

Case Study: Asthma During an Introductory Mountaineering Course

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8 min read



The Situation

You are leading a five-day introductory mountaineering course in the Sierra Nevada in early October. The course includes basic climbing and scrambling at elevations between 8,000 and 11,000 feet. Emily is a participant who grew up in the mountains of Colorado but has lived on the East Coast for the last several years. She has extensive hiking experience and has been a strong group member. She is enthusiastic, capable, and has

a “can-do” attitude, but has had limited recent experience at higher elevations than the mountains back east.

The weather has been clear and dry. On the morning of day 3, you note that the winds must have shifted overnight. The regional wildfires that had not been much of an impact the first two days, have now produced hazy conditions and a noticeable smoky smell is in the air.

During an afternoon uphill approach, Emily begins coughing and reports chest tightness and increased difficulty catching her breath. As the trip leader, Emily’s symptoms aren’t sitting well with you. Pivoting into wilderness first responder mode, you dig into your pack, grab your first aid kit, gloves, and trusty field guide, ready to see what’s really going on with Emily.

SOAP Report

Subjective

Emily is a 22-year-old female who is reporting chest tightness, coughing, and wheezing. She says she has experienced similar symptoms during exercise in the past, particularly when running in cold weather, and has been diagnosed with asthma.

She has her prescribed albuterol inhaler with her but says she hasn’t used it yet because she thought the breathing difficulty was “just the altitude.” She denies any recent accidents or injuries. She is currently Awake +Oriented x 4 (person, place, time, and events).

Objective

The patient is found sitting on her backpack. She is alert, mildly anxious, and cooperative. The physical exam is unremarkable, although the patient complains of chest tightness. Circulation, sensation, and motion are intact in all four extremities. Her respirations are at an increased rate and effort, with audible expiratory wheezes and a frequent, nonproductive cough. Respirations are increased in rate and effort with audible expiratory wheezing and frequent, nonproductive cough. The patient is able to speak in full sentences now that she is at rest.

Vital Signs:

TIME	1430
LOR	A+Ox4
HR	108, strong and regular
RR	26, regular, labored
SCTM	pink, warm, dry
B.P.	radial pulse present
Pupils	PERRL, a little red/irritated
T°	Not taken

Symptoms:	Coughing, wheezing, with chest tightness, feels short of breath with exertion.
Allergies:	Seasonal environmental allergies, historically worse in the late summer and early fall. Patient reports "this feels similar".
Medications:	Prescribed albuterol inhaler as needed, the patient has not used her inhaler today. Denies taking any anti-histamines recently but "would normally if back in Colorado this time of year".
Pertinent Hx:	Asthma; previous exercise-associated symptoms; grew up in Colorado but has lived on the East Coast for several years. Reports that she flew into Reno, NV 4 days ago from Boston, MA. Slept poorly and had a mild headache after the first night at elevation, no issues yesterday and slept "pretty great" last night.
Last in/out:	Approximately 1.5 L of water today; breakfast and lunch; normal urination and defecation
Events:	Patient spent the last several hours traveling uphill at elevation in dry air with wildfire smoke. She has also had recent exposure to flowering rabbitbrush, a known seasonal allergen for the patient. Her symptoms began during a sustained uphill section.

What is your Assessment and Plan? *Think about this before continuing to find out the rest of the story.*

Assessment

- Possible asthma exacerbation associated with strenuous exercise and one or more environmental triggers (dry air, wildfire smoke, or flowering rabbitbrush/allergen noted).
- Possible altitude-related changes in breathing.
- Possible normal exertional dyspnea (shortness of breath).

Plan

- Stop ascent and reduce exertion.
- Rest in a position of comfort and minimize exertion.
- Use prescribed rescue inhaler according to established asthma plan.
- Reassess vital signs, with particular attention to respiratory rate and effort.
- Hydrate.
- Provide an over-the-counter antihistamine, Allegra (fexofenadine) from the first aid kit, per Emily's request for the possible complication of rabbitbrush exposure.
- Determine whether symptoms improve enough to continue, recognizing that the environmental triggers may still be present and unavoidable.
- Evaluate route for evacuation contingencies. Does it make sense to go forward, up and over, or to turn back now?
- Offer a properly fitting N95 respirator while Emily is resting to reduce smoke exposure, if comfortable/tolerable and available.
- Evacuate if symptoms fail to improve, recur with minimal exertion, or progress to significant respiratory distress.

Anticipated Problems

- Symptoms worsening despite rescue medication and progressing to respiratory distress or failure
- Continued smoke/allergen exposure with no ability to easily change environment
- Difficulty distinguishing asthma from altitude illness/normal exertional breathing
- Recurrence when trail requires climbing uphill again
- Pressure (internal and/or peer) to continue because the group has a scheduled climbing objective

What Happened?

You stop the ascent and have Emily rest. She uses her prescribed albuterol inhaler, taking 2 puffs as directed by her prescribing provider.

Over the next 15–20 minutes, her cough and breathing improve, and the wheezing diminishes. She is able to speak comfortably, her respiratory rate decreases to 20, and her heart rate also decreases.

Although Emily has improved, her symptoms occurred with moderate exertion, and the environmental conditions remain similar. The route ahead remains similar to the level of exertion that was just experienced. You discuss the situation with Emily. You both share the concern that continuing higher on the route could make evacuation more difficult if her breathing worsens. She also does not want to become a burden to the group or put the rest of the team at risk if a rescue becomes necessary. The group has been experiencing noticeable smoke and haze, and several people have reported burning eyes. Although you do not have a specific AQI measurement in the field, the environmental conditions observed are concerning. You offer Emily an N95 mask from the first aid kit, and she initially declines to use it, as she feels like it will make breathing difficult while hiking. You assure her she can hang on to it, use it just while she is resting, and then take it off while hiking. She accepts the N95, and you ensure that it fits her well. She remarks, “Wow, it actually smells less smoky in here!”

Looking at the map together, you and Emily decide not to continue the day’s objective. Given the route, the continued smoke exposure, and the potential difficulty of evacuating from higher on the route, you decide it is not worth continuing to see whether her symptoms recur and you all begin descending the mountain.

Strong experience and good expedition behavior can sometimes make recognition more difficult. A participant who is capable and accustomed to pushing through physical challenges may minimize symptoms, assume they simply need to work harder, or be reluctant to slow the group. Add in an optimal weather window in the midst of a recent fickle mountain weather pattern, or a tight turnaround due to airport logistics and you have additional pressures exerting their force upon your decisions. Leaders can watch for changes in pace, breathing, and participants’ energy and attitudes. Maintaining an approachable and open attitude to participants, along with frequent check-ins and overall good communication about plans and concerns can help catch smaller things before they become bigger issues.

Environmental conditions are an everchanging part of assessment in the field. In a mountain environment, it may not be possible to eliminate an environmental trigger such as wildfire smoke. A high quality respiratory mask like an N-95 or KN-95 may offer relief from airborne particulates, may be tolerable while at rest, but may not be practical to wear during exertion, which is often when it’s most needed. The field decision may instead depend on reducing exertion, treating the participant according to their established plan if they have pre-existing concerns, reassessing response, and determining whether the objective remains appropriate in present conditions.

Improvement after rescue medication does not automatically mean a participant is ready to return to strenuous activity or warrant further evaluation. Reassessment and an operational decision about continued participation are still necessary. The interpersonal relationships we develop on expeditions can confound and cloud the decision-making process, tempting us to move the goal posts for evacuations or other tough decisions. And when looking at the map and planning your route out, sometimes the closest and easiest point may be forward as planned.

Combined with regular reviews of your medical protocols prior to leaving the trailhead and refreshing your training through regular wilderness first responder recertification courses, a NOLS Wilderness Medicine Field Guide can provide additional information about asthma, respiratory emergencies, and all sorts of other conditions when the inevitable cobwebs are found to be in the way of making a decision.

