

ABSTRACT: 2016 ELAM Institutional Action Project Symposium

Project Title: Creating an Advanced Imaging Research Core Lab: Supporting Clinical and Translational Research in an Academic Medical Center

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Collaborators: William Ball MD, Melanie Cushion PhD, James Heubi, MD, Chris Lindsell PhD, Achala Vagal MD

Background, Challenge, Opportunity: Enhancing the research mission of the College of Medicine (COM) is a priority for the institution. In addition to supporting its 16 clinical departments and six basic science departments, the COM has invested substantial resources to develop three institutes: in Neurosciences, Cardiovascular Diseases, and Cancer. Imaging is an integral part of nearly all clinical research in the COM. Yet a gap exists in supporting the imaging research endeavors of these departments and institutes. The approach to imaging research within the Department of Radiology has been fragmented and largely dependent upon relationships between individual radiologists and clinical researchers. A more cohesive and seamless approach is needed. As the future of imaging research is closely tied to harnessing “big data,” there is a need to build imaging research support and embrace the evolving role of imaging research. Creating an advanced imaging research core lab within the Department of Radiology will provide the needed infrastructure to support clinical trials, service the needs of researchers with advanced imaging requirements, and stimulate new research by creating an environment of scientific inquiry, collaboration, and discovery.

Purpose: Establish an advanced imaging research core lab within the Department of Radiology

Objectives: To provide a centralized imaging research support infrastructure for the College of Medicine comprised of two complementary pillars: a) Clinical Trial Core, and b) Advanced Imaging and Post Processing Core.

Methods/Approach:

- 1) Identify key stakeholders
- 2) Conduct a comprehensive needs assessment to include the scope of imaging research currently underway in the COM, the services to be provided by the Clinical Trial Lab and Advanced Imaging Lab, and the resources needed including space, staff, and equipment
- 3) Work with leadership within the COM to develop the strategic plan, associated business plan, advisory group
- 4) Implement the Imaging Core lab and evaluate performance relative to the benchmarks set forth in the plan

Outcomes and Evaluation Strategy:

Implementation metrics:

- Identify core group of radiologists interested in imaging research
- Recruit research coordinator and core lab/grants manager
- Develop IT infrastructure to support research
- Complete renovation of CIR space
- Develop mechanism to identify imaging research at point of entry in COM
- Establish standard operating procedures for core lab
- Implement collaboration with CCTST for providing imaging support through a common portal
- Train faculty as investigators-Clinical & Translational Research Program

Productivity metrics:

- Number of research studies using the imaging core lab
- Number of investigators
- Studies with a radiologist as PI
- Number of collaborating departments
- Number of grants and manuscripts generated
- New imaging technologies utilized in research: 3D processing, 3D printing, deep learning, data analytics

Mary C. Mahoney, MD

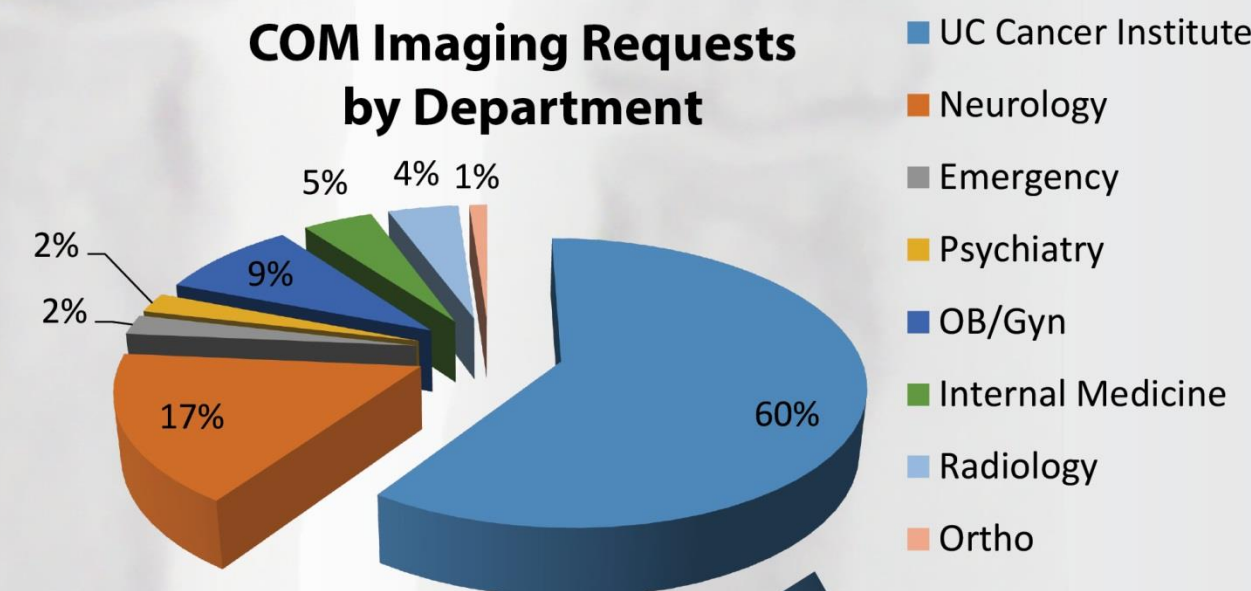
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BACKGROUND

Enhancing the research mission of the College of Medicine (COM) is a priority for the institution. In addition to supporting its 16 clinical departments and six basic science departments, the COM has invested substantial resources to develop three institutes: in Neurosciences, Cardiovascular Diseases, and Cancer. Imaging is an integral part of nearly all clinical research in the COM.

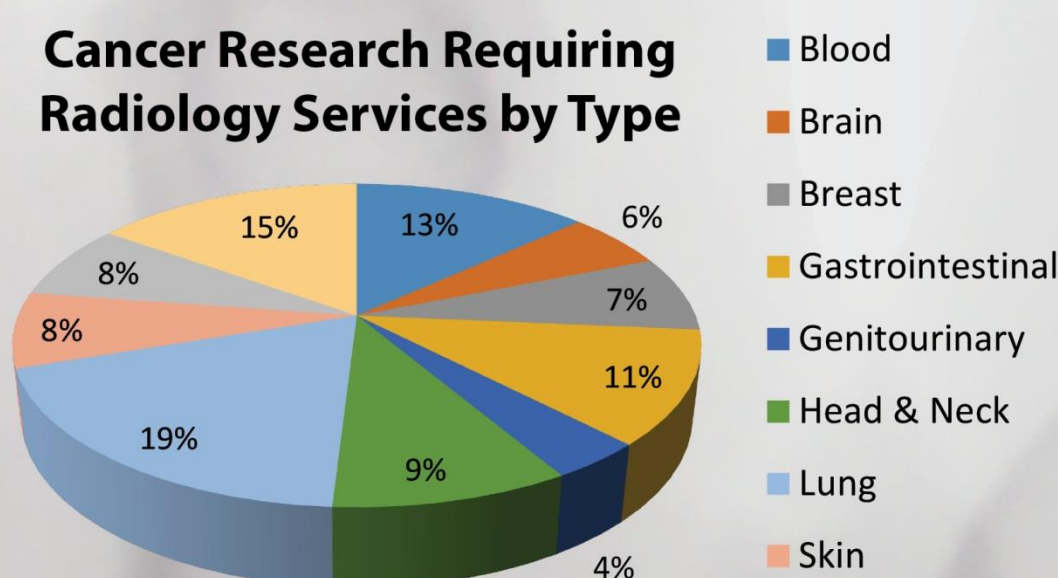
CHALLENGE

Yet a gap exists in supporting the imaging research endeavors of these departments and institutes. The approach to imaging research within the Department of Radiology has been fragmented and largely dependent upon relationships between individual radiologists, clinical researchers, and study coordinators. A more cohesive and seamless approach to protocol development and review, defining imaging and equipment requirements, de-identifying data, performing data archival and back-up, submitting data to clinical research organizations (CRO), completing specialized reports and documentation, formulating imaging budgets, and providing study specific subspecialty interpretations is needed. Furthermore, there is no infrastructure within the COM to provide advanced imaging, post-processing capabilities, and imaging data analytics.



OPPORTUNITY

As the future of imaging research is closely tied to harnessing "big data," there is a need to build imaging research support and embrace the evolving world of imaging research. Creating an advanced imaging research core lab within the Department of Radiology will provide the needed infrastructure to support clinical trials, service the needs of researchers with advanced imaging requirements, and stimulate new research by creating an environment of scientific inquiry, collaboration, and discovery.



CLINICAL TRIAL CORE LAB

PURPOSE

To establish an advanced imaging research core within the Department of Radiology

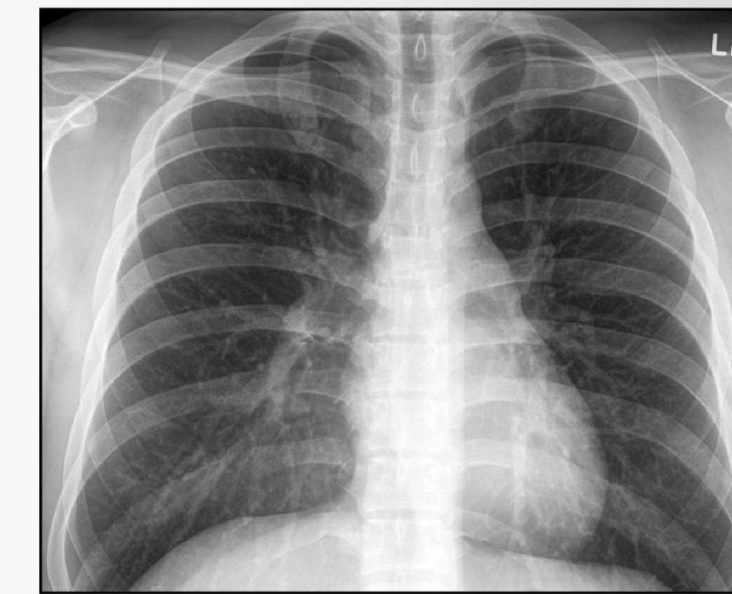
OBJECTIVES

Provide a centralized imaging research support infrastructure for the College of Medicine comprised of two complementary pillars:
a. Clinical Trial Core Lab
b. Advanced Imaging and Post Processing Core Lab

METHODS/APPROACH

1. Identify key stakeholders:

- Bioinformatics
- Biomedical Engineering
- Biostatistics/Epidemiology
- Imaging Research Center at Cincinnati Children's Hospital
- CCTST
- Faculty researchers in the COM



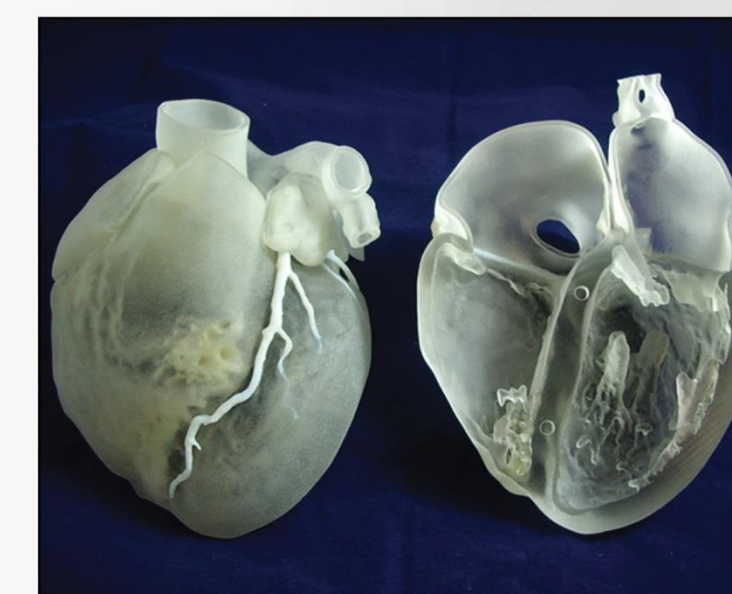
2. Conduct a comprehensive needs assessment, starting with key stakeholders and building out to the research community

- Identify the scope of imaging research currently underway in the COM
- Meet with key stakeholders, faculty researchers and coordinators to determine needs
- Define the services to be provided by the Clinical Trial Lab and Advanced Imaging Lab
- Define the resources needed including space, staff, and equipment



3. Work with leadership within the COM to develop the strategic plan, associated business plan, and advisory group

4. Implement the Imaging Core lab and evaluate performance relative to the benchmarks set forth in the strategic and business plan, refining approach as required.



3D Image courtesy of Jane M. Matsumoto, M.D., Mayo Clinic

ADVANCED IMAGING & POST PROCESSING CORE LAB

OUTCOMES/EVALUATION STRATEGY

Implementation Metrics:

- Identify core group of radiologists interested in imaging research
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Productivity Metrics:

- Number of research studies using the imaging core lab
- Number of investigators
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- Number of collaborating departments
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Advanced Imaging Metrics:

- 3D Processing
- Computer Aided Detection
- Deep Learning Neural Networks
- 3D Printing
- Imaging Data Analytics

