RUSH

Integrating Generative AI in Clinical Practice

American Medical Association
IPPS Interim Meeting

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Rush University System for Health | October 2024

No Disclosures

About RUSH

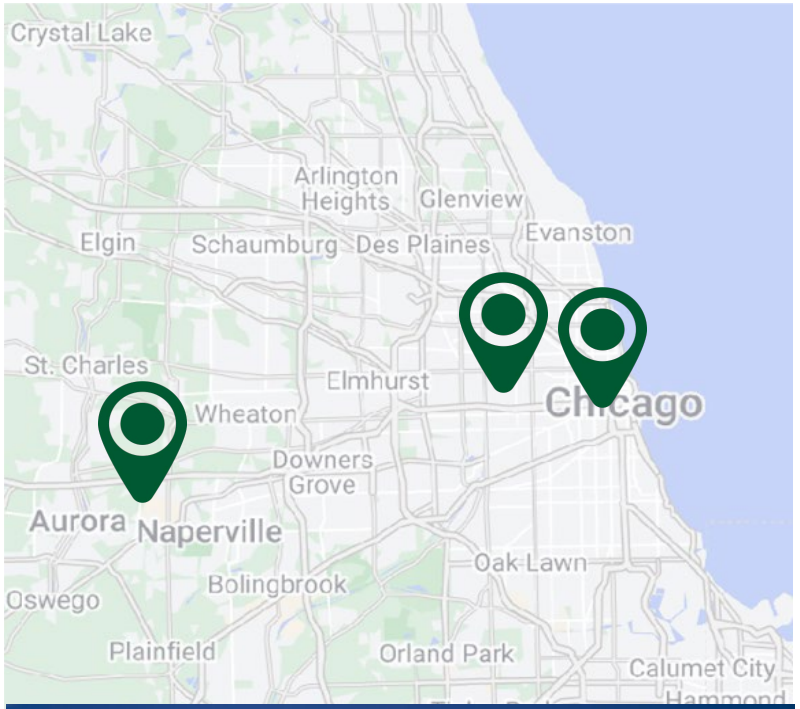
Quality

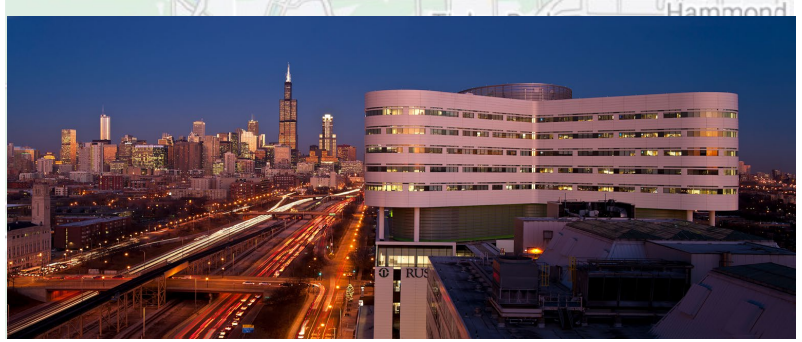
U.S. News & World Report's 2023-2024 Best Hospitals Honor Roll

10 Nationally ranked clinical programs

#2 in the nation for quality

Vizient quality ranking for inpatient and outpatient care





Patients

1,133	Licensed Beds
46,868	Admissions
59,090	Surgeries
180,479	ED Visits
963,044	Outpatient Visits

People

938	Employed Physicians
>500	APPs
14,021	Full-Time Employees

Learners

2,208	Students (Summer Semester)

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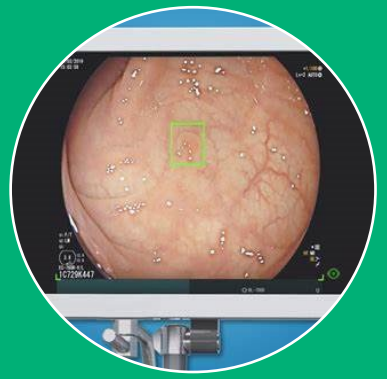
As of December 2023

Generative AI Challenges: Philosophy



Is there a **risk** of over-reliance on AI technology?

How do we **measure** if the AI is improving outcomes?

Do people provide the same level of professional scrutiny when using AI vs traditional approaches?

Is it right for an AI vendor to profit from our **data**?

What is the cost / benefit trade-off of AI?

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Augmented Intelligence | Governance

AI Incubator

- Defines RUSH's AI Strategy and Vision.
- Identification, evaluation and prioritization of AI opportunities.
- Sponsors AI training, change management, and AI adoption.
- Assesses and evaluates business impacts.

Center for Bioinformatics, Robotics & Augmented Intelligence (CoBRA)

- Evaluates and maintains data sets for machine learning, large language models, etc.
- Clinical and scientific valuation and verification.
- Protocol monitoring.

RUSH AI Center of Excellence

Center for Digital Health Enablement:

AI & Automation

- Selects and supports AI and automation platforms.
- Designs, builds, tests, and implements AI solutions.
- Supports integration of solutions within RUSH digital ecosystem.

Data Governance:

Office of Responsible AI

- Coordinates cyber, regulatory, medical ethics, compliance, privacy, and legal reviews for AI initiatives.
- Supports agreements with platform and solution vendors.
- Supports standard contract language for vendor agreements.

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Endoscopic Polyp Detection

Use Case:

- Nearly 1 in 20 adults will be diagnosed with colon cancer in their lifetime and 90% of them can beat it if caught early
- GI Genius is an AI-powered medical device, FDA approved in 2021, used to enhance the ability to detect colorectal polyps of all shapes and sizes in real time

AI Technology used: Computer Vision

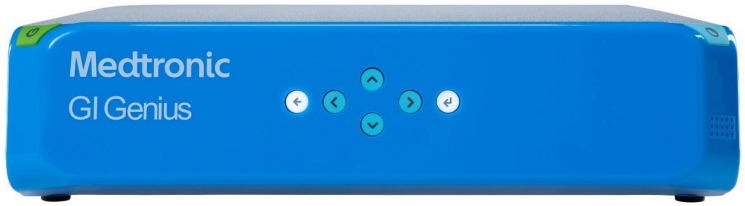
Implementation Stage: Scaling

Challenges:

- Clinician training
- Patient consent and education

Desired Outcome:

- Increase in Adenoma Detection Rate (ADR) leading to earlier detection of pre-cancerous lesions
- Vigilant “second observer”: Reduce chance of missed polyps by up to 50%



Courtesy of Medtronic © 2021

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Emergency Stroke Treatment Systems

Use Case:

- 1:6 deaths from CV Disease is from strokes
- Every 40 seconds someone in the US has a stroke

AI Technology used: AI Mediated Activation

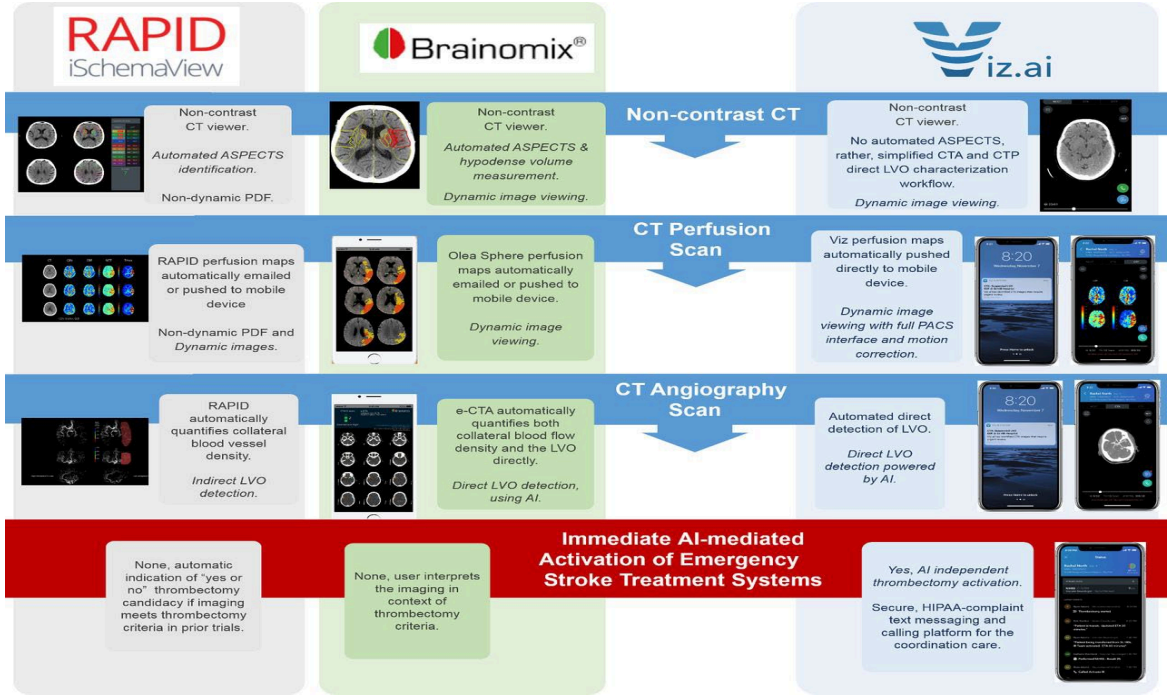
Implementation Stage: Scaling

Challenges:

- Clinician training
- Multifacility Interfaces

Desired Outcome:

- Automated coordination of acute stroke care
- AI mediated activation of Emergency Stroke Treatment Systems



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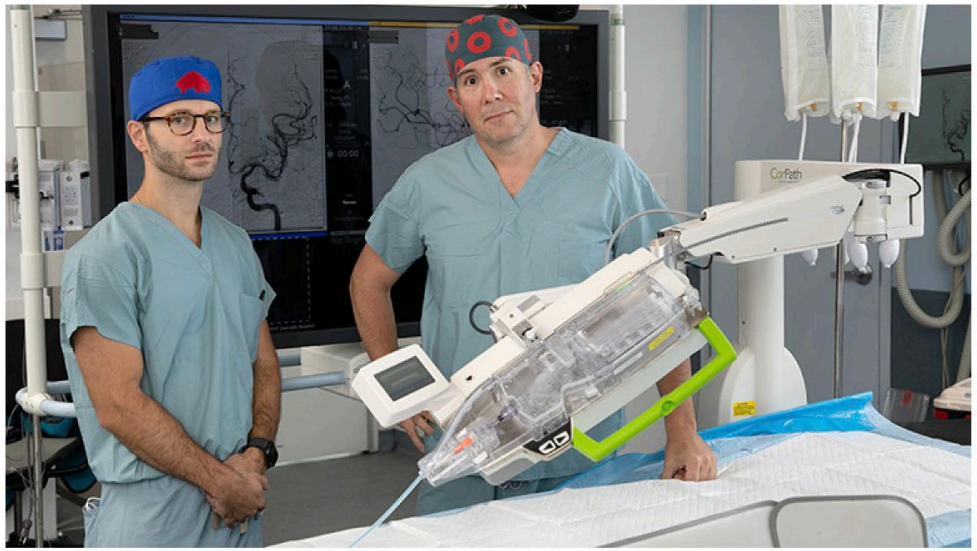
RUSH Doctors Services Locations Patients & Visitors Schedule Appointment

Rush Becomes First in Chicago To Use Robotic System for Neurovascular Care

Rush University System for Health expands its complement of minimally invasive care with new vascular robotic technology

Brain Health & Conditions September 15, 2021



Rush neurosurgeons Stephan Munich, MD (left), and R. Webster Crowley, MD

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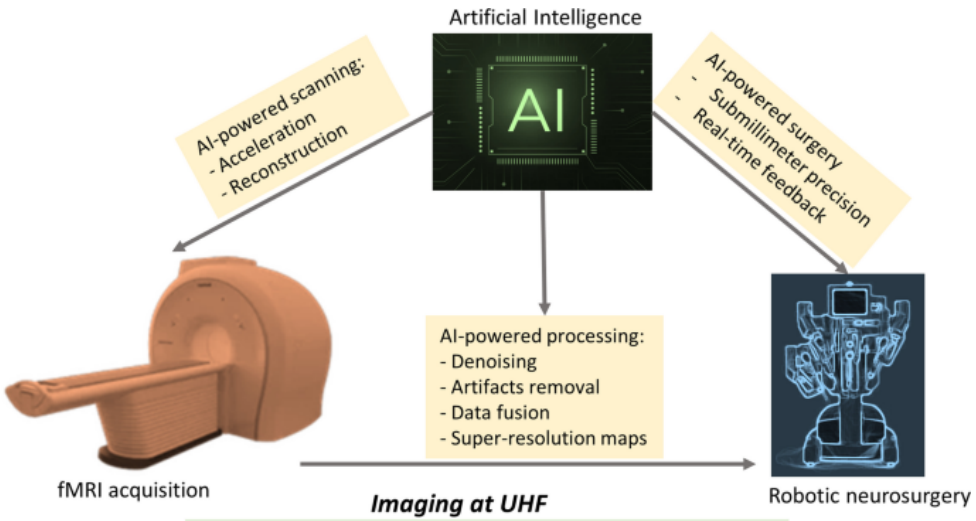
R. Webster Crowley, MD

Use of Ultra-High Field MRI for precise surgical planning of neurosurgical procedures

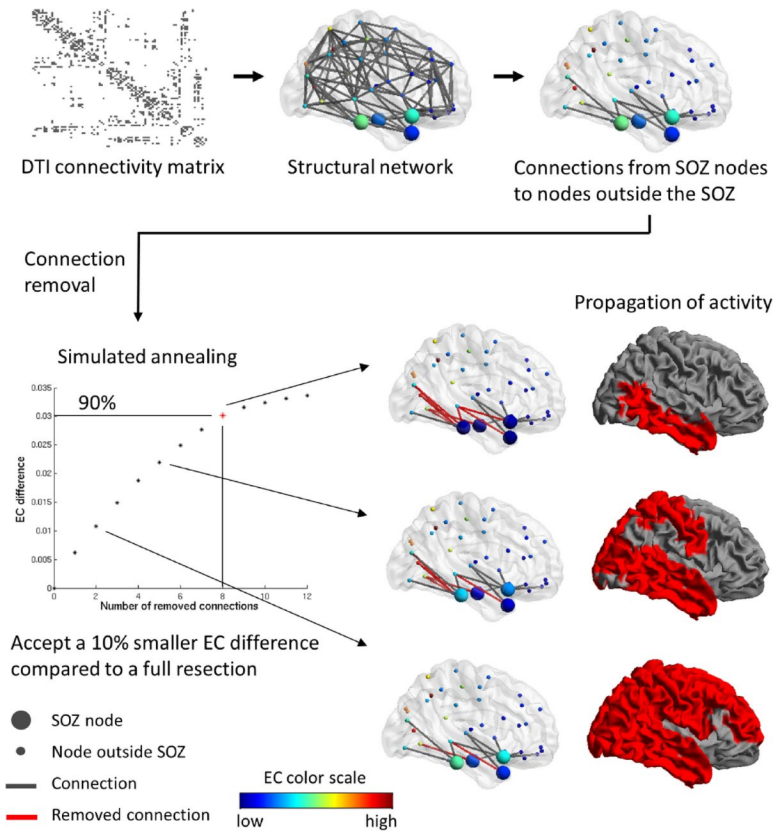


Imaging at UHF

High SNR → high spatial resolution & high BOLD sensitivity/specificity
But: High susceptibility artifacts → heterogeneous spatial uncertainty

Tradeoff: Imaging at ≥ 1 mm isotropic voxel size
- Lower risk of false negatives
- Clinically useful spatial specificity
- Shorter acquisition time
- Manageable data size

AI processing of fMRI, EEG, and MRI for mapping of abnormal neural networks in epilepsy



Radiology AI Platform

Use Case:

- There is increasing pressures on radiology departments given increased complexity, number of images per scan, and demands on radiologists
- Over 700 FDA approved AI algorithms in Radiology
- Calantic takes previously fragmented AI solutions and coordinates them into a **single platform** and helps deliver AI technology to the end user on an accelerated timeline

AI Technology used: AI platform broker

Implementation Stage: Scaling

Challenges:

- Complex implementation given multiple PAC systems

Desired Outcome:

- Agile AI algorithm deployments
- Increased provider satisfaction- SINGLE viewpoint
- Improved patient outcomes

Calantic™ Digital Solutions + Blackford

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Automated Patient “Draft” Replies

Use Case:

- Increased communication via the In-basket has led to clinician dissatisfaction
- Epic Automated “Draft” Replies reads the patient message and using an AI powered algorithm, drafts a response to the patient to increase speed of response

AI Technology used: Generative AI, Large language model

Implementation Stage: Scaling

Challenges:

- Clinician buy-in: Replies may not feel personal
- Consent
- Cost

Desired Outcome:

- Timely and empathetic responses to patient inquiries
- Decreased clinician in-basket time
- Improved patient and clinician satisfaction

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Questions