

## References

1. Freifeld AG, Bow EJ, Sepkowitz KA, et al: Clinical practice guideline for the use of antimicrobial agents in neutropenic patients with cancer: 2010 update by the Infectious Diseases Society of America. *Clin Infect Dis* 52:e56-93, 2011
2. Bucaneve G, Castagnola E, Viscoli C, et al: Quinolone prophylaxis for bacterial infections in afebrile high risk neutropenic patients. *EJC* 5:5-12, 2007 (suppl)
3. Drgona L, Paul M, Bucaneve G, et al: The need for aminoglycosides in combination with  $\beta$ -lactams for high-risk, febrile neutropaenic patients with leukaemia. *EJC* 5:13-22, 2007 (suppl)
4. Cometta A, Marchetti O, Calandra T: Empirical use of anti-Gram-positive antibiotics in febrile neutropaenic cancer patients with acute leukaemia. *EJC* 5:23-31, 2007 (suppl)
5. Marchetti O, Cordonnier C, Calandra T: Empirical antifungal therapy in neutropaenic cancer patients with persistent fever. *EJC* 5:32-42, 2007 (suppl)
6. National Comprehensive Cancer Network: NCCN Guidelines™ for Supportive Care: Prevention and Treatment of Cancer-Related Infections (Version 2.2011), Fort Washington, PA: National Comprehensive Cancer Network, 2011 ([http://www.nccn.org/professionals/physician\\_gls/f\\_guidelines.asp](http://www.nccn.org/professionals/physician_gls/f_guidelines.asp))
7. de Naurois J, Novitzky-Basso I, Gill MJ, et al: Management of febrile neutropenia: ESMO Clinical Practice Guidelines. *Ann Oncol* 21:v252-6, 2010 (suppl 5)
8. Sung L, Phillips R, Lehrnbecher T: Time for paediatric febrile neutropenia guidelines - children are not little adults. *Eur J Cancer* 47:811-3, 2011
9. Oxman AD, Fretheim A, Schunemann HJ: Improving the use of research evidence in guideline development: introduction. *Health Res Policy Syst* 4:12, 2006
10. Brouwers MC, Kho ME, Browman GP, et al: Development of the AGREE II, part 1: performance, usefulness and areas for improvement. *CMAJ* 182:1045-52
11. Brozek JL, Akl EA, Alonso-Coello P, et al: Grading quality of evidence and strength of recommendations in clinical practice guidelines. Part 1 of 3. An overview of the GRADE approach and grading quality of evidence about interventions. *Allergy* 64:669-77, 2009
12. Agyeman P, Aebi C, Hirt A, et al: Predicting bacteremia in children with cancer and fever in chemotherapy-induced neutropenia: results of the prospective multicenter SPOG 2003 FN study. *Pediatr Infect Dis J* 30:e114-9, 2011
13. Alexander SW, Wade KC, Hibberd PL, et al: Evaluation of risk prediction criteria for episodes of febrile neutropenia in children with cancer. *J Pediatr Hematol Oncol* 24:38-42, 2002
14. Ammann RA, Aebi C, Hirt A, et al: Fever in neutropenia in children and adolescents: evolution over time of main characteristics in a single center, 1993-2001. *Support Care Cancer* 12:826-32, 2004
15. Ammann RA, Bodmer N, Hirt A, et al: Predicting adverse events in children with fever and chemotherapy-induced neutropenia: the prospective multicenter SPOG 2003 FN study. *J Clin Oncol* 28:2008-14, 2010
16. Ammann RA, Hirt A, Luthy AR, et al: Identification of children presenting with fever in chemotherapy-induced neutropenia at low risk for severe bacterial infection. *Med Pediatr Oncol* 41:436-43, 2003
17. Baorto EP, Aquino VM, Mullen CA, et al: Clinical parameters associated with low bacteremia risk in 1100 pediatric oncology patients with fever and neutropenia. *Cancer* 92:909-13, 2001

18. Hakim H, Flynn PM, Srivastava DK, et al: Risk prediction in pediatric cancer patients with fever and neutropenia. *Pediatr Infect Dis J* 29:53-9, 2010
19. Hann I, Viscoli C, Paesmans M, et al: A comparison of outcome from febrile neutropenic episodes in children compared with adults: results from four EORTC studies. International Antimicrobial Therapy Cooperative Group (IATCG) of the European Organization for Research and Treatment of Cancer (EORTC). *Br J Haematol* 99:580-8, 1997
20. Jones GR, Konsler GK, Dunaway RP, et al: Infection risk factors in febrile, neutropenic children and adolescents. *Pediatr Hematol Oncol* 13:217-29, 1996
21. Klaassen RJ, Goodman TR, Pham B, et al: "Low-risk" prediction rule for pediatric oncology patients presenting with fever and neutropenia. *J Clin Oncol* 18:1012-9, 2000
22. Lucas KG, Brown AE, Armstrong D, et al: The identification of febrile, neutropenic children with neoplastic disease at low risk for bacteremia and complications of sepsis. *Cancer* 77:791-8, 1996
23. Macher E, Dubos F, Garnier N, et al: Predicting the risk of severe bacterial infection in children with chemotherapy-induced febrile neutropenia. *Pediatr Blood Cancer* 55:662-7, 2010
24. Paganini HR, Aguirre C, Puppa G, et al: A prospective, multicentric scoring system to predict mortality in febrile neutropenic children with cancer. *Cancer* 109:2572-9, 2007
25. Rackoff WR, Gonin R, Robinson C, et al: Predicting the risk of bacteremia in children with fever and neutropenia. *J Clin Oncol* 14:919-24, 1996
26. Rondinelli PI, Ribeiro Kde C, de Camargo B: A proposed score for predicting severe infection complications in children with chemotherapy-induced febrile neutropenia. *J Pediatr Hematol Oncol* 28:665-70, 2006
27. Santolaya ME, Alvarez AM, Aviles CL, et al: Prospective evaluation of a model of prediction of invasive bacterial infection risk among children with cancer, fever, and neutropenia. *Clin Infect Dis* 35:678-83, 2002
28. Santolaya ME, Alvarez AM, Becker A, et al: Prospective, multicenter evaluation of risk factors associated with invasive bacterial infection in children with cancer, neutropenia, and fever. *J Clin Oncol* 19:3415-21, 2001
29. Tezcan G, Kupesiz A, Ozturk F, et al: Episodes of fever and neutropenia in children with cancer in a tertiary care medical center in Turkey. *Pediatr Hematol Oncol* 23:217-29, 2006
30. West DC, Marcin JP, Mawis R, et al: Children with cancer, fever, and treatment-induced neutropenia: risk factors associated with illness requiring the administration of critical care therapies. *Pediatr Emerg Care* 20:79-84, 2004
31. Phillips B, Wade R, Stewart LA, et al: Systematic review and meta-analysis of the discriminatory performance of risk prediction rules in febrile neutropaenic episodes in children and young people. *Eur J Cancer* 46:2950-64, 2010
32. Toll DB, Janssen KJM, Vergouwe Y, et al: Validation, updating and impact of clinical prediction rules: A review. *J Clin Epidemiol* 61:1085-1094, 2008
33. Phillips R, Lehrnbecher T, Alexander S, et al: Updated systematic review and meta-analysis of the performance of risk prediction rules in children and young people with febrile neutropenia. *PLoS One* 7:e38300, 2012
34. Dommett R, Geary J, Freeman S, et al: Successful introduction and audit of a step-down oral antibiotic strategy for low risk paediatric febrile neutropaenia in a UK, multicentre, shared care setting. *Eur J Cancer* 45:2843-9, 2009
35. Scheinmann K, Ethier MC, Dupuis LL, et al: Utility of peripheral blood cultures in bacteremic pediatric cancer patients with a central line. *Support Care Cancer* 18:913-9, 2010
36. DesJardin JA, Falagas ME, Ruthazer R, et al: Clinical utility of blood cultures drawn from indwelling central venous catheters in hospitalized patients with cancer. *Ann Intern Med* 131:641-7, 1999

37. Chen WT, Liu TM, Wu SH, et al: Improving diagnosis of central venous catheter-related bloodstream infection by using differential time to positivity as a hospital-wide approach at a cancer hospital. *J Infect* 59:317-23, 2009
38. Adamkiewicz TV, Lorenzana A, Doyle J, et al: Peripheral vs. central blood cultures in patients admitted to a pediatric oncology ward. *Pediatr Infect Dis J* 18:556-8, 1999
39. Raad I, Hanna HA, Alakech B, et al: Differential time to positivity: a useful method for diagnosing catheter-related bloodstream infections. *Ann Intern Med* 140:18-25, 2004
40. Handrup MM, Moller JK, Schroder H: Catheter-related bloodstream infections in children with cancer admitted with fever, 42nd Congress of the International Society of Pediatric Oncology (SIOP). Boston, MA, *Pediatr Blood Cancer*, 2010
41. Barriga FJ, Varas M, Potin M, et al: Efficacy of a vancomycin solution to prevent bacteremia associated with an indwelling central venous catheter in neutropenic and non-neutropenic cancer patients. *Med Pediatr Oncol* 28:196-200, 1997
42. O'Grady NP, Alexander M, Burns LA, et al: Guidelines for the prevention of intravascular catheter-related infections. *Am J Infect Control* 39:S1-34, 2011
43. Wilson ML, Mitchell M, AMorris AJ, et al: Principles and Procedures for Blood Cultures; Approved Guideline. CLSI document M47-A. Wayne, PA, Clinical and Laboratory Standards Institute, 2007
44. Isaacman DJ, Karasic RB, Reynolds EA, et al: Effect of number of blood cultures and volume of blood on detection of bacteremia in children. *J Pediatr* 128:190-5, 1996
45. Kellogg JA, Manzella JP, Bankert DA: Frequency of low-level bacteremia in children from birth to fifteen years of age. *J Clin Microbiol* 38:2181-5, 2000
46. Connell TG, Rele M, Cowley D, et al: How reliable is a negative blood culture result? Volume of blood submitted for culture in routine practice in a children's hospital. *Pediatrics* 119:891-6, 2007
47. Gaur AH, Giannini MA, Flynn PM, et al: Optimizing blood culture practices in pediatric immunocompromised patients: evaluation of media types and blood culture volume. *Pediatr Infect Dis J* 22:545-52, 2003
48. Klaassen IL, de Haas V, van Wijk JA, et al: Pyuria is absent during urinary tract infections in neutropenic patients. *Pediatr Blood Cancer* 56:868-70, 2011
49. Mori R, Yonemoto N, Fitzgerald A, et al: Diagnostic performance of urine dipstick testing in children with suspected UTI: a systematic review of relationship with age and comparison with microscopy. *Acta Paediatr* 99:581-4, 2010
50. Sickles EA, Greene WH, Wiernik PH: Clinical presentation of infection in granulocytopenic patients. *Arch Intern Med* 135:715-9, 1975
51. Renoult E, Buteau C, Turgeon N, et al: Is routine chest radiography necessary for the initial evaluation of fever in neutropenic children with cancer? *Pediatr Blood Cancer* 43:224-8, 2004
52. Korones DN, Hussong MR, Gullace MA: Routine chest radiography of children with cancer hospitalized for fever and neutropenia: Is it really necessary? *Cancer* 80:1160-1164, 1997
53. Feusner J, Cohen R, O'Leary M, et al: Use of routine chest radiography in the evaluation of fever in neutropenic pediatric oncology patients. *J Clin Oncol* 6:1699-702, 1988
54. Katz JA, Bash R, Rollins N, et al: The yield of routine chest radiography in children with cancer hospitalized for fever and neutropenia. *Cancer* 68:940-3, 1991
55. Phillips R, Wade R, Riley R, et al: Systematic review and meta-analysis of the value of clinical features to exclude radiographic pneumonia in febrile neutropenic episodes in children and young people. *J Paediatr Child Health*, 2011
56. Furno P, Bucaneve G, Del Favero A: Monotherapy or aminoglycoside-containing combinations for empirical antibiotic treatment of febrile neutropenic patients: a meta-analysis. *Lancet Infect Dis* 2:231-42, 2002

57. Paul M, Soares-Weiser K, Leibovici L: Beta lactam monotherapy versus beta lactam-aminoglycoside combination therapy for fever with neutropenia: systematic review and meta-analysis. *BMJ* 326:1111, 2003
58. Manji A, Lehrnbecher T, Dupuis LL, et al: A systematic review and meta-analysis of anti-pseudomonal penicillins and carbapenems in pediatric febrile neutropenia. *Support Care Cancer*, 2011 (in press)
59. Manji A, Lehrnbecher T, Dupuis LL, et al: A Meta-Analysis of Anti-Pseudomonal Penicillins and Cephalosporins in Pediatric Patients with Fever and Neutropenia. *Pediatr Infect Dis J* 31:353-8, 2012
60. Paul M, Yahav D, Bivas A, et al: Anti-pseudomonal beta-lactams for the initial, empirical, treatment of febrile neutropenia: comparison of beta-lactams. *Cochrane Database Syst Rev*:CD005197, 2010
61. Kim PW, Wu YT, Cooper C, et al: Meta-analysis of a possible signal of increased mortality associated with cefepime use. *Clin Infect Dis* 51:381-9, 2010
62. Marron A, Carratala J, Alcaide F, et al: High rates of resistance to cephalosporins among viridans-group streptococci causing bacteraemia in neutropenic cancer patients. *J Antimicrob Chemother* 47:87-91, 2001
63. Vardakas KZ, Samonis G, Chrysanthopoulou SA, et al: Role of glycopeptides as part of initial empirical treatment of febrile neutropenic patients: a meta-analysis of randomised controlled trials. *Lancet Infect Dis* 5:431-9, 2005
64. Riikonen P: Imipenem compared with ceftazidime plus vancomycin as initial therapy for fever in neutropenic children with cancer. *Pediatr Infect Dis J* 10:918-23, 1991
65. Shenep JL, Hughes WT, Roberson PK, et al: Vancomycin, ticarcillin, and amikacin compared with ticarcillin-clavulanate and amikacin in the empirical treatment of febrile, neutropenic children with cancer. *N Engl J Med* 319:1053-8, 1988
66. Viscoli C, Moroni C, Boni L, et al: Ceftazidime plus amikacin versus ceftazidime plus vancomycin as empiric therapy in febrile neutropenic children with cancer. *Rev Infect Dis* 13:397-404, 1991
67. Speyer E, Herbinet A, Vuillemin A, et al: Agreement between children with cancer and their parents in reporting the child's health-related quality of life during a stay at the hospital and at home. *Child Care Health Dev* 35:489-95, 2009
68. Teuffel O, Amir E, Alibhai SM, et al: Cost-effectiveness of outpatient management for febrile neutropenia in children with cancer. *Pediatrics* 127:e279-86, 2011
69. Teuffel O, Ethier MC, Alibhai SM, et al: Outpatient management of cancer patients with febrile neutropenia: a systematic review and meta-analysis. *Ann Oncol* 22:2358-65, 2011
70. Ahmed N, El-Mahallawy HA, Ahmed IA, et al: Early hospital discharge versus continued hospitalization in febrile pediatric cancer patients with prolonged neutropenia: A randomized, prospective study. *Pediatr Blood Cancer* 49:786-92, 2007
71. Santolaya ME, Alvarez AM, Aviles CL, et al: Early hospital discharge followed by outpatient management versus continued hospitalization of children with cancer, fever, and neutropenia at low risk for invasive bacterial infection. *J Clin Oncol* 22:3784-9, 2004
72. Manji A, Beyene J, Dupuis LL, et al: Outpatient and Oral Antibiotic Management of Low-Risk Febrile Neutropenia are Effective in Children - a Systematic Review of Prospective Trials. *Support Care Cancer* 20:1135-45, 2012
73. Vidal L, Paul M, Ben-Dor I, et al: Oral versus intravenous antibiotic treatment for febrile neutropenia in cancer patients. *Cochrane Database Syst Rev*:CD003992, 2004
74. Cometta A, Kern WV, De Bock R, et al: Vancomycin versus placebo for treating persistent fever in patients with neutropenic cancer receiving piperacillin-tazobactam monotherapy. *Clin Infect Dis* 37:382-9, 2003

75. Oude Nijhuis C, Kamps WA, Daenen SM, et al: Feasibility of withholding antibiotics in selected febrile neutropenic cancer patients. *J Clin Oncol* 23:7437-44, 2005
76. Aquino VM, Buchanan GR, Tkaczewski I, et al: Safety of early hospital discharge of selected febrile children and adolescents with cancer with prolonged neutropenia. *Med Pediatr Oncol* 28:191-5, 1997
77. Pizzo PA, Robichaud KJ, Gill FA, et al: Duration of empiric antibiotic therapy in granulocytopenic patients with cancer. *Am J Med* 67:194-200, 1979
78. Santolaya ME, Villarroel M, Avendano LF, et al: Discontinuation of antimicrobial therapy for febrile, neutropenic children with cancer: a prospective study. *Clin Infect Dis* 25:92-7, 1997
79. Wacker P, Halperin DS, Wyss M, et al: Early hospital discharge of children with fever and neutropenia: a prospective study. *J Pediatr Hematol Oncol* 19:208-11, 1997
80. Cohen KJ, Leamer K, Odom L, et al: Cessation of antibiotics regardless of ANC is safe in children with febrile neutropenia. A preliminary prospective trial. *J Pediatr Hematol Oncol* 17:325-30, 1995
81. Bash RO, Katz JA, Cash JV, et al: Safety and cost effectiveness of early hospital discharge of lower risk children with cancer admitted for fever and neutropenia. *Cancer* 74:189-96, 1994
82. Hodgson-Viden H, Grundy PE, Robinson JL: Early discontinuation of intravenous antimicrobial therapy in pediatric oncology patients with febrile neutropenia. *BMC Pediatr* 5:10, 2005
83. Lehrnbecher T, Stanescu A, Kuhl J: Short courses of intravenous empirical antibiotic treatment in selected febrile neutropenic children with cancer. *Infection* 30:17-21, 2002
84. Griffin TC, Buchanan GR: Hematologic predictors of bone marrow recovery in neutropenic patients hospitalized for fever: implications for discontinuation of antibiotics and early discharge from the hospital. *J Pediatr* 121:28-33, 1992
85. Kaplan AH, Weber DJ, Davis L, et al: Short courses of antibiotics in selected febrile neutropenic patients. *Am J Med Sci* 302:353-4, 1991
86. Mullen CA, Buchanan GR: Early hospital discharge of children with cancer treated for fever and neutropenia: identification and management of the low-risk patient. *J Clin Oncol* 8:1998-2004, 1990
87. Aquino VM, Tkaczewski I, Buchanan GR: Early discharge of low-risk febrile neutropenic children and adolescents with cancer. *Clin Infect Dis* 25:74-8, 1997
88. Slobbe L, Waal L, Jongman LR, et al: Three-day treatment with imipenem for unexplained fever during prolonged neutropenia in haematology patients receiving fluoroquinolone and fluconazole prophylaxis: a prospective observational safety study. *Eur J Cancer* 45:2810-7, 2009
89. Cornelissen JJ, Rozenberg-Arska M, Dekker AW: Discontinuation of intravenous antibiotic therapy during persistent neutropenia in patients receiving prophylaxis with oral ciprofloxacin. *Clin Infect Dis* 21:1300-2, 1995
90. de Marie S, van den Broek PJ, Willemze R, et al: Strategy for antibiotic therapy in febrile neutropenic patients on selective antibiotic decontamination. *Eur J Clin Microbiol Infect Dis* 12:897-906, 1993
91. Joshi JH, Schimpff SC, Tenney JH, et al: Can antibacterial therapy be discontinued in persistently febrile granulocytopenic cancer patients? *Am J Med* 76:450-7, 1984
92. Bjornsson S, Preisler H, Henderson ES: A study of antibiotic therapy in fever of unknown origin in neutropenic cancer patients. *Med Pediatr Oncol* 3:379-85, 1977
93. Mahendra P, Jacobson SK, Ager S, et al: Short-course intravenous antibiotics with oral quinolone prophylaxis in the treatment of neutropenic fever in autologous bone marrow or peripheral blood progenitor cell transplant recipients. *Acta Haematol* 96:64-7, 1996

94. Tomiak AT, Yau JC, Huan SD, et al: Duration of intravenous antibiotics for patients with neutropenic fever. *Ann Oncol* 5:441-5, 1994
95. Groll AH, Kurz M, Schneider W, et al: Five-year-survey of invasive aspergillosis in a paediatric cancer centre. *Epidemiology, management and long-term survival. Mycoses* 42:431-42, 1999
96. Zaoutis TE, Heydon K, Chu JH, et al: Epidemiology, outcomes, and costs of invasive aspergillosis in immunocompromised children in the United States, 2000. *Pediatrics* 117:e711-6, 2006
97. Leahey AM, Bunin NJ, Belasco JB, et al: Novel multiagent chemotherapy for bone marrow relapse of pediatric acute lymphoblastic leukemia. *Med Pediatr Oncol* 34:313-8, 2000
98. Mor M, Gilad G, Kornreich L, et al: Invasive fungal infections in pediatric oncology. *Pediatr Blood Cancer* 56:1092-7, 2011
99. Rosen GP, Nielsen K, Glenn S, et al: Invasive fungal infections in pediatric oncology patients: 11-year experience at a single institution. *J Pediatr Hematol Oncol* 27:135-40, 2005
100. Castagnola E, Cesaro S, Giacchino M, et al: Fungal infections in children with cancer: a prospective, multicenter surveillance study. *Pediatr Infect Dis J* 25:634-9, 2006
101. Hovi L, Saarinen-Pihkala UM, Vettentranta K, et al: Invasive fungal infections in pediatric bone marrow transplant recipients: single center experience of 10 years. *Bone Marrow Transpl* 26:999-1004, 2000
102. Villarroel M, Aviles CL, Silva P, et al: Risk factors associated with invasive fungal disease in children with cancer and febrile neutropenia: a prospective multicenter evaluation. *Pediatr Infect Dis J* 29:816-21, 2010
103. Afzal S, Ethier MC, Dupuis LL, et al: Risk factors for infection-related outcomes during induction therapy for childhood acute lymphoblastic leukemia. *Pediatr Infect Dis J* 28:1064-8, 2009
104. Haupt R, Romanengo M, Fears T, et al: Incidence of septicaemias and invasive mycoses in children undergoing treatment for solid tumours: a 12-year experience at a single Italian institution. *Eur J Cancer* 37:2413-9, 2001
105. Grigull L, Beier R, Schrauder A, et al: Invasive fungal infections are responsible for one-fifth of the infectious deaths in children with ALL. *Mycoses* 46:441-6, 2003
106. Panackal AA, Li H, Kontoyiannis D, et al: Geoclimatic influences on invasive aspergillosis after hematopoietic stem cell transplantation. *Clin Infect Dis* 50:1588-1597, 2010
107. Haiduvan D: Nosocomial aspergillosis and building construction. *Med Mycol* 47:S210-6, 2009 (suppl 1)
108. De Pauw B, Walsh TJ, Donnelly JP, et al: Revised definitions of invasive fungal disease from the European Organization for Research and Treatment of Cancer/Invasive Fungal Infections Cooperative Group and the National Institute of Allergy and Infectious Diseases Mycoses Study Group (EORTC/MSG) Consensus Group. *Clin Infect Dis* 46:1813-21, 2008
109. Pfeiffer CD, Fine JP, Safdar N: Diagnosis of invasive aspergillosis using a galactomannan assay: a meta-analysis. *Clin Infect Dis* 42:1417-27, 2006
110. Morrissey CO, Bardy PG, Slavin MA, et al: Diagnostic and therapeutic approach to persistent or recurrent fevers of unknown origin in adult stem cell transplantation and haematological malignancy. *Intern Med J* 38:477-95, 2008
111. Maschmeyer G, Beinert T, Buchheidt D, et al: Diagnosis and antimicrobial therapy of pulmonary infiltrates in febrile neutropenic patients--guidelines of the Infectious Diseases Working Party (AGIHO) of the German Society of Hematology and Oncology (DGHO). *Ann Hematol* 82:S118-26, 2003 (Suppl 2)

112. Maertens J, Marchetti O, Herbrecht R, et al: European guidelines for antifungal management in leukemia and hematopoietic stem cell transplant recipients: summary of the ECIL 3-2009 Update. *Bone Marrow Transpl* 46:709-18, 2010
113. Rohrlich P, Sarfati J, Mariani P, et al: Prospective sandwich enzyme-linked immunosorbent assay for serum galactomannan: early predictive value and clinical use in invasive aspergillosis. *Pediatr Infect Dis J* 15:232-7, 1996
114. El-Mahallawy HA, Shaker HH, Ali Helmy H, et al: Evaluation of pan-fungal PCR assay and Aspergillus antigen detection in the diagnosis of invasive fungal infections in high risk paediatric cancer patients. *Med Mycol* 44:733-9, 2006
115. Hovi L, Saxen H, Saarinen-Pihkala UM, et al: Prevention and monitoring of invasive fungal infections in pediatric patients with cancer and hematologic disorders. *Pediatr Blood Cancer* 48:28-34, 2007
116. Steinbach WJ, Addison RM, McLaughlin L, et al: Prospective Aspergillus galactomannan antigen testing in pediatric hematopoietic stem cell transplant recipients. *Pediatr Infect Dis J* 26:558-64, 2007
117. Hayden R, Pounds S, Knapp K, et al: Galactomannan antigenemia in pediatric oncology patients with invasive aspergillosis. *Pediatr Infect Dis J* 27:815-9, 2008
118. Armenian SH, Nash KA, Kapoor N, et al: Prospective monitoring for invasive aspergillosis using galactomannan and polymerase chain reaction in high risk pediatric patients. *J Pediatr Hematol Oncol* 31:920-6, 2009
119. Castagnola E, Furfaro E, Caviglia I, et al: Performance of the galactomannan antigen detection test in the diagnosis of invasive aspergillosis in children with cancer or undergoing haemopoietic stem cell transplantation. *Clin Microbiol Infect* 16:1197-203, 2010
120. Challier S, Boyer S, Abachin E, et al: Development of a serum-based Taqman real-time PCR assay for diagnosis of invasive aspergillosis. *J Clin Microbiol* 42:844-6, 2004
121. Marr KA, Laverdiere M, Gugel A, et al: Antifungal therapy decreases sensitivity of the Aspergillus galactomannan enzyme immunoassay. *Clin Infect Dis* 40:1762-9, 2005
122. Miceli MH, Graziutti ML, Woods G, et al: Strong correlation between serum aspergillus galactomannan index and outcome of aspergillosis in patients with hematological cancer: clinical and research implications. *Clin Infect Dis* 46:1412-22, 2008
123. Maertens J, Maertens V, Theunissen K, et al: Bronchoalveolar lavage fluid galactomannan for the diagnosis of invasive pulmonary aspergillosis in patients with hematologic diseases. *Clin Infect Dis* 49:1688-93, 2009
124. Desai R, Ross LA, Hoffman JA: The role of bronchoalveolar lavage galactomannan in the diagnosis of pediatric invasive aspergillosis. *Pediatr Infect Dis J* 28:283-6, 2009
125. Roilides E, Pavlidou E, Papadopoulos F, et al: Cerebral aspergillosis in an infant with corticosteroid-resistant nephrotic syndrome. *Pediatr Nephrol* 18:450-3, 2003
126. Viscoli C, Machetti M, Gazzola P, et al: Aspergillus galactomannan antigen in the cerebrospinal fluid of bone marrow transplant recipients with probable cerebral aspergillosis. *J Clin Microbiol* 40:1496-9, 2002
127. Verweij PE, Maertens J, Lehrnbecher T, et al: ECIL guidelines: Non-culture based diagnostic procedures for Aspergillus infections. Juan-les-Pins, France, European Conference on Infections in Leukemia, 2010
128. Karageorgopoulos DE, Vouloumanou EK, Ntziora F, et al: beta-D-glucan assay for the diagnosis of invasive fungal infections: a meta-analysis. *Clin Infect Dis* 52:750-70, 2011
129. Mularoni A, Furfaro E, Faraci M, et al: High Levels of beta-D-glucan in immunocompromised children with proven invasive fungal disease. *Clin Vaccine Immunol* 17:882-3, 2010
130. Zhao L, Tang JY, Wang Y, et al: Value of plasma  $\beta$ -Glucan in early diagnosis of invasive fungal infection

in children. *Chin J Contemp Pediatr* 11:905-908, 2009

131. Smith PB, Benjamin DK, Jr., Alexander BD, et al: Quantification of 1,3-beta-D-glucan levels in children: preliminary data for diagnostic use of the beta-glucan assay in a pediatric setting. *Clin Vaccine Immunol* 14:924-5, 2007

132. Heussel CP, Kauczor HU, Heussel GE, et al: Pneumonia in febrile neutropenic patients and in bone marrow and blood stem-cell transplant recipients: use of high-resolution computed tomography. *J Clin Oncol* 17:796-805, 1999

133. Caillot D, Casasnovas O, Bernard A, et al: Improved management of invasive pulmonary aspergillosis in neutropenic patients using early thoracic computed tomographic scan and surgery. *J Clin Oncol* 15:139-47, 1997

134. Taccone A, Occhi M, Garaventa A, et al: CT of invasive pulmonary aspergillosis in children with cancer. *Pediatr Radiol* 23:177-80, 1993

135. Burgos A, Zaoutis TE, Dvorak CC, et al: Pediatric invasive aspergillosis: a multicenter retrospective analysis of 139 contemporary cases. *Pediatrics* 121:e1286-94, 2008

136. Archibald S, Park J, Geyer JR, et al: Computed tomography in the evaluation of febrile neutropenic pediatric oncology patients. *Pediatr Infect Dis J* 20:5-10, 2001

137. Agrawal AK, Saini N, Gildengorin G, et al: Is routine computed tomographic scanning justified in the first week of persistent febrile neutropenia in children with malignancies? *Pediatr Blood Cancer* 57:620-4, 2011

138. Sorensen J, Becker M, Porto L, et al: Rhinocerebral zygomycosis in a young girl undergoing allogeneic stem cell transplantation for severe aplastic anaemia. *Mycoses* 49:31-6, 2006 (suppl 1)

139. Rassi SJ, Melkane AE, Rizk HG, et al: Sinonasal mucormycosis in immunocompromised pediatric patients. *J Pediatr Hematol Oncol* 31:907-910, 2009

140. Flynn PM, Shenep JL, Crawford R, et al: Use of abdominal computed tomography for identifying disseminated fungal infection in pediatric cancer patients. *Clin Infect Dis* 20:964-70, 1995

141. Bochennek K, Abolmaali N, Wittekindt B, et al: Diagnostic approaches for immunocompromised paediatric patients with pulmonary infiltrates. *Clin Microbiol Infect* 12:199-201, 2006

142. Prentice HG, Hann IM, Herbrecht R, et al: A randomized comparison of liposomal versus conventional amphotericin B for the treatment of pyrexia of unknown origin in neutropenic patients. *Br J Haematol* 98:711-8, 1997

143. Maertens JA, Madero L, Reilly AF, et al: A randomized, double-blind, multicenter study of caspofungin versus liposomal amphotericin B for empiric antifungal therapy in pediatric patients with persistent fever and neutropenia. *Pediatr Infect Dis J* 29:415-20, 2010

144. Sandler ES, Mustafa MM, Tkaczewski I, et al: Use of amphotericin B colloidal dispersion in children. *J Pediatr Hematol Oncol* 22:242-6, 2000

145. Walsh TJ, Teppler H, Donowitz GR, et al: Caspofungin versus liposomal amphotericin B for empirical antifungal therapy in patients with persistent fever and neutropenia. *N Engl J Med* 351:1391-402, 2004

146. White MH, Bowden RA, Sandler ES, et al: Randomized, double-blind clinical trial of amphotericin B colloidal dispersion vs. amphotericin B in the empirical treatment of fever and neutropenia. *Clin Infect Dis* 27:296-302, 1998

147. Walsh TJ, Finberg RW, Arndt C, et al: Liposomal amphotericin B for empirical therapy in patients with persistent fever and neutropenia. National Institute of Allergy and Infectious Diseases Mycoses Study Group. *N Engl J Med* 340:764-71, 1999

148. Madsen K, Rosenman M, Hui S, et al: Value of electronic data for model validation and refinement: bacteremia risk in children with fever and neutropenia. *J Pediatr Hematol Oncol* 24:256-62, 2002

149. Miedema KG, de Bont ES, Oude Nijhuis CS, et al: Validation of a new risk assessment model for predicting adverse events in children with fever and chemotherapy-induced neutropenia. *J Clin Oncol* 29:e182-4; author reply e185, 2011
150. Corapcioglu F, Sarper N, Zengin E: Monotherapy with piperacillin/tazobactam versus cefepime as empirical therapy for febrile neutropenia in pediatric cancer patients: a randomized comparison. *Pediatr Hematol Oncol* 23:177-86, 2006
151. Petrilli AS, Cypriano M, Dantas LS, et al: Evaluation of ticarcillin/clavulanic acid versus ceftriaxone plus amikacin for fever and neutropenia in pediatric patients with leukemia and lymphoma. *Braz J Infect Dis* 7:111-20, 2003
152. Uygun V, Karasu GT, Ogunc D, et al: Piperacillin/tazobactam versus cefepime for the empirical treatment of pediatric cancer patients with neutropenia and fever: a randomized and open-label study. *Pediatr Blood Cancer* 53:610-4, 2009
153. Vural S, Erdem E, Gulec SG, et al: Imipenem-cilastatin versus piperacillin-tazobactam as monotherapy in febrile neutropenia. *Pediatr Int* 52:262-7, 2009
154. Aksoylar S, Cetingul N, Kantar M, et al: Meropenem plus amikacin versus piperacillin-tazobactam plus netilmicin as empiric therapy for high-risk febrile neutropenia in children. *Pediatr Hematol Oncol* 21:115-23, 2004
155. Bolton-Maggs PH, van Saene HK, McDowell HP, et al: Clinical evaluation of ticarcillin, with clavulanic acid, and gentamicin in the treatment of febrile episodes in neutropenic children. *J Antimicrob Chemother* 27:669-76, 1991
156. Duzova A, Kutluk T, Kanra G, et al: Monotherapy with meropenem versus combination therapy with piperacillin plus amikacin as empiric therapy for neutropenic fever in children with lymphoma and solid tumors. *Turk J Pediatr* 43:105-9, 2001
157. Fleischhack G, Schmidt-Niemann M, Wulff B, et al: Piperacillin, beta-lactam inhibitor plus gentamicin as empirical therapy of a sequential regimen in febrile neutropenia of pediatric cancer patients. *Support Care Cancer* 9:372-9, 2001
158. Gonzalez M, Clavell LA: Piperacillin and gentamicin as non toxic empirical therapy in pediatric patients with fever and neutropenia. *P R Health Sci J* 6:13-5, 1987
159. Haddad AMA: Comparison of cefoperazone-sulbactam versus piperacillin plus amikacin as empiric therapy in pediatric febrile neutropenic cancer patients. *Curr Ther Res* 56:1094-1099, 1995
160. Hamidah A, Rizal AM, Nordiah AJ, et al: Piperacillin-tazobactam plus amikacin as an initial empirical therapy of febrile neutropenia in paediatric cancer patients. *Singapore Med J* 49:26-30, 2008
161. Hemsworth S, Nunn AJ, Selwood K, et al: Once-daily netilmicin for neutropenic pyrexia in paediatric oncology. *Acta Paediatr* 94:268-74, 2005
162. Heney D, Lewis IJ, Ghoneim AT, et al: Aztreonam therapy in children with febrile neutropenia: a randomized trial of aztreonam plus flucloxacillin versus piperacillin plus gentamicin. *J Antimicrob Chemother* 28:117-29, 1991
163. Kosmidis H, Varvoutsis M, Kafetzis D, et al: Efficacy and safety of azlocillin and ticarcillin in febrile neutropenic children with cancer: a comparative study. *Chemioterapia* 6:396-8, 1987
164. Miranda-Novales MG, Belmont-Martinez L, Villasis-Keever MA, et al: Empirical antimicrobial therapy in pediatric patients with neutropenia and fever. Risk factors for treatment failure. *Arch Med Res* 29:331-5, 1998
165. Morgan G, Duerden BI, Lilleyman JS: Cefazidime as a single agent in the management of children with fever and neutropenia. *J Antimicrob Chemother* 12:347-51, 1983 (suppl A)
166. Smith L, Will AM, Williams RF, et al: Ceftriaxone vs. azlocillin and netilmicin in the treatment of febrile neutropenic children. *J Infect* 20:201-6, 1990

167. Yildirim I, Aytac S, Ceyhan M, et al: Piperacillin/tazobactam plus amikacin versus carbapenem monotherapy as empirical treatment of febrile neutropenia in childhood hematological malignancies. *Pediatr Hematol Oncol* 25:291-9, 2008
168. Zulfikar B, Devecioglu O, Anak S, et al: The efficacy of mezlocillin-amikacin combination in febrile neutropenic children with oncologic disease. *J Chemother* 3:250-4, 1991
169. Chuang YY, Hung IJ, Yang CP, et al: Cefepime versus ceftazidime as empiric monotherapy for fever and neutropenia in children with cancer. *Pediatr Infect Dis J* 21:203-9, 2002
170. Fleischhack G, Hartmann C, Simon A, et al: Meropenem versus ceftazidime as empirical monotherapy in febrile neutropenia of paediatric patients with cancer. *J Antimicrob Chemother* 47:841-53, 2001
171. Granowetter L, Wells H, Lange BJ: Ceftazidime with or without vancomycin vs. cephalothin, carbenicillin and gentamicin as the initial therapy of the febrile neutropenic pediatric cancer patient. *Pediatr Infect Dis J* 7:165-70, 1988
172. Jacobs RF, Vats TS, Pappa KA, et al: Ceftazidime versus ceftazidime plus tobracyclin in febrile neutropenic children. *Infection* 21:223-228, 1993
173. Kebudi R, Gorgun O, Ayan I, et al: Randomized comparison of cefepime versus ceftazidime monotherapy for fever and neutropenia in children with solid tumors. *Med Pediatr Oncol* 36:434-41, 2001
174. Mullen CA, Petropoulos D, Roberts WM, et al: Outpatient treatment of fever and neutropenia for low risk pediatric cancer patients. *Cancer* 86:126-34, 1999
175. Mustafa MM, Carlson L, Tkaczewski I, et al: Comparative study of cefepime versus ceftazidime in the empiric treatment of pediatric cancer patients with fever and neutropenia. *Pediatr Infect Dis J* 20:362-9, 2001
176. Ariffin H, Arasu A, Mahfuzah M, et al: Single-daily ceftriaxone plus amikacin versus thrice-daily ceftazidime plus amikacin as empirical treatment of febrile neutropenia in children with cancer. *J Paediatr Child Health* 37:38-43, 2001
177. Charnas R, Luthi AR, Ruch W: Once daily ceftriaxone plus amikacin vs. three times daily ceftazidime plus amikacin for treatment of febrile neutropenic children with cancer. Writing Committee for the International Collaboration on Antimicrobial Treatment of Febrile Neutropenia in Children. *Pediatr Infect Dis J* 16:346-53, 1997
178. Corapcioglu F, Sarper N: Cefepime versus ceftazidime + amikacin as empirical therapy for febrile neutropenia in children with cancer: a prospective randomized trial of the treatment efficacy and cost. *Pediatr Hematol Oncol* 22:59-70, 2005
179. Hung KC, Chiu HH, Tseng YC, et al: Monotherapy with meropenem versus combination therapy with ceftazidime plus amikacin as empirical therapy for neutropenic fever in children with malignancy. *J Microbiol Immunol Infect* 36:254-9, 2003
180. Laoprasopwattana K, Pruekprasert P, Laosombat V, et al: Clinical outcome of febrile neutropenia in children with cancer using ceftazidime and aminoglycosides. *Pediatr Hematol Oncol* 24:595-606, 2007
181. Maltezou HC, Baka M, Gombakis N, et al: Comparison of isepamicin with amikacin for the empirical treatment of febrile neutropenic children with malignancies. *Int J Antimicrob Agents* 18:383-6, 2001
182. Cagol AR, Castro Junior CG, Martins MC, et al: Oral vs. intravenous empirical antimicrobial therapy in febrile neutropenic patients receiving childhood cancer chemotherapy. *J Pediatr (Rio J)* 85:531-5, 2009
183. Chastagner P, Plouvier E, Eyer D, et al: Efficacy of cefepime and amikacin in the empiric treatment of febrile neutropenic children with cancer. *Med Pediatr Oncol* 34:306-8, 2000
184. Hamidah A, Lim YS, Zulkifli SZ, et al: Cefepime plus amikacin as an initial empirical therapy of febrile neutropenia in paediatric cancer patients. *Singapore Med J* 48:615-9, 2007

185. Kutluk T, Kurne O, Akyuz C, et al: Cefepime vs. Meropenem as empirical therapy for neutropenic fever in children with lymphoma and solid tumours. *Pediatr Blood Cancer* 42:284-6, 2004
186. Gupta A, Swaroop C, Agarwala S, et al: Randomized controlled trial comparing oral amoxicillin-clavulanate and ofloxacin with intravenous ceftriaxone and amikacin as outpatient therapy in pediatric low-risk febrile neutropenia. *J Pediatr Hematol Oncol* 31:635-41, 2009
187. Paganini H, Gomez S, Ruvinsky S, et al: Outpatient, sequential, parenteral-oral antibiotic therapy for lower risk febrile neutropenia in children with malignant disease: a single-center, randomized, controlled trial in Argentina. *Cancer* 97:1775-80, 2003
188. Paganini H, Rodriguez-Briehcke T, Zubizarreta P, et al: Oral ciprofloxacin in the management of children with cancer with lower risk febrile neutropenia. *Cancer* 91:1563-7, 2001
189. Bartolozzi S, Clerico A, Properzi E, et al: Ceftriaxone as a single agent in empirical therapy of unexplained fever in granulocytopenic children with solid tumors. *J Chemother* 9:227-31, 1997
190. Shrestha PN, Sah KP, Rana R: Empirical oral antibiotic therapy for children with low risk febrile neutropenia during cancer chemotherapy. *J Nepal Paediatr Soc* 29:22-25, 2009
191. Abbas AAH, Felimban SK, Cittana BA, et al: Once daily ceftriaxone and amikacin for outpatient treatment of neutropenic fever in children with acute lymphoblastic leukaemia. *Haema* 6:501-506, 2003
192. Aquino VM, Herrera L, Sandler ES, et al: Feasibility of oral ciprofloxacin for the outpatient management of febrile neutropenia in selected children with cancer. *Cancer* 88:1710-4, 2000
193. Kaplinsky C, Drucker M, Goshen J, et al: Ambulatory treatment with ceftriaxone in febrile neutropenic children. *Isr J Med Sci* 30:649-51, 1994
194. Malik IA: Out-patient management of febrile neutropenia in indigent paediatric patients. *Ann Acad Med Singapore* 26:742-6, 1997
195. Mustafa MM, Aquino VM, Pappo A, et al: A pilot study of outpatient management of febrile neutropenic children with cancer at low risk of bacteremia. *J Pediatr* 128:847-9, 1996
196. Petrilli A, Altruda Carlesse F, Alberto Pires Pereira C: Oral gatifloxacin in the outpatient treatment of children with cancer fever and neutropenia. *Pediatr Blood Cancer* 49:682-6, 2007
197. Petrilli AS, Dantas LS, Campos MC, et al: Oral ciprofloxacin vs. intravenous ceftriaxone administered in an outpatient setting for fever and neutropenia in low-risk pediatric oncology patients: randomized prospective trial. *Med Pediatr Oncol* 34:87-91, 2000
198. Sulahian A, Boutboul F, Ribaud P, et al: Value of antigen detection using an enzyme immunoassay in the diagnosis and prediction of invasive aspergillosis in two adult and pediatric hematology units during a 4-year prospective study. *Cancer* 91:311-8, 2001
199. Herbrecht R, Letscher-Bru V, Oprea C, et al: Aspergillus galactomannan detection in the diagnosis of invasive aspergillosis in cancer patients. *J Clin Oncol* 20:1898-906, 2002