

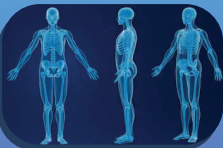
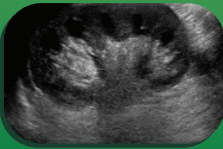
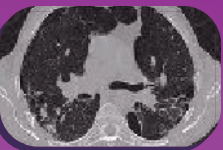



## 11. 4 Physics in medical diagnosis and therapy

Medical science very much revolves around physics principles. Medical instrumentation has widened the life span due to the technology integrated diagnosis and treatment of most of the diseases. This modernisation in all fields is possible due to efficient application of fundamental physics.

### 11.4.1 The development in medical field has been proportional to the evolution of physics as indicated below (Not for examination)

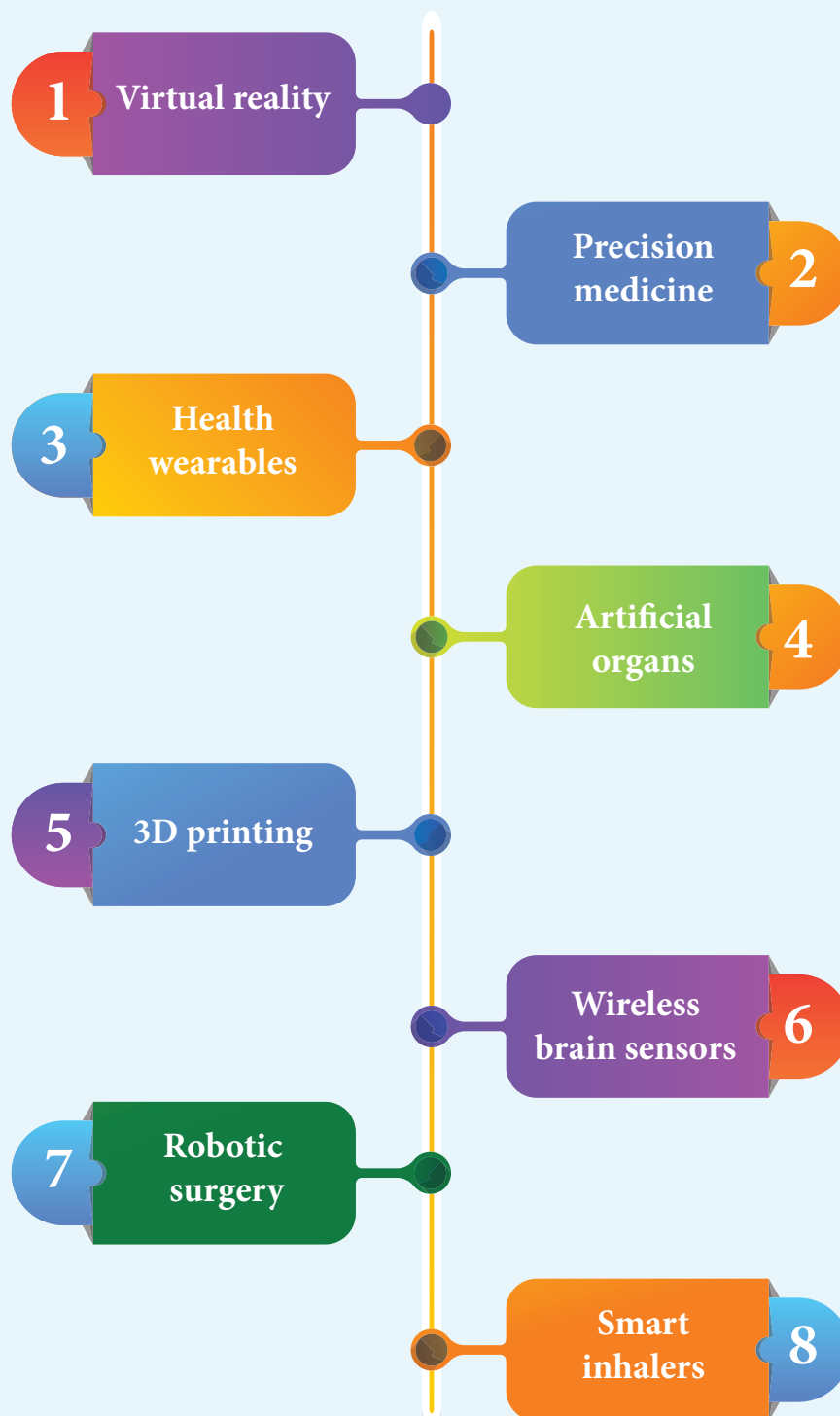
Year	Invention in physics (Inventors)	Technique used in medicine	Image
1 1895	X-rays (Wilhelm Conrad-Röntgen)	Radiology-Xray imaging	
2 1896 and 1898	Theory of Radioactivity (Antonie Henri Becquerel, Pierre Curie and Marie Cuire)	Radioisotope imaging Nuclear Medicine	
3 1934	Artificial Radioactivity (Joliot and Irene Curie)	Scintigraphy	
4 1950	Echography & Sonography	Ecography	
5 1979	X-ray computed tomography (Cormack and Hounsfield)	Computed Tomography (CT)	
6 1952	Nuclear Magnetic Resonance (NMR) (Felix Bloch and Edward Purcell)	Magnetic Resonance Imaging (MRI)	



Year	Invention in physics (Inventors)	Technique used in medicine	Image
7 1934	Artificial Radioactivity (Joliot and Irene Curie)	Positron Emission Tomography	
8 1940's	Optical fibre	Endoscopy, Biomedical sensors	
9 1960	LASER	Surgical instrument and diagnosis tool	
10 1959	Nanotechnology	Nanomedicine Drug delivery	
11 2005	Dual Source Computed Tomography (DSCT)	Computed Tomography (CT)	
12 1998	Nuclear medicine (David Townsend, Ronald Nutt)	Fusion Imaging Techniques (PET-CT, PET-MR)	



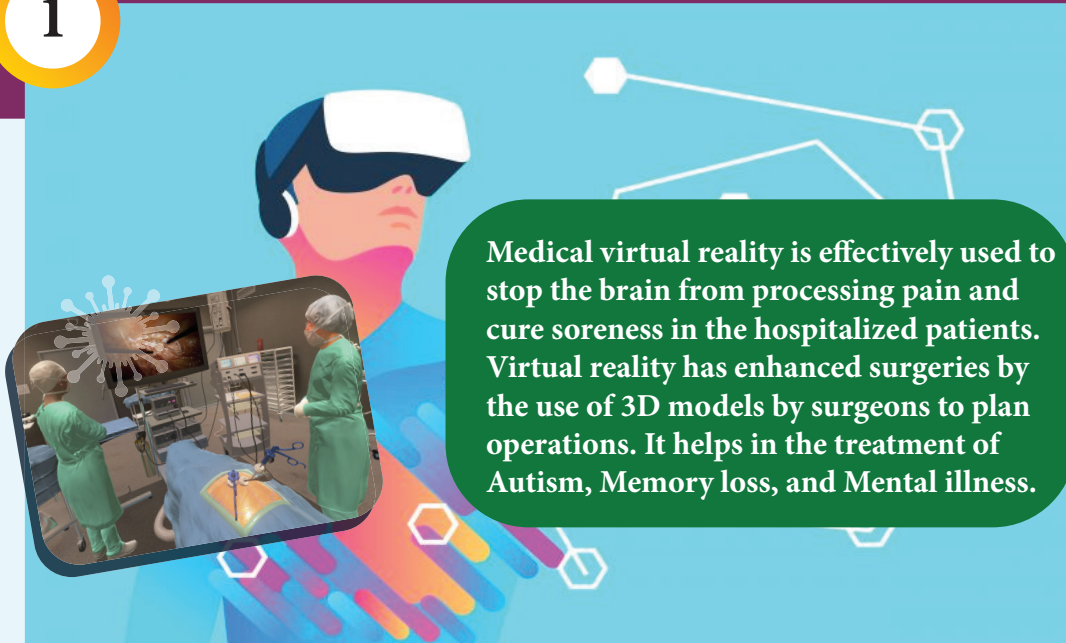
## 11.4. 2 The recent advancement in medical technology includes



The innovation in medical diagnosis has taken leaps and bounds due to the integration of technology and basic physics. A few of such advancements are discussed.

## 1. Virtual reality

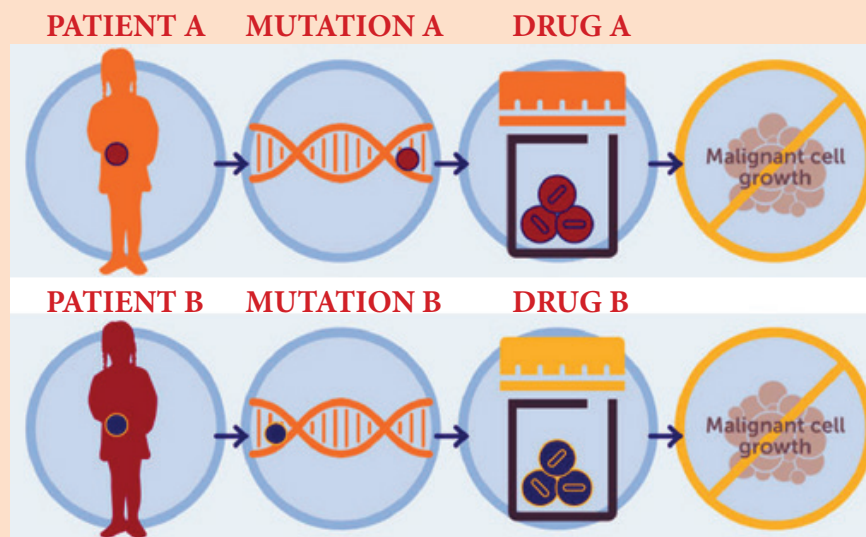
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## 2. Precision medicine

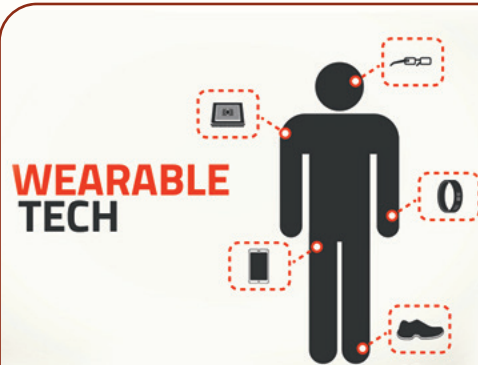
Precision medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. In this medical model it is possible to customise healthcare, with medical decisions, treatments, practices, or products which are tailored to the individual patient.



### 3

## 3. Health wearables

A health wearable is a device used for tracking a wearer's vital signs or health and fitness related data, location, etc. Medical wearables with artificial intelligence and big data provide an added value to healthcare with a focus on diagnosis, treatment, patient monitoring and prevention.



### NOTE

**Big Data:** Extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

### 4

## 4. Artificial organs

An artificial organ is an engineered device or tissue that is implanted or integrated into a human. It is possible to interface it with living tissue or to replace a natural organ. It duplicates or augments a specific function or functions of human organs so that the patient may return to a normal life as soon as possible.

