

Rural Track Module: Dehydration and Illnesses of the Mountains

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Abstract and Aim

Abstract:

Much of rural Colorado resides at high altitude where there is a decrease in temperature, ambient humidity, and partial pressure of oxygen. Such environmental features can become maladaptive and cause dehydration. Further illness risks accompany Colorado mountain towns because of weather exposures, physical exertion events taking place in the mountains, and patient co-morbidities less tolerant to altitude change. Dehydration is a significant source of morbidity and mortality as both a symptom and primary disorder under these conditions. It requires management appropriate to patient presentation during diagnosis and treatment of the underlying disorder.

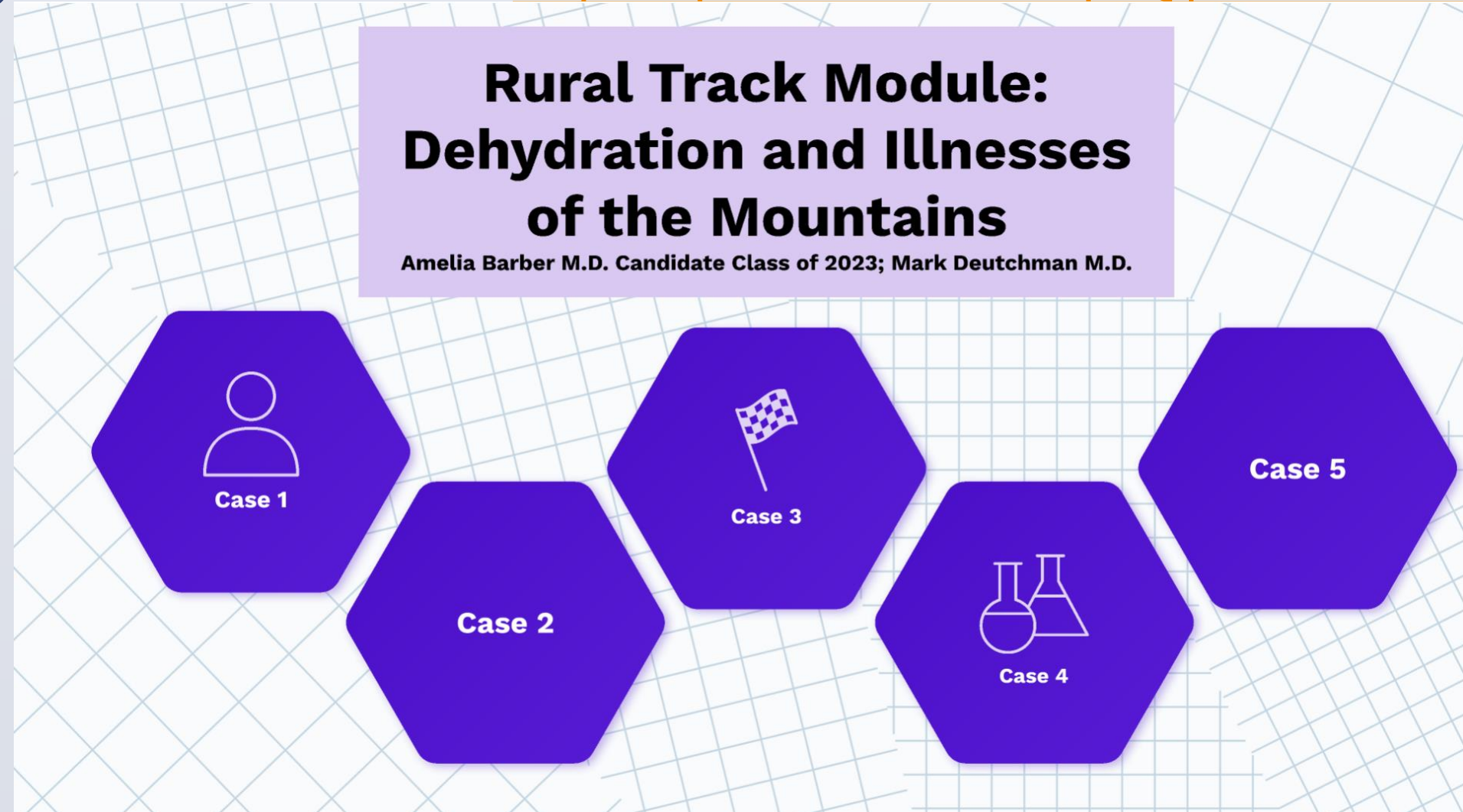
This teaching module is designed for the medical professional students in the Rural Track at the University of Colorado Anschutz Medical Campus who are likely to encounter patients with conditions involving dehydration in their future practice. This module consists of patient vignettes designed to have students make treatment and diagnostic decisions concurrently while forming a differential diagnosis in different clinical settings. Students will have to manage treatment decisions to appropriately manage symptoms while receiving more information on their patient for proper diagnosis and definitive treatment. The patient vignettes center on a classic presentation of an illness common to Colorado mountain towns with dehydration management, but will vary in severity of illness, patient demographics, and clinical setting.

Aim:

To use case-based learning to better prepare future physicians to care for patients in rural Colorado. Professional students of the rural track are expected to better grasp management during diagnosis of dehydration conditions as part of this teaching module.

Materials, Methods, and Objectives

This module has been designed in Prezi to allow navigation through information in any order. The module requires a facilitator to guide students through learning objectives, talking points, correct and incorrect diagnoses, and navigate through case resolution and learning points following correct diagnosis. Facilitator guides have been made for this purpose. Facilitator guides include learning objectives, talking points, differential diagnoses, and references. Link: <https://prezi.com/view/qfvQqsNXnNfd2a6q5An5/>

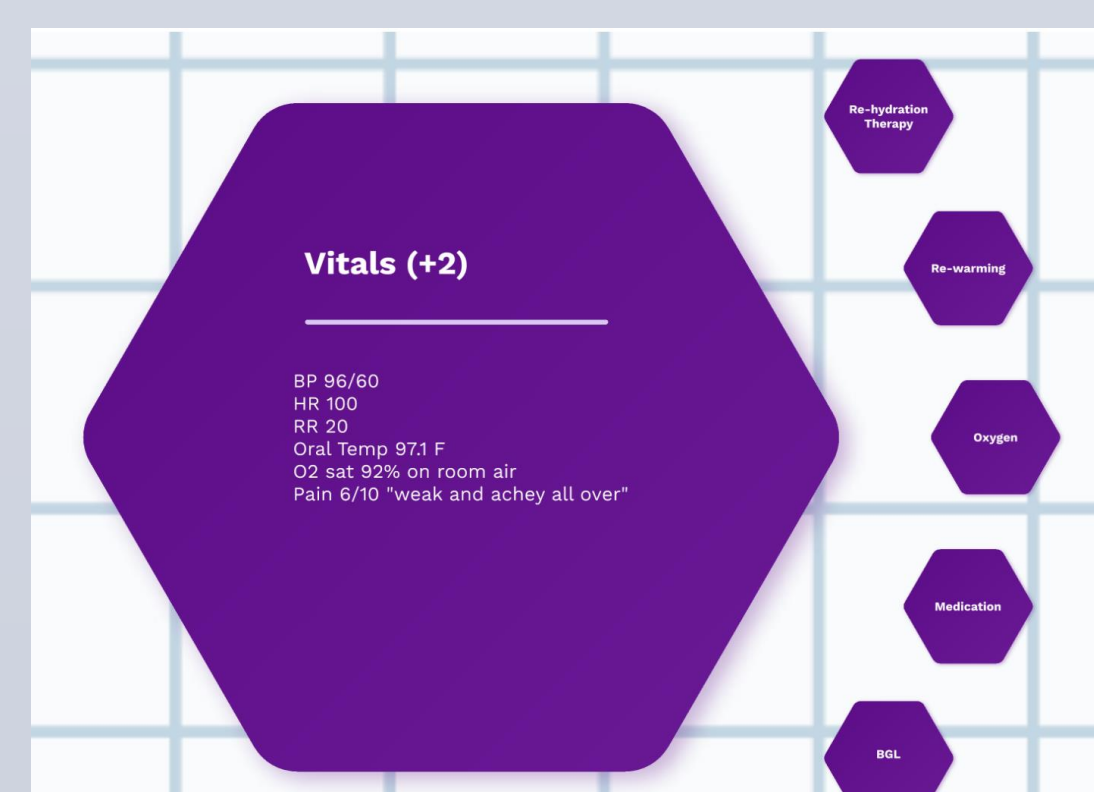
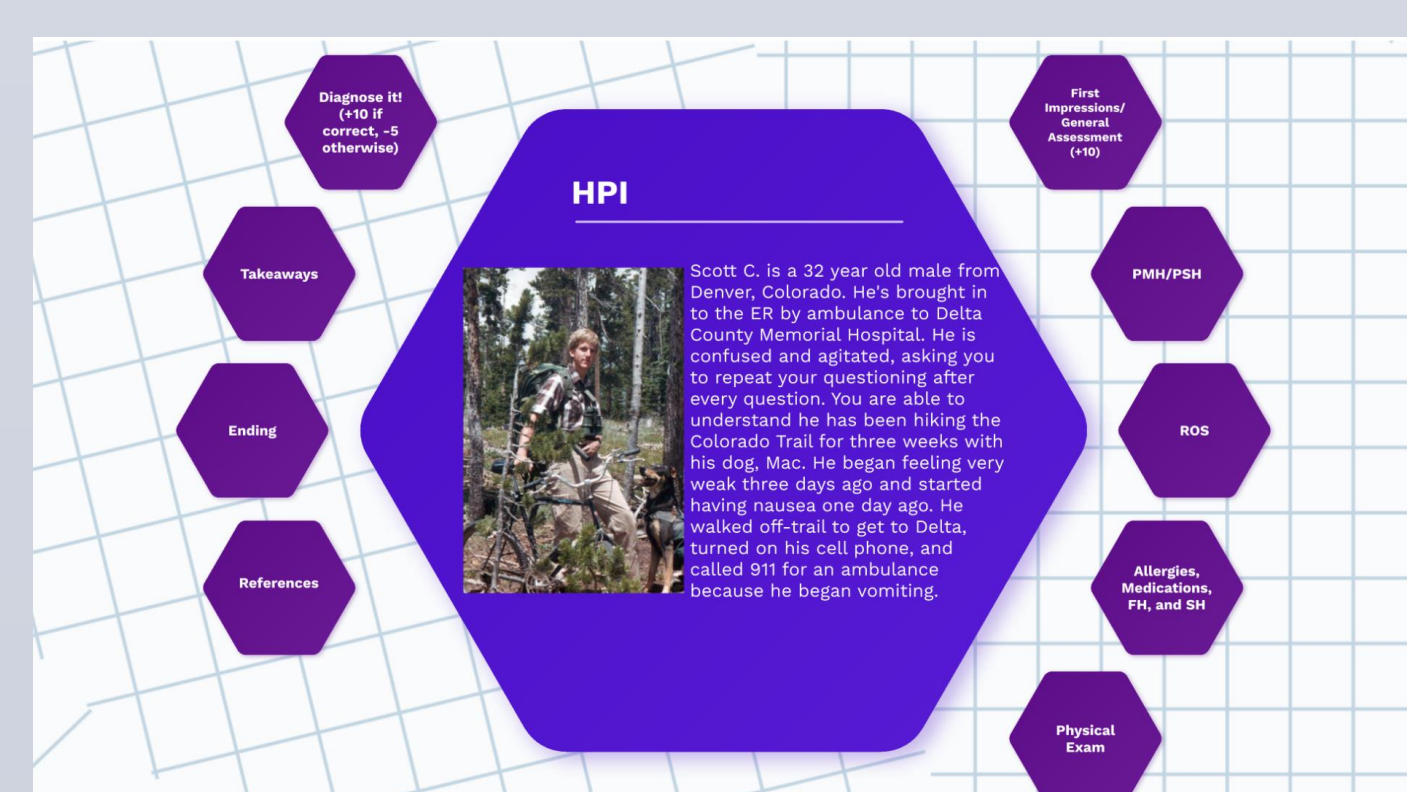


Learning Objectives for Module

1. Work through patient cases of illnesses more common in high-altitude mountain towns of rural Colorado
2. Build prioritized differentials, make treatment decisions as information is received, and make preliminary diagnoses
3. Understand dehydration as a symptom and primary disorder in patient morbidity and mortality
4. Attend to social and psychosocial determinants of health
5. Discuss considerations of treating patients in the mountains, as Rural Track students are more likely to encounter these patients in their future careers

Patient Vignettes

1. Child with moderate gastroenteritis
2. Adult with acute mountain sickness
3. Mountaineer with rhabdomyolysis
4. Wilderness presentation of endurance athlete with hypovolemic hyponatremia
5. Nursing home patient hospitalized for hyperosmotic hyperglycemic state



Discussion and Conclusion

Discussion

Students in the Rural Track completed this teaching module November 2022 and gave positive feedback for the cases. Case 3 was completed as a group to show students the methodology and flow of a case. The room was then divided into three groups and each group was assigned either Case 1, 2, or 4. The whole group re-convened after cases were completed and each group shared their final diagnosis with salient learning points to the larger group. Case 5 was then completed as a large group again because it is a more advanced case for first-year medical students.

Students performed well on the case-based learning. Case 1 received 39 out of a possible 41 points for a 95%. Case 2 29/29 for a 100%. Case 3 58/67 for an 87%. Case 4 29/33 for an 88%. And Case 5 32/43 for a 74%.

Students reported enjoying working through the cases, getting to “choose your own adventure”, make treatment decisions, and discuss the learning points from each case.

Limitations

The teaching module takes place in Prezi so computers are needed to move through the cases and multiple computers are needed if small groups are formed. Students also reported there were not enough negative points incorporated into the cases to penalize poor treatment decisions. A facilitator who understands the teaching module is needed to confirm diagnosis and guide students through cases.

Conclusions

Students performed above expected on the case-based learning and enjoyed the teaching module. It can be used to continue education for students in the Rural Track. Future directions may include adding cases, studying student knowledge change with use of the module, and adding more treatment decisions to make more nuanced and sophisticated clinical scenarios.

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