



**INTERNATIONAL UNION FOR
PHYSICAL AND ENGINEERING SCIENCES
IN MEDICINE**

*Incorporating the International Federation for Medical and Biological Engineering and
the International Organization for Medical Physics*

Affiliated with the International Council for Science (ICSU)

**Report of Health Technology Task Group (HTTG)
since May 2012**

**By Cari Borrás, D.Sc., Chair and
Yadin David, PhD, Vice-Chair**

**to the IUPESM Administrative Council
at the 20th International Conference for Medical Physics
Brighton, United Kingdom, 1 September 2013**

A. Summary of Activities

I. Organizational

- Cari Borrás was appointed new Chair by Herb Voight, IUPESM President, and Yadin David as Vice-Chair.
- New Terms of Reference (TOR) were developed with input from IUPESM officers as well as prospective HTTG members. The TOR document is attached as Appendix 1.
- Members for the HTTG were sought, including a Vice-Chair. The goal was to have a globally distributed representation of medical physicists and biomedical engineers interested in implementing the HTTG goals under the IUPESM umbrella. The current list of proposed HTTG members is attached in Appendix 2.
- A virtual meeting deploying shared computer, internet and teleconference (eMeeting) with most of these proposed HTTG members was held.
- With their contribution, a Work Plan was elaborated, and specific functions, assigned. The Work Plan is attached as Appendix 3.
- The HTTG link on the IUPESM website is being worked upon by Yadin David, HTTG Vice-Chair, with the help of James Goh, IUPESM Secretary. Relevant old materials from Joachim Nagel, Barry Allen and Cari Borrás, and new current documents are being incorporated.

II. Scientific/Educational – ONGOING or PLANNED

- **Publication in Preparation: “Defining the medical imaging requirements for a rural health center”.** It had been decided that the HTTG would prepare a publication based on the Workshop on the same subject held during the ICMP 2011 in Porto Alegre, Brazil, aimed at addressing the use of medical imaging to facilitate the diagnosis and treatment of the most common health conditions present in a rural health center. The publication is to expand on the consensus recommendations reached at the Workshop on the required imaging technologies, equipment, staff, telemedicine options, quality control and radiation protection programs and the need for coordination among the different health levels within the health system. Cari Borrás agreed to be the editor, identified authors –most of them Workshop participants– and obtained contributions. The latter are undergoing a considerable revision after a discussion in Beijing in May 2012 with Christopher Baumann, from the publishing company Springer that expressed interest in publishing the book. Dr. Baumann recommended to expand the text to include more tables, graphs, and diagrams.
- **Low Cost Tuberculosis Screening Project:** Cari Borrás has continued participating in the research project on low cost digital x-rays, carried out by Karim S. Karim PhD PEng, Associate Director, Center for Bioengineering and Biotechnology and Associate Professor, University of Waterloo, Waterloo, Ontario, Canada. She has been advising on phantoms and dose measurements, and has consulted with the Center of Devices and Radiological Health of the United States Food and Drug Administration, which has expressed great interest in the project and has even offered to test the digital detector using their specialized chest phantoms. Dr. Karim has been invited to make two presentations at the HTTG Workshop on Digital Radiology at the ICMP 2013 and discuss the technical challenges with medical physicists experts in medical imaging with digital detectors.
- **On-line CT QC Program:** An on-line quality control program (QC) for computed tomography (CT) scanners was initiated in Porto Alegre and in Sao Paulo, two main cities of Brazil, led by two university medical physicists, with the technical input of Cari Borrás on behalf of the HTTG. The program consists in documenting CT protocols in clinical use for adult head and abdomen scans, evaluating the scanner performance and image quality using a combination of commercial phantoms and in-house computer software and acquiring patient dose data in terms of $CTDI_{vol}$ through the DICOM metafiles, after validation following the methodologies developed by the AAPM and the ACR. A pilot study involving two institutions in Porto Alegre and three in Sao Paulo was undertaken, comprising a total of 10 scanners. The results of the pilot study were presented in a poster at the AAPM and the abstract was published in Medical Physics. Parallel to this pilot study, the Brazilian researchers have evaluated a commercially available software which would automatically analyze the results of the phantom scans and transmit the results to the two universities, where the CT-QC team leaders would further analyze the data collected, integrate it with the other parameters obtained directly from the PACS system of the hospitals and provide recommendations to the local QC-CT person in each facility; such a person could be a CT technologist with special training in QC, a medical physicist or a biomedical engineer. (It should be noted that in Latin America QC of medical equipment is often performed by biomedical engineers). Once fully developed, it is expected the program can be implemented throughout Brazil.

- **Fourth HTTG Workshop:** An HTTG Workshop on “Digital Imaging X-ray Detectors: Historical Perspectives, Current Capabilities, Future Promises” will be presented in Brighton at the ICMP 2013 on September 1, 2013. The speakers are medical physicists from the USA, Spain and Malaysia, and a bioengineer from Canada. Except for the HTTG Chair, who will make a short introduction on what the HTTG is and why this particular subject was thought to be of importance, all the speakers have subsidized their participation without any financial support from the IUPESM. The details of the Workshop program can be read in the ICMP 2013 program and they are available from its website.
- **Participation in Medicon 2013, Seville, Spain:** The HTTG, through Yadin David, participated in the Conference International Scientific Program Committee. It made contributions to the call for papers and to the papers review as well as to organizing a track on Safety and Human Factors Engineering for Medical Devices and Systems. HTTG will also be represented in a Round Table on “The role of Biomedical Engineers in Healthcare Technology Assessment”, the program of which is attached as Appendix 5. Cari Borrás will make a presentation on: “HTA in developing countries: An HTTG perspective on the role of the biomedical engineer”, sharing some of her experiences gathered during her work at the Pan American Health Organization.

III. Scientific/Educational – PROPOSED

- **HTTG Website design and implementation:** The goal is to create and implement a global website that will inform and connect communities around the world about promotion of health and quality of life through the advancement of application and management of health technologies.
- **Symposium on “Health Technology Management and Utilization Challenges: The role of biomedical/clinical engineers, medical physicists and radiation safety professionals” at the Second World Health Organization (WHO) Global Forum on Medical Devices: “Priority Medical Devices for Universal Health Coverage”:** Medical devices involve those health technologies that are critical to health care delivery within health systems. These technologies contain more embedded intelligence, more interoperability features, more connectivity and with larger number than ever before. However, attention to issues of equity, quality, safety and access is insufficient and often the most essential medical devices are not globally available. Health technology management must plan for and support changing demands but with resilient and safe quality of service.

The adoption of the first resolution on health technologies in May 2007 by the World Health Assembly (WHA 60.29) set the framework for an unprecedented focus on health technologies.

Yadin David collaborated with WHO unit on the planning of the 1st Global Forum on Medical Devices and Cari Borrás participated actively in the meeting, that took place in Bangkok, Thailand in September 2010 -with participants coming from 107 Member States- raised awareness, and served as a forum to share ideas on how to increase access to safe, effective medical devices.(link to : [First WHO Global Forum on Medical Devices](#)).

The 2nd WHO Global Forum on Medical Devices is planned for 22-24 November 2013, Geneva, Switzerland, and HTTG proposes to make a series of presentations that will clarify the need for, the role, and contribution of the biomedical engineers, clinical engineers, medical physicists and radiation protection specialists in global health technology management. Emphasis will be placed on information technology challenges, especially in resource-limited settings.

This is unique opportunity for HTTG to reach out and raise awareness, promote its service, and connect with over 100 countries worldwide. Health policy makers, funding decision makers and health administrators from resources-limited countries are expected to be in audience. The conference will allow other stakeholders from academia, international organizations, industry, NGOs, and end users to learn from HTTG experiences and challenges in providing access to medical devices.

The presentations will consist of 3x lectures by HTTG faculty on the roles of different professionals (Biomedical/clinical engineer, Medical physicist, Radiation safety professional) in the development and sustainability of Healthcare Technology Management program at the point-of-care.

- **Fifth HTTG Workshop : “Screening technologies to assess environmental exposure to toxic elements”:** Exposure to heavy metals can be harmful to both children and adults. Among their negative health effects include neurological impairment, kidney damage, autoimmunity diseases, joint diseases, and nervous system damage. Most heavy metals are colorless and odorless, which is why chances of being exposed to them without knowledge is high. An effective way to mitigate exposure is to find out if heavy metals are present in households or within the community by running tests in the drinking water, soil, and other solid materials where they potentially creep in or by processing biological sample from the residents.

There are many individual metals causing varying degrees of illness based on acute and chronic exposures with ability to damage nerves and tissues. Heavy metals is the term used for a group of elements that have particular weight characteristics. They are on the "heavier" end of the periodic table of elements. Some heavy metals - such as Cobalt, Copper, Iron, Manganese, Molybdenum, Vanadium, Strontium, and Zinc - are essential to health in trace amounts. Dr. Sanjay Gupta (CNN) showed how people in La Oroya, Peru, try to reduce exposure to arsenic, lead and other heavy metals thrown off by an industrious-owned smelter. Heavy metals exposure among indigenous communities of the Peruvian Amazon has been documented and health and environmental groups have filed a petition urging the Peruvian government take urgent action to protect people from illnesses and death.

HTTG is proposing to plan and conduct a workshop describing advances in technology and screening methodologies that will bridge the gap between research and affordable practice.

Scientific literature suggests that if the analysis is accurate, this type of test is a reliable gauge for chronic toxic exposure. Should the levels be elevated, a number of lifestyle and clinical interventions can be implemented to decrease toxin levels. One of these screening methods is hair testing. The correlation between hair element levels and physiological disorders is determined by different factors. Individual variability and compensatory mechanisms are major factors that affect the relationship between the distribution of elements in hair and symptoms and pathological conditions. However,

training about careful consideration of and the limitations of the various screening methods must be understood and made prior to the interpretation of results. The data provided also should be considered in conjunction with symptomology, occupation, diet analysis and lifestyle, physical examination and the results of other analytical laboratory tests.

This workshop will offer critical information that people in Peru are seeking.

The possibility of having this Workshop co-sponsored by the Pan American Health Organization will be explored

- **Sixth HTTG Workshop:** Following the tradition in previous WCs, the HTTG proposes to plan and conduct a workshop for both medical physicists and engineers at the World Congress for Medical Physics and Biomedical Engineering to be held in Toronto, Canada in 2015 on the impact of technology on quality of care, a topic of interest to both professionals.
- **Health and Technology (H&T) Journal:** Cari Borrás has continued her role as Associate Editor for the IUPESM journal; reviewing manuscripts and soliciting papers. Both she and David Yadin have approached the H&T Editor to ask for a special issue on papers presented at HTGG Workshops. One issue will be based on the Telemedicine workshop held in Beijing in 2012; another one on the Effects of Heavy Metals workshop planned for 2014 in Peru.

B. Budget:

See attached Excel spreadsheet, that lists already incurred expenses and proposed new items.

It is respectfully requested that the IUPESM Administrative Council approve this report, including its Terms of Reference, Work Plan and requested budget.



Cari Borrás, D.Sc., FACR, FAAPM

HTTG Chair

1 September 2013

Appendix 1

The IUPESM Health Technology Task Group (HTTG) Revised Terms of Reference July 14, 2013

1. **Mission:** The mission of the IUPESM Health Technology Task Group is to promote health and quality of life through the advancement of application and management of health technology. In pursuit of its mission the HTTG promotes international cooperation and communication among those engaged in health-care technology.
2. **Goals:** The charges* to the Health Technology Task Group is to assist countries in:
 - (a) defining their needs for health technology and human resources;
 - (b) formulating policies and implementation strategies on acquisition and utilization of appropriate health technology;
 - (c) developing appropriate infrastructure for adequate management and utilization of health technology;
 - (d) identifying and rectifying health system constraints, particularly through training and capacity building.
3. **Objectives:** The tasks** of the Health Technology Task Group are:
 - (a) to identify and advise on specific health technology needs of individual countries;
 - (b) to cooperate with and provide professional support to WHO and other international organizations on planning and implementation of health technology programs and initiatives;
 - (c) to determine policy concerning HTTG activities in collaboration with national and international partners and stakeholders;
 - (d) to coordinate and harmonize regional and global activities on health technology;
 - (e) to promote advocacy of the HTTG, building and maintaining partnerships with stakeholders and mobilizing resources for HTTG activities;
 - (f) to organize and support regional and international meetings and workshops on appropriate health technologies.
4. **Administration:**
 - 4.1 The Task Group will be presided by a Chair and a Vice-Chair representing the IOMP and the IFMBE. The position of chair and vice-chair will alternate every three years with designates from the IOMP and the IFMBE. Initially the chair will be a medical physicist and the vice-chair a biomedical engineer.
 - 4.2 The Chair will report directly to the IUPESM President and Administrative Council (AC) and may form Working Groups composed by IOMP and IFMBE members who have pledged their commitment to HTTG and are working on specific tasks.

* A Charge is a general description of what the TG has to do to meet its goals.

** A Task is a specific activity that the TG is to do to meet one or more of its charges.

4.3 The responsibilities of the Chair and the Vice-Chair are:

- (a) implementing HTTG policy;
- (b) initiating and maintaining HTTG activities, and providing the overall leadership to the HTTG work;
- (c) mobilizing resources for HTTG activities;
- (d) forming Working Groups as needed for the operation of the HTTG;
- (e) promoting visibility and leadership of HTTG, building and maintaining partnerships with stakeholders;
- (f) interacting with national and international partners and stakeholders;
- (g) preparing HTTG annual operational plans, reports and budgets;
- (h) supervising the Medical Equipment Donations Assessment and Advisory Service that matches health technology donations with appropriate recipients;
- (i) calling and chairing the HTTG meetings;
- (j) reporting to the AC.

4.4 Other Task Group members will have the following responsibilities:

- (a) Coordinator of Dissemination of information;
- (b) Coordinator of Education and Publications
- (c) Fund raiser: To apply for grants and coordinate with IUPESM Treasurer reception of project and service fees promote advocacy of the HTTG, building and maintaining partnerships with stakeholders and mobilizing resources for HTTG activities
 - a. Webmaster liaison
 - b. New technologies scout and evaluator

4.5 Procedures

At the beginning of the three-year term, the Chair will develop an operational Working Plan explaining how responsibilities will be allocated and describing the activities planned. To monitor activity progress, the HTTG members shall hold at least one physical or virtual annual meeting, inviting the members who have agreed to be part of the Working Groups, to report on accomplishments. In addition, once a year, the Working Plan is updated by the Chair, working with the President. The updated plan and all accomplishments will be reported in writing to the AC

Appendix 2

HTTG Membership

Chair: Cari Borrás, Spain/USA

Vice-Chair: Yadin David, USA

Members:

Barry Allen, Australia

Saide Calil, Brazil

Mario Castaneda, USA

Tobey Clark, USA

Kwan Hoong Ng, Malaysia

Colin Orton, USA

Marlen Perez, Cuba

Khondkar Siddique-e Rabbani, Bangladesh

Rossana Rivas, Peru

Appendix 3

Work Plan of the IUPESM's Health Technology Task Group 2012-2015 July 2013

1. Goal

Identify and facilitate the implementation of appropriate health technologies in resource-limited settings by fostering joint scientific and educational activities of medical physicists, medical and biological engineers and clinical engineers.

2. Activities / Coordinator

a. Dissemination of Information - Identify, set web links and complement when needed / C. Borrás (on an interim basis):

- i. Bibliographic data bases
- ii. Technical standards
- iii. Educational and training opportunities
- iv. Research opportunities
- v. New health technologies

b. Education and Publications / Y. David

- i. Identify/adapt on-line training packages
- ii. Identify fellowships
- iii. Develop Workshops and publish Proceedings
- iv. Periodically contribute to *Health and Technology*
- v. Consider other publications as appropriate
- vi. Manage website

c. Projects and Services / B. Allen

- i. Offer evaluation of health services on a fee-for-service basis
- ii. Set up expert data base and provide links to other bases
- iii. Facilitate on-line QA programs by identifying institutional needs and reliable service providers
- iv. Participate in an advisory capacity on special projects

d. Activities with ICSU / C. Orton

- i. Bioclusters
- ii. Urban Health
- iii. Future Earth

3. Budget (US \$) - See Excel Spreadsheet