NANOTECHNOLOGY IN RELATION TO MEDICINE

DEFINITION:

Nanotechnology is a newer branch of technology that focuses on the manipulation of matter at a miniscule scale. It includes four types of nanotechnology: carbon-based, metal-based, dendrimers and nanocomposites. This technology is primarily used within the energy, industrial, and medical areas, however, is still utilised in a vast number of other fields. Examples of current nanotechnology include solar panels, sunscreen, Kevlar and nanomedicine.

JUSTIFICATION:

Nanotechnology within medicine or nanomedicine is very beneficial for society. Developed in the 90s, its main purpose is aiding and monitoring the health of an individual. Currently, nanomedicine is being used to manufacture vaccines, aid in drug delivery, develop implants and numerous other things. I chose this topic as I believe that it is and will be relevant in the current and near future. Additionally, I also found the topic interesting as it is a relatively new technology with a lot of future possibilities.

IMPORTANCE:

In the biomedical industry nanomedicine has been vital in developing drugs that can help battle complex diseases such as cancer. According to the article *"Nanotechnology and human health: risks and benefits (2010)"* it could also offer a cure the to the "medical nightmare" of tuberculosis. In addition, the technology is also beneficial to treat diseases that require surgery such as the removal of a tumour and detecting artery blockages. Nanomedicine has saved many lives and has the potential to save, protect and extend the lives of millions more.

OPPORTUNITIES:

As of now nanomedicine still impacts our society greatly. Even through the pandemic, nanotechnology has been used to help develop a more potent deterrent to COVID-19 (Cardoso, V. M. D. O., et al. , 2020). In addition to that, nanomedicine has also been used to help treat multiple diseases such as cancer, fungal infections, hepatitis and many more (Ventola C. L., 2012). Even in the present nanotechnology helps treat and will continue to treat the masses.

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RISKS:

Potential Toxicity:

- Research within nanotoxicity is still a very recent development. However, the degrading and release of the nanomaterial debris and functionalisation can have poisonous effects to living beings that have not yet been explored within the field of nanotoxicity.

Lack of safety assessments:

- According to multiple sources nanomedicine/nanomaterials has remained poorly assessed when it comes to safety assessment due to the primary focus being around technological improvement. In addition, there are also no technical means to monitor the impact of the nanomaterials and nanoparticles.

Unknown Potential Risks:

- According to the article "Nanotechnology: legal and ethical issues" (2016), the European Commission confirmed the lack of knowledge and methods when it comes to determining the potential risks of nanotechnology and nanomaterials

CHOICES

How Nanomedicine will affect the future:

- Reading the article *"Future impact of nanotechnology on medicine and dentistry (2008)",* Nanomedicine will eventually be including aspects of complex machine systems and nanorobots within the field. Further in the paper there are also mentions of other practical uses of nanomedicine such as nanodevices to help with surgery, drug administering, health interventions and it all being controlled and monitored by nano computers. Within the article they predict that these could become reality within a 10-to-20-year time period.

What choices can we make to help further the impact of nanomedicine in the future:

- Some choices that we can make to help further the development and impact of nanomedicine within the future can include things like using the products, volunteering for tests, side research and many other things.
- If you are willing to, study biology, chemistry and other subjects needed in university and help in the actual of it.

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