Singapore

Clinical Engineering in Singapore – Report by TAN Peck Ha – 15 October 2019

1. BES Healthcare Chapter [BES-HC]
BES-HC was launched on 10 Dec 2016.

**Mission:**
To provide a platform for Biomedical Engineers (BME) working in the healthcare sector to network, to share professional knowledge, expertise, experience and collaborate in advancing the Biomedical Engineering Profession in Singapore.

**Objectives:**

a) BES-HC shall jointly organize with education institutions relevant training for members with an aim for skills certification in clinical engineering. This shall enhance the efficiency and effectiveness of the hospital clinical engineering system by reviewing medical technology to optimize healthcare delivery and improve core competency of biomedical engineers. Currently, there is no BME certification in Singapore.

b) BES-HC shall review the skills certification requirements of a clinical engineer to work in a Singapore healthcare facility. BES-HC shall conduct joint reviews with the educational institutions to match industry requirements with current BME Course curriculum.

c) BES-HC shall study healthcare technology assessment, a systematic evaluation of the properties and impacts of health technology and help healthcare providers in healthcare technology decision making.

d) BES-HC shall seek to improve members’ appreciation of patient safety in terms of usage of biomedical devices on patients and to be in alignment with international patient safety goals.

e) BES-HC shall collaborate with government agencies, regulatory authorities, and medical device industry, providing opportunities for professional training and development as well as matching of BME graduates with hospitals BME and the healthcare industry.

There was a change in Chapter Chair in April 2019.

2. Singapore’s Public Healthcare Organisation
10 public hospitals organized in 3 clusters as follows:

**Central region – National Healthcare Group (NHG)**
Khoo Teck Puat Hospital (761-bed) - general and acute care
Tan Tock Seng Hospital (1700-bed) – including National Centre for Infectious Diseases
Yishun Community Hospital (428-bed)
Woodlands Health Campus (1800-bed) – scheduled for 2022
Eastern region – SingHealth

- Changi General Hospital (1000-bed) - general and acute care (including prison inmates)
- KK Women’s and Children’s Hospital (830-bed) – obstetric and gynaecology, neonatology and paediatric services
- Singapore General Hospital (1785-bed) – first and largest
- Sengkang General Hospital (1000-bed) – opened Aug 2018

Western region – NUHS

- National University Hospital - tertiary hospital with more than 50 medical, surgical and dental specialties, more than a million patients every year
- JurongHealth Campus comprising the integrated 700-bed Ng Teng Fong General Hospital (NTFGH) and 400-bed Jurong Community Hospital (JCH)
- Alexandra Hospital (326-bed) - acute, sub-acute to rehabilitative care

The larger public hospitals typically have BME teams of about 20 engineers and assistant engineers.

The roles of the BME engineers include:

1. Technology Management
2. Risk Management
3. Technology Assessment
4. Facilities Design and Project Management
5. Quality Assurance
6. Training
7. Administration
8. Others - such as computer support and telecommunications; cybersecurity for wireless equipment.

There are also 9 private hospitals of various sizes. Most of the private hospitals have very small BME teams.

In total, there are about 200 engineers working directly with hospitals. However, they do not use the term “clinical engineers” to refer to their profession.

3. Seminars

- 10 Dec 2016 - “Driving Excellence in Healthcare Technology”, where six invited speakers shared their knowledge on global and regional trends in Healthcare Technology.
- 9 Dec 2017 – “Digital Healthcare”, which attracted 50 participants including BME engineers, facilities management engineers, equipment suppliers and medtech companies.

4. Education/Certification

- Public hospitals BME teams composition is typically 50% engineers (with Bachelor’s degrees and above) and 50% assistant engineers (diplomas and other qualifications).
Most of the assistant engineers will undertake part-time continuing education to qualify as engineers during their employment.

- The engineering background of the teams can be biomedical, electrical, electronic, mechanical, etc.
- There is no requirement for professional certification of engineers to work in the hospitals.
- Most of the training are on-the-job, by equipment vendors or more specialized staff members.

5. Educational Training by Institutions of Higher Learning
- No university programmes with Clinical Engineering.
- Only 1 polytechnic offers Clinical Engineering training.

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