

THE LAKE LOUISE CONSENSUS ON THE DEFINITION AND QUANTIFICATION OF ALTITUDE ILLNESS

At the 1991 International Hypoxia Symposium, a consensus process to quantify the various altitude maladies occurred. There were several stages in the process which was chaired by Peter Hackett and Oswald Oelz.

Prior to the conference, a consensus committee was given documents pertaining to definitions and ways to quantify altitude illness. At the conference, all delegates were given the opportunity to have input into the preparation of the document. The committee met on several occasions during the meeting and developed this consensus document.

This document represents the present state of its evolution, as of March, 1991. It consists of:

- a) diagnostic criteria of altitude syndromes,
- b) an agreed process of scoring the various symptoms/signs of altitude illness.
- c) self assessment questionnaires,
- d) clinical assessment—performed by an observer

It is proposed that the above schema be used over the next two years by those investigators conducting field research into altitude illness and the outcome discussed at the 1993 International Hypoxia Symposium at Lake Louise, February 9–13, 1993.

- a) The following **DIAGNOSTIC CRITERIA** were accepted.

AMS In the setting of a recent gain in altitude, the presence of headache and at least one of the following symptoms: gastrointestinal (anorexia, nausea or vomiting), fatigue or weakness, dizziness or lightheadedness, difficulty sleeping.

HACE Can be considered “end stage” or severe AMS. In the setting of a recent gain in altitude, the presence of a change in mental status and/or ataxia in a person with AMS, or the presence of both mental status change and ataxia in a person without AMS.

HAPE In the setting of a recent gain in altitude, the presence of the following:
Symptoms: at least two of: dyspnea at rest, cough, weakness or decreased exercise performance, chest tightness or congestion.

Signs: at least two of: rales or wheezing in at least one lung field, central cyanosis, tachypnea, tachycardia.

Comment from Dr. E.J.M. Campbell:

Although this is not my field, I must express some concern that the so-called classification put forward is not heterologous. AMS is defined in symptomatic or syndromal terms whereas HACE is defined in pathophysiological terms. It may well be that AMS has as its basic pathophysiology something not unlike HACE. On the

other hand, it may well be that the pathophysiology of HACE can cause a syndrome like AMS. It is much preferable that any classification (as opposed to simply a list) should be isologous.

To be done:

- 1) Address Moran Campbell's concern about unclear definition of HACE.
2. Bärtsch suggests that tachypnea and tachycardia should be quantified.

b) AMS SCORING SYSTEMS

It was agreed that:

1. Separate tools should be used for self assessment and clinical studies.
2. The five symptoms used for scoring AMS are: headache, gastrointestinal, difficulty sleeping, fatigue/weakness, and dizziness/lightheadedness. The double worded terms are to facilitate understanding as well as translation into many languages.
3. Pulmonary symptoms would not be included in the scoring.
4. The physical signs incorporated into the clinical scoring system are: change in mental status, ataxia (heel to toe walking) and peripheral edema. The general consensus was not to include rales in the scoring of AMS.
5. Additional questions would be placed on the questionnaire for the use of researchers, but not included in the scoring. These were questions regarding feeling sick, mental confusion, difficulty breathing, cough, and coordination being off.
6. Although difficult to decide between a functional assessment for each symptom or a severity rating, symptom severity seemed best. Some use of clinical descriptors was best to help clarify the appropriate answer for respondents.
7. A functional evaluation was necessary, but not for each specific symptom. An overall rating based on limitation of physical activity was considered a workable compromise.
8. The scoring system and definitions would be used by various researchers and another evaluation of the consensus statement would be made at the next International Hypoxia Symposium in 1993. The philosophy is to modify these tools as necessary in the future after we have gained experience in their use.

c) AMS SELF ASSESSMENT

Headache:	0 None at all
	1 A mild headache
	2 Moderate headache
	3 Severe headache, incapacitating
Gastrointestinal symptoms:	0 Good appetite
	1 Poor appetite or nausea
	2 Moderate nausea or vomiting
	3 Severe, incapacitating nausea and vomiting
Fatigue and/or weakness:	0 Not tired or weak
	1 Mild fatigue/weakness
	2 Moderate fatigue/weakness
	3 Severe fatigue/weakness, incapacitating

Dizziness/lightheadedness:	0	None
	1	Mild
	2	Moderate
	3	Severe, incapacitating
Difficulty sleeping:	0	Slept as well as usual
	1	Did not sleep as well as usual
	2	Woke many times, poor night's sleep
	3	Could not sleep at all

TOTAL

Overall, if you had any of these symptoms, how did they affect your activities?

Not at all	0
Mild reduction	1
Moderate reduction	2
Severe reduction (bedrest)	3

OPTIONAL—Include if you would like, for your own purposes. Other questions asked but not scored:

0=Not at all; 1=Mild; 2=Moderate; 3=Severe

I feel sick	0	1	2	3
Mentally confused, disoriented	0	1	2	3
Difficulty breathing	0	1	2	3
Cough	0	1	2	3
Coordination is off	0	1	2	3

d) CLINICAL ASSESSMENT TOOL: All responses obtained by interview. Same questions as self assessment, plus the following:

Change in mental status	0	1	2	3
1=lethary/lassitude				
2=disoriented/confused				
3=stupor/semiconscious				
4=coma				

Ataxia (heel to toe walking)	0	1	2	3
1=balancing maneuvers				
2=steps off line				
3=falls down				
4=can't stand				

Peripheral edema	0	1	2	3
1=one location				
2=two or more locations				

TOTAL

FUNCTIONAL ASSESSMENT (Assigned by investigator, not self assessment)

Grade 0 No symptoms

Grade 1 Symptoms, but forces no change in activity

Grade 2 Must reduce activities

Grade 3 Reduced to bed rest

Grade 4 Life-threatening

Citation: Hackett PH, Oelz O. (1992). The Lake Louise Consensus on the definition and quantification of altitude illness. In: Hypoxia and Mountain Medicine. JR Sutton, CS Houston, G Coates, eds. Queen City Press, Burlington, VT; pp 327-330.