Known Side Effects of Biomedical Engineering

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School and Early Life

- Always liked to play with (read break) electronics
  - Parents could not have nice things!
  - Built my own electric go cart... Needed an extension cord
- Always afraid of doctors and medicine
  - Quite sick as a child
- High school – Iona College Lindum
  - Math, Chem and Phys Nerd
  - Also did Graphics and IPT
  - Didn’t like one enough to carry it to Uni
  - Many are probably feeling the same
  - Thought engineering might combine a few
University

- Engineering combined all the things I liked
  - Not to sure what flavour engineer to be
  - General Plan

- How did Biomed get into all this?
  - Blame Dr. Wilson
  - Electronics and Biology sounded pretty cool!
  - Double Major in Elec and Biom was introduced in 2006
Some Advice

- **Do a double major!**
  - 2 Degrees for the price of one (if you don’t fail/repeat)
  - Many courses are relevant in both Electrical and Biomed
  - Interesting diversity in your course work
  - Taste of medicine while still in your engineering comfort zone

- **Don’t be put off by the biology**
  - You will pick it up easy
  - If you can do Math C, you can handle bio at uni
What will the degree do to you?

- A thorough basis in electronics
  - Instrumentation courses give you experience in analogue and digital diagnostic tools.
  - 3rd year design course has you building EGC’s and writing software for heart rate detection
- An understanding of medical imaging
  - Several imaging courses take you through multiple modalities from MRI-to Ultrasound.
How to Learn

- The Big one: How to learn!
  - Lots of courses have some relevant info and “less” relevant info
  - The biggest still you can have as an engineer is learning and then applying knowledge quickly.
  - As a biomed, your job is to take the knowledge from traditional form of engineering and combine it with biology to solve problems no one else can.
Teamwork

• The Bigger one: Teamwork
  ○ UQ puts all engineers through 2 team design projects
  ○ Work with engineers of different backgrounds and disciplines
  ○ This was my favourite course
  ○ Forces you to develop good strategies for:
    ▸ Project management
    ▸ Intra-team communication
    ▸ Documentation of work done
    ▸ Conflict resolution
    ▸ And surviving extended hours without sleep
Of course sometimes you need sleep
Currently I am a Biomedical Technician at the Mater

What does that mean?

- We are responsible for:
  - Planned maintenance
  - Service and repairs
  - Emergency repairs
  - Equipment installation & modification

- Very enjoyable hands on work
- Work in a clinical environment
- Punctuated emergency call-outs
Everyday Skills

• Teamwork and conflict resolution:
  o We deal with:
    ▪ Doctors
    ▪ Nurses
    ▪ Clinical Technicians
    ▪ Researchers
  o They all have different ideas on the definitions of important and urgent!
  o Different to working with like minded engineers in an office
Everyday Skills

- **Good knowledge of electronics and medical equipment**
  - Day to day you play with everything from infusion pumps to bladder scanners
  - Good problem solving and analytical skills to figure out if there is an error and how to fix it
  - Difficult to have an encyclopaedic knowledge of every machine so you need that ability to learn fast and apply

- **Head for safety**
  - You will sometimes be in a more dangerous environment than a lab
  - Have to be sure that the repair/service has left the equipment safe for patient use
  - Electrical safety for cardiac and body floating devices
Emergencies

• The ability to use all your other skills quickly and with a level head
• Emergency responses are a lot of fun (and stress)
• They do require the ability to prioritise
  o Everybody thinks their problem is an emergency

• My favourite emergency story
Boring Skills

- Those photos are the result of writing up an incident report.
- Documenting work done, while tedious, is one of the most important tasks.
  - Considering most other power engineers just fly a spreadsheet, we are lucky.
- Hardest thing for me was the idea of safety first.
  1. Entertainment value
  2. Profit
  3. Safety
The Future

- Biomedical engineering is a growth industry
- There are numerous service and research jobs out there
- Also plenty of opportunity to stay at uni for a higher degree
- And there is no reason you can’t be involved in both
- Currently there are slightly more opportunities overseas than at home... But that's slowly changing
- No need to feel tied down
- If you play your degree right, you still have all the opportunities of an electrical engineer
Thanks

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