



Use Case Acute Altered Mental Status

Swoop® brings neuroimaging to the patient's bedside.

Acute altered mental status (AMS) refers to the sudden onset of a change in cognitive function or level of consciousness and accounts for up to 10% of complaints in the ED¹ and 11% to 82% in the ICU.² Symptoms may include delirium, depression, dementia, coma, headache, dizziness, and more.

AMS patients require immediate mental status assessment via direct imaging to understand the underlying pathology. The Swoop Portable MR Imaging System™ brings neuroimaging to the patient's bedside and is poised to potentially accelerate diagnosis of the underlying cause of AMS, improve workflow, and decrease treatment time.

Potential Benefits

- **Reduced time to diagnosis:** We estimate that Swoop scan results are available **at least 3 to 7 hours** earlier than those from conventional MRI.³
- **Reduced patient care interruption:** Typical patient transport to an MRI suite can take **2 to 3 hours**.^{4,5} During this time, the patient's care is interrupted, and their clinical condition may deteriorate. Additionally, the prolonged reduction in ICU nursing staff may have adverse effects upon other ICU patients.
- **Reduced adverse events associated with patient transport:** Adverse events occur in **up to 79%** of transported patients.⁶ In addition to the clinical risks, one study showed an additional \$2,000 in cost due to length of stay and therapy.⁷
- **Reduced costs associated with length of stay:** Shortening the time to diagnosis, avoiding interruptions in care, and preventing adverse events should help reduce ED and ICU lengths of stay. For example, if ICU care costs \$300 per hour,⁸ a five-hour reduction in ICU length of stay would save \$1,500.
- **Optimized staffing in the ICU and ED:** Patient transportation to and from an MRI suite is time-consuming for ED and ICU staff (i.e., nursing, respiratory therapist, anesthesia, transport, and practitioner).
- **Reduced exposure to ionizing radiation:** Ionizing radiation from CT used for serial follow-up scans poses additional risks for patients, especially pediatric populations,⁹ as well as the staff.

Case Studies

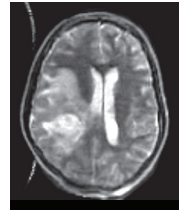
At the patient's bedside, the Swoop system can quickly identify actionable causes of acute altered mental status such as intraparenchymal hemorrhage, intraventricular hemorrhage, new mass lesions, extra-axial hematoma/collection, acute hydrocephalus, and stroke.

Presentation: **Post-Op Coma**

Cause: **Hemorrhage**

Age: **Elderly Adult**

Summary: Swoop images obtained in the ICU showed a large hemorrhage requiring immediate neurosurgical evacuation.



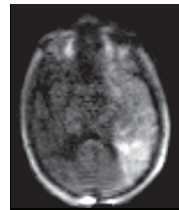
T2

Presentation: **Admitted to ICU. Patient unstable with progressing symptoms.**

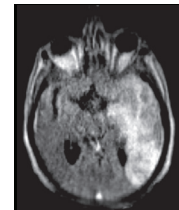
Cause: **Infarct**

Age: **Adult**

Summary: Swoop images obtained in the ICU showed a new acute infarct superimposed upon a previously documented infarct.



DWI



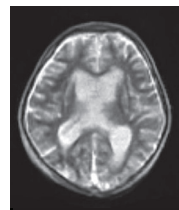
FLAIR

Presentation: **Headache**

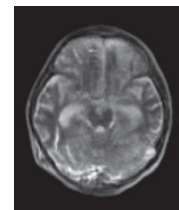
Cause: **Enlarged Ventricles**

Age: **Pediatric**

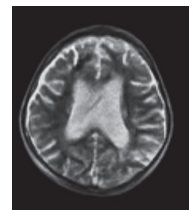
Summary: Swoop images obtained in the neurosurgery clinic demonstrated ventricular catheter (without artifact from valve) and enlarged ventricles. Clinicians immediately performed a shunt revision, preventing radiation exposure from CT and a delay in treatment.



T2



T2



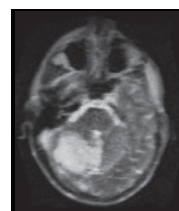
T2

Presentation: **Dizziness**

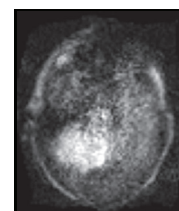
Cause: **Mass Lesion**

Age: **Adult**

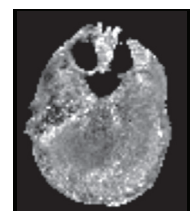
Summary: Swoop images obtained in the ED demonstrated an abnormal mass lesion in the right cerebellum. Unlike CT, diffusion imaging with the Swoop system enables the precise diagnosis of acute stroke, allowing immediate admission to the hospital for treatment.



T2



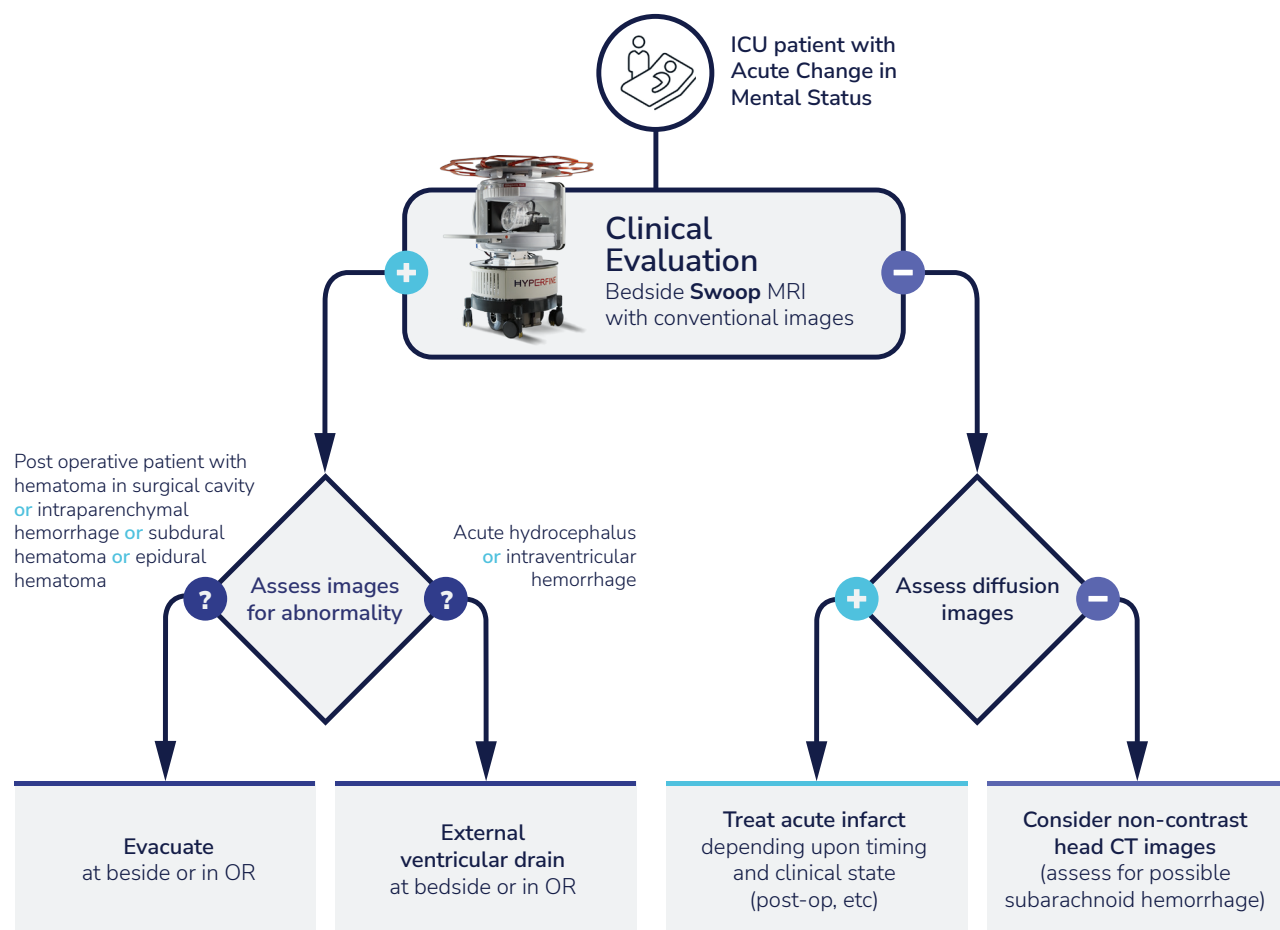
DWI



ADC

How will AMS be evaluated with the Swoop Portable MR Imaging System?

Diagnosing and treating acute change in mental status in an ICU with the Swoop Portable MR Imaging System.



1. Luttrull, M. D. et al. J Am Coll Radiol 16, S26–S37 (2019). <https://doi.org/10.1016/j.jacr.2019.02.024>
2. Sutter, R. et al. in Brain Disorders in Critical Illness: Mechanisms, Diagnosis, and Treatment (eds. Stevens, R. D. et al.) 1–14 (Cambridge University Press, 2013). <https://books.google.com/books?id=CZnqAAAAQBAJ&printsec=frontcover>
3. Customer data on file at Hyperfine.
4. Customer data on file at Hyperfine.
5. Brunsveld-Reinders, A. H. et al. Crit Care 19, 214 (2015). <https://doi.org/10.1186/s13054-015-0938-1>
6. Jia, L. et al. Crit Care 20, 12 (2016). <https://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1183-y>
7. Mello, M. M. et al. Journal of Empirical Legal Studies 4, 835–860 (2007). <https://doi.org/10.1111/j.1740-1461.2007.00108.x>
8. Gylmarm, M. Crit Care Med 23, 964–972 (1995). <https://doi.org/10.1097/00003246-199505000-00028>
9. FDA (2018). <https://www.fda.gov/radiation-emitting-products/medical-x-ray-imaging/what-are-radiation-risks-ct>

Swoop Portable MR Imaging System

Hyperfine designed the Swoop system to address the limitations of current imaging technologies and make MR imaging accessible anytime, anywhere, and to any patient.

Ready to scan in less than two minutes, the system produces its first images just minutes after that, enabling care decisions without the need for patient transport to radiology.

Small and highly portable, the system is ideal for use in the ICU, ED, or anywhere else patients are in need—even pediatric, stroke, and COVID-19 units.

Designed to fit inside elevators and through 34-inch doors, the Swoop system effortlessly maneuvers through crowded healthcare environments to a patient's bedside at the point of care. Imaging sequences include T1, T2, FLAIR, and DWI (and accompanying ADC map).

1. AI Enabled

The Swoop system automatically maps and corrects for electromagnetic interference within the imaging environment. The result is crisp, clear T1, T2, FLAIR, and DWI (with ADC map) sequences. Advanced AI Applications also offer automated and auto-aligned brain volume measurements, ventricular volume, and midline shift.

2. Power Supply

The Swoop system plugs into a standard 120V wall outlet and is ready to scan in less than two minutes. Astonishingly efficient, the system uses just 900 watts, about the same power as a coffee maker.

3. Transfer Bridge

Unfold the transfer bridge for easy bedside patient loading. Fold the bridge back up to move the system to your next patient.

4. Gauss Guard

Even in a crowded health care environment, the system assures safety with a convenient 62-inch diameter 5 gauss guard that quickly expands and contracts.

5. Shield Door

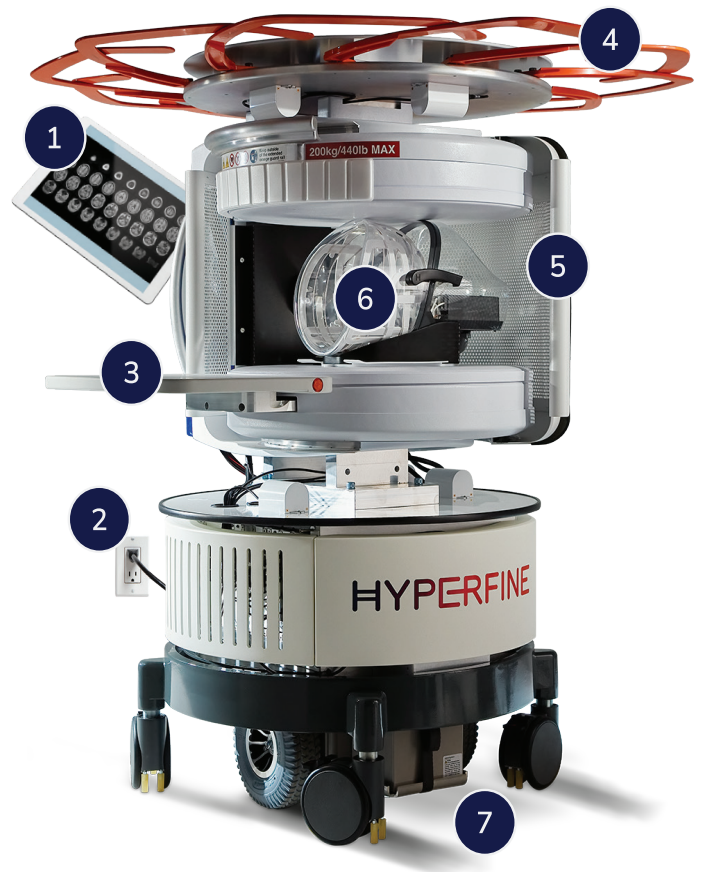
Operation requires no external shielding with built-in continuous 'noise cancellation' of electromagnetic interference and the specific design of our aluminum screen.

6. Head Coil

An 8-channel removable head coil comes encased in clear, durable, and easy-to-disinfect polycarbonate plastic.

7. Casters and Joystick

The Swoop system effortlessly glides between patients, courtesy of a joystick and powered drive wheels.



Indications for Use: The Swoop Portable MR Imaging System is a bedside magnetic resonance imaging device for producing images that display the internal structure of the head where full diagnostic examination is not clinically practical. When interpreted by a trained physician, these images provide information that can be useful in determining a diagnosis.

HYPERFINE

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