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Innovating Together: Collaboration Leads to the Development of Groundbreaking Radiological Assessment Tools

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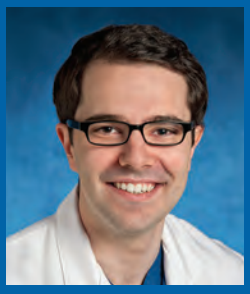

As a standardized assessment tool, qEASL provides a very specific scientific end point for the assessment of therapeutic success, and will be key in helping hospitals to evaluate their own success rates.

Julius Chapiro, MD
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Liver cancer is the second-most common cause of cancer-related deaths worldwide and the fastest-growing cause of cancer deaths in the United States, according to a recent study published by the American Cancer Society.[1] New cases have been on the rise since the mid-1970s, and death rates have doubled in the mid-1980s. With such numbers, it becomes obvious why more and more frequently, academic scientists and clinicians are teaming up with industry partners to bring together different areas of expertise and resources as a means of discovering new solutions for evaluating effectiveness of cancer therapies.

Julius Chapiro, MD, currently the Co-Director of the Interventional Oncology Research Lab in the Department of Radiology and Biomedical Imaging at Yale, was a post-doctoral researcher at the Johns Hopkins University five years ago when the NIH-sponsored laboratory, led by Jeff Geschwind, MD, from Baltimore, teamed up with Philips to advance their important work and find more effective ways to assess tumor response to treatment of liver cancer. Ming De Lin, MD, a Philips' clinical scientist, is working onsite with Dr. Chapiro as a key member of the team.

In liver cancer, most patients are not amenable to surgical therapies due to the fact that tumors mostly become diagnosed at more advanced stages. Such patients mostly have to rely on minimally invasive, catheter-based, image-guided tumor therapies, which have become the mainstay of therapy in patients with intermediate to advanced-stage disease. In all such cases, assessing tumor response to treatment is of major clinical interest. Traditional treatment response tracking methods, such as RECIST (Response Evaluation Criteria in Solid Tumors), are purely size and anatomically based and do not take into account tumor viability or cell death. However, the availability of functional information from imaging modalities such as MR now makes it possible to identify more specific tissue characteristics of solid tumors. This means clinicians can track subtle tissue changes such as tumor viability or cell death over the course of treatment, even when the tumor doesn't shrink immediately.

The outcome of Philips and Dr. Chapiro's collaboration is qEASL (quantitative European Association for the Study of the Liver), a very sensitive post-processing tool that allows radiologists to make a standardized analysis of 3D imaging scans (eg, CT and MRI) to obtain a precise measurement of potentially viable tumor tissue, and thereby permits clinicians to assess treatment effectiveness via a quantitative and visual indication of tumor tissue response to therapy. qEASL has been fully integrated into Philips' powerful Multi-Modality Tumor Tracking application, which itself is part of Philips' IntelliSpace Portal, an advanced visualization platform that offers a single integrated solution to help clinicians work quickly with increased diagnostic confidence – especially for complex cases and follow-up.

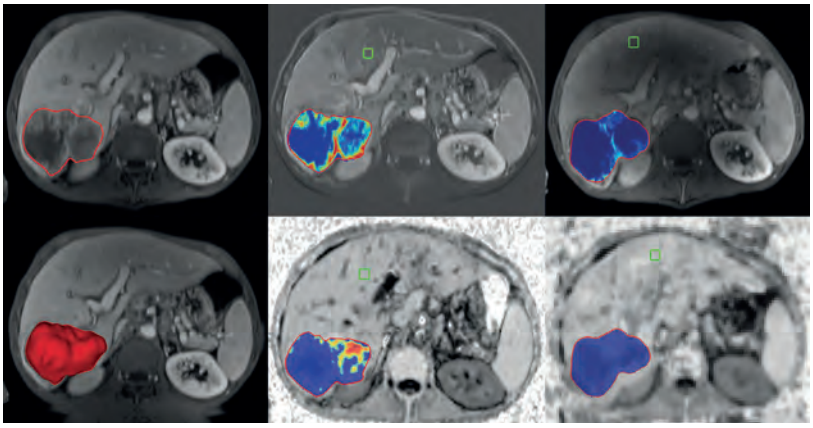
"The [Philips Multimodality Tumor Tracking with the qEASL] tool answers a very important question for the patient," Dr. Chapiro explained. "The patient, as well as his treating physicians, want to know as soon as possible after the therapy whether the tumor responded well, and this tool is able to answer that question with high precision, reproducibility and certainty," said

Dr. Chapiro. Secondly, "this tool standardizes assessment and provides a very specific measure for therapeutic success, putting response in quantifiable numbers rather than giving a vague 'gestalt'-based assessment," said Dr. Chapiro, who was able to validate this technique, together with his team, in a large number of patients, the results of which were published extensively in recent years.

One of the most important qualities of qEASL is that it improves clinical workflow for radiologists and shortens the length of time needed to evaluate whether a treatment is working. Using the RECIST method, a two- to three-month window of time is typically needed to make the assessment on the effectiveness of treatment. "With qEASL," Dr. Chapiro reported, "we usually tested at the one-month time point using imaging, such as MR and CT. And in some cases, we have demonstrated that immediate, intra-procedural assessment using cone-beam CT imaging can directly predict what is typically identified one month after therapy on CT or MR. Thus, qEASL has become a very solid predictor of therapeutic outcomes directly in the procedure room or one month after therapy at the very latest."

If radiologists can assess the effectiveness of a given treatment quicker, the potential impacts on patient care are substantial. The ability to identify non-responders to therapy and to retreat patients early or switch over to alternative treatments may give them a better quality of life and deliver better outcomes. This way, costly, ineffective treatments can be limited; this will be of tremendous benefit both for the patient as well as the entire healthcare system. When a therapy is working for a patient, clinicians have a better chance of predicting successful treatment with the same therapy if the patient develops multiple lesions with similar characteristics.

"As a standardized assessment tool," Dr. Chapiro explained, "qEASL provides a very specific scientific end point for the assessment of therapeutic success, and will be key in helping hospitals to evaluate their own success rates both in daily routine as well as for clinical trials. qEASL will help them guide their patients through the treatment algorithm in a much more scientific way than was done before. It will provide tumor boards with more specific data for clinical decision-making."



The qEASL [quantitative European Association for the Study of the Liver] capability within Multi-Modality Tumor Tracking offers a new method for enhanced measurement of tumor volume based on MRI and CT scans.

What's the next frontier for qEASL? Dr. Chapiro first stressed the importance of widespread adoption of qEASL for therapy assessment. "Because qEASL is now really changing our whole approach to the assessment of therapeutic success in liver cancer therapy, I think it has the potential to replace RECIST as the standard method for evaluating tumor response beyond loco-regional therapies, and also to be used in evaluating systemic therapies, where tumor response is a very important marker, for example, when triaging new anti-cancer agents based on imaging response in prospective phase 2 clinical trials."

qEASL has already proven effective in the setting of loco-regional tumor therapies in the liver, and Dr. Chapiro is working to apply it in neurosurgical and radiation oncology cases, as well. In the race to assess emerging therapies for oncology, neurology and gynecology, Dr. Chapiro is committed to co-innovating new applications for qEASL within Philips' IntelliSpace Portal. In this case the victory will belong not to the swift, but to the patient.

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