

## Graft-versus-Host-Erkrankung nach allogener Blutstammzelltransplantation: Standardmanagement und neue zelluläre Therapien

1. Penack O, Marchetti M, Aljurf M, Arat M, Bonifazi F, Duarte RF et al. Prophylaxis and management of graft-versus-host disease after stem-cell transplantation for haematological malignancies: updated consensus recommendations of the European Society for Blood and Marrow Transplantation. *The Lancet Haematology* 2024; 11(2): e147-e159.
2. Harris AC, Young R, Devine S, Hogan WJ, Ayuk F, Bunworasate U et al. International, Multicenter Standardization of Acute Graft-versus-Host Disease Clinical Data Collection: A Report from the Mount Sinai Acute GvHD International Consortium. *Biol Blood Marrow Transplant* 2016; 22(1): 4-10. e-pub ahead of print 2015/09/20; doi: 10.1016/j.bbmt.2015.09.001.
3. Jagasia MH, Greinix HT, Arora M, Williams KM, Wolff D, Cowen EW et al. National Institutes of Health Consensus Development Project on Criteria for Clinical Trials in Chronic Graft-versus-Host Disease: I. The 2014 Diagnosis and Staging Working Group report. *Biol Blood Marrow Transplant* 2015; 21(3): 389-401 e381. e-pub ahead of print 2014/12/23; doi: 10.1016/j.bbmt.2014.12.001.
4. Schoemans HM, Lee SJ, Ferrara JL, Wolff D, Levine JE, Schultz KR et al. EBMT-NIH-CIBMTR Task Force position statement on standardized terminology & guidance for graft-versus-host disease assessment. *Bone marrow transplantation* 2018; 53(11): 1401-1415. e-pub ahead of print 2018/06/07; doi: 10.1038/s41409-018-0204-7.
5. Bolaños-Meade J, Reshef R, Fraser R, Fei M, Abhyankar S, Al-Kadhimi Z et al. Three prophylaxis regimens (tacrolimus, mycophenolate mofetil, and cyclophosphamide; tacrolimus, methotrexate, and bortezomib; or tacrolimus, methotrexate, and maraviroc) versus tacrolimus and methotrexate for prevention of graft-versus-host disease with haemopoietic cell transplantation with reduced-intensity conditioning: a randomised phase 2 trial with a non-randomised contemporaneous control group (BMT CTN 1203). *The Lancet Haematology* 2019; 6(3): e132-e143. doi: 10.1016/S2352-3026(18)30221-7.
6. Broers AEC, de Jong CN, Bakunina K, Hazenberg MD, van Marwijk Kooy M, de Groot MR et al. Posttransplant cyclophosphamide for prevention of graft-versus-host disease: results of the prospective randomized HOVON-96 trial. *Blood Adv* 2022; 6(11): 3378-3385. doi: 10.1182/bloodadvances.2021005847.
7. Holtan SG, Hamadani M, Wu J, Al Malki MM, Runaas L, Elmariam H et al. Post-Transplant Cyclophosphamide, Tacrolimus, and Mycophenolate Mofetil As the New Standard for Graft-Versus-Host Disease (GvHD) Prophylaxis in Reduced Intensity Conditioning: Results from Phase III BMT CTN 1703. *Blood* 2022; 140: 14-16. doi: 10.1182/blood-2022-171463.
8. Luznik L, Pasquini MC, Logan B, Soiffer RJ, Wu J, Devine SM et al. Randomized Phase III BMT CTN Trial of Calcineurin Inhibitor-Free Chronic Graft-Versus-Host Disease Interventions in Myeloablative Hematopoietic Cell Transplantation for Hematologic Malignancies. *Journal of Clinical Oncology* 2022; 40(4): 356-368. doi: 10.1200/JCO.21.02293.
9. Nagler A, Labopin M, Dholaria B, Wu D, Choi G, Aljurf M et al. Graft-versus-Host Disease Prophylaxis with Post-Transplantation Cyclophosphamide versus Cyclosporine A and Methotrexate in Matched Sibling Donor Transplantation. *Transplantation and Cellular Therapy* 2022; 28(2): 86.e81-86.e88. doi: 10.1016/j.tct.2021.11.013.
10. Walker I, Panzarella T, Couban S, Couture F, Devins G, Elemetry M et al. Pretreatment with anti-thymocyte globulin versus no anti-thymocyte globulin in patients with haematological malignancies undergoing haemopoietic cell transplantation from unrelated donors: a randomised, controlled, open-label, phase 3, multicentre trial. *The Lancet. Oncology* 2016; 17(2): 164-173. e-pub ahead of print 2016/01/03; doi: 10.1016/S1470-2045(15)00462-3.
11. Kroger N, Solano C, Wolschke C, Bandini G, Patriarca F, Pini M et al. Antilymphocyte Globulin for Prevention of Chronic Graft-versus-Host Disease. *N Engl J Med* 2016; 374(1): 43-53. e-pub ahead of print 2016/01/07; doi: 10.1056/NEJMoa1506002.
12. Bonifazi F, Solano C, Wolschke C, Sessa M, Patriarca F, Zallio F et al. Acute GvHD prophylaxis plus ATLG after myeloablative allogeneic haemopoietic peripheral blood stem-cell transplantation from HLA-identical siblings in patients with acute myeloid leukaemia in remission: final results of quality of life and long-term outcome analysis of a phase 3 randomised study. *The Lancet. Haematology* 2019; 6(2): e89-e99. e-pub ahead of print 2019/02/03; doi: 10.1016/S2352-3026(18)30214-X.
13. Rubio MT, D'Aveni-Piney M, Labopin M, Hamladji RM, Sanz MA, Blaise D et al. Impact of in vivo T cell depletion in HLA-identical allogeneic stem cell transplantation for acute myeloid leukemia in first complete remission conditioned with a fludarabine iv-busulfan myeloablative regimen: a report from the EBMT Acute Leukemia Working Party. *Journal of hematology & oncology* 2017; 10(1): 31. e-pub ahead of print 2017/01/26; doi: 10.1186/s13045-016-0389-4.
14. Finke J, Bethge WA, Schmoor C, Ottinger HD, Stelljes M, Zander AR et al. Standard graft-versus-host disease prophylaxis with or without anti-T-cell globulin in haematopoietic cell transplantation from matched unrelated donors: a randomised, open-label, multicentre phase 3 trial. *The Lancet. Oncology* 2009; 10(9): 855-864. e-pub ahead of print 2009/08/22; doi: 10.1016/S1470-2045(09)70225-6.
15. Finke J, Schmoor C, Bethge WA, Ottinger H, Stelljes M, Volin L et al. Long-term outcomes after standard graft-versus-host disease prophylaxis with or without anti-human-T-lymphocyte immunoglobulin in haemopoietic cell transplantation from matched unrelated donors: final results of a randomised controlled trial. *The Lancet. Haematology* 2017; 4(6): e293-e301. e-pub ahead of print 2017/06/07; doi: 10.1016/S2352-3026(17)30081-9.

16. Modi D, Kondrat K, Kim S, Deol A, Alavi A, Kin A et al. Comparison of Post-Transplant Cyclophosphamide and Rabbit Anti-Thymocyte Globulin in 7/8 HLA-Mismatched Unrelated Donor Stem Cell Transplantation for AML and MDS. *Transplantation and Cellular Therapy* 2021; 27(3): S288-S289. doi: 10.1016/S2666-6367(21)00367-5.
17. Mushtaq MU, Shahzad M, Tariq E, Iqbal Q, Chaudhary SG, Zafar MU et al. Outcomes with mismatched unrelated donor allogeneic hematopoietic stem cell transplantation in adults: A systematic review and meta-analysis. *Frontiers in Oncology* 2022; 12. doi: 10.3389/fonc.2022.1005042.
18. Paviglianiti A, Mussetti A, Ngoya M, Boumendil A, Fegueux N, Bonifazi F et al. A comparison between atg and pt-cy graft-versus-host-disease prophylaxis in patients with lymphoma undergoing reduced intensity conditioning regimen HSCT from 1 antigen mmud. *Bone Marrow Transplantation* 2022; 57: 224-225. doi: 10.1038/s41409-022-01798-0.
19. Bacigalupo A, Milone G, Cupri A, Severino A, Fagioli F, Berger M et al. Steroid treatment of acute graft-versus-host disease grade I: a randomized trial. *Haematologica* 2017; 102(12): 2125-2133. e-pub ahead of print 2017/10/04; doi: 10.3324/haematol.2017.171157.
20. Mielcarek M, Furlong T, Storer BE, Green ML, McDonald GB, Carpenter PA et al. Effectiveness and safety of lower dose prednisone for initial treatment of acute graft-versus-host disease: a randomized controlled trial. *Haematologica* 2015; 100(6): 842-848. e-pub ahead of print 2015/02/16; doi: 10.3324/haematol.2014.118471.
21. Mielcarek M, Storer BE, Boeckh M, Carpenter PA, McDonald GB, Deeg HJ et al. Initial therapy of acute graft-versus-host disease with low-dose prednisone does not compromise patient outcomes. *Blood* 2009; 113(13): 2888-2894. e-pub ahead of print 2008/11/13; doi: 10.1182/blood-2008-07-168401.
22. Zeiser R, von Bubnoff N, Butler J, Mohty M, Niederwieser D, Or R et al. Ruxolitinib for Glucocorticoid-Refractory Acute Graft-versus-Host Disease. *N Engl J Med* 2020; 382(19): 1800-1810. e-pub ahead of print 2020/04/23; doi: 10.1056/NEJMoa1917635.
23. Koc S, Leisenring W, Flowers ME, Anasetti C, Deeg HJ, Nash RA et al. Therapy for chronic graft-versus-host disease: a randomized trial comparing cyclosporine plus prednisone versus prednisone alone. *Blood* 2002; 100(1): 48-51. e-pub ahead of print 2002/06/19;
24. Sullivan KM, Witherspoon RP, Storb R, Weiden P, Flournoy N, Dahlberg S et al. Prednisone and azathioprine compared with prednisone and placebo for treatment of chronic graft-v-host disease: prognostic influence of prolonged thrombocytopenia after allogeneic marrow transplantation. *Blood* 1988; 72(2): 546-554. e-pub ahead of print 1988/08/01;
25. Arora M, Wagner JE, Davies SM, Blazar BR, Defor T, Enright H et al. Randomized clinical trial of thalidomide, cyclosporine, and prednisone versus cyclosporine and prednisone as initial therapy for chronic graft-versus-host disease. *Biol Blood Marrow Transplant* 2001; 7(5): 265-273. e-pub ahead of print 2001/06/13;
26. Yadav H, Peters SG, Keogh KA, Hogan WJ, Erwin PJ, West CP, Kennedy CC. Azithromycin for the Treatment of Obliterative Bronchiolitis after Hematopoietic Stem Cell Transplantation: A Systematic Review and Meta-Analysis. *Biol Blood Marrow Transplant* 2016; 22(12): 2264-2269. e-pub ahead of print 2016/08/31; doi: 10.1016/j.bbmt.2016.08.027.
27. Williams KM, Cheng GS, Pusic I, Jagasia M, Burns L, Ho VT et al. Fluticasone, Azithromycin, and Montelukast Treatment for New-Onset Bronchiolitis Obliterans Syndrome after Hematopoietic Cell Transplantation. *Biol Blood Marrow Transplant* 2016; 22(4): 710-716. e-pub ahead of print 2015/10/18; doi: 10.1016/j.bbmt.2015.10.009.
28. Hakim A, Cooke KR, Pavletic SZ, Khalid M, Williams KM, Hashmi SK. Diagnosis and treatment of bronchiolitis obliterans syndrome accessible universally. *Bone marrow transplantation* 2019; 54(3): 383-392. e-pub ahead of print 2018/07/25; doi: 10.1038/s41409-018-0266-6.
29. Zeiser R, Polverelli N, Ram R, Hashmi SK, Chakraverty R, Middeke JM et al. Ruxolitinib for Glucocorticoid-Refractory Chronic Graft-versus-Host Disease. *N Engl J Med* 2021; 385(3): 228-238. doi: 10.1056/NEJMoa2033122.
30. Edinger M. Driving allotolerance: CAR-expressing Tregs for tolerance induction in organ and stem cell transplantation. *The Journal of clinical investigation* 2016; 126(4): 1248-1250.
31. Rhoades R, Gaballa S. The role of B cell targeting in chronic graft-versus-host disease. *Biomedicines* 2017; 5(4): 61.
32. McManigle W, Youssef A, Sarantopoulos S. B cells in chronic graft-versus-host disease. *Human immunology* 2019; 80(6): 393-399.
33. Zeiser R, Sarantopoulos S, Blazar BR. B-cell targeting in chronic graft-versus-host disease. *Blood, The Journal of the American Society of Hematology* 2018; 131(13): 1399-1405.
34. Kansal R, Richardson N, Neeli I, Khawaja S, Chamberlain D, Ghani M et al. Sustained B cell depletion by CD19-targeted CAR T cells is a highly effective treatment for murine lupus. *Science translational medicine* 2019; 11(482): eaav1648.
35. Quaranta S, Shulman H, Ahmed A, Shoenfeld Y, Peter J, McDonald G et al. Autoantibodies in human chronic graft-versus-host disease after hematopoietic cell transplantation. *Clinical immunology* 1999; 91(1): 106-116.
36. Patriarca F, Skert C, Sperotto A, Zaja F, Falletti E, Mestroni R et al. The development of autoantibodies after allogeneic stem cell transplantation is related with chronic graft-vs-host disease and immune recovery. *Experimental hematology* 2006; 34(3): 389-396.

37. Srinivasan M, Flynn R, Price A, Ranger A, Browning JL, Taylor PA et al. Donor B-cell alloantibody deposition and germinal center formation are required for the development of murine chronic GvHD and bronchiolitis obliterans. *Blood, The Journal of the American Society of Hematology* 2012; 119(6): 1570-1580.
38. Munshi NC, Anderson Jr LD, Shah N, Madduri D, Berdeja J, Lonial S et al. Idecabtagene vicleucel in relapsed and refractory multiple myeloma. *New England Journal of Medicine* 2021; 384(8): 705-716.
39. Gomes-Silva D, Srinivasan M, Sharma S, Lee CM, Wagner DL, Davis TH et al. CD7-edited T cells expressing a CD7-specific CAR for the therapy of T-cell malignancies. *Blood, The Journal of the American Society of Hematology* 2017; 130(3): 285-296.
40. Aghajanian H, Kimura T, Rurik JG, Hancock AS, Leibowitz MS, Li L et al. Targeting cardiac fibrosis with engineered T cells. *Nature* 2019; 573(7774): 430-433.
41. Trzonkowski P, Bieniaszewska M, Juscinska J, Dobyszek A, Krzystyniak A, Marek N et al. First-in-man clinical results of the treatment of patients with graft versus host disease with human ex vivo expanded CD4+ CD25+ CD127- T regulatory cells. *Clinical immunology* 2009; 133(1): 22-26.
42. Theil A, Tuve S, Oelschlägel U, Maiwald A, Döhler D, Oßmann D et al. Adoptive transfer of allogeneic regulatory T cells into patients with chronic graft-versus-host disease. *Cytotherapy* 2015; 17(4): 473-486.
43. Johnston L, Armstrong R, Baker J, Sahaf B, Otani J, Tate K et al. A phase I study of donor regulatory T cells as treatment for steroid dependent/refractory chronic graft versus host disease. *Blood* 2016; 128(22): 385.
44. Nikiforow S, Kim HT, Jones KT, Stewart J, Garrity H, Daley H et al. Phase I trial of regulatory T-cell donor lymphocyte infusion plus daily low-dose interleukin-2 for steroid-refractory chronic graft-versus-host disease. *Blood* 2017; 130: 511.
45. Weng JY, Du X, Geng SX, Peng YW, Wang Z, Lu ZS et al. Mesenchymal stem cell as salvage treatment for refractory chronic GvHD. *Bone Marrow Transplant* 2010; 45(12): 1732-1740. doi: 10.1038/bmt.2010.195.
46. Li T, Luo C, Zhang J, Wei L, Sun W, Xie Q et al. Efficacy and safety of mesenchymal stem cells co-infusion in allogeneic hematopoietic stem cell transplantation: a systematic review and meta-analysis. *Stem Cell Res Ther* 2021; 12(1): 246. doi: 10.1186/s13287-021-02304-x.
47. Zhao L, Chen S, Yang P, Cao H, Li L. The role of mesenchymal stem cells in hematopoietic stem cell transplantation: prevention and treatment of graft-versus-host disease. *Stem Cell Res Ther* 2019; 10(1): 182. doi: 10.1186/s13287-019-1287-9.
48. Boberg E, von Bahr L, Afram G, Lindstrom C, Ljungman P, Heldring N et al. Treatment of chronic GvHD with mesenchymal stromal cells induces durable responses: A phase II study. *Stem cells translational medicine* 2020; 9(10): 1190-1202. doi: 10.1002/sctm.20-0099.
49. Peng Y, Chen X, Liu Q, Zhang X, Huang K, Liu L et al. Mesenchymal stromal cells infusions improve refractory chronic graft versus host disease through an increase of CD5+ regulatory B cells producing interleukin 10. *Leukemia* 2015; 29(3): 636-646. doi: 10.1038/leu.2014.225.
50. Brissot E, Lapobin M, Labussière H, Chevallier P, Blaise D, Yakoub-Agha I et al. POST-transplantation cyclophosphamide vs. antithymocyte globulin after ric regimen allo-hct: First analysis of a prospective randomized multicenter trial in recipients of 10/10 matched donors. *Bone Marrow Transplantation* 2021; 56: 12-13. doi: 10.1038/s41409-021-01341-7.
51. Morozova EV, Moiseev IS, Vlasova YY, Tsvetkov NY, Rudnitskaya YV, Barabanschikova MV et al. Randomized study between thymoglobulin and posttransplant cyclophosphamide in patients with chronic myeloid neoplasms undergoing unrelated allogeneic stem cell transplantation. *Cellular Therapy and Transplantation* 2020; 9(1): 53-59. doi: 10.18620/ctt-1866-8836-2020-9-1-53-59.
52. Tang L, Liu Z, Li T, Dong T, Wu Q, Niu T et al. Post-transplant cyclophosphamide versus anti-thymocyte globulin in allogeneic hematopoietic stem cell transplantation from unrelated donors: A systematic review and meta-analysis. *Frontiers in Oncology* 2023; 13. doi: 10.3389/fonc.2023.1071268.
53. Penack O, Marchetti M, Ruutu T, Aljurf M, Bacigalupo A, Bonifazi F et al. Prophylaxis and management of graft versus host disease after stem-cell transplantation for haematological malignancies: updated consensus recommendations of the European Society for Blood and Marrow Transplantation. *Lancet Haematol* 2020; 7(2): e157-e167. e-pub ahead of print 2020/02/01; doi: 10.1016/S2352-3026(19)30256-X.
54. McSweeney PA, Niederwieser D, Shizuru JA, Sandmaier BM, Molina AJ, Maloney DG et al. Hematopoietic cell transplantation in older patients with hematologic malignancies: replacing high-dose cytotoxic therapy with graft-versus-tumor effects. *Blood* 2001; 97(11): 3390-3400.
55. Ram R, Storer B, Mielcarek M, Sandmaier BM, Maloney DG, Martin PJ et al. Association between calcineurin inhibitor blood concentrations and outcomes after allogeneic hematopoietic cell transplantation. *Biol Blood Marrow Transplant* 2012; 18(3): 414-422. doi: 10.1016/j.bbmt.2011.08.016.
56. Storb R, Deeg HJ, Whitehead J, Appelbaum F, Beatty P, Bensinger W et al. Methotrexate and cyclosporine compared with cyclosporine alone for prophylaxis of acute graft versus host disease after marrow transplantation for leukemia. *N Engl J Med* 1986; 314(12): 729-735. doi: 10.1056/NEJM198603203141201.
57. Hiraoka A, Ohashi Y, Okamoto S, Moriyama Y, Nagao T, Kodera Y et al. Phase III study comparing tacrolimus (FK506) with cyclosporine for graft-versus-host disease prophylaxis after allogeneic bone marrow transplantation. *Bone marrow transplantation* 2001; 28(2): 181-185. doi: 10.1038/sj.bmt.1703097.
58. Nash RA, Antin JH, Karanes C, Fay JW, Avalos BR, Yeager AM et al. Phase 3 study comparing methotrexate and tacrolimus with methotrexate and cyclosporine for prophylaxis of acute graft-versus-host disease after marrow transplantation from unrelated donors. *Blood* 2000; 96(6): 2062-2068.

59. Hamilton BK, Rybicki L, Dean R, Majhail NS, Haddad H, Abounader D et al. Cyclosporine in combination with mycophenolate mofetil versus methotrexate for graft versus host disease prevention in myeloablative HLA-identical sibling donor allogeneic hematopoietic cell transplantation. *Am J Hematol* 2015; 90(2): 144-148. doi: 10.1002/ajh.23882.
60. Kharfan-Dabaja M, Mhaskar R, Reljic T, Pidala J, Perkins JB, Djulbegovic B, Kumar A. Mycophenolate mofetil versus methotrexate for prevention of graft-versus-host disease in people receiving allogeneic hematopoietic stem cell transplantation. *Cochrane Database Syst Rev* 2014; (7): CD010280. doi: 10.1002/14651858.CD010280.pub2.
61. Ram R, Yeshurun M, Vidal L, Shpilberg O, Gafter-Gvili A. Mycophenolate mofetil vs. methotrexate for the prevention of graft-versus-host-disease--systematic review and meta-analysis. *Leuk Res* 2014; 38(3): 352-360. doi: 10.1016/j.leukres.2013.12.012.
62. Chhabra S, Liu Y, Hemmer MT, Costa L, Pidala JA, Couriel DR et al. Comparative Analysis of Calcineurin Inhibitor-Based Methotrexate and Mycophenolate Mofetil-Containing Regimens for Prevention of Graft-versus-Host Disease after Reduced-Intensity Conditioning Allogeneic Transplantation. *Biol Blood Marrow Transplant* 2019; 25(1): 73-85. e-pub ahead of print 2018/08/29; doi: 10.1016/j.bbmt.2018.08.018.
63. Fan S, Huo WX, Yang Y, Shen MZ, Mo XD. Efficacy and safety of ruxolitinib in steroid-refractory graft-versus-host disease: A meta-analysis. *Frontiers in Immunology* 2022; 13. doi: 10.3389/fimmu.2022.954268.
64. Hui L, Qi L, Guoyu H, Xuliang S, Meiao T. Ruxolitinib for treatment of steroid-refractory graft-versus-host disease in adults: a systematic review and meta-analysis. *Expert Review of Hematology* 2020; 13(5): 565-575. doi: 10.1080/17474086.2020.1738214.
65. Zhang M-y, Zhao P, Zhang Y, Wang J-s. Efficacy and safety of ruxolitinib for steroid-refractory graft-versus-host disease: Systematic review and meta-analysis of randomised and non-randomised studies. *PLOS ONE* 2022; 17(7): e0271979-e0271979. doi: 10.1371/journal.pone.0271979.
66. Rashidi A, DiPersio JF, Sandmaier BM, Colditz GA, Weisdorf DJ. Steroids Versus Steroids Plus Additional Agent in Frontline Treatment of Acute Graft-versus-Host Disease: A Systematic Review and Meta-Analysis of Randomized Trials. *Biol Blood Marrow Transplant* 2016; 22(6): 1133-1137. e-pub ahead of print 2016/03/13; doi: 10.1016/j.bbmt.2016.02.021.
67. Van Lint MT, Uderzo C, Locasciulli A, Majolino I, Scime R, Locatelli F et al. Early treatment of acute graft-versus-host disease with high- or low-dose 6-methylprednisolone: a multicenter randomized trial from the Italian Group for Bone Marrow Transplantation. *Blood* 1998; 92(7): 2288-2293. e-pub ahead of print 1998/09/25;
68. Hings IM, Filipovich AH, Miller WJ, Blazar BL, McGlave PB, Ramsay NK et al. Prednisone therapy for acute graft-versus-host disease: short- versus long-term treatment. A prospective randomized trial. *Transplantation* 1993; 56(3): 577-580. e-pub ahead of print 1993/09/01;
69. Hockenbery DM, Cruickshank S, Rodell TC, Gooley T, Schuening F, Rowley S et al. A randomized, placebo-controlled trial of oral beclomethasone dipropionate as a prednisone-sparing therapy for gastrointestinal graft-versus-host disease. *Blood* 2007; 109(10): 4557-4563. e-pub ahead of print 2007/01/25; doi: 10.1182/blood-2006-05-021139.
70. McDonald GB, Bouvier M, Hockenbery DM, Stern JM, Gooley T, Farrand A et al. Oral beclomethasone dipropionate for treatment of intestinal graft-versus-host disease: a randomized, controlled trial. *Gastroenterology* 1998; 115(1): 28-35. e-pub ahead of print 1998/07/03;
71. Cutler C, Lee SJ, Arai S, Rotta M, Zoghi B, Lazaryan A et al. Belumosudil for chronic graft-versus-host disease after 2 or more prior lines of therapy: the ROCKstar Study. *Blood* 2021; 138(22): 2278-2289. doi: 10.1182/blood.2021012021.
72. Jagasia M, Lazaryan A, Bachier CR, Salhotra A, Weisdorf DJ, Zoghi B et al. ROCK2 inhibition with belumosudil (KD025) for the treatment of chronic graft-versus-host disease. *Journal of Clinical Oncology* 2021; 39(17): 1888-1898. doi: 10.1200/JCO.20.02754.
73. Doki N, Toyosaki M, Shiratori S, Osumi T, Okada M, Kawakita T et al. An Open-Label, Single-Arm, Multicenter Study of Ibrutinib in Japanese Patients With Steroid-dependent/Refractory Chronic Graft-Versus-Host Disease. *Transplantation and Cellular Therapy* 2021; 27(10): 867.e861-867.e869. doi: 10.1016/j.jtct.2021.05.019.
74. Miklos DB, Abu Zaid M, Cooney JP, Albring JC, Flowers M, Skarbnik AP et al. Ibrutinib for First-Line Treatment of Chronic Graft-Versus-Host Disease: Results From the Randomized Phase III INTEGRATE Study. *Journal of Clinical Oncology* 2023; 41(10): 1876-1887. doi: 10.1200/JCO.22.00509.
75. Waller EK, Miklos D, Cutler C, Arora M, Jagasia MH, Pusic I et al. Ibrutinib for Chronic Graft-versus-Host Disease After Failure of Prior Therapy: 1-Year Update of a Phase 1b/2 Study. *Biology of Blood and Marrow Transplantation* 2019; 25(10): 2002-2007. doi: 10.1016/j.bbmt.2019.06.023.
76. Bergeron A, Chevret S, Granata A, Chevallier P, Vincent L, Huynh A et al. Effect of Azithromycin on Airflow Decline-Free Survival After Allogeneic Hematopoietic Stem Cell Transplant: The ALLOZITHRO Randomized Clinical Trial. *Jama* 2017; 318(6): 557-566. e-pub ahead of print 2017/08/09; doi: 10.1001/jama.2017.9938.