

CELEBRATING  
COMMERCIALISATION  
YEAR 2014

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention  
innovation  
& design  
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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**RESEARCH INNOVATION BUSINESS UNIT**  
UiTM-MTDC Technopreneur Centre, Universiti Teknologi MARA  
40450 Shah Alam, Selangor Darul Ehsan, MALAYSIA  
Tel : +603-5544 2747/2748/2750  
Fax : +603-5544 2790

Web : [www.iiindex.com.my](http://www.iiindex.com.my)  
Email : [iiindexuitm@gmail.com](mailto:iiindexuitm@gmail.com)



## 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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## CP-TruPeC

Ida Hasni Shaari, Romizan Bin Jathin, Bahman Bin Jamaluddin  
Nur Farhana Md Yunus, Mohd Shukree Jafri Sham  
Faculty of Health Sciences, UiTM Puncak Alam, Selangor.  
*Email: idahasni02@gmail.com*

The ability to rise from sitting can be considered as one of the most common movements and a fundamental transition to acquired functional activities (Da Costa et al., 2013). This transition requires good body segmental alignment in order to maintain an upright posture (Kouta, Shinkoda & Kanemura, 2006). A cerebral palsy child however shows difficulty in performing this activity as they developed a poor body alignment, abnormal muscle tone and muscle weakness (Dos Santos et al., 2011). This impairment makes them develop various compensatory movements (Park et al., 2003). Previous studies found that those compensatory patterns might lead to deviation of the normal kinematics pattern (Reid, Elliot, Alderson et al., 2010; Piccinini et al., 2011). The application of orthosis together with physiotherapy session is commonly apply to overcome the mal-alignment on the child's posture (Radtka, Skinner & Johanson, 2005). Rigid thesis such as AFO has found to be effective in increasing range of motion in the knee and ankle of CP child (Lykissas & McCarthy, 2013). This indicates that the hinged AFO did provide structural support to the knee and ankle during the STS task. However, none of the previous studies have indicated any changes on the pelvis and hip angular motion for STS with AFO and without AFO. A possible reason could be; the AFO is only giving support on the distal structural alignment rather than the proximal joints which is the pelvis and hip (Park et al., 2004). Therefore, the application of another orthosis may correct the pelvis and spine alignment during STS motion. Other than AFO, Sitting, Standing and Walking Hip Orthosis (SWASH) has also been used to enhance transition and mobility level in CP children (Boyd, Dobson, Parrott et al., 2001). However, the effectiveness of this device was unclear. This is due to limited study has investigated the effects of SWASH application on the STS ability in CP children. Improvement on the material and concept of orthosis application initiated the development of undergarment orthosis such as TheraTogs and Lycra garment (Ibuki et al., 2010). The application of garment orthosis on CP child has found to improve bone and joint alignment, improves the patient's functional activity level (Richards et al., 2012). Compared with the rigid orthosis, the undergarment orthosis was found to be more clinically beneficial as the undergarment allows multiple segmental corrections at the same time allows the child to move actively. However, for the SWASH, no studies have investigated the effectiveness on this soft orthosis in providing spine-pelvis correction, and improving the STS ability in CP children. Therefore, a better design orthosis could possibly enhance the STS ability in CP children. Thus, this project adds additional value on the current orthosis device to enhance the spine-pelvis alignment at the same time improving the CP child STS ability. This project combines the concept of rigid orthosis which is SWASH with soft orthosis, TheraTogs to produce device that could improve the child STS ability by providing correction on the spine-pelvis alignment.