



**Ask ED: LIVE at ....**

You've heard him speak and read his work, now you have the chance to Ask Ed your questions in person!

**....ISMRM**

Ed Ashton will deliver 2 presentations at the International Society for Magnetic Resonance in Medicine - 17th Scientific Meeting & Exhibit in Honolulu April 18-24.

[Dr. Ashton's Presentations](#)

**....ASCO**

**Ed Ashton will be at the VirtualScopics booth, #3621, during the ASCO Annual Meeting in Orlando, May 30-June 1.** Take this opportunity to visit with Ed and the VirtualScopics team to discuss the latest imaging findings and trends in oncology drug trials.

Or, schedule a private meeting with Ed during ASCO at [Ask\\_Ed@virtualscopics.com](mailto:Ask_Ed@virtualscopics.com)

**Recent Publications**

**Scan-Rescan Variability in Perfusion Assessment of Tumors in MRI Using Both Model and Data-Derived Arterial Input Functions.**

By Edward Ashton, PhD, David Raunig, PhD, Chaan Ng, MD, Fredrick Kelcz, MD, Theresa McShane, DVM, PhD, and Jeffrey Evelhoch, PhD Journal of Magnetic Resonance Imaging, (JMRI) Volume 28, Number 3, September 2008

[VirtualScopics' publications](#)

**Ask Ed:**

**How sensitive to change is DCE-MRI? How many patients do I need per cohort to see anti-vascular treatment effects?**



**Ed Ashton, PhD**  
Chief Scientific Officer  
VirtualScopics, Inc.

The sensitivity of a functional imaging technique like DCE-MRI depends on the measurement noise - the change we see when there is no biological change. The noise we expect to see with DCE-MRI varies with the location of the target lesion. In general, it will be a bit higher in the lungs, better in the liver and other abdominal organs, and best in areas that are not subject to respiratory motion. The range from best to worst is roughly 6% - 12% for a coronal acquisition. If we assume an all-comers trial with an optimal protocol, 10% is a good, conservative noise estimate. Based on that, we can detect changes greater than 20% in a single patient with 95% confidence.

In a dose cohort, the average change we can detect will be dependent on the number of subjects as well as the biological noise, so it is more difficult to predict. For example, if you have an effective VEGF inhibitor and your cohort happens to include one or two subjects with tumors that are not dependent on VEGF, then you will likely have a few subjects with decreases and one or two possibly with no change, or even increases in blood flow and vessel permeability. This is not due to measurement noise, but rather to heterogeneity in biological response to treatment. If we assume that all patients have the average response  $\pm$  measurement noise (i.e. ignore biological noise) then we need six patients to detect an average treatment effect of 12%. Including biological noise in an all-comers trial, the minimum reliably detectable change for n=6 rises to ~20%.

**VirtualScopics to present free seminars on West Coast.**  
**"Quantitative Imaging for Oncology Trials"**

Fresh off two well-received NJ area seminars in February, VirtualScopics is pleased to announce the upcoming dates for its West Coast seminars:

- May 12, 2009 - San Diego**
- May 13, 2009 - San Francisco**

We invite you to attend either **FREE** 1/2 day seminar exploring the benefits and hidden pitfalls of selecting and implementing quantitative imaging in multi-site oncology clinical trials.

"Very comprehensive" and "excellent presentations" was the overwhelming feedback from our February seminars.

Sign up now to learn more about the latest trends in integrating functional imaging techniques, including DCE-MRI, FDG-PET, and FLT-PET, into your oncology trials along with structural measurements including tumor volume and RECIST, as well as radio density with CT.

Look for forthcoming details at <http://www.virtualscopics.com/event-calendar.aspx> or contact Erik Jensen at [erik\\_jensen@virtualscopics.com](mailto:erik_jensen@virtualscopics.com)

For more information on **VirtualScopics** technology or services, please contact Rosemary Shull, Vice President of Business Development at 585-249-6231 x206 or [rosemary\\_shull@virtualscopics.com](mailto:rosemary_shull@virtualscopics.com)



Upcoming Events

International Society for Magnetic Resonance in Medicine - 17th Scientific Meeting & Exhibit\*\*

\*\*Ed Ashton and Jon Riek presenting

Honolulu, Hawaii  
April 18-24, 2009

<http://www.ismrm.org/09/index.htm>

Partnerships with CROs

Booth #602

Orlando, FL

April 28-30, 2009

<http://www.iirusa.com/cropartners/>

International Cartilage Repair Society—8th World Congress\*\*

\*\*Mark Tengowski presenting

Miami, FL  
May 23-26, 2009

<http://www.cartilage.org/>

ASCO Annual Meeting 2009

Booth #3621

Orlando, FL

May 28–June 2, 2009

<http://www.asco.org/ASCO/>

DIA 45th Annual Meeting

Booth #631

San Diego, CA

June 21-25, 2009

<http://www.diahome.org/DIAHome/>

ECCO 15: 15th European Cancer Conference

Booth #C51 Hall 17

Berlin, Germany

September 20-24, 2009

<http://www.ecco-org.eu/Conferences-and-Events/>

Ask Jon: What imaging endpoints should I measure in a cartilage repair trial?



Jon Riek, PhD.  
VP Technology & Product Development  
VirtualScopics, Inc.

Microfracture surgery is the current standard of care for repairing lesions in articular cartilage. As such, many trials will use microfracture as a control. Before determining which imaging endpoints are appropriate, one must first determine the question the trial is attempting to answer.

If the trial is to determine whether there is an increased success rate or rate of repair, then structural MRI endpoints may be sufficient. Success should be measured by improvements in activities of daily living and reduction in pain. The percentage of the cartilage defect that is filled by repair tissue is highly correlated with these measurements. In addition to poor cartilage repair fill, microfracture can fail in several ways including osseous overgrowth and peripheral integration failure. Other contra-

indications include bone defects and persistent bone marrow lesions. These factors can all be determined from structural MR images.

If the trial is to determine whether the repair tissue resembles normal hyaline cartilage and is thus more durable than the fibrocartilage created by microfracture, compositional MRI endpoints may also be appropriate. T2 mapping and Delayed Gadolinium-Enhanced MRI of Cartilage (dGEMRIC) can be used as measures of similarity between the repair tissue and the surrounding hyaline cartilage.

In addition to quantitative imaging endpoints, semi-quantitative MRI scoring, such as MO-CART, can provide additional information about the success and quality of the repair.

The choice of endpoints will be trial-specific and needs to take into consideration the question to be answered and the burden and benefit to the subject.

VIRTUALSCOPICS' QUANTITATIVE IMAGING PROVIDES PRIMARY ENDPOINT IN CARTILAGE REPAIR PIVOTAL CLINICAL TRIAL

VirtualScopics, announced that BioSyntech Inc., a Canadian medical device company based in Laval, Quebec, has reached its enrollment goal in the Canadian-European pivotal clinical trial for its cartilage repair device (BST-CarGel®) and will now focus on quantitative measures to determine enhanced efficacy compared to the surgical technique called microfracture.

Historically, clinical trials for cartilage-related therapies have used pain as the primary endpoint. In the BST-CarGel® study, however, VirtualScopics is providing blinded data analysis of quantitative magnetic resonance imaging (MRI) which will allow BioSyntech to demonstrate BST-CarGel's potential for affecting the quantity and quality of the repaired cartilage as their primary endpoint.

[Read full article here](#)

Imaging for cartilage repair trials to be discussed at ISMRM & ICRS

ISMRM: Jonathan Riek, Ph.D., VP of Technology and Product Development, presenting poster entitled: "Use of a Dual-Echo Fast-Spin-Echo Sequence for T2 Mapping of Cartilage within a Clinical Trial"

ICRS: Mark W. Tengowski, DVM, MS, PhD, Director of Clinical Affairs, presenting poster entitled: "Quantitative imaging biomarkers for cartilage repair clinical trials"

Learn More at

<http://www.virtualscopics.com/>

Keep abreast of all the latest news, events and recent staff publications.

For more information on VirtualScopics technology or services, please contact Rosemary Shull, Vice President of Business Development at 585-249-6231 x206 or [rosemary\\_shull@virtualscopics.com](mailto:rosemary_shull@virtualscopics.com)