PICO Search Assignment Worksheet Name__Lisette Romo_____

Brief description of patient problem/setting (summarize the case very briefly)

A 99-year-old female resident of a long-term care setting with a history of hypertension and hyperlipidemia was evaluated following a recent hospitalization for bleeding from her colostomy site and stoma prolapse. She previously underwent a perineal proctectomy that was complicated by rectal bleeding, rectal wound dehiscence, pelvic blood/fecal collections, and pseudoaneurysms requiring subsequent colostomy creation. During hospitalization, CT imaging was obtained, which confirmed a peri-anastomotic pelvic collection that was not amenable to drainage. A consult for Infectious Disease was placed, and they recommended a three-week course of oral cefpodoxime and metronidazole. After stabilization and resolution of active bleeding, the patient was discharged back to the long-term care facility for subacute rehab, continued recovery, ostomy management, and follow-up care. Given the decision to utilize oral antibiotic therapy instead of prolonged intravenous treatment, this raises the clinical question of whether oral step-down antibiotic therapy is as safe and effective as prolonged IV antibiotic therapy in elderly postoperative patients with intra-abdominal or pelvic collections.

Search Question:

In elderly postoperative patients with intra-abdominal or pelvic collections, does oral step-down antibiotic therapy compared with prolonged intravenous antibiotic therapy result in similar infection resolution and readmission rates?

Question Type: What type of question is this?

□ **Treatment** □ Diagnosis □ Prognosis □ Screening □ Prevalence □ Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)?
Please explain your choices.

If the highest level of evidence were not available, including systematic reviews and meta-analyses, then I would also include other appropriate studies, such as randomized controlled trials (RCTs), prospective cohort studies, and retrospective cohort studies. RCTs are helpful because they directly compare interventions and, with blinding, minimize bias; thus, they are a strong form of research. Prospective and retrospective cohort studies can also provide important data, particularly for complex postoperative patients who are often underrepresented in randomized trials. For my PICO question, the most clinically applicable studies were retrospective cohort studies since they assessed patients with complicated intra-abdominal infections who were transitioned from IV to oral antibiotics. Retrospective cohort studies were able to provide information better associated with my patient's clinical scenario, including postoperative collections and management decisions regarding continued prolonged antibiotic therapy. One important thing I also considered was using newer studies when available, since practice patterns, antibiotic stewardship recommendations, and resistance trends might not be reflected in older studies. For my clinical scenario and question, using a combination of various

evidence allows for a comprehensive evaluation and can help in determining how applicable the findings are for patients in long-term care for subacute rehabilitation.

PICO search terms:

P (Population)	I (Intervention)	C (Comparison)	O (Outcome)
Elderly post-operative patients	Oral antibiotic therapy	Prolonged IV antibiotic therapy	Infection resolution
Patients with intra-abdominal collections	Step-down oral antibiotic therapy	Continued IV antibiotics	Readmission rates
Postoperative patients with complicated intra-abdominal infections	IV to PO antibiotic therapy	Long-term parenteral antibiotics	Hospital readmission
Postoperative patients with nondrainable collections	Cefpodoxime and Metronidazole	IV only therapy	Infection recurrence
			Adverse events

Search tools and strategy used:

Please indicate what databases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters.

Database	Search Terms Used	Number of Results	Filters/Limiters Applied	Notes/Observations
PubMed	oral antibiotics AND complicated intra-abdominal infection	385	English language, published within 10 years	Initial broad search yielding 385 results. The results included studies that evaluated PO antibiotic therapy, switching over from IV to oral antibiotics, and managing complicated intra-abdominal

				infections. Identified the most relevant studies for post-op elderly patients.

Google Scholar	(oral step-down antibiotic therapy OR oral antibiotics) AND (complicated intra-abdominal infection OR pelvic collection OR intra-abdominal abscess) AND (intravenous antibiotics OR IV therapy)	788	Published from 2016 to 2026, English language	Broad search with. results including systematic reviews, meta-analyses, RCTs, and cohort studies evaluating oral antibiotic therapy and IV to oral antibiotic transition. Articles were screened for relevance, assessing complicated intra-abdominal infections, postoperative patients, infection resolution, readmission rates, and adverse events.
Wiley Online Library	intravenous to oral antibiotic transition AND complicated intra-abdominal infection	8,491	Published within the last 10 years; English language; Journal articles	A significantly large number of results included a variety of articles; due to this, further screening was done to identify studies that were most applicable to the case scenario.

I used reliable databases, including PubMed, Google Scholar, and Wiley, in order to search for evidence relating to my PICO question and clinical scenario. PubMed was used to identify clinical studies evaluating oral antibiotic therapy and complicated intra-abdominal infections. Google Scholar provided a broader search and helped identify additional studies, including systematic reviews, randomized controlled trials, and cohort studies. Wiley Online Library was used to further expand the search and identify articles related to

IV-to-oral antibiotic transition and management of complicated intra-abdominal infections. Search terms regarding oral step-down antibiotic therapy, intravenous antibiotic therapy, intra-abdominal infections, pelvic collections, and treatment outcomes were used to ensure a comprehensive search strategy. After reviewing the available studies, I decided to choose the studies that were most relevant to my PICO question, as well as providing the highest level of evidence regarding infection resolution, readmission rates, and the overall effectiveness of using oral antibiotic therapy in postoperative patients.

Results found:

1. Using the Comparing Oral versus Parenteral Antimicrobial Therapy (COPAT) Clinical Trial to Influence Institutional Practice Transformation Towards Earlier Transition to Oral Antibiotics
https://pubmed.ncbi.nlm.nih.gov/41419216/

Juskowich JJ, Thompson JM, Bage SD, Palmateer KM, Guilfoose JA, Lastinger AM, Smith CL, Arcega VA, Stanley JE, Summerfield HM, Fisher-Duda C, Nepal M, Wen S, Sarwari AR. Using the Comparing Oral versus Parenteral Antimicrobial Therapy (COPAT) Clinical Trial to Influence Institutional Practice Transformation Towards Earlier Transition to Oral Antibiotics. Clin Infect Dis. 2026;82(4). doi:10.1093/cid/ciaf707.

a. Study type: Randomized Controlled Trial

Abstract

Background: Extensive literature has established equivalent efficacy of early intravenous (IV) to oral antibiotic transition. However, there is variability in adoption across practice settings. Unlike Outpatient Parenteral Antimicrobial Therapy (OPAT) programs, Complex Outpatient Antimicrobial Therapy with Oral Agents (COpAT) programs face significant implementation science challenges. We used a clinical trial with broad enrollment criteria to determine the impact of early oral transition in a real-world setting and studied its influence on practice transformation.

Objective: To determine the impact of early intravenous-to-oral antibiotic transition compared with IV-only therapy in a real-world setting, assessing both safety (superiority hypothesis) and therapeutic efficacy (equivalence hypothesis) at 3 months, while also studying the trial's influence on institutional practice transformation toward earlier oral antibiotic transition.

Methods: Comparing Oral versus Parenteral Antimicrobial Therapy (COPAT) Trial was a pragmatic, randomized controlled trial at 5 hospitals in 1 rural health system. Patients who required 2 or more weeks of IV antibiotics (for all but central nervous system infections) were randomized 2:1 to experimental (early-oral) group or control (IV-only) group. Two primary outcomes and hypotheses were assessed at 3 months: early-oral group safety superiority and efficacy equivalence. Clinical cases of patients who completed the trial were presented at multiple forums.

Results: The trial was stopped early after two-thirds enrollment for a significant safety benefit. Early-oral group demonstrated a significantly lower adverse event rate (3.2% versus 6.5%, P = .02). Lower cumulative hazard for first study-related adverse event in early-oral group (hazard ratio, 0.24; 95% confidence interval, .08-.75; P = .01) appeared to emerge by day 10. Therapeutic efficacy was

equivalent. Cumulative enrollment in the trial had a significant association with the COpAT:OPAT program consult ratio (R2= 0.54, P < .001).

Conclusion: Early oral antibiotic transition was significantly safer. At our academic health system, implementation of the COPAT Trial accelerated practice transformation.

Why I chose this article:

I decided to choose this article since it assessed whether patients could safely transition from IV antibiotics to oral antibiotics, and this applies to my patient case for the management of a surgical complication. Although the study did not specifically focus on intra-abdominal or pelvic collections, it evaluated patients with serious infections who required prolonged antibiotic therapy and compared outcomes between oral step-down therapy and continued IV treatment. The study found that patients who transitioned to oral antibiotics had similar treatment outcomes while experiencing fewer adverse events. This was relevant to my patient because she was discharged on oral cefpodoxime and metronidazole after being stabilized in the hospital for a postoperative pelvic collection. In elderly patients, prolonged IV therapy can increase the risk of IV-related complications and may be more difficult to manage in a subacute rehabilitation setting. Overall, the article provided adequate evidence regarding the use of oral antibiotics as a step-down measure from IV antibiotics.

Key Points:

i. Patients who transitioned to oral antibiotics had significantly fewer adverse events than patients who remained on IV therapy (3.2% vs. 6.5%)

ii. Oral antibiotic therapy demonstrated equal therapeutic efficacy compared with continued IV therapy.

iii. Early transition to oral antibiotics reduces complications associated with prolonged IV access, including catheter-related infections, phlebitis, line malfunction, and the need for long-term IV catheter maintenance.

2. Patients with Complicated Intra-Abdominal Infection Presenting with Sepsis Do Not Require Longer Duration of Antimicrobial Therapy https://pubmed.ncbi.nlm.nih.gov/26920994/

Rattan R, Allen CJ, Sawyer RG, Askari R, Banton KL, Claridge JA, Cocanour C, Coimbra R, Cook CH, Cuschieri J, Dellinger EP, Duane TM, Evans HL, Lipsett P, Mazuski J, Miller PR, O'Neill PJ, Rotstein OD, Namias N. *Patients with Complicated Intra-Abdominal Infection Presenting with Sepsis Do Not Require Longer Duration of Antimicrobial Therapy.* J Am Coll Surg. 2016;222(4):440-446. doi:10.1016/j.jamcollsurg.2015.12.050.

a. Study Type: Randomized Controlled Trial

Abstract

Background: A recent prospective, multicenter, randomized controlled trial found that 4 days of antibiotics after source control of complicated intra-abdominal infections resulted in similar outcomes

when compared with longer duration. We hypothesized that the subset of patients presenting with sepsis have similar outcomes when treated with the shorter course of antibiotics.

Objective: The objective was to determine whether the subset of patients with complicated intra-abdominal infections (cIAI) presenting with sepsis had similar outcomes when treated with a short course of antibiotics (4 ± 1 days) compared with a longer, symptom-based course (up to 10 days). The authors hypothesized that even patients meeting sepsis criteria (temperature <36°C or >38°C and WBC <4,000 or >12,000 cells/mm³) would not require longer duration of antimicrobial therapy after adequate source control. This was a post hoc analysis of the multicenter STOP-IT (Study to Optimize Peritoneal Infection Therapy) trial database, analyzing 112 of 518 patients who met sepsis criteria and were protocol-adherent.

Methods: Patients from the STOP-IT (Study to Optimize Peritoneal Infection Therapy) trial database meeting criteria for sepsis (ie, temperature <36°C or >38°C and a WBC count <4000 cells/mm(3) or >12,000 cells/mm(3)) were analyzed. Patients had been randomized to receive antibiotics until 2 days after the resolution of fever, leukocytosis, and ileus, with a maximum of 10 calendar days of therapy (n = 45), or to receive a fixed short-course of antibiotics for 4 ± 1 calendar days (n = 67). Outcomes included incidence of and time to surgical site infection, recurrent intra-abdominal infection, Clostridium difficile infection, and extra-abdominal infections, as well as hospital days and mortality.

Results: One hundred and twelve of the 588 patients in the STOP-IT database met criteria for sepsis and were adherent to the protocol. With regard to short- vs long-course therapy, surgical site infection (11.9% vs 8.9%; p = 0.759), recurrent intra-abdominal infection (11.9% vs 13.3%; p = 1.00), extra-abdominal infection (11.9% vs 8.9%; p = 0.759), hospital days (7.4 ± 5.5 days vs 9.0 ± 7.5 days; p = 0.188), days to recurrent intra-abdominal infection (12.5 ± 6.6 days vs 18.0 ± 8.1 days; p = 0.185), days to extra-abdominal infection (12.6 ± 5.8 days vs 17.3 ± 3.9 days; p = 0.194), and mortality (1.5% vs 0%; p = 1.00) were similar. There were no cases of C difficile infection. Days to surgical site infection (6.9 ± 3.5 days vs 21.3 ± 6.1 days; p < 0.001) were fewer in the 4-day therapy group.

Conclusion: There was no difference in outcomes between short and long-course antimicrobial therapy in patients with complicated intra-abdominal infection presenting with sepsis. Our findings suggest that the presence of systemic illness does not mandate a longer antimicrobial course if source control of complicated intra-abdominal infection is obtained.

Why I chose this article:

I decided to choose this article since it was one of the few studies that specifically evaluated patients with complicated intra-abdominal infections, which closely relates to the patient in the clinical scenario with several postoperative complications. This study mostly focused on antibiotic duration rather than oral versus intravenous treatment, however, it demonstrated that patients with sepsis who received a shorter course of antibiotics after adequate source control had similar rates of recurrent infection, mortality, and other complications compared with those who received a longer course. This is important because it supports antimicrobial stewardship and suggests that prolonged antibiotic exposure may not provide additional benefit once the source of infection has been controlled. Since this patient was clinically stabilized and treated with antibiotics for a complication of pelvic collection that could not be drained, this article helped support that longer/ more aggressive antibiotic treatment is not always necessary and that treatment decisions should be based on the patient's clinical response rather than

duration alone. This article is applicable since longer use of antibiotics is not needed, and this can also support the fact that oral antibiotics can be tapered or discontinued without prolonged use or IV intervention needed to provide treatment success and prevent further complications like sepsis.

Key Points:

i.Patients with complicated intra-abdominal infections and sepsis had similar rates of recurrent infection regardless of whether they received a short-course or longer-course antibiotic regimen.

ii. Several factors, including mortality, hospital length of stay, and abdominal infection rates, were not significantly different between treatment groups.

iii. There were no cases of common adverse drug events associated with antibiotics, including Clostridium difficile (C.diff) infection, reported in either group.

iv. Longer durations of antibiotic therapy did not improve clinical outcomes after an adequate source control was found and resolved.

v. The study supports antimicrobial stewardship by reducing unnecessary antibiotic exposure without compromising patient outcomes.

3. Oral Is the New IV: Challenging Decades of Blood and Bone Infection Dogma: A Systematic Review https://pubmed.ncbi.nlm.nih.gov/34715060/

Wald-Dickler N, Holtom P, Phillips M, et al. Oral Is the New IV: Challenging Decades of Blood and Bone Infection Dogma: A Systematic Review. Am J Med. 2022;135(3):369-379.e5. doi:10.1016/j.amjmed.2021.10.007.

a. Study type: Systematic Review

Abstract

Background: We sought to determine if controlled, prospective clinical data validate the long-standing belief that intravenous (IV) antibiotic therapy is required for the full duration of treatment for 3 invasive bacterial infections: osteomyelitis, bacteremia, and infective endocarditis.

Objective: The objective of this systematic review was to determine whether controlled, prospective clinical data validate the long-standing belief that intravenous (IV) antibiotic therapy is required for the full duration of treatment for three invasive bacterial infections: osteomyelitis, bacteremia, and infective endocarditis. The authors systematically reviewed all published prospective controlled trials comparing IV-only regimens to oral step-down regimens in the treatment of these diseases.

Methods: We performed a systematic review of published, prospective, controlled trials that compared IV-only to oral stepdown regimens in the treatment of these diseases. Using the PubMed database, we identified 7 relevant randomized controlled trials (RCTs) of osteomyelitis, 9 of bacteremia, 1 including both osteomyelitis and bacteremia, and 3 of endocarditis, as well as one quasi-experimental endocarditis

study. Study results were synthesized via forest plots and funnel charts (for risk of study bias), using RevMan 5.4.1 and Meta-Essentials freeware, respectively.

Results: The 21 studies demonstrated either no difference in clinical efficacy, or superiority of oral versus IV-only antimicrobial therapy, including for mortality; in no study was IV-only treatment superior in efficacy. The frequency of catheter-related adverse events and duration of inpatient hospitalization were both greater in IV-only groups.

Conclusion: Numerous prospective, controlled investigations demonstrate that oral antibiotics are at least as effective, safer, and lead to shorter hospitalizations than IV-only therapy; no contrary data were identified across all 21 studies reviewed. In no study was IV-only treatment superior in efficacy. Catheter-related adverse events were more frequent and duration of inpatient hospitalization was greater in IV-only groups. The authors concluded that treatment guidelines should be modified to indicate that oral therapy is appropriate for reasonably selected patients with osteomyelitis, bacteremia, and endocarditis.

Why I chose this article:

This is a systematic review that evaluated multiple studies comparing oral antibiotic therapy with prolonged IV therapy in patients with serious bacterial infections. Although the article focused on osteomyelitis, bacteremia, and infective endocarditis rather than complicated intra-abdominal infections, it provided high-level evidence supporting the overall concept of oral step-down therapy. I found this article important because none of the studies reviewed showed IV-only therapy to be superior to oral therapy, and oral antibiotics were associated with fewer catheter-related complications and shorter hospitalizations. These findings support the idea that appropriately selected patients may not require prolonged IV treatment to achieve favorable clinical outcomes. Since my patient was transitioned from inpatient management to oral antibiotics after stabilization, the article allows one to understand the effectiveness of using oral antibiotics instead of continued IV access.

Key Points:

i. In over 21 included studies, oral antibiotic therapy demonstrated similar or better clinical outcomes compared with IV-only therapy.

ii. No study found IV-only therapy to be superior to oral therapy in terms of efficacy/mortality.

iii. Catheter-related adverse events occurred more frequently in patients receiving prolonged IV therapy.

iv. Patients treated with oral antibiotics generally experienced shorter hospital stays compared with those receiving IV-only therapy.

4. Association of 30-Day Mortality With Oral Step-Down vs Continued Intravenous Therapy in Patients Hospitalized With Enterobacteriaceae Bacteremia
https://pubmed.ncbi.nlm.nih.gov/30667477/

Tamma PD, Conley AT, Cosgrove SE, et al. Association of 30-Day Mortality With Oral Step-Down vs Continued Intravenous Therapy in Patients Hospitalized With Enterobacteriaceae Bacteremia. JAMA Intern Med. 2019;179(3):316-323. doi:10.1001/jamainternmed.2018.6226.

a. Study type: Retrospective Cohort Study

Abstract

Background: Conversion to oral therapy for Enterobacteriaceae bacteremia has the potential to improve the quality of life of patients by improving mobility, eliminating catheter-associated discomfort, decreasing the risk for noninfectious and infectious catheter-associated adverse events, and decreasing health care costs.

Objective: To compare the association of 30-day mortality with early oral step-down therapy vs continued parenteral therapy for the treatment of Enterobacteriaceae bloodstream infections.

Methods: This retrospective multicenter cohort study included a 1:1 propensity score-matched cohort of 4967 unique patients hospitalized with monomicrobial Enterobacteriaceae bloodstream infection at 3 academic medical centers from January 1, 2008, through December 31, 2014. Eligibility criteria included appropriate source control measures, appropriate clinical response by day 5, active antibiotic therapy from day 1 until discontinuation of therapy, availability of an active oral antibiotic option, and ability to consume other oral medications or feeding. Statistical analysis was performed from March 2, 2018, to June 2, 2018.

Results: Of the 2161 eligible patients, 1185 (54.8%) were male and 1075 (49.7%) were white; the median (interquartile range [IQR]) age was 59 (48-68) years. One-to-one propensity-score matching yielded 1478 patients, with 739 in each study arm. Sources of bacteremia included urine (594 patients [40.2%]), gastrointestinal tract (297 [20.1%]), central line-associated (272 [18.4%]), pulmonary (58 [3.9%]), and skin and soft tissue (41 [2.8%]). There were 97 (13.1%) deaths in the oral step-down group and 99 (13.4%) in the intravenous (IV) group within 30 days (hazard ratio [HR], 1.03; 95% CI, 0.82-1.30). There were no differences in recurrence of bacteremia within 30 days between the groups (IV, 6 [0.8%]; oral, 4 [0.5%]; HR, 0.82 [0.33-2.01]). Patients transitioned to oral step-down therapy were discharged from the hospital an average of 2 days (IQR, 1-6) sooner than patients who continued to receive IV therapy (5 days [IQR, 3-8 days] vs 7 days [IQR, 4-14 days]; $P < .001$).

Conclusion: In this study, 30-day mortality was not different among hospitalized patients who received oral step-down vs continued parenteral therapy for the treatment of Enterobacteriaceae bloodstream infections. The findings suggest that transitioning to oral step-down therapy may be an effective treatment approach for patients with Enterobacteriaceae bacteremia who have received source control and demonstrated an appropriate clinical response. Early transition to oral step-down therapy may be associated with a decrease in the duration of hospital stay for patients with Enterobacteriaceae bloodstream infections.

Why I chose this article:

This article directly evaluated oral step-down treatment compared with continued intravenous antibiotics and found similar mortality and recurrence rates between the two groups. Although the study focused on Enterobacteriaceae bacteremia rather than complicated intra-abdominal infections, I felt it was relevant because Enterobacteriaceae are common organisms involved in gastrointestinal and intra-abdominal infections. My patient had a postoperative pelvic collection with positive brown fecal output following colorectal surgery with colostomy and a Foley catheter in place, all of which increase the risk for gram-negative bacterial infections. Additionally, the patient was transitioned to oral antibiotics after clinical stabilization, which is similar to the treatment strategy evaluated in this study. I found this article important because it demonstrated that appropriately selected patients who respond to treatment and achieve source control may safely transition to oral antibiotics without increased mortality or recurrence. The study also demonstrated that patients receiving oral therapy were discharged sooner, which is beneficial in elderly patients transitioning to a subacute rehabilitation setting.

Key Points:

i. Thirty-day mortality was similar between the oral step-down and IV therapy groups (13.1% vs. 13.4%).

ii. Recurrence of bacteremia within 30 days was very low and did not significantly differ between groups (0.5% vs. 0.8%).

iii. Patients transitioned to oral antibiotics were discharged approximately 2 days sooner than patients who remained on IV therapy (5 vs. 7 days)

iv. Oral step-down antibiotics are a safe alternative to prolonged IV therapy in clinically stable patients whose source of infection has been identified and controlled.

What is the clinical "bottom line" derived from these articles in answer to your question?

Overall, the articles supported that transitioning from IV antibiotics to oral antibiotics is a safe and more effective alternative in patients who are stable, respond to treatment, and tolerate the oral route. There were similar rates of infection recurrence, mortality, and treatment success between the two routes of administering medications. The patient in the clinical scenario is a 99-year-old female with a postoperative complication of a stoma prolapse and bleeding from the colostomy site, who was stabilized and then sent to subacute rehabilitation on cefpodoxime and metronidazole for a three-week course for management of the peri-anastomotic pelvic collection; the evidence supports the transition to oral antibiotics after being clinically stabilized instead of continuously prolonging IV treatment despite significant complications. Several complications with prolonged IV therapy include catheter infections, phlebitis, and bruising. Transitioning patients to oral therapy shortens hospital stays and improves overall quality of life.

This approach applies to many underserved urban populations since oral antibiotics are easier to administer, less costly, and do not require long-term IV access. This is especially relevant to the patient in the scenario, who resides in a long-term care facility located in an urban community. In this particular setting, oral therapy allows patients to recover in a comfortable and familiar environment rather than undergoing ongoing IV treatment, which can create a hospital-like experience. The facility promotes a

home-like atmosphere for the patients, and this includes reducing IV administration to improve patient comfort while still providing effective treatment.

Moreover, social and economic factors should still be considered when applying these article findings. Medication adherence, health literacy, access to follow-up care, and financial barriers are all crucial factors that influence treatment success. In elderly patients, there are even more factors to take into consideration, such as cognitive impairment, limited family support, and functional limitations, which further complicate management. Therefore, while oral step-down therapy appears to be an effective option, treatment decisions should also be individualized and take into account each patient's medical condition, support system, and ability to adhere to the prescribed regimen.