**Appendix Table C76. Treatment characteristics: Glial tumors**

| **Study (Investigator, country, year)** | **Record Num-ber** | **Group (N)** | **Stem Cell Source** | **Type of HSCT** | **Prior Treatment** | **Conditioning Regimen** | **Immunosuppressive therapy for GVHD prophylax-is** | **Supportive Care** | **Compar-ative Treatment** | **Compar-ative Treatment Dose/Reg-imen** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ayan, Turkey, 1995 | 74690 | Anaplastic Ependymoma 4 |   |   |   |   |   |   | "8 in 1" chemotherapy | methylprednisolone, vincristine, lomustine, procarbazine, hydroxyurea, cisplatin, cytosine arabinoside, cyclophosphamide in a targeted 8 courses or until disease progression |   |
| Berger, France, 1998 | 75380 | HSCT CPC (2)Conventional therapy CPC (20) | Peripheral blood | Autologous | Surgical resection | 1 HSCT patient received: carboplatin, procarbazine, etoposide, cisplatin, vincristine, cyclophosphamide. 1 patient received etoposide, ifosfamide and carboplatin |   |   | Conventional chemotherapy was given to 17 of 20 remaining patients. 2 of the patients who did not receive chemotherapy had radiotherapy, and two had no treatment other than partial surgical resection. Chemotherapy regimen varied by patient. | 10 patients had: carboplatin, procarbazine, etoposide, cisplatin, vincristine, cyclophosphamide. 3 patients had etoposide, carboplatin. 1 patient had carboplatin and ifosfamide; 1 patient received monthly lomustine |   |
| Bertolone, United States, 2003 | 10380 | 18 |   |   | Surgical Excision |   |   |   | Standard Chemotherapy Regimen (A) vs. Experimental 8-in-1 Chemotherapy Regimen (B) | (A) 10 week induction with 8 weekly injections of vincristine, 48 week maintenance with 8 cycles of vincristine, CCNU, and prednisone. (B) 10 week induction of two cycles of 8-in-1 chemotherapy followed by 5400 GY radiotherapy | 8-in-1 chemotherapy consisted of (Vincristine, CCNU, procarbazine, hydroxyurea, cisplatin, cytarabine, dacarbazine, and methylprednisone) |
| Bouffet, France, 1997 | 78760 | 5 | Bone Marrow | Single Autologous | 2 VM-BCNU-PCZ with radiotherapy, 2 VM-CDDP-FU-DTIC-CPM-PCZ one with radiotherapy, and 1 VM-BCNU-PCZ |   |   |   |   |   |   |
| Bouffet, France, 2000 | 78770 | 24 | Bone Marrow | Autologous | NR, Newly Diagnosed | RT initiated as soon as possible after post-op recovery in surgery or after radiologic diagnosis. 50-50Gy given over 6 weeks at a rate of 8-9 Gy per week in 5 daily fracs. HDC initiated 40-60 days after RT. HDC consisted of busulfan 150mg/m^2/d on -8,-7, | -6, and -5. And Thiotepa 300 mg/m^2/d -4, -3, and -2. clonazepam .1 mg/kg/day Day -8 to -1. ABM reinfused 48 hours after chemo. |   |   |   | Only 24 of 35 children proceeded to HDC. One child died during RT, 8 other children experienced early disease progression preventing consolidation, two families declined further treatment. |
| Busca, Italy, 1997 | 73190 | Ependymoma 2, Anaplastic Astrocytoma 1, Glioblastoma Multiforme 2, Oligodendroglioma 1 | ABMT | Autologous | All pts had maximal surgical resection. 3 pts (50%) had 1st line RT, 1 pt. had 1st line chemotherapy (17%). 3 pts had secondary total resection after relapse (50%), 3 pts had secondary chemotherapy and 1 pt had radiotherapy (17%). | Two regimen: A, BCNU 2x/d for 3 days and etoposide 1x/d for 3 days (n=5). B, Thiotepa and etoposide 1x/d for 3 days (n=6) |   | HEPA filtered room, low microbial diet, IV acyclovir, oral nonabsorbable antibiotics, and cotrimoxazole. Broad-spectrum antibiotics were administered to febrile patients. Blood component therapy to keep elevated platelet count |   |   |   |
| Conter, France, 2009 | 73540 | Ependymoma 24 |   |   |   |   |   |   | Surgical resection followed by radiotherapy | In a complete resection, patients were given 60 Gy HFRT in two daily frac of 1 Gy (photon energy was >8 MeV. For partial removal, second look surgery discussed before RT. If not complete resection a 6 Gy boost was given to the initial 60Gy | No patients received chemotherapy |
| Doireau, France, 1998 | 55990 | 8 |   |   | ventriculo-peritoneal shunt in 1 pt, 2 pts had biopsy alone, and partial excision in 6 patients |   |   |   | chemotherapy | 16 month/seven cycle of carboplatin (15 mg/kg), procarbazine (4 mg/kg), etoposide (5 mg/kg), cisplatin (1mg/kg) vincristine (.05 mg/kg), and cyclophosphamide (50 mg/kg) |   |
| Dunkel, United States, 1998 | 78780 | 10 | Bone Marrow | Single Auto | 10 radiotherapy, 5 with chemotherapy, 1 with beta-interferon | 6 Thiotepa Etoposide, 2 BCNU Thiotepa Etoposide, 2 Carboplatin Thiotepa Etoposide |   |   |   |   |   |
| Finlay, United States | 1300 | 27 | Bone marrow | Autologous | NR | ThioTEPA 900 mg/m^2 w/ etoposide 750 or 1,500 mg/m^2 over 3 days (n=11), 600 mg/m^2 over 3 days preceded by carmustine (n=5), or carboplatin 1,500 mg/m^2 over 3 days (n=11) w/ AEUC of 7 mg/ml/min day | NR | NR | Chemotherapy Only |   |   |
| Grill, France, 1996 | 73240 | Ependymoma 16 | Bone Marrow Stem Cells in 15 pts and PBSC in 1 pt. | Autologous | NR. 8 patients received HDCT + autologous SCT as first treatment of relapse, 8 patients received ASCT as second or further relapse treatment | Busulfan, Thiotepa, |   | Isolated laminar air flow rooms with atrial catheters. Parenteral nutrition and broad spectrum antibiotics when needed. |   |   |   |
| Grill, France, 2001 | 74360 | 73 |   |   |   |   |   |   | Resection and Chemotherapy followed by irradiation in the event of progression or relapse | Maximal surgical resection followed by three courses of two different drugs (carboplatin and procarbazine, etoposide and mannitol, and vincristine cyclophosphamide and uromitexan). Irradiation for relapse was 50 Gy 1.8 Gy/frac 5x week |   |
| Grovas, United States, 1999 | 16600 | 11 | 2 PBSC (18), 9 ABMT (82) | single autologous | NR, newly diagnosed | carmustine, thiotepa, and etoposide. Carmustine at dose of 100 mg/m^2 for six doses, Thiotepa 300 mg/M^2/d \* 3 , Etoposide 250 mg/m^2/d \*3 |   | Corticosteroids for control of tumor mass effect and cerebral edema. Pts not given corticosteroids had dexamethasone 5 mg/m^2/d \*3. 6 Pts given G-CSF on reinfusion (55). All pts received RT on approximately day +42. 30 fracs 180 cGy 5200 cGy w/ 540 boost |   |   | 1 patient died before radiotherapy |
| Grundy, United Kingdom, 2007 | 73750 | Ependymoma 89 |   |   |   |   |   |   | Chemotherapy w or w/o RT | 4 courses alternating myelosuppressive and non-myelosuppressive carboplatin, vincristine, methotrexate, cyclophosphamide and mesna, cisplatin. RT after progression |   |
| Grundy, United States, 2010 | 51800 | 41 |   |   | Surgical Resection: HGG 14 (74), Brain Stem Glioma 0 (0) |   |   |   | Chemotherapy with or without radiotherapy | Four courses with 7 cycles: course 1 vincristine (1.5mg/^2) and carboplatin (550 mg/m^2), course 2 Vincristine (1.5mg/m^2) Methotrexate (8000mg/m^2) and Folinic Acid 15 mg, course 3 Vincristine (1.5 mg/m^2) Cyclophosphamide (1500mg/m^2) and Mesna (1800 mg | Course 4 Cisplatin continuous infusion for 4 hours (40 mg/m^2 x 2 days), children 10 kg and under were dosed to weight rather than surface area. Six patients completed Chemotherapy |
| Gururangan, United States, 1998 | 18000 | N=7,1 cpc, 1 ependymoma, 4 glioblastoma multiforme, 1 anaplastic astrocytoma | Bone marrow | Autologous | Surgery and chemotherapy in all pts except the astrocytoma patient who had biopsy online | Four patients had carboplatin, thiotepa, and etoposide, one patient had thiotepa and etoposide only, and one patient had carboplatin, thiotepa and carmustine |   | Varied by treatment protocol. Patients received antifungal and antibiotics if febrile and neutropenic. Maintenance of platelet counts. GCSF use varied by protocol. |   |   |   |
| Horn, Untied States, 1999 | 74470 | Ependymoma 83 |   |   |   |   |   |   | Patients in this multicenter retrospective study were classified as having either surgery alone 6 (7), chemotherapy alone 17 (20), radiation alone 31 (37), or radiation and chemotherapy 29 (35). | Chemotherapy type was broken into: None 37 (45), Nitrosourea based 13 (16), Alkylating agent based 21 (25), Nitrosourea and alkylating 9 (11), other types 3 (4) No RT 23 (28), Local 36 (41), Local and cranial 5 (6), and craniospinal 21 (25) |   |
| Hurwitz, United States, 2001 | 53330 | 45 |   |   |   |   |   |   | Chemotherapy | Dexamethasone .25 mg/kg 14 and 7 hours before other drug administration, paclitaxel 1mg/kg 350mg/m^2 over 24 hours every 3 weeks, and diphenhydramine 1mg/kg |   |
| Jaing, Taiwan, 2004 | 74030 | Ependymoma 43 |   |   |   |   |   |   | Surgical excision followed by 30 Gy irradiation w/ 20-25 Gy boost to the primary tumor area [spinal mets irradiated with a total dose of 30-45 Gy]. 9 pts did not receive RT due to >3 years old. 13 pts received chemotherapy | Chemotherapy protocols varied between patients [5 protocols, either platinum or nitrosourea or other combinations exclusive of nitrosourea or platinum] |   |
| Jakacki, United States, 1999 | 15920 | 11 | PBSC | Autologous given in four doses concurrent with chemotherapy and radiotherapy | NR, newly diagnosed | CCNU 130mg/m^2, vincristine 1.5mg/m^2 on day 0 and procarbazine 150 mg/m^/d on 1-7.PBSC infusion was infused 36-72 hrs after procarbazine. RT began 48-72 hrs after PBSC 180cGY (5040-5940 cGy).2nd, 3rd, and 4th chemotherapy regimens started 4 wks after prev |   | Pts who developed a procarbazine related rash received diphenhydramine prior to subsequent doses |   |   | 1 pt with spinal cord glioblastoma had 3600 cGy craniospinal radiation therapy with boost to tumor area, all other pts had involved field RT.4 pts w/ non-brainstem large volume tumors had <4 PBSC and Chemotherapy, due to progression recruitment was stopped |
| Kobrinsky, United States, 1999 | 53560 | High grade astrocytoma 20, brain stem glioma 22 |   |   | Previously treated with chemotherapy and/or radiation therapy |   |   |   | Etoposide or etoposide/mannitol | 150mg/M^2 Iv over 3h for 5 days |   |
| Korones, United States, 2006 | 52670 | 9 |   |   | 3 RT alone, 2 RT and Chemo, 4 BMT and other therapy |   |   |   | Chemotherapy | Temozolomide and VP-16 |   |
| Kuhl, Germany, 1998 | 17700 | 21 |   |   |   |   |   |   | Chemotherapy: procarbazine, ifosfamide, mesna, vp-16, methotrexate, CF-rescue, cisplatin, cytarabine followed by radiotherapy of 35.2 gy in 22 frac and maintenance chemotherapy in some patients (% unknown for EPD) |   |   |
| Macdonald, United States, 2005 | 55000 | 76 |   |   | Induction, four 3 week cycles in three different regiments: A) carboplatin, VP-16 B) ifosfamide, mesna VP-16 C) Cyclophosphamide, mesna, VP-16. |   |   | Corticosteroids used at clinician recommendation; recommended for raised intracranial pressure and adrenal insufficiency restriction | Chemotherapy with Radiotherapy | Interim therapy: one 12-week course Vincristine at 1.5 mg/m^2 (2 mg max) for 8 weeks w/ 6-week RT followed by 4-week rest. Maintenance cycle of eight 4-week cycles 6 weeks after RT consisting of oral CCNU 100mg/m^2 \* 1 day and vincristine 1.5 mg/m^2 | (Dose information not entered due to char limit - available in paper) |
| Mahoney, United States, 1996 | 73250 | 7 | Bone Marrow | Autologous | Radiation and Chemotherapy | CTX 4 days, Melphalan 3 days following marrow infusion patients were given escalating CTX dose with mesna support |   | Amino Acid withholding during melphalan treatment. Irradiated CMV for hematocrit level maintenance, Fluconazole, Acyclovir in pts. With positive HSV |   |   |   |
| Mason, United States, 1998 | 73180 | Ependymoma 15 | ABMR | Autologous | Maximal surgical resection in all pts. 13 pts had radiotherapy (87%), 14 of the pts had prior chemotherapy (93%). | 5 patients received thiotepa/etoposide (33), 10 received thioTEPA/etoposide/carboplatin (67) |   | platelet counts maintained above 50,000, hemoglobin maintained above 8.0g/dL, febrile neutropenic patients treated with broad-spectrum antibiotics and antifungal agents. Pts received trimethoprim-sulfamethoxazole prophylaxis from day 30 |   |   |   |
| Massimino, Italy, 2005 | 55220 | 21 | PBC | Single Auto, in 4 pts two cycles due to residual tumor response after first course | Surgical Excision | CDDP plus VP-16 week 1 and 4; VCR plus CTX and hd-MTX week 7 and 10, hd-Thiotepa and G-CSFT week 13 |   |   |   |   |   |
| Merchant, United States, 2002 | 74280 | Ependymoma 64 |   |   |   |   |   |   | Radiotherapy with three dimensional treatment planning | Conventional fractionation of 1.8 Gy/d to 59.4 Gy. 4 young children with Ependymoma received 54.0 Gy. Dose limiting to upper cervical spinal cord was 54 Gy, optic chiasm 55.8 Gy, optic nerves 50.4 Gy, and optic globe 50.4 Gy |   |
| Ozkaynak, United States, 2004 | 7850 | 6 | PBSC | Tandem Autologous | 2 Surgery XRT (5400 cGY) and Chemotherapy (CTX, CDDP, VP-16, VCR, CCNU), 3 XRT alone (dose NA), 1 surgery and chemo (CCG-9921) | Cyclophosphamide 4-6 g/m^2 with G-CSF 10 ug/kg/d, Thiotepa 240 mg/m^2/d \* 3, carboplatin 400 mg/m^2/d \* 3, |   | Rifampin, trimethoprim/sulfamethoxazole, gentamicin, amphotericin-B, fluconazole, acyclovir. |   |   | 4 of these pts. GBM, Ependymoma, 1 BSG, and 1 AA had only 1 PBSC. 2 were due to parental decision and 2 were due to tumor progression after first course transplant |
| Robertson, United States, 1998 | 74630 | Ependymoma 32 |   |   |   |   |   |   | Maximal surgical resection, randomized assignment to one of two treatment arms. | Regimen A: Craniospinal radiotherapy w/ 8 weekly doses of IV vincristine concurrent with radiotherapy. Pts then received 8 6-week courses of vincristine, ccnu, and prednisone. Regimen B: 8-in-1 regimen, followed by RT, and then maintenance 8-in-1 | 8-in-1 regimen consisted of methylprednisone, vincristine, lomustine [ccnu] or carmustine [bcnu], procarbazine, hydroxyurea, cisplatin, cytarabine, and cyclophosphamide |
| Shih, United States, 2008 | 2530 | 5 | Bone Marrow | Single Autologous | 1 chemotherapy for EPD, 1 chemotherapy + local RT for AA, 1 craniospinal irradiation for AA, 1 Chemotherapy + craniospinal irradiation for GBM, and 1 craniospinal irradiation for GBM | 1 Busulfan and Thiotepa for EPD, 2 Thiotepa and cyclophosphamide for AA, 1 carboplatin and etoposide for GBM, and 1 Thiotepa and cyclophosphamide for GBM |   |   |   |   |   |
| Sio, Italy, 2006 | 6950 | 14 |   |   | Surgery 3 (21%), Chemotherapy 6 (43%), Radiotherapy 12 (86%), Bone Marrow Transplant 2 (14%), 1 patient had no prior treatment |   |   | Authors not explicit; antibiotics, blood products were administered when required and steroid therapy was limited to treatment of raised intracranial pressure or cerebral edema in brain tumor pts. | Chemotherapy | Temozolomide single oral dose for 5 consecutive days (214 mg/m^2/day in patients with no prior CSI and 180 mg/m^2/day in CSI or BMT) Courses were repeated every 21-28 days. TMZ reduced by 25% in patients with grade 4 toxicity. |   |
| Thorarinsdottir, United States, 2007 | 73050 | 6 | PBSC | Autologous | Newly Diagnosed | 3 cycles induction cisplatin, cyclophosphamide, etoposide, vincristine. 3 cycles consolidation carboplatin, thiotepa |   |   |   |   |   |
| Wrede, Germany, 2009 | 75590 | 34 CPC |   |   | Newly Diagnosed, surgical resection |   |   |   | 6 cycles chemotherapy 31 (91%), radiotherapy in children over 3 years of age |   | 3 patients did not receive chemotherapy (9%) |
| Yule, United Kingdom, 1997 | 18960 | 5 | BMP | Tandem Autologous | Surgery 2 (50), RT 1 (25), No Chemotherapy | 2 dose CTX accompanied by mesna at 160%. Starting dose CTX was 2.5m/m^2/d and escalated at .5m/m^2/d to 2 g/m^2. stem |   | oral dexamethasone before CTX 10 mg/m^2/d, prophylactic acyclovir 1,500 mg/m^2/d) and ciprofloxacin (10 mg/kg/d), and oral nystatin. |   |   |   |
| Zacharoulis, United States, 2007 | 73020 | Ependymoma 29 | PBSC | Autologous | Newly diagnosed | Maximal surgical resection followed by induction (vincristine, etoposide, cyclophosphamide w/ mesna, methotrexate) and consolidation (carboplatin, thiotepa, etoposide) chemotherapy with radiotherapy when indicated by tumor response, age, and location |   | platelet counters were maintained above 10,00/mm with transfusion as necessary. Febrile neutropenic pts were given broad spectrum IV antibiotics. Pts received PCP pneumonia prophylaxis |   |   |   |
| Gilheeney, United States, 2010 | 2187 | Anaplastic Astrocytoma (1); Oligoastrocytoma (1); Glioblastoma multiforme (2) |  |  Autologous | AA: resection and radiotherapy; OA: sub-total resection; GBM: 1 patient gross total resection, 1 patient resection radiotherapy and chemotherapy | Thiotepa 300mg/m^2 day -8, -7, -6; topotecan 2 mg/m^2 day -8, -7, -6, -5, -4; carboplatin ~500 mg day -5, -4, -3 |   | Granulocyte colony-stimulating factor |   |   |   |