

Document Title:	TREADMILL STRESS ECHOCARDIOGRAM	
Department/Section:	Non-Invasive Cardiovascular Imaging Sciences	
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Document Type:	Standard Operating Procedure	
Effective Date:	12-30-2021	
Document Code:	DPOTMH-E-65-P01-S05	

PURPOSE:

To provide a guidelines on how to perform the procedure to patient correctly.

SCOPE:

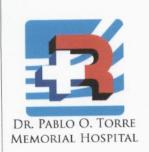
Applies to all staffs of Non-Invasive Cardiovascular Imaging Sciences (NICIS) of Dr. Pablo O. Torre Memorial Hospital

RESPONSIBLE PERSON:

Physicians (Cardiologists), Stress Test Technician and 2D Echo Technician, and other allied healthcare professionals who had undergone training or certification.)

GENERAL GUIDELINES:

- 1. Patient must have a referral/request from a Cardiologist for a treadmill stress echo indicating what type of exercise protocol and the indication for the procedure.
- 2. Only a trained cardiologist or trained health care professional is allowed to perform the test.
- 3. Privacy and confidentiality should be maintained throughout the procedure.
- Avoid giving personal comments or impressions with regards to the result. Only a
 qualified healthcare professional and Cardiologist are allowed to interpret and
 explain the final results.
- Machines and equipment should be routinely checked for damages and efficiency to ensure safety and accurate results.



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PROCEDURE:

EQUIPMENT:

- Exercise ECG/ Stress Testing system (example: Philips Stress Vue, GE Marquette cardiosys) with ECG electrodes attachments and monitoring device.
- 2. Heavy duty treadmill specially designed for cardiac and pulmonary stress testing which can be interfaced with the Exercise ECG/Stress Testing system. (ex: Track master treadmills)
- 3. Height adjustable sphygmomanometer
- 4. Color Duplex ultrasound scanner machine (HDI 5000 or HD11-XE)
- Low frequency transducer / select frequency appropriate to body habitus P4-2 for adult / P7-4 for pedia) Phased array with Doppler and/or Color (Doppler capabilities)
- 6. Warm acoustic coupling gel
- 7. Recording device (VHS tape or Compact disc and thermal paper)

PATIENT PREPARATION:

- 1. No food intake 2 hours prior to testing.
- 2. Take medications as ordered unless given special instructions by attending physician.
- Wear his/her most comfortable running attire (running/rubber shoes, pants, shorts, t-shirts).
- Bring necessary medications that may be needed while undergoing the procedure. (ex. Inhalers for asthmatic patients, etc.).
- 5. Bring snacks to be taken after testing (optional).
- 6. Bring adult companion during the session.
- 7. Bring all things deemed necessary by the patient: extra shirts, towels, water, etc. ** Preferably given by the cardiologist who will perform the procedure.



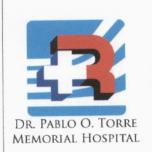
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OUT-PATIENT PRE-EXAMINATION PROCEDURES:

- Patient must be assessed first if fit to do the stress test. Health conditions, medications and disabilities which may affect the test should be identified prior to the procedure.
- 2. Turn on the machine:
 - Plug in power cord of electronic voltage regulator, treadmill machine, CPU of the computer and printer.
 - 2.2. Turn on Electronic voltage regulator and wait for the red button to turn green.
 - 2.3. Turn on power button of the CPU of the computer and the printer. Run test printer by printing the test print sheet.
 - Click the "StressVue" icon on the desktop screen to begin testing.
- 3. Interview patient for necessary data which includes: Name, age, sex, address, birthday, attending physician, height, weight, reason for testing and medications. and inform the performing cardiologist that patient has arrived.
- 4. Patient pays to the cashier for cash transactions. For transactions chargeable to insurances or company, procedure is charged accordingly.

DIRECT EXAMINATION PROCEDURES:

- 1. Instructions for the procedure should be clearly explained to ensure the comfort and safety of the patient.
- 2. Skin prep the area of the chest where the ECG electrodes are to be attached.
- 3. Wipe/Clean the skin with cotton wet with alcohol or an alcohol swab.
- 4. Patient with chest hair; shave chest hair properly.
- 5. Make sure that the patient is not allergic to alcohol.
- 6. Electrodes on designated part over fleshy areas and fix them properly as follows:



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LIMB ELECTRODES:

Code	Location	Color Code(GE Marquette)	Color Code (Philips stress vue)
RA (Right arm)	Just below the right clavicle medial to the deltoid muscle	White	White
LA (Left Arm)	Just below the left clavicle medial to the deltoid muscle	Black	Black
RL (Right Leg)	Just above the right iliac crest on mid axillary line (GE Marquette); On the sternum, midway between the clavicle and the 4 th intercostals space (Philips)	Green	Green
LL (Left Leg)	Just above the left iliac crest on mid axillary line	Red	Red

CHEST ELECTRODES:

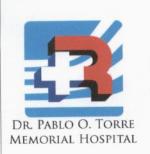
Code	Location	Color Code(GE Marquette)	Color Code (Philips stress vue)
V1	Placed in the fourth intercostal space to the right of the sternum.	Red	Red
V2	Placed in the fourth intercostal space to the left of the sternum.	Yellow	Yellow



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V3	Placed directly between leads V2 and V4.	Green	Green
V4	Placed in the fifth intercostal space in the midclavicular line (even if the apex beat is displaced).	Blue	Blue
V5	Placed horizontally with V4 in the anterior axillary line	Orange	Orange
V6	Placed horizontally with V4 and V5 in the midaxillary line.	Violet	Violet

- Encode patient's data in the stress test computer system and set exercise protocol indicated.
- 8. Take pre-exercise ECG and blood pressures in different positions (Supine, sitting, hyperventilation and standing positions) and encode in computer. Print out a copy of the ECG strip for each position.
- 9. Once cardiologist (or qualified medical practitioner) is present, a pre-exercise 2D echocardiogram is taken and the exercise protocol is then started.
- 10. Instructions while on treadmill:
 - 10.1. Use hand rails for balance.
 - 10.2. Take long comfortable strides instead of shorter strides.
 - 10.3. Patient's head should be in neutral angle, avoid stooping down.
 - 10.4. Immediately inform staff in charge/cardiologist for any symptom or feeling of discomfort (Chest pains, leg pain, difficulty of breathing, etc).
- 11. Blood pressure should be checked as often as possible (usually every 2 minutes during exercise and recovery stage).

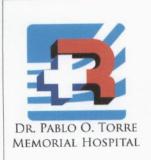


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- 12. Watch out for danger signs of Cardiac stress testing:
 - 12.1. Very fast and labored respiration
 - 12.2. Cyanosis, sudden severe pallor
 - 12.3. Cold, clammy perspiration
 - 12.4. Fainting spells, loss of consciousness
 - 12.5. Severe nausea
 - 12.6. Sudden drop/increase in blood pressure
 - 12.7. Sudden drop/increase in cardiorespiratory rate
 - 12.8. Severe chest pain/angina
 - 12.9. Sudden severe headache
- 13. After patient has reached his/her peak exercise/limit, patient is immediately transferred to bed for a peak exercise 2D echocardiogram.
- 14. Recovery period is then initiated to gradually cool down the patient. Blood pressure and ECG printouts are taken immediately after exercise (30 secs in recovery), 1 minute after and every 2 minutes thereafter until the end of the test.
- 15. A post exercise echocardiogram is taken.
- Leave electrodes attached and continuously monitor patient until instructed by cardiologist to remove or until the test is finished.

POST-EXAMINATION PROCEDURES:

- After the test, remove electrodes, wipe off electrode residues and let patient rest, change clothes, drink water and other personal necessities. Observe for signs and symptoms of complications.
- Facilitate completion of all necessary data and information for interpretation of results.
- Complete the necessary data and information on the stress test worksheet. Secure all ECG tracings.
- 4. Cardiologist interprets and makes final result.



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- 5. Stress test technologist encodes final result in the computer and let cardiologist sign the official result for releasing.
- Proper documentation should be observed.
- 7. Results released in two days after test.

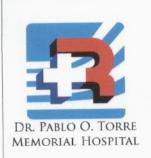
IN-PATIENT PRE-EXAMINATION PROCEDURES:

- 1. The staff nurse on duty encodes request on the bizbox computer system and schedules patient upon receiving doctor's order for treadmill stress echo.
- Nurse Technician renders request for treadmill stress echo. All rendered request are automatically charged to the patient's account.
- 3. Patient is given the list of preparation for the stress testing.
- 4. The nurse technician calls the station to bring down the patient at the NICIS Department before the scheduled time.
- 5. The Nurse Technician informs the examining performing cardiologist once the patient arrives in the unit.
- 6. The Nurse Technician prepares machine, inputs the patient's data and sets the equipment for proper test documentation.
- 7. The Nurse Technician introduces self to patient and assists him/her in changing to hospital gown maintaining the patient's privacy and confirms the patient's identity using the two patient identifier.

<u>DIRECT EXAM PROCEDURES</u> (Please refer to Out-Patient Direct Examination <u>Procedures</u>)

POST EXAMINATION PROCEDURES:

- After the test, remove electrodes, wipe off electrode residues and let patient rest, change clothes, drink water and other personal necessities. Observe for signs and symptoms of complications.
- 2. Patient is brought back to the room/ ward.



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- 3. Facilitate completion of all necessary data and information for interpretation of results on the stress test worksheet.
- 4. Secure all ECG tracings.
- 5. Cardiologist interprets and makes final result.
- Stress Test Technologist encodes final result in the computer and let Cardiologist sign the official result for releasing.
- 7. Proper documentation should be observed.
- 8. Do after care of the machine and turn off properly when not in use.

TURN AROUND TIME (TAT)

Pre-exam procedures:	TIME	
1. Completion of pre-exam paperwork	1 minute	
2. Exam charging and billing activities	3 minutes	
3. Exam room and equipment preparation	3 minutes	
4. Patient preparation and positioning	3 minutes	
Direct examination:		
8. Pre infusion baseline ECG and 2DEcho	20-30minutes	
9. Exercise proper	6-10stages (depending on exercise protocol) each stage duration 3 minutes (18-30 mins)	
10. Recovery	6-15 minutes (until baseline ECG and vital signs go back to pre-exercise levels) or depending on the cardiologist.	



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Post-e	examination procedures:	
1.	Cleanup	5 minutes
2.	Review exam data for preliminary and/or formal interpretation by cardiologist	15 minutes
	Total:	Approximately 1 hour to 1 hour and 30 minutes



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APPROVAL:

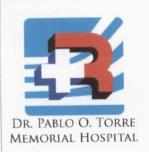
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	OUT-PATIENT PRE-EXAMINATION PROCEDURE		
KEY TASK		PERSON RESPONSIBLE	
1.	Does assessment of the patient first if fit to do the procedure.		
2.	Interviews patient for necessary data.	Nurse Technician	
3.	Pays to the Cashier for cash transactions		
4.	Performs direct examination according to different approaches.		

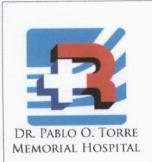
KEY TASK		PERSON RESPONSIBLE
1.	Removes and wipes off electrode residues.	
2.	Facilitates completion of all necessary data and information for the interpretation of results.	Nurse Technician
3.	Completes the necessary data and information on the Stress Test Worksheet.	
4.	Interprets and makes final result.	Cardiologist
5.	Encodes the final result in the computer.	Stress Test Technologist



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IN-PATIENT PRE-EXAMINATION PROCEDURE		
KEY TASK	PERSON RESPONSIBLE	
1. Encodes the request on the Bizbox computer system and schedules the patient.	Nurse-on-duty	
2. Renders request for the procedure and instructs the Nurse-on-duty regarding patient preparation.		
3. Calls the Nursing Station to bring down the patient at the NICIS Section for the procedure.	Nurse Technician	
4. Prepares the machine, introduces self to the patient inputs the patient's data and sets the equipment for proper test documentation.	TVIISC Technician	

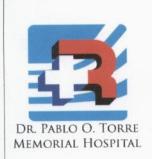
IN-PATIENT POST-EXAMINATION PROCEDURE		
	KEY TASK	PERSON RESPONSIBLE
1.	Removes the excess gel by wiping it off gently and monitors the patient for possible complication.	
2.	Brings the patient back to the room/ward.	
3.	Facilitates completion of all necessary data and information for interpretation of results.	Nurse Technician
4.	Completes the necessary data and information on the Stress Test Worksheet and secures all ECG tracings.	
5.	Interprets and makes the final result.	Cardiologist
6.	Encodes the final result in the computer.	Stress Test Technologist



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Approved:	Total Quality Division Officer GENESIS GOLDI D. GOLINGAN President and CEO	. ,	

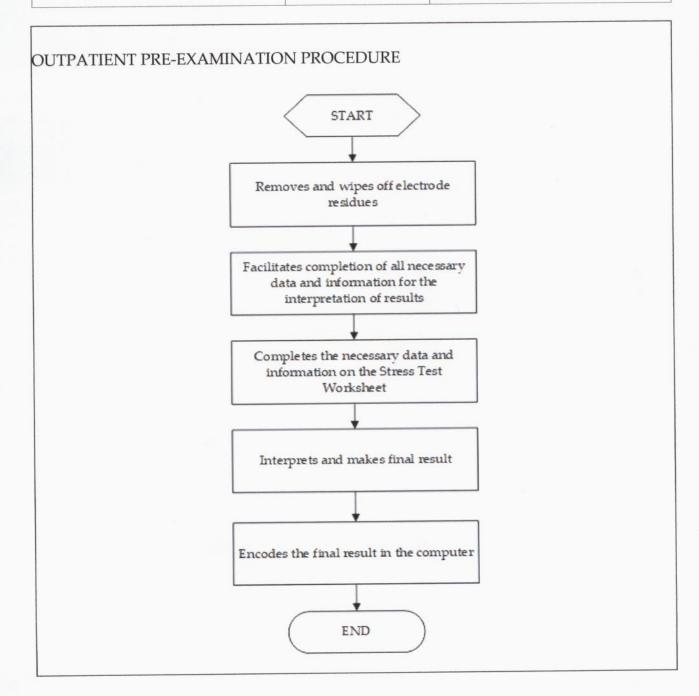


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FLOWCHART OUTPATIENT PRE-EXAMINATION PROCEDURE START Does assessment of the patient first if fit to do the procedure Interviews the patient for necessary data Pays to the cashier for cash transaction Performs direct examination according to different approaches END

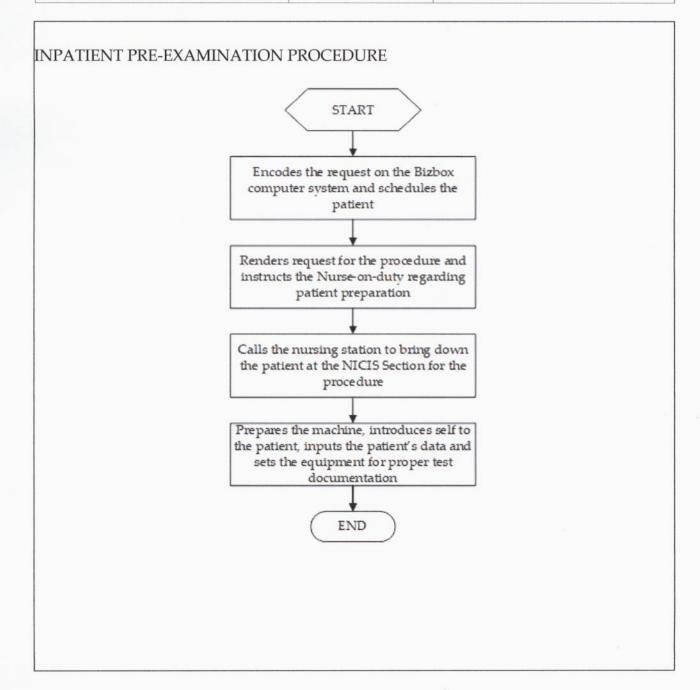


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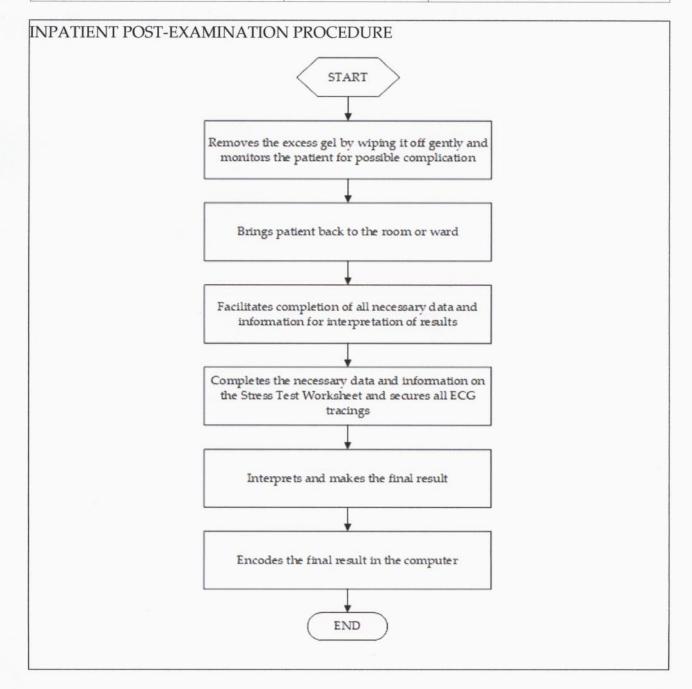


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