



Role of Copper in Radiation

Dr. Rajiv Kumar Singh*

Department of Radiation Oncology, Apex Hospital, India

***Corresponding Author:** Rajiv Kumar Singh, Department of Radiation Oncology, Apex Hospital, India.

Received: October 11, 2023

Published: October 25, 2023

© All rights are reserved by **Rajiv Kumar Singh**.

Pacemaker is a device that send small electrical impulses to the heart muscle to maintain a suitable heart rate or to stimulate the tower chambers of the heart (Ventricles). Depending on your condition there are 3 types of pacemakers available.

- Single chamber pacemaker - carries electrical impulses to the ought ventricle of heart
- Dual chamber pacemaker - For controlling the timing of Contraction between the two chambers, it carries electric impulses to the right ventricle and the atrium also.
- Bi-Ventricular pacemaker - Called Cardiac resynchronization therapy, Patient having problem in heart failure and heart-beat. It stimulates both lower chambers (Left and Right Ventricles) in heartbeat work efficiently.

Radiation - Energy that comes from a source and travels through space at the speed of light includes alpha, beta, neutron, gamma and electromagnetic waves. It can have harmful effects materials as it can degrade their properties so that they are no on solid Longer mechanically sound. The use of radiation is especially for sites in and around implanted pace device due to its malfunction or failure of pacemaker device, due to its ionizing effect or via electromagnetic interference or dysfunction.

Copper usually in form of mesh will shield against most wavelength radio-frequency radiation and other Electromagnetic radiation. It is highly effective at blocking or shielding radio-frequency radiation because it absorbs magnetic waves and radio. During radiation, may or may not the radiation field will come near to pacemaker as the electromagnetic rays come indirectly by scattering and can cause failure to the pacemaker as both consists of electromagnetic substance. Unfortunately not all pacemaker look the same, different indicators may be used to determine that a pacemaker is nuclear word or curies or an symbol of Pu238. The battery which was there in Pacemaker can contain Plutonium238 or non-nuclear simply contain a chemical type of battery some of the

company contain nuclear power cardiac pacemaker. Like – ARCO-Perma - grain Medtronic- Laurens Alcatel.

Gulf general Atomic Cordis – Telektronic, Accuffix American optical – Bio-control Tech (Coratomic).

Introduction

Copper is a chemical element with the symbol Cu atomic number 29. It is a soft malleable and ductile metal with very high thermal and electrical conductivity. It has radionuclides with varying decay characteristics range of which offer the potential to use in imaging and radiotherapy. The production decay and relevant chelation (a type of bonding of ions and molecules to metal ions) chemistry of copper.

On off view we must put the Cu mesh near function of the field lower border for the protection of Pacemaker. As we know Copper usually in form of Mesh will shield against most wavelength radiofrequency radiation and other Electromagnetic radiation. It is highly effective at blocking or shielding radio frequency Radiation, because it absorbs magnetic waves and radio. On other hand copper mesh can be used as a bolus which does not significantly change dose at depth and increase surface dose. It may be used as a substitute for tissue equivalent bolus to improve the surface. Conformity when used direct between skins and radiation fields.

Conclusion

It has been mentioned in pacemaker that the absorbing dose effect to a min 2Gy to a max 5 Gy dose of radiation only, which is usually can be gained from the scattered dose with including pacemaker production which include radioactive substance itself. Measuring copper mesh 260 x 260 mm with nominal aperture 0.2m and thicken 0.004mm with 3 to 4 folds which can Reduce Electromagnetic interference from Common Laboratory items can protect sensitive setups and Electronic Equipment's.

Specification	
Attenuation -10MHZ Wire Diameter	57dB
Wire Diameter	0.25m
Width	1.22m
Density	16strands. Inch

Table 1