



ALMA Safety Manual

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- High Altitude Pulmonary Edema - HAPE is abnormal fluid accumulation in the lungs resulting from mal-adaptation to altitude. HAPE rarely occurs below 2,500 m.
- High Altitude Cerebral Edema - HACE is swelling of the brain thought to be caused by hypoxia-damage to brain tissue. HACE generally occurs above 3,500 m but has been recorded at 3,100 m.

MEDICAL EXAM REQUIREMENTS

- Every individual meeting the requirements defined in this section must consult a physician (according to their organization agreement) to complete a high altitude medical examination.
 The following tests shall be done as a minimum:

	Less than 40 years old	40 years and older
Examination by a physician	Every year	Every year
Questionnaire on altitude experience	Every year	Every year
Hemoglobin level	Every year	Every year
ECG without stress condition	Every year	Every year
Creatinine level	First exam + Every 5 years	First exam + Every 2 years
Glycemia level (urine and blood)	First exam + Every 5 years	First exam + Every 2 years
PA chest X-ray (if requested by physician)	First exam + Every 5 years	First exam + Every 2 years
Pulmonary function test	First exam + Every 5 years	First exam + Every 2 years
ECG under stress conditions	First exam + Every 5 years	First exam + Every 2 years

- Proof of medical clearance has to be provided prior to commencement of work. The attending physician must verify and certify that the individual has no medical conditions that make it inadvisable for them to work or ascend to 5000 meters (or over 3000m) above sea level. The annual medical certificate must be sent to the ALMA Safety Office.

ABSOLUTE CONTRAINDICATIONS (permanent conditions not subject to change within a timeframe relevant to company needs; one such condition is sufficient contraindication).

- Background of cerebral ischemia.
- Chronic respiratory insufficiency (any one of the following: arterial PO₂ less than 50mmHg, vital capacity less than 50% of predicted value, maximum respiratory minute volume less than 40l, FEV₁ equal to or less than 1lt, cor pulmonale, cyanosis).
- Severe renal insufficiency (Creatinine clearance less than 40 ml/min)⁵.
- Unstable coronary artery disease.
- Malign arterial hypertension.

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Creatinine clearance (Cockcroft formula) = $\frac{(140 - \text{Age}) \times \text{Weight (KG)}}{72 \times \text{serum creatinine}}$

The result is expressed in ml/min, and the figure is multiplied by 0.85 for women.



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- Pulmonary arterial hypertension (any etiology).
- Hemoglobinemia greater than 18.7 gr/dl in men, or greater than 18 gr/dl in women.
- Severe anemia (Hb less than 8 gr/100ml).
- Thromboembolisms or blood clots.
- Background of pulmonary and/or cerebral edema resistant to prophylaxis by acetazolamide, nifedipine and/or corticoids.
- Epilepsy with seizure in the last year.
- Morbid obesity (BMI > 40)⁶.
- Serious uncompensated arrhythmias (e.g., high-frequency, severe ventricular arrhythmias in general, symptomatic WPW, supraventricular arrhythmias with compromised hemodynamics).
- Pregnancy.
- Recent (less than 6 months) acute myocardial infarction.
- Decompensated cardiac insufficiency, or grade III or IV compensated.

RELATIVE CONTRAINDICATIONS - (modifiable in the short term).

- Well-controlled epilepsy, no seizure in last year.
- Compensated psychiatric disorders.
- Presence of cardiovascular risk factors.
- Insulin-dependent diabetes mellitus (evaluate isolation of workplace).
- Decompensated type-II diabetes mellitus.
- Severe hypertriglyceridemia (greater than 800 mg%).
- Decompensated systemic arterial hypertension.
- Any uninvestigated cardiac pathology.
- Other anemias (with hemoglobinemia greater than 8gr/dl).

HEALTH CERTIFICATION (HAME)

- The medical certificate must mention that the worker is “Acceptable for executing his (her) work at 5000 (or above 3000) meters above the sea level”
- If the conclusion is “Acceptable with restrictions”, inform ALMA and provide the corresponding restriction(s). This conclusion will have relative contraindication(s), or condition(s). Restrictions may be temporary, permanent and restricted levels of altitude.
- The medical certificate is valid for 1 year, unless a specific lesser term is presented in the Report of the evaluating doctor.
- The form shall indicate the beginning and end of the one year period.



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Evaluación de Salud Anual para Altitud Geográfica (Annual Altitude Health Evaluation)

* Based on the AHCS Norm for Medical Examinations

INFORMACIÓN PERSONAL / PERSONAL INFORMATION			
Nombre: <i>Name:</i>		Fecha: <i>Date:</i>	
EXÁMENES REALIZADOS / TESTS PERFORMED			
	Consulta Médica (Incluye índice de masa) / <i>Medical Checkup(Including body mass)</i>		
	Electrocardiograma de reposo por medico cardiologo (examen inicial con test de esfuerzo + cada 2/5 años) <i>Resting Electrocardiogram with cardiologist report (stress test for the first exam + every 2/5 years)</i>		
	RX thorax AP (examen inicial +cada 2 a 5 años) <i>PA Chest X-ray</i> (First exam + every 2 or 5 years)		
	Perfil Bioquímico / <i>Biochemical Profile</i> (examen inicial +cada 2 a 5 años)		
	Orina Fisiológico / <i>Urine Test</i> (examen inicial +cada 2 a 5 años)		
	Hemograma completo / <i>Blood Test - Cada año- Every year</i>		
	Espirometría basal / <i>Basal Spirometry</i>		
	Encuesta de altitud / <i>Altitude Survey</i>		
	Perfil lípido / <i>Lipid profile</i>		
	Otros / <i>Others</i>		
RESULTADOS (por favor marque la evaluación correcta) / <i>RESULTS (please mark correct evaluation)</i>			
	Apto: Exámenes no muestran aparentemente ninguna condición que contraindique asignaciones a gran altura. <i>Acceptable: The examination does not show condition(s) which contraindicate altitude assignment.</i>		
	Apto con restricciones: Favor entregar las restricciones correspondientes al caso. <i>Acceptable with restrictions: Please provide the corresponding restriction(s).</i>		
	Autorización Pendiente: Requiere diagnóstico médico, manejo o estabilización. <i>Pending authorization: Requires medical diagnosis, management or stabilization.</i>		
	No Apto: Examen arroja contraindicación(es) para el trabajo en altura. <i>Non-Acceptable: There are condition(s) in the examination which contraindicates work at altitude.</i>		
INSTRUCCIONES ESPECIALES / SPECIAL INSTRUCTIONS			
1.	Los resultados de los exámenes realizados deben ser entregados al Empleado y no enviados a la Empresa. <i>Results should be delivered to the employee and not sent to the employer.</i>		
2.	Por favor devuelva este formulario, marcado CONFIDENCIAL, a: <i>Please forward this form, marked CONFIDENTIAL, to:</i>		
Observatorio ALMA Alonso de Cordoba - 3107 VITACURA – SANTIAGO - CHILE			
Esta Evaluación de Salud tiene validez hasta: dd/mm/aaaa <i>Health Evaluation valid until: dd/mm/yyyy</i>			
INFORMACIÓN SOBRE EL DOCTOR / PHYSICIAN INFORMATION			
Nombre y firma del médico tratante: <i>Physician Name and Signature:</i>			