Best practices in neurosurgery

- Radiation Therapy for WHO Grade 4 Adult-Type Diffuse Glioma: An ASTRO Clinical Practice Guideline
- The GREENBEAN checklist for reporting studies evaluating the effectiveness of EEG-based biomarkers
- IMAGING OVER-DIAGNOSIS OF LOW BACK PAIN IN PRIMARY CARE
- Implementing best practice for peripheral intravenous cannula use in Australian emergency departments: a stepped-wedge cluster-controlled trial and health economic analysis protocol
- Revised European Society of Endocrinology Clinical Practice Guideline for the management of aggressive pituitary tumours and pituitary carcinomas
- The transformative power of telemedicine in delivering effective neurosurgical care in low and middle-income countries: A review
- Diagnosis and Management Guidelines for Moyamoya Disease
- Standardization and accuracy of race and ethnicity data: Equity implications for medical AI

1. Preoperative Evaluation and Surgical Planning

Detailed neuroimaging analysis (MRI with contrast, tractography, CT, angio when needed).

Multidisciplinary case discussion in tumor boards or vascular meetings, when appropriate.

Use of navigation systems, intraoperative monitoring, and functional mapping for eloquent areas.

Patient-specific neurosurgical plans based on comorbidities, functional status (KPS), and prognosis.

2. Intraoperative Best Practices

Surgical checklists and timeouts (WHO Surgical Safety Checklist).

Meticulous microsurgical technique: Respect for neural and vascular structures.

Hemostasis and clean dissection planes: reduce risk of infection, edema, or reoperation.

Minimally invasive approaches when safe and appropriate.

3. Postoperative Management and Follow-up

Early postoperative imaging when indicated (e.g., within 24–72h for tumor resection).

Close neurological monitoring in the ICU/step-down for high-risk cases.

Clear criteria for escalation of care: worsening deficits, hydrocephalus, CSF leak, etc.

Structured follow-up schedule with imaging and functional assessment.

4. Documentation and Communication

Structured operative notes: approach, findings, complications, implants, resection extent.

Daily progress notes with focused neuro exam.

Clear handoffs using SBAR or similar protocols.

Timely discharge summaries ensure continuity of care.

5. Education, Mentorship, and Simulation

Teach step-by-step decision making, not just techniques.

Promote anatomical lab dissection and simulation training (esp. for junior residents).

Encourage question-driven learning, case-based discussions, and morbidity/mortality sessions.

Use intraoperative teaching moments wisely — without compromising safety.

6. Patient-Centered and Ethical Practice

Transparent risk–benefit discussion with patients and families, especially for high-risk or palliative cases.

Avoid “indication creep”: operate only when the benefit clearly outweighs the risk.

Respect for autonomy: shared decision-making is key, even when patients choose not to operate.

7. Quality Assurance and Morbidity/Mortality Review

Regular M&M conferences with root cause analysis, not blame.

Track key metrics: infection rate, reoperation rate, readmissions, and long-term outcomes.

Use complication grading systems (e.g., Clavien-Dindo adapted to neurosurgery).

Actively participate in quality improvement projects.

8. Research and Lifelong Learning

Stay updated on clinical trials and evolving technologies (e.g., AI, robotics, focused ultrasound).

Contribute to publications, clinical databases, or registries.

Critical appraisal of literature is a core skill for surgeons, not just academics.

Encourage multidisciplinary research (oncology, radiology, rehab, etc.).

9. Neuro-navigation and Technological Integration

Use intraoperative tools wisely: neuronavigation, 5-ALA, ultrasound, IOM, endoscopy.

Ensure training and team familiarity with the equipment (OR staff included).

Adapt technology to the patient, not the other way around.

10. Teamwork and Leadership

Promote a culture of mutual respect in the OR and the ward.

Empower nurses and scrub techs to raise safety concerns.

Support residents and junior staff emotionally and academically.

Lead by example in humility, precision, and continuous improvement.

see Neurosurgical Practice Guidelines.

A best practice is a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things, e.g., a standard way of complying with legal or ethical requirements.

Clinicians' trust level of evidence 1 recommendations, issued on preponderantly solid randomized clinical trials (RCTs), to guide best practice decision-making. However, sometimes physicians following one clinical practice guideline (CPG) find themselves in a situation in which they do not follow another, issued on the same strong evidence base. The aim of Volovici et al. is to reflect on the consistency of recommendations in different guidelines (between-guideline consistency). They also consider within-guideline consistency (or durability), defined as the number of recommendations carried over from one edition to another in consecutive editions of the same CPG. For illustration purposes, they use two examples: hypertension guidelines and traumatic brain injury guidelines. They conclude that just like research, CPGs also need to have between-guideline and within-guideline consistency (akin to the reproducibility of studies). Clinicians and researchers should take into account the lower consistency of guidelines that are not based on at least one strong RCT [1].

In an attempt to improve and standardize the use of cervical traction in pediatric patients, the authors have identified 49 best-practice recommendations, which were generated by reaching consensus among a multidisciplinary group of pediatric spine experts using a modified Delphi technique. Further study is required to determine if the implementation of these practices can lead to reduced

complications and improved outcomes for children [2].

The majority of surgeons obtain preoperative head CTs in Patients With Craniosynostosis, whereas only 25% obtain CTs postoperatively, often to evaluate outcomes. Because outcomes may be evaluated clinically, this is a poor use of resources and exposes children to radiation. Consensus guidelines are needed to create best practices and limit unnecessary studies [3]

1)
Volovici V, Steyerberg EW. Lost in translation between evidence and recommendations: Expert opinion is needed to define “level I”. World Neurosurg. 2021 Mar 25:S1878-8750(21)00465-4. doi: 10.1016/j.wneu.2021.03.095. Epub ahead of print. PMID: 33775869.
2)
Alexiades NG, Shao B, Braga BP, Bonfield CM, Brockmeyer DL, Browd SR, DiLuna M, Groves ML, Hankinson TC, Jea A, Leonard JR, Lew SM, Limbrick DD, Mangano FT, Martin J, Pahys J, Powers A, Proctor MR, Rodriguez L, Rozzelle C, Storm PB, Anderson RCE. Development of best practices in the utilization and implementation of pediatric cervical spine traction: a modified Delphi study. J Neurosurg Pediatr. 2021 Apr 2:1-12. doi: 10.3171/2020.10.PEDS20778. Epub ahead of print. PMID: 33799292.
3)
Makar KG, Garavaglia HE, Muraszko KM, Waljee JF, Vercler CJ, Buchman SR. Computed Tomography in Patients With Craniosynostosis: A Survey to Ascertain Practice Patterns Among Craniofacial Surgeons. Ann Plast Surg. 2021 Feb 12. doi: 10.1097/SAP.0000000000002751. Epub ahead of print. PMID: 33587463.