GCT-16. LONG-TERM CLINICAL OUTCOMES OF GERM CELL TUMORS
Kemichio Matsuda, Kaori Sakurada, Takamasa Kayama, and Yukihiko Sonoda; Department of Neurosurgery, Faculty of Medicine, Yamagata University, Yamagata, Japan

BACKGROUND: Intracranial germ cell tumors (GCT) are mainly arising in adolescent term and treated with chemotherapy concomitant with radiation therapy. There is accumulating evidence that the progress of treatment. Besides, long-term outcome and adverse effects are major problem in daily life. So we studied the impact of these outcomes in three main areas: daily life, sexuality, and work. RESULTS: We reviewed the clinical features and outcomes of 52 cases of intracranial GCT in 1975 to 2019. Ages on diagnosis were 5-35 years old (median 14 years old), consisted with 44 male cases. The pathologic distributions are these: pure germinoma: 40 cases, non-germinomatous germ cell tumor (NGGCT): 10 cases (mature teratoma: 4, mixed germ cell tumors: 3, and one cases of choriocarcinoma, embryonal carcinoma, yolk sac tumor and undifferentiated). Almost all cases have been biopsied and treated by chemotherapy and radiation therapy. RESULTS: Chemotherapy with ICE regimen (ifosphamide, cisplatin, etoposide) or CAR regimen (carboplatin, etoposide) concomitant with radiation therapy were given to germinoma, and chemotherapy with PABV regimen (cisplatin, doxorubicin, bleomycin, and vincristine) or 2xcarboPEI chemotherapy (carboplatin/etoposide alternating with etoposide/cisplatin) was given to NGGCT. Almost all patients have gained better outcome and ADL. But there is slightly lower rate in work or marriage. Serial evaluation in outcome, and higher brain functions should be performed in follow up.

GCT-17. WHAT IS THE CLINICAL OUTCOME OF PROTON BEAM THERAPY FOR PATIENTS WITH INTRACRANIAL GERM CELL TUMOR IN KOREA?
Sang Hee Youn, and Joo-Young Kim; National Cancer Center, Goyang-si, Republic of Korea

PURPOSE: To evaluate the clinical outcome of patients with intracranial germ cell tumor treated with proton beam therapy (PBT). MATERIALS AND METHODS: Fifty-seven patients with intracranial germ cell tumor treated with PBT between 2009 and 2016 were retrospectively analyzed. RESULTS: Median follow-up duration was 63.7 months (range, 5.6–204.3). Thirty-seven patients (64.9%) were pure germinoma and 20 patients (35.1%) were non-germinomatous germ cell tumor (NGGCT). All patients except 2 patients received chemotherapy before PBT. Twenty-one patients (36.8%) of localized germinoma were treated with whole brain irradiation (WBI), while 36 (63.2%) patients who were diagnosed as disseminated germinoma or NGGCT received cranial-spinal irradiation (CSI). Two patients with pure germinoma in basal ganglia showed disease relapse at 3.0 and 6.9 years after PBT at the primary site and pituitary gland, respectively. There was one patient with NGGCT who died of chemotherapy-related mortality at 4.7 years after PBT while her disease was complete remission. The 7-year progression-free survival and overall survival were 70.8% and 100% for focal germinoma, 100% and 100% for disseminated germinoma, 100% and 100% for focal NGGCTs, and 100% and 80.0% for disseminated NGGCTs, respectively. CONCLUSIONS: PBT of pure or non-germinomatous germ cell tumors resulted in comparable clinical outcomes to that with photon radiotherapy. Our result for NGGCT is also excellent compared to other reports. Failure patterns of germ cell tumors originating in basal ganglia needs to be assessed in large pooled data.

GCT-18. CLINICAL FEATURES OF GERM CELL TUMORS IN CHILDREN
Nayuta Higa; Kagoshima University, Kagoshima, Japan

INTRODUCTION: Here, we discuss the presentation, histology, therapy, and outcome of germ cell tumors in children. METHODS: Treatment outcome and management was assessed for children diagnosed with germ cell tumors from 2007 to 2017 at Kagoshima University. RESULTS: Twenty-six patients (20 boys, 6 girls) with a mean age of 11.5 ± 4.9 years were included in this study. Patient tumor types included: germinoma (n = 19); immature teratoma (n = 3); yolk sac tumor (n = 3); choriocarcinoma (n = 1); embryonal carcinoma (n = 1). The most common patient clinical features were headache and vomiting associated with hydrocephalus. The median follow-up period was 96.5 months. Tumor location was pineal (n=9), bifocal (n=6), suprasellar (n=5), basal ganglia (n=2), and cerebellum (n=2). Surgical procedures included stereotactic biopsy (n=13), endoscopic third ventriculostomy and biopsy (n=8), and tumor decompression (n=5). All patients with germ cell tumors underwent adjuvant chemotherapy and radiation therapy; patients with yolk sac tumor or immature teratoma underwent chemotherapy before and after tumor resection to achieve disease-free survival. The 7-year progression-free survival and overall survival were 70.8% and 100% for focal germinoma, 100% and 100% for disseminated germinoma, 100% and 100% for focal NGGCT, and 100% and 80% for disseminated NGGCT. There was one patient with NGGCT who died of chemotherapy-related mortality at 4.7 years after PBT while her disease was complete remission. The 7-year progression-free survival and overall survival were 70.8% and 100% for focal germinoma, 100% and 100% for disseminated germinoma, 100% and 100% for focal NGGCT, and 100% and 80% for disseminated NGGCT. There was one patient with NGGCT who died of chemotherapy-related mortality at 4.7 years after PBT while her disease was complete remission.

GCT-19. MODELING GERM CELL TUMORS WITH KIT MUTANT HIPSCS
Sakura Kurasu 1, Yoji Kosjura 2, Koshibi Ishimura 2, and Motsuji Saitou 1, 2

1) Kyoto University Institute for Advanced Study, Kyoto, Kyoto, Japan
2) Kyoto University Inamori Institute of Medical Science, Kyoto University, Kyoto, Japan

Central Nervous System Germ Cell Tumor (CNS GCT) is the second most common pediatric brain tumor in Japan, and within CNS GCT, germinoma is the most common subtype, accounting for 62.3%. Recent reports of transcriptome and methylation analysis suggested that germinoma highly resembles germ cell tumors in the testis. In our study, we attempted to identify the molecular mechanism of tumorigenesis in relation to KIT activation using this system.

GCT-20. EVALUATION OF NEURO-ONCOLOGICAL RESPONSE TO INDUCTION CHEMOTHERAPY FOR PATIENTS WITH LOCALISED GERMINOMA IN THE SIOP CNS GCT II TRIAL
Brigitte Bison 1, Giovanni Morana 2, Dipayan Mitra 3, Herve Brisse 1, Cécile Faure-Gontier 4, Markus Frank 5, Francesca Bazzurri 5, Caroline Beate Timmermann 6, James Nicholson 7, Gabriele Calamis 8, and Matthew Murray 9

1) Department of Neurosurgery, University of Wuerzburg, Wuerzburg, Germany
2) Department of Neurosurgery, Gasthospitalet, Girona, Spain
3) Department of Neurosurgery, Royal Innsbruck Medical Clinic, Innsbruck, Austria
4) Department of Neurosurgery, Kagoshima University, Kagoshima, Japan
5) Department of Radiation Oncology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom
6) Imaging Department, Curie Institute, Paris, France
7) Department of Paediatric Haematology and Oncology, Instituto de Paediatrica Haematology, Lyon, France
8) Department of Radiation Oncology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom
9) Department of Paediatric Hematology and Oncology, University Hospital, Bonn, Germany

INTRODUCTION: The SIOP-CNS-GCT-96 trial demonstrated excellent survival for patients with germinoma. Localised patients received either craniospinal irradiation (CSI) + 2xcarboPEI chemotherapy (carboplatin/etoposide alternating with etoposide/cisplatin) and focal teletherapy to avoid ventricular relapse. Accordingly, current research priorities focus on reducing treatment burden and long-term neurocognitive sequelae. METHODS: SIOP-CNS-GCT-II employed national central neuro-oncology network to assess whether dropping the 16 Gy boost was safe for localised germinoma in complete remission (CR) following 2xcarboPEI: i.e. no disease on clinical/marker/radiological assessment. Any abnormal