You Can See a Lot Just By Looking

Why diagnosis remains the most important challenge in medicine...

...and imaging continues to add value

Greg Sorensen
Siemens Healthcare
The first 15 minutes of healthcare are the most expensive

• Once a diagnosis is suspected, a whole chain of spending is unleashed.

• Errors of diagnosis are:
  – The most costly type of error
  – The most frequent type of error
  – The most deadly type of error

See: blogs.HBR.org Jan 2014
Stroke, too, is misdiagnosed

• Malpractice databases indicate stroke is among the most common dangerous missed diagnoses.

• Preventable deaths from stroke are attributed to diagnostic error over 30 times more often than deaths from myocardial infarction.

• A systematic review estimated that about 9% of all strokes are not recognized at first medical contact.

Ann Neurol 2008; 64:S17
Before fibrin-targeted MRI agent

After fibrin-targeted MRI agent

LV

RV

SPECT antibody probe for D-Dimer (agenix.com)
PET-CT imaging after embolic stroke

Courtesy of Francesco Blasi, MGH / Globus Award, Abstract 212
Molecular imaging of thrombolysis

Courtesy of Francesco Blasi, MGH / Globus Award, Abstract 212
JENNIFER ON THE BRAIN

Caltech and UCLA scientists use pictures of celebrities to study how the brain processes what the eyes see. In 2005 they found an individual nerve cell that fired only when the subject were shown pictures of Jennifer Aniston. Another neuron responded only to pictures of Halle Berry—even when she was masked as Catwoman. Follow-up studies suggest that relatively few neurons are involved in representing any given person, place, or concept, making the brain staggeringly efficient at storing information.

made from a Vancouver
THE COLOR OF THOUGHT

The brain’s many regions are connected by some 100,000 miles of fibers called white matter—enough to circle the Earth four times. Images like this, taken at the Martinos Center, reveal for the first time the specific pathways underlying cognitive functions. The pink and orange bundles, for example, transmit signals critical for language.

Van Wedeen and L. L. Wald, Martinos Center for Biomedical Imaging, Human Connectome Project
Take-home messages

• Accurate diagnosis is a way of thinking; technology plays an important but nevertheless supporting role.

• Emerging contrast agents will allow us to find – and monitor – thrombus.

• “Connectome”-style performance is newly feasible on a clinical high end 3T scanner.