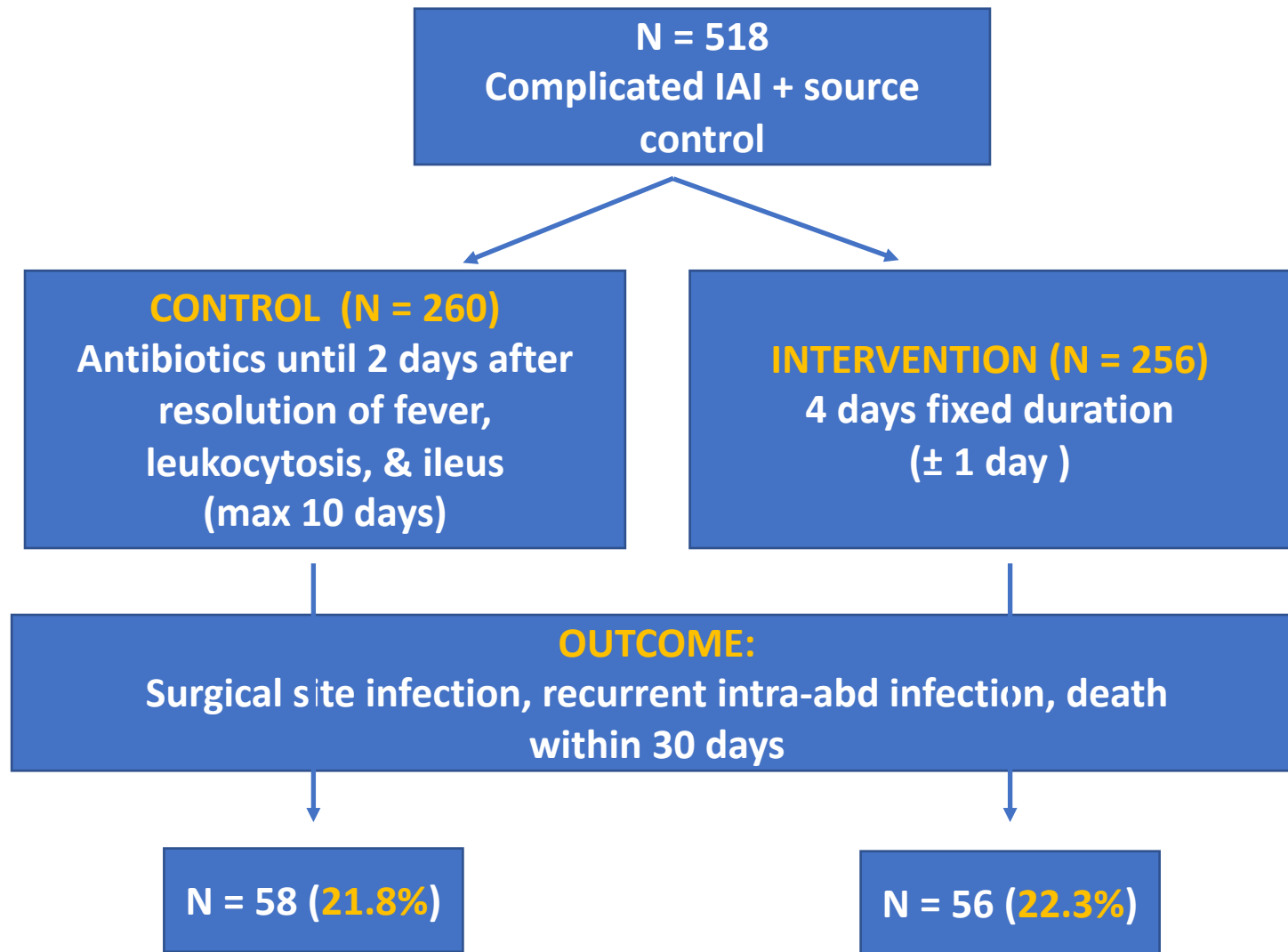
Trial of Short-Course Antimicrobial Therapy for Intraabdominal Infection

R.G. Sawyer, J.A. Claridge, A.B. Nathens, O.D. Rotstein, T.M. Duane, H.L. Evans, C.H. Cook, P.J. O'Neill, J.E. Mazuski, R. Askari, M.A. Wilson, L.M. Napolitano, N. Namias, P.R. Miller, E.P. Dellinger, C.M. Watson, R. Coimbra, D.L. Dent, S.F. Lowry,* C.S. Cocanour, M.A. West, K.L. Banton, W.G. Cheadle, P.A. Lipsett, C.A. Guidry, and K. Popovsky, for the STOP-IT Trial Investigators†



STOP-IT:

4-5 days no different than 8-10 days of abx



Would you recommend stopping antibiotics in a patient with continued s/sx of infection?

- Yes
- No
- Not sure



STOP-IT

- *Traditionally, physicians have administered antimicrobial therapy in patients who have intraabdominal infections until clinical and laboratory evidence suggests that the infection has resolved. They reasoned that ongoing sepsis was indicative of ongoing replication of pathogens.*

More recent experimental data, however, suggest that a prolonged SIRS may be more a reflection of host immune activity than an indication of the presence of viable microorganisms.



Summary

- **Optimize antibiotics in order sets**
 - Remove ampicillin-sulbactam for empiric use
- **Address penicillin allergies**
 - PCN Skin Test
 - Formal/Detailed Allergy history intake
- **Review process for intra-op cultures**
 - Overuse vs. underuse
 - Over-interpretation
- **Duration of therapy**
 - STOP-IT: 4 days is just as good as 8-10 days

