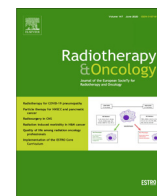




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



COVID-19 Rapid Letter

Practice recommendations for lung cancer radiotherapy during the COVID-19 pandemic: An ESTRO-ASTRO consensus statement^{*}

*To the Editor*

With great interest we read the recommendations by Guckenberger and colleagues [1] on radiation treatment of lung cancer patients in times of COVID-19, which were endorsed by ESTRO and ASTRO. The authors should be applauded for their timely and constructive guidance. Such recommendations are highly needed in these unprecedented times and we strongly support their initiative.

Methodologically, the paper deals with two scenarios of a COVID-19 pandemic, in which (1) the risk to patients and care-workers needs to be minimized, and (2) reduced radiotherapy resources are available. The experts were given six different lung cancer cases, NSCLC and SCLC, in various TNM stages, and a Delphi process was used to reach consensus on different questions.

In the second scenario, consensus amongst experts seems to have been reached unequivocally. In the event of (severely) limited resources, most experts opted to triage patients according to their potential for cure, the possible benefit of irradiation and their life expectancy, as well as to consider hypofractionation schedules in patients with stage I, III or IV NSCLC, and with limited stage SCLC. We believe these are sensible considerations and hence recommendations to make in times of reduced resources.

In the first scenario, experts agreed to decide on a possible delay of treatment on the basis of the clinical cases. Most colleagues opted to not delay start of treatment in patients with stage III NSCLC or with limited stage SCLC. Also, the consensus was to not delay palliative treatment in NSCLC patients, but instead to use hypofractionated courses. Moreover, experts favored to recommend standard-of-care concomitant radiochemotherapy instead of giving sequential chemo-radiotherapy, or targeted agents or immunotherapy instead of chemotherapy.

In one point, due to recent developments, we would like to initiate a discussion of the recommendations given, *i.e.*, regarding management of COVID-19 positive cases. During the pandemic, we have learned that the overall mortality from COVID-19 may be rather low, depending on the healthcare resources. As we have also learned in recent weeks, most persons infected with COVID-19

will have mild or asymptomatic disease and recover completely. Of course, a dominant issue is the protection of other patients and healthcare workers. However, for the individual patient with a highly life-threatening cancer, we are dealing with the possible undermining of a potentially curative treatment when postponing or interrupting treatment. Our societies may need to coexist with the virus for a while and asymptomatic or mildly symptomatic cases are expected to appear frequently in our cancer clinics in the coming months. While the recommendations might need to be revisited as the setting changes, they may be a prototype for future pandemics and the basis for a unified response.

With this in mind, we were surprised, that the authors only addressed “COVID-positive patients” in general, not taking into account existing subgroups of this virus-positive cohort. This may lead to indistinct conclusions affecting many patients. The authors recommend postponing the initiation of treatment in case the patient is tested positive prior to radio(chemo)therapy or to interrupt treatment when tested positive [1]. Frequencies for these recommendations are provided for all six cases and these seem rather low for interruption of treatment (only 54%, 57% and 48% for 3 of the 6 cases discussed). In the discussion, they then state that ‘postponement or interruption (...) should be considered’. Finally, in the paper’s highlights, which the reader may come across first, this is simplified as ‘postponement or interruption (...) is generally recommended’.

We are worried about the impact of this recommendation and are unaware of the basis of this advice. Regarding the hopefully less emotional phases of the COVID-19 pandemic to come, we believe that the decision on whether or not to treat or to interrupt treatment should be based on the individual prognosis and treatment aim, weighed against the risks by the COVID-19 virus and the capacities of the respective healthcare system. In our eyes, it would be unethical to restrict curative cancer treatment to COVID-19 negative cohorts. As far as resources are available, especially for the protection of other patients and staff, asymptomatic and mildly symptomatic COVID-19-positive patients should be treated according to oncological standards, adhering to current national and international guidelines. In agreement with recommendations by the German Radiation Protection Committee [2], the German Society for Radiation Oncology (DEGRO) [3] as well as by the Dutch Society for Radiotherapy and Oncology (NARO) [4], it is common clinical practice to decide on whether or not to interrupt treatment in a COVID-19 positive (lung) cancer patient taking into account several factors:

- 1) In asymptomatic COVID-19 positive patients, radio(chemo)therapy may be continued as planned, in case all precautionary measures for the care givers are in place to avoid exposure. In practice, those patients may be, *e.g.*, treated as last patients of the shift or on a dedicated linear accelerator.

^{*} The Editors of the Journal, the Publisher and the European Society for Radiotherapy and Oncology (ESTRO) cannot take responsibility for the statements or opinions expressed by the authors of these articles. Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds or experiments described herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made. For more information see the editorial “Radiotherapy & Oncology during the COVID-19 pandemic”, Vol. 146, 2020.

- 2) In mildly symptomatic COVID-19 positive patients, radio (chemo)therapy may be continued providing the patient is very closely monitored. Again, all precautions need to be taken.
- 3) In critically symptomatic COVID-19 positive patients, indeed treatment needs to be postponed, interrupted or even preliminarily terminated. In those patients, the life expectancy may not longer depend on the underlying lung cancer.

These differentiated recommendations, together with the patient's pre-existing general condition, medical history, and biological features of the lung malignancy, need in our view to be considered to maximize the overall outcome for lung cancer patients. This principle obviously applies to other, especially rapidly growing tumors. Meanwhile, the risk of infection of other patients or members of the medical staff is to be minimized.

References

- [1] Guckenberger M, Belka C, Bezjak A, et al. Practice recommendations for lung cancer radiotherapy during the COVID-19 pandemic: an ESTRO-ASTRO consensus statement. *Radiother Oncol* 2020;146:223–9. <https://doi.org/10.1016/j.radonc.2020.04.001>.
- [2] <https://www.ssk.de/SharedDocs/Beratungsergebnisse/2018/2018-12-13Ausfall.html>.
- [3] <https://www.degro.org/2-stellungnahme-degro-aro-bvdst-zur-strahlentherapie-waehrend-der-covid-19-pandemie-25-3-2020/>.
- [4] <http://www.nvro.nl/component/k2/item/419-radiotherapie-in-tijden-van-covid-19-update.html>.

Esther G.C. Troost^{a,b,c,*}

Ursula Nestle^{d,e,f}

Paul Martin Putora^{g,h}

Johan Bussinkⁱ

^a *OncoRay National Center for Radiation Research in Oncology, Dresden, Germany*

^b *Institute of Radiooncology – OncoRay, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

^c *Department of Radiotherapy and Radiation Oncology, Faculty of Medicine and University Hospital and Carl Gustav Carus, Technische Universität Dresden, Germany*

^d *Department of Radiation Oncology, Faculty of Medicine, Medical Center, University of Freiburg, Germany*

^e *German Cancer Consortium Partner Site Freiburg and German Cancer Research Center, Heidelberg, Germany*

^f *Department of Radiation Oncology, Kliniken Maria Hilf, Mönchengladbach, Germany*

^g *Department of Radiation Oncology, Kantonsspital St. Gallen, Switzerland*

^h *Department of Radiation Oncology, University of Bern, Switzerland*

ⁱ *Department of Radiation Oncology, Radboud University Medical Center Nijmegen, The Netherlands*

* Corresponding author at: Faculty of Medicine and University Hospital Carl Gustav Carus of Technische Universität Dresden, Department of Radiotherapy and Radiation Oncology, Fetscherstraße 74, 01307 Dresden, Germany.

E-mail address: esther.troost@uniklinikum-dresden.de (E.G.C. Troost)

Received 18 April 2020

Received in revised form 20 April 2020

Accepted 20 April 2020

Available online 24 April 2020