

Evidence Discussion (ONC 2.6)

Central Nervous System Germ Cell Tumors

Central nervous system germ cell tumor imaging indications in adult individuals are identical to those for pediatric individuals and are described in the eviCore HC PEDONC 4.7 guidelines. Central nervous system germ cell tumors are a heterogeneous group of tumors that occur predominately in children, adolescents and young adults. These tumors are divided into two broad histologic categories germinomas, the most common subtype, and non-germinomatous germ cell tumors. Treatment approaches are based on the subtype tumor. The Imaging guidelines follow evidence –based standards established pediatric oncology community.

Standard imaging protocols include magnetic resonance imaging with and without gadolinium contrast of brain and whole spine at diagnosis, staging, restaging and surveillance. Whole spine imaging is included as this group of tumors is associated with risk for intracranial dissemination that can be present at diagnosis. CT imaging of the head without contrast is supported for rapid assessment when there is concern for acute neurologic deterioration, intracranial hemorrhage, worsening ventriculomegaly and ventriculoperitoneal shunt malfunction. Advanced imaging using MR spectroscopy to complement standard imaging for evaluation of a brain lesion of indeterminate nature to determine whether biopsy/resection can be delayed.

References

Echevarría ME, Fangusaro J, Goldman S. Pediatric central nervous system germ cell tumors: a review. *Oncologist*. 2008;13(6):690.

Jung AY. Basics for Pediatric Brain Tumor Imaging: Techniques and Protocol Recommendations *BrainTumor Res Treat* 2004. 12: 1-13

Jaju A, Li Y, Dahmouch et al. Imaging of pediatric brain tumors: A COG Diagnostic Imaging Committee/SPRONcology Committee/ASPNR White Paper. *Pediatr Blood Cancer*. 2023;70(Suppl. 4):e30147. <https://doi.org/10.1002/pbc.30147>

American College of Radiology. ACR–ASNR–SPR practice parameter for the performance and interpretation of magnetic resonance spectroscopy of the central nervous system. www.acr.org/-/media/ACR/Files/Practice-Parameters/mr-spectroscopy.pdf?la=en

WHO Classification of Tumors Editorial Board (2021) Central nervous system tumours, 5th edn. International Agency for Research on Cancer, Lyon

Evidence Summary for CNS Lymphoma (also known as Microglioma) (ONC-2.7)

Primary central nervous system lymphoma is an aggressive non-Hodgkin lymphoma that can occur in any location within the intracranial neuraxis (brain, spine, cranial nerves, and leptomeninges). This malignancy can occur in immunocompromised patients or immunocompetent patients and represents approximately 4 % of all intracranial malignancies. Individuals may present with focal neurological deficits or nonspecific neurological findings depending on the specific location of tumor involvement.

Evicore guidelines align with NCCN guidelines for imaging evaluation. For initial staging, MRI brain without and with contrast and whole spine imaging without and with gadolinium contrast are indicated. CNS lymphoma has potential to spread throughout the intracranial neuraxis. For confirmation as a primary central nervous system lymphoma, extra neural evaluation is indicated and follows the Evicore ONC 27:Non-Hodgkin Lymphoma Guideline. This evaluation includes CT Chest with contrast and CT Abdomen and Pelvis with contrast. FDG PETCT can be approved if extra neural CT imaging is inconclusive. Evaluation of treatment response can be assessed after every 2 cycles of treatment with MRI without and with contrast of all positive disease sites. All imaging obtained for initial staging is repeated for suspected disease recurrence to evaluate for metastatic disease. Surveillance imaging includes MRI brain without and with of all positive disease sites on a schedule outlined in the guideline.

References

Grommes C, Rubenstein JL *et al.* Comprehensive approach to diagnosis and treatment of newly diagnosed primary CNS lymphoma. *Neuro-Oncol* 21 (3), 296-305, 2018. doi:10.1093/neuonc/noy192

Nabors LB, Portnow J *et al.* Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Central Nervous System Cancers. Version 1.2024-May 31, 2024. All rights reserved. Accessed [June 26, 2024]. To view the most recent and complete version of the guideline, go online to NCCN.org

WHO Classification of Tumors Editorial Board (2021) Central nervous system tumours, 5th edn. International Agency for Research on Cancer, Lyon