3 ways artificial intelligence can increase your revenue in 2025
ASRS Business of Retina Meeting 2025

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AAO AI Committee

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Financial Disclosures

Optain Health
AKASA
FerRx Bio
OMNY Health
Amaros AI

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Objectives

- How deep-learning-based segmentation of OCT images can unlock commercial value of your datasets
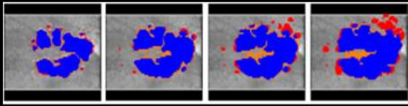- How AI can accelerate your clinical trial recruitment
- LLM for prior authorization

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#1 Segmentation/quantification

Input: image

Output: quantification of specific biomarkers

Deep Learning-Based Prediction of Individual Geographic Atrophy Progression from a Single Baseline OCT

Julia Mai, MD, Dmitrii Lachinov, MSc, Gregor S. Reiter, PhD, Sophie Riedl, PhD, Christoph Grechenig, MD, Hrvoje Bogunovic, PhD, Ursula Schmidt-Erfurth, MD

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Current limitations in ophthalmology big data

- Management and prognostication of retinal vascular diseases is heavily reliant on OCT images and associated biomarkers.
- EHR: demographics, VA, treatment regimen, ?CST
- CST only has moderate correlation with VA

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OCT biomarkers

- Type of fluid, amount of fluid, fluctuation of fluid
- How turbid/ hyper-reflective is the fluid
- Intraretinal hyperreflective foci
- Outer retinal tubulation
- Pigment epithelial detachment morphology, e.g. shape, height, volume
- EZ
- SRHM

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3/25/2025

Why would pharma care/pay?

- **Need more fine-grained data, beyond VA, to differentiate themselves from competitors and convince payors to skip step therapy**
- **Real world data: natural prevalence and progression of biomarkers, change in biomarkers in response to therapies**
- **Explore novel structural endpoints for therapies for earlier diseases**

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Why would pharma care/pay?

- **Built in segmentation algorithms are rudimentary and very limited**
- **Manual segmentation is labor intensive and only feasible in a clinical trial/reading center setting, not for large-scale commercialization of imaging data**
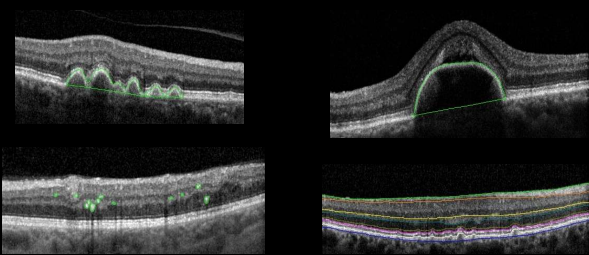
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Why would pharma care/pay?

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Why would pharma care/pay?
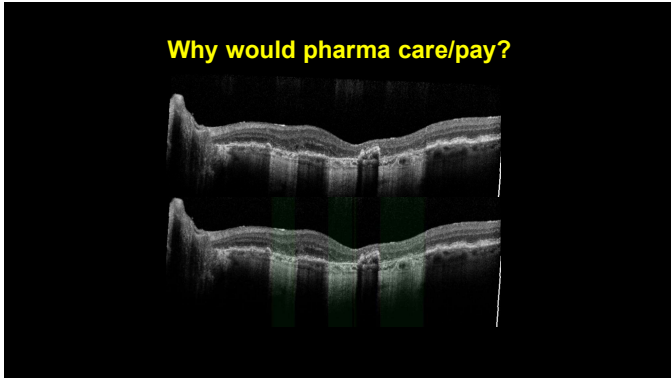
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#2 Clinical trial recruitment

- **Current limitations: time consuming, labor intensive, not comprehensive; requires manual identification of patients and then additional verification of images**
- **Needs integration of the EHR and imaging databases (IT infrastructure), automatic AI analysis of the images (real time or *a priori*) and an intuitive user interface (LLM)**

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Is there anything I can assist you with, Ben?

yes, I'm looking for patients for a GA clinical trial and need some assistance. How many active GA patients do we have?

We currently have 2,622 active GA (Geographic Atrophy) patients.

Ben

how many of them are at least 60 years old and have BVCA of at least 24

Out of the active GA patients, 2,559 are at least 60 years old and have a BVCA (Best Corrected Visual Acuity) of at least 24.
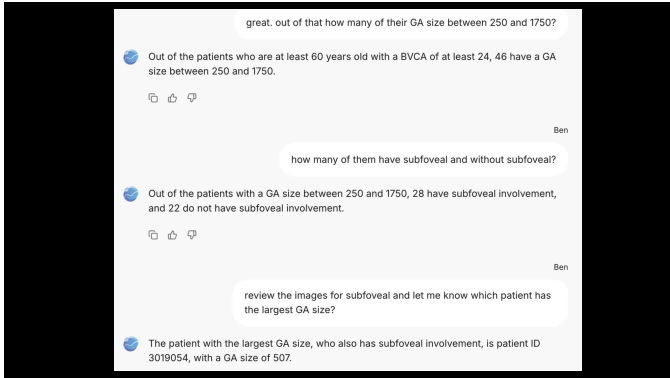
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#3 revenue cycle management (RCM)

- How providers bill for service and get paid by insurance payers? ~ 92% patients have insurance coverage
- RCM = $156 billion market per year
- 12% claims denied; 65% of denied claims were never resubmitted
- Health systems are losing between to 1 to 5% of net revenue due to denied claims; average margin 4% in 2024 Q1

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Courtesy of Elion
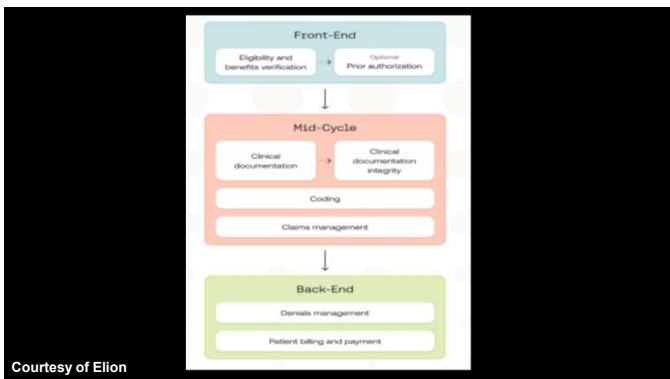
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Why does front end of RCM matter?

- Eligibility and prior authorization (PA) issues are top denial reasons.
- PAs are complex, time-consuming, tedious and costly.
- PAs are often required in retina, e.g. intravitreal injections.
- Submission of PAs often require going through a payer portal online (50 to 60%), but each payer portal typically has its own interface and navigation.

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RPA vs. LLM

About 50% of health systems have adopted some form of automation, mostly via robotic process automation (RPA).

RPA (legacy solution):
- explicit rules/instructions that have to be programmed ahead of time, e.g. a complex decision tree; cannot handle edge cases
- Brittle to payer portal interface change
- Not proficient with unstructured data, e.g. free clinical text

LLM (cutting edge solution):
- Proficient with unstructured data
- Adaptive; can be finetuned with reinforcement learning
- Great in understanding complex set of payer requirements and searching through lots of health records to find the right documents for PA

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Case study:
Pilot implementation of LLM-based process for prior authorizations at Johns Hopkins Medicine

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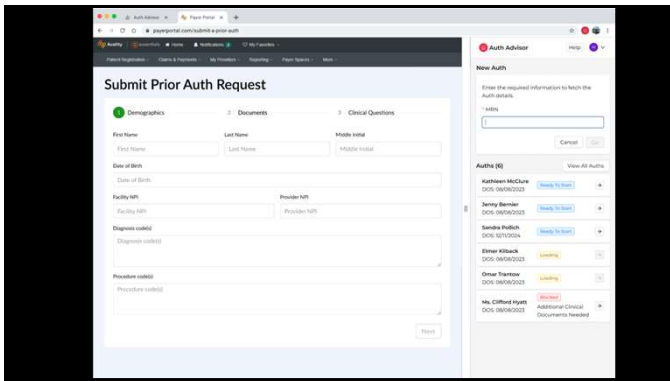
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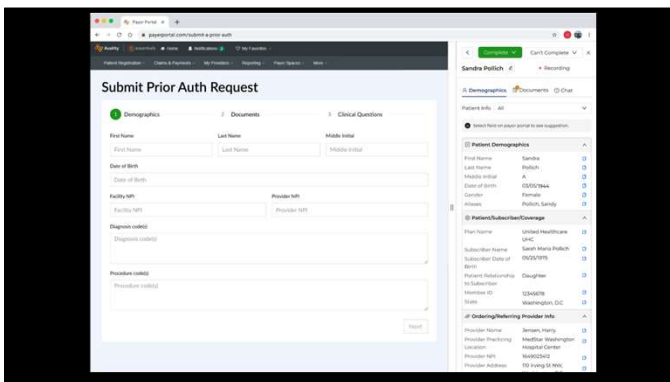
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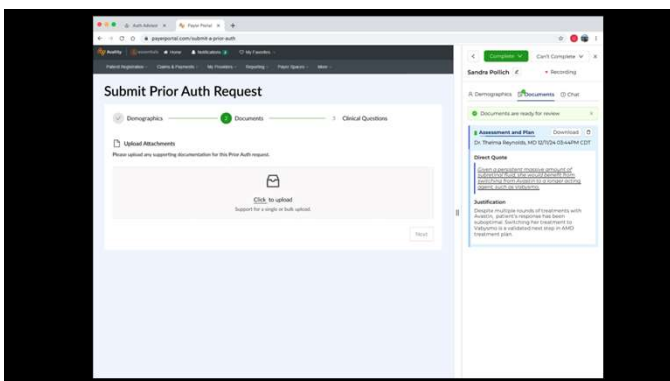
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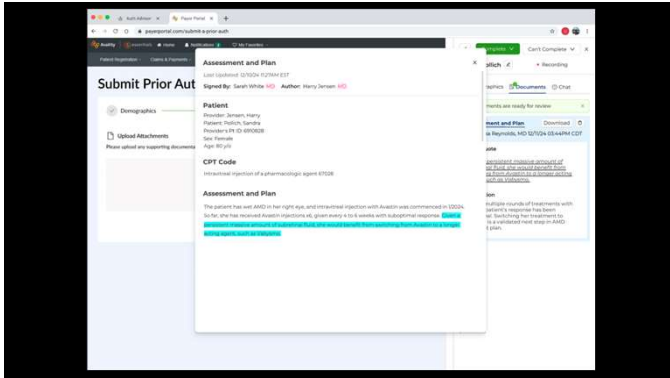
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LLM for prior authorization: lessons learned

Hopkins metrics during pilot:

Improved productivity by 25%

PA with all uploaded documents suggested by LLM: 71%

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Thank you!

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