Cardiopulmonary exercise testing

Cardiopulmonary exercise testing

CPET is the gold standard measurement of a patient’s fitness. The oxygen consumption (VO) and carbon dioxide produc 2 tion (VCO) of the patient are measured while they undergo 2 a 10-minute period of incrementally demanding exercise (usually on a cycle ergometer) up to their maximally tolerated level (Figure 21.9). CPET is based on the principle that, when a subject’s delivery of O to active tissues becomes inadequate, anaerobic 2 /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF metabolism begins; lactate is bu ff ered by bicarbonate and the resulting CO increases out of proportion to the escalation 2 in physical di ffi culty and O consumption. The ‘anaerobic 2 threshold’ (AT) is the VO in mL/kg/min at which this occurs. 2 Peak oxygen consumption is also measured. This is the end- product of a subject’s combined respiratory , cardiac, vascular and musculoskeletal fitness, and subjects with either an AT below 11 /uni00A0 mL/kg/min or a VO peak below 15 /uni00A0 mL/kg/min are 2 at higher risk of morbidity and mortality after major surgery . Patients who are found to be unfit can be enrolled in pre - habilitation. This involves supervised exercise over 4–6 weeks with the aim of improving the patient’s AT and reducing their risk profile. Where CPET is not available, the low-cost incremental shuttle walk test (ISWT) is an attractive option. It depends on the patient’s ability to walk at increasing speed over a flat surface. Patients who fail to achieve 350 metr es on the ISWT have been shown to be at higher risk for oesophageal surgery . It correlates well with VO peak but does not identify all low-risk 2 patients as it is subject to patient motivation and is a ff ected by - sex, age and height.

1 MET = 3.5 /uni00A0 mL O /kg/min (oxygen consumption by a 40-year

2 old, 70-kg man at rest) 1 MET = eating and dressing 4 METs = climbing two /f_l ights of stairs 6 METs = short run

> 10 METs = able to participate in strenuous sport Figure 21.9 Cardiopulmonary exercise testing (CPET). . Note

-

Cardiopulmonary exercise testing

CPET is the gold standard measurement of a patient’s fitness. The oxygen consumption (VO) and carbon dioxide produc 2 tion (VCO) of the patient are measured while they undergo 2 a 10-minute period of incrementally demanding exercise (usually on a cycle ergometer) up to their maximally tolerated level (Figure 21.9). CPET is based on the principle that, when a subject’s delivery of O to active tissues becomes inadequate, anaerobic 2 /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF metabolism begins; lactate is bu ff ered by bicarbonate and the resulting CO increases out of proportion to the escalation 2 in physical di ffi culty and O consumption. The ‘anaerobic 2 threshold’ (AT) is the VO in mL/kg/min at which this occurs. 2 Peak oxygen consumption is also measured. This is the end- product of a subject’s combined respiratory , cardiac, vascular and musculoskeletal fitness, and subjects with either an AT below 11 /uni00A0 mL/kg/min or a VO peak below 15 /uni00A0 mL/kg/min are 2 at higher risk of morbidity and mortality after major surgery . Patients who are found to be unfit can be enrolled in pre - habilitation. This involves supervised exercise over 4–6 weeks with the aim of improving the patient’s AT and reducing their risk profile. Where CPET is not available, the low-cost incremental shuttle walk test (ISWT) is an attractive option. It depends on the patient’s ability to walk at increasing speed over a flat surface. Patients who fail to achieve 350 metr es on the ISWT have been shown to be at higher risk for oesophageal surgery . It correlates well with VO peak but does not identify all low-risk 2 patients as it is subject to patient motivation and is a ff ected by - sex, age and height.

1 MET = 3.5 /uni00A0 mL O /kg/min (oxygen consumption by a 40-year

2 old, 70-kg man at rest) 1 MET = eating and dressing 4 METs = climbing two /f_l ights of stairs 6 METs = short run

> 10 METs = able to participate in strenuous sport Figure 21.9 Cardiopulmonary exercise testing (CPET). . Note

-

Revision #1
Created 2025-12-31 15:10:33 UTC by Omar Ayman

Updated 2025-12-31 15:10:33 UTC by Omar Ayman