



UW TASP
tele-antimicrobial stewardship program

12 March, 2019

Agenda

- Paul Pottinger: *Peri-Op Antibiotics Revisited*
- Case Discussions
- Open Discussion



UW TASP

tele-antimicrobial stewardship program

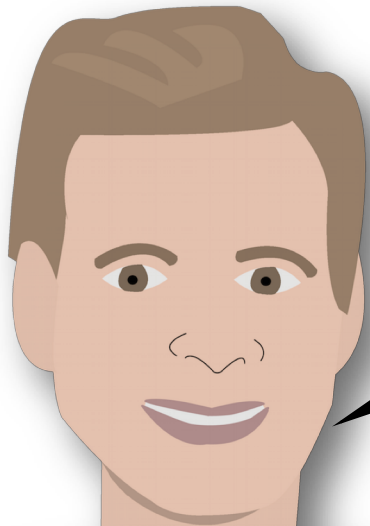
- No financial conflicts of interest.
- Everything we discuss is QI, thus protected from legal discovery under WA State Code.



Paul Pottinger MD

Peri-Op Abx: *Objectives*

- Epidemiology
- Common Procedures...
 - ✓ Drug
 - ✓ Dose
 - ✓ Timing
- Share challenges & successes

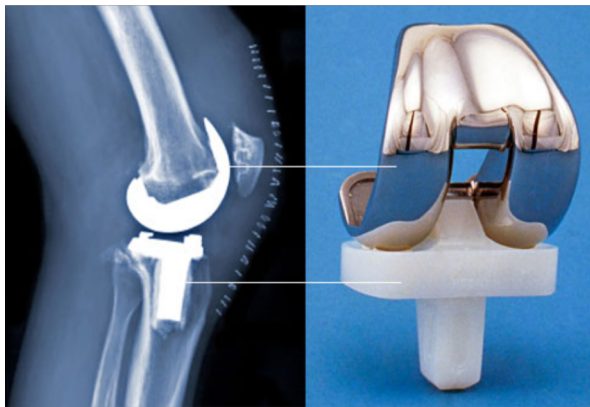


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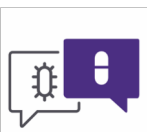
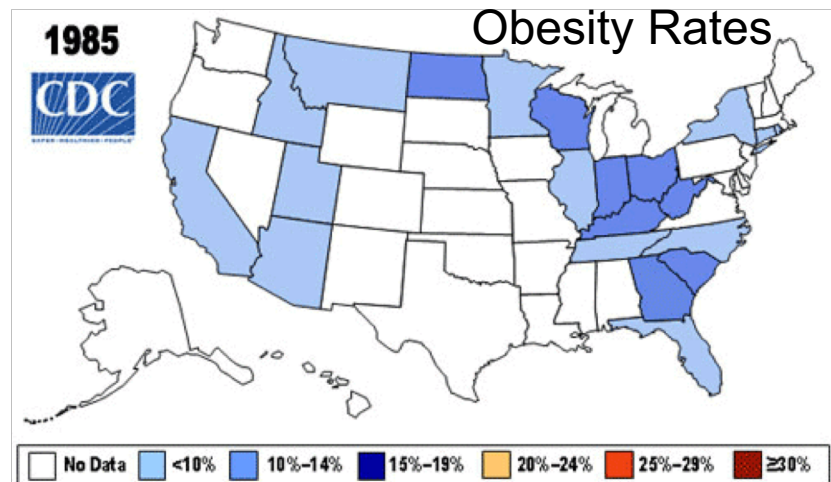


Peri-Op Abx: *Epidemiology*

- ~100 million cases per year (equal split inpt & outpt)
 - ✓ Hysterectomy: 498,000
 - ✓ Cesarean section: 1.3 million
 - ✓ Reduction of fracture: 671,000
 - ✓ Coronary artery bypass graft: 395,000
 - ✓ Total knee replacement: 719,000
 - ✓ Total hip replacement: 332,000



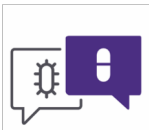
CDC



Peri-Op Abx: *Epidemiology*

- ~100 million cases per year (equal split inpt & outpt)
- Peak age: 75 (16% / year)
- 9.2 procedures / lifetime
 - ✓ 3.4 inpatient operations
 - ✓ 2.6 outpatient operations
 - ✓ 3.2 non-OR invasive procedures

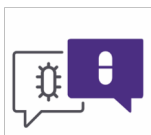
Leading Procedures	
Women	Men
✓ C-section	✓ Coronary (CABG, PCI)
✓ Cholecystectomy	✓ Wound debridement
✓ Cataracts	✓ Herniorraphy



Peri-Op Abx: *Epidemiology*



- Surgical Site Infection Rate: *Variable!*
 - ✓ Procedure?
 - ✓ Technical Complexity?
 - ✓ Medical Conditions / Comorbidities?
 - ✓ Emergent vs Elective?
 - ✓ Clean... Clean / Contaminated... Contaminated?
 - ✓ Superficial vs Deep?
 - ✓ Early vs Delayed?

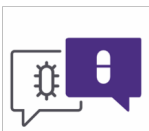


Peri-Op Abx: *Rarely indicated before day of surgery!*



“Urine: It’s what NOT to check...”

- **Concern:** Bacteriuria may seed blood due to Foley trauma, then seed a new implant or mesh.
- **Reality:** *This is not a thing.*
- OK... it COULD happen, but is **exceedingly rare**.
- **Risk** of abx >>> potential benefits
- Cutting into the urethra? Check the pee. **Otherwise, leave it be.**
- **ALWAYS** a good idea to get that Foley out in < 24 Hrs
- When it comes to ABU: “**Don’t ask, don’t tell!**”

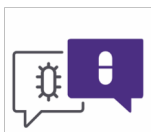


Peri-Op Abx: *PRE-op Priorities*



Reduce Risk Factors

- Obesity: **Lose weight!**
- DM: **Improve A1C**
- Depression: **Treat it!**
- Immunosuppression: Complex... **work with rheum** etc.
- Prior surgery: Consider **referral to specialist**
- ASA score ≥ 3 : Careful pre-op **anesthesia consult**
- Addiction: Treat with goal of **quitting**
- **Antibiotic Allergies: Fact or Fiction?**
- *S.aureus* colonization (MSSA or MRSA): **Decolonize**



Peri-Op Abx: *Allergies*



“A Hot Mess”

“I’m Allergic:” **Please figure this out!**

- 10% of Americans report a “PCN allergy”
- **> 90% of these are bogus! (nausea, yeast infxn....)**
- **50% increase in surgical site infections and adverse reactions** with second-line abx (vanco alone, clinda, FQ)
- **Inferiority** of clinda vs cefazolin for surgical prophylaxis



Peri-Op Abx: *Allergies*



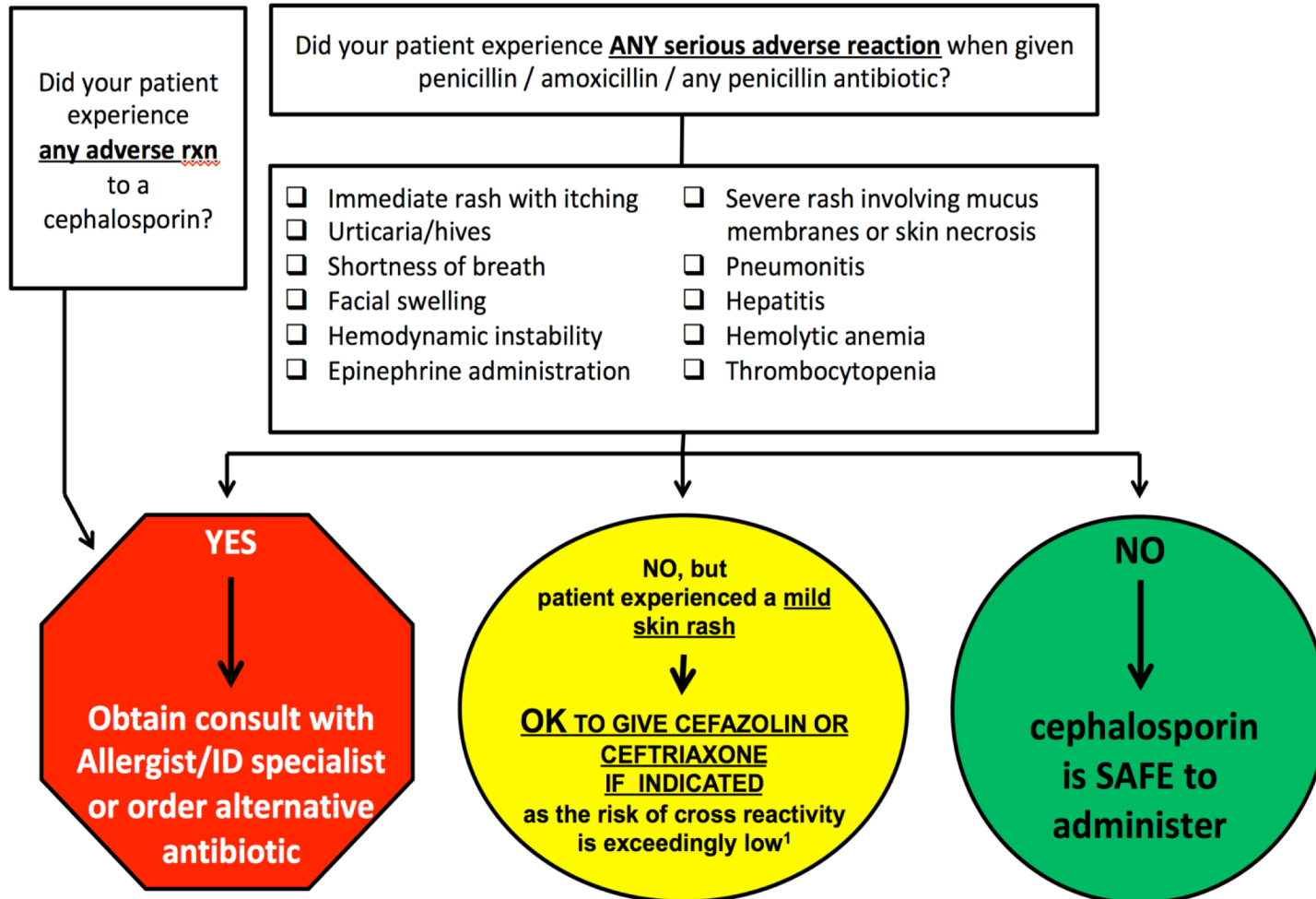
History is key”

- **WHAT?** (Airway? Intubation? Itching? “Hives” used differently by many folks)
- **WHEN?** (Relation to dose? >10 years ago?)
- **WHO?** (Witnessed, recorded, historical?)
- Beware shibboleths in the **EMR!**
- Patient need elective surgery? Often on abx? You have time to **get this right!**
- If reaction was not life-threatening, oral amox challenge always safe, and **> 95% have no reaction!**



Peri-Op Abx: Allergies

ASSESSING PENICILLIN ALLERGY PRE-OP



Peri-Op Abx: Allergies

All surgeries UWMC 2011

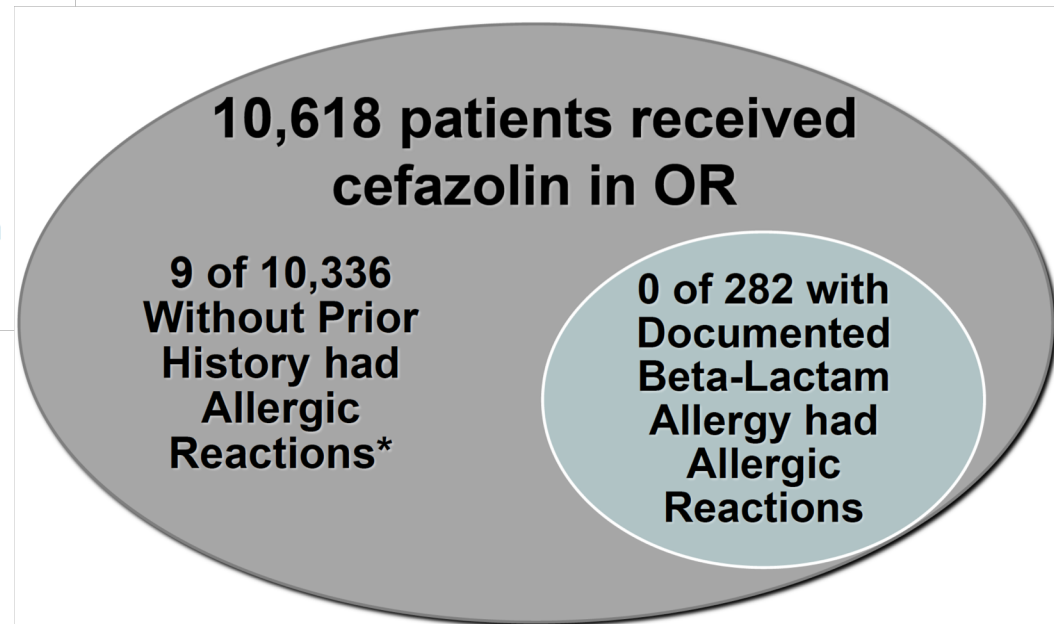
We found that 11.7% (1,723/14,773) of operations involving antibiotic prophylaxis were performed on patients with a beta-lactam allergy.

Antibiotic administered	n = 1,723
Cefazolin	282 (16.3 %)
Clindamycin	789 (45.7 %)
Vancomycin	373 (21.6 %)
Other	279 (16.1 %)

Some patients received cefazolin in spite of historical beta-lactam allergy.

Reported Reaction type	n= 282
Anaphylaxis	15 (5.3 %)
GI related	20 (17.7 %)
Rash	97 (34.3 %)
Hives	40 (13.1%)
Itching	22 (7.8 %)
Unknown	5 (1.7 %)
Unspecified	44 (15.6 %)

Some patients reported multiple reactions, therefore total > 100%



*2 of 9 patients had anaphylaxis, remaining patients had mild reactions (e.g. rash)



Surgical Procedure	Antibiotic	Dosing Regimen	IntraOp Re-dosing Interval
<p>Upper GI tract/Pancreaticobiliary*</p> <p>GU (open or laparoscopic)</p> <p>Head & Neck when no mouth or sinus is entered</p> <p>Ortho (except shoulders)/ Thoracic/Vascular/Neurosurgery/Burns-Plastic</p>	<p>Cefazolin</p> <p>OK to use if PCN allergic</p>	<p>2 g IVPB over 20 min</p> <p>>120kg, give 3g</p>	<p>3 hr</p>
<p>*History of MRSA/+ MRSA screen – give in addition to above</p>	<p>Vancomycin</p>	<p>Vancomycin:</p> <p>50-70kg = 1g over 60 min</p> <p>71-100kg = 1.5g over 90 min</p> <p>>120kg = 2g over 120 min</p>	<p>Redose if surgery > 8 hours</p>

Surgical Procedure	Antibiotic	Dosing Regimen	IntraOp Re-dosing Interval
Colorectal OR GYN-ONC*	Cefazolin PLUS Metronidazole	2g Cefazolin + 500mg Metronidazole (1 bag) >120kg, give 3g Cefazolin + 500mg Metronidazole (2 bags)	Cefazolin: 3 hrs Metronidazole: None
GYN/OB (hysterectomies)*	Cefazolin OK to use if PCN allergic	2 g IVPB over 5 min >120kg, give 3g	3 hr
GU (cystoscopy)*	Levofloxacin	750mg IVPB over 60 min	None
Head & Neck, Dental or Neurosurgery (sinus or mouth involved)*	Ampicillin-Sulbactam	3 g IVPB over 30 min	3 hours
*History of MRSA/+ MRSA screen – give in addition to above	Vancomycin	Vancomycin: 50-70kg = 1g over 60 min 71-100kg = 1.5g over 90 min >120kg = 2g over 120 min	Redose if surgery > 8 hours

Peri-Op Abx: *Drug Choice*

“Abx Choice Matters”

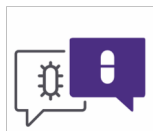
- **Cefazolin** 2gm IV (3gm if > 120kg)
 - ✓ Redose Q 3-4 hours
- If h/o MRSA colonization or infection: Add **Vancomycin**
 - ✓ 50-70kg = 1 gm
 - ✓ 71-100kg = 1.5 gm
 - ✓ > 120 kg = 2 gm
 - ✓ Redose if case > 8 hours
- If truly cephalosporin allergic: **See alternative options**



Peri-Op Abx: *Drug Choice*

“In case of shortage...”

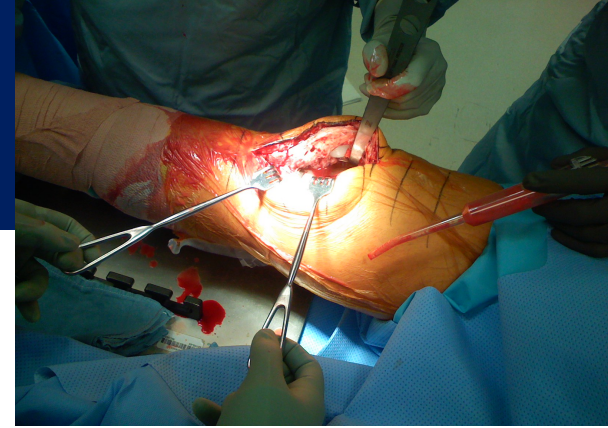
- **Ceftriaxone** 2gm IV x 1 dose
 - ✓ No need to re-dose, one shot lasts a day
- If h/o MRSA colonization or infection: Add **Vancomycin**
 - ✓ 50-70kg = 1 gm
 - ✓ 71-100kg = 1.5 gm
 - ✓ > 120 kg = 2 gm
 - ✓ Redose if case > 8 hours
- If truly cephalosporin allergic: **See alternative options**



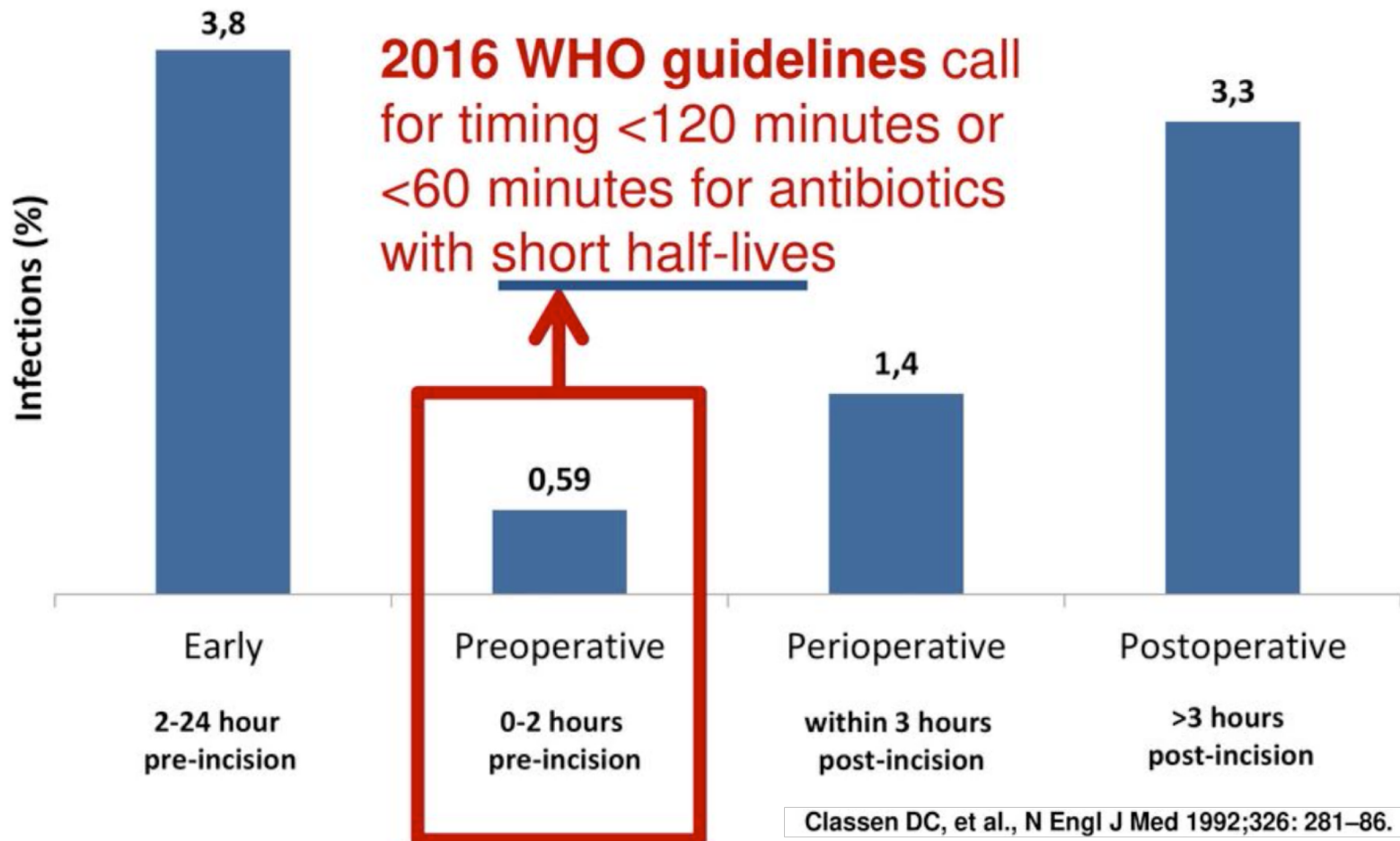
Surgical Procedure	Antibiotic	Dosing Regimen	IntraOp Re-dosing Interval
For Beta-Lactam Anaphylaxis			
GI/Colorectal/GYN-ONC (Either option is appropriate)*	Levofloxacin	750mg IVPB over 60 min	None/
	PLUS		
	Clindamycin	900 mg IVPB over 30 min	6 hours
	OR		
	Levofloxacin	750 IVPB over 60 min	None /
	PLUS		
	Metronidazole	500mg IVPB over 30 min	None
GYN/OB (e.g. hysterectomies)	Levofloxacin	750 IVPB over 60 min	None /
	PLUS	Vancomycin:	Redose if surgery > 8 hours
	Vancomycin	50-70kg = 1g over 60 min	
		71-100kg = 1.5g over 90 min	
		>120kg = 2g over 120 min	
Head/Neck*	Clindamycin	900mg IVPB over 30 min	6 hours
Ortho/Thoracic/Vascular/Neurosurgery/Burns-Plastics	Vancomycin	Vancomycin:	Redose if surgery > 8 hours
		50-70kg = 1g over 60 min	
		71-100kg = 1.5g over 90 min	
		>120kg = 2g over 120 min	



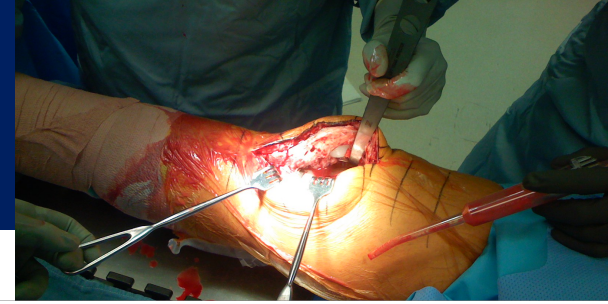
Peri-Op Abx: *Drug Timing*



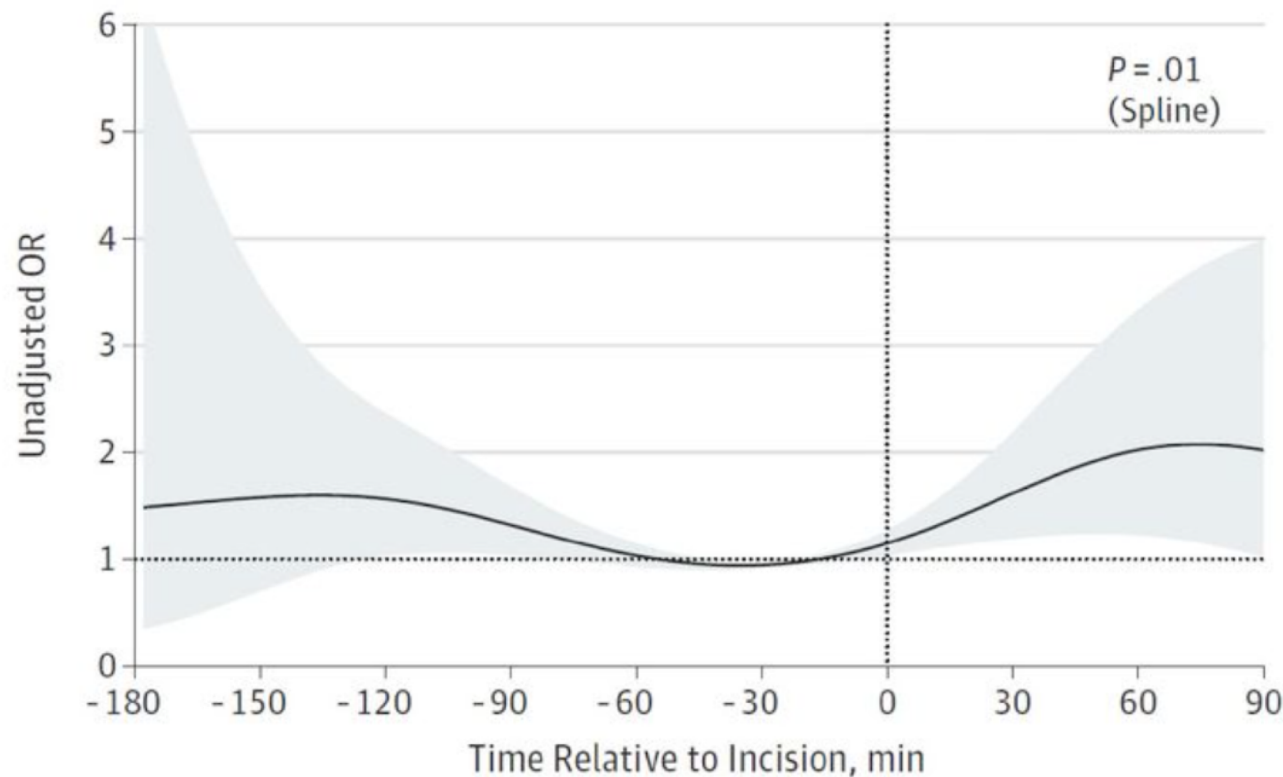
“Timing is Everything”



Peri-Op Abx: *Drug Timing*



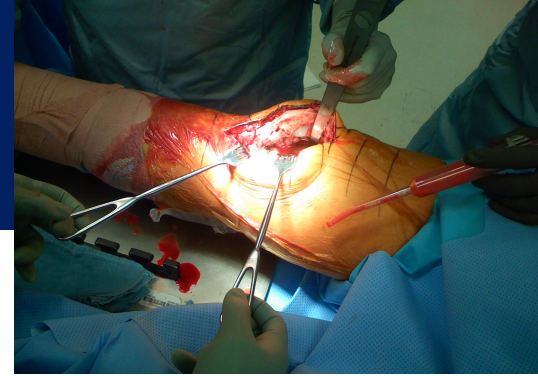
Odds ratio of SSI from 32,459 patients undergoing hip or knee arthroplasty, colorectal surgical procedures, arterial vascular surgical procedures, and hysterectomy



Peri-Op Abx: *Only One Factor*

“Many Opportunities”

- OR checklist preop?
- Normothermic?
- Euglycemic?
- Normoxic?
- Technical factors?
- Cardiopulmonary baseline?
- Duration of case?

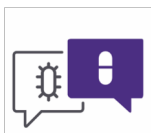


Peri-Op Abx: *Drug Timing*



“Duration Matters”

- Question: Continue abx after incision is closed?
- WHO, CDC, SIS: No abx post-op.
- Got drains? Who cares! Abx not necessary for drain prophylaxis.
 - ✓ AAOS: No drain prophylaxis.
 - ✓ Lower cost, less CDI, fewer side effects (documented at HMC neurosurgery).
 - ✓ This is true for **all elective** surgery.

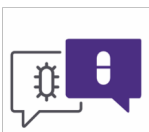




Safety Action Bundle: Surgical Site Infections (SSI) – Colorectal Surgeries

Post-Operative Period

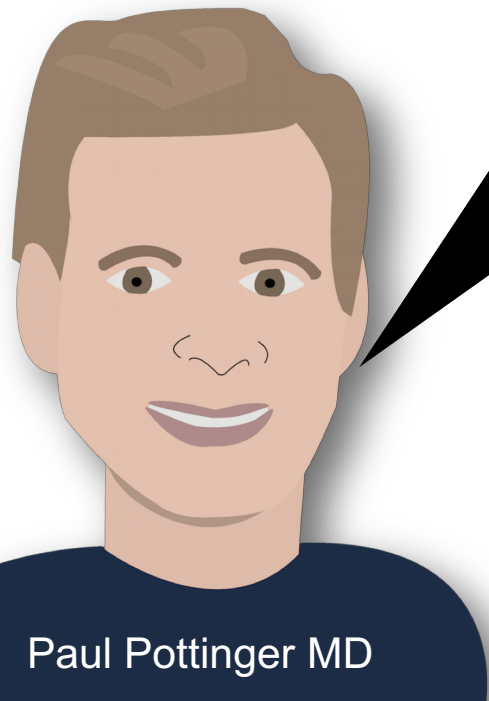
- ☐ Discontinue antibiotics when patient leaves the OR.
- ☐ Maintain blood glucose during the postoperative period at 160mg/dl or lower.
- ☐ Optimize tissue oxygenation by administering supplemental oxygen.
- ☐ Promote a patient shower with Hibiclens after dressing removal.
- ☐ Promote good hand hygiene practices with patient/family and provide hand sanitizing products at bedside.
- ☐ Reinforce patient education about SSI prevention measures and objectives.



Peri-Op Abx: *Questions*

- Do you know your hospital's current SSI rate?

- A. Yep
- B. Nope
- C. I'm not sure

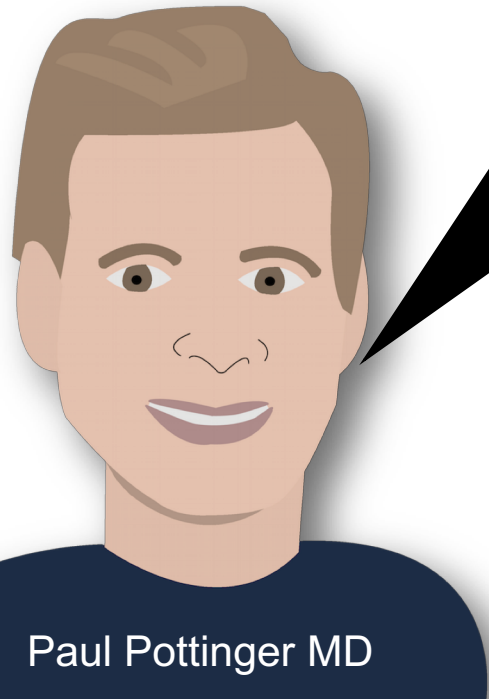


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Peri-Op Abx: *Questions*

- Do you know your hospital's peri-op abx duration (either in order sets or in reality)?



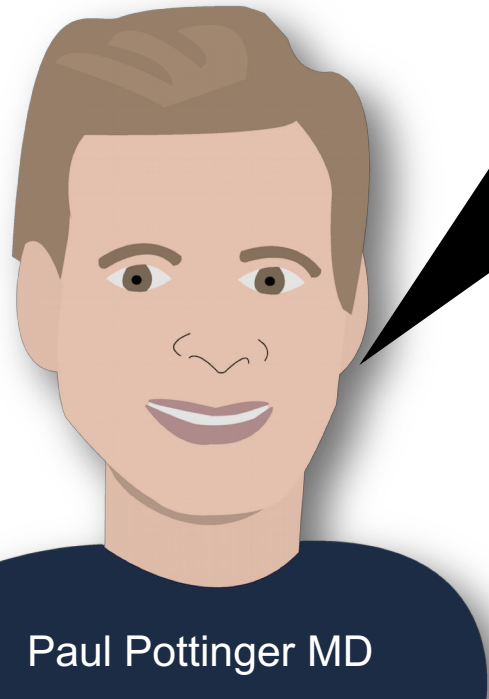
Paul Pottinger MD

- A. Yep
- B. Nope
- C. I'm not sure



Peri-Op Abx: *Questions*

- Are you having trouble getting cefazolin for peri-op prophylaxis?



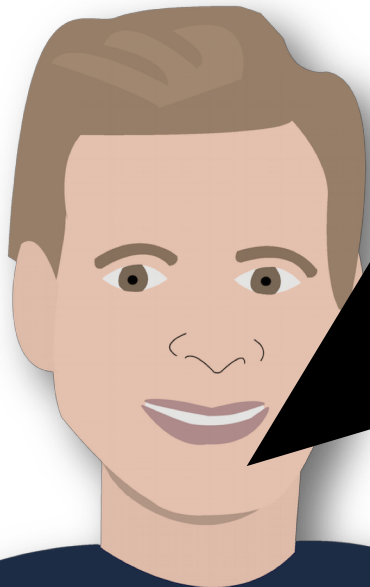
Paul Pottinger MD

- A. Yep
- B. Nope
- C. I'm not sure



Peri-Op Abx: *Conclusions*

- Low-Hanging AS Fruit
- Focus:
 - ✓ Drug (cefazolin 1st choice)
 - ✓ Dose (weight-based)
 - ✓ Timing (just before incision... no doses after surgery)
- Collaboration with surgeons, nurses, infection control, and anesthesiologists



Paul Pottinger MD

