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# OHSU Knight Cancer Institute Findings Help to Advance Radiation Medicine

*The 10th Biennial European Society for Therapeutic Radiology and Oncology convenes Aug. 30*

**MAASTRICHT, The Netherlands –** Oregon Health & Science University Knight Cancer Institute researchers are among a select group of radiation oncology clinical investigators to present their latest findings at the 10th Biennial ESTRO (European Society for Therapeutic Radiology and Oncology) conference Sunday, Aug. 30, through Thursday, Sept. 3 The findings, which advance and refine radiation medicine for a number of cancers, also are published in the August 2009 issue of *Radiotherapy & Oncology*, the official journal of ESTRO.

"The four papers that the Knight Cancer Institute team is presenting represent state-of-the-art interface between emerging image-guidance technology and practical applications in the everyday clinical setting. In aggregate, these studies will continue to help us deliver more accurate and precise radiation to the tumor along with sparing normal tissue. Hence the therapeutic ratio and overall quality of life may be improved with these improvements," said Charles Thomas, M.D., professor and chairman, Department of Radiation Medicine, OHSU Knight Cancer Institute, Portland, Ore., USA.

## Intensity-Modulated Radiation Therapy

- **Weekly Dose Planning Reduces Radiation Exposure to Critical Structures**

  To ensure patients undergoing intensity-modulated radiation therapy (IMRT) for head and neck cancer receive the optimum radiation dose with minimal exposure to surrounding structures, **Patrick Gagnon, M.D.,** and his team analyzed whether weekly adaptive re-planning had an impact on total radiation exposure. Using a deformable registration algorithm that accounts for daily changes in organ shape and volume, they found weekly dose mapping improved PTV (planning treatment volume) coverage and reduced the amount of radiation exposure to critical structures, including the spinal cord and parotid glands.

  *Oral presentation No. 69*: *"Dosimetric analysis of weekly adaptive head & neck IMRT using a deformable registration algorithm,"* Patrick Gagnon, M.D., co-chief resident in the Department of Radiation Medicine, Oregon Health & Science University Knight Cancer Institute, Portland, Ore., USA

## Stereotactic Body Radiation Therapy

- **Metabolic Lung Cancer Tumor Responds to SBRT; No Link to Tumor Control**
  **Martin Fuss, M.D.,** and his team analyzed how early-stage non-small cell lung cancer tumor responded to stereotactic body radiation therapy (SBRT), which delivers a targeted, small dose of radiation therapy over several days. He and his team found that SBRT is highly effective in reducing the metabolic activity of the tumor by more than 50 percent. No patients have experienced local failure to date. Ultimately, excellent tumor response did not protect all patients from the eventual development of systemic disease spread.

*Oral presentation No. 312: "Metabolic NSCLC Response to SBRT,"* Martin Fuss, M.D., professor in the Department of Radiation Medicine, Oregon Health & Science University Knight Cancer Institute, Portland, Ore., USA.

- **SBRT and HFxRT Safe, Effective for Liver Cancer Patients**
  At research team led by **Tasha McDonald, M.D.,** has found that both stereotactic body radiation therapy (SBRT) and hypofractionated radiation therapy (HFxRT) are safe for patients with hepatocellular carcinoma. They found that SBRT, which precisely delivers radiation to the tumor in several small doses once a day over several days, and HFxRT, which delivers several large doses more than once a day, preserve liver function and result in favorable preliminary survival outcomes.

*Poster No. 388: "Stereotactic body radiotherapy and hypofractionated radiotherapy for hepatocellular carcinoma: short-term outcomes and liver tolerance,"* Tasha McDonald, M.D., co-chief resident in the Department of Radiation Medicine, Oregon Health & Science University Knight Cancer Institute, Portland, Ore., USA

## Image-Guided Radiation Therapy – 4D Imaging

- **4-D Automatic Contouring Works, Saves Time**
  Typically radiation oncologists use a mouse or other pointing device to delineate organs and the tumor to ensure accuracy of radiation planning and delivery. With increases use of 4DCT data, radiation oncologists today can end up with 14 individual CT data sets requiring manual contouring. To determine the most efficient means of achieving accuracy, **Wolfram Laub, Ph.D.,** and his team compared manual contours with those provided using a commercially available auto-segmentation tool called ABAS. They found the automated system works well for contouring the liver, bladder and rectum, thus saving physicians a lot of time.

*Poster No. 435: "A comparison between atlas based auto-segmentation and manual contouring in 4d-image based treatment planning,"* Wolfram Laub, Ph.D., chief physicist, Department of Radiation Medicine, OHSU Knight Cancer Institute, Portland, Oregon, USA.

**About ESTRO**
Founded in 1980, ESTRO, the European Society for Therapeutic Radiology and Oncology, is focused on improving all aspects of patient care and supports the role of radiation oncology in the multimodality treatment of cancer. With 5,000 members, the society promotes excellence through education, congresses and conferences, and promotion of research and dissemination of outcomes

**About the OHSU Knight Cancer Institute**
With the latest treatments, technologies and 300 research studies, including dozens of clinical trials, it is the only cancer center between Sacramento and Seattle designated by the National Cancer Institute. It is an honor earned only by the nation's top cancer centers, and shared among the more than 500 doctors, nurses, scientists and staff who work together at the OHSU Knight Cancer Institute to reduce the impact of cancer.

**About OHSU**
Oregon Health & Science University is the state's only health and research university, and Oregon's only academic health center. OHSU is Portland's largest employer and the fourth largest in Oregon (excluding government). OHSU's size contributes to its ability to provide many services and community support activities not found anywhere else in the state. It serves patients from every corner of the state, and is a conduit for learning for more than 3,400 students and trainees. OHSU is the source of more than 200 community outreach programs that bring health and education services to every county in the state.