

## Press release

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### Basic information

Name: Christina Maria Lutz Email: [chrilutz@rm.dk](mailto:chrilutz@rm.dk) Phone: 28262184

Department of: Clinical Medicine

Main supervisor: Morten Høyer

Title of dissertation: Multi-variable models of dose response for precision radiotherapy of advanced lung cancer

Date for defence: 29-10-2020 at (time of day): 14:30 Place: Auditorium G206-142, Indgang G

Press release (Danish)

Multi-variable models of dose response for precision radiotherapy of advanced lung cancer

Sammenhængen mellem stråledosis og lungebivirkning efter strålebehandling af inoperable ikke-småcellet lungekræft er emnet i et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Christina Maria Lutz, der forsvarer det d. 29. Oktober

Strålebehandling af inoperabel lokalavanceret ikke-småcellet lungekræft indebærer ofte medbestråling af store områder i lungen. Dette giver en risiko for alvorlig, og i nogle tilfælde dødelige, bivirkninger. Sammenhængen mellem stråledosis og den mest fremtrædende lungebivirkning, stråleinduceret lungebetændelse, er emnet i dette ph.d.-projekt. Denne sammenhæng kan modelleres, og en pålidelig model bruges til at individualisere stråledosis for fremtidige patienter med det formål at minimere bivirkninger og øge stråledosis, og dermed behandlingens effekt. Vi har vist, at der kræves store patientkohorter for at kunne identificere pålidelige modeller. For en stor kohorte af lungekræftpatienter kunne vi efterfølgende vise en tydelig sammenhæng mellem middeldosis givet til lungen og bivirkninger. Dosis til lungen kan reduceres ved hjælp af adaptiv strålebehandling, som er blevet udviklet og indført for alle lungekræftpatienter på Aarhus Universitetshospital i 2013. For patienter behandlet med adaptiv strålebehandling kan vi opnå en stor reduktion i lungebivirkninger uden at gå på kompromis med behandlingseffekten. Derudover er overlevelsen tydelig forbedret, hvilket understreger betydningen af en moderne, adaptiv strålebehandling for patienter med inoperabel ikke-småcellet lungekræft.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 29/10 kl. 14:30 på Zoom og i auditorium G206-142, Indgang G, Aarhus Universitetshospital, Palle Juul-Jensens Blvd 99, Aarhus N. Titlen på projektet er "Multi-variable models of dose response for precision radiotherapy of advanced lung cancer". Yderligere oplysninger: Ph.d.-studerende Christina Maria Lutz, e-mail: [chrilutz@rm.dk](mailto:chrilutz@rm.dk), tlf. 2388 6915.

Bedømmelsesudvalg: Juliane Hörner-Rieber, Privatdozent, PhD, Department of Radiation Oncology, University Hospital Heidelberg, Heidelberg, Germany; Jan-Jakob Sonke, Professor, PhD, Department of Radiation Oncology, The Netherlands Cancer Institute, Amsterdam, the Netherlands; Kari Tanderup, Professor, PhD, Kræftafdelingen, Aarhus Universitetshospital, Aarhus, Danmark.

Press release (English)

Multi-variable models of dose response for precision radiotherapy of advanced lung cancer

Thursday 29 October at 14:30 Christina Maria Lutz defends her PhD dissertation entitled "Multi-variable models of dose response for precision radiotherapy of advanced lung cancer".

Radiotherapy treatment of inoperable locally-advanced non-small cell lung cancer patients often involves irradiation of extensive volumes of the lungs. With this follows a risk of serious, sometimes

lethal, toxicities. The relationship between the radiation dose administered and the most prominent lung toxicity, radiation pneumonitis, is the subject of this ph.d. project. The relationship can be modeled, and a reliable model can be used to individualize the radiation dose for future patients with the purpose of minimizing toxicity and increasing radiation dose, and with this treatment effect. We showed that large patient cohorts are required to identify reliable models. For a large lung cancer patient cohort, we found a clear correlation between the mean dose to the lungs and lung toxicity. One approach to reduce the radiation dose to the lungs in general is adaptive radiotherapy, which was developed and introduced for all lung cancer patients at Aarhus University Hospital in 2013. Following the introduction of adaptive radiotherapy, we can show a large reduction in lung toxicity without compromising treatment effect. In addition to this, survival was improved, illustrating the importance of a modern, adaptive radiotherapy treatment for patients with inoperable non-small cell lung cancer.

The defence is public and will be held via Zoom and in Auditorium G206-142, Entrance G, Aarhus University Hospital, Palle Juul-Jensens Blvd 99, Aarhus N. Please read the attached press release for more information.

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