WHO Surgical Safety Checklist, Never Events and Neurosurgical Patient Marking

The SBNS is keen to reduce the occurrence of "never events", including wrong site surgery. The adverse effects on patients suffering from wrong site surgery are potentially devastating and all surgeons must take adequate steps to minimise the occurrence of wrong site surgery. The SBNS recognises that there are situations in which wrong site surgery can occur despite all suitable precautions having been taken.

In 2008, the WHO published the **WHO surgical safety checklist and implementation manual** and the SBNS is supportive of the WHO initiative and supports the adaptation of the checklist to local needs.

The WHO FAQs are available HERE and give some information on the evidence base for the adoption of the checklists.

NHS England "Never Events" are also relevant and surgeons should be aware of the relevance to Neurosurgical practice.

Many Trusts will have local policies and surgeons should be aware of these.

Marking of Neurosurgical patients:

1. Laterality

Where Trusts have a specific local policy, this should be adhered to.
Marking in Neurosurgery poses particular challenges but the SBNS recommends the following:

- An indelible pen marking as close as possible to the incision site, preferably remaining visible after draping, and making the laterality obvious to the surgeon and theatre staff. The choice of mark must avoid ambiguity, for example an arrow should point to the side of a radiculopathy.
- Laterality should be confirmed from reliable documentation, imaging and where possible may involve the patient or family members.
- Marking performed by operating surgeon, or nominated deputy, who will be present in theatre and at the pre-operative team brief and timeout.
- Marking should be done before transfer to theatre and before pre-med.
- Marking should be verified, and signed off, at each transfer, by members of the theatre team and the marking and laterality (and levels in the spine) confirmed by members of the theatre team prior to the start of surgery and after positioning on the operating table and confirmed against the consent form.
- Unless there is good reason, all patients should have a preoperative mark.
  Some examples where marking may not be necessary include:
  Emergency surgery where a delay will be detrimental
  Bilateral surgery eg bilateral burr holes, bilateral DBS
  Midline approaches to midline or bilateral structures/pathology e.g. intramedullary spinal cord, lumbar canal stenosis, trans-sphenoidal surgery.
  Mucous membranes

The SBNS recommends that where there are situations where any doubt as to the laterality of an approach, that the patient is suitably marked.

Stereotactic and Image Guided Surgery. Despite the use of stereotaxy, the possibility exists for the wrong sided approaches to be used. The SBNS recommends that where this remains a possibility, that the patient is marked preoperatively as for other non-image guided operations.

2. Intra-operative spinal level localisation

The SBNS recommends the following minimum confirmation:

Spinal levels should, where possible, be listed on the Consent form and Theatre list.

Anterior cervical surgery- intraoperative image with a radiopaque marker at the relevant disc space, or pathology, where anatomically possible and the image where possible should include C2 and the marker needle. Occasionally an intermediate level marker may be required. The disc should be incised under direct vision prior to marker removal.

Posterior cervical decompression- Optional pre incision image. Post incision intraoperative image identifying anatomic landmarks at a level of relevant pathology, if anatomically possible with reference to C2 also on the image. Intermediate markers may be required.

Lumbar decompression- in addition to a pre-incision x-ray, an intraoperative image is also obtained after exposure of the spine, and prior to commencement of fenestration /decompression to confirm the level of surgery, in the inter-laminar or inter-spinous space. This should take into account segmentation abnormalities and must include the lumbo-sacral junction. A third image should be performed at the operated level if the expected pathology is not found.

Posterior thoracic surgery where the pathology is not visible on fluoroscopy- localisation technique will depend on the surgeon's preference and surgical approach but may require sequential images with multiple markers, but should be verified with an independent assistant/radiographer/radiologist. If reliant on counting from C2, T12, 12th rib or lumbosacral junction, the relevant starting point must have been appropriately imaged preoperatively and correlated with the lesion level to ensure counting is correct. Imaging should be performed with markers in the disc space prior to discectomy. Ultrasound may be useful for confirming intra-dural pathology prior to opening the dura.

Anterior thoracic surgery- pre-operative investigations may need to include whole spine MRI and full length radiographs and correlation between them, and operative options include placement of bone anchored wires/needles in conjunction with and verified by a second clinician. Lateral fluoroscopy should be used to confirm the correct level of thoracotomy and to confirm pathology level.

As with any imaging, robust mechanisms should be in place for the correct interpretation of imaging to identify correct level surgery and independent verification of radiological interpretation is encouraged with the surgical assistant, radiographer or radiologist.
All intraoperative images must be stored for future reference.
In exceptional circumstances where intraoperative imaging is not possible, leaving anatomical markers and abandoning the procedure pending post-operative imaging may be appropriate. If this situation can be anticipated, the consent should include this scenario.