

## MEDB 1.1 Pre- and Postflight Physical Exam for Long Duration Crews

### 3.2 Medical Requirements Overview

**TABLE 3.2: MEDICAL REQUIREMENTS OVERVIEW**

<b>MRID# and Title:</b>	MEDB 1.1 Pre- and Postflight Physical Exams for Long Duration Crews (includes MEDB 1.4 Neurological Assessment)
<b>Sponsor:</b>	Medical Operations
<b>Category:</b>	Medical Requirements (MR)
<b>References:</b>	SSP 50260 ISS Medical Operations Requirements Document (MORD) SSP 50667 Medical Evaluation Documents (MED) Volume B
<b>Purpose/Objectives:</b>	To assess the medical status and flight readiness of crewmembers for long-duration missions before flight and medical status after landing.
<b>Measurement Parameters:</b>	Vital signs, head/face, mouth, throat, ears, nose, eyes, chest, cardiovascular, abdomen, musculoskeletal, skin, and neurologic
<b>Deliverables:</b>	A preflight and postflight physical examination report will be included in the crewmember's chart in the Electronic Medical Record (EMR).
<b>Flight Duration:</b>	≥ 30 days
<b>Number of Flights:</b>	All long duration missions
<b>Number and Type of Crew Members Required:</b>	ISS crewmembers. Back-up crew will only complete preflight MATs greater than L-45 days unless specifically waived by crew surgeon. If crew swap does occur, back-up crew will complete all preflight MATs.
<b>Other Flight Characteristics:</b>	N/A

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### 3.3 Preflight Training – N/A

### 3.4 Preflight Activities

**TABLE 3.4: PREFLIGHT ACTIVITIES**

<b>Preflight Activity</b>	<b>Description:</b>	Clinical examinations include medical interview, interval history since the previous evaluation and basic vital signs. See Flight Surgeon Physical Exam Description on page 3 for more details.				
	<b>Schedule:</b>	<b>Activity:</b>	<b>Duration:</b>	<b>Schedule:</b>	<b>Flexibility:</b>	<b>Personnel Required:</b>
		Full Exam	60 minutes	AME L-9/6 m, also as clinically indicated.	N/A	Flight Surgeon & crew Nurse and/or Paramedic as required
		Brief Exam (USCV)	30 minutes	L-21/14 days, L-2/1 days, also as clinically indicated.		
Brief Exam (Soyuz)	L-21/7days, L-2/1 days, also as clinically indicated.					
<b>Ground Support Requirements</b>	<b>Preflight Hardware:</b>		<b>Preflight Software:</b>		<b>Test Location:</b>	
<b>Hardware/Software</b>	General physical exam hardware and consumables		N/A		Agency specific or Kazakhstan	
<b>Testing Facilities</b>	<b>Minimum Room Dimensions:</b>		<b>Number of Electrical Outlets:</b>	<b>Temperature Requirements:</b>	<b>Special Lighting:</b>	
	Standard physical exam room, 8' X 10'		1 required (4 desired) 110V for U.S. 220V for Russia	Normal	N/A	
	<b>Hot or Cold Running Water:</b>		<b>Privacy Requirements:</b>	<b>Vibration/Acoustic Isolation:</b>	<b>Other:</b>	
	Both are required		Private room and hallway (Neurologic), free from distraction	N/A	N/A	
<b>Constraints/Special Requirements:</b>		N/A				
<b>Launch Delay Requirements:</b>		The Physical Exam will be repeated at the Crew Surgeon's discretion if launch is delayed.				
<b>Notes:</b>		N/A				
<b>Data Delivery:</b>		A preflight physical examination report will be included in the crewmember's chart in the EMR within 48 hours of completion of the physical exam.				

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### Flight Surgeon Physical Exam Description:

Activity:	Schedule:	Description
Full Exam (AME and Post Flight)	L-9/6 m, R+0, R+45/60 day (return to duty), ACI	<ul style="list-style-type: none"> <li>• Vital signs: pulse and blood pressure recumbent, sitting, standing, body temperature, respiratory rate, height, and weight</li> <li>• Head and face: nares/nasal mucosa, sinuses, maxillary and frontal</li> <li>• Mouth and throat</li> <li>• Ears: external meatus, tympanic membrane, and response to Valsalva</li> <li>• Eyes: general appearance, extra-ocular movements, pupil reactivity, and ophthalmoscopic exam</li> <li>• Neck: thyroid, vascular exam, motion</li> <li>• Pulmonary/Chest and lungs: cardiovascular exam, including cardiac auscultation, carotid and venous upstrokes, and peripheral pulses</li> <li>• Abdomen: auscultation, palpitation of major organs and herniations</li> <li>• Rectum/anus: to include prostate exam for males, rectal vault and occult blood testing</li> <li>• Genitourinary exam: appearance, general exam, and herniations</li> <li>• Breast exam</li> <li>• Pelvic exam/Pap smear: for female crewmember (may be performed by a gynecologist)</li> <li>• Extremities: to include range-of-motion and general strength assessments on a 1-5 scale</li> <li>• Spine: general appearance and mobility</li> <li>• Skin: to include lymphatics and identifying body marks</li> <li>• Neurologic: to include standard functional exam and gait exam (see appended test)</li> </ul>
Brief Exam (USCV)	L-21/14, L-2/1, ACI	<ul style="list-style-type: none"> <li>• Vital signs: pulse and blood pressure, body temperature, respiratory rate, height, and weight</li> <li>• Ear, Nose, and Throat</li> <li>• Chest and Lungs</li> <li>• Abdominal</li> <li>• Extremities/Spine</li> <li>• Neurologic: does not include standard functional exam and gait exam (see appended test)</li> </ul>
Brief Exam (Soyuz)	L-21/7, L-2/1	
Brief Exam (Post Flight)	R+3, R+7/14, ACI	

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### 3.5 In-Flight Activities – NO IN-FLIGHT ACTIVITIES

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### 3.6 Postflight Activities

**TABLE 3.6: POSTFLIGHT ACTIVITIES**

Postflight Activity	Description:	A clinically directed physical exam R+0, R+3, R+7/14, R+45/60 day (return to duty), will be performed by the Flight Surgeon on the ISS crew. Also may be performed as clinically indicated. See Flight Surgeon Physical Exam Description on page 3.					
	Schedule:	Activity	Duration:	Schedule:	Flexibility:	Personnel Required:	
		Full Exam	60 minutes	R+0, R+45/60 days (return to duty), also as clinically indicated.	N/A	Flight Surgeon & crew Nurse and/or Paramedic as required	
		Brief Exam (Post Flight)	30 minutes	R+3, R+7/14 days, also as clinically indicated.			
Ground Support Requirements Hardware/Software		Postflight Hardware:		Postflight Software:		Test Location:	
		General physical exam hardware and consumables		N/A		Agency Specific	
Testing Facilities		Minimum Room Dimensions:		Number of Electrical Outlets:		Temperature Requirements:	Special Lighting:
		Standard physical exam room, 8' X 10'		4 110V for U.S. 220V for Russia		Normal room temperature	N/A
		Hot or Cold Running Water:		Privacy Requirements:		Vibration/Acoustic Isolation:	Other:
		Both are required		Private room, free from distraction		N/A	N/A
Constraints/Special Requirements:		N/A					
Notes:							
Data Delivery:		A postflight physical examination report will be included in the crewmember's chart in the EMR within 48 hours of completion of the physical exam.					

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### 3.7 Summary Schedule

**TABLE 3.7: SUMMARY SCHEDULE**

ACTIVITY	DURATION OF ACTIVITY	SCHEDULE	FLEXIBILITY	PERSONNEL REQUIRED	CONSTRAINTS
Preflight Training – N/A					
Preflight					
Full Physical Exam	60 minutes	AME L-6/9 m, also as clinically indicated.	N/A	Attending FS and crewmember Nurse and/or Paramedic as required	N/A
Brief Physical Exam (USCV)	30 minutes	L-21/14, L-2/1 days, also as clinically indicated.			
Brief Physical Exam (Soyuz)	30 minutes	L-21/7, L-2/1 days, also as clinically indicated.			
In-Flight – N/A					
Postflight					
Full Physical Exam	60 minutes	R+0, R+45/60 day (return to duty), also as clinically indicated.	N/A	Attending FS and crewmember Nurse and/or Paramedic as required	N/A
Brief Physical Exam (Post Flight)	30 minutes	R+3, R+7/14 days, also as clinically indicated.			
Postflight Debrief – N/A					

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## MedB 1.4 – Neurovestibular Assessment

Crewmember \_\_\_\_\_ Mission \_\_\_\_\_ Date \_\_\_\_\_

Exam → ☐ Preflight ☐ Landing ☐ +3 days ☐ +7/14 days ☐ As needed \_\_\_\_\_

Fluids and Meds (Landing Day Only)				
	Pre-Landing Prophylactic	Post-Landing Treatment		
<b>Fluids</b>				
<b>Medications</b>	Med(s): Dose: Route (circle): PO - IM - IV	Med(s): Dose: Route (circle): PO - IM - IV		
<b>Other</b>				
<b>Subjective</b>				
		None	Mild	Moderate
<b>Dizziness</b> (Feeling of movement or unsteadiness, NO tumbling or spinning)				
<b>Vertigo</b> (A tumbling or spinning sensation, worse with head movement)				
<b>Lightheaded</b> (Feeling weak or faint, especially when rising to stand)				
<b>Objective</b>				
<b>Gaze / Ocular Movements</b> (Hold far lateral gazes for 5 seconds, watch for nystagmus; watch for dysconjugate gaze; finger to bridge of nose, watch for convergence)	Nystagmus → <input type="checkbox"/> No <input type="checkbox"/> Yes Fast beat (circle) → L / R / U / D, # of beats? _____ Dysconjugate Gaze → <input type="checkbox"/> No <input type="checkbox"/> Yes Convergence to Center → <input type="checkbox"/> No <input type="checkbox"/> Yes			
<b>Finger to Nose</b> (5 times per side)	<input type="checkbox"/> No misses <input type="checkbox"/> 1 miss <input type="checkbox"/> 2 misses <input type="checkbox"/> >2 misses			
<b>Rising from Chair</b> (Without use of arms, arms kept at sides)	<input type="checkbox"/> Able <input type="checkbox"/> Arms away from sides <input type="checkbox"/> Arms above waist <input type="checkbox"/> Uses arms /can't do			
<b>Romberg / Pronator Drift</b> (Bare feet w/ pants rolled up; feet together, arms extended, eyes closed, push arms gently down about 6 inches, watch for recovery, 30 seconds)	Posture → <input type="checkbox"/> Stable <input type="checkbox"/> Sway / Missteps Any Drift → <input type="checkbox"/> No <input type="checkbox"/> Yes Recovery → <input type="checkbox"/> Close to original <input type="checkbox"/> Far off (>6")			
<b>Tandem Heel-Toe Walk</b> (Bare feet w/ pants rolled up; eyes closed, walk to 5 m distant point, heel to toe, <u>upper arms at sides</u> . Walk just beside them to spot them.)	<input type="checkbox"/> Completes (sway is okay) <input type="checkbox"/> Minor deviation, No missteps <input type="checkbox"/> Moderate deviation, 1 – 2 missteps <input type="checkbox"/> Major deviation, >2 missteps, falls, or unable			

Comments:

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Flight Surgeon \_\_\_\_\_ / \_\_\_\_\_