

NEUROIMAGE

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RIGHT VS LEFT BRAIN

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“Everybody is creative, and everybody is talented. I just don't think everybody is disciplined.”

~ Al Hirschfeld (1903 – 2003)

An American caricaturist best known for his black & white portraits of celebrities and Broadway stars.



J.P. Acco's first Neuro Image Issue October 1991

The present issue of Neuro Image is dedicated to the Neurophotography Department, now referred to as Neuro Media Services.

Neuro Media Services has been in constant collaboration over the years with the Department of Radiology, and more specifically, with myself, as a practising radiologist, teacher and archivist for over 45 years.

In recent years, Neuro Media Services has helped me in the production of Neuro Image; J.P. Acco has been the main actor, Susan Kaupp and Helmut Bernhard assistants whenever necessary, and Marcus Arts transferring to the Web.

The text in the present issue has been prepared by Victor Swoboda with the collaboration of Marcus Arts.

I hope you enjoy these historical notes and pictures.

I am deeply thankful to everyone for their dedication and expert work at the Neuro, and I am especially thankful for the special attention to the Radiology Department and also to me.

Please keep in touch and visit NeuroImage's website neurostudyclub.mcgill.ca

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NEURO MEDIA SERVICES AND RADIOLOGY

VICTOR SWOBODA

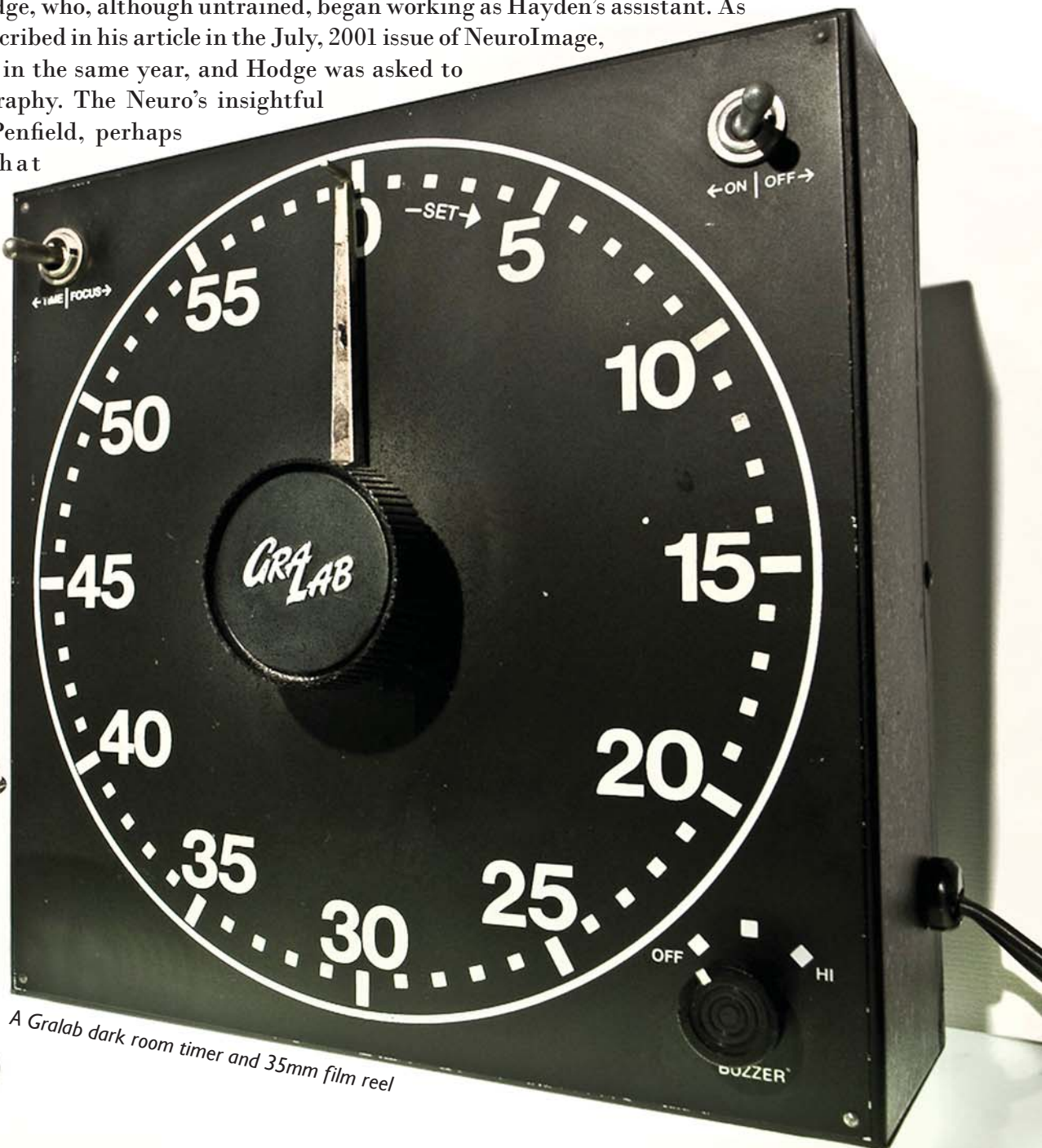
Charles Hodge & Dr. Jerzy Olszewski, 1952



In the early years of the Montreal Neurological Institute and Hospital, a productive relationship developed between the radiologists and the Neuro's photography service. Over the following decades, radiology's need for visual material grew exponentially, as more patients underwent scans and as scanning technology took on new forms and produced increasingly accurate images. Photography's technology developed as well in an attempt to keep pace with radiologists' demands. Finally, the introduction of digital photography and computer software led to changes in the relationship between neuroradiology and neurophotography that continue today.

Radiologist Arthur Childe was among the Neuro's founding staff in 1934. The initial staff photographer was Peter Hayden. The relationship between the two services took a momentous turn in 1945 with the arrival of 21-year-old Charles Hodge, who, although untrained, began working as Hayden's assistant. As Dr. William Feindel described in his article in the July, 2001 issue of *NeuroImage*, Hayden left the Neuro in the same year, and Hodge was asked to take charge of photography. The Neuro's insightful director, Dr. Wilder Penfield, perhaps early suspected that Hodge's enthusiasm for photography and his inventiveness would prove fruitful.

Dr. Penfield's belief was well placed. Working out of his neurophotography studio on the first floor of the Neuro's original building, now the Rockefeller Pavilion, Hodge made major innovations in the art of neurophotography. Two innovations might be cited among many:



A Galab dark room timer and 35mm film reel



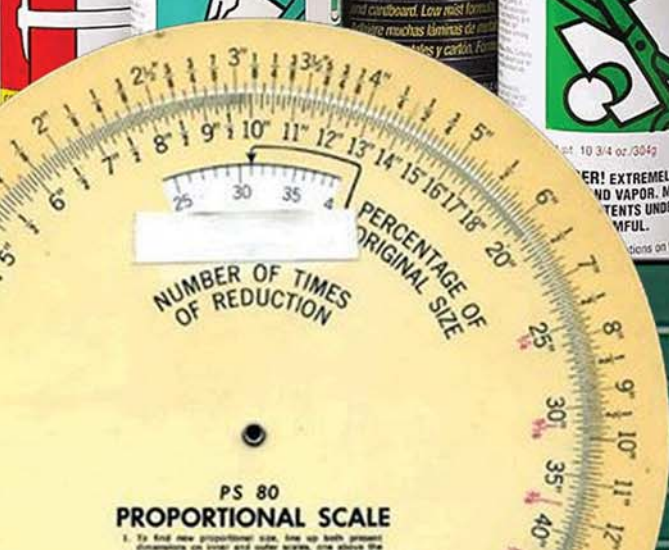
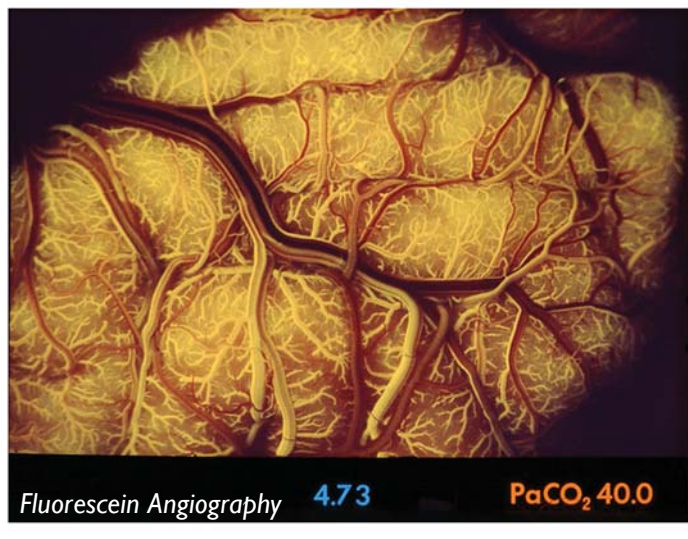
in 1949, Hodge with the help of engineer Robert Knebel, developed a stroboscopic camera for making images during surgery. In the 1960s, Hodge developed a specialized method to make images of blood flow in the brain's surface vessels, a technique called fluorescein angiography. This method proved useful both in the operating room and in laboratory experiments. As a neurosurgeon, Dr. Feindel, well appreciated this method.

“We applied this method in the Cone Laboratory for many experimental studies of cerebral ischemia,” wrote Dr. Feindel.

In 1952, the neurophotography department moved from the Rockefeller pavilion to the McConnell wing on the sixth floor, where it remains today.

In 1976, Marcus Arts joined the department, beginning a career that continues to this day. At the time, there was no brain imaging centre. An imaging service called the Brain Scan Department was on the second floor.

Neurophotography was kept busy serving Neuroradiology's needs. Neuroradiology typically asked for photos or slides of X-rays and angiograms, mostly for teaching purposes. X-ray films were large, at least 8 by 10 inches. Neurophotography first made a 4 by 5 negative, which was large enough so that no quality would be lost. The negative was then reduced to a slide using Kodak film called Finegrain Positive, which had an extremely high resolution. At the time, film stock had grain, not the pixels that make digital photographic images today.



Making films was time consuming. A negative of each scan required several minutes, while processing and printing the film took a couple of hours. Slides were another time-consuming process.

Rapid-process copy film allowed photographers to skip making a negative and immediately create a positive. Rapid-process copy film had such a low film speed, ASA, that exposures required upwards of a minute and a half, depending on the density of the scan. The slides of these scans then had to be mounted by hand. Labeling slides was also done by hand. Filing neuroradiology images required filling out a host of details. A typical file card might read, "MR scan, sagittal view, patient's name and hospital number, name of requesting doctor." With hundreds of such requests flowing into neurophotography each week, the department was a busy hive.

For a brief time, the department used a new black-and-white film, LPD4, which also allowed photographers to skip making a negative and immediately create a positive. The photographers were able to do this by flashing the film with light to lower the black density of the image to a reasonably dark grey. In most cases, the process delivered an image that was acceptable to the radiologists, but in the end, the images were deemed to lack sufficient contrast.

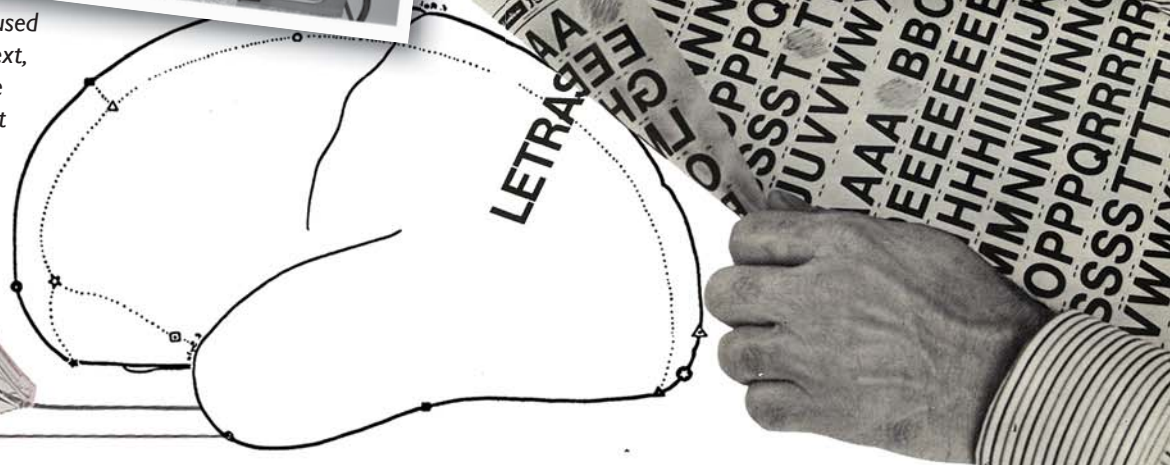
For published pictures, Neurophotography went the route of first making a high-quality negative and creating a positive print from that.

Neurophotography used a variety of 4 by 5 cameras including a Crown Graphic and German-made Linhofs. Crown Graphics were popular among newspaper photographers of the 1940s and 50s. One of the department's Linhofs was the famous Technika model. Introduced in 1934, it was the world's first all-metal folding camera for use in the field. The Linhof sat firmly on a stand and was used for copying illustrations, graphs and charts in books. Radiologists showed photographic copies of their scans during their lectures.



The Leitz (now Leica) 4x5 Copy Stand

Before scanners, a 4x5 Copy Stand was used to photograph images for publications. Text, lines & symbols (like dots & arrows) were created using "obsolete" tools like letraset and line tape, which are seen here.





This station was used up until 2000 to prepare negatives and slides.



For shooting slides, Neurophotography used a 150-frame bulk load Nikon. Loading 150 film cartridges into the camera was a chore, and with the heavy demand for images from Neuroradiology and other departments, reloading the camera was an oft-repeated task.

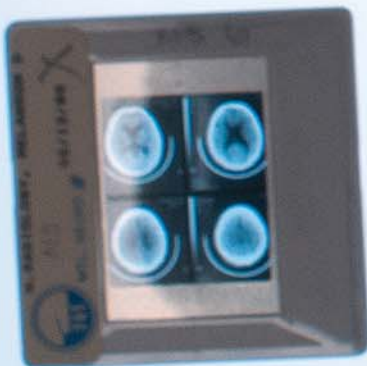


Some snap shots from the Neuro Media's annual Christmas lunch, 2009

In 1984, Hodge was elected honorary fellow of the Royal Photographic Society, one of many awards that were bestowed on him for his achievements in medical photography. He remained head of the department until his retirement in 1994. At his death in 2001, he was eulogized as one of the most accomplished scientific photographers of his era.

In 1989, Helmut Bernhard joined Marcus Arts as a member of the department's staff, which already included Susan Kaupp. Later, Jean-Paul Acco joined the team. He arrived just as the digital photography era was beginning to take hold, aided by computer software designed for capturing, manipulating and preserving images.

Although it was possible in the 1990s to produce digital images on a computer monitor, transferring the images to film or print was costly because printers and film imagers were expensive. To economize, Arts and Bernhard improvised. They placed a hood over a camera on a tripod, turned off any overhead lights and directly photographed images seen on the colour CT monitor. Photos were shot at a slow shutter speed to avoid capturing the tracking bands that flickered on the monitor. Cameras could pick up the bands even though they were unseen by the human eye. The process was time consuming, but it was the only cost-effective way to get computer-generated images.



The original dark room that was on the first floor of the Neuro



During this period, Neuroradiology was also exploring the possibility of digital computing. Radiologists began submitting small, flimsy computer printouts of black-and-white angiograms produced by CT scans. Neurophotography was able to reproduce these images, but colour images were still shot directly off the computer screen.

The arrival of Dr. Richard Murphy as director of the Neuro in 1992 led to an expansion of Neurophotography and its technical arsenal.

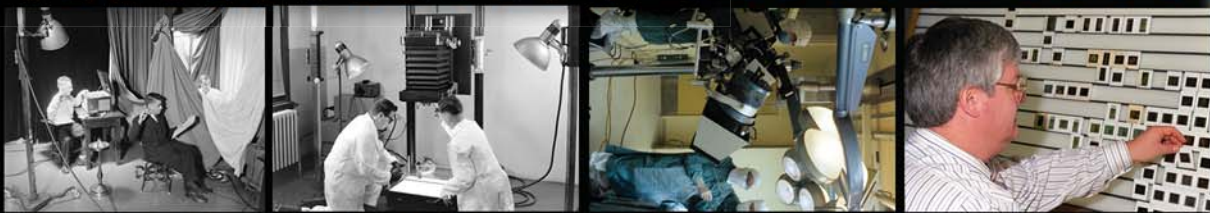
Inspired by the potential of digital photography, Arts requested funds to buy a high-resolution digital camera. With this new camera, Neurophotography began digitizing films and returning JPG images to clients. Acco was assigned to work at a new graphics work station.

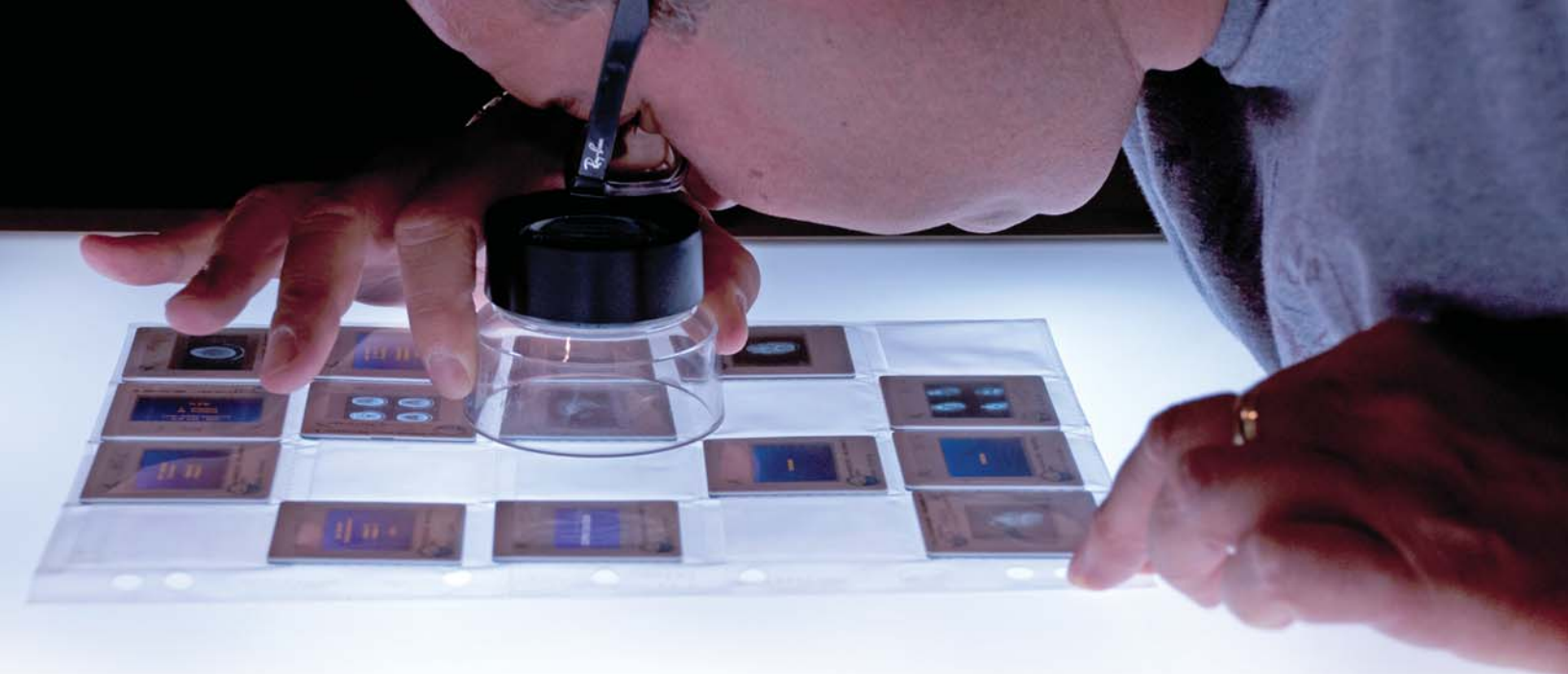
In the past decade, further work stations were added as conventional photography evolved and the department ultimately switched to a strictly digital format.

The transition from conventional to digital photography brought technical problems. Images on conventional film could not be reproduced by a scanner because light had to pass through the film to produce an image. Special scanners for conventional film were prohibitively expensive. Again, the ingenuity of Neurophotography staff came up with a system whereby film was put on a light box and then digitally photographed. Again, it was both time-consuming and required patience. Storage was also a problem, because CDs at the time were still expensive and portable CD burners for computers were unavailable. In 1995, Neurophotography began making its first digital images from scans.



The award winning de Grandpre Communications Centre in the Neuro's Brain Tumour Research Centre, which is administered by Tony Rizzuto and Anthony Revoy, the Audio-Visual guys of Neuro Media Services





The department was able to produce as many as 300 slides from digital files a day, many of them for Neuroradiology, although with the introduction of digital projectors, the demand for conventional would ultimately disappear. Neurophotography bought a portable Electrohome digital projector. The early model weighed about 50 pounds, but it easily transported with a wheeled case.

In the past decade, Neurophotography was renamed Neuro Media Services. The new name best reflects the broader range of services offered, which now include, audio visual services, graphics, desktop publishing, video production, web design and database creation. Meanwhile, Neuroradiology began investing in new software, its staff no longer needed to send out material to Neuro Media Services. Today, Neuroradiology's computer centre on the first floor handles the department's own copying and printing of medical scans.

Nonetheless, Neuroradiology continues to rely on Neuro Media Services for graphics and publications work, for pre-scan photos of patients, and for making large-sized posters. Occasionally radiologists bring archival films to be digitized. The skill and experience of the Neuro Media Services staff still comes in handy, too, whenever a department needs help in understanding how to use the complicated software instructions that come with a new scanner.

Neuro Media Services: <http://neuromedia.mcgill.ca>

POST-SCRIPT

JEAN-PAUL ACCO



My relationship with Dr. Melançon officially began when he asked me to design and layout my first Neuro Image back in October 1999. I wasn't quite sure what the newsletter was about, let alone the purpose of it, but he gave me a wonderful gift to be imaginative in an environment where most requests were specific and didn't have much latitude. What developed was a not only a nice diversion from our routine; but was also a wonderful friendly collaboration and exchange of ideas, discoveries and aesthetics; which I think is the true spirit of Neuro Image. On behalf of Neuro Media Services, we can't thank him enough (and others like him in the Neuro family) for entrusting us with all of his creative projects.