A new device will make quality control of radiotherapy treatments possible

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The research team from the Department of Electronics and Computer Science at the University of Granada (UGR), together with the Department of Radiology at the Hospital Virgen de las Nieves in Granada, have designed a portable and low-cost device which can measure the ionizing radiation someone is exposed to, for example, during radiotherapy.

Ionizing radiations play a vital role in the treatment and diagnosis of malignant neoplastic illnesses as well as in the diagnosis of other pathologies. However, according to Manuel Vilches Pacheco from the Medical Physics and Radiology Department at the Hospital Virgen de las Nieves in Granada, "the potential harm ionizing radiations can cause means that, in order to obtain clinical benefits and reduce the onset of unwanted adverse effects as much as possible, they must be used under strict quality control".

According to experts, this is why it is important to develop instruments which can verify the final result by carrying out a direct follow-up of treatments administered to patients, such as image registration (portal imaging system) or the in vivo measurement of the exact dose administered to patients.

In vivo control

Portal imaging systems have greatly improved in the last five years and are widely used today. This is not the case for systems used for in vivo dose measurement in vivo which, in a significant number of patients and treatment sessions, "has been limited to a few centres". This is because a great amount of effort is required to place the device onto the patient and as it interferes noticeably with the treatment "it can considerably modify the distribution of the administered dose".

On this matter, Alberto Palma López, from the Department of Electronics and Computer Science at the University of Granada, explains that this new device does not require an electricity connection or a reading supply unit and, among other improvements, it minimizes treatment disorders and is made of low-cost and reusable electronic devices, "something that was impossible until now".

Furthermore, the device's design has metrological characteristics which ensures that it performs correctly at high temperatures. This means the room does not need to be specially fit out. The detector's minuscule size can measure the radiation quickly in different areas of the body as well as keep a historical record of the patient.

Significant progress has been made in encouraging the widespread use in vivo dosimetry control, an important element among patients undergoing radiotherapy. However, its use can be extended to other radiological practices such as diagnosis by X-ray or for the protection of professionals exposed to a radioactive environment.

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