

# Nuclear medicine

Education



The Advancement in Nuclear Medicine Insert Insert Nuclear medicine is one of the most advanced breakthroughs achieved by humans in the field of medicine. It involves the use of sophisticated technology and techniques to treat or try to suppress diseases in humans. This branch of medicine involves the use of trace radioactive material to treat or find the cause of a disease in the malfunctioning organs (Saha, 2006).

The most common type of radiation involved in nuclear medicine is the positron emission tomography (PET). This diagnostic test not only provides information about different body organs, but also gives information about how they are functioning. The patients to undergo nuclear medicine procedures do not require undergoing any special programs before the procedure, except, in cases involving gastro-intestinal system. In this situation, the patient is subjected to fasting four hours prior to the procedures (Murray, 2009).

Nuclear medicine has several advantages that include

1. The technology is a safe, painless and a safer method of examining cells that otherwise would require a more sophisticated and riskier diagnosis
2. The medicine has an upper hand to other tests, as it is extremely sensitive and detects abnormalities in organ structure and functionality of the structure at a very early time
3. The medicine is cost effective in treatment, in diagnostics of thyroid cancer, and bony pain among others

However the technology also has its fair deal of limitations that include

I. It exposes the patient to a fair deal of radiation than the X- ray Chest radiation.

II. Nuclear medicine images do not show much anatomic details. To obtain a

<https://assignbuster.com/nuclear-medicine/>

more detailed image we have to combine it with other modalities (Saha, 2006)

III. Nuclear medicine requires a higher level of expertise to administer it, which is not available in many countries

IV. The Price of equipment that is required in the treatment is high and unattainable to many hospitals.

Nuclear medicine procedures, are used to treat many diseases that include hyperthyroidism, thyroid cancer, blood imbalances, and any bony pain from certain types of cancer (Ramer, 2008).

Positron Emission Tomography (PET) can examine body chemistry and is applied in medical tests as CT and MR scans. The test shows more information on the body organs like their current state of functioning and their structure.

Hybrid scanning techniques employ X-ray computed tomography (CT) or magnetic resonance imaging (MRI). This technique sees the structure of an organ with 0.5 mm resolution but nuclear medicine uses 5.0 mm resolution to observe metabolism (Ramer, 2008)

Indium white blood cell scans by the nuclear medicine helps determine the structure of the blood cells and how they are functioning. This scan aids in detection of cancer and any malfunction in the cells.

Scientifically, nuclear fusion produces power as an energy resource. This occurs in a nuclear reactor where fusion in the nucleolus of radioactive material helps produce a lot of power transmitted and distributed for different uses. Energy produced from these materials is obtained by an action of splitting uranium into two by action of a neutron. This leads to radiations and heat evolved from atom and the reaction is fission (Murray, <https://assignbuster.com/nuclear-medicine/>)

2009).

The process of nuclear fission involves the conversion of uranium into pellets and into rods. Lots of water is required to cool the uranium rods. When the rods emerge from the water, they produce lots of heat controlled by raising or lowering them from the water surface. To obtain more heat we raise them further way from the water. The heat produces steam that runs power-generating turbines(Morris, 2006)

Nuclear power has some advantages and disadvantages that include

Merits:-

- I. A nuclear power plant produces large amounts of power equivalent to a fossil fuel generating station.
- II. The nuclear power generation station does not produce gases that are pollutants to the air.
- III. The method of power production is environmental friendly and does not contribute to global warming. The Nuclear fission is viewed as an alternative source of power that reduces global warming by many people.
- IV. The power reduces over reliance on fossil fuel that is depleting at an alarming rate.

Demerits

- i. Waste management and storage is expensive and risky to the health of the personnel handling them.
- ii. Accidents involving nuclear plants are catastrophic and result to many casualties.
- iii. The countries that are hostile may develop nuclear weapons and this is a threat to world peace if they gain access to nuclear technology.

References

<https://assignbuster.com/nuclear-medicine/>

Morris, N. (2006). Nuclear Power . Howard: Smart Apple Media.

Murray, R. L. (2009). Nuclear Energy an Introduction to Concepts and concepts systems and applicatoion of Nuclear Energy . Oxford: Butteworth-Heinmann.

Rahman, M. (2005). Nuclear Medicine. Retrieved march 04, 2013, from Bangladesh Atomic Energy Commision: [www. cnmumym. org](http://www.cnmumym.org)

Ramer, K. (2008, March 04). NUclear Medicine Technology. Berlin: springler-Verlag.

Saha, G. B. (2006, September 9). Physics and Radiobiology of Nuclear Medicine. New York: springler science and Business Media Inc.