therapeutic strategies addressed to these pts. At first it has become evident that any age-cut-off adopted to identify “elderly pts” ( > 65 yo, > 75 yo or even > 85 yo) has intrinsic limitations because geriatric pts are an extremely heterogeneous group with respect to their general health status. Second, a comprehensive geriatric assessment is needed to stratify and weigh the spectrum of dysfunctions present at old ages in order to select pts suitable for treatment (with standard protocol or with adapted ones). Several instruments and screening tools are proposed in the literature aiming at evaluate the vulnerability of elderly cancer pts: from complex and time consuming procedures to more easy to apply ones and to self-administered questionnaires based on self-assessment of a short list of items. Finally elderly pts should be evaluated during and after their cancer treatments in order to detect signs and symptoms related to potential complications due to the treatment itself in order to eventually modulate it accordingly.

Brachytherapy (BT) is an attractive treatment option for elderly cancer patients and this is especially true for prostate and gynaecological malignancies. The International Society of Geriatric Oncology (SIOG) Radiotherapy Task Force has reviewed the current best practice and priorities for research in radiation oncology for elderly patients with cancer. It has been stated that life expectancy and comorbidities should influence the selection criteria for prostate BT and that an international consensus is needed to define the subset of geriatric pts for prospective evaluation of BT acknowledging that a specific literature on BT for this group of cancer pts is virtually non-existent. Interestingly enough the same paper that a specific literature on BT for this group of cancer pts is geriatric pts for prospective evaluation of BT acknowledging international consensus is needed to define the subset of pts. Specific and details guidelines are still lacking accordingly.

Brachytherapy (BT) is an attractive treatment option for elderly cancer patients and this is especially true for prostate and gynaecological malignancies. The International Society of Geriatric Oncology (SIOG) Radiotherapy Task Force has reviewed the current best practice and priorities for research in radiation oncology for elderly patients with cancer. It has been stated that life expectancy and comorbidities should influence the selection criteria for prostate BT and that an international consensus is needed to define the subset of geriatric pts for prospective evaluation of BT acknowledging that a specific literature on BT for this group of cancer pts is virtually non-existent. Interestingly enough the same paper addresses the issue of BT (vaginal Brachytherapy, VBT) for postoperative irradiation of pts diagnosed with Endometrial cancer (ECa) in the Intermediate to High Risk Group. The PORTEC-2 Trial has found no significant differences between external beam RT and VBT in pts > 60 years old in terms of local or distant recurrence rates, but with a reduced toxicity and improved quality of life making VBT the adjuvant treatment option in this setting. Furthermore, the last update of the Guidelines of the European Association of Urology (EAU) devotes a specific chapter to the Management of Prostate Cancer in Older Men, recognizing that this is a specific subgroup of PCa pts emphasizing that, according to published results from the US Surveillance Epidemiology and End Results (SEER) database, 71 % of PCa-related deaths occur in men aged ≥ 75 years. Surprisingly enough, after a list of rather generic recommendations about the need of a comprehensive baseline evaluation of life expectancy, comorbidities and health status, BT is not even mentioned in the paragraph devoted to the treatment of localized disease...On the contrary, the recently published Updated recommendations of the working party on the management of PCa of the SIOG, clearly states that BT “can be a suitable option for older men with PCa”, but any further details is given concerning the profile of the “suitable” pts. In conclusion, the general picture of the management of older pts with PCa or gynaecological malignancies is rapidly changing: particular attention is nowadays reserved to this subset of pts. Specific and details guidelines are still lacking but the oncological community is aware of the importance of a tailored approach that has to take into account a correct evaluation of the baseline profile of the pt before any treatment can be proposed.

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### Symposium: Nanodosimetry

**SP-0210**

**Experimental methods for microdosimetry, nanodosimetry and track structure determination: state of the art**

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Experimental microdosimetry is performed with TEPC (Tissue Equivalent Proportional Counter) that are able to measure the stochastic of radiation interaction with micrometric sensitive volumes. To measure ionizations produced in microscopic site with a macroscopic volume, TEPC are filled with low-pressure gas. At Legnaro National Laboratories of INFN new TEPC have been developed that are able to measure high intensity therapeutic beams. They are called mini-TEPC because of their small dimensions of the sensitive volume. Moreover, miniaturization involves also the external dimensions since the counter is inserted in a titanium sleeve of 2.7mm external diameter. Mini-TEPC have been tested under different fields. With proton beams, they showed that is possible to assess the RBE of proton beam by using a proper weighting function.

It is possible to perform microdosimetry at nanometric level, at least down to 25nm, with an avalanche confinement TEPC. An Italian research project called MITRA is developing this kind of detector for ion beams.

Finally, in the world there are only three operative nanodosimeters. They measure the track structure of the beam: two of them are able to measure the track structure due to the beam core and the penumbra. The BioQuaRT project compared the responses of the three nanodosimeters. The three nanodosimeters are very different as well as their outputs in terms of ICSD (Ionization Cluster Size Distributions). However, the sum distribution $F_k$ versus $M_1$ of the three devices forms an almost perfect universal curve, and shows a saturation effect like radio-biological cross sections as a function of LET. Results will be presented.

**SP-0211**

**Track structure modelling and biodescriptors of the topology of energy deposition**

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Monte Carlo simulations are commonly used in radiobiology or medical applications for evaluating the energy deposition of ionizing radiation in biological targets. Nevertheless, trying to predict the earlier radio-induced biological effects in a cell population starting from an accurate description of the energy deposition at their origin needs the development of dedicated simulation tools. The first requirement of these simulation tools is their capability to calculate the track structure of the ionizing radiation with nanometric precision. Indeed, the nanometer scale corresponds to molecular dimensions and in particular to the scale of the DNA molecule that is the main target for which radiation damages can be linked to mutagenic or even lethal effects. Several dedicated simulation tools for this purpose have been developed in the last decades, following a mechanistic approach for the simulation of early radiation-induced biological effects. In