

For almost 2 million years, the Great Lakes area of Michigan was intermittently covered by glaciers during a period called the Ice Age. Sea level dropped as much as 492 feet as water was locked in glacial ice and continental ice sheets covered as much as 30 percent of the earth's land surface. Nearly all of the landforms, hills, lakes, and rivers of southeast Michigan were formed during the retreat of the last continental glacier.



You and your team suddenly find yourselves at the top of one of these glaciers, towering thousands of feet above what would eventually become the top of the Detroit Renaissance Center. Some of you feel short of breath. Some have headaches.

References

1. Gifts of the Glaciers – www.oaklandcountyblog.com



References to ruminate on en route to this station:

1. Auerbach, P. Field Guide to Wilderness Medicine, 4th Ed. Chapter 1, High Altitude Medicine. Elsevier. 2013
2. Wipplinger, F, et al. *Point-of-Care Ultrasound Diagnosis of Acute High Altitude Illness: A Case Report*. Wilderness & Environmental Medicine, 2021
[https://www.wemjournal.org/article/S1080-6032\(21\)00003-X/fulltext](https://www.wemjournal.org/article/S1080-6032(21)00003-X/fulltext)
3. Yang W, et al. *Lung Ultrasound Is Accurate for the Diagnosis of High-Altitude Pulmonary Edema: A Prospective Study*. Canadian Respiratory Journal, 2018
4. Raffiz, M. *Optic nerve sheath diameter measurement: a means of detecting raised ICP in adult traumatic and non-traumatic neurosurgical patients*. Am J Emer Med, 2017
5. Copetti R and Cattarossi L. *Optic nerve ultrasound: artifacts and real images*. Intensive Care Medicine, 2009

Station 2: Elevation Station



1 Point At the peak of the last ice age (only ~20,000 years ago), how much ice would have been above your head right here on Belle Isle?

1 Point As you ascended the glacier, you noticed one of your teammates developing symptoms concerning for acute mountain sickness. Name 5 of the symptoms that are part of the Lake Louise Score for the diagnosis of AMS.

1 Point

1 Point What feature(s) distinguish acute mountain sickness from HACE? What is the definitive treatment for both?

1 Point Identify and demonstrate proper technique for assessing elevated intracranial pressure on POCUS

1 Point What is the most common pitfall when performing an ultrasound measurement for elevated intracranial pressure? How can one assure they are measuring the correct structure?

1 Point What other eye emergencies commonly occur at very high altitude?

Hypoxia triggers hypoxic pulmonary vasoconstriction, which leads to marked increase in pulmonary artery pressures (pulm HTN), leakage of fluid into alveoli, and non-cardiogenic pulmonary edema.

1 Point What echocardiography findings would you expect to see with HAPE? (Demonstrate on your teammate how you would assess with TAPSE)

1 Point

1 Point How do you treat HAPE?