INNOVATIONS/NEW TECHNOLOGIES/IMPROVEMENT SCIENCE

The Global Health 'Interactive Curricula Experience (iCE) Platform & App'

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Program/Project Purpose: Content: The Global Health module in the "interactive Curricula Experience (iCE) Platform & App" is an innovative technology that is timely and important for medical educators. It is a content management system that facilitates the organization and delivery of Jefferson-developed content for faculty. The iCE Platform & App provides a mechanism to rapidly create new learning objects/course content that can be accessed, used as is, or duplicated and modified by instructors for use in different courses. The courseware is published and then made available to the students via iPad, as well as on laptop and desktop computers. In conjunction with iPad integration, the iCE Platform & App enables migration to new academic models with engaging content that encourages exploration. Program period: on-going Why: The global health iCP Platform & App provides a distribution mechanism for Global Health content that can be woven into any course at Jefferson. Aim: To facilitate inter-institutional learning across Schools and Learning Centers, encourage exploration and innovation, meet student expectations and provide the most up-to-date information on the broad field of global health.
Structure/Method/Design: Program Goals, Outcomes: To develop and maintain a courseware platform utilizing multiple methodologies of learning that enable faculty and students to explore. Participants: The Global Health modules in The iCE Platform & APP were developed by Jefferson's Global Health Interdisciplinary Committee, an inter-academic committee of instructors and students focused on global health. A volunteer team from GHIC produced the initial platform. Sustainability: Faculty self select training from four progressive segments, depending on their technical agility. The GHIC modules are integral to the institution-wide database available to all faculties.
Outcomes & Evaluation: To date: Six key modules were initially identified and built utilizing existing curricula, up-to-date evidence based research, and multiple methodologies to draw attention to key issues, terminology and information; these include: "watch and learn" animation, hot spots, meters, timelines, decision trees. M & E: Utilization is continuously monitored. Periodic quantitative and qualitative evaluations with instructors and students are planned.
Going Forward: Challenges? The ongoing challenge is the continuous update of information. Faculty monitor websites and review relevant articles, reports, conferences, webinars and post them to iCE. Future program activities: The iCE Platform & App is developed to fluidly adapt and incorporate the newest information, crises, global summits and events.
Funding: Funding for the development of the iCE Platform & App was provided by internal Information Technology and Academic departments at Thomas Jefferson University.
Abstract #: *02ITIS001*

What factors are associated with compliance of integrated management of childhood illness guidelines in Egypt? An analysis using the 2004 egypt service provision assessment survey

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Background: 6.6 million children under the age of five die annually from preventable diseases. The United Nations Children's Fund and WHO developed the Integrated Management of Childhood Illness (IMCI) strategy in 1992 to reduce mortality and morbidity largely due to preventable diseases. This study explores whether provider, facility, region, child, and caregiver characteristics are associated with compliance with IMCI clinical guidelines in Egypt to ultimately identify priority program and project area improvements.
Methods: The study uses child health service data from the 2004 Egypt Service Provision Assessment Survey (ESPA). The ESPA collects data about health facility service delivery, compliance with standards of care, and client and provider service delivery satisfaction. A nationally representative sample of 659 health facilities were surveyed, of which 479 provided child health services. The child health module consists of facility, provider, and caregiver surveys. The sample consists of 2,071 child observations (1,164 were male). Two multivariate regression models were developed to identify statistically significant predictors of observed care.
Findings: Full compliance was low. About 70% of physicians checked for fever, 36.3% weighed the child, and 17.6% checked for anemia (childhood anemia is a major public health concern in Egypt). In only 3% of child visits were caregivers asked about three key danger signs and three or more key symptoms as per IMCI guidelines. Compliance was higher for providers who had received IMCI training and for younger children. After controlling for the patient's and provider's demographics and background and facility characteristics, we found that providers with IMCI training had a significantly greater odds of asking two or more danger signs adjusted odds ratio (AOR)=6.7 (95%CI 3.8, 12.9) if the patient had diarrhea, AOR=6.2 (95%CI 3.5-10.9) for cough/respiratory, and AOR=6 (95%CI 3.7, 9.7) for fever. No evidence was found that compliance is associated with child sex, caregiver attributes (except in cases of diarrhea), or region. About half of health care facilities lacked handwashing equipment in the exam room, reliable electricity, and generators.
Interpretation: Two ESPAs have been conducted in Egypt. This study recommends a new one to be carried out. Following the 2011 revolution, Egypt experienced a severe economic downturn. Anecdotal evidence points to the deterioration of quality of care in government facilities serving low-income populations. IMCI is a promising strategy to improve quality of care and thereby reduce childhood morbidity and mortality, but compliance is low. The findings illustrate the potential for further analysis of the factors that influence compliance. The small sample size for private facilities, however, limited analysis for comparison with government facilities. Missing data reduced sample size significantly for some regressions and prevented others. Research to understand provider practices and motivations is needed.
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Abstract #: *02ITIS002*

Assessing community health: Innovation in anthropometric tool for measuring height and length

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Background: Anthropometric measurements, including height, are routinely needed for health research worldwide. Current best practices are to use a measuring board to obtain length and height

measurements. But measuring boards are large and cumbersome to use in the field and children may be restless or afraid to use them. Alternative strategies that light, portable and provide accurate measurement under field conditions should be explored. Advances in laser measuring technology make the use of lasers one promising method. We tested the Leica Disto D2 Laser Distance Meter 763495 as a tool to quantify children's' height/length. The aim of the study was to determine and evaluate the instrument's accuracy and reliability within anthropometric field studies. To determine the acceptability of this method, a qualitative investigation of the proposed technology and measuring boards was assessed among field researchers.

Methods: This study was conducted in Western Kenya in primary schools and clinical settings. The production laser model was modified to suit anthropometric requirements and was tested against a Shorr Board®. Two experiments were carried out to systematically pilot the Leica Disto D2 Laser tool. Experiment 1 focused on the assessment of tool accuracy tested by measuring the laser tool compared the Shorr board differences. Study researcher measured (N=62) children between the ages of 0 months − 8 years old. Experiment 2 assessed reproducibility of results within trained field staff. Reproducibility was tested by field assistant (n=6) measurements of children (n=15) over 3 days between the laser and measurement board tools. 77 study participants were recruited from schools and clinics within the ages of 0 months to 8 years old. Experiment 1 differences in measurements between tools were calculated and statistically analyzed for significance. Experiment 2 variance components, reliability coefficients (R) and coefficients of variation (CV) were estimated and systematic differences of measurements between field staff and study day were assessed.

Findings: Preliminary statistical evaluations suggest that the Leica Disto D2 Laser Distance Meter 763495 represents an adequate technical alternative to the standard methods currently used.

Interpretation: This study demonstrates the importance of innovation within the field of anthropometrics. Current methods are outdated, while technological advances are available and affordable. Leica Disto D2 Laser Distance Meter 763495 could be a viable alternative that can adequately measure height/length accurately and reliably, while being an affordable and portable alternative to current measuring methods ideal for fieldwork in low-resourced countries.

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Abstract #: *02ITIS003*

Adaptation of new sterilization technology to facilitate sterile surgical care in low-resource settings

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Background: A significant and growing portion of the global burden of disease is attributable to conditions that can be treated with basic surgical procedures. Poor infrastructure and resource limitations in healthcare settings around the world present obstacles to the delivery of this cost-effective care. To date, one of these obstacles has been the sterilization of surgical instruments where availability of electricity and water is unreliable. Without sterilization capabilities, surgical care presents a high risk of infection, causing further morbidity and mortality. Innovation in sterilization technology has been static, and established methods have not been successfully adapted for use in low-resource settings on a large scale. The development of reliable, durable, affordable sterilization equipment that can operate independently of infrastructure would facilitate safe surgical care for the two billion people who currently lack access. This study was done to determine the appropriateness of a new sterilization technology to meet this need. The authors believe that nitrogen dioxide technology can be adapted for reliable sterilization in low-resource settings.

Methods: Recently commercialized nitrogen dioxide sterilization technology was adapted into a form suitable for use in low-resource environments, which was then analyzed for sterilization efficacy, operator safety, and preservation of medical instrument functionality. Stainless steel surgical instruments were exposed to NO2 within a rugged enclosure. Lab testing was conducted in microbiological testing facilities simulating low-resource environments and in accordance with the requirements of the international sterilization standard ANSI/AAMI/ISO. The hinges of the instruments, determined to be the most challenging location for sterilization, and biological indicators (BIs) were evaluated for successful sterilization.

Findings: Results of cycle efficacy testing showed that all hinges were sterile at the conclusion of the cycle. Cycle length depended on the amount of time needed for the sterilant gas to be absorbed by the scrubber medium to a safe level. This took between three to eight hours depending on cycle exposure requirements. A few of the cycles with exposure to lower concentrations of NO2 had surviving BIs, which was attributed to the high density of spores on the BI.

Interpretation: When deployed, NO2 sterilization technology will have the twin benefits of reducing healthcare acquired infections and limiting a major constraint for access to surgical care on a global scale. Additional benefits are achieved in reducing costs and bio-hazard waste generated by current health care initiatives that rely primarily on disposable kits, increasing the effectiveness and outreach of these initiatives. Next steps will involve testing of the adapted NO2 form factor for ease of use in the field.

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Abstract #: *02ITIS004*

Food fortification as a strategy for alleviating micronutrient deficiencies in low- and middle-income countries: A systematic review

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Background: Currently, the World Health Organization (WHO) estimates that over 2 billion people are deficient in key vitamins and minerals. The majority of these individuals live in low and middle-income countries (LMICs), where resources are scarce and diets are not diversified. Mass food fortification refers to the process whereby one or more essential micronutrients are added during production to a staple food or condiment in order to improve its nutritional quality. This is a safe and effective strategy that has been used to prevent micronutrient deficiencies in developed countries for more than a century. The objectives of the systematic review as a whole are to evaluate the effectiveness of mass food fortification efforts with key micronutrients (iron, folic acid, iodine, vitamin A, calcium, vitamin D or multiple micronutrients) in LMICs, and to describe the various contextual and design factors that contribute towards effective implementation of food fortification programs. This abstract will pertain specifically to the effects of folic acid fortification on neural tube defects.

Methods: Study Design A comprehensive search strategy was formulated and publications systematically retrieved from a total of 15