



Healthcare Technology for the Digital Age

Feb 2024

Sean White, PhD

Director of Research and Technology

Connection to UCI



Sean White



Tyler Rice



Bruce Yang



From UCI, to LAS, to Medtronic



Medtronic

From UCI, to LAS, to Medtronic



1 Flow Value

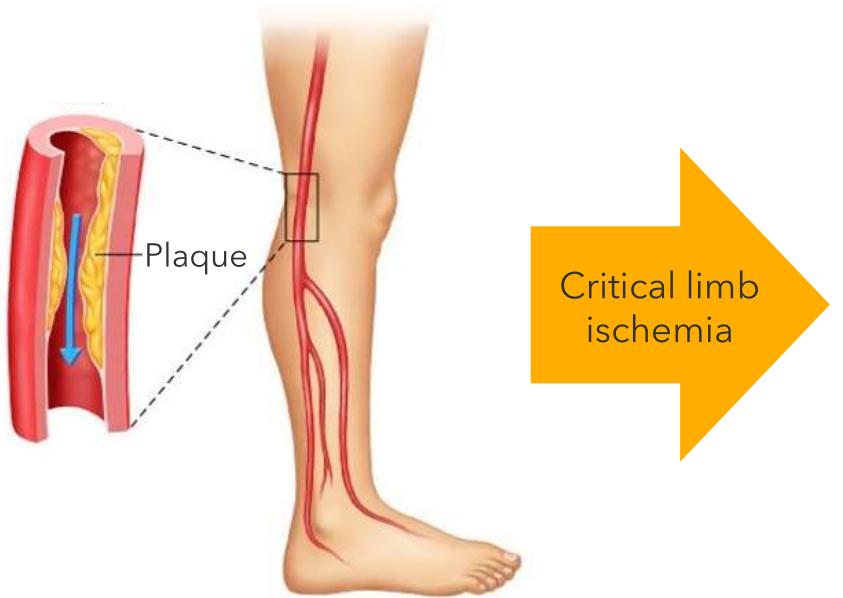
Numerically shows average blood flow

2 Velocity Waveform

Shows shape of pulse waveform

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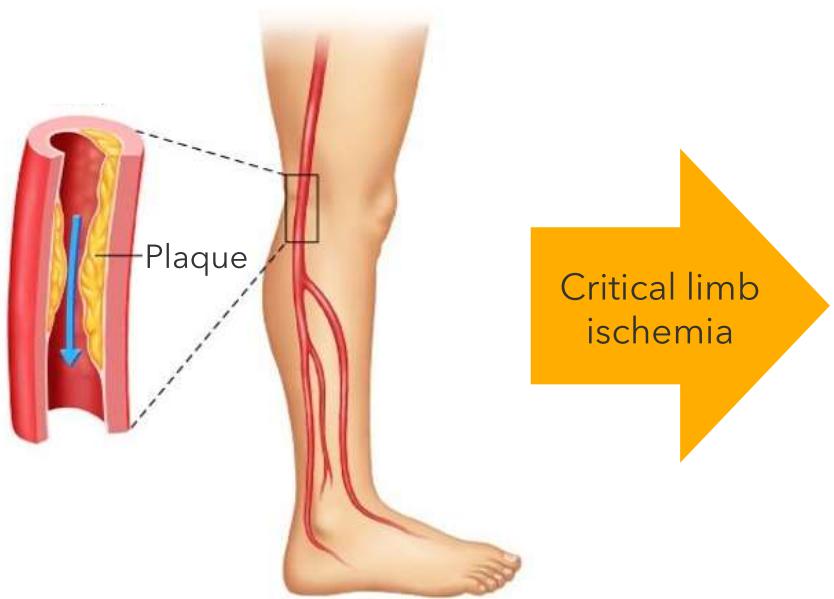
"My" Problem: Peripheral Artery Disease



Medtronic

Duff, Steve, et al. "The burden of critical limb ischemia: a review of recent literature." *Vascular health and risk management* (2019): 187-208.

"My" Problem: Peripheral Artery Disease



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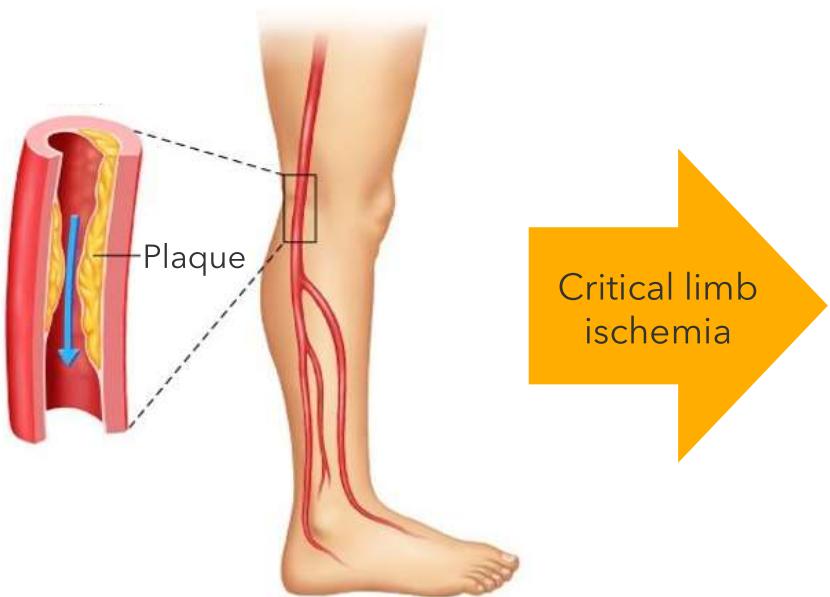
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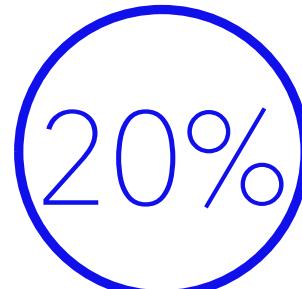
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"My" Problem: Peripheral Artery Disease



Critical limb
ischemia



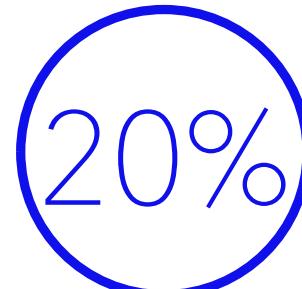
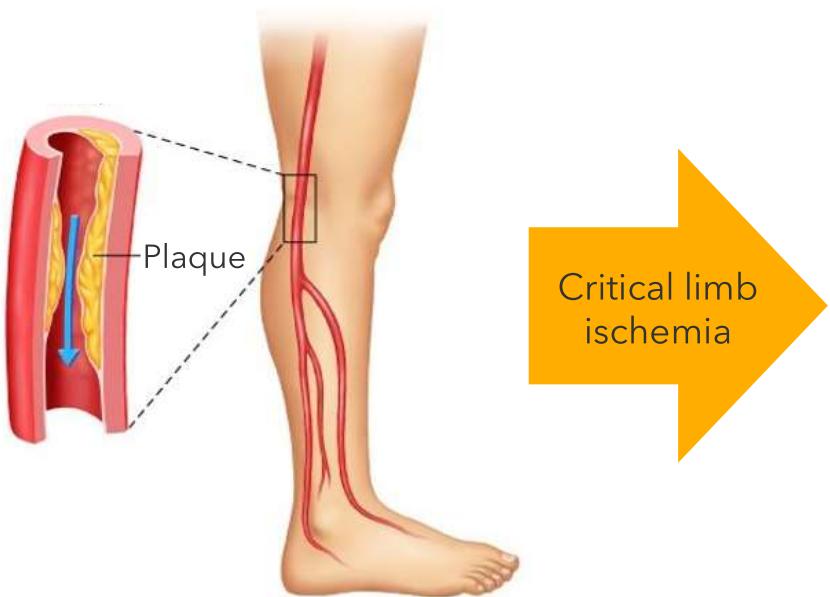
Amputation at 1-year



Mortality at 1 year

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"My" Problem: Peripheral Artery Disease



Amputation at 1-year



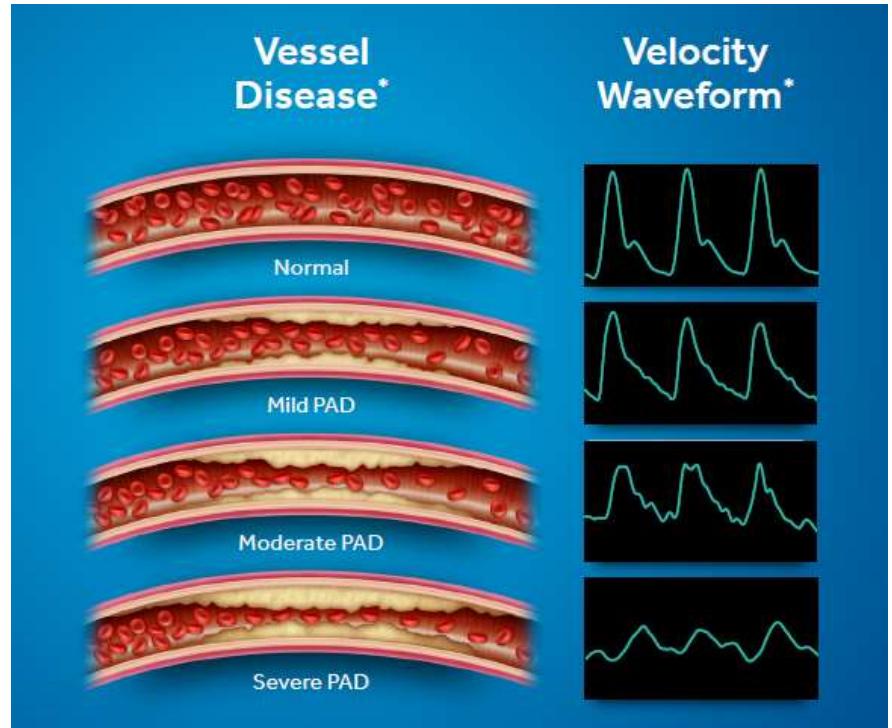
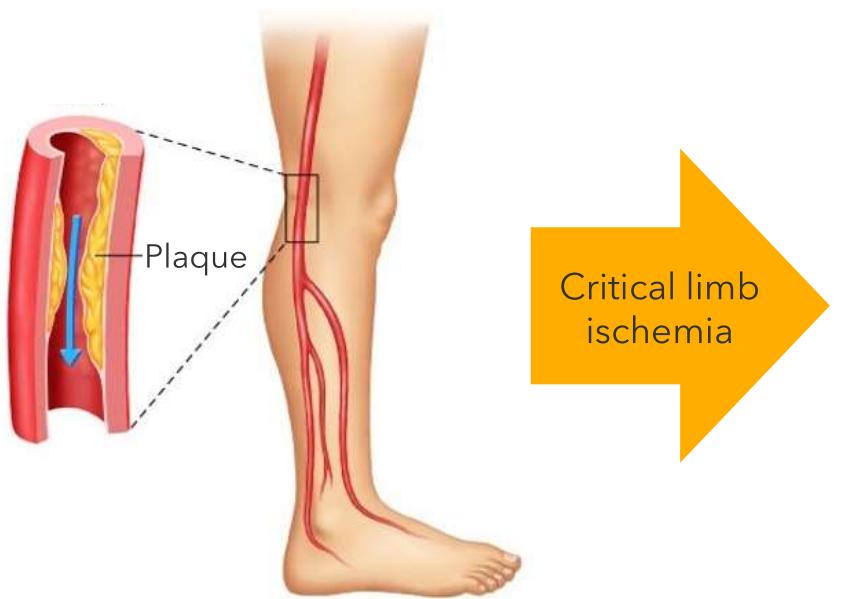
Mortality at 1 year



Mortality at 5 years

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"My" Problem: Peripheral Artery Disease



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Fertile Ground for Innovation

First angiogram to
guide balloon
angioplasty
1964



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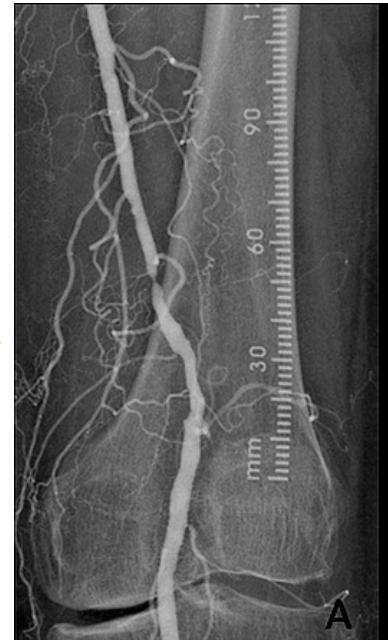
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Fertile Ground for Innovation

First angiogram to
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~60 years

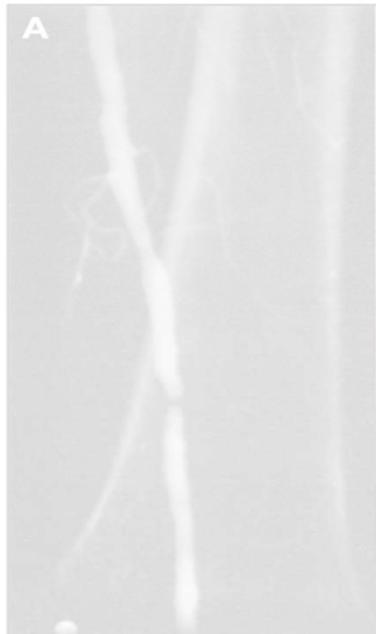


Angiogram to guide
balloon angioplasty
2023

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Fertile Ground for Innovation

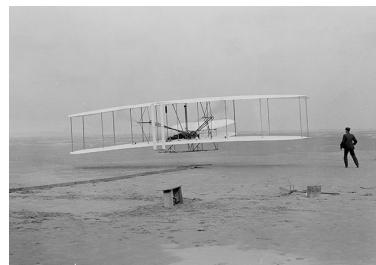
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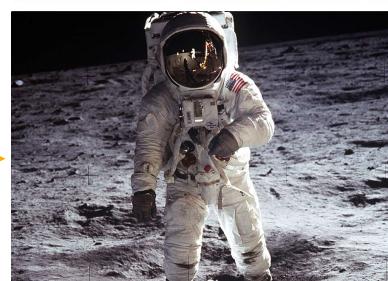
~60 years →



Angiogram to guide
balloon angioplasty
2023



66 years →



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Barton, Matthias, et al. "Balloon angioplasty—the legacy of Andreas Grüntzig, MD (1939–1985)." *Frontiers in cardiovascular medicine* 1 (2014): 15.

Emerging Impact of AI/ML



Insertable Cardiac Monitor

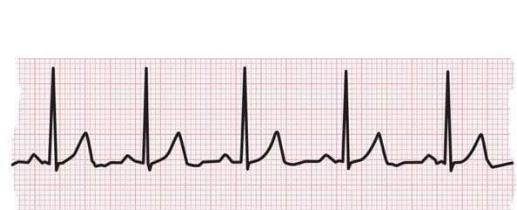
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Image credit: <https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/electrocardiogram-ecg-or-ekg>

Emerging Impact of AI/ML



Insertable Cardiac Monitor



Time series data

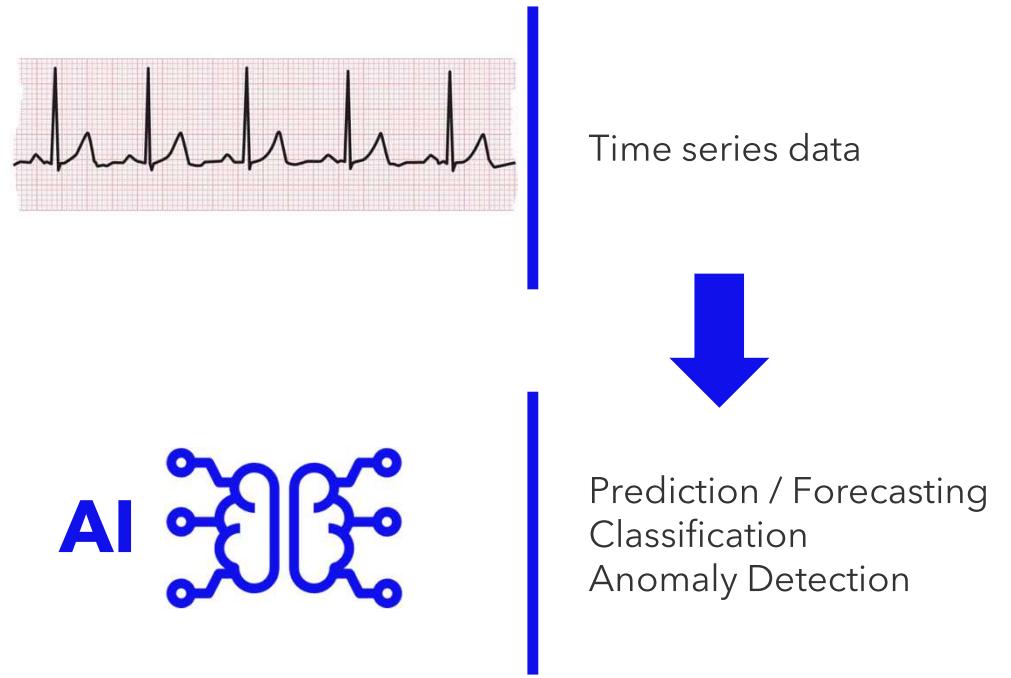
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Emerging Impact of AI/ML



Insertable Cardiac Monitor



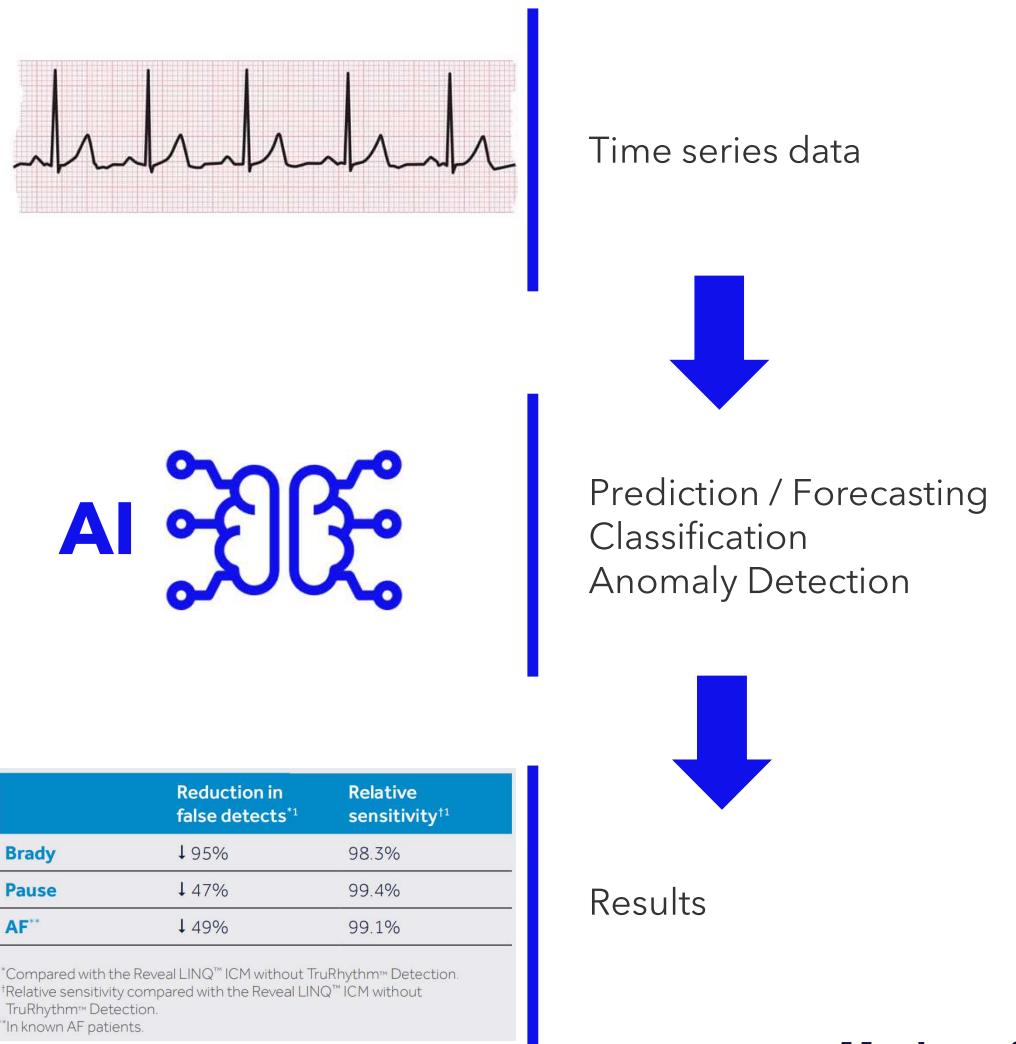
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Emerging Impact of AI/ML



Insertable Cardiac Monitor



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Emerging Impact of AI/ML



Intelligent Endoscopy Module

Medtronic

Image credit: <https://www.bioworld.com/articles/517581-medtronics-gi-genius-in-study-for-detecting-adenomas-during-colonoscopy?v=preview>

Emerging Impact of AI/ML



Intelligent Endoscopy Module

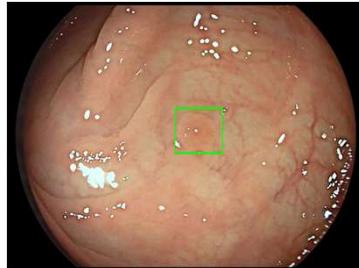


Image Stream

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Emerging Impact of AI/ML



Intelligent Endoscopy Module

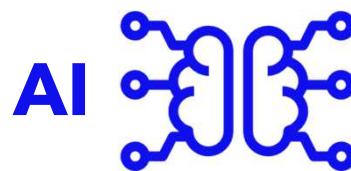
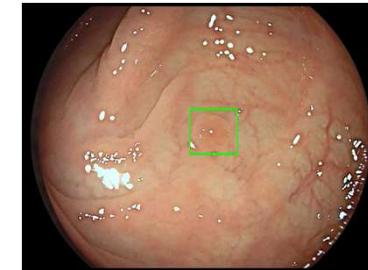
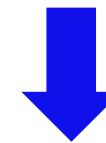


Image Stream



Segmentation
Feature Analysis

Medtronic

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Emerging Impact of AI/ML



Intelligent Endoscopy Module

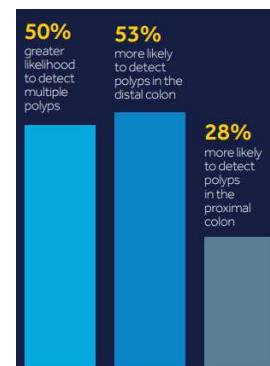
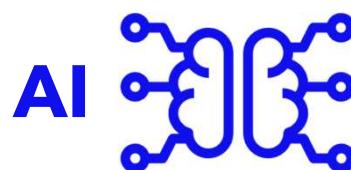
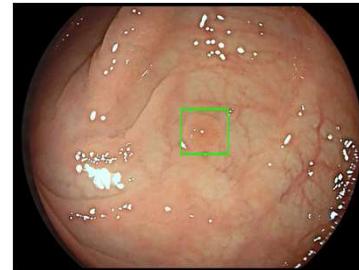
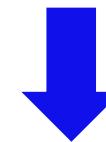
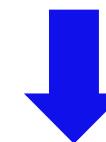


Image Stream



Segmentation
Feature Analysis



Results

Medtronic

(Dis)integration

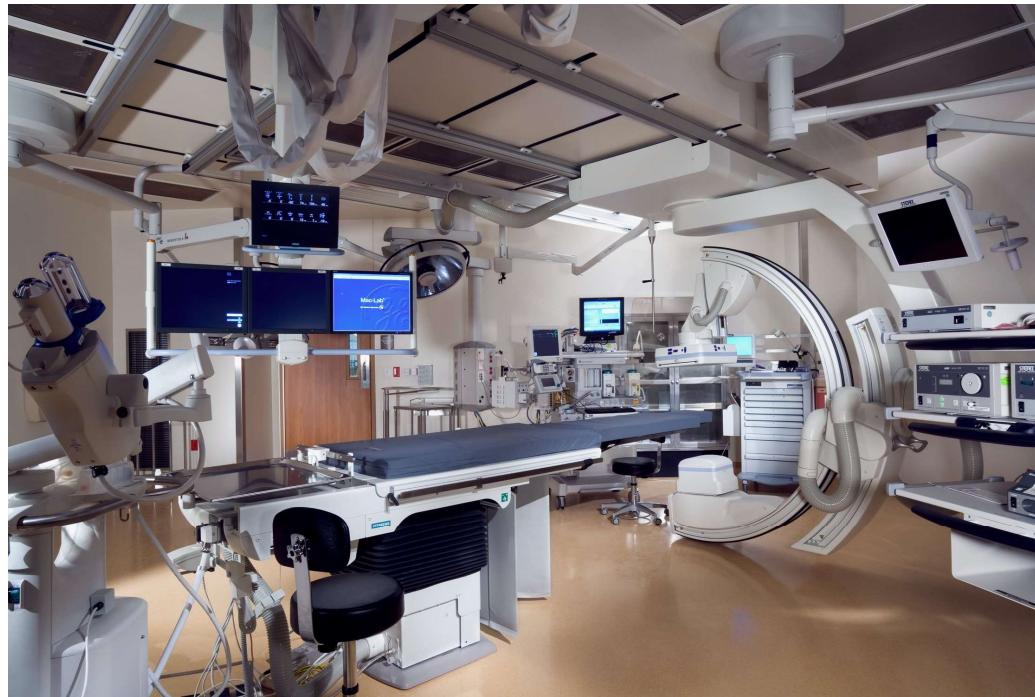


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<https://www.drrasi.com/peripheral-angiography>
<https://www.usa.philips.com/e/image-guided-therapy/mobile-c-arm/vascular>
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<https://www.usa.philips.com/healthcare/education-resources/technologies/igt/intravascular-ultrasound-ivus/peripheral/peripheral-ivus>
<https://www.sciencedirect.com/science/article/pii/S1936879819322836#fig1>

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(Dis)integration

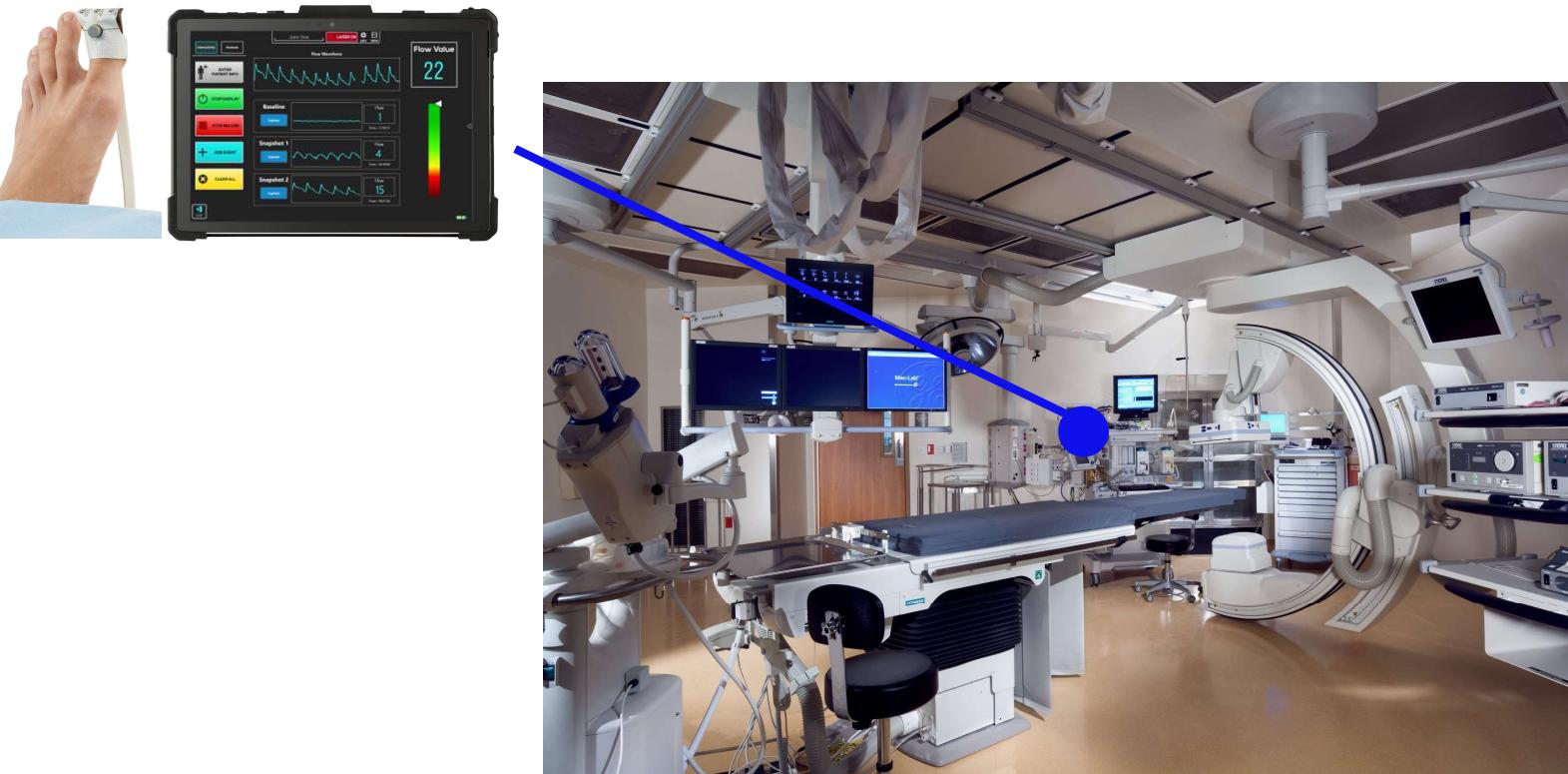


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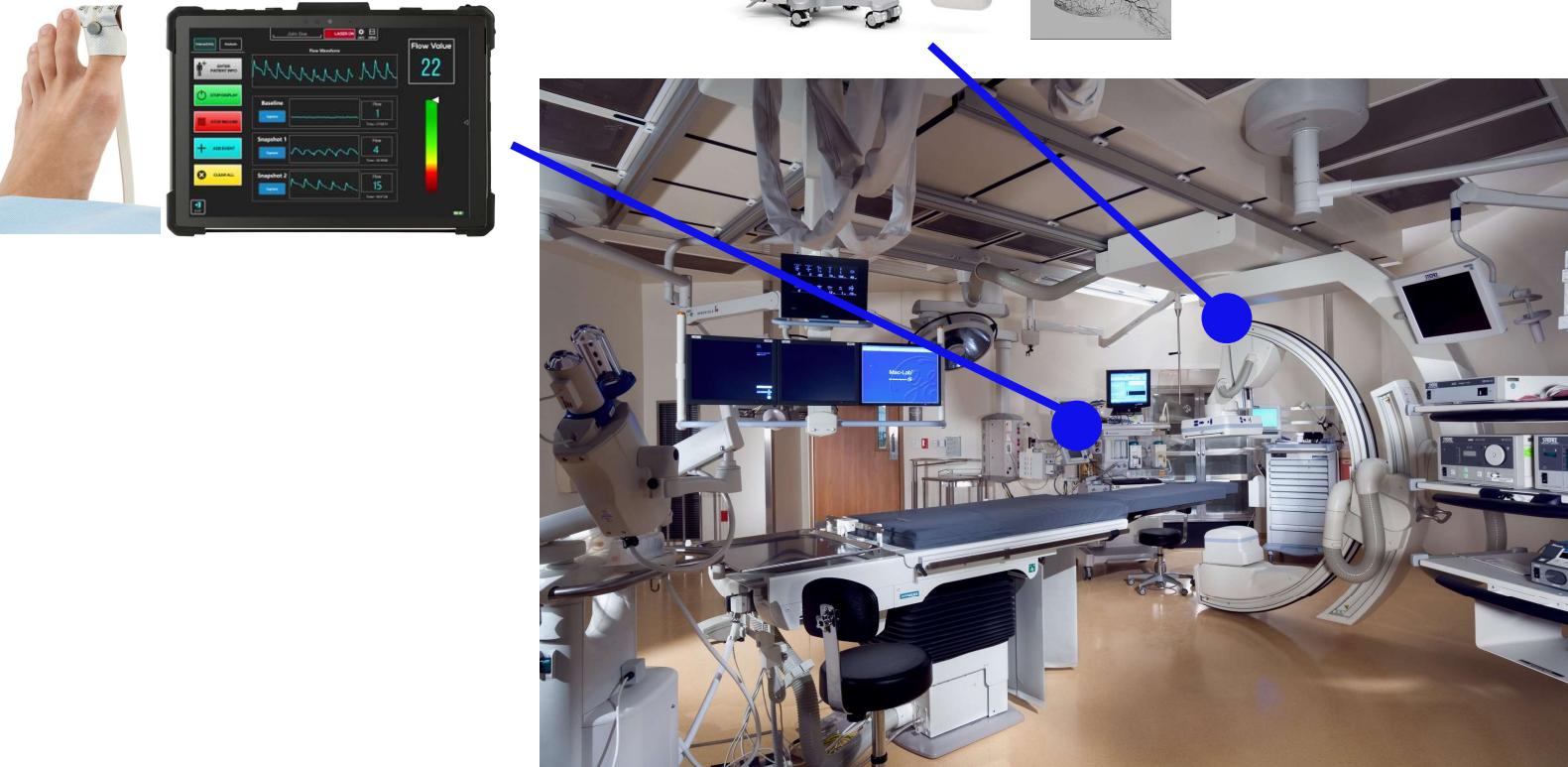


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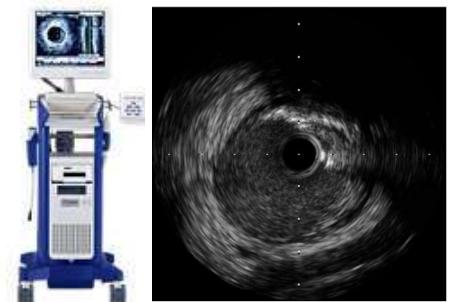
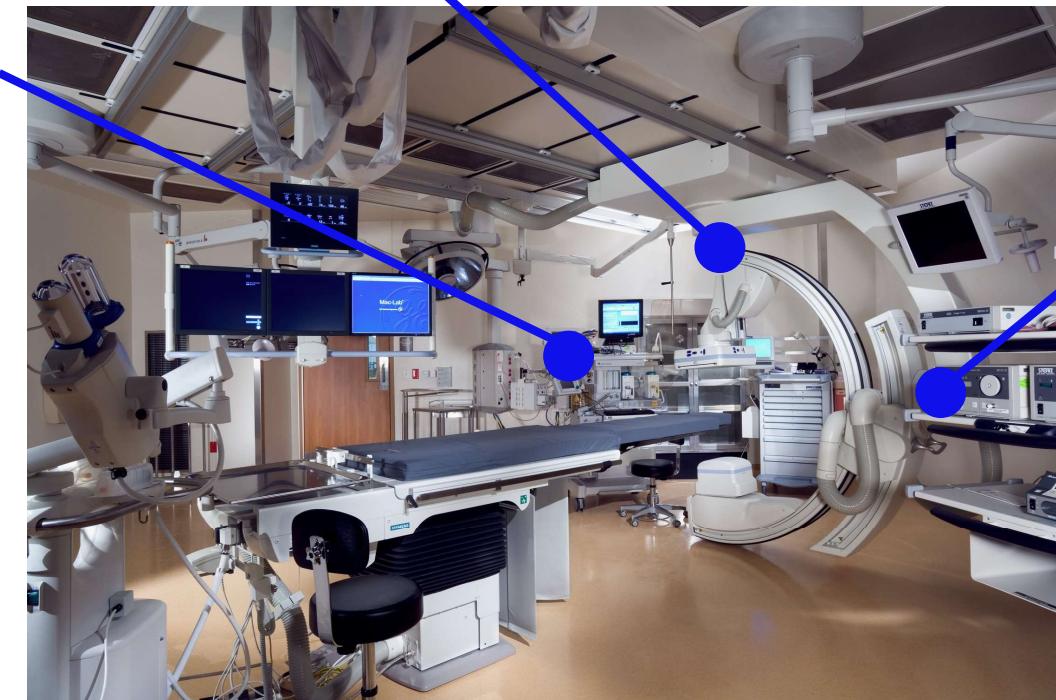
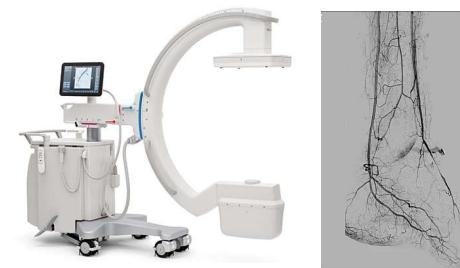


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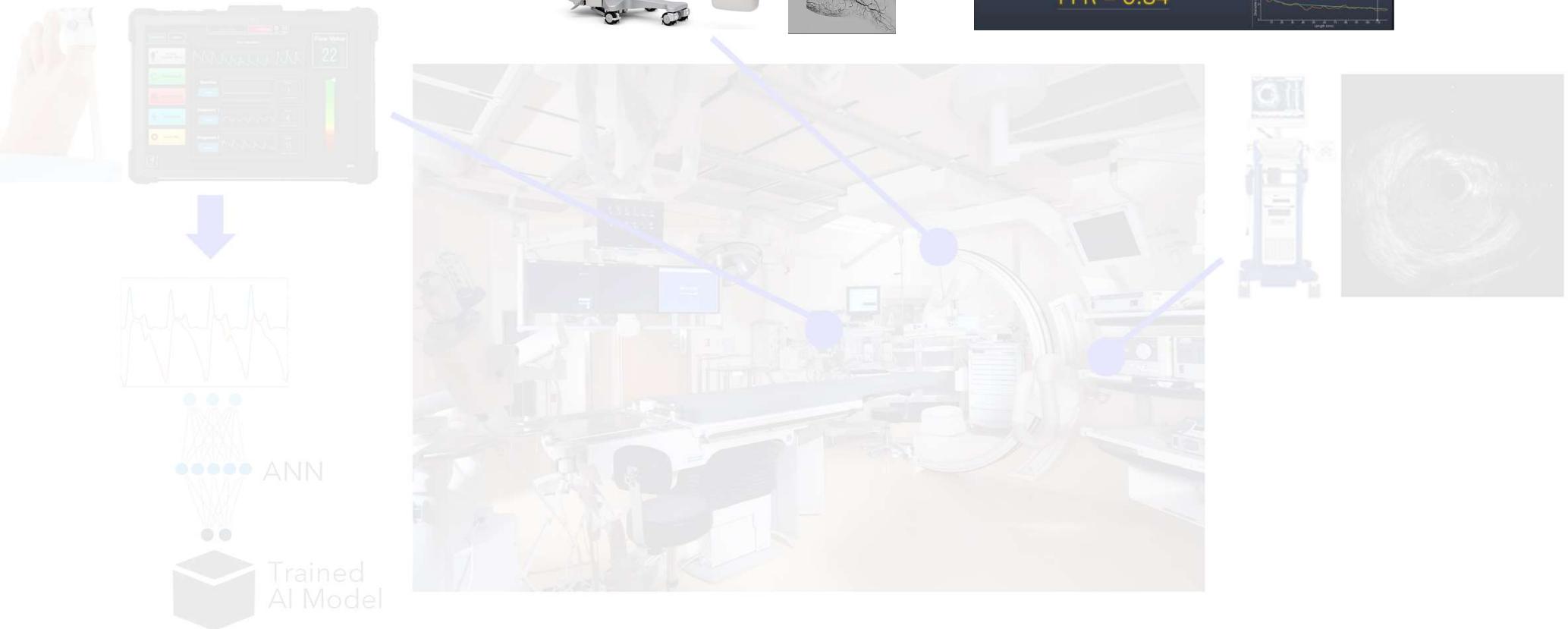


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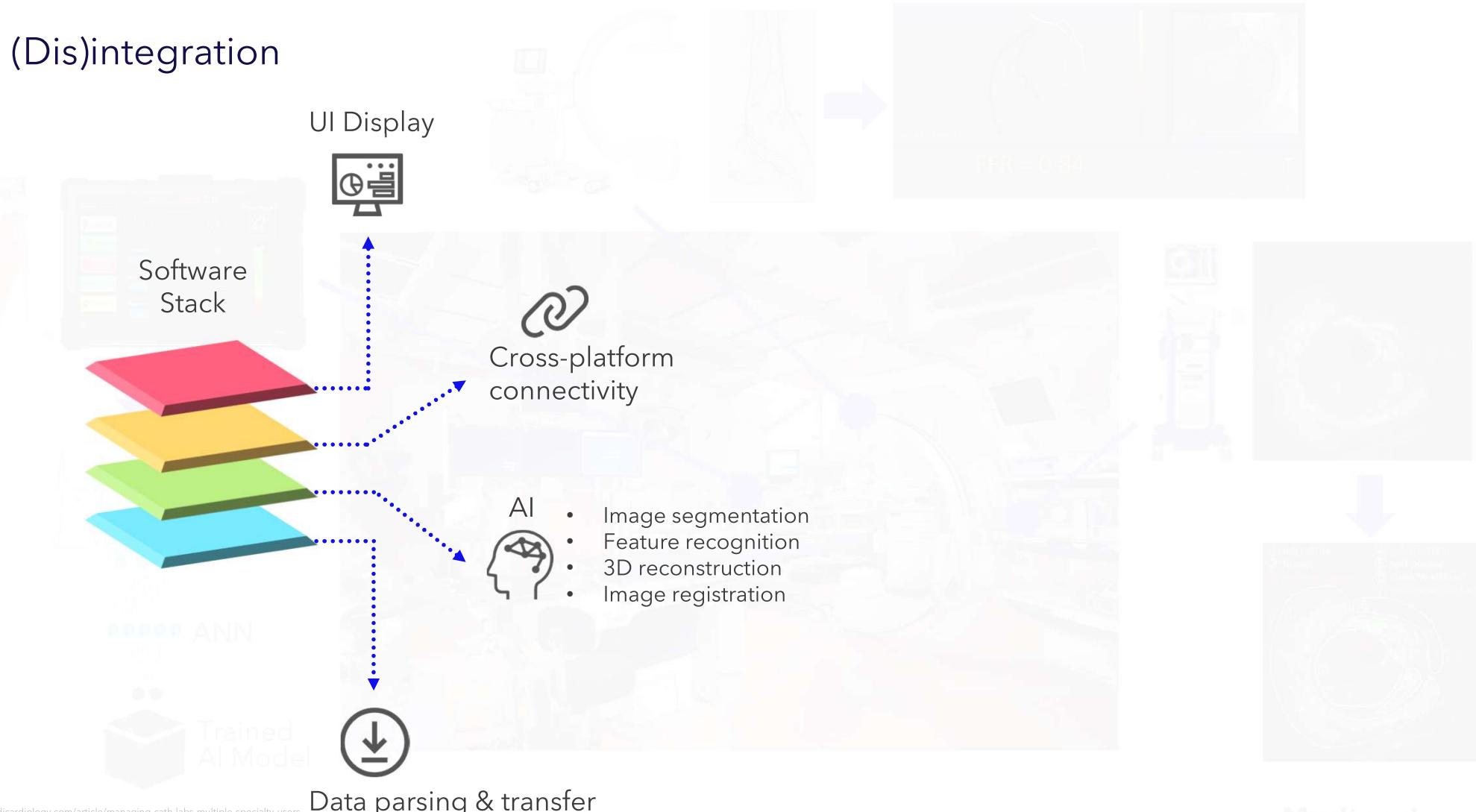


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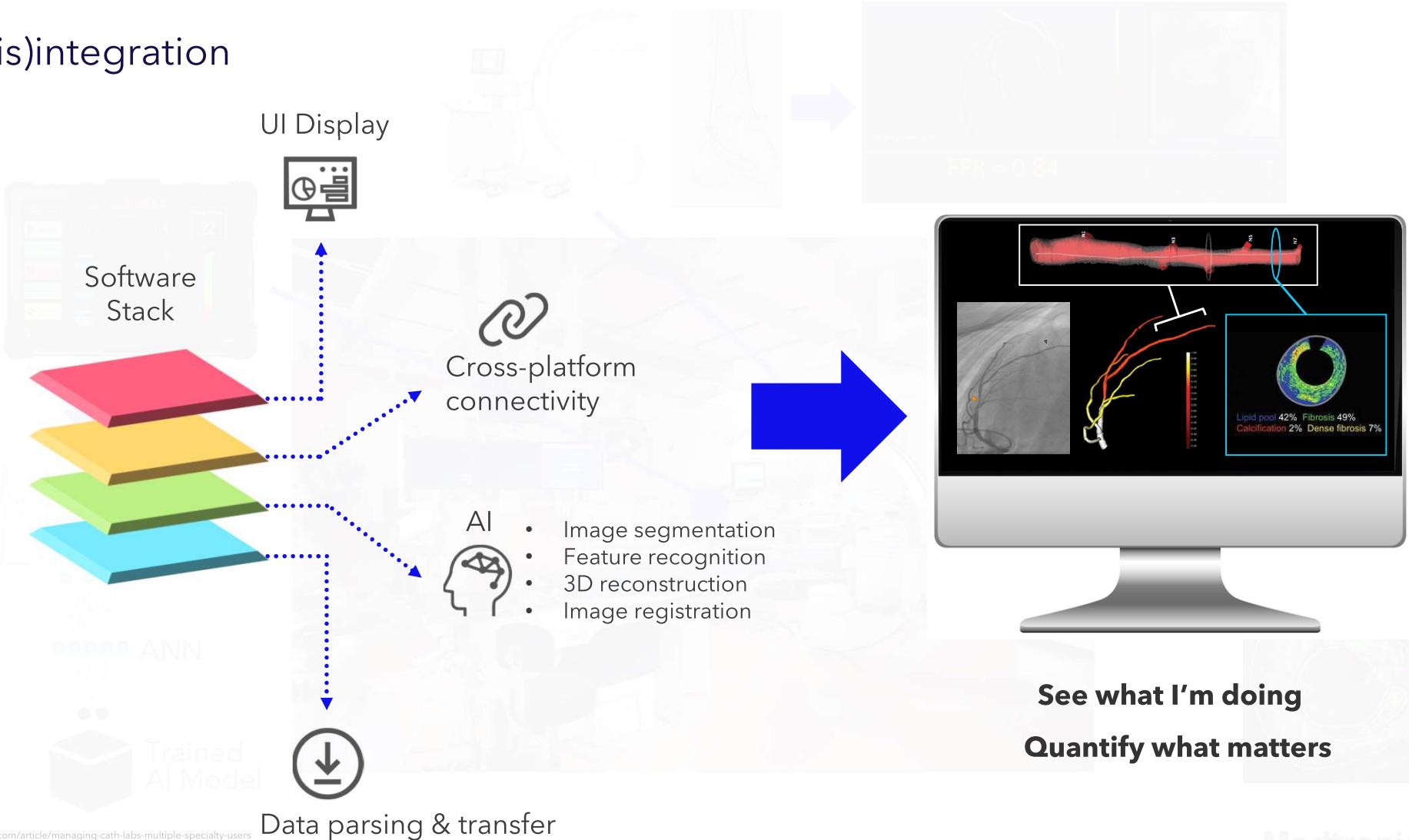


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Thank you

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Title with subtitle

Subtitle (optional)