Debate: This house believes that centralised large radiotherapy units will provide the best academia and the best treatment quality

SP-0494
For the motion - SIZE MATTERS
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The field of radiation oncology has moved away from a generalistic radiotherapy practice to a number of specialized areas where radiation oncologists have broadened their knowledge outside the field of radiation oncology per se to be a better partner in multidisciplinary teams. Most radiation oncologists in the larger centers nowadays have only one or two areas of expertise (commonly around brain, head & neck, breast, lung, upper GI, lower GI, urogenital, gynecology, hematology, palliation, etc.). In these areas, radiation oncologists can be better counterparts for the organ-specialists, which have often left all the non-oncological work in their specialty to other colleagues.
With 2-3 areas of expertise per radiation oncologists and accounting for sufficient back-up, the minimum size of a department treating all categories of patients should be around 8 radiation oncologists. Based on 250 new patients per radiation oncologist and about 500 new patients per linac, the minimum size of a department which covers all areas of expertise should be 4 linacs. This size will also allow physicists and therapists to specialize, although at a size of 6-8 machines, this opportunity may be even better. A minimum size also makes investments of specialized equipped within the department, such as CT, PET-CT or MRI feasible and makes it easier to accommodate machine breakdown or replacement.
The economic lifetime of a linac is generally around 10-12 years. Since the pace of technical innovation is much faster, a department with 4-8 linacs has the opportunity to install the latest technology every 2-3 years. This, in combination with a larger physics group, will allow earlier implementation of new treatments. In Europe, the median size of a radiotherapy department is between 2 and 3 linacs, with on average more than 4 linacs per department in only 6 countries.
Sufficiently sized departments are also better equipped for research and moving the field forward. The multidisciplinary setting and available infrastructure in larger departments will help to work off the beaten track. Studies in various tumor sites have shown that outcome for patients treated in highly accruing (often larger) centers is better.
However, there is probably also a maximum size. For patients, entering a mega-department can be intimidating and beyond a certain size, no further benefits may exist. In addition, geographical circumstances should be taken into consideration. It is well known that easy access to care is related to use of radiotherapy. In more remote areas, satellite centers may be an alternative, especially if infrastructure and staffing can be shared and allow for similar protocols and expertise. Especially where resources are limited, a close collaboration between centers may further improve health care.
A possible disadvantage of subspecialization could be that highly specialized radiation oncologists may lose their overview of the developments in the radiotherapy arena and the transfer of new ideas and solutions from one indication to another may be reduced. For that reason, radiation oncologists working with one leg in the tumor-specific field, should keep their other leg in the radiation oncology field.

SP-0495 Against the motion - against dinosaurs
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Smart-modular-flexible: The essentials for academic excellence and high quality

NoBodis and nobody can believe that there is a general relationship between physical size and quality neither in biology, politics, industry, administration, culture nor more importantly for this forum, in science. Centralisation on the other hand is often an imposed structural process and has nothing to do with guaranteed high quality performance of high quality research. In organic systems and in most operational business units high quality growth is overwhelmingly present in (early) development i.e. in small structures. Moreover biology (organic) systems have a finite size to protect them from excessive and dysfunctional growth.
Neither data from radiation oncology industry, health care insurance companies, patient advocacy organisations nor from international data banks provide published evidence that large centralised radiation oncology units provide a higher treatment quality compared with small units. Moreover there is no international accepted definition of "small" and "large" RO unit. Large centralised radiation oncology units might produce more academic quantity because it is in their to do list. However academic quality is never a matter of size and/or centralisation. Most breakthrough innovations arise by chance, in small teams of 6-12 researches and fostered by a creative und productive environment (The majority of Nobel prizes laureates are citizens of small countries).
If you have to choose between one monopolistic large radiation oncology department and several smaller units think about similar choices made historically by politics or by evolution. The audience should carefully consider the scientific information provided in this debate not according to the evidence but also by common sense, gut feeling and empathy (e.g. in what type of radiation oncology environment would you like to work and/or be taken care of as a patient: Familial or military?). And by the way Radium, the "potion magique" of radiation oncology, was discovered in a storeroom and introduced into clinics by a handful enthusiastic scientists.
To pave the way for a constructive debate consider this: Based on the existing local health care systems in Europe both types of radiation oncology units (large and small) can co-exist and improve each other by cross-feeding. The IAEA has published recommendations as to how national radiation oncology services should be established, specifically in low- and middle-income countries with little or no RO infrastructure. Their recommendation is to start with small primary centers and step by step establish a network with a few secondary and eventually one tertiary (national reference) RO center(s). Such tailored RO networks allow proper allocation of professional skills and resources to each center including modern communications tools like telemedicine to optimize patient care especially where long distances might prevent patients from reaching the larger center(s).
In a multidisciplinary environment such as a RO clinic, the quality (education, experience, research as commitment for continuous improvement) of the staff will always be more important than quantity.
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Varian Intl.	International Network Partner	Palo Alto/Zug	USA/Switzerland
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