Penicillin Allergy: A Rare Case Demanding Special Attention

Elizabeth Hall-Lipsy, JD, MPH
University of Arizona College of Pharmacy

Meghan Jeffres, PharmD
University of Colorado Skaggs School of Pharmacy

Supporter

- Developed in partnership with the Society for Infectious Diseases Pharmacists.

Disclosures

- Meghan Jeffres
  - Stock owner – Pfizer, Merck
  - Grant support – Pfizer
  - Speaker honorarium – Pfizer, Cubist (Merck)

- Elizabeth Hall-Lipsy:
  - Declare(s) no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings, and honoraria

The American Pharmacists Association is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Learning Objectives

At the completion of this application based activity, the pharmacist will be able to:
1. Assess the risk of cross-reactivity in patients with penicillin, cephalosporin, or carbapenem allergy
2. Compare treatment outcomes between patients with and without penicillin allergies
3. Identify actions pharmacists can take to mitigate adverse outcomes for patients with beta-lactam allergies
4. Analyze trends in malpractice actions for negligent antibiotic prescribing cases
5. Summarize antibiotic prescribing and dispensing strategies for managing risk to avoid liability

- Target Audience: Pharmacists
- ACPE#: 0202-9999-16-070-L01-P
- Activity Type: Application-based
1. What is the risk of a patient with a penicillin allergy experiencing an allergic reaction to a cephalosporin?
   A. 20%
   B. 10%
   C. 1%
   D. <1%

2. What is the risk of a patient with a penicillin allergy experiencing an allergic reaction to a carbapenem?
   A. 20%
   B. 10%
   C. 1%
   D. <1%

3. Patients with beta-lactam allergies treated with non-beta-lactams for gram negative bloodstream infections have worse outcomes. What is a possible explanation for this?
   A. NBL antibiotics are less likely to be active against gram negative pathogens
   B. NBL antibiotics have a higher volume of distribution
   C. NBL antibiotics are contraindicated for bloodstream infections

4. Which of the following are the four essential elements of a case for professional negligence?
   A. Duty, Breach, Causation, Harm (Damages)
   B. Duty, Breach, Intent, Harm (Damages)
   C. Duty, Breach, Intent, Incurred Expenses
   D. Relationship, Omission, Causation, Incurred Expense

5. What is the duty of care a pharmacist owes to his or her patient?
   A. That degree of skill or diligence exercised by an experienced professional under similar circumstances.
   B. That degree of skill or knowledge exhibited by an ordinary professional under similar circumstances.
   C. That degree of knowledge or skill exhibited by any individual with that professional training.

Professional Malpractice:
- Lawsuits filed against health care practitioners/professionals are usually civil lawsuits
- Parties to the suit are: Plaintiff and Defendant
- There is a verdict- but a defendant is not “guilty”
  - He, she, or they are found to be at fault or liable
- Occasionally, very rarely, a health care provider will be charged criminally for negligence-
  - This is requires a higher degree of negligence
    - Wanton or willful
### Common causes of action for “malpractice” for pharmacists

- Negligence/wrongful death
- Vicarious liability/failure to supervise or train
- Failure to warn
- Over dispensing
- Corresponding responsibility

### Four Elements of professional negligence

- Duty
- Breach
- Causation
- Harm

### Duty

- Did plaintiff and defendant enter into a professional relationship
- Is/Was this person your patient?

### Breach

- Standard of care:
  - Negligence arises when a provider fails to comply with the applicable standard of care.
  - Example jury instruction:
    - A health care [professional] must exercise that degree of care skill and learning that would be expected under similar circumstances of a reasonably prudent health care [professional] within this state.

### Causation

**Fault**
- **But for** the negligence, would [Plaintiff] have been harmed? (LEGAL CAUSE)
- **Where in the chain of events** did the harm occur? (PROXIMATE CAUSE)
- Example jury instruction
  - Before you can find [Defendant] at fault, you must find that [Defendant] was a cause of injury to [Plaintiff]. Negligence causes an injury if it helps produce the injury and if the injury would not have happened without the negligence.

### Harm, Damages, Injury

- Was plaintiff injured, harmed
- Damages?
  - The nature, extent, and duration of the injury.
  - The pain, discomfort, suffering, disability, disfigurement, and anxiety already experienced, and reasonably probable to be experienced in the future as a result of the injury.
  - Reasonable expenses of necessary medical care, treatment, and services rendered, and reasonably probable to be incurred in the future.
  - Lost earnings to date, and any decrease in earning power or capacity in the future.
  - Loss of love, care, affection, companionship, and other pleasures of the [marital] [parent – child] relationship.
  - Loss of enjoyment of life, that is, the participation in life’s activities to the quality and extent normally enjoyed before the injury.
Medical negligence

- Example jury instruction:
  - On the claim of fault for medical negligence [Plaintiff] has the burden of proving:
    - [Defendant] was negligent;
    - [Defendant]’s negligence was a cause of injury to [Plaintiff]; and
    - [Plaintiff]’s damages
  - Plaintiff must prove his or her case by a preponderance of the evidence-
    - This is a significantly lower standard than: beyond a reasonable doubt.

Comparative Fault

- Some jurisdictions call this: contributory negligence
- In a pure comparative fault state:
  - All parties to an action are apportioned damages according to their degree of fault (percentage).
  - A plaintiff’s award is diminished in proportion to the claimant’s relative degree of fault, but the claimant’s fault generally will not act as a bar to recovery.

LAW & ORDER
SPECIAL PHARMACY UNIT

In the hypothetical pharmacy justice system, the patients are treated by two separate, but equally important groups: the prescribers who order the drugs and pharmacists who dispense the drugs. These are their stories.....

Case 1: Boone v. William Backus Hospital
FACTS

- 4 year old boy (Boone) presented to the ED with signs and symptoms of otitis media
- Allergy history: penicillin and sulfa; immediate reaction
- Given: 250mg injection of ceftriaxone IM and 5ml acetaminophen with codeine elixir
- In ED – vomiting, sweating, became pale – nurse states symptoms caused by injections and safe to take child home

ED = emergency department; IM = intramuscular
Legal issues

• Parties
• Claims: negligence and recklessness
  • Not specifically medical malpractice

Jury Members

• Jury groups
  • Row 1 and 2
  • Rows 3 and 4
  • Rows 5 and 6, etc.
  • As a group decide if the parties sued are
    ✔ Liable  ✔ Not Liable

Legal Issues

• Motions:
  • Defense successfully moved for summary judgment
  • Plaintiff appealed case to Connecticut Supreme Court
  • Court upheld trial court

Use of cephalosporins in PCN allergy

• Traditional teaching – 10%
• Patients with a penicillin allergy had a reaction to first generation cephalosporin
  • JAMA 1966 – 4 of 51 (8%)
  • J Infect Dis 1978 – 57 of 701 (8%)
  • Conclusion: PCN allergic patients are 4xs more likely to be allergic to cephalosporins

PCN = penicillin

1978 Theory

• Lawrence D. Petz MD
• “There is evidence of specific immune response to cephalosporins that indicates independently acquired hypersensitivity rather than cross-reactivity”
  • Still being debated almost 40 years later

Population Analysis

New cephalosporin allergy

<table>
<thead>
<tr>
<th>History</th>
<th>0.0%</th>
<th>0.4%</th>
<th>0.8%</th>
<th>1.2%</th>
<th>1.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No allergic history</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of other medication allergy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of cephalosporin allergy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of penicillin allergy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 new cephalosporin allergy for every 135 patients given cephalosporin who have penicillin allergy vs. patients with no drug allergies

Macy E. J Allergy Clin Immunol 2015;135:745-52
Cross-reactivity is a myth (ish)

- Side chain issue not beta-lactam issue
- Cephalosporins and penicillins with identical side chains

<table>
<thead>
<tr>
<th>Amoxicillin</th>
<th>Ampicillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefadroxil</td>
<td>Cefaclor</td>
</tr>
<tr>
<td>Cefprozil</td>
<td>Cephalexin</td>
</tr>
</tbody>
</table>

Monday Morning Quarterback

- 4 year old male with otitis media
- Allergy history: penicillin and sulfa; immediate reaction
  1. Amoxicillin or amoxicillin/clavulanate
  2. Ceftriaxone
  3. Azithromycin

Case 2: Brown vs. Roche

FACTS

- Adult female (Brown) with a sinus infection
- Allergy history: penicillin – nausea
- Given: TMP/SMX by clinic physician
- Day 13 – fever, photophobia, headache, neck pain, blisters in mouth and throat
- Given: ceftriaxone for suspected bacterial meningitis
- Immediate reaction – rash on back and trunk – symptoms worsen – diagnosed with SJS/TEN

Legal Issues

- Parties: Roche Laboratories, Hoffman-LaRoche, Inc., and Eon Labs, Inc.
- Claims-
  - Negligent in labeling drug product
  - Strictly liable for labeling defect
  - Breach of implied warranty that drug products were of merchantable quality and fit for such use
  - Misrepresentation of safety and effectiveness

Legal Issues

- Expert Witness Testimony
  - Brown’s expert witness: warning label for ceftriaxone should have instructed provider to perform precautionary skin test for determinates of penicillin and substitute alternative antibiotic for severe allergy.

Jury Members

- In your jury groups decide if Roche Laboratories, the makers of ceftriaxone are
  - ☑ Liable
  - ☑ Not Liable
Legal Issue

• Roche defendants successfully filed motion to exclude plaintiff’s expert witness
  • Expert lacked expertise regarding drug products at issue
  • Expert lacked expertise regarding FDA regulatory practice and requirements
  • Couldn’t establish causation
  • Patient had been exposed to both ceftriaxone and TMP/SMX and either drug could have caused the SJS/TENS

To BL or not to BL

• 3-5 million admissions annually
  • Sepsis
  • Meningitis
  • Pneumonia
  • Intra-abdominal infections
  • Skin and skin structure infections

Consequences of penicillin allergy label

• Increased use of second line antibiotics
• Higher rates of infections caused by
  • Clostridium difficile
  • Methicillin-resistant Staphylococcus aureus
  • Vancomycin-resistant Enterococcus spp.
• Higher costs
  • Canada: 2nd line antibiotic cost hospital pharmacy $15,000 more than 1st line beta-lactams, n=48
  • UK: NBL costs 1.82-2.58-fold higher compared to first line antibiotics

Beta-lactam vs. non-beta-lactam

<table>
<thead>
<tr>
<th></th>
<th>Beta-lactam, n=433</th>
<th>Non-beta-lactam, n=119</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical failure at 72-96 hours, n (%)</td>
<td>115 (27.4)</td>
<td>36 (38.7)</td>
<td>0.030</td>
</tr>
<tr>
<td>Appropriate empiric antibiotics, n (%)</td>
<td>396 (91.7)</td>
<td>89 (74.8)</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Length of stay, days ± SD</td>
<td>21.5 ± 30.0</td>
<td>30.9 ± 52.4</td>
<td>0.065</td>
</tr>
</tbody>
</table>

16 (3%) new hypersensitivity reactions

GNB = gram-negative bacilli; BSI = bloodstream infections

Case 3: Soares vs Greenblatt

FACTS

• Soares, adult female, presented to PCP in 2005 with infected bug bites
• Allergy history: PCN and cefaclor; unknown reaction
• Initial treatment: 500mg cephalaxin, lincomycin (parent medication of clindamycin), isradipine (HTN)
• Day 1: Seen in ED; advised to continue treatment
• Day 3: Symptoms worsen – Soares calls office – swollen legs, oozing sores
• Day 3: Seen by PCP and refused hospital admission – antibiotic changed to levofloxacin
• Day 4: Admitted to the hospital for DM foot wound with cellulitis

Monday Morning Quarterback

• Adult female with suspected meningitis, failed TMP/SMX
• Allergy history: penicillin – nausea
  1. Vancomycin + ceftriaxone
  2. Levofloxacin
  3. Chloramphenicol

Beta-lactam vs. non-beta-lactam

<table>
<thead>
<tr>
<th></th>
<th>Beta-lactam, n=433</th>
<th>Non-beta-lactam, n=119</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical failure at 72-96 hours, n (%)</td>
<td>115 (27.4)</td>
<td>36 (38.7)</td>
<td>0.030</td>
</tr>
<tr>
<td>Appropriate empiric antibiotics, n (%)</td>
<td>396 (91.7)</td>
<td>89 (74.8)</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Length of stay, days ± SD</td>
<td>21.5 ± 30.0</td>
<td>30.9 ± 52.4</td>
<td>0.065</td>
</tr>
</tbody>
</table>

16 (3%) new hypersensitivity reactions

GNB = gram-negative bacilli; BSI = bloodstream infections

Case 3: Soares vs Greenblatt

FACTS

• Soares, adult female, presented to PCP in 2005 with infected bug bites
• Allergy history: PCN and cefaclor; unknown reaction
• Initial treatment: 500mg cephalaxin, lincomycin (parent medication of clindamycin), isradipine (HTN)
• Day 1: Seen in ED; advised to continue treatment
• Day 3: Symptoms worsen – Soares calls office – swollen legs, oozing sores
• Day 3: Seen by PCP and refused hospital admission – antibiotic changed to levofloxacin
• Day 4: Admitted to the hospital for DM foot wound with cellulitis

PCP = primary care physician; PCN = penicillin; HTN = hypertension; ED = emergency department; DM = diabetes mellitus
Case 3: Soares vs Greenblatt

FACTS
• Hospital day 1: ID consultant wound culture, whirlpool therapy, ertapenem, and intraconazole
• Hospital day 4: Develops blisters – doxycycline added for suspicion of Rocky Mountain Spotted Fever
• Hospital day 5: Wound culture grows *Staphylococcus sciuri* – stop ertapenem and doxycycline start cefadroxil
• Hospital day 7: discharged
• Cefadroxil x 2 weeks - wounds healed
• One month after initial infection patient has paresthesia and areas of hypo and hyper pigmentation in both legs

ID = infectious diseases

Legal Issues – Plaintiff’s claims
• Soares filed suit based on two theories of causation:
  1. That an allergic reaction to isradipine was responsible for the worsening of her skin problems; and
  2. That ertapenem should not have been administered to a patient with a penicillin allergy.

Legal Issues – Parties
• Sued:
  • Greenblatt
  • Lesser
  • Weinberg
  • Each physician’s professional practice entity
  • Hospital

Legal Issues
• Could a reasonably prudent provider have distinguished whether plaintiff was having an allergic reaction to medications or responding to an infection?
• Who wins the case?

Legal Issues- Plaintiff’s claims
• Soares filed suit based on two theories of causation:
  1. That an allergic reaction to isradipine was responsible for the worsening of her skin problems; and
  2. That ertapenem should not have been administered to a patient with a penicillin allergy.

Jury Members
• In your jury groups decide if the ertapenem prescriber is
  ✅ Liable   ✅ Not Liable
**Legal Issues**

- Defendants moved for summary judgment
- Summary judgment is awarded when judgment is a matter of law and no facts are in dispute
- Both sides submitted support from expert witnesses

**Use of carbapenem in penicillin allergy**

- Meta-analysis of PCN allergic patients, n=838

<table>
<thead>
<tr>
<th>Reaction to carbapenem</th>
<th>Proven</th>
<th>Suspected</th>
<th>Possible</th>
<th>IgE Type reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kula et al. CID 2014;59(8):1113–22

**Penicillin skin test**

- Step 1 – prick puncture
- Step 2 – intradermal
  - 50% positive predictive value
  - 99-97% negative predictive value
- Step 3 – oral challenge if negative skin test


**Carbapenems and immediate reaction**

- PCN skin test positive pts, n=212
  - mix of penicillin derivatives
- Reaction history
  - Anaphylaxis 71%
  - Urticaria 15%
  - Urticaria + angioedema 10%
  - Erythema 3%
- Skin test positive
  - Imipenem – 0%
  - Meropenem – 0%
  - Ertapenem – 0%
- IV challenge, n=211
  - Imipenem – 0%
  - Meropenem – 0%
  - Ertapenem – 0%


**Carbapenems and delayed reaction**

- T-cell mediated reactions + PCN skin test positive, n=204
  - mix of penicillin derivatives
- Reaction history
  - Rash 48%
  - Rash + edema 39%
  - Erythema 4%
- Skin test positive
  - Imipenem – 0%
  - Meropenem – 0%
  - Ertapenem – 0%
- IV challenge
  - Imipenem – 0%
  - Meropenem – 0%
  - Ertapenem – 0%

Kula et al. CID 2014;59:1113–1122

PCN = penicillin; IV = intravenous
**Monday Morning Quarterback**

- Adult female with cellulitis
- Allergy history: PCN and cefaclor; unknown reaction

1. Cephalexin
2. Clindamycin
3. TMP/SMX

PCN = penicillin; TMP/SMX = trimethoprim/sulfamethoxazole

---

**Case 4: Corbin vs. Thomas**

**FACTS**

- Adult female (Corbin) had a dentist appointment, 2007
- Allergy history: Penicillin – reaction SJS (1960)
- Prior to a dentist visit she took clindamycin per PCP
- Diagnosed with a cracked tooth, planned extraction later
- Prior to extraction dentist prescribes penicillin - patient calls and requests an alternative due to allergy – dentist prescribes amoxicillin

**SJS** = Stevens-Johnson Syndrome; **PCP** = primary care physician

---

**Case 4: Corbin vs. Thomas**

**FACTS**

- Patient picks amoxicillin on the way to her dental appointment – takes a pill – notices it is amoxicillin
- Informs dentist - dentist says it was “no big deal” – continued with the tooth extraction
- Next day – redness, swelling, itching of hands – takes diphenhydramine
- Day 5 – walk-in clinic – diagnosed with a reaction to amoxicillin – mild edema and purplish discoloration on hands – prescribed a prednisone taper

**ED** = emergency department; **UTI** = urinary tract infection; **IV** = intravenous; **TMP/SMX** = trimethoprim/sulfamethoxazole

---

**Legal issues**

- Plaintiff's claims: her hospitalization was the result of the reaction to amoxicillin
- Defense argued that TMP/SMX cause the severe edema and hypotension, not a delayed amoxicillin reaction

**Jury Members**

- In your jury groups decide if the dentist is
  - Liable
  - Not Liable
Legal Issues

• Who won the case?
  • Jury found for Plaintiff and awarded $125,000 for damages. BUT...
  • Apportioned fault:
    • 75% Defendant (Thomas)
    • 25% Plaintiff (Corbin)
  • What does that mean?

Legal Issues

• Defendant appealed:
  • First he moved for a new trial- verdict not based on evidence AND challenged the damages awarded
  • Then he appealed when court denied motion for new trial
  • Appeal was denied

Legal Issues

• Could the pharmacist who filled the prescription share any responsibility?
  • Remember the four elements of negligence:
    • Duty
    • Breach
    • Causation
    • Harm

Issues Related to Causation

• Multiple hypersensitivity syndrome
• Allergy to ≥ 2 chemically different medications
• 2 subtypes
  • Development of hypersensitivity to multiple medications simultaneously
  • Development of hypersensitivity sequentially sometimes years apart


Predictors of multiple drug intolerance

<table>
<thead>
<tr>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
</tr>
<tr>
<td>Glycopeptides</td>
</tr>
<tr>
<td>TMP/SMX</td>
</tr>
<tr>
<td>Macrolides</td>
</tr>
<tr>
<td>Tetracyclines</td>
</tr>
<tr>
<td>Quinolones</td>
</tr>
<tr>
<td>Cephalosporins</td>
</tr>
</tbody>
</table>


Monday morning quarterback

• Adult female with an uncomplicated UTI
• Allergy history: penicillin – SJS (1960), TMP/SMX – SJS
  1. Nitrofurantoin
  2. Fosfomycin
  3. Ciprofloxacin/levofloxacin
  4. Cephalexin

UTI = urinary tract infection; SJS = Stevens-Johnson Syndrome; TMP/SMX = trimethoprim/sulfamethoxazole
Testing for sensitivity

- **Patch testing**
  - Medication mixed with petroleum, applied to skin, covered x 48 hrs, evaluate 48-96 hrs after placement
  - Reproducible in 24% of patients with SJS/TEN
- **Intradermal**
  - Pin prick, then intradermal placement, read 24-48 hrs after placement
- **In vitro assays**
  - Sensitivity 80%, specificity of 95% in SJS/TEN

SJS = Stevens-Johnson Syndrome; TEN = toxic epidermal necrolysis

Porebski et al. Clin Exp Allergy. 2013 Sep;43(9):1027-3

Key Points

- **Clinical**
  - Cephalosporin side chains are important, rings probably aren’t
  - Avoiding beta-lactams = worst outcomes
  - Carbapenems safe in patient with penicillin allergy – delayed and immediate
- **Legal**
  - Increase in cases over time
  - Expanding role of pharmacist = more liability
  - Document, document, document

Context: What are the trends in published cases over time

![Graph showing trends in professional malpractice penicillin cases by decade](image)

What does this mean for pharmacists?

**WITH GREAT POWER COMES GREAT RESPONSIBILITY**

Klasch v. Walgreens

**FACTS**

- Plaintiff visited new doctor in 2011
  - On med history indicated might have a sulfa allergy- indicated on chart with “?”
- Later visit- diagnosed with UTI, prescribed TMP/SMX
- Filled script at Walgreens
  - Flagged by computer system for potential allergy
  - Pharmacist called Klasch; she said she’d taken it before with no reaction. Ultimately dispensed drug.

UTI = urinary tract infection; TMP/SMX = trimethoprim/sulfamethoxazole

Klasch v. Walgreens

**FACTS**

- After taking TMP/SMX, Klasch complained she felt “itchy”
- Called doctor the next day and left voice mail that she was wrong about not having sulfa allergy
- Condition continued to worsen. Taken to ED, and admitted.
  - Diagnosed with SJS/TEN
  - Transferred to burn unit
  - Lapsed into coma and died

ED = emergency department; TMP/SMX = trimethoprim/sulfamethoxazole; SJS = Stevens-Johnson Syndrome; TEN = toxic epidermal necrolysis
Legal Issues
• Klasch’s two children sued for wrongful death- alleged Walgreens and pharmacist breached duty of care.
  • Pharmacist failed to adequately warn of the prescribed medication’s risk in light of allergy
  • Pharmacist failed to call doctor to clarify whether he intended to prescribe a medication to which patient was allergic

Legal Issues
• Walgreens successfully moved for summary judgment
  • Argued that “learned intermediary doctrine” limited the pharmacist’s liability.
  • Pharmacist complied with duty- filled the prescription in with correct drug and quantity prescribed.
• Plaintiffs’ appealed to Nevada Supreme Court

Appeal
• Nevada Supreme Court rejected the “learned intermediary doctrine” argument
• Court held that Walgreens had specific knowledge of Klasch’s allergy
  • When pharmacy/pharmacist has such knowledge, they have a duty to warn the customer or to notify the prescribing doctor of patient specific risk

What can you do to limit liability
• Maintain professional liability insurance
• Monitor the applicable scope of practice regulations and policies
  • Especially new cases that expand the duty owed
• DOCUMENT- everything, every time, as close to concurrently as possible
  • Patient discussions- including phone consultations, what was discussed
  • Informed consent
  • Test results, procedures, referrals, consultations
  • Reviews and patient history
  • Your decision making process when exploring differential diagnoses

1. What is the risk of a patient with a penicillin allergy experiencing an allergic reaction to a cephalosporin?
   A. 20%
   B. 10%
   C. 1%
   D. <1%

2. What is the risk of a patient with a penicillin allergy experiencing an allergic reaction to a carbapenem?
   A. 20%
   B. 10%
   C. 1%
   D. <1%
3. Patients with beta-lactam allergies treated with non-beta-lactams for gram negative bloodstream infections have worse outcomes. What is a possible explanation for this?
   A. NBL antibiotics are less likely to be active against gram negative pathogens
   B. NBL antibiotics have a higher volume of distribution
   C. NBL antibiotics are contraindicated for bloodstream infections

4. Which of the following are the four essential elements of a case for professional negligence?
   A. Duty, Breach, Causation, Harm (Damages)
   B. Duty, Breach, Intent, Harm (Damages)
   C. Duty, Breach, Intent, Incurred Expenses
   D. Relationship, Omission, Causation, Incurred Expense

5. What is the duty of care a pharmacist owes to his or her patient?
   A. That degree of skill or diligence exercised by an experienced professional under similar circumstances.
   B. That degree of skill or knowledge exhibited by an ordinary professional under similar circumstances.
   C. That degree of knowledge or skill exhibited by any individual with that professional training.