

CELEBRATING  
COMMERCIALISATION  
YEAR 2014

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention  
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exposition 2014

INNOVATEUR  
wannabe!  
2014

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UNIVERSITI TEKNOLOGI MARA  
MALAYSIA

*Bridging  
the valley of death :  
advancing the  
commercialisation  
of research*

RESEARCH BOOK

# iiindex2014

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innovation  
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## FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed  
Pro-Chancellor, Universiti Teknologi MARA

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## D-EXERCISE FOR PATIENTS WITH CORONARY HEART DISEASE (CHD)

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Exercise stress electrocardiogram (ESE) is the preferred method for the evaluation of known or suspected coronary heart disease (CHD). ESE is also used to evaluate functional capacity for activity prescription and exercise training as part of comprehensive cardiac risk reduction and rehabilitation after hospital discharge. Therefore, ESE is also useful in assessing a patient prior to initiating an exercise. The proper selection of an exercise will have an impact on the quality of life (HRQOL) and its treatment on a person's physical, emotional and social functioning and well being, including the impact on daily functioning of patient with CHD. Moderate to vigorous exercise is prescribed as part of treatment for patients with CHD. Therefore, physician and allied health professional who prescribe exercise to patients with CHD must consider the patient's age, gender and clinical status and the most important is the result derived from an exercise tolerance test which is exercise stress testing. An exercise test allows the physician to assess patient's heart response to an increase workload or demand for blood during the various stages of exercise. The aim of this study is to measure the quality of life in association with exercise tolerance among patients with coronary heart disease and to determine the types of exercise among patients with CHD. A set of self administered questionnaires were given to 108 coronary heart disease patients immediately before stress test exercise. Exercise stress testing used Bruce protocol or modified Bruce protocol. Patients need to be prepared before procedure. An explanation of the test is provided and the patient is asked to sign a consent form on the appointment day. patient is advice to wear comfortable clothing and shoes suitable for exercise and not to eat or drink three hours prior to the procedure. In an exercise stress test, the leads of the ECG are placed on the chest wall and a resting ECG, heart rate and blood pressure is performed as a baseline measurement. Exercise is performed on a treadmill which the speed and gradient of the treadmill are increased every three minutes. This protocol includes three minutes periods to allow achievement of a steady state before workload is increased. The result showed significant association between exercise minutes with HRQOL emotional ( $p=0.005$ ), physical ( $p=0.001$ ) and social domain ( $p=0.000$ ) among patients with coronary heart disease referred for exercise stress test. Correspondingly, electrocardiogram (ECG) result of these patients also showed significant association with emotional ( $p=0.000$ ) and physical domain ( $p=0.011$ ) of HRQOL. The study demonstrated that tolerance to exercise may influence overall differences in emotional, physical and social well being of the coronary heart disease patients. Physical and emotional well being may indicate good ECG result and high tolerance to activity performed during stress test. The expected outcome of this innovation is to enable nurses and other health care providers to provide recommendation on the types of exercise required by coronary heart disease patients based on the duration of exercise in minute after stress test assessment.