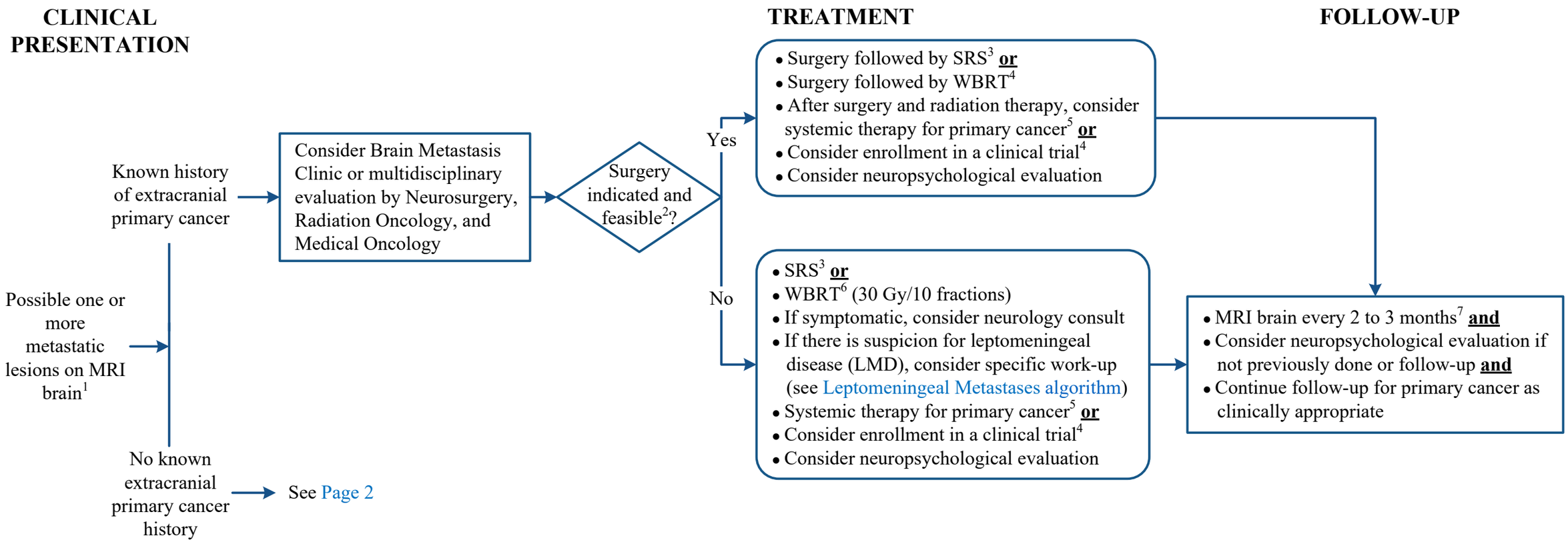
Brain Metastasis Management

NOTE: Consider Clinical Trials as treatment options for eligible patients



SRS = stereotactic radiosurgery
WBRT = whole brain radiation therapy

[1] Discuss Goal Concordant Care (GCC) with patient or if clinically indicated, with Surrogate-Decision Maker (SDM). GCC should be initiated by the Primary Oncologist. If Primary Oncologist is unavailable, Primary Team Attending Physician to initiate GCC discussion and notify Primary Oncologist. Patients or if clinically indicated the SDM should be informed of therapeutic and/or palliative options. GCC discussion should be consistent, timely, and re-evaluated as clinically indicated. The Advance Care Planning (ACP) note should be used to document GCC discussion. Refer to the GCC home page (for internal use only).

[2] The decision to resect a tumor should be made after multidisciplinary discussion of each case, and it will be dependent on the size, location, easibility and necessity (e.g., symptomatic lesion or tissue is required for best clinical decision). For smaller (< 2 cm), deep, or asymptomatic lesions, SRS alone may be more appropriate. Additional treatment of untreated brain metastases after surgery should be considered.

[3] SRS is defined as 1-5 fractions per American Society of Radiation Oncology (ASTRO) guidelines. The term SRS implies highly conformal, image-guided, potentially ablative radiotherapy.

[4] Clinical trial is the preferred option if one is available and the patient is eligible

[5] Refer to Cancer Treatment algorithms for melanoma, breast, and lung cancers

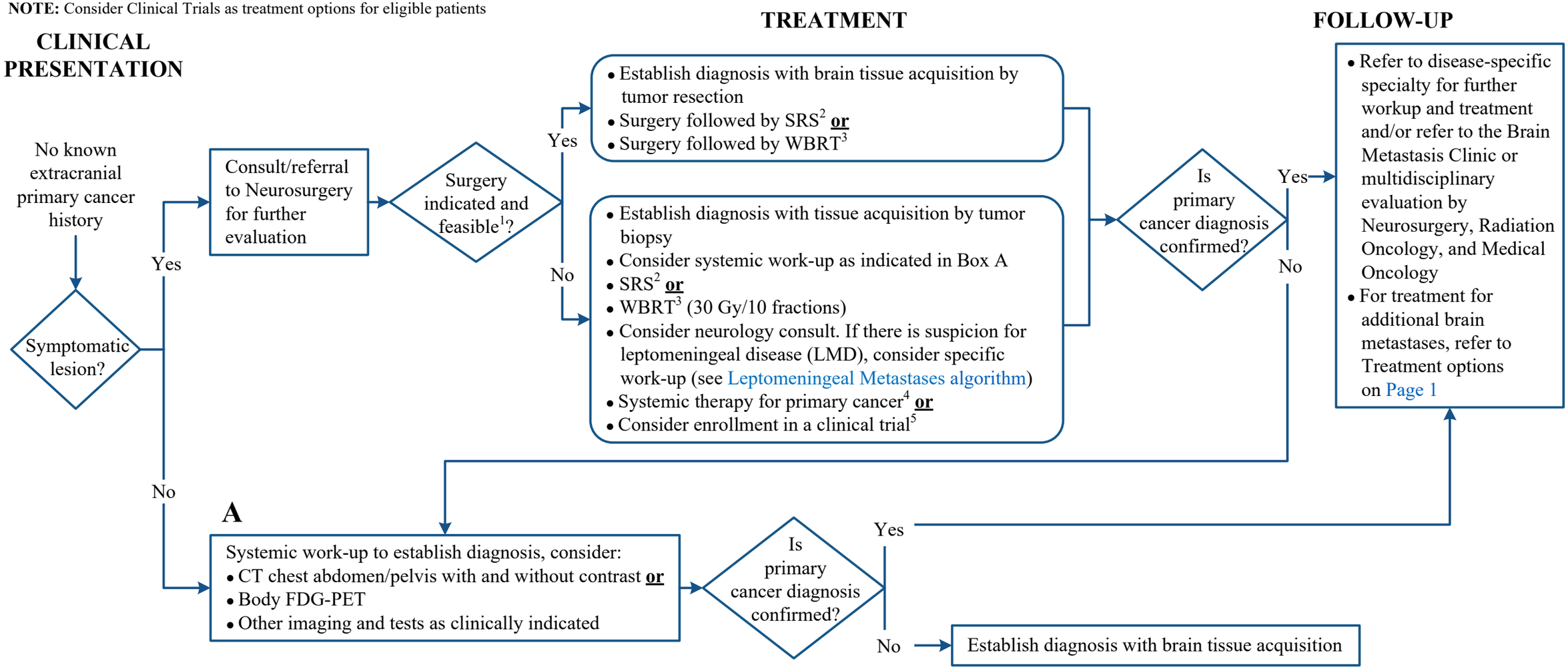
[6] Consider hippocampal sparing (if all lesions >5 mm from the hippocampi) and memantine to prevent cognitive decline associated with WBRT

[7] In selected cases, surveillance may be spaced out as clinically appropriate. Follow-up will be done by the primary team and the team who provided treatment for the brain metastases.

Department of Clinical Effectiveness V1 rev
Approved by the Executive Committee of the Medical Staff on 06/21/2022

Brain Metastasis Management

NOTE: Consider Clinical Trials as treatment options for eligible patients



[1] The decision to resect a tumor should be made after multidisciplinary discussion of each case, and it will be dependent on the size, location, feasibility and necessity. For smaller (< 2 cm), deep, or asymptomatic lesions, SRS alone may be more appropriate. WBRT after surgery or SRS should be considered in selected cases in which multiple brain metastases remain untreated.

[2] SRS is defined as 1-5 fractions per American Society of Radiation Oncology (ASTRO) guidelines

[3] Consider memantine and hippocampal sparing (if lesions <5 mm from hippocampi) to prevent cognitive decline associated with WBRT

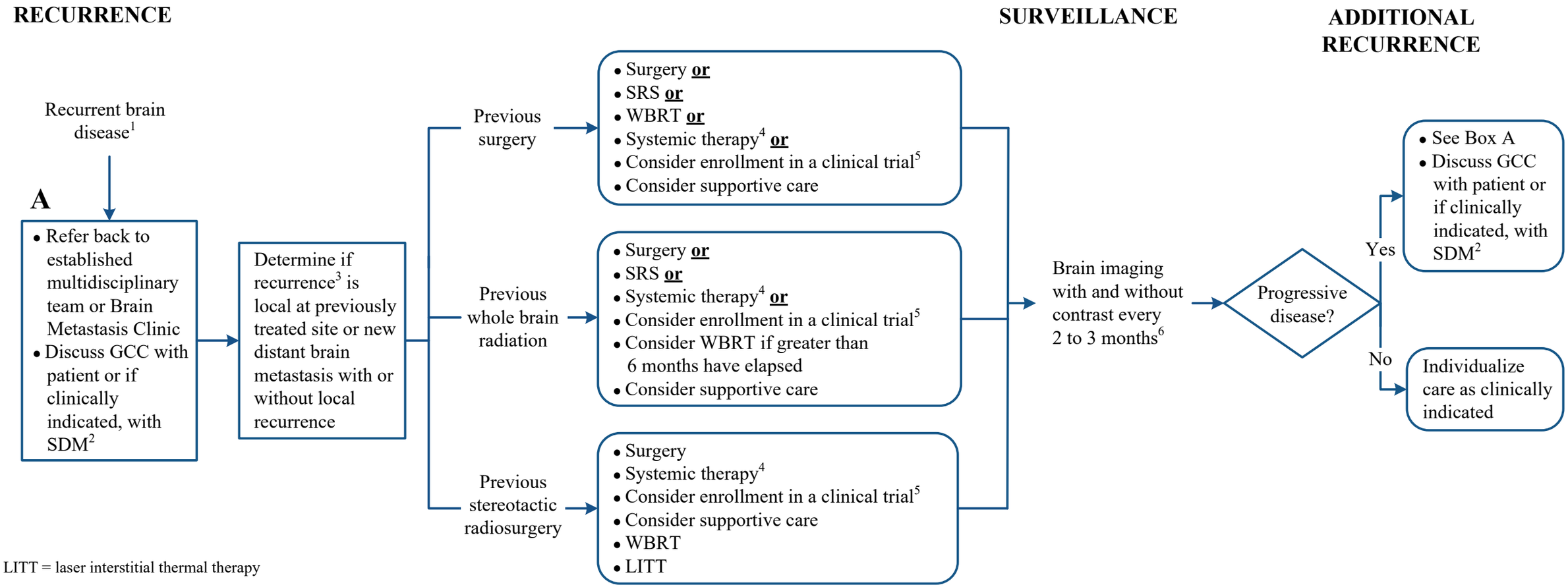
[4] Refer to Cancer Treatment algorithms for melanoma, breast, and lung cancers

[5] Clinical trial is the preferred option if one is available and the patient is eligible

Department of Clinical Effectiveness V1 rev
Approved by the Executive Committee of the Medical Staff on 06/21/2022

Brain Metastasis Management

NOTE: Consider Clinical Trials as treatment options for eligible patients



LITT = laser interstitial thermal therapy

[1] Clinician should ensure that imaging changes are more likely secondary to tumor recurrence rather than necrosis due to prior stereotactic radiosurgery (SRS)

[2] GCC should be initiated by the Primary Oncologist. If Primary Oncologist is unavailable, Primary Team Attending Physician to initiate GCC discussion and notify Primary Oncologist. Patients or if clinically indicated the SDM should be informed of therapeutic and/or palliative options. GCC discussion should be consistent, timely, and re-evaluated as clinically indicated. The Advance Care Planning (ACP) note should be used to document GCC discussion. Refer to the GCC home page (for internal use only).

[3] Recurrence on imaging can be confounded by treatment effects; strongly consider tumor tissue sampling if there is a possibility of treatment-related necrosis. Consider advanced brain tumor imaging such as dynamic perfusion and spectroscopic MRI or PET of the brain.

[4] Systemic disease to be treated as clinically indicated

[5] Clinical trial is the preferred option if one is available and the patient is eligible

[6] In selected cases, surveillance may be spaced out as clinically appropriate. Follow-up will be done by the primary team and the team who provided treatment for the brain metastases.

Department of Clinical Effectiveness V1 rev
Approved by the Executive Committee of the Medical Staff on 06/21/2022

SUGGESTED READINGS

Andrews, D. W., Scott, C. B., Sperduto, P. W., Flanders, A. E., Gaspar, L. E., Schell, M. C., … Souhami, L. (2004). Whole brain radiation therapy with or without stereotactic radiosurgery boost for patients with one to three brain metastases: Phase III results of the RTOG 9508 randomised trial. *The Lancet*, *363*(9422), 1665-1672.

Aoyama, H., Shirato, H., Tago, M., Nakagawa, K., Toyoda, T., Hatano, K., … Kunieda, E. (2006). Stereotactic radiosurgery plus whole-brain radiation therapy vs stereotactic radiosurgery alone for treatment of brain metastases: A randomized controlled trial. *Jama*, *295*(21), 2483-2491.

Brown, P. D., Jaeckle, K., Ballman, K. V., Farace, E., Cerhan, J. H., Anderson, S. K., … Ménard, C. (2016). Effect of radiosurgery alone vs radiosurgery with whole brain radiation therapy on cognitive function in patients with 1 to 3 brain metastases: A randomized clinical trial. *Jama*, *316*(4), 401-409.

Brown P. D., Gondi V., Pugh S., Tome W. A., Wefel J. S. … Stea B. (2020). Hippocampal Avoidance During Whole-Brain Radiotherapy Plus Memantine for Patients With Brain Metastases: Phase III Trial NRG Oncology CC001. *Journal of Clinical Oncology.* doi:10.1200/JCO.19.02767

Brown, P. D., Pugh, S., Laack, N. N., Wefel, J. S., Khuntia, D., Meyers, C., … Kavadi, V. (2013). Memantine for the prevention of cognitive dysfunction in patients receiving whole-brain radiotherapy: A randomized, double-blind, placebo-controlled trial. *Neuro-oncology*, *15*(10), 1429-1437.

Chang, E. L., Wefel, J. S., Hess, K. R., Allen, P. K., Lang, F. F., Kornguth, D. G., … Meyers, C. A. (2009). Neurocognition in patients with brain metastases treated with radiosurgery or radiosurgery plus whole-brain irradiation: A randomised controlled trial. *The Lancet Oncology*, *10*(11), 1037-1044.

Ewend, M. G., Morris, D. E., Carey, L. A., Ladha, A. M., & Brem, S. (2008). Guidelines for the initial management of metastatic brain tumors: role of surgery, radiosurgery, and radiation therapy. *Journal of the National Comprehensive Cancer Network*, *6*(5), 505-514.

Lal, L. S., Byfield, S. D., Chang, E. L., Franzini, L., Miller, L. A., Arbuckle, R., … Swint, J. M. (2012). Cost-effectiveness analysis of a randomized study comparing radiosurgery with radiosurgery and whole brain radiation therapy in patients with 1 to 3 brain metastases. *American Journal of Clinical Oncology*, *35*(1), 45-50.

Lal, L. S., Franzini, L., Panchal, J., Chang, E., Meyers, C. A., & Swint, J. M. (2011). Economic impact of stereotactic radiosurgery for malignant intracranial brain tumors. *Expert Review of Pharmacoeconomics & Outcomes Research*, *11*(2), 195-204.

Mahajan, A., Ahmed, S., McAleer, M. F., Weinberg, J. S., Li, J., Brown, P., … McGovern, S. (2017). Post-operative stereotactic radiosurgery versus observation for completely resected brain metastases: A single-centre, randomised, controlled, phase 3 trial. *The Lancet Oncology, 18*(8), 1040-1048.

National Comprehensive Cancer Network. (2021). *Central Nervous System Cancers* (NCCN Guideline Version 2.2021). Retrieved from https://www.nccn.org/professionals/physician_gls/pdf/cns.pdf

Patchell, R. A., Tibbs, P. A., Regine, W. F., Dempsey, R. J., Mohiuddin, M., Kryscio, R. J., … Young, B. (1998). Postoperative radiotherapy in the treatment of single metastases to the brain: A randomized trial. *Jama*, *280*(17), 1485-1489.

Patchell, R. A., Tibbs, P. A., Walsh, J. W., Dempsey, R. J., Maruyama, Y., Kryscio, R. J., … Young, B. (1990). A randomized trial of surgery in the treatment of single metastases to the brain. *New England Journal of Medicine, 322*(8), 494-500.

Patchell, R. A. (2003). Cancer treatment reviews. The management of brain metastases. *29*(6), 533-540.

DEVELOPMENT CREDITS

This practice algorithm is based on majority expert opinion of the Brain Metastasis workgroup at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

Core Development Team Leads

Ecaterina E. Dumbrava, MD (Investigational Cancer Therapeutics)

Frederick F. Lang, MD (Neurosurgery)

Jing Li, MD (Radiation Oncology)

Hussein Tawbi, MD, PhD (Melanoma Medical Oncology)

Workgroup Members

Thomas Beckham, MD, PhD (Radiation Oncology)
Caroline Chung, MD (Radiation Oncology)
Michael Davies, MD, PhD (Melanoma Medical Oncology)
Sherise Ferguson, MD (Neurosurgery)
Olga N. Fleckenstein, BS♦
Isabella Glitza Oliva, MD, PhD (Melanoma Medical Oncology)
Betty Kim, MD, PhD (Neurosurgery)
Cheryl Martin, ADN, BSN, MS, RN (Neurosurgery)
Rashmi Murthy, MD (Breast Medical Oncology)
Alissa Nguyen, MSN, RN (Radiation Oncology)
Barbara O'Brien, MD (Neuro-Oncology)
Amy Pai, PharmD♦
Jordi Rodon, MD, PhD (Investigational Cancer Therapeutics)
Gisela Sanchez, MSN, APRN, ANP-BC (Radiation Oncology)
Komal Shah, MD (Neuroradiology)
Todd Swanson, MD, PhD (Radiation Oncology)
Jianbo Wang, MD, PhD (Genitourinary Medical Oncology)
Michael Wang, MD (Lymphoma/Myeloma)
Jeffrey Wefel, PhD (Neuropsychology)
Jeffrey Weinberg, MD (Neurosurgery)

♦ Clinical Effectiveness Development Team