October 11, 2019

Introduction;

- In the Philippines, the Body of Practice (BOP) CEHTM, BMETs lies basically from a market driven economic systems where the market “Health Care Systems” and its demand of products and services would be the barometer and indicators like in any typical political and economic activity of developing countries. There are various market segments namely;
  - Public Hospitals
    - DOH, Department of Health managing Regional & Medical Centers
    - PLGU, Provincial Local Government Units managing District Hospitals
    - City and Municipal Hospitals
    - Rural Health Units, RHUs= remote health stations based in the community.
  - Private Hospitals
    - Corporations
    - Missionary and Non-Profit Organizations
    - Family owned private hospitals
  - Stand-Alone Centers are all private entities
    - Dialysis-Renal Centers
    - Diagnostic-Imaging and Laboratory centers
    - Clinics- OPD, Mobile, Institutions/Organizations

1. State of Clinical Engineering (CE) - Health Technology Management (HTM) – Body of Practice (BOP)

- CE-HTM, BMETs professions and its practices were designed and organized based on the organizational structures of the Health Care providers in accordance with the medical services being offered, organizational policies and regulations set by the National Department of Health-DOH; whether they are in public or private organizations.
  - DOH, National, Regional & Medical Centers have their own set-up on their organizational structure of Biomedical Engineering/CE-HTM Team attached to Engineering & Facility Department
  - PLGU, District Hospitals are being operated by the Provincial Local Government Units (Local Code), Biomedical Technicians are also attached to Engineering & Facility Department where they are considered all-around technicians.
  - Private Hospitals-have manpower complement responsible in the maintenance and management of their medical equipment and devices and attached to their Engineering & Facility Department.
  - Most of the preventive maintenance and repairs of medical devices are being serviced by the vendors/manufacturer’s subsidiaries; BMETs or Technical Support provider. In most cases, Vendor Technical Support & Independent Service Providers (ISOs) are also being sought to commission and fix on medical equipment and devices problem that are within and beyond warranty.
2. How would you suggest to show the Value of and from having CE-HTM program

- There are plenty of benefits and significance of having CE-HTM programs in our Health Care Systems especially in the organizational management of human resources and capital assets in the delivery of medical services and foremost on patient’s safety, compliance on standards, regulations and organizational policies which some duties of HTM professionals’ role and responsibilities are not being covered much in the Philippines due to limited resources available; such as professionals with clinical engineering qualifications and BMET’s soft-skills on (IoT)-Internet of Things, AI, Health Technology Assessment and Selections, Negotiations, Certifications, Project Management on Health Care Systems, Research & Investigations and innovations on medical devices’ clinical functions to ensure patient’s safety. Moreover on conducting orientation on users/operators on medical equipment and devices appropriate handling and operations; basic preventive maintenance for patient’s safety, user’s safety and safety of the workplace environment to name a few.

Realistic approaches, strategies and suggestions;

- Awareness campaign on the significance of CEHTM/BMETS through promotional activities on the roles and responsibilities in managing capital assets and manpower complement on health care technology in the Healthcare systems. Conducting user’s orientation on the significance of diagnostic medical devices, drug delivery and clinical functions. Patient’s safety and the safety operations on medical devices; organize and schedule training on users’ basic preventive maintenance and documentation, functional testing on pre-operation, during and post operations of medical equipment and devices. Designing and implementing policies in the workplace safety practices to avoid risks and hazards that may lead to injury in the workplace environment.

- Empowering and capacity building for CEHTM/BMETS through MET training and Professional Development; “Training the Trainer”, “Leadership and Management” for team leaders where they could conduct mentoring on members, colleagues and operators/users of medical devices; to develop a sustainable team and core group to represent in the organization’s management planning and policy making which focusing patient’s safety, investigations and research, addressing medical device’s engagement issues from the workplace.

- Organizing an organic HTM Team with representatives from the Executive Committee, ExCom, C-suite, Medical Practitioners, Medical Staff/Users and CE-Biomedical Engineers and Technicians, “Bottom-Top Management Style or vice versa”. Defining the roles and responsibilities to develop a sustainable and economic framework that addresses the challenges and daily operations in the workplace environment, especially the needs of BMETs in which decisions and approvals would be fast and immediate. Engagement, intervention and involvement with medical practitioners, research and innovations of medical devices in line with the mission and vision of the organization in the delivery of medical services for patient’s safety, for the quality of life and well-being.

Objectives and goals of the organic HTM Team may derive on;

- Participating on medical devices selection and HTA-Health Technology Assessment in line with the attainment of the organizational target goals
- Planning, Budgeting and Forecasting on capital assets and its maintenance costs
- Implementing WHO Guidelines, Medical Equipment Inventory management, donations acceptance & more
- Mentoring “Trainer’s and User’s training” and induction of newly hired medical staffs and other personnel on safety practices in the utilization of office equipment, machines and the like that are being used and operated in the workplace environment
e) Formulating organizational policies, regulations in accordance with the national and local business requirements, regulations, standards and policies within the industry practices and the attainment of its vision and mission statement.

3. Example of success stories where CE supported patient outcomes, (Philippines)

- September is Global Patient’s Safety Month and Government Hospitals under the DOH were celebrating this occasion with various activities. Privileged to be part of the celebration and was invited to talk and discuss the issue regarding skin burns with the use of Electrosurgical Unit. I was able to lecture the causes of skin burns with the inappropriate placement of grounding pads and how electrical conductivity produces heat that may lead to skin burns. After few slides presentation, we performed the simulations on cutting and coagulation mode on ESU machine and the appropriate placements of ground pad/return electrical path. Medical Staff, especially OR nurses and attendees were enlightened with the appropriate handling and safety operation practices to be observed when engaging with volatile materials, medical supplies and electrical medical devices in the OR and with the use of ESU machine for surgical intervention procedures.
4. CE Education program available (levels and content) – Body of Knowledge (BOK)

- State Universities and Colleges in the Philippines have engineering courses in varied disciplines like BS Electrical, BS Electronics, BS Mechanical, BS Chemical and other field of related engineering such as mechatronics, automations, robotics and the like. However no specializations on Clinical Engineering. TESDA, Technical Education and Skills Development Authority is a TVET/TVI Vocational Institution offering technical vocational programs operated by the Philippine Government. Thus, Biomedical Equipment Services, NCII (960 nominal hours of course study). "NC means National Certification" There are Private Educational Institutions being accredited by TESDA to offer the full qualifications on BES NCII training programs.

- LORMA Colleges-Skills Development Institution, SDI is one of the most active TESDA accredited Training and Assessment Centers north of Manila, Philippines. LORMA Colleges was one of the pioneering Academe qualified and partnered with International Aid/WHO Grants in cooperation with Rotary International, Modesto California for MET Training programs in the Philippines. Privileged to be one of the pioneers of BMETs from International Aid MET Training Program in 2008-2009. As of to date, LORMA Colleges was able to generate and spawn 500+ BMETs from 2-3 year study programs on Biomedical Equipment Technology, NCII Certifications since the advent of MET Training program in the Philippines. I was also invited as part-time MET Trainer from 2010-2013. Represented Lorma Institution, Philippines’ MET Trainer for AIHA-American International Health Alliance Projects on Non-automated Laboratory Medical Equipment Training in UGANDA, AFRICA with International Veteran Mentors, Director Billy Teninty and Ruthann Robinson in 2016.

- Career path of BMETs after graduation from their varied study course programs;
  - "BS Engineering/Associate Degree/ Vocational may lead to varied employment opportunities;
    - Biomed Engineers or Technical Support Technicians, have the job opportunity as an entry level mostly from manufacturers and subsidiaries of medical devices in the country. This is where they acquire the technical skills and knowledge about the nomenclature of medical devices; its physiology, anatomy and clinical functions that focuses on marketing the products and services being offered to hospitals and clinics.
    - Another entry level- would be direct employment at the Public/Private hospitals where they could gain technical and practical experiences through engagement with medical devices that are being used in the delivery of medical services with the supervision of senior Biomeds/MET, "Medical Equipment Technicians". They acquired some of the technical training from vendors/suppliers as part of the package once the hospital purchased the machines. Wherefore, the accumulation of experiential knowledge and acquired technical skills of medical devices from the workplace environment are from the vendor/suppliers influenced.
    - Another group of skilled professionals in the field of CE-HTM were those came from overseas employment (OFWs), had acquired the technical skills and knowledge as CE-Biomedical Engineers and Technicians from their former overseas employers. When they returned home for good, they seek employment from various sectors of health care industry in the country and some registered their own businesses as Independent Service Providers, Freelance Technicians.
1st HTM Symposium in the Philippines, August 2019.
Sharing of experiences and challenges in the workplace environment and business activities. A review and updates on the current profiles of BMETs’ professionals capacity and capabilities, their duties and responsibilities at workplace assignments and designations in the organization, and business activities of Independent Service Providers. Part of the HTM symposium workshop activities. (CE-BMETs career mapping)

5. CE Association/Society and Credentialing/Certification program if available

There are 2 active associations in the Philippines.
- BSP, Biomed Society of the Philippines Inc., 2016
- PABETs, Philippine Association of Biomedical Engineers and Technicians and Stakeholders Inc. 2019
**Credentialing and Certification Program:** TESDA-TVET is the only nationally recognized Institution that provide qualifications and certifications on Biomedical Equipment Services NCII.

**Manufacturers and Vendors:** provides certificate of training on specialized Medical Devices being marketed in the Philippines.

PABETs is working on this as part of the capacity building on HTM Professionals. This is also part of the 1st HTM Symposium that was held last August, 2019. Review of the current practices in the workplace environment and challenges on the management structures and management culture within their respective organizations. (Corporate politics and culture management practices)

6. CE major challenges (think of 3 subjects), Philippines setting;

1. CE-HTM training and learning materials on the roles and responsibilities in the workplaces
   a. Curriculum development and Learning Modules, WHO guidelines for the Academia and TVET /TVI institutions in the Philippines
   b. Manufacturers and Vendor’s service manuals on machines marketed in the Philippines. Users/BMETs training & orientation.

2. Politically and Economically Sustainable framework policies, regulations and implementation of CE-HTM programs in the Health Care System Industry in accordance with WHO, AAMI, ACCE, IFMBE-CE Division and more; Guidelines, Standards, Regulations and Policies, and Global Health Care Industry Practices. ‘Accreditation and Credentialing’.

3. Increasing awareness campaign and promotions on CEHTM professionals to populate the community in the health care sectors in cooperation with International & National link agencies, stakeholders, organizations and academia.

7. What is the most important action you will support to increase CE recognition.

- I would suggest and recommend some of the strategies that may help in the promotion and recognition of CE “locally and internationally” such as;

1. Collaboration, Coordination, Cooperation and Conventions, “4Cs” within the community of Global CEHTM leading organizations including the Asia-Pacific Region and Philippines; explore and expedite globally and develop community of HTM professionals to be politically, socially and economically sustainable in lined with WHO Guidelines and mandate linking to national WHO, affiliated countries, (Regional- Asia Pacific and National Conventions)

2. Global Leaders in the Health Care Systems Industry, Stakeholders, HTM Associations & Organizations, and Councils have to collaborate and spearhead in formulating sustainable and economically viable framework which is synergistically inclined with Global Health Care Systems common goal in human’s “well-being and health care”; adaptable even in diverse settings, culture and traditions, especially in developing countries.

- On a personal note;
  a. Once given the opportunity to represent CEHTM, organizations to promote its advocacy, I am more than willing to join the activities, projects and programs; be grateful and committed myself to do so like;
     i. Join the team of trainers on mentorship, help in organizing CE activities and programs (Local, National, Regional & Global)
  b. To date, I have some projects ongoing locally “Philippines” on the pipeline;
     i. MET 1 Training locally, to increase the community of Biomedical Technicians to serve our domestic and local Healthcare Systems and related industry in the countryside.
     ii. Proposed HTM Planning workshop for the conceptualization of HTM Team and organizational structure of BMETs from the Local Provincial Government; to centralize the management, procurement and maintenance of medical equipment and devices for the District Hospitals in the Province of La Union under the leadership of the Governor and the Provincial Health Office.
iii. Users’ training on basic preventive maintenance and safety operations on medical equipment and devices for patient’s safety to remote health care unit/stations (BHCs) in the villages, infirmary and level 1 private and public hospitals in the northern Luzon Island, Region 1, Philippines.

As one of the developing world economies, Philippines and BMET professionals is continuously improving and creating awareness campaign to promote the significance of CE/BME-HTM within our limited resources. Utilizing our networking initiatives, scarce resources and financial capacity, we are able to support our technical skills and professional development through projects and activities like; straightforward MET, Medical Equipment Technology Training, HTM Symposia and creating local organizations/associations that may strengthen the community of skilled professionals who can serve and help the Health Care Systems in the country and the well-being of its citizenry.

Thereby, we are trying our best to collaborate with the local stakeholders and link agencies to get involve in the conceptualization of sustainable framework that would help the local and National Health Care Systems that is economically, socially and politically inclined with WHO guidelines, regulations, policies and industry standards in the delivery of medical services for the well-being of every individual to attain and enjoy the quality of life to the fullest. Health is Wealth and everyone’s responsibility.

Consequently, we are also pursuing potential opportunities for further collaborations with Global leading organizations to expedite and explore areas on research and technology innovations to be globally at par with other international HTM professionals on industry practices, certifications and accreditations.

In addition to the letter forwarded by Chair Tom Judd, 2nd of October, may I just take few perspectives on the following;

1. Gather your country’s local society, CE Colleagues… it was already mentioned above.
2. Further to be reviewed and discussed as this is our first time to join in the forum where CEHTM is quite unpopular to BMETs-Philippines in terms of industry practices and organizational structures and policies. Already mentioned above, #2 & (BOK); Some suggested measures
3. Next Steps on chosen topics
   i. Discuss political challenges to implement. Implementation would be enforced once it is being required by appropriate authorities within the national mandate based on national government constitutions.
      As mentioned above, WHO-DOH Compliance, Regulations and policies.
   ii. Discuss Financial/Resources available to implement. I can’t speak on my own personal capacity when it comes to financial/resources as this would be national & global initiative projects and programs.

By: MR. BENITO L. MACALINAO, MBA, BSMATH, Dip. ECE
    MET TRAINER AND FACILITATOR, BES NCII
    CE-HTM MENTOR/TRAINER