The greater the amount of troponin, the more severe the heart attack. However, there are no Troponin monitors for patients to use on a daily basis that can assist those at risk of heart attacks in quickly identifying when their troponin levels are misidentified. This alert would notify the patient to seek immediate medical attention in order to reduce the severity of the heart attack and thus the risk of death.

Disadvantages

- Would have to take monitor off when swimming/bathing as not waterproof
- Only works for a period of time
- Expensive for large populations over long periods of time
- May be more expensive to manufacture
- Would not necessarily cover the cost of supplies e.g. reservoir cartridges, infusion sets, tubing, cannula, batteries, tape and adhesive. A certain percentage is therefore reduced the risk of death on the way to the hospital. It is possible for tests to yield false positive or negative results, troponin tests are usually highly accurate. Why not make a continuous monitor for a cardiovascular patient’s troponin concentration within the bloodstream?

Troponin Monitor

1. Design
   - Novelty
   - Public acceptability
   - Price breakdown

2. How it works
   - Elevation of cardiac troponin levels can be identified by a variety of means. In a secondary care environment, they are often identified using high sensitivity assays. A blood sample is taken from the vein in the arm and is analysed using platforms and verified by a biochemist. Commercially, these blood tests can cost around £125 whereas a continuous troponin monitor would cost significantly less and give constant readings which would allow in early diagnosis of heart attacks, rather than waiting for a doctor to consider other illnesses.

   The sensor would identify a change in conditions that occurs when troponin binds to RNA or DNA and is analysed using platforms and verified by a biochemist. The spike in troponin levels 4 hours after a heart attack. The aptasensor would be able to fit in a smartphone and has a limit of detection (LOD) of 0.1 microgram during preclinical trials which is accurate to identify a heart attack 0.4ng/ml then the path would increase to a certain level 0.4ng/ml then the patch would alert the patient that a heart attack may have occurred. This alert would notify the patient to seek immediate medical attention in order to reduce the severity of the heart attack and thus the risk of death.

   Continuous Troponin Monitor

   By: Shawn Shibu, Megan Fraser, Isabelle de Plessis, Haydn Campbell, Isabella Westerbeek & James Montford

   How the approach can be shown and implemented notes
   - Pre-clinical research
   - Phase 1: £2.2 million
   - Phase 2: £7 million
   - Phase 3: £25.2 million
   - Review phase - £2 million
   - Total - £27.5 million
   - Total: £64.1 million

   Clinical Trial Expenses
   - The average cost of phase 1, 2, and 3 clinical trials across therapeutic areas is £4, £11, and £20 million respectively