



Center for Integrated Diagnostics at Massachusetts General Hospital

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I have no conflicts of interest

Member of the CMS Advisory Panel on Clinical Diagnostic Laboratory Tests

PNAS

Loss of the Par-1b/MARK2 polarity kinase leads to increased metabolic rate, decreased adiposity, and insulin hypersensitivity *in vivo*

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Contributed by Lewis C. Cantley, February 8, 2007 (sent for review January 2, 2007)

MOL

Loss of Par-1a/MARK3/C-TAK1 Kinase Leads to Reduced Adiposity, Resistance to Hepatic Steatosis, and Defective Gluconeogenesis¹⁷

Jochen K. Lennerz^{1,2,3,4}, Jonathan B. Hurrova^{2,3,5}, Lynn S. White^{2,8,9}, Katherine T. Lewandowski^{2,8}, Julie L. Prior^{3,8}, G. James Ploner⁴, Robert W. Gereau IV⁵, David Pivnicka-Worms^{3,6,8}, Robert E. Schmidt¹, and Helen Pivnicka-Worms^{1,7,8,9*}

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nature

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LETTERS

A human natural killer cell subset provides an innate source of IL-22 for mucosal immunity

Marina Cella^{1*}, Anja Fuchs^{1*}, William Vermi², Fabio Facchetti², Karel Otero¹, Jochen K. M. Lennerz¹, Jason M. Doherty¹, Jason C. Mills¹ & Marco Colonna¹

nature

Vol 456 | 13 November 2008 | doi:10.1038/nature07416

LETTERS

A key role for autophagy and the autophagy gene *Atg16l1* in mouse and human intestinal Paneth cells

Ken Cadwell¹, John Y. Liu¹, Sarah L. Brown¹, Hiroyuki Miyoshi¹, Joy Loh¹, Jochen K. Lennerz¹, Chieko Kishi¹, Wumesh Kc¹, Javier A. Carrero¹, Steven Hunt¹, Christian D. Stone¹, Elizabeth M. Brunt¹, Rannik J. Xavier², Barry P. Sleckman¹, Ellen Li¹, Noboru Mizushima³, Thaddeus S. Stappenbeck^{1*} & Herbert W. Virgin IV^{1,4*}



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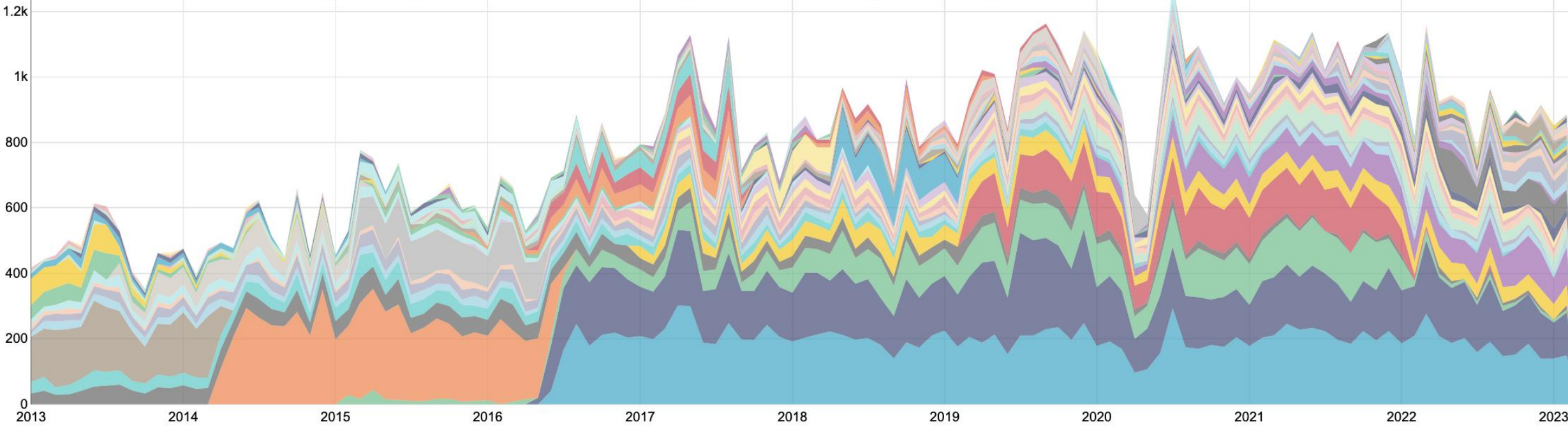
Earth Section

☆ Altered

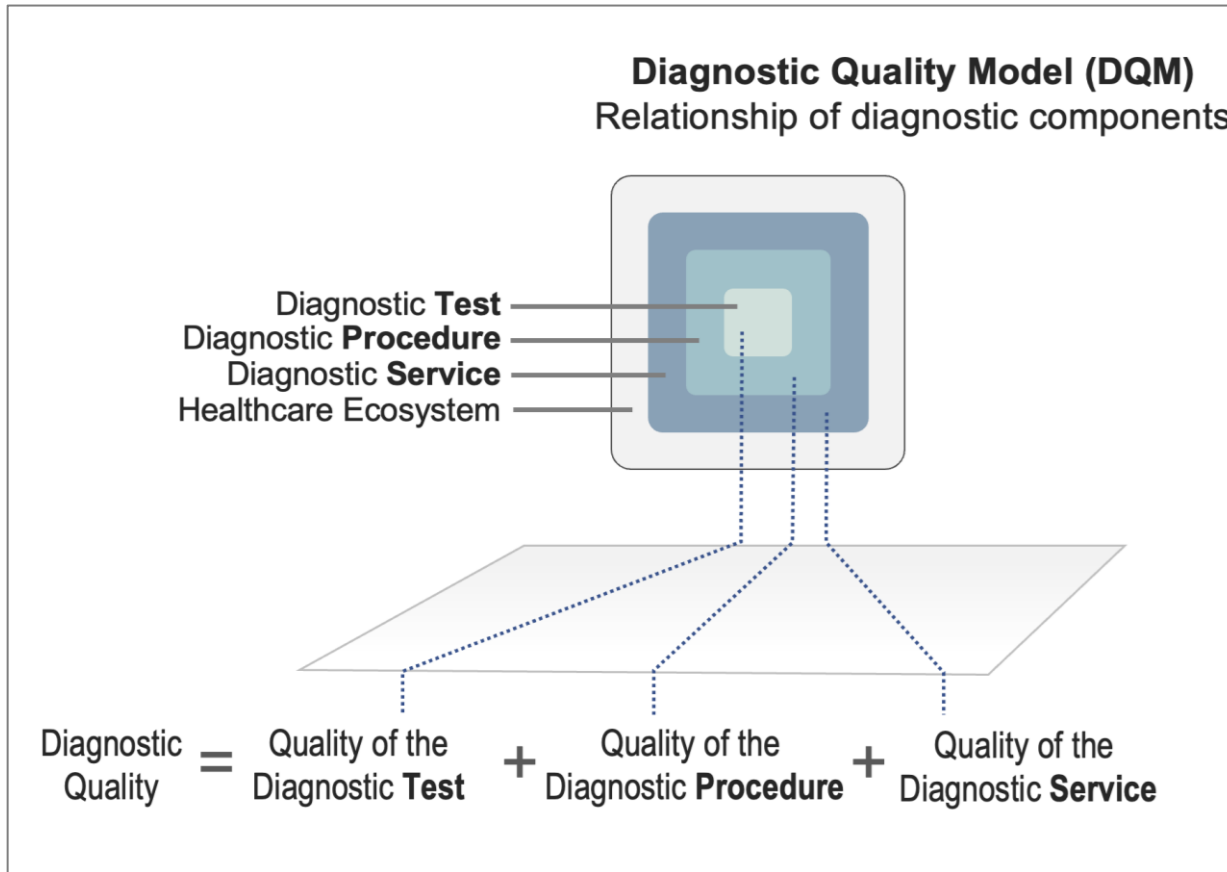
2.27k rows

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- SNAPSHOT-NGS-V2
- HER2 Breast FISH
- Solid Fusion Assay V...
- Sarcoma Fusion Assay...
- Calreticulin
- MLH1
- MSI
- Solid Fusion Assay V...
- BRAF
- NGS cfDNA SNAPSHOT (...)
- NGS cfDNA SNaPshot (...)
- Solid Fusion Assay V...
- EGFR FISH
- JAK2-V617F-CALR
- ALK FISH
- Rapid EGFR Assay
- NGS Heme SNAPSHOT V2
- Heme Fusion Assay V2
- Foundation Medicine
- NGS cfDNA SNAPSHOT (...)
- Tempus
- FLT3-NPM1
- SNaPshot
- Rapid IDH1/2 Assay
- NGS Heme Snapshot V1
- MYC FISH
- Rapid BRAF I/B
- MMR-IHC
- Rapid Fusion I/B
- COVID-19 qPCR
- Rapid KRAS I/B
- NTRK3 Break Apart FI...
- SNAPSHOT-NGS-V1
- HFE
- MSI-IHC
- Genexus NGS v1
- NGS-PGDx-V1 Assay
- JAK2-V617F
- Rapid BRAF V600E/V60...
- 1P19Q FISH
- Natera
- NGS-PGDx-V1 Assay No...
- FGFR2 Break Apart FI...
- MET FISH
- HER2 FISH
- FGFR1 FISH
- CEBPA Genotyping
- Pancreatic Cyst Flui...
- AMP Fusion
- Caris
- Rapid TERT Promoter ...
- Chromosomal Microarr...
- Rapid MYD88
- NGS Heme SNAPSHOT V4
- Heme Fusion Assay V3
- AMP-Translocation V1
- ROS1 FISH
- BCL2 FISH
- PDGFRA FISH
- Heme Fusion Assay V1
- COVID-19 IgM/IgG Rap...
- MDM2 FISH
- FKHR FISH
- NTRK1 FISH
- Chimerism
- MGMT
- NGS Heme SNAPSHOT V3
- Rapid EGFR I/B
- BCL6 FISH
- PIK3CA FISH
- CDKN2A FISH
- RET FISH
- EWSR1 FISH
- NGS cfDNA SNAPSHOT (...)

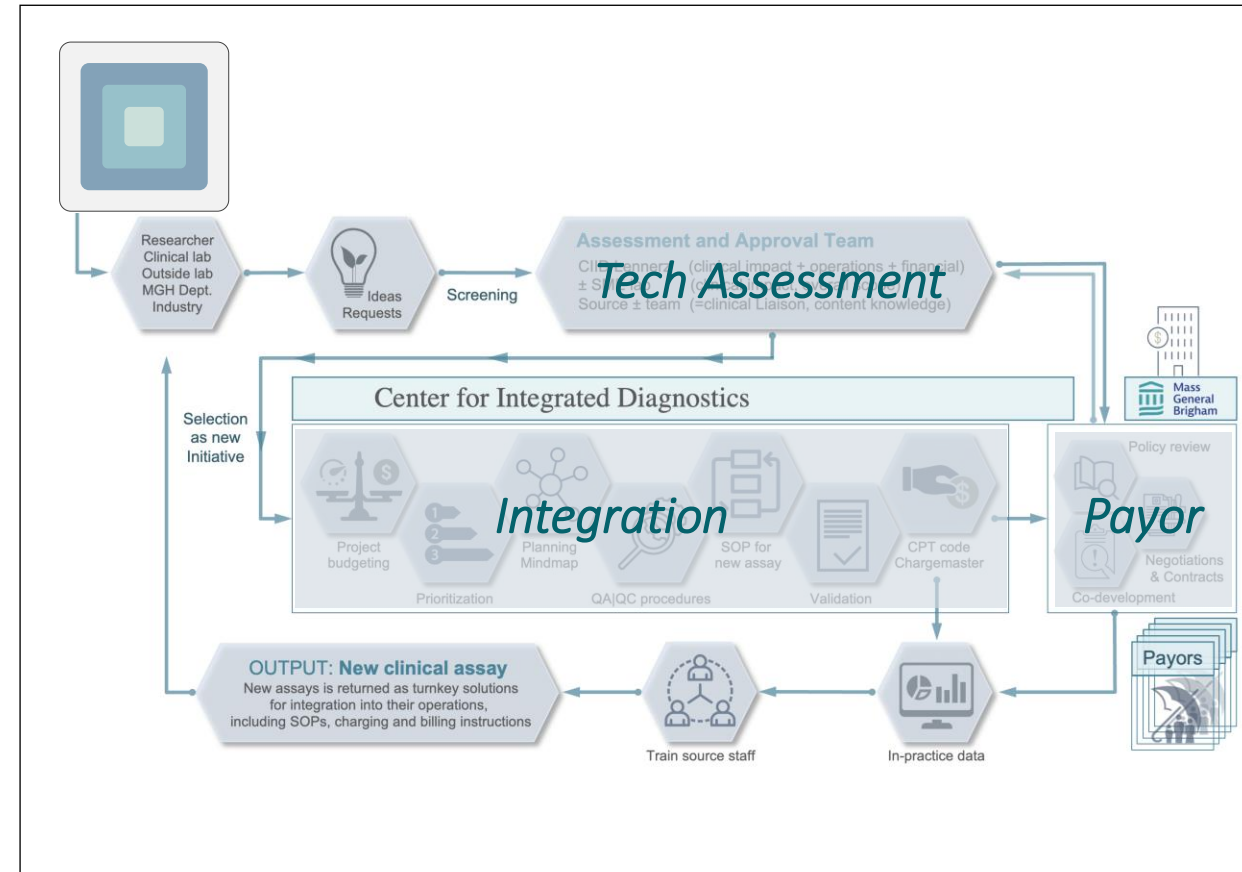


Diagnostic Quality Definition

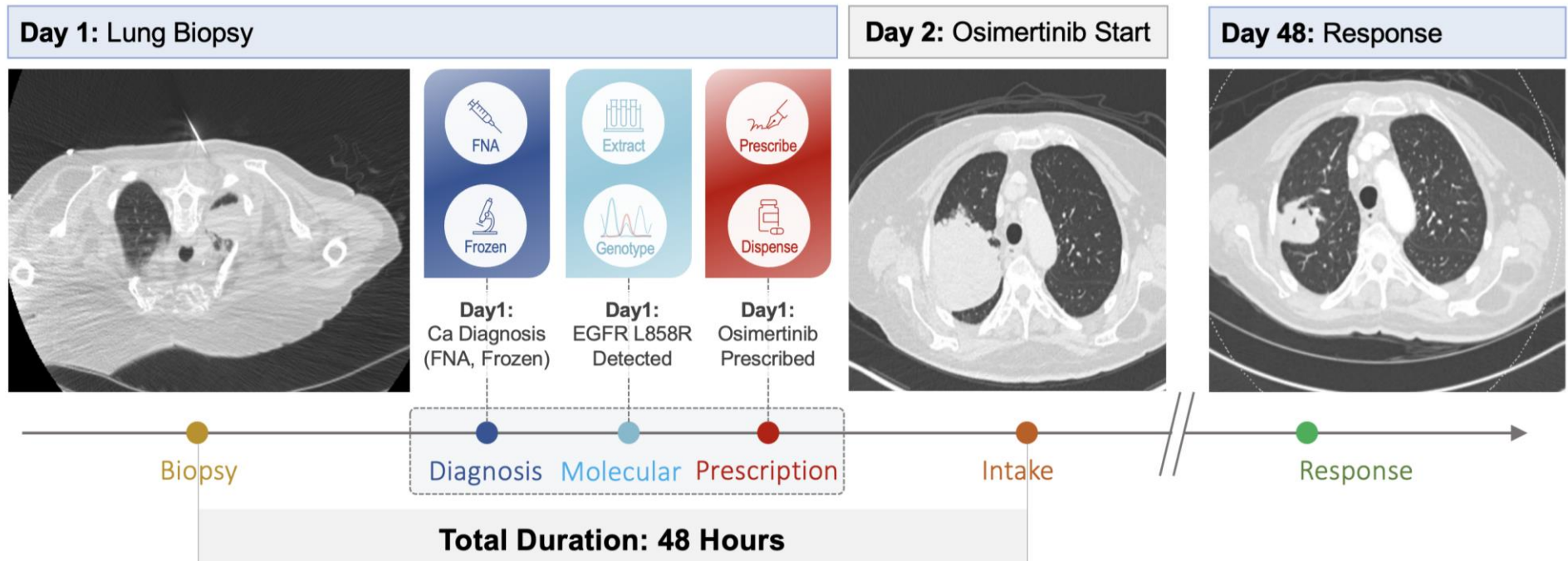


CCLM 2023; PMID: 36696602

Integration Process

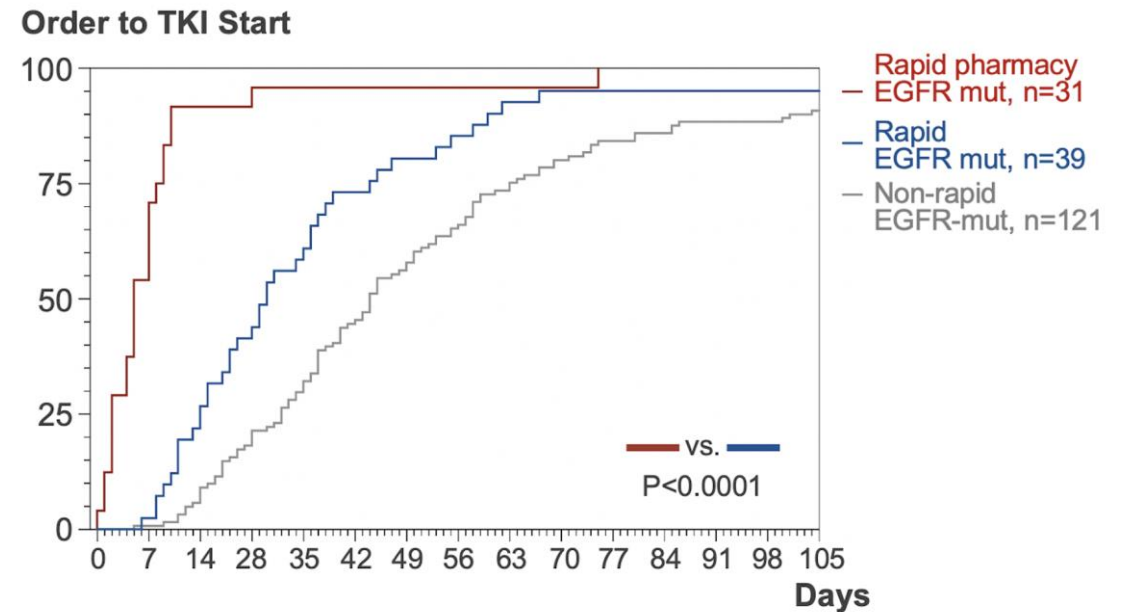


CID-internal, unpublished

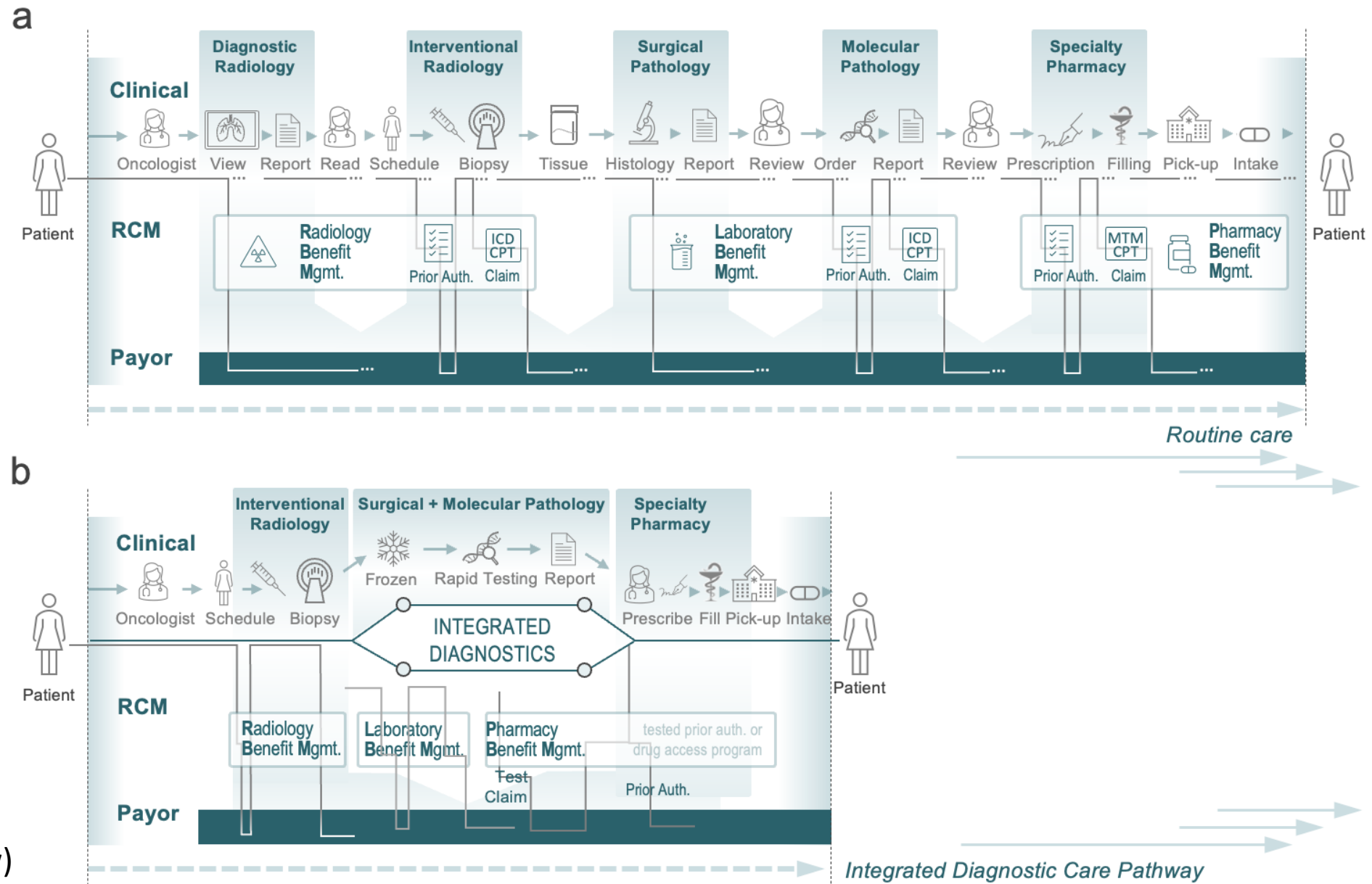


iDX example: Targeted therapy in Lung Cancer

Dagogo-Jack et al., 2023 (in revision)



Workflow comparison



Bredella et al., 2023 (in review)


Proposed iDx Definition

*“Integrated Diagnostics is the
functional alignment of the
meaningful diagnostic and
relevant administrative components
for a specific patient journey”*

iDX Initiatives at MGH

DE GRUYTER

Lennerz et al.: Diagnostic quality model for AI/ML implementation — 5
 Clin Chem Lab Med 2023 <https://doi.org/10.1515/ccim-2022-1151>

- Lung, heme, neuro

- Heart transplant rejection monitoring
- Cross-discipline AI (radiology/pathology)
- Payor “Pathway Pilot”
- Tech assessment
- Consultation service

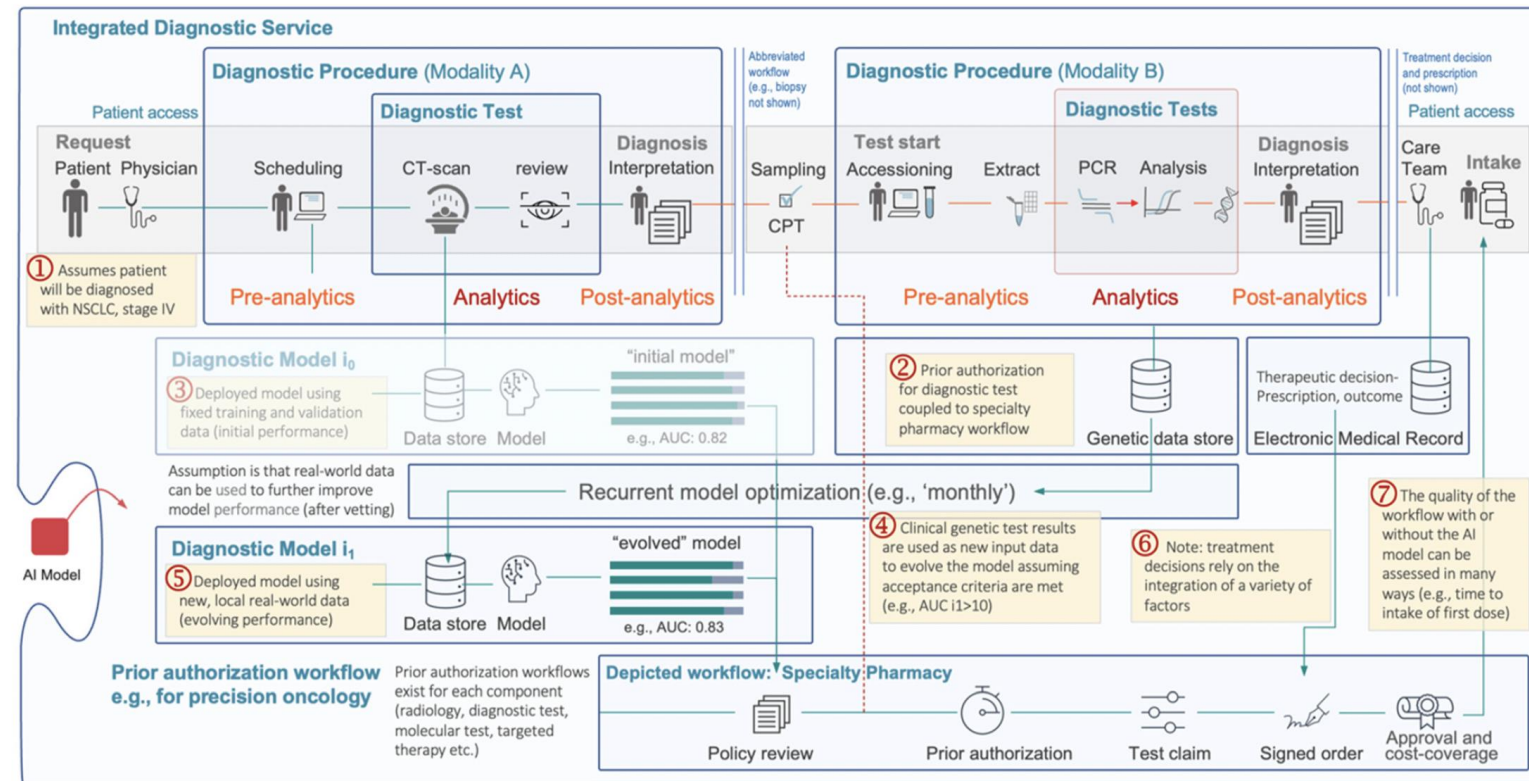


Figure 3: Multimodality workflow. The main aim is to apply the diagnostic quality model to the complexity of a multi-modality learning model. Depicted

Summary iDX at CID (MGH)

Center for Integrated
Diagnostics



iDX is functional and administrative alignment of relevant components

We have come to value

Individuals and interactions *over* processes and tools

Sustainability *over* quick wins

Specific journeys *rather than* general application

Payor operations *in addition to* innovation-driven funding streams

Patient centricity *rather than* solely a scholarly exercise