

[1] The field of medical equipment technology is one where ongoing innovation is often closely related to socio-cultural factors acting at the particular time.

Economics will be an important factor in most developments with many pieces of new equipment developed in a way that allows them to be sold at a lower cost than standard equipment already in use and so bringing the cost of treatment down to a more affordable level and extending the potential market for the new equipment.

Another factor in developments in this field is where the equipment is going to be used and who is going to use it. The development of equipment which is designed to be used by trained medical professionals in a modern hospital will be different to things which are designed to be used by non-trained people in less patient-friendly places.

Social issues will also impact significantly on developments in medical equipment technology. Low cost infant incubators are now more readily available in developing countries to try to lower the unacceptably high death rate of newly born babies.

In an international market place cultural differences will invariably impact on the way a medical product is viewed and used. If a product is to be effectively used in the way that is intended then cultural influences need to be clearly identified and addressed in the development process.

[2] Developments in medical equipment will start from a specific need or opportunity. This need may be to lower the cost to the purchaser to increase usage and so increase profits. It could also be to produce new equipment to work better than equipment that is already available or to be easier for the user to operate. Sometimes making something work better will increase the cost and this may affect potential sales.

In designing the equipment both form and function are important. The equipment has obviously got to be able to do what it is intended to do but sometimes this can affect the 'look' of the device and put potential users off. Where it is to be used and whether it will be used by trained medical professionals can also influence design decisions that have to be made.

Material choices will most often be made to match the properties of materials and their costs to the desired performance requirements of the equipment being developed. In the hospital environment this choice often hinges on sterility and durability issues. However when the equipment is designed to be used in more remote requirement the ability to be easily transported, assembled and serviced may be equally important.

How the product is actually manufactured could also be influenced by competing priorities such as the need to manufacture cheaply in bulk, but also to do this in a way that takes into account the needs of the people involved in the manufacturing process

[3] The Acuset IV infusion flow controller was developed to administer medicines and rehydration fluids safely and accurately to patients in developing countries. In a hospital situation this medical procedure is most often carried out using microprocessor controlled syringe pumps by trained medical staff. In under developed counties this procedure often has to be carried out in the field by non-trained staff or by the patients themselves or close family members using roller clamp devices. Although these roller clamps are cheap to manufacture they can be inaccurate and difficult to control with the result that many patients end up not surviving when they should have.

Medicine Mondiale picked up initial designs for a device developed by a partner not-for-profit organisation and had the immediate problem of identifying and engaging the technical expertise which would be required to develop these initial design ideas within the limited budget available.

Using existing social entrepreneur networks a like minded industrial designer was engaged without cost. The designer focused on the dual demand of ensuring both the functionality of the device and the need for a design that could be effectively operated by an inexperienced user working in the field.

The final device would have to be not only accurate and reliable but also inexpensive and so affordable in developing countries. This was achieved by a final design which would be re-usable rather than disposable.

This involved careful selection of materials. Because of the need to manufacture in bulk the construction material had to be relatively inexpensive, so plastic was the obvious choice. However the plastic chosen would have to be able to be machined accurately and also be strong enough to resist any movement from the pre-set flow rate while in use.

With a workable prototype now developed additional funding had to be found to make the equipment needed for commercial manufacture. The task of finding additional funding was helped by identifying both a like minded funding partner and a totally different market for the device.

