

Acute Neurosurgical Consultation Guidelines

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In all cases, ABC's should be evaluated and treated prior to the application of these guidelines.



If criteria in first step are satisfied, there should be a reasonable expectation of discussion regarding patient transfer.

1 Identify patients eligible for acute transfer

Acute transfer is most often required if a patient meets **at least 1 clinical and 1 imaging criteria** from the lists below:

Clinical criteria

- Penetrating head injury
- Altered LOC not attributable to intoxicants
- High ICP (nausea, vomiting, headache) with altered LOC
- Seizures
- Focal Neurological Deficit (cranial nerve or motor deficit)
- Lateralizing signs (e.g. pupillary dilatation, hemiparesis)

Imaging criteria

- Traumatic intracerebral, acute subdural, or epidural hematoma
- Brain contusion
- Non traumatic brainstem or cerebellar intracerebral hemorrhage (ICH) *(Non traumatic cortical ICH if a vascular malformation is suspected)*
- Penetrating cranial object
- Hydrocephalus
- Non traumatic subarachnoid hemorrhage
- Mass Lesion (posterior fossa lesion, midline shift >3mm, hemorrhage within tumor or significant peri-lesional edema in lesion >3cm)

Unique circumstances that might mandate transfer in absence of access to imaging

- Lateralizing signs & GCS ≤ 8 in institution without access to CT scan
- LP proven subarachnoid hemorrhage (presence of xanthochromia)

2 Stabilization and management

For all pathology, in preparation for transfer:

- Attend to ABC's
- Reverse coagulopathy (INR <1.5)
- Perform neurovitals frequently (q1h)
- Treat hypotension & hypoxia
- Consider medical therapy for elevated ICP
- Judicious use of sedation (short acting drugs preferred)
- Intubate if GCS ≤ 8 or for transport if GCS ≤ 10

3 Consultation

At this stage **contact CritiCall at 1-800-668-4357** for all patients where physician requires a neurosurgical opinion.

Involve your ICU early if applicable

Intensity of care should be discussed with the patient and/or family if prognosis is poor

Stabilization and management appropriate for the pathophysiology should be initiated

4 Disease specific management

Traumatic brain injury

- Give **Dilantin** 15-20mg/kg if documented seizure or GCS ≤ 8
- Give **Mannitol** 1.5g/kg for suspected raised ICP
- **Do not use steroids** for raised ICP
- Assume C-Spine injury and maintain spine precautions
- If penetrating object, stabilize but **do not remove**

Subarachnoid hemorrhage

- Keep patient normotensive, avoid $120 \leq \text{SBP} \leq 180$ (use pressors or antihypertensives as necessary)*
- Consult neurosurgeon prior to giving **Mannitol**

Brain tumors

- **Dilantin** 20mg/kg for documented seizures
- **Decadron** 10mg IV[†] followed by 4mg IV q6h

Intracerebral hemorrhage

- **Dilantin** 20mg/kg for documented seizures
- Manage and set target BP in consultation with neurosurgeon
- Discuss with neurosurgeon the appropriateness of transfer using CT and clinical criteria

* Age-specific blood pressure values apply to paediatric patients.

† Adjust dosage for paediatric patients.

Acute Spine Consultation Guidelines

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In all cases, ABC's should be evaluated and treated prior to the application of these guidelines.



Proceed with next step before contacting CritiCall

1 Stabilization and management

For all pathology, in preparation for transfer:

- Attend to ABC's
- Be mindful of FVC and ventilation in C-Spine injury
- MAP ≥ 85
- For neurogenic shock use **Dopamine** 5-10mcg/kg/min
- Avoid hypotension
- Aggressive pain control
- Perform neurovitals frequently (q1h)
- Judicious use of sedation (short acting drugs preferred)
- Reverse coagulopathy (INR < 1.5)

2 Imaging red flags

If no CT scanner but clinical/radiographic suspicion arises, arrange urgent transfer for proper imaging to closest facility. If significant neurological deficit and abnormalities on plain x-rays, consultation with neurosurgeon recommended prior to CT scan.

CT scan demonstrating at least 1 of the following

- Spinal column fracture
- Subluxation/dislocation of facet joints in cervical spine
- Collapse of vertebral body
- Lumbar disc herniation with significant canal compromise
- Spinal cord compression secondary to new mass

Special considerations

- Patients with new deficit and history of malignant disease should be evaluated by gadolinium enhanced MRI emergently
- If history of trauma and new deficit, patient requires urgent MRI despite negative CT

3 Disease specific management

For all pathologies, images should be **reviewed with an available radiologist prior to CritiCall referral.**

Spinal Cord Injury (SCI)

CT scan is first line imaging modality.

Cervical

- Be vigilant in patients with new deficit and/or significant neck pain after trauma with normal CT scan. These patients require MRI to rule out spinal cord injury without radiographic abnormality.
- Immobilize in hard collar

Thoracolumbar

- Assess bowel and bladder function
- Keep on bedrest with head of bed flat
- Investigate for associated spinal and systemic injuries (e.g. bowel injury, occult spinal injury)

Acute (<48hrs) spinal cord compression (metastatic)

Early symptoms and signs

- Neurologic dysfunction
- Localized tenderness
- Severe unremitting spinal pain
- Nocturnal pain

Management

- Delineate primary lesion if applicable
- Avoid hypotension* (SBP < 100)
- **Dexamethasone** 16mg IV x 1[†]
- Look for lesions, the whole spine must be imaged with MRI + gadolinium

Cauda equina syndrome

Keys to diagnosis

- Post void residual $> 150\text{cc}^*$
- Saddle anesthesia
- Decreased rectal tone
- Bilateral motor weakness

Next steps

- Once clinical diagnosis established, must be corroborated by MRI to establish diagnosis prompting referral.
- Optimize laboratory values (i.e. coagulation) for operative intervention.



Once all steps have been completed, urgently contact CritiCall at 1-800-668-4357

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† Adjust dosage for paediatric patients.