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References

- Aliberti S, Di Pasquale M, Zanaboni AM, et al. Stratifying risk factors for multi-drug-resistant pathogens in hospitalized patients coming from the community with pneumonia. *Clin Infect Dis* **2012**; 54:470–8.
- Aliberti S, Cilloniz C, Chalmers JD, et al. Multidrug-resistant pathogens in hospitalised patients coming from the community with pneumonia: a European perspective. *Thorax* **2013**; 68:997–9.
- Shindo Y, Ito R, Kobayashi D, et al. Risk factors for drug-resistant pathogens in community-acquired and healthcare-associated pneumonia. *Am J Respir Crit Care Med* **2013**; 188:985–95.
- Musher DM, Thorner AR. Community-acquired pneumonia. *N Engl J Med* **2014**; 371:1619–28.
- Mandell LA, Wunderink RG, Anzueto A, et al; Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* **2007**; 44(suppl 2):S27–72.
- Lim WS, Baudouin SV, George RC, et al. BTS guidelines for the management of community acquired pneumonia in adults. *Thorax* **2009**; 64(suppl III):iii1–55.
- Woodhead M, Blasi F, Ewig S, et al; Joint Taskforce of the European Respiratory Society and European Society for Clinical Microbiology and Infectious Diseases. Guidelines for the management of adult lower respiratory tract infections—full version. *Clin Microbiol Infect* **2011**; 17(suppl 6):E1–59.
- Furman CD, Rayner AV, Tobin EP. Pneumonia in older residents of long-term care facilities. *Am Fam Physician* **2004**; 70:1495–500.
- Cillóniz C, Polverino E, Ewig S, et al. Impact of age and comorbidity on cause and outcome in community-acquired pneumonia. *Chest* **2013**; 144:999–1007.
- Aliberti S, Reyes LF, Faverio P, et al; GLIMP investigators. Global Initiative for Meticillin-Resistant *Staphylococcus aureus* Pneumonia (GLIMP): an international, observational cohort study. *Lancet Infect Dis* **2016**; 16:1364–76.
- Magiorakos AP, Srinivasan A, Carey RB, et al. Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance. *Clin Microbiol Infect* **2012**; 18:268–81.
- Wan QJ, Hu HF, He YC, et al. Severe pneumonia in mycophenolate mofetil combined with low-dose corticosteroids-treated patients with immunoglobulin A nephropathy. *Kaohsiung J Med Sci* **2015**; 31:42–6.
- Li F, Jin HZ, Su F, Jia L, Sun QN. Pneumocystis pneumonia in patients with immunobullous dermatoses. *Int J Dermatol* **2011**; 50:1144–9.
- Gruson D, Vargas F, Hilbert G, et al. Predictive factors of intensive care unit admission in patients with haematological malignancies and pneumonia. *Intensive Care Med* **2004**; 30:965–71.
- Garcia JB, Lei X, Wierda W, et al. Pneumonia during remission induction chemotherapy in patients with acute leukemia. *Ann Am Thorac Soc* **2013**; 10:432–40.
- Lee JO, Kim DY, Lim JH, et al. Risk factors for bacterial pneumonia after cytotoxic chemotherapy in advanced lung cancer patients. *Lung Cancer* **2008**; 62:381–4.
- Lim KH, Yoon HI, Kang YA, et al. Severe pulmonary adverse effects in lymphoma patients treated with cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP) regimen plus rituximab. *Korean J Intern Med* **2010**; 25:86–92.
- Waks AG, Tolanev SM, Galar A, et al. *Pneumocystis jirovecii* pneumonia (PCP) in patients receiving neoadjuvant and adjuvant anthracycline-based chemotherapy for breast cancer: incidence and risk factors. *Breast Cancer Res Treat* **2015**; 154:359–67.
- Kim T, Choi SH, Kim SH, et al. Point prevalence of *Pneumocystis* pneumonia in patients with non-Hodgkin lymphoma according to the number of cycles of R-CHOP chemotherapy. *Ann Hematol* **2013**; 92:231–8.
- Aliberti S, Myers JA, Peyrani P, et al. The role of neutropenia on outcomes of cancer patients with community-acquired pneumonia. *Eur Respir J* **2009**; 33:142–7.
- Sogaard OS, Lohse N, Gerstoft J, et al. Hospitalization for pneumonia among individuals with and without HIV infection, 1995–2007: a Danish population-based, nationwide cohort study. *Clin Infect Dis* **2008**; 47:1345–53.
- Kuehnhardt D, Hannemann M, Schmidt B, Heider U, Possinger K, Eucker J. Therapeutic implication of BAL in patients with neutropenia. *Ann Hematol* **2009**; 88:1249–56.
- Maschmeyer G, Beinert T, Buchheidt D, et al. Diagnosis and antimicrobial therapy of lung infiltrates in febrile neutropenic patients: guidelines of the Infectious Diseases Working Party of the German Society of Haematology and Oncology. *Eur J Cancer* **2009**; 45:2462–72.
- Alanio A, Hauser PM, Lagrou K, et al; 5th European Conference on Infections in Leukemia (ECIL-5), a joint venture of the European Group for Blood and Marrow Transplantation (EBMT), the European Organization for Research and Treatment of Cancer (EORTC), the Immunocompromised Host Society (ICHS) and the European LeukemiaNet (ELN). ECIL guidelines for the diagnosis of *Pneumocystis jirovecii* pneumonia in patients with haematological malignancies and stem cell transplant recipients. *J Antimicrob Chemother* **2016**; 71:2386–96.
- Freifeld AG, Bow EJ, Sepkowitz KA, et al; Infectious Diseases Society of America. 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* **2011**; 52:e56–93.
- Chemaly RF, Shah DP, Boeckh MJ. Management of respiratory viral infections in hematopoietic cell transplant recipients and patients with hematologic malignancies. *Clin Infect Dis* **2014**; 59(suppl 5):S344–51.
- Buchacz K, Lau B, Jing Y, et al; North American AIDS Cohort Collaboration on Research and Design (NA-ACCORD) of IeDEA. Incidence of AIDS-defining opportunistic infections in a multicohort analysis of HIV-infected persons in the United States and Canada, 2000–2010. *J Infect Dis* **2016**; 214:862–72.
- Madeddu G, Porqueddu EM, Cambosu F, et al. Bacterial community acquired pneumonia in HIV-infected inpatients in the highly active antiretroviral therapy era. *Infection* **2008**; 36:231–6.
- Park DR, Sherbin VL, Goodman MS, et al; Harborview CAP Study Group. The etiology of community-acquired pneumonia at an urban public hospital: influence of human immunodeficiency virus infection and initial severity of illness. *J Infect Dis* **2001**; 184:268–77.
- Torres HA, Bodey GP, Rolston KV, Kantarjian HM, Raad II, Kontoyiannis DP. Infections in patients with aplastic anemia: experience at a tertiary care cancer center. *Cancer* **2003**; 98:86–93.
- Gil-Prieto R, Pascual-García R, Walter S, Álvaro-Meca A, Gil-De-Miguel Á. Risk of hospitalization due to pneumococcal disease in adults in Spain: the CORIENNE study. *Hum Vaccin Immunother* **2016**; 12:1900–5.

32. Putot A, Tetu J, Perrin S, et al. Impact of microbiological samples in the hospital management of community-acquired, nursing home-acquired and hospital-acquired pneumonia in older patients. *Eur J Clin Microbiol Infect Dis* **2016**; 35:489–95.
33. Polverino E, Dambrava P, Cillóniz C, et al. Nursing home-acquired pneumonia: a 10 year single-centre experience. *Thorax* **2010**; 65:354–9.
34. Kohli R, Lo Y, Homel P, et al; HER Study Group. Bacterial pneumonia, HIV therapy, and disease progression among HIV-infected women in the HIV epidemiologic research (HER) study. *Clin Infect Dis* **2006**; 43:90–8.
35. Benito N, Rañó A, Moreno A, et al. Pulmonary infiltrates in HIV-infected patients in the highly active antiretroviral therapy era in Spain. *J Acquir Immune Defic Syndr* **2001**; 27:35–43.
36. Mori H, Ohno Y, Ito F, et al. Polymerase chain reaction positivity of *Pneumocystis jirovecii* during primary lung cancer treatment. *Jpn J Clin Oncol* **2010**; 40:658–62.
37. Boersma WG, Erjavec Z, van der Werf TS, de Vries-Hospes HG, Gouw AS, Manson WL. Bronchoscopic diagnosis of pulmonary infiltrates in granulocytopenic patients with hematologic malignancies: BAL versus PSB and PBAL. *Respir Med* **2007**; 101:317–25.
38. Mikulska M, Del Bono V, Gandolfo N, et al. Epidemiology of viral respiratory tract infections in an outpatient haematology facility. *Ann Hematol* **2014**; 93:669–76.
39. Beard OE, Freifeld A, Ison MG, et al. Current practices for treatment of respiratory syncytial virus and other non-influenza respiratory viruses in high-risk patient populations: a survey of institutions in the Midwestern Respiratory Virus Collaborative. *Transpl Infect Dis* **2016**; 18:210–5.
40. Poonyagariyagorn HK, Gershman A, Avery R, et al. Challenges in the diagnosis and management of *Nocardia* infections in lung transplant recipients. *Transpl Infect Dis* **2008**; 10:403–8.
41. Tavadze M, Rybicki L, Mossad S, et al. Risk factors for vancomycin-resistant *Enterococcus* bacteremia and its influence on survival after allogeneic hematopoietic cell transplantation. *Bone Marrow Transplant* **2014**; 49:1310–6.
42. Bock AM, Cao Q, Ferrieri P, Young JA, Weisdorf DJ. Bacteremia in blood or marrow transplantation patients: clinical risk factors for infection and emerging antibiotic resistance. *Biol Blood Marrow Transplant* **2013**; 19:102–8.
43. Herbers AH, de Haan AF, van der Velden WJ, Donnelly JP, Blijlevens NM. Mucositis not neutropenia determines bacteremia among hematopoietic stem cell transplant recipients. *Transpl Infect Dis* **2014**; 16:279–85.
44. Wu SW, Liu KS, Lin CK, et al. Community-acquired urinary tract infection in kidney transplantation: risk factors for bacteremia and recurrent infection. *J Formos Med Assoc* **2013**; 112:138–43.
45. Daskalaki E, Koukoulaki M, Bakalis A, et al. Blood stream infections in renal transplant recipients: a single-center study. *Transplant Proc* **2014**; 46:3191–3.
46. Huson MA, Stolp SM, van der Poll T, Grobusch MP. Community-acquired bacterial bloodstream infections in HIV-infected patients: a systematic review. *Clin Infect Dis* **2014**; 58:79–92.
47. Taramasso L, Tatarelli P, Di Biagio A. Bloodstream infections in HIV-infected patients. *Virulence* **2016**; 7:320–8.