

3.2 Medical Requirements Overview**TABLE 3.2: MEDICAL REQUIREMENTS OVERVIEW**

MRID# and Title:	Annual Medical Examinations
Sponsor:	Medical Operations
IPT:	N/A
Category:	Annual Medical Requirements
References:	Astronaut Medical Evaluation Requirements Document (AMERD) Vol. 1B - Annual and STS Medical Examinations JSC24834
Purpose/Objectives:	Evaluate astronauts health and well being annually
Measurement Parameters:	See specific exams within this MRID
Deliverables:	Annual medical exam data deposited within the Electronic Medical Records
Flight Duration:	N/A
Number of Flights:	N/A
Number and Type of Crew Members Required:	All U.S. Astronauts
Other Flight Characteristics:	N/A

3.3 Audiometry**TABLE 3.3: Audiometry**

Annual Exam	Description:	Astronaut hearing sensitivity will be evaluated with pure tone, air conduction audiometry annually, or as needed (i.e., per MRID requirements for pre-flight and post-flight audiometric data).			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		10 minutes	Annually or as needed	N/A	Technician, crewmember, physician/audiologist, and data entry clerk
Measurement Parameters	Hearing threshold at specified frequencies				
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	Audiometer and audiometric earphones (calibrated to ANSI standards)	Hear Trak		Occupational Health Clinic, Audiology Clinic	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	Approximately 4 ft. X 5 ft.	2	Normal range	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	Sound-treated audiometric booth	Acoustic isolation from external noises is necessary	N/A	
Constraints/Special Requirements:	Shift of 10 dB or more (averaging 2k, 3k, and 4kHz) in either ear compared to baseline hearing test requires a re-test within 30 days. That test should be preceded by at least 14 hours of low noise (i.e., less than 85dBA).				
Notes:	N/A				
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	Electronic Medical Records and Hear Trak Database.				

3.4 Cardiovascular/Cardiopulmonary Evaluations

TABLE 3.4: Cardiovascular/Cardiopulmonary Evaluations

Annual Exam	Description:	<u>Cardiovascular</u> Graded Exercise Test (GXT): Treadmill test will be performed at age-specific intervals to baseline and establish max HR and VO ₂ max. It will also measure blood pressure, workloads, resting and exercise ECG, and perception of effort. - Graded exercise tests at ages 30, 35, 40; every two (2) years between ages 40-50; every year after age 50 - Resting Electrocardiogram, 12 lead (annually)			
	Schedule:	<u>Pulmonary</u> - Pulmonary function tests, which include standard spirometry, and diffusion capacity - Purified Protein Derivative (PPD) (tuberculin) skin test for tuberculosis, unless clinically contraindicated.			
	Duration:	Schedule:	Flexibility:	Personnel Required:	
	1.5 to 2.0 hours	According to age requirements	N/A	Physician, nurse or nurse and technician	
Measurement Parameters	Aerobic capacity (VO ₂), heart rate, ECG, blood pressure, work load and perception of effort. Lung volume and diffusion capacity.				
Ground Support Requirements Hardware/Software	Hardware:		Software:		Test Location:
	Treadmill Spirometer		N/A		B-261 Clinic
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	Standard room, 8 ft.x 10 ft.	4(U.S. 110V)	20 degrees centigrade	Normal lighting	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	Hot and cold water	Private room required	N/A	N/A	
Constraints/Special Requirements:	Ergometer used only if injury prevents use of treadmill, or if requested by astronaut.				
Notes:	Test utilizes Bruce Protocol (Treadmill) procedure.				
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	Data entered into the Electronic Medical Record.				

3.5 Clinical Laboratory Testing

TABLE 3.5: Clinical Laboratory Testing

Annual Exam	Description:	Clinical Laboratory Assessment will be performed annually on all astronauts. The examination will include collection of blood and urine from astronauts for analyses of astronaut health.				
	Schedule:	Duration:	Schedule:	Blood Volume	Flexibility:	Personnel Required:
		20 minutes	Annually	28.5 ml (active astronaut) 20.0 ml (retired astronaut)	N/A	Medical Technologist
Measurement Parameters	<p>Clinical Laboratory Assessment will include the following:</p> <ul style="list-style-type: none"> Blood: CBC with differential count, reticulocyte count, Chemistry Profile, lipid profile, Calcium (ionized), Serum iron, Total iron binding capacity (TIBC), Transferrin, Transferrin Saturation, Ferritin, Thyroid Stimulating Hormone (TSH), Free Thyroxine (Free T4), High Sensitivity C-reactive protein, PSA (males equal to or greater than 40 years old). The testing interval of the following tests follows a q3y schedule and coincides with the q3y DEXA scan: serum protein electrophoresis, quantitative immunoglobulins (IgG, IgA, and IgM), bone-specific alkaline phosphatase, and osteocalcin. Active astronauts are tested for HIV, hepatitis C, and RPR yearly, and hepatitis A and B in accordance with the immunization record. <p>Urine: Urinalysis from random urine sample. N-telopeptides (2nd morning void) is obtained q3y following the schedule listed above.</p>					
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:		
	Laboratory supplies specific to tests	N/A		Flight Medicine Clinic		
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:		
	Standard room, 8ft. x 10ft.	4(U.S. 110V)	Normal, 20° - 25°	Normal lighting		
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:		
	Hot and cold water	Private room required	N/A	N/A		

Constraints/Special Requirements:	Fasting 12 hours before blood draw.
Notes:	N/A
Data Delivery	<p data-bbox="638 394 1913 440">Data/Report to Designated Recipients (Nominal/Contingency):</p> <p data-bbox="638 448 1913 519">Data is imported to the Flight Medicine Clinic Electronic Medical Records (EMR) System from the Clinical Laboratory Information System (CLIMS). Physicians can view their patient information on the EMR. Results are completed within 48 hours after specimen receipt for all but tests that are sent to a reference laboratory.</p>

3.6 Dental Examination

TABLE 3.6: Dental Examination

Annual Exam	Description:	Annual general dental examination and cleaning (bitewing X-rays, as clinically indicated). A baseline Panorex will be obtained and updated every five (5) years.			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		45 to 60 minutes	Annually	N/A	Dental Assistant, Dentist, crewmember
Measurement Parameters:	Brief Dental History/unusual oral symptoms - pain in the oral cavity - bleeding when brushing - facial muscle and/or joint pain Periodontal evaluation: - Visually examine for supergingival plaque and calculus, and condition of soft tissue - Periodontal probing to determine: <ul style="list-style-type: none"> • probing depths around each tooth • amount of bleeding during probing • detect any hidden fistulas from necrotic teeth that might not otherwise be detected • determine amount of subgingival calculus Oral hygiene instruction		Oral cancer screening exam: - extra-oral visual exam - radiographic survey for unusual pathology <ul style="list-style-type: none"> • hard tissue, maxillary sinus, and visible soft tissue area - intra-oral visual exam <ul style="list-style-type: none"> • tongue, cheeks, throat, gingival tissue, and hard and soft palate Odontal evaluation: - caries detection - visible cracks in teeth - abfraction lesions - occlusal evaluation - check all restorations to determine if they are serviceable - check any removable appliances to determine their serviceability		
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	Dental hardware provided by NASA/JSC	Gendex software for digital X-rays Logician		NASA Dental Clinic	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	JSC dental Office at B8 Clinic	4(U.S. 110V)	Normal, 20° - 25°	Overhead dental light	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	Hot and cold water	private room required	N/A	N/A	

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Constraints/Special Requirements:	The preflight dental exam (MR012L) may be substituted if performed within 30 days of a crewmembers birth date.
Notes:	Digital radiographs are used to provide less radiation.
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):
	The portion of the dental exam documenting the flight qualification status, including class/type of exam and some dental history, is entered into the EMR.

3.7 Gastrointestinal

TABLE 3.7: Gastrointestinal

Annual Exam	Description:	Proctosigmoidoscopy Colonoscopy			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		Proctosigmoidoscopy – 1.5 to 2.0 hours Colonoscopy – See constraints/special requirements	Proctosigmoidoscopy – ages 40, 45, 55, 65, and 70 Colonoscopy – ages 50 and 60, and as clinically indicated	N/A	Proctosigmoidoscopy – Physician and nurse Colonoscopy – Physician, nurse, and anesthesiologist
Measurement Parameters	Gastrointestinal imaging				
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	Proctosigmoidoscopy – Scopes, monitor, and camera Colonoscopy – Scopes, monitor, and camera	Imaging software used for proctosigmoidoscopy and colonoscopy		Proctosigmoidoscopy – Occupational Health Clinic Colonoscopy – Out-patient procedure done at local medical treatment facility	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	N/A	N/A	N/A	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	N/A	N/A	N/A	
Constraints/Special Requirements:	<p>Proctosigmoidoscopy - Avoid high fiber food and drink lots of fluids the day before the procedure is done.</p> <p>Colonoscopy – Liquid diet the day before the procedure is done. Follow-up exams are scheduled if clinically indicated.</p> <p>Note: A detailed instruction sheet, including constraints, is given to patients prior to the test date. Colonoscopies performed at the Clear Lake Hospital require up to 30 minutes travel time and 3 hours total time at the facility. Colonoscopies performed at St. Luke's require up to 2 hours travel time and 4 hours total time at the facility. Because of sedation, patients cannot drive themselves or work for the remainder of the day the procedure is performed.</p>				

Notes:	N/A
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):
	Data and images are kept on file in the Flight Medicine Clinic (FMC). Summary results and interpretations are entered into the EMR.

3.8 Genitourinary

TABLE 3.8: Genitourinary

Annual Exam	Description:	A pap smear is required annually for all female crewmembers.			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		60 minutes	Annually	N/A	OB/GYN health care provider
Measurement Parameters		Manual assessment of pelvic organs and visual interpretation of cellular morphology			
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	N/A	N/A		Flight Medicine Clinic or at astronaut's OB/GYN health care provider	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	N/A	N/A	N/A	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	N/A	N/A	N/A	
Constraints/Special Requirements:		Well woman exam consists of a pelvic exam and pap smear done by an OB/GYN health care provider			
Notes:		N/A			
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	Pap smear results data and interpretation are recorded in the Electronic Medical Record				

3.9 Imaging Evaluations

TABLE 3.9: Imaging Evaluations

Annual Exam	Description:	Chest X-ray (CXR), posteroanterior and lateral Mammography Bone densitometry, by Dual-Energy X-Ray Absorptiometry (Dexa)			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		Bone density – 60 minutes Chest X-ray – 20 minutes Mammography 20 minutes	First annual exam and every three (3) years thereafter As clinically indicated Every two (2) years 40-50; every year after age 50	N/A	Lab personnel and subject X-ray Technician and subject Mammography technician and subject
Measurement Parameters	Chest X-rays, Mammograms, Dexascans				
Ground Support Requirements Hardware/Software	Hardware:	Software:	Test Location:		
	Hologic QDR 4500 W DEXA Scanner	N/A	Bone density – Johnson Space Center Chest X-ray – Occupational Health Clinic Mammography - Breast Diagnostic Center		
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	N/A	N/A	N/A	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	N/A	N/A	N/A	
Constraints/Special Requirements:	All female patients presenting for a dexascan will have a pregnancy test accomplished prior to the dexascan and the result verified as negative with the following three exceptions: <ul style="list-style-type: none"> • The patient no longer has a uterus. • The patient is greater than one year post menopause. • The patient has a documented negative pregnancy test obtained during the three days preceding the dexascan. For chest x-ray and mammography, a detailed instruction sheet, including constraints, is given to patients prior to the test date.				
Notes:	Bone density not required for completion of physical.				

Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):
	Bone density not recorded in Electronic Medical Record (EMR). Mammography reports are maintained in the EMR. Chest x-ray results and interpretation are entered into the EMR.

4.0 Medical History Review

TABLE 4.0: Medical History Review

Annual Exam	Description:	Medical history review includes all relevant medical events in the interim year (diagnoses, records of hospitalizations and emergency room visits, medications use, international travel history).			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		20 to 30 minutes	Annually	N/A	Nurse and Data Entry personnel.
Measurement Parameters	Relevant medical events in the interim year (diagnoses, records of hospitalizations and emergency room visits, medications use, international travel history).				
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	N/A	N/A		Clinic	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	N/A	N/A	N/A	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	N/A	N/A	N/A	
Constraints/Special Requirements:	N/A				
Notes:	Scheduled in 45 minutes to one hour block of time				
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	SF93 form, Past Medical History form, and Family History Form will be kept in the crew medical record. Personal, family history, and risk factor data are re entered into the EMR.				

4.1 Optometry

TABLE 4.1: Optometry

Annual Exam	Description:	An annual optometry examination will be conducted by a specialist.			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		20 minutes to 1 hour	Annually or as required	N/A	Optometrist
Measurement Parameters	<ul style="list-style-type: none"> • Visual acuity : High contrast uncorrected and best corrected, Low contrast best corrected • Refraction • Color vision • Depth perception • Pupils Assesment: size, reaction to light and near stimulus • Extra Ocular Muscle Assesment: Phorias, range and quality of motion, flexibility, abduction and adduction • Tonometry by applanation • Visual Field Assesment: by confrontation annually, by threshold perimetry every 3 years • Biomicroscopy: assessment of all ocular structures and adnexa posteriorly to posterior lens capsule • Fundoscopic exam with dilation • Retinal photography every 3 years • Ocular Lens Assesment: photography and LOCS III grading • Corneal topography may be performed as indicated. 				
Ground Support Requirements Hardware/Software	Hardware:	Software:	Test Location:		
	N/A	N/A	Optometry Clinic room 220 B8, Specialized testing at Specialist office		
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	20 foot test distance required	N/A	N/A	Rheostat light control	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	Hot and Cold Water	N/A	N/A	N/A	
Constraints/Special Requirements:	Drugs used to dilate the pupils will cause increased sensitivity to bright light and blurred vision. Constraints <u>following</u> the exam include, no piloting of aircraft for 24 hours after dilation. Driving may be done but with extra caution				

Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency): Optometrist inputs eye data into the Electronic Medical Record. Images and threshold visual field results maintained by hard copy in optometry patient records room 220 B8.
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4.2 Physical Examination

TABLE 4.2: Physical Examination

Annual Exam	Description:	A physical exam will be performed annually on all astronauts.			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		30 minutes to 1 hour	Annually	N/A	Nurse, Physician
Measurement Parameters		<ul style="list-style-type: none"> • Vital signs: pulse and blood pressure recumbent, sitting, standing, body temperature, respiratory rate, height, and weight • Head and face: nares/nasal mucosa, sinuses, maxillary and frontal • Mouth and throat • Ears: external meatus, tympanic membrane, and response to Valsalva • Eyes: general appearance, extra-ocular movements, pupil reactivity, and ophthalmoscopic exam • Neck: thyroid, vascular exam, motion • Chest and lungs: cardiovascular exam, including cardiac and pulmonary auscultation, carotid and venous upstrokes, and peripheral pulses • Abdomen: auscultation, palpation of major organs and herniations • Extremities: to include range-of-motion and general strength assessments • Spine: general appearance and mobility • Skin: to include lymphatics and identifying body marks • Neurologic: to include standard functional and gait exam 			
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	N/A	N/A		Flight Medicine Clinic	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	N/A	N/A	N/A	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	N/A	N/A	N/A	
Constraints/Special Requirements:	Does not require fasting.				

Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):
	Electronic Medical Record

4.3 Psychiatric/Psychological Evaluation

TABLE 4.3: Psychiatric/Psychological Evaluation

Annual Exam	Description:	<ul style="list-style-type: none"> • 15 minutes of psychological questionnaires (POMS,History Review) followed by a 15 minute semi-structured behavioral interview. • Face-to-face assessment to confirm the astronaut’s continued fitness for duty, including review of any documented behavioral assessments of the astronaut during professional training • Performed by psychological/psychiatric specialist with additional qualifications in relevant operational environments as defined by the crewmember’s home agency • Medical behavioral health and performance information will be accessible only to the psychological/psychiatric specialists authorized by the home agency, who must ensure that any information with mission impact will be forwarded to the crew surgeon. 			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
	30 minutes	Annually, scheduled within 3 months of the last day of the birth month.	Call the BHPG office for changes to schedule	Behavior Health and Performance Group (BHPG) or BHPG sanctioned Psychiatrist	
Measurement Parameters	Medical behavioral health and performance				
Ground Support Requirements Hardware/Software	Hardware:	Software:		Test Location:	
	Laptop Computer	Psychological Questionnaire		Suitable for private, face-to-face discussion	
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	Standard Office	1	Normal	Normal Office Lighting	
	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	
	N/A	Yes, must provide complete privacy for conversation	N/A	N/A	

Constraints/Special Requirements:	If clinically indicated, further examination may be required to ensure compliance with Medical Standards. Behavioral Health exam must be completed before signature or annual physical can be finalized. In addition to the annual exam, a single baseline cognitive assessment and a single personality assessment must be completed at this time unless already completed during the initial astronaut selection process. Observer/test proctor must be available when completing questionnaires. Questionnaires must be completed and stored with results available at the time of exam.
Notes:	Behavioral Health Plan, JSC #27384 used as a reference. International Space Station Medical Operations Requirements Documents (Paragraph, 3.0, 3.3); Astronaut Medical Evaluation Requirements Document, Volume 1B (Section II, 2.2)
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):
	Certification results reported to the Aeromedical Board (AMB) and the Multilateral Space Medicine Board (MSMB)

4.4 Summary Schedule

TABLE 4.4: SUMMARY SCHEDULE

ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	BLOOD VOLUME	PERSONNEL REQUIRED	CONSTRAINTS
Annual Exam						
Audiometry	10 minutes	Annually or as needed	N/A	N/A	Technician, crewmember, physician/audiologist, and data entry clerk	Shift of 10 db or more in either ear requires a re-test within 30 days preceded by at least 14 hours of low noise.
Cardiovascular/ Cardiopulmonary Evaluations	1.5 to 2.0 hours	According to age requirements	N/A	N/A	Physician, nurse or nurse & technician	Use ergometer only if injured or requested. Otherwise use treadmill.
Clinical Laboratory Testing	20 minutes	Annually	N/A	28.5 ml (active astronaut) 20.0 ml (retired astronaut)	Medical technologist	Fasting 12 hours before blood draw.
Dental Examination	45 to 60 minutes	Annually	N/A	N/A	Dental Assistant, Dentist, crewmember	The preflight dental exam (MR012L) may be substituted if performed within 30 days of a crewmembers birth date.

ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	BLOOD VOLUME	PERSONNEL REQUIRED	CONSTRAINTS
Gastrointestinal	Proctosigmoidoscopy – 1.5 to 2.0 hours Colonoscopy – Procedure done at hospital (see constraints/special requirements)	Proctosigmoidoscopy – ages 40, 45, 55, 65, and 70 Colonoscopy – ages 50 and 60, and as clinically indicated	N/A	N/A	Proctosigmoidoscopy – Physician and nurse Colonoscopy - Physician, nurse, & anesthesiologist	Proctosigmoidoscopy - Avoid high fiber food and drink lots of fluids the day before the procedure is done. Colonoscopy – Liquid diet the day before the procedure is done. Follow-up exams are scheduled if clinically indicated. Note: A detailed instruction sheet, including constraints, is given to patients prior to the test date. Colonoscopies performed at the Clear Lake Hospital require up to 30 minutes travel time and 3 hours total time at the facility. Colonoscopies performed at St. Luke's require up to 2 hours travel time and 4 hours total time at the facility. Because of sedation, patients cannot drive themselves or work for the remainder of the day the procedure is performed.

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ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	BLOOD VOLUME	PERSONNEL REQUIRED	CONSTRAINTS
Genitourinary	60 minutes	Annually	N/A	N/A	OB GYN health care provider	Well woman exam consists of a pelvic exam and pap smear done by an OB/GYN health care provider.
Imaging Evaluations: Bone Density	60 minutes	First annual exam and every three (3) years thereafter	N/A	N/A	Lab personnel and subject	All female patients presenting for a dexascan will have a pregnancy test accomplished prior to the dexascan and the result verified as negative with the following three exceptions: <ul style="list-style-type: none"> • The patient no longer has a uterus. • The patient is greater than one year post menopause. • The patient has a documented negative pregnancy test obtained during the three days preceding the dexascan. For chest x-ray and mammography, a detailed instruction sheet, including constraints, is given to patients prior to the test date.
Chest X-ray	20 minutes	As clinically indicated	N/A	N/A	X-ray technician and subject	
Mammography	20 minutes	Every two (2) years 40-50; every year after age 50.	N/A	N/A	Mammography technician and subject	

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ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	BLOOD VOLUME	PERSONNEL REQUIRED	CONSTRAINTS
Medical History Review	20 to 30 minutes	Annually	N/A	N/A	Nurse & Data Entry personnel.	N/A
Optometry	20 minutes to 1 hour	Annually or as required	N/A	N/A	Optometrist	Drugs used to dilate the pupils will cause increased sensitivity to bright light and blurred vision. Constraints following the exam include, no piloting of aircraft for 24 hours after dilation. Driving may be done but with extra caution.
Physical Examination	30 minutes to 1 hour	Annually	N/A	N/A	Nurse, Physician	Does not require fasting.
Psychiatric / Psychological Evaluation	30 minutes	Annually, scheduled during the same month as their physical	Call the BHPG office for changes to schedule	N/A	Behavior Health and Performance Group (BHPG) or BHPG sanctioned Psychiatrist	If clinically indicated, further examination may be required to ensure compliance with Medical Standards. Behavioral Health exam must be completed before signature or annual physical can be finalized. In addition to the annual exam, a single baseline cognitive assessment and a single personality assessment must be completed at this time unless already completed during the initial astronaut selection process. Observer/test proctor must be available when completing questionnaires. Questionnaires must be completed and stored with results available at the time of exam.

4.5 Appendix

ASCAN In Processing

Astronaut candidates (ASCANs) are in processed to the Flight Medicine Clinic using the following protocol:

Name: _____

√	Needed	Completed Date
	Footprints	
	Hair Sample	
	DNA Sample	
	Registration Form	
	Registration Supplement Form	
	Blood Type	
	Viral Titers * *	
	Hepatitis A Screen Results	
	Hepatitis B Screen Results	
	Check Immunization Status (Records or Laboratory Immune Status)	
	<ul style="list-style-type: none"> • DT 	
	<ul style="list-style-type: none"> • Polio 	
	<ul style="list-style-type: none"> • Hepatitis A 	
	<ul style="list-style-type: none"> • Hepatitis B 	
	<ul style="list-style-type: none"> • 	
	<ul style="list-style-type: none"> • PPD 	

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	Audiometry and Consultation with Audiologist	
	Photo for EMR	
√	To Be Done If Due or Not Immune	Date Given
	MMR	
	PPD	
	Hepatitis A Series	
	Hepatitis B Series	
	DT	
	Polio	
	Varicella	

* * Viral Titers include Mumps, Measles, Rubella, Varicella Zoster Virus, EBV Antibody to VCA IgG, EBV Antibody to NA IgG, CMV IgG, Herpes Simplex Virus I and II.
Bone Markers will be done at time of next Dexascan at 3 years out.