

The logo of Galgotias University is a circular emblem with a stylized 'G' shape in the center. The 'G' is composed of three curved segments in shades of blue, yellow, and red. The background of the emblem is a light, multi-colored swirl.

Exercise Testing

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Disclaimer

This content is for educational and teaching purpose.

The logo of Galgotias University is a circular emblem with a stylized 'G' shape inside. The 'G' is composed of three curved segments in yellow, blue, and red. The background of the circle is a gradient of light colors.

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TERMS

- *Physical activity* is defined as any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure.
- *Exercise* is a type of physical activity consisting of planned, structured, and repetitive bodily movement done to improve and/or maintain one or more components of physical fitness.
- *Physical fitness* is defined as a set of attributes or characteristics individuals have or achieve that relates to their ability to perform physical activity.

Exercise Testing

- It is a **non-invasive** procedure that provides diagnostic and prognostic information and evaluation of an individual's capacity for dynamic exercise.
- The changes in heart rate , blood pressure , respiration , perceived level of exertion provide data that permit quantitative estimation of cardiovascular conditioning and functioning.

Aims of Exercise Testing

- Aerobic ability
- Endurance
- Strength
- Flexibility
- Neuromuscular skills
- Functional performance



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Determinants of Exercise Testing

- Heart rate
- Blood Pressure
- Rate of perceived exertion (RPE)
- VO_2 max
- Metabolic Equivalents (METs)

Modified Borg CR-10 Scale

A Modified Borg scale – Burdon et al²²

0	Nothing at all
0.5	Very, very slight (just noticeable)
1	Very slight
2	Slight
3	Moderate
4	Somewhat severe
5	Severe
6	
7	Very severe
8	
9	Very, very severe (almost maximal)
10	Maximal

B Modified Borg scale – Kendrick et al²³

0	No breathlessness at all
0.5	Very, very slight (just noticeable)
1	Very slight
2	Slight breathlessness
3	Moderate
4	Somewhat severe
5	Severe breathlessness
6	
7	Very severe breathlessness
8	
9	Very, very severe (almost maximal)
10	Maximal

PRE TESTS INSTRUCTIONS

- Wear loose fitting, comfortable clothes that will easily allow a person to perform a particular test.
- Avoid food ,alcohol , and caffeine for atleast 3 hours before the test.
- Drink plenty of fluids during the preceding 24 hours until the test.
- HHQ or a PAR-Q should be done and ACSM risk stratification should be considered.

- Avoid strenuous exercise on the day of the test.
- Get plenty of rest or sleep (6-8 hours) on the night before the test.
- The room temperature should be between 70 and 74°F(21-23°C).

- There should be clear explanation of all the procedures.
- H.R, B.P, RPE, patient appearance, as well as symptoms should be mentioned regularly.
- Contraindications for testing and indications for stopping exercise should be closely observed.
- All observations should be continued for atleast 4 minutes of recovery unless abnormal responses occur which would require a longer post-test observation.

INDICATIONS OF EXERCISE Testing

- Pre-cordial chest pain.
- Determine prognosis and severity of heart disease.
- Evaluation of coronary artery disease.
- Evaluation of functional capacity and make exercise prescription.

Indications for CPET

- Evaluation of dyspnea

- Distinguish cardiac vs pulmonary vs peripheral limitation vs other
- Detection of exercise-induced bronchoconstriction
- Detection of exertional desaturation

- Pulmonary Rehabilitation

- Exercise intensity/prescription
- Response to participation

- Pre-op evaluation and risk stratification
- Prognostication of life expectancy
- Disability determination
- Fitness evaluation
- Diagnosis
- Assess response to therapy

ABSOLUTE CONTRAINDICATIONS

- Patient with Acute MI.
- Patient with Acute myocarditis or pericarditis
- Patient with unstable progressive angina.
- Patient with rapid ventricular and atrial arrhythmias
- Patient with 2nd and 3rd degree AV block
- Acutely ill patient ie ; with infection, or severe anemia.

RELATIVE CONTRAINDICATIONS

- Left main coronary stenosis.
- Stenotic valvular disease.
- Tachyarrhythmias or bradyarrhythmias.
- Severe hypertension (i.e systolic BP of >200 mmHg and/or diastolic BP >110 mm Hg) at rest.
- Severe ST depression at rest and history of angina.
- Ventricular aneurysm

- **Cardiorespiratory Fitness Measurement:**

- Conventional tests



- 1. Step tests
- 2. Field tests

- Laboratory tests



- 1. Submaximal test
- 2. Maximal tests

References

- <https://doi.org/10.1378/chest.126.3.668>
- <https://images.app.goo.gl/vR2nApbD2bp9NSv47>
- Am Rev Respir Dis. 126(5), Burdon, et al. The perception of breathlessness in asthma, 825–828; Copyright (1982); With permission from American Thoracic Society.
- Journal of Emergency Nursing, 26(3), Kendrick et al, Usefulness of the modified 0–10 Borg scale in assessing the degree of dyspnea in patients with COPD and asthma, 216–222, Copyright (2000); With permission from Elsevier.

Thank You.

The logo of Galgotias University is a circular emblem. It features a stylized 'G' shape formed by three curved, overlapping bands. The top band is yellow, the middle band is light blue, and the bottom band is reddish-brown. The entire emblem is set against a light, semi-transparent background.

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