NRAO Department of Environmental Safety & Security
High Altitude Medical Considerations

MEMORANDUM

To: All NRAO Employees

From: Environment, Safety & Security Manager

Date: February 2024

Subject: **High Altitude Medical Considerations**

Any billing charges for High Altitude Exams MUST be charged to NRAO – DO NOT USE NRAO'S EMPLOYEE MEDICAL INSURANCE PLAN . If the high altitude medical provider(s) (provider can be a Nurse Practitioner) asks you for your insurance information, do not give it out. If they have questions, please have them contact NRAO Safety Division (575-835-7305).

The Observatory has published rules and requirements to address High Altitude medical exams for employees working or visiting work sites above 3000 meters (ALMA work is done at altitudes in excess of 5,000 meters). All employees must obtain a high altitude medical examination to verify that no medical conditions exist that would make it inadvisable to work at such elevations.

The high altitude medical examination focuses on health conditions that would be absolute or relative contraindications, detailed below, to high altitude work or visits. These requirements are based on Chilean requirements for work at high elevations.

1. Initial high altitude examination:

Prior to the site visit or taking up duty at a site higher than 3000 meters altitude, a high altitude medical examination must be performed. This examination should take place no earlier than 6 months before the visit or taking up duty.

The initial examination includes the tests detailed in the ***Annual Altitude Health Evaluation,*** attached. Additional tests may be performed if requested by the medical advisor.

2. Regular high altitude examination:

An annual high altitude medical check-up is required for staff working at high altitude or visiting the high altitude site. It is the responsibility of the medical advisor to decide which tests shall be performed in this annual examination to provide medical clearance for work at high altitude.

The following tests shall be done as a minimum:

Requirements	Less than 40 years old	40 years and older
Examination by a physician	Every year	Every year
Hemoglobin level	Every year	Every year
Creatinine level	Every year	Every year
Glycemia level (urine and blood)	Every year	Every year
Pulmonary function test[1]	Baseline	Baseline
ECG under stress conditions[2]	Every 5 years	Every 2 years

[1] Initial medical exam (baseline), then as clinically indicated.
[2] Or if deemed medically necessary

3. Contraindications for high altitude access:

Absolute contraindications: (permanent conditions not subject to change; one condition is sufficient for a contraindication)

1. Background of cerebral ischemia.
2. Chronic respiratory insufficiency.
3. Severe renal insufficiency (Creatinine clearance less than 40 ml/min)*.
4. Unstable coronary artery disease.
5. Malign arterial hypertension.
6. Pulmonary arterial hypertension (any etiology).
7. Hemoglobinemia greater than 18.7 gr/dl in men, or greater than 18 gr/dl in women.
8. Severe anemia (Hb less than 8 gr/100ml).
9. Thromboembolisms or blood clots.
10. Background of pulmonary and/or cerebral edema resistant to prophylaxis by acetazolamide, niphedipine and/or corticoids.
11. Epilepsy with seizure in the last year.
12. Morbid obesity (BMI $\geq$ 40)**.
13. Serious uncompensated arrhythmias (e.g. high-frequency, severe ventricular arrhythmias in general, symptomatic WPW, supraventricular arrhythmias with compromised hemodynamics).
14. Pregnancy.
15. Recent (less than 6 months) acute myocardial infarction.
16. Decompensated cardiac insufficiency, or grade III or IV compensated.

Relative contraindications: (modifiable in the short term)

1. Well-controlled epilepsy, no seizure in last year.
2. Compensated psychiatric disorders.
3. Presence of cardiovascular risk factors.
4. Insulin-dependent diabetes mellitus.
5. Decompensated type-II diabetes mellitus.
6. Severe hypertrigliceridemia (greater than 800 mg%).
7. Decompensated systemic arterial hypertension.
8. Any uninvestigated cardiac pathology.
9. Other anemias (with hemoglobinemia greater than 8gr/dl).

*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.

**Body mass index (BMI) = $\frac{\text{Weight (kg)}}{\text{Height (meters) squared}}$

Your physician may prescribe a medication to reduce the physical effects of high altitude ascents. Your doctor can discuss these medications with you. More detailed information on the effects of high altitude exposure is available upon request from the ES&S Office.

4. High Altitude Medical Exam Authorization

Prior to scheduling your exam, the attached form must be authorized by ES&S. You can either fax the form to the ES&S division at 304-456-2106 or email to: dltorres@nrao.edu or jpirner@nrao.edu. This policy is also valid for all NRAO ALMA employees.

5. Scheduling Your Exam (*Appointments should be made at least six (6) weeks prior to your trip date to allow for medical exam scheduling.*)

Employees in Green Bank and Charlottesville must schedule their examination with:

UVA-WorkMed
1910 Arlington Boulevard
Charlottesville, VA 22908
Phone: 434-243-0075
Fax: 434-243-0078

Notify the scheduler of your age, your work location, and the date of your last stress test, if applicable.

Employees in Socorro must coordinate the exam schedule with Dee Torres at 575-835-7305:

Modern Pain and Spine
1540 Juan Tabo Blvd NE SuiteA
Albuquerque, NM 87112
Phone: (505) 800-7246

6. High Altitude Medical Examination Evaluation and Payment Information

High Altitude Physical Exam costs are fully covered. The physician's office should submit claims/invoices with the appropriate authorization and the signed physician's evaluation to the ES&S Division on the attached Annual Altitude Health Evaluation, marked *CONFIDENTIAL*, to:

(Do not submit claim/invoices to NRAO's medical insurance plan)

National Radio Astronomy Observatory
ES&S Division

1011 Lopezville Road
Socorro, NM 87801

Address questions to:

ES&S Division
Administrative Assistant
Dee Torres
575-835-7305

Attachments:
Annual Altitude Health Evaluation **(Required for Green Bank, Charlottesville, Socorro)**
UVA-WorkMed Medical Questionnaire **(Required for Green Bank, Charlottesville)**
Authorization for Release of Information **(Required for Green Bank, Charlottesville)**

_____

Signature of ES&S Representative

****Annual High Altitude Health Evaluation (ALMA Work can be in excess of 5,000 M)*** ***Evaluación de Salud Anual para Altitud Geográfica*** * Based on the ACHS norm for medical examinations			
PERSONAL INFORMATION (INFORMACIÓN PERSONAL)			
Name (nombre):		***Date (fecha):***	
TESTS PERFORMED			
	Medical Checkup (Consulta Médica)		
	Electrocardiogram w/stress test (Electrocardiograma con test de esfuerzo)		
	PA Chest X-ray {2-view chest x-ray} (RX thorax AP)		
	Biochemical Profile (Perfil Bioquímico)		
	Urine Test (Orina Fisioquímico)		
	Blood Test (Hemograma completo)		
	Basal Spirometry (Espirometría basa)		
	Lipid profile (Perfil lípido)		
	Pulse Oximetry (Pulso Oximetría)		
	Calculated creatinine clearance (Espacio libre calculado de creatinine)		
	BMI-Body Mass Index (Indice de Masa de cuerpo)		
	Others (Otros)		
RESULTS (please mark correct evaluation) (RESULTADOS-por favor marque la evaluación correcta)			
	Acceptable: *The examination does not show condition(s) that contraindicate altitude assignment.* ***(Apto:*** *Exámenes no muestran aparentemente ninguna condición que contraindique asignaciones a gran altura.)*		
	Acceptable with restrictions: *Please provide the corresponding restriction(s).* ***(Apto con restricciones:*** *Favor entregar las restricciones correspondientes al caso.)*		
	Pending authorization: *Requires medical diagnosis, management or stabilization.* ***Autorización Pendiente:*** *Requiere diagnóstico médico, manejo o estabilización.*		
	Non-Acceptable: *There are condition(s) in the examination that contraindicates work at altitude.* ***(No Apto:*** *Examen arroja contraindicación(es) para el trabajo en altura)*		
SPECIAL INSTRUCTIONS (INSTRUCCIONES ESPECIALES)			
1.	*Results should be delivered to the employee and not sent to the employer.* *(Los resultados de los exámenes realizados deben ser entregados al Empleado y no enviados a la Empresa.)*		
2.	***Please forward this form and billing information, but not the examination results, marked CONFIDENTIAL, to: (Por favor devuelva este formulario, marcado CONFIDENCIAL, a:)***		
ES&S Administrative Assistant **1011 Lopezville Road** **Socorro, NM 87801** **Or Fax: 575-835-7024**			
Health Evaluation valid until: dd/mm/yyyy *(Esta Evaluación de Salud tiene validez hasta: dd/mm/aaaa)*			
PHYSICIAN INFORMATION *(INFORMACIÓN SOBRE EL DOCTOR)*			
Physician Name and Signature: ***(Nombre y firma del médico tratante)***			

UVA-WorkMed
1910 Arlington Boulevard
Charlottesville, VA 22908
Phone: 434-243-0075 Fax: 434-243-0078

UVA-WorkMed Medical Questionnaire

*The information contained on this form will be used **ONLY** for physician/patient consultation.*
*This information **WILL NOT** be provided to the employer.*

Section 1

Soc Sec#_____History#_____Race_____Sex _____

Name_____Birth Date: _____
Last *First* *Middle/Maiden*

In what country were you born? _____

Date of Employment_____Job Classification_____Dept. _____

Department Address_____Work Phone _____

Home Address_____Home Phone _____

In case of emergency please contact:_____Phone _____
Name/Relationship

Section 2

Check if there is any family history of the following diseases:

☐ Tuberculosis ☐ High Blood Pressure ☐ Cancer ☐ Heart Disease
☐ Kidney disease ☐ Arthritis ☐ Epilepsy ☐ Diabetes

1. Do you take any medication regularly? If so, what? .....YES NO
2. Are you **allergic** to any medications? If so, what? .....YES NO
3. Do you have any type of **chronic dermatitis**? If so, what? .....YES NO
4 Do you have any moles that have changed color or gotten larger?.....YES NO
5. Have you ever had the **tetanus** series? Date_____Date of last booster _____
6. Do you wear corrective lenses?.....YES NO
7. Do you have any **chronic eye conditions**? .....YES NO
8. Do you have trouble identifying colors? .....YES NO
9. Do you have any **loss of hearing**?.....YES NO
10. Do you have hay fever? .....YES NO
11. Have you ever had a **chronic breathing condition** (emphysema, bronchitis)?.....YES NO
12. Do you smoke cigarettes? How many a day?.....YES NO
13. Has a doctor ever said your **blood pressure** was too high? .....YES NO

14. Have you ever been bothered by a thumping or racing **heart**? .....YES NO
15. Do you have trouble with dizziness or lightheadedness? .....YES NO
16. Do you ever get pains or tightness in your chest? .....YES NO
17. Do you often have difficulty in breathing? .....YES NO
18. Do you often have trouble with swollen feet or ankles?.....YES NO
19. Have you ever been told that you have a heart murmur, or any other heart condition? .....YES NO
20. Do you have trouble stopping even a small cut from bleeding?.....YES NO
21. Have you ever had a seizure or convulsion (**epilepsy**)? .....YES NO
22. Have you frequently had episodes of dizziness or fainting?.....YES NO
23. Do you have frequent **headaches**?.....YES NO
24. Has your vision ever been effected by headaches?.....YES NO
25. Do cuts in your skin take a long time to heal? .....YES NO
26. Are you often bothered by severe itching?.....YES NO
27. Are you aware of any unexplained "knots", "bumps", lymph nodes, or masses?.....YES NO
28. Following a bowel movement, have you ever noticed blood in your stool or in the toilet.....YES NO
29. Have you ever had any sensitivity to chemicals?.....YES NO
30. Have you ever had **Eczema**?.....YES NO
31. Have you ever felt you should cut down on your **drinking**? .....YES NO
32. Have people annoyed you by criticizing your drinking? .....YES NO
33. Have you ever felt bad or guilty about your drinking? .....YES NO
34. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hang-over (eye-opener)?.....YES NO
35. Have you ever been hospitalized for any illness, injury or surgery?.....YES NO
36. Do you have any chronic illnesses? .....YES NO
37. Have you ever had chickenpox?_____UNKNOWN.....YES NO
38. Have you ever had a rubella titer (German Measles) drawn? When?.....YES NO
39. Have you ever had a measles, **mumps and/or rubella vaccine**? When?.....YES NO
40. Have you received **Polio** vaccination? When?.....YES NO
41. Have you ever had a **reaction (redness and swelling) to a tuberculin skin test**? .....YES NO
42. Have you ever coughed up blood? .....YES NO
43. Do you sometimes have severe soaking sweats at night?.....YES NO
44. Have you ever had **tuberculosis**? When?.....YES NO
45. Did you ever live with anyone who had tuberculosis? When?.....YES NO
46. Have you ever received the **hepatitis B vaccination**? When? .....YES NO
47. Have you ever received the **hepatitis A vaccination**? When?.....YES NO
48. Do you frequently have **diarrhea**?.....YES NO
49. Have you ever had **yellow jaundice/hepatitis**? When?.....YES NO

50. Have you ever been told that you have a **chronic liver disease**?.....YES NO
51. Have you ever been hospitalized for mental illness or nervous breakdown?.....YES NO
52. Have you ever received psychiatric treatment or been advised by a doctor to have it?.....YES NO
53. Have you ever been addicted to or constantly used drugs?.....YES NO
54. Have you been told by a physician that you have an allergy to any latex product?.....YES NO

If yes, to what specifically did the physician say you were allergic?

_____

55. Have you had a reaction to any of the following items within one hour of exposure? Reactions include itching, redness, swelling, hives, runny nose, congestion, wheezing, or chest tightness.

	Yes	**No**	
Adhesive tape	☐	☐	Balloon
Dental mask	☐	☐	Condom
Face mask	☐	☐	Face pillow
Ostomy bag	☐	☐	IV tubing
Rubber band	☐	☐	Rubber cement
Dish gloves	☐	☐	Golf/Tennis grip

Other items that you have reacted to that you think contain latex: _____

56. Do you have personal history of any of the following?

	Yes	**No**		**Yes**	**No**
Asthma	☐	☐	Urticaria (itching)	☐	☐
Conjunctivitis	☐	☐	Contact Dermatitis (rash)	☐	☐
Eczema	☐	☐	Rhinitis (runny nose)	☐	☐

57. Do you carry an epinephrine (EpiPen/AnaKit)?.....YES NO

If yes, why? _____

58. Do you have any food allergies?.....YES NO

If yes, are you allergic to any of the following? Common symptoms are mouth tingling, lip swelling, itchy throat, rhinorrhea, wheezing, urticaria, or nausea.

☐Avocado	☐Banana	☐Chestnut	☐Kiwi	☐Papaya
☐Passion fruit	☐Peach	☐Raw potato	☐Tomato	☐Nuts

Other food allergies: _____

59. Have you ever had any adverse reactions or complications to any previous surgeries?.....YES NO
60. How many **previous surgeries** have you had? _____
61. Have you had any **physical problems while having dental work completed**? _____
62. Do you have any congenital abnormalities (e.g. spina bifida)?.....YES NO

If yes, what type? _____

63. Do you have a hernia (rupture)?.....YES NO
64. Have you ever had a surgical repair for a hernia?.....YES NO
65. Are your joints often painfully swollen?.....YES NO
66. Do your muscles and joints feel stiff on arising?.....YES NO

67. Do you usually have pain in the arms and legs?.....YES NO
68. Do you have a diagnosis of arthritis, osteoarthritis or rheumatoid arthritis? .....YES NO
69. Do your feet constantly hurt/ ache? .....YES NO
70. Are you ever stiff and sore after heavy work? .....YES NO
71. Have you ever been told not to lift heavy objects? When? .....YES NO
72. Have you ever had a **back/neck injury/strain**? When?.....YES NO
73. Have you ever had **back or neck surgery**? When?.....YES NO
74. Have you ever had a **back or neck injury** that required you to miss work, restrict activity, or require bed rest?.....YES NO
75. (Males) Have you had a prostate exam within the last year?.....YES NO
76. (Males) Do you regularly perform self-testicular examination? .....YES NO
77. (Females) Do you regularly perform self-breast examination? .....YES NO
78. (Females) Have you had a gynecological exam within the last year? .....YES NO
79. Has any part of your body ever been paralyzed? When?_____What part?_____.....YES NO
80. Have you ever had knee surgery? When? .....YES NO
81. Do you have a physical condition that limits your activity or prevents you from performing certain body movements such as bending, lifting or squatting?.....YES NO
82. Do you have any conditions affecting the joints such as bursitis, dislocation, or other disabling joint diseases?.....YES NO
83. Do you regularly exercise? (running, jogging, swimming, walking, bicycling, aerobics, etc.) .....YES NO
84. Do you play any sport regularly? (softball, tennis, basketball) .....YES NO
85. Have you ever been told you stop breathing during sleep? (Circle one)
    (1) Never (2) Sometimes (<3 nights a week) (3) Often (3-7 nights a week (4) Uncertain
86. How often do you snore? (Circle one)
    (1) Never (2) Moderate (<3 nights a week) (3) Most nights (3-7 nights a week) (4) Uncertain

Comments:

Section 3

I hereby certify that information given on this questionnaire is true and accurate to the best of my knowledge. I understand that falsification of information may be reason for dismissal.

Signature: _____ Date:_____

Reviewed by:_____Date: _____

UVA-WorkMed
1910 Arlington Boulevard
Charlottesville, VA 22908
Phone: 434-243-0075 Fax: 434-243-0078

AUTHORIZATION FOR RELEASE OF INFORMATION

Date: _____

Name (print):_____**Employee ID:**_____**Date of Birth**: _____

I authorize UVA-WorkMed to release health information to my employer for personnel purposes at my request, as described below:

1. To:

☐ **National Radio Astronomy Observatory** Dept./Division: **Environment, Safety and Security (ES&S)**

2. The information to be released is the entire UVA-WorkMed medical record of employer-requested occupational health services, including evaluation, immunization, and/or testing services.

I understand that I have a right to revoke this authorization at any time. My revocation becomes effective when delivered in writing to UVA-WorkMed. I understand that the revocation will not apply to information that has already been released in response to this authorization. This authorization will expire in ten (10) years from the date signed, unless an expiration date, event or condition is specified as follows:

_____

_____

I understand that the information released to the above individual or organization may be re-disclosed and no longer be protected to the same extent as such health information was protected by law while solely in UVA-WorkMed's possession.

I understand that UVA-WorkMed may condition its providing of the above described health evaluation or treatment on my signing of this authorization, because the evaluation or treatment is being provided specifically for its results to be released under this authorization.

Signature of Patient: _____