Impact of Thomas Waters on the Field of Occupational Ergonomics

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Background:
Jack is an associate of the late Dr. Thomas Waters. Webinar was a summary of the three areas of Dr. Waters's research.

1) **Revised NIOSH Lifting Equation (RNLE)**
   - Confirmed that the recommended version of use is 1991 (not 1981); refer to online manual (1994) for questions associated with use
   - Completed systematic review of literature (N=137)
     - Internationally recognized/used equation for positive relationship between CLI/LI scores and low back pain (LBP) especially if LI/CLI >2.0.
     - Additional considerations in equation (i.e. asymmetry, coupling, etc…) are important to consider with assessing lifting risk.
   - Future considerations for NIOSH and RNLE:
     - Sequential Lifting Index (LI) and Variable (LI) and related articles

       T.R. waters,M.-L. Lu & E. Occhipinti (2007). New procedure for assessing sequential manual lifting jobs using revised NIOSH lifting equation. *Ergonomics*, Vol 50, Issue 11, pg. 1761-1770.

       Waters-T; Occhipinti-E; Colombini-D; Alvarez-E; Hernandez-A (2009). The variable lifting index (VLI): a new method for evaluating variable lifting tasks using the revised NIOSH lifting equation. Proceedings of the 17th World Congress on Ergonomics (IEA2009), Beijing, China, August 9-14, 2009. Madison, WI: International. Ergonomics Association, 2009 Aug:1-3.

       Colombini et al., (2009). Procedures for collecting and organizing data useful for the analysis
       of variable lifting tasks and for computing the VLI.
       http://www.epmresearch.org/userfiles/files/2009%20IEA%20PECHINO%20Colombini%20et%20al_%20VLI-2%20x%20invitedsession%203MU0650-v2.pdf

     - NIOSH is in process of developing an online calculating tool (ETA Summer 2016)
     - Future plan to revise the lifting equation further (i.e. shift length, dynamic lifting, etc..)
   - Guideline for Manually Handled Containers Automotive Industry Action Group (AIAG)

2) **Advancements in Healthcare Ergonomics**
   - There is no safe way to manually lift a patient

- Proper lifting technique will not help with preventing injury
- Best way to avoid injury is use of lifting equipment ceiling or floor
    - Ceiling lifts appear to reduce spinal loading more than floor lifts
    - Floor lifts have increased risk associated with less control capability
- Cost concern – study result showed lifting equipment will pay for itself in 3 years
- Veterans Health Administration (VHA), 2006. Safe patient handling and movement algorithms for different scenarios (i.e. repositioning, transferring A-B, etc…)
    - Decision tree for safe patient handling
- AORN Safe patient handling documents 1-7
- Determine a weight limit for lifting patient body part = should not exceed 35 lbs (~16 kg) (Waters, AJN, 2007; AORN, 2011)
    - Technique available to estimate body part weight based on weight of patient
- NIOSH document: Safe Patient Handling Training for Schools of Nursing

3) Ergonomics for Youth Working in Agriculture

- Youth <20 years old who are working in agriculture industry
    - 2 million individuals exposed to medium to high risk jobs
- Farm youth tend to have stiffer bones than non-farm youth which increases risk for osteoarthritis in adult farmers
- No clear effective ergo interventions for this population
- Developed a 2D biomechanical for youth (2010)
- Ergonomics for Children: designing products and places for toddlers to teens (Rani Lueder and Valerie J Berg Rice) (2008)