Molecular diagnosis and treatment of meningiomas: an expert consensus (2022)

Supplementary Table 1: Molecular characteristics of meningioma subtypes in WHO classification 2021.

Items	Subtypes	Common mutations	CNVs
WHO grade 1	Meningothelial	*AKT1* (/*TRAF7*), *SMO*	del 22q
	Fibroblastic	*NF2*	del 22q
	Transitional	*NF2*	del 22q
	Secretory	*KLF4*/*TRAF7*[*]	Unknown
	Psammomatous	*NF2*	del 22q
	Metaplastic	*NF2*	gain 5
	Microcystic	*NF2*	gain 5
	Angiomatous	*NF2*	gain 5
	Lymphoplasmacyte-rich	Unknown	Unknown
WHO grade 2	Atypical	*NF2*	del 1p, del 22q, del 14q
	Chordoid	None	del 2p
	Clear cell	*SMARCE1*	None
WHO grade 3	Anaplastic	*NF2*, *TERT* promoter[*]	del 1p, 10, 14, 22q, homo del *CDKN2A/B*[*]
2016 WHO grade 3	Rhabdoid	*BAP1*	*BAP1* locus
	Papillary	*PBRM1*	No specific

[*] Novel molecular criterion for subtypes, besides histology features, in WHO classification 2021. CNVs: Copy number variations; del: Deletion; homo del: Homozygous deletion; WHO: World Health Organization.

Supplementary Table 2: Categories of evidence of CSCO clinical practice guidelines.

Level of evidence			
Categories	Quality of level	Evidence sources	CSCO expert consensus
1A	High	Based on data from well-structured and rigorously controlled meta-analysis, and/or large-scale, randomized controlled clinical trials.	Uniform consensus achieved (support level: ≥80%).
1B	High	Based on data from well-structured and rigorously controlled meta-analysis, and/or large-scale, randomized controlled clinical trials.	Consensus achieved with minimum disagreement (support level: 60%–80%).
2A	Relatively low	Based on data from meta-analysis, small-scale randomized controlled trials, well-designed large-scale retrospective studies, and/or case-control studies.	Uniform consensus achieved (support level: ≥80%).
2B	Relatively low	Based on data from meta-analysis, small-scale, randomized controlled trials, well-designed large-scale retrospective studies, and/or case-control studies.	Consensus achieved with minimum disagreement (support level: 60%–80%).
3	Low	Based on data from single-arm clinical studies, case reports, and/or expert opinions.	No consensus reached and had major disagreement (support level: <60%).

CSCO: Chinese Society of Clinical Oncology.

Supplementary Table 3: Criteria for the recommendation grades of Chinese Society of Clinical Oncology (CSCO) clinical practice guidelines.

Recommendation grades	Criteria
Grade I	Evidence level 1A and some Evidence level 2A: Grade I recommendations include Evidence level 1A and some Evidence level 2A which obtained high consensus from the expert panel and have suitable applicability for Chinese patients with meningiomas. Specifically, in the CSCO Guidelines, Grade I recommendations include the following: universally acceptable measures with clear indications for diagnosis and treatment, which have adequate applicability for Chinese patients with meningiomas, and are included in the National Reimbursement Drug List (NRDL). The priority for allocating Grade I recommendations is solely for the benefits of the patients and is independent of the changes of commercial medical insurance.
Grade II	Evidence level 1B and some Evidence level 2A: Grade II recommendations include Evidence level 1B and some Evidence level 2A which obtained satisfactory consensus with minimum disagreements from the expert panel and has limited applicability for Chinese patients with meningiomas. Specifically, Grade II recommendations include the following: high-level evidence provided by multi-center studies that have been randomly controlled on internationally or domestically (in China), but may have limited applicability for Chinese patients or low potency ratio, in addition to drugs or treatments that may exceed the purchasing power of the general public; treatments that are expensive but may have substantial benefits for the patients are also regarded as Grade II recommendations.
Grade III	Evidence level 2B and 3: Despite lack of strong evidence-based data, however, these are recommendations that have obtained satisfactory consensus with minimum disagreements from the expert panel and are provided as a reference for medical personnel usage.
Not recommended/objection	Recommendations for which the expert panel has uniform consensus that there are adequate evidences to prove that the drugs or medical technologies do not have sufficient benefits or may even cause harm to Chinese patients. These are labeled as “experts do not recommend” or, when applicable as “experts’ disapproval”. It can be allocated to any grade recommendations.