Radiologic Components of mBIG (Rad-mBIG) score: Toolkit for Radiologists

Supporting the Use of Modified Brain Injury Guidelines (mBIG) in Ontario Emergency Departments

This document was developed by the Medical Imaging and Diagnosis Program, Ontario Health, in collaboration with CritiCall Ontario, and the mBIG Medical Imaging Clinical Working Group.

In July 2026, Ontario Health launched the **Use of Modified Brain Injury Guidelines (mBIG) in Ontario Emergency Departments** to support the management of adult patients with traumatic subdural hematoma and traumatic subarachnoid hemorrhage. The Ontario mBIG guideline integrates radiologic and clinical findings to inform decisions related to observation, specialist consultation and referral, and patient disposition. This supplementary document focuses on the radiologic considerations and reporting elements of mBIG.

Important: The radiologic component of mBIG (Rad-mBIG) is based solely on imaging findings and does not represent the patient's final mBIG category.

Radiologic findings represent one component of the overall mBIG category. The determination of a patient's mBIG category requires integration of the radiologic findings with the patient's clinical status, including factors such as Glasgow Coma Scale (GCS), anticoagulant or antiplatelet use, and other relevant clinical findings. Final patient classification and management decisions remain the responsibility of the treating clinical team and should follow local institutional policies.

When does Rad-mBIG score apply?

Assessment of Rad-mBIG score is intended for acute traumatic brain injury when there is a clear traumatic context in patients aged 18+. The use of CT imaging should continue to follow established radiation safety and dose optimization principles, including ALARA (As Low As Reasonably Achievable).

Individual sites should establish a process to ensure that a patient's clinical history of **trauma** is included in the request for CT imaging. This will prompt the radiologist to include an mBIG category in their report. This may include documentation through:

- The imaging request
- An electronic medical record (EMR) field or order indication
- A standardized trauma or mBIG flag
- Verbal communication with the radiologist

What is the Radiologist's role?

The radiologist should provide descriptions and measurements of relevant traumatic CT findings. The key reporting elements are:

- Presence, type, and size of intracranial hemorrhage
- Location and laterality
- Midline shift
- Mass effect and/or herniation
- Skull fracture, including displacement
- Acute, subacute, or chronic appearance where relevant

If a Rad-mBIG score is provided, recommendations regarding the timing of follow-up imaging are not required.

Table 1 below provides additional context. Measurements should be reported in millimetres where applicable.

Should the Radiologist include a Rad-mBIG score in the report?

The inclusion of a Rad-mBIG score will support clinical decision-making and communication for referring and consulting physicians and is highly recommended to include for appropriate traumatic brain injury patients. If a Rad-mBIG score is included, it should follow local institutional reporting practices and should clearly be identified as an imaging-based score that is not presented as the patient's final mBIG category. Referring physicians are expected to read the radiology report in full and should not rely solely on the Rad-mBIG score when determining the final mBIG score.

A suggested disclaimer to include in the report is:
"The Rad-mBIG score is based on imaging findings only and does not represent the patient's final mBIG category. The final mBIG category requires integration of the radiologic findings with the patient's clinical status."

For questions, comments, or concerns related to this Toolkit, please reach out to the Medical Imaging and Diagnosis Program, at **OH-MedicalImaging@ontariohealth.ca**

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Table 1: Radiological Measurements and Reporting for Rad-mBIG

Finding	Report Requirements	Rad-mBIG Score 1	Rad-mBIG Score 2	Rad-mBIG Score 3
Subdural Hematoma (SDH)	• Maximum thickness in millimetres • Laterality (left, right, bilateral, and/or midline) and Location • Acute, subacute, or chronic appearance	≤4 mm	4.1–7.9 mm	≥8 mm or multiple
Epidural Hematoma (EDH)	• Maximum thickness in millimetres • Laterality (left, right, bilateral, and/or midline) and Location • Acute, subacute, or chronic appearance	None	None	Any EDH
Subarchnoid Hemorrhage (SAH)	• Maximum thickness in millimeters • Number of involved sulci, where applicable • Distribution: single hemisphere, bi-hemispheric, supratentorial, perimesencephalic, infratentorial • Laterality and location • Whether appearance is consistent with traumatic/non-aneurysmal SAH	≤3 sulci (total)	>3 sulci AND single hemisphere	>3 sulci AND bi-hemispheric
Intra-parenchymal Hemorrhage (IPH)	• Maximum thickness in millimetres • Number of hemorrhagic foci • Laterality and Location • Acute, subacute, or chronic appearance where relevant	Single focus ≤4 mm	Single focus 4.1–7.9 mm	Multiple foci or ≥8 mm
Intra-ventricular Hemorrhage (IVH)	• Presence or absence of IVH • Location/distribution, and Laterality where relevant • Hydrocephalus if present	None	None	Any IVH
Midline Shift	• Presence or absence of midline shift • Maximum displacement in millimetres • Location/reference point used for measurement where relevant • Associated mass effect	None	None	Any
Mass Effect/ Herniation	• Effacement: Sulcal, Ventricular, Basal cistern • Herniation: Subfalcine, Uncal, Tonsillar • Other clinically significant herniation	None	None	Any
Skull Fracture	• Presence or absence • Laterality and Location • Whether displaced or non-displaced	None	Non-displaced	Displaced

Note: The Rad-mBIG score is determined by the highest applicable imaging finding. The final mBIG category is determined by the treating clinical team after integration of radiologic findings with the patient's clinical status and other relevant clinical factors.

References

Ontario Health. Use of Modified Brain Injury Guidelines (mBIG) in Ontario Emergency Departments. Version 1.1. Toronto (ON): Ontario Health; 2026 Aug. Available from: https://www.criticall.org/wp-content/uploads/2026/08/MBIG_GUIDELINES_V1.1.pdf

Acronyms

Acronym	Definition
ALARA	As low as reasonably achievable
CT	Computed Tomography
ED	Emergency Department
EDH	Epidural Hematoma
EMR	Electronic Medical Record
GCS	Glasgow Coma Scale
IPH	Intraparenchymal Hemorrhage
IVH	Intraventricular Hemorrhage
mBIG	Modified Brain Injury Guidelines
SAH	Subarachnoid Hemorrhage
SDH	Subdural Hematoma