PRACTICE AID

Treatment Recommendations for Glioblastoma: NCCN Guidelines Summary[1]

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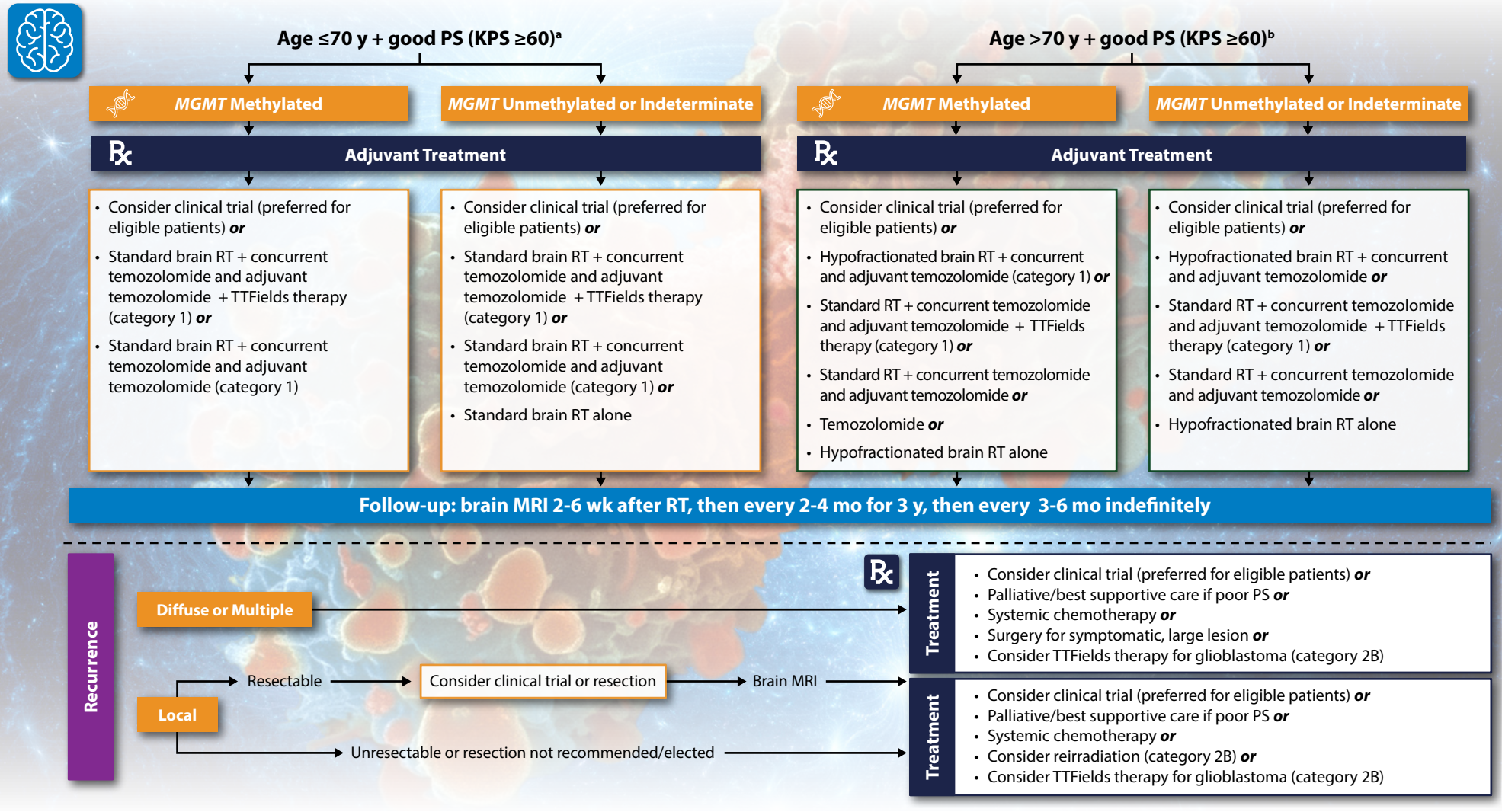

[a] For patients with poor PS (KPS <60), adjuvant treatment consists of hypofractionated brain RT (preferred) ± concurrent or adjuvant temozolomide, or temozolomide, or palliative/best supportive care; and follow-up consists of brain MRI 2-6 wk after RT, then every 2-4 mo for 3 y, then every 3-6 mo indefinitely. [b] For patients with poor PS (KPS <60), adjuvant treatment consists of hypofractionated brain RT, or temozolomide, or palliative/best supportive care; and follow-up consists of brain MRI 2-6 wk after RT, then every 2-4 mo for 3 y, then every 3-6 mo indefinitely.

KPS: Karnofsky Performance Score; MGMT: O6-methylguanine-DNA methyltransferase; PS: performance score; RT: radiotherapy; TTFields: tumor treating fields.

1. NCCN Clinical Practice Guidelines in Oncology. Central Nervous System Cancers. Version 1.2019. https://www.nccn.org/professionals/physician_gls/pdf/cns.pdf. Accessed August 20, 2019.

Access the activity, "Readying the Modern Radiation Oncology Practice for Incorporation of a Fourth Modality in Cancer Treatment: Understanding the Science, Evidence, & Clinical Application Across a Range of Solid Malignancies," at **PeerView.com/RadOnc19.**

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Treatment Options for Malignant Pleural Mesothelioma (MPM)

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What Are the Options Available for Patients With MPM?

For patients with disease limited to one hemithorax, limited or no nodal metastases, and good performance status, and who can undergo a gross macroscopic resection

- Extended pleurectomy/decortication or extrapleural pneumonectomy ± intraoperative/adjuvant treatment
- Neoadjuvant or adjuvant chemotherapy

For patients who are not candidates for extended pleurectomy/decortication or extrapleural pneumonectomy

- Pemetrexed-based regimen
  - Pemetrexed with cisplatin (good performance status)
  - Pemetrexed with carboplatin (palliative setting)
- Addition of bevacizumab

For patients with unresectable, locally advanced or metastatic MPM in the first-line setting

- FDA approved TTFields therapy in combination with pemetrexed plus platinum-based chemotherapy (Humanitarian Device Exemption)

NCCN Guidelines[1,a]

First-line chemotherapy regimens

- Pemetrexed 500 mg/m^2 and cisplatin 75 mg/m^2 on day 1 every 3 weeks (category 1)
- Pemetrexed 500 mg/m^2, cisplatin 75 mg/m^2, and bevacizumab 15 mg/kg on day 1 every 3 weeks for 6 cycles followed by maintenance bevacizumab 15 mg/kg every 3 weeks until disease progression[b] (category 1)
- Pemetrexed 500 mg/m^2, carboplatin AUC 5 ± bevacizumab 15 mg/kg on day 1 every 3 weeks for 6 cycles ± maintenance bevacizumab 15 mg/kg given with pemetrexed and carboplatin every 3 weeks until disease progression[b]
- Gemcitabine 1,000-1,250 mg/m^2 on days 1, 8, and 15 and cisplatin 80-100 mg/m^2 on day 1 in 3- to 4-week cycles
- Pemetrexed 500 mg/m^2 every 3 weeks
- Vinorelbine 25-30 mg/m^2 weekly

Second-line systemic options

- Pemetrexed (if not administered as first-line treatment) (category 1)
- Vinorelbine
- Gemcitabine
- Nivolumab ± ipilimumab
- Nivolumab
- Pembrolizumab

[a] All recommendations are category 2a unless otherwise specified. [b] The combination regimens of pemetrexed, cisplatin, and bevacizumab or pemetrexed, carboplatin, and bevacizumab are only for unresectable disease.
TTFields: tumor treating fields.

1. NCCN Clinical Practice Guidelines in Oncology. Malignant Pleural Mesothelioma. Version 2.2019. https://www.nccn.org/professionals/physician_gls/pdf/mpm.pdf. Accessed August 20, 2019.

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Tumor Treating Fields (TTFields): A New Modality for Treating Cancer

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What are TTFields?

TTFields are alternating electric fields that are tuned to specific frequencies to disrupt cell division, inhibiting tumor growth and causing affected cancer cells to die.

How do TTFields work?

TTFields therapy is administered via a wearable medical device with transducer arrays, which is placed based on the location of the tumor.

Effects on Cells Are Frequency Specific and Inversely Related to Cell Size[1-4]

TTFields Frequencies

Normal intestine	Breast cancer	Mesothelioma	Pancreatic cancer	NSCLC	Ovarian cancer	GBM	SCLC
~50 kHz	120 kHz	150 kHz	150 kHz	150 kHz	200 kHz	200 kHz	240 kHz

Integrating TTFields Therapy Into Clinical Practice: Factors to Consider

Training on TTFields Device

- Device support specialists/nurses provide training in the patients' homes
- Comprehensive initial visit: discussion of array placement, equipment use, and skin care
- Monthly visits thereafter: downloading of compliance reports that show patients how many hours of therapy they received each day
- Phone or in-person support as needed

Patient Factors

- Positioning of transducer arrays is individualized for every patient
- Patient education and compliance with wearing the device are critical
- Continuous monitoring is necessary

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Tumor Treating Fields (TTFields): A New Modality for Treating Cancer

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Selected Ongoing Trials of TTFields[5]

Study Arm	TTFields with immune checkpoint inhibitor or docetaxel (LUNAR)	Standard radiosurgery followed by continuous TTFields (METIS)	TTFields with nab-paclitaxel and gemcitabine (PANOVA-3)	TTFields with weekly paclitaxel (INNOVATE-3)	TTFields with sorafenib (HEPANOVA)	TTFields with pembrolizumab and adjuvant temozolomide (2-THE-TOP)	TTFields with adjuvant temozolomide (FORWARD)	TTFields with bevacizumab	TTFields with bevacizumab	TTFields with bevacizumab and temozolomide	TTFields with nivolumab and ipilimumab	TTFields
Tumor	NSCLC	Brain metastasis of NSCLC	Pancreatic	Ovarian	HCC	GBM	Astrocytoma	GBM	GBM	GBM	Brain metastasis of melanoma	Brain metastasis of SCLC
NCT No.	NCT02973789	NCT02831959	NCT03377491	NCT03940196	NCT03606590	NCT03405792	NCT03906448	NCT02663271	NCT01894061	NCT02343549	NCT03903640	NCT03995667
Trial Phase	3	3	3	3	2	2	2	2	2	2	2	N/A
Patient Population	Stage IV NSCLC following progression while on or after platinum-based treatment	Advanced NSCLC with brain metastases	Newly diagnosed, locally advanced pancreatic cancer	Platinum-resistant ovarian cancer	Advanced HCC	Newly diagnosed GBM	Newly diagnosed grade II and III astrocytoma	Bevacizumab-refractory GBM	Bevacizumab-naïve patients with recurrent GBM	Newly diagnosed unresectable GBM	Melanoma with brain metastasis	Patients with limited- or extensive-stage SCLC

GBM: glioblastoma multiforme; HCC: hepatocellular carcinoma; NSCLC: non–small cell lung cancer; SCLC: small cell lung cancer; TTFields: tumor treating fields.

1. Gutin PH, Wong ET. *Am Soc Clin Oncol Educ Book*. 2012;32:126-131. 2. Kirson ED et al. *Proc Natl Acad Sci USA*. 2007;104:10152-10157. 3. Gutin PH, Wong ET. *Am Soc Clin Oncol Educ Book*. 2012;32:126-131. 4. Kirson ED et al. *Proc Natl Acad Sci USA*. 2007;104:10152-10157. 5. https://clinicaltrials.gov. Accessed August 28, 2019.

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