

# Medical Ethics

## Translational Medicine

Translational medicine is a branch of medicine that focuses on the main principle of ‘bench to bedside’- in an effort to create the best possible method of treating a patient, either through medication, care services or surgery. This means that every effort is taken to create personalised treatments for individual patients, rather than a general approach that does not particularly cater to the patient’s specific needs. <sup>3</sup>It can be applied to nearly all branches of medicine, ranging from R&D to clinical practices.

One way in which translational medicine is applied is through increasing communication between researchers and clinical practices<sup>2</sup> to provide and incorporate the newest knowledge from research into clinical practices. Not only does this mean that patients have new medicines and procedures readily available to them, but it also means that the researchers who have developed these medicines and procedures can have comprehensive feedback on how they have worked through the clinician’s observation, rather than computer simulated results or results from animal testing.

On the contrary, every effort has to be made to ensure that any procedures or medications are fit for human use/consumption. For example, any drug that has recently been developed but has not undergone any sort of human or animal trialling will not be fit for human use, even if it may be the newest or possibly even the most ‘effective’ drug on the market. However, translational medicine preaches that basic findings should be prevented from undergoing clinical use before extensive clinical testing. Once again this is to ensure that the patient gets the best possible effect from their medicine or procedure.

Unfortunately however, places such as hospitals are also forced to take into account how expensive a treatment is and its predicted effectiveness, which is where medical ethics often comes into play. Medical ethics takes into account four things which are:<sup>4</sup>

Autonomy — it has to respect the rights of the patient and their wishes

Non-maleficence — the treatment must benefit the patient more than it harms them

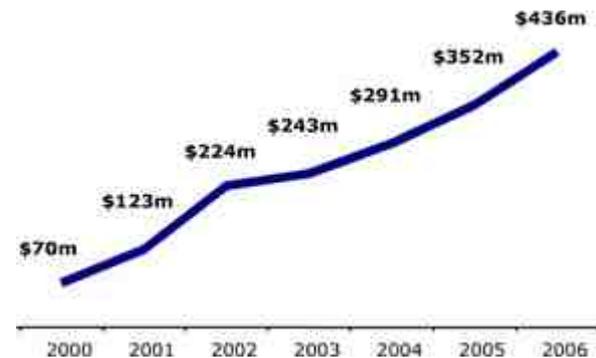
Justice — the consequences of a treatment should take into consideration all stakeholders (i.e. patients, families etc.)

Beneficence — to what extent does it benefit the patient?

Whilst factoring in the above, medical consultants have to consider whether a treatment is actually viable within a budget. An example of this is where a patient may have a terminal illness and is on life support. A consultant must take into account the hospital’s budget for that patient, as well as listen to the requests of the family, whether that be to keep them on life support for as long as possible or take the patient off of it. The problem here is that keeping the patient on life support may not be in their best interest as they could be suffering. The consultant has to adhere

to any laws that are in place, but also come to a decision that all stakeholders can mutually agree to.

Nano - ethics is also another discipline that ties in closely with medical ethics.<sup>5</sup>As put by the US National Science and Technology committee, the utilisation of nanotechnology is the start of ‘the new industrial revolution’, where all manner of things from medicine to weapons can utilise nanotechnology. However, the ethical dilemma here is whether humans are actually ready to take the responsibility of these great advancements. Much like nuclear weapons, there is a huge controversy surrounding nanotechnology weaponry of mass destruction. The question is who, in the event of the technology falling into the ‘wrong hands’ does the responsibility fall to? Whilst the clients who receive the technology are responsible for how they use it, it is arguable that it ultimately comes down to the researchers who have developed the technology in the first place.<sup>6</sup>One example of this is the US military who have started to invest considerably more into nano technology (see right). Whilst their reason may be for ‘defence’, there is still no guarantee that weapons of mass destruction will not be used as threats or in offensive attacks. These types of weapons may just be too destructive for humans to take responsibility for as of current.



<sup>7</sup>Another controversial topic is the use of nano-technology within the cosmetics industry. The debate has been centred on whether people should actually be using it to alter their looks or should whether it should only be used for life threatening problems. A similar controversy surrounded the use of the human growth hormone implant for athletes, who wanted to boost their physicals fitness, or for children who were considered abnormally short for their age. The problem started when parents who could afford surgery for their children to have this implant used it just for cosmetic purposes. Many believed that this type of surgery should only be for those that actually need it.

Interestingly enough, whilst some people are against using the technology for altering appearances, nano-technology has been embraced into products that are accessible to everyone.<sup>8</sup>Some sun creams for example, use titanium dioxide as a UV blocking agent, as well as Silver nano particles that kill bacteria for products such as rubber gloves and hair brushes.

To conclude, translational medicine, medical ethics and nano-ethics are all disciplines that have gained an increasingly large amount of attention in recent years. I personally believe that they are a necessity in today’s world, where perhaps more thought needs to be put into thinking about how and where nano-technology should be used. There is certainly a need for it in areas such as medicine and curing diseases that could not be cured otherwise, but there must be a clear distinction between using it for the greater good and using it for one’s own benefit.

<sup>1</sup> [https://en.wikipedia.org/wiki/Translational\\_medicine](https://en.wikipedia.org/wiki/Translational_medicine): An article covering the brief aspects of translational medicine, i.e. principles, applications etc.

<sup>2</sup> <https://www.britannica.com/topic/translational-medicine> WRITTEN BY: Francesco Marincola, Sten Lindahl. A page focusing on the needs, challenges and opportunities translational medicine holds.

<sup>3</sup> <https://www.imperial.ac.uk/medicine/study/postgraduate/masters-programmes/mres-clinical-research/pathway--translational-medicine/>: Brief introduction to translational medicine along with career and employment opportunity examples.

<sup>4</sup> <https://www.themedicportal.com/e-learning/interview/ethics/> : Brief introduction to translational medicine as well theoretical medical dilemmas with answer guides.

<sup>5</sup> <http://ethics.calpoly.edu/nanoethics/papero10807> : Article providing an in depth description of the nanotechnology disciplines, the issues surrounding them and their uses.

<sup>6</sup> <http://www.nanowerk.com/spotlight/spotid=1015.php> : Describes the how nanotechnology can be used in weapons for militaries along with risks and examples that are already in use.

<sup>7</sup> [https://books.google.co.uk/books?id=dE4vNXbS5wC&pg=PT175&lpg=PT175&dq=nanoethic+questions&source=bl&ots=1PrCKEOUXe&sig=SBZuPBiGj7VwJl2yX2v\\_pU4qJrY&hl=en&sa=X&ved=0ahUKEwik1dKkk\\_XUAhUiC8AKHfBxChMQ6AEIQzAF#v=onepage&q=nanoethic%20questions&f=false](https://books.google.co.uk/books?id=dE4vNXbS5wC&pg=PT175&lpg=PT175&dq=nanoethic+questions&source=bl&ots=1PrCKEOUXe&sig=SBZuPBiGj7VwJl2yX2v_pU4qJrY&hl=en&sa=X&ved=0ahUKEwik1dKkk_XUAhUiC8AKHfBxChMQ6AEIQzAF#v=onepage&q=nanoethic%20questions&f=false) : Document describing some ethical dilemmas and theoretical problems with advancements in nanotechnology.

<sup>8</sup> <http://www.nanoandme.org/nano-products/cosmetics-and-sunscreen/> : A page describing some common uses of nano-technology in everyday products.