



Antibiotics in Infected Pancreatic Necrosis

Most patients with acute pancreatitis do not need antibiotics; however, 30% of patients with pancreatic necrosis will develop infected pancreatic necrosis. Antibiotics are indicated in infected pancreatic necrosis and ones that penetrate pancreatic necrosis should be used.² Which antibiotics can be used in the management of infected pancreatic necrosis?

Which antibiotics penetrate the pancreas?

Antibiotics with known pancreatic penetration and/or demonstrated efficacy in infected pancreatitis necrosis are summarized in the table below.²⁻¹³

Antimicrobials to Avoid	Antimicrobials To Use
<ul style="list-style-type: none">• Aminoglycosides• Ampicillin• First-generation cephalosporins• Cefoxitin	<ul style="list-style-type: none">• Ceftriaxone• Ceftazidime• Cefepime• Piperacillin-tazobactam• Carbapenems• Fluoroquinolones• Metronidazole• Vancomycin• Linezolid• Fluconazole• Anidulafungin• Micafungin

Common pathogens of infected pancreatic necrosis include enteric gram-negative bacteria and anaerobes, therefore empiric antibiotic regimens should provide coverage of these (e.g. [piperacillin-tazobactam monotherapy](#), cefepime + metronidazole).

Key Takeaway: Antibiotics with adequate penetration into pancreatic necrosis are necessary for the management of patients with infected pancreatic necrosis.

References

1. Forsmark CE, Vege SS, Wilcox CM. Acute Pancreatitis. *N Engl J Med*. 2016 Nov 17;375(20):1972-1981
2. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. Ninth Edition. Chapter 76. Pancreatic Infection.
3. Craig RM, Dordal E, Myles L. Letter: The use of ampicillin in acute pancreatitis. *Ann Intern Med*. 1975 Dec;83(6):831-2.
4. Martin C, Cottin A, Francoi-Godfroy N, et al. Concentrations of prophylactic ceftriaxone in abdominal tissues during pancreatic surgery. *J Antimicrob Chemother*. 1997 Sep;40(3):445-8.
5. Leppäniemi, A., Tolonen, M., Tarasconi, A. et al. 2019 WSES guidelines for the management of severe acute pancreatitis. *World J Emerg Surg* **14**, 27 (2019). <https://doi.org/10.1186/s13017-019-0247-0>
6. De Waele JJ. Rational Use of Antimicrobials in Patients with Severe Acute Pancreatitis. *Semin Respir Crit Care Med*. 2011 Apr;32(2):174-80.
7. Delcenserie R, Dellion-Lozinguez MP, Yzet T, et al. Pancreatic concentrations of ceftazidime. *J Antimicrob Chemother*. 2001;47(5):711-713. doi:10.1093/jac/47.5.711
8. Drewelow B, Koch K, Otto C, Franke A, et al. Penetration of Ceftazidime into Human Pancreas. *Infection*. 1993 Jul-Aug;21(4):229-34.
9. Otto W, Komorzycki K, Krawczyk M. Efficacy of antibiotic penetration into pancreatic necrosis. *HPB (Oxford)*. 2006;8(1):43-8.
10. Wang C, Li X, Li C, He N, Ge Q, Zhai S. Good abdominal drainage fluid penetration and pharmacokinetics analysis of vancomycin for severe acute pancreatitis: A case report. *J Clin Pharm Ther*. 2021;46(3):856-858. doi:10.1111/jcpt.13342
11. Rao GG, Steger A, Tobin CM. Linezolid levels in pancreatic secretions. *J Antimicrob Chemother*. 2001;48(6):931-932. doi:10.1093/jac/48.6.931-a
12. Shrikhande S, Fries H, Issenegger C, et al. Fluconazole penetration into the pancreas. *Antimicrob Agents Chemother*. 2000;44(9):2569-2571. doi:10.1128/AAC.44.9.2569-2571.2000
13. Marx J, Welte R, Gasperetti T, Moser P, Joannidis M, Bellmann R. Human Tissue Distribution of Anidulafungin and Micafungin. *Antimicrob Agents Chemother*. 2021;65(7):e0016921. doi:10.1128/AAC.00169-21