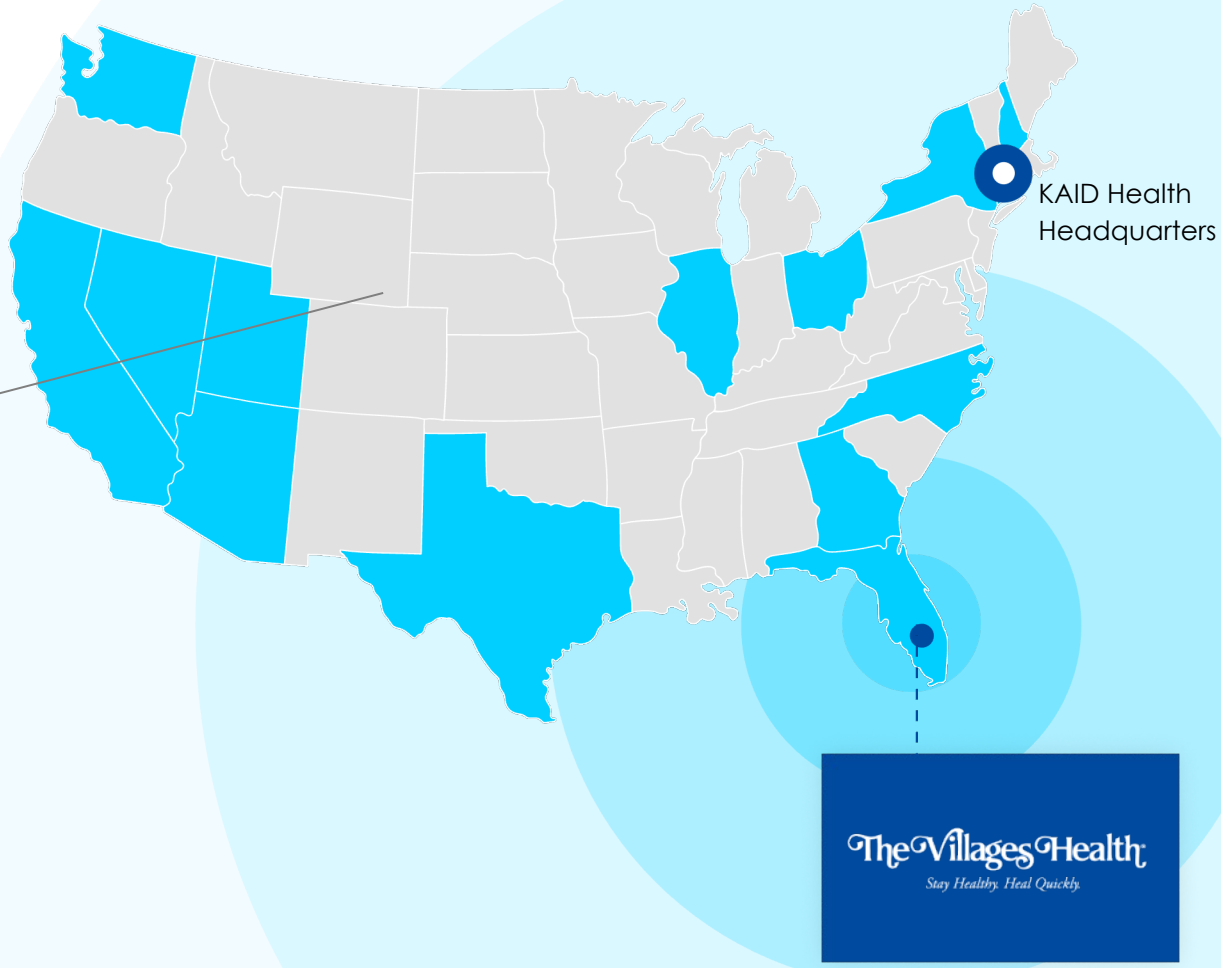
KAIDhealth
Clinical Analytics & Provider Engagement

A little bit of clinical makes the coding go down

How AI Makes Population Health & Revenue Analytics Actionable

KAID Health

HCIT company focused on clinical analytics and provider activation



Used by for profit health systems, Academic Medical Centers, and Managed Care Orgs **touching 10M+ lives**

“Water, water, everywhere,
Nor any a drop to drink”

S. T. Coleridge


“Data, data everywhere,
I think I need a drink”

80 Megabytes of new data per patient per year

EMR Structured Data

Medical Notes

Claims & Payer Data

Conditions

Medications

Labs & Testing

Procedures

SDoHs

Behavioral Health Risks

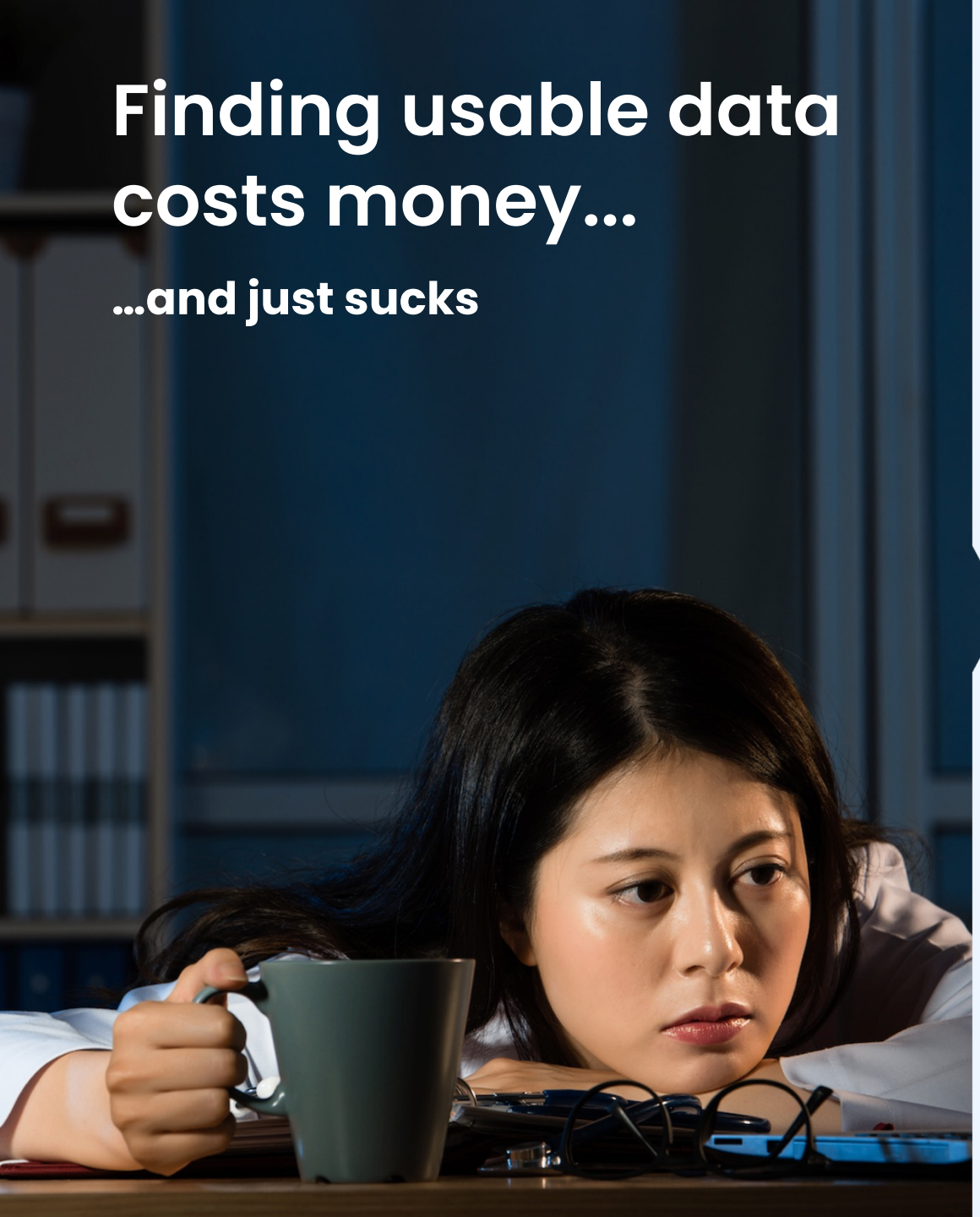
Knowledge Gaps

Treatment Plan

Health Behaviors

Finding usable data costs money...

...and just sucks



The Volume and Cost of Quality Metric Reporting

Preparing and reporting data for these [quality] metrics required an estimated **108,478 person hours**, with an estimated personnel cost of **$5M**

Physician Time Spent Using the Electronic Health Record During Outpatient Encounters

A Descriptive Study

Physicians spent an average of **16 minutes and 14 seconds** per encounter using EHRs, **with chart review [accounting for] 33%...**

Care providers cannot get the patient insights they need…

- Buried in the PETABYTES of EMR data
- Multiple formats spread over multiple systems
- Much of the "good stuff" is in text and images

“In the land of the blind, the one-eyed man is king…”

Erasmus of Rotterdam


“In the land of the blind, the one-eyed man is king... AI opens at least one eye for chart review”

The promise of AI for chart review…

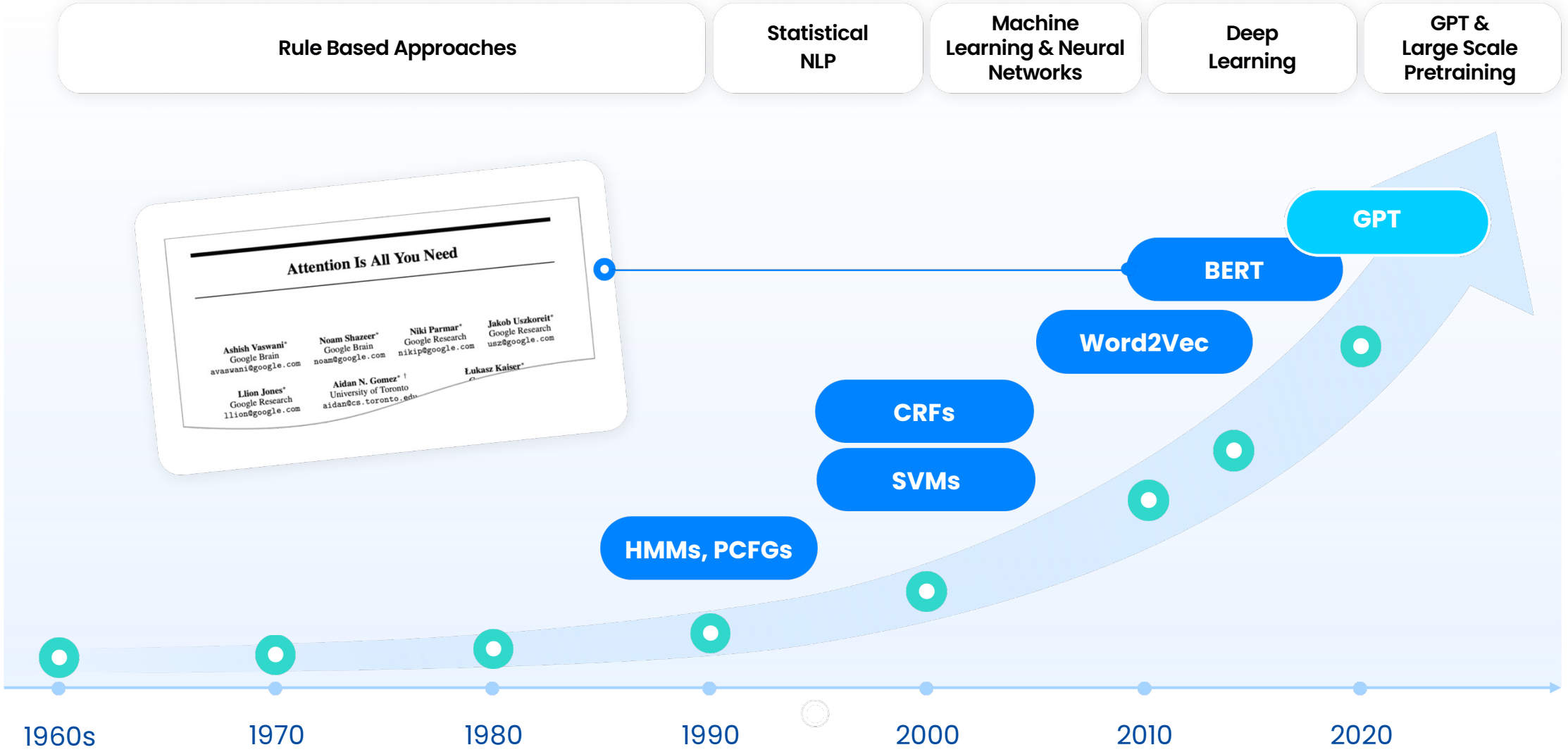
01 **Consistent**

02 **Accurate**

03 **Unbiased**

! 04 **Cheaper**
& thus it can be “always on”

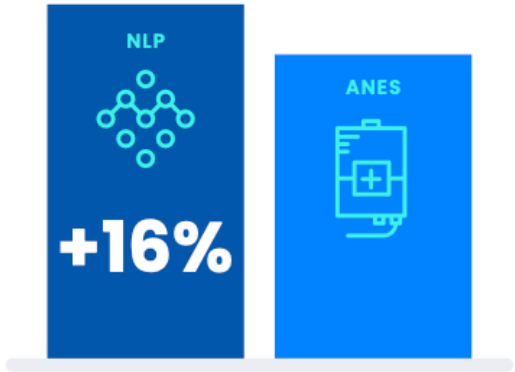
NLP is not new, but it is a whole lot better



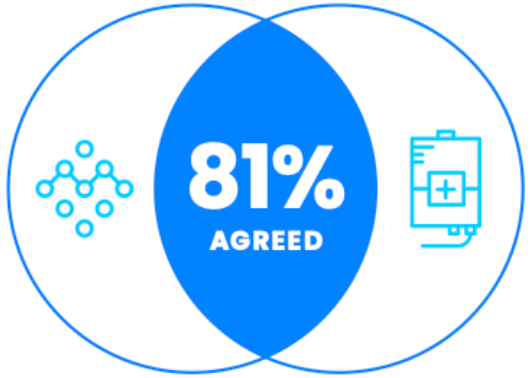
UC San Diego Health

AI beating doctors for pre-op chart review

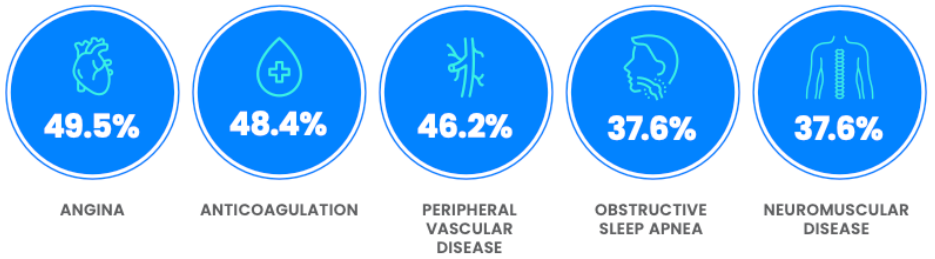
NLP Engine captured more than **16%** of critical medical conditions **not found by an anesthesiologist**



NLP pipeline and anesthesiologist **agreed in over 81%** of instances on the presence of medical conditions



Additional cases the **NLP pipeline captured that the anesthesiologist did not** include:



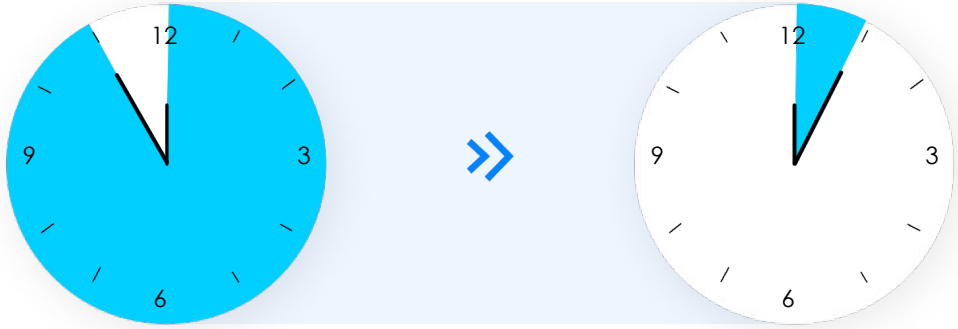
Identification of Preanesthetic History Elements by a Natural Language Processing Engine
Harrison S Suh, Jeffrey L Tully, Minhthy N Meineke, Ruth S Waterman, Rodney A Gabriel
Anesth Analg. 2022 Dec 1;135(6):1162-1171

Saving time for select activities

Real World Examples

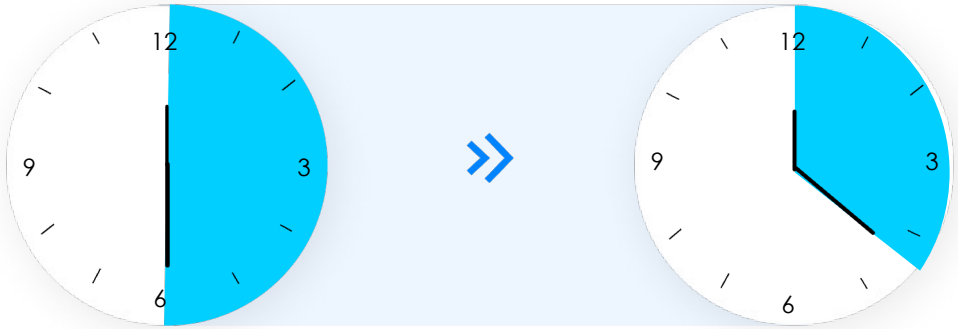
HCC coding review…

Reduced average time for a chart review **from 55 minutes to 9 minutes**



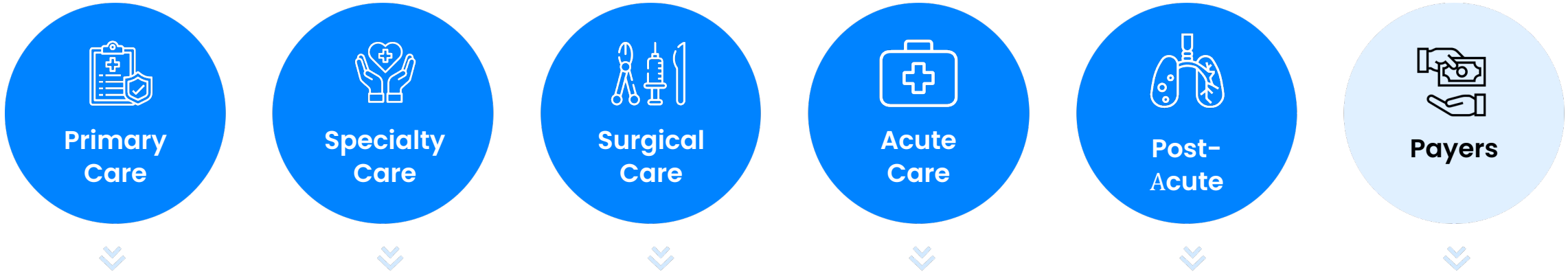
Oncology prior auth review…

Average to review an oncology chart **reduced by 21%**, which is transformative for this labor-intensive business



Source: Analysis by KAID Health Customers

Better chart review can help a lot of people a lot



- Billing & coding
- Visit prep
- Patient stratification
- Care standardization

- Care transitions
- Care management
- Risk management
- Clinical trail enrollment

- Risk Adjustment / HCC
- Prior Authorization
- Quality Review

Why AI-supported chart review not ubiquitous, *yet*

Hard to get the data

Hard to understand the data

Hard to make it helpful

Today's Focus

“

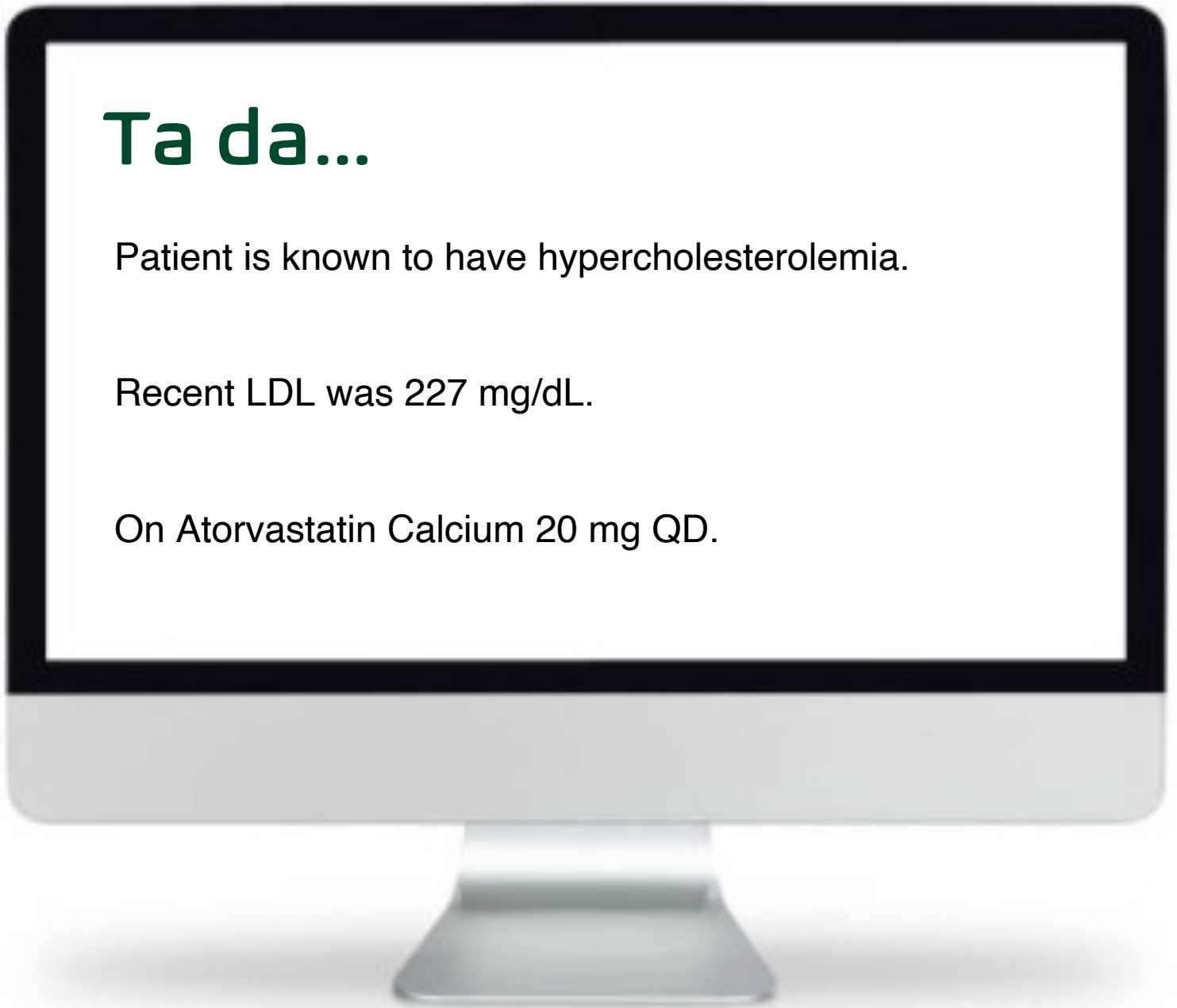
“The good physician treats the disease; the great physician treats the patient who has the disease.”

”

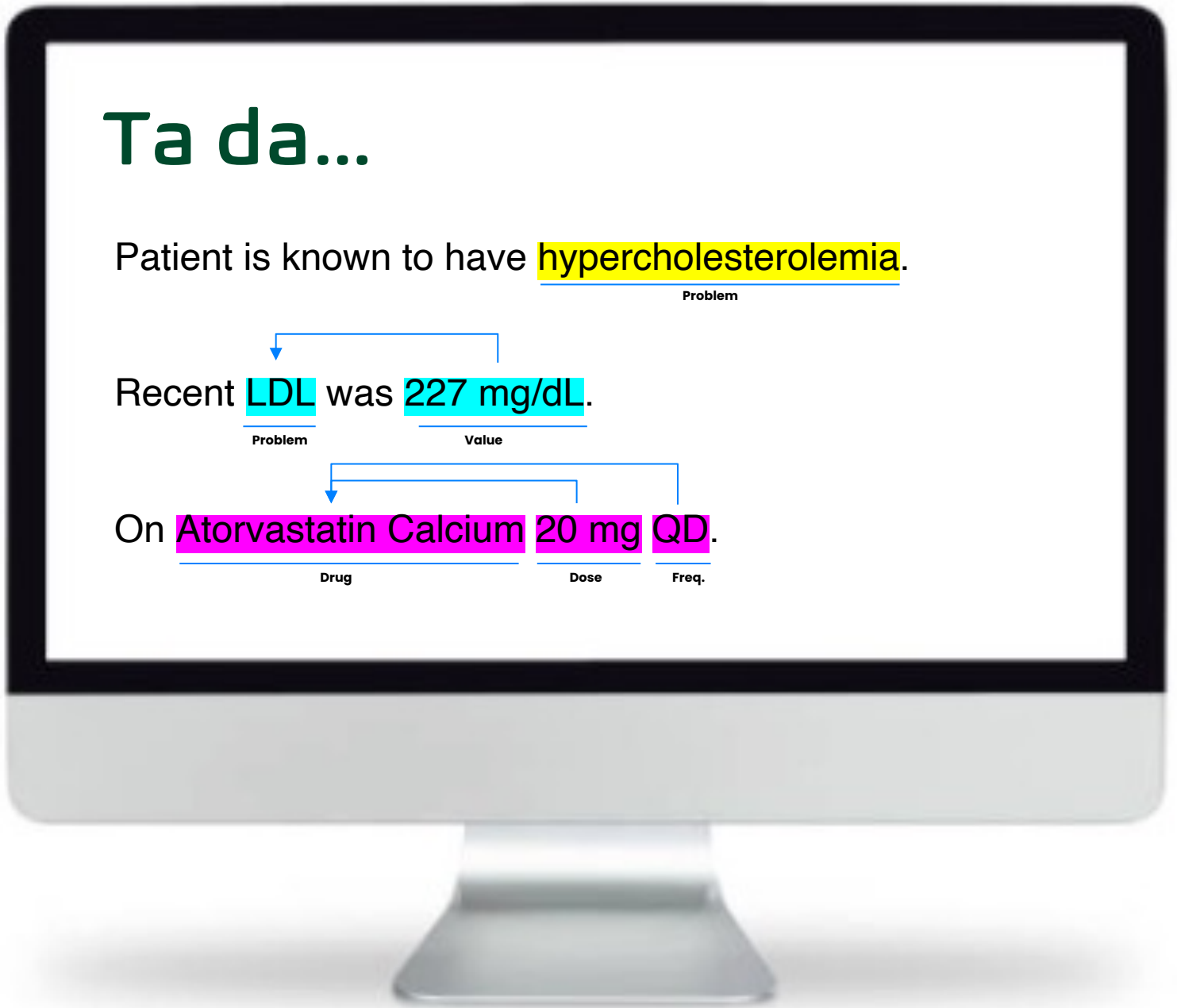
Dr. William Osler


“Good AI understands what diseases are in the patient’s charts, great AI understands the patient.”

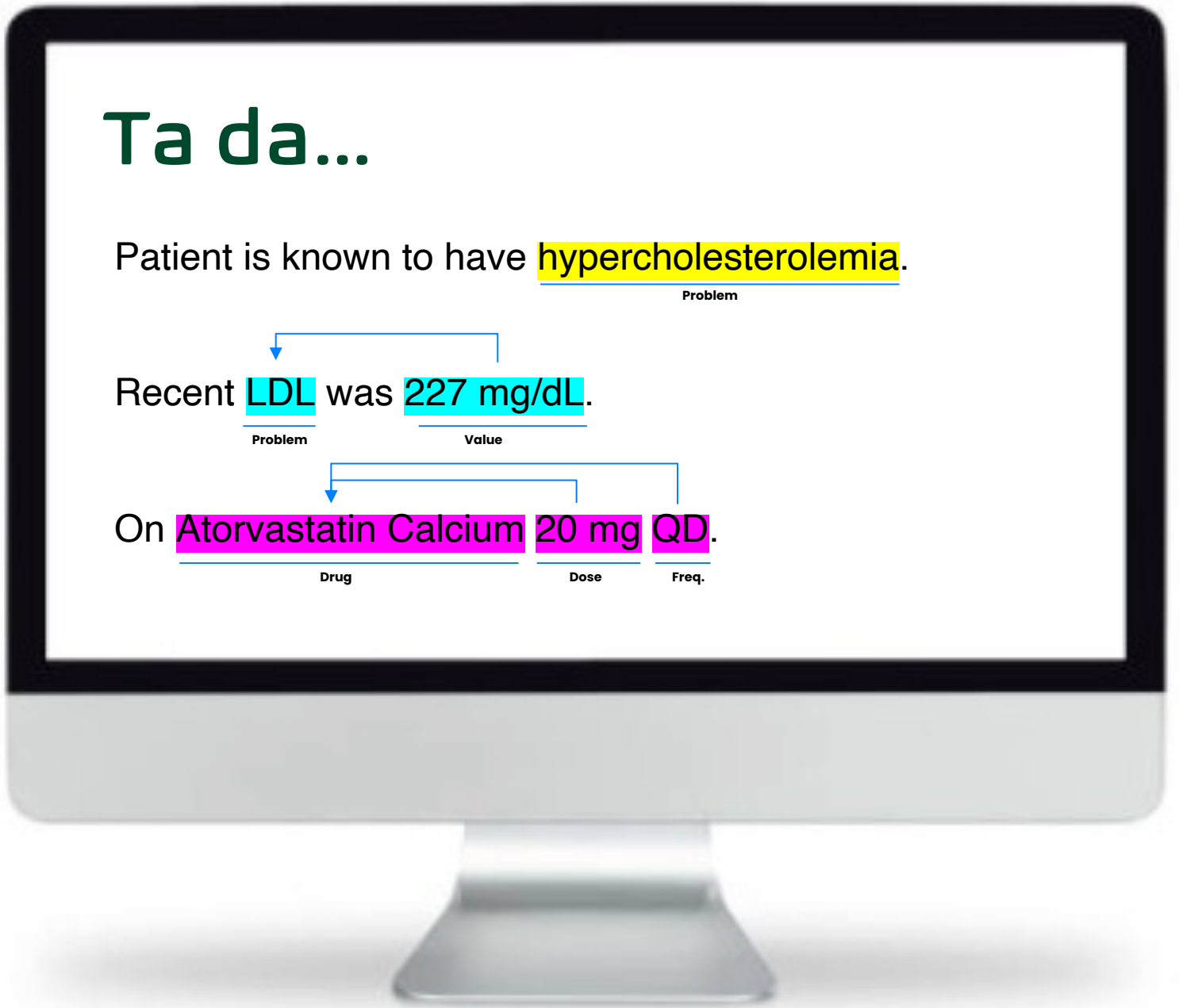
NLP seems easy



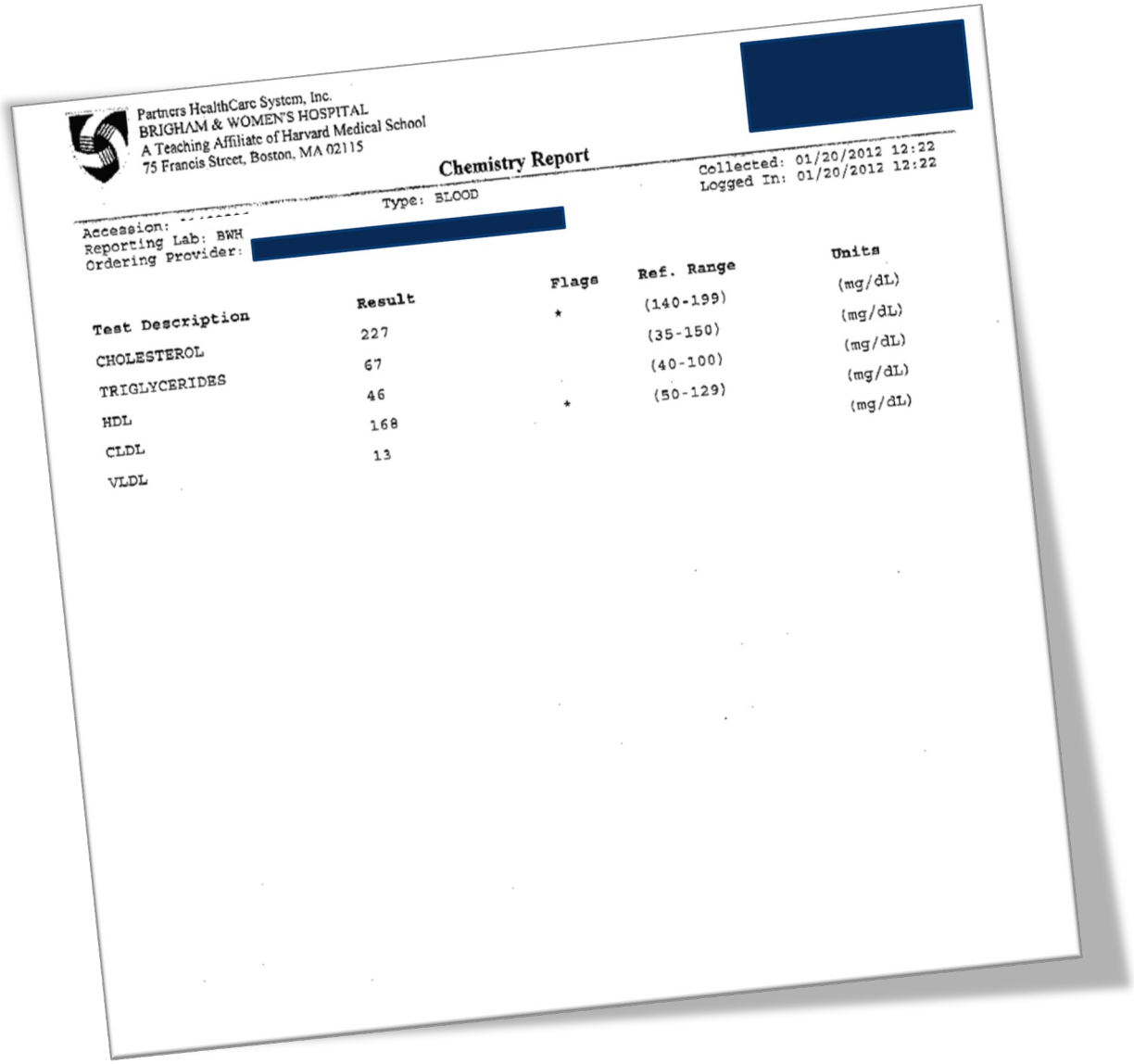
NLP seems easy



NLP seems easy
at least during the demo



A little harder on real world data



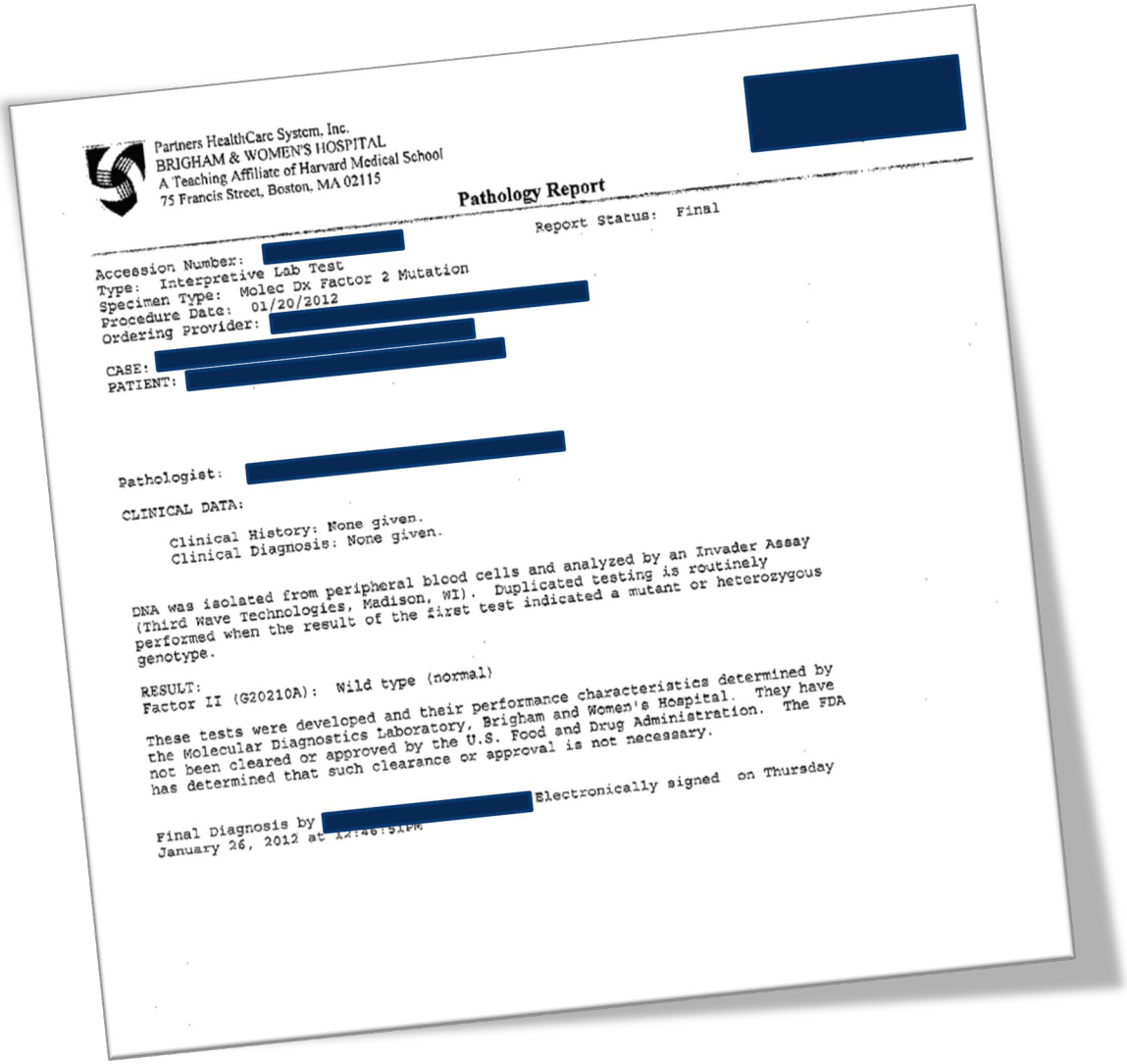
Partners HealthCare System, Inc.
BRIGHAM & WOMEN'S HOSPITAL
A Teaching Affiliate of Harvard Medical School
75 Francis Street, Boston, MA 02115

[redacted]

Chemistry Report

Accession: [redacted]
Type: BLOOD
Collected: 01/20/2012 12:22
Logged In: 01/20/2012 12:22
Reporting Lab: BWH
Ordering Provider: [redacted]

Test Description	Result	Flags	Ref. Range	Units
CHOLESTEROL	227	*	(140-199)	(mg/dL)
TRIGLYCERIDES	67		(35-150)	(mg/dL)
HDL	46		(40-100)	(mg/dL)
CLDL	168	*	(50-129)	(mg/dL)
VLDL	13			(mg/dL)



Partners HealthCare System, Inc.
BRIGHAM & WOMEN'S HOSPITAL
A Teaching Affiliate of Harvard Medical School
75 Francis Street, Boston, MA 02115

[redacted]

Pathology Report

Report Status: Final

Accession Number: [redacted]
Type: Interpretive Lab Test
Specimen Type: Molec Dx Factor 2 Mutation
Procedure Date: 01/20/2012
Ordering Provider: [redacted]
CASE: [redacted]
PATIENT: [redacted]

Pathologist: [redacted]

CLINICAL DATA:

Clinical History: None given.
Clinical Diagnosis: None given.

DNA was isolated from peripheral blood cells and analyzed by an Invader Assay (Third Wave Technologies, Madison, WI). Duplicated testing is routinely performed when the result of the first test indicated a mutant or heterozygous genotype.

RESULT:
Factor II (G20210A): Wild type (normal)

These tests were developed and their performance characteristics determined by the Molecular Diagnostics Laboratory, Brigham and Women's Hospital. They have not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary.

Final Diagnosis by [redacted] Electronically signed on Thursday
January 26, 2012 at [redacted]

Data used with permission of the patient

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

Complexity of medical text

Acronyms

“dx of **HL** in 2021”

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

Complexity of medical text

- **Acronyms**
  - “dx of **HL** in 2021”
  - “Refer to audiology”

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

Complexity of medical text

Acronyms

“dx of **HL** in 2021”

“On Lipitor®”

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

Complexity of medical text

Acronyms

“dx of **HL** in 2021”

“In remission since…”

“Understanding” a real chart is different…

General data quality

- Document readability
- Document layout
- Poor/no sentence structure
- Tables and figures
- Spelling errors
- Missing pages

And much more…

Complexity of medical text

Patient Attribution
”patient is **smoker**” vs. “mother is **smoker**”

Synonymy
“**T2DM**,” “**Adult Onset Diabetes**”, & “**the Sugars**”

Negation
“pertinent negatives include blurred **vision, headaches, malaise**”

Relationships
“**Metformin** for **PCOS** is also addressing **hyperglycemia**”

Uncertainty
“ddx considered, but not limited to: **pna, covid, bronchitis**…”

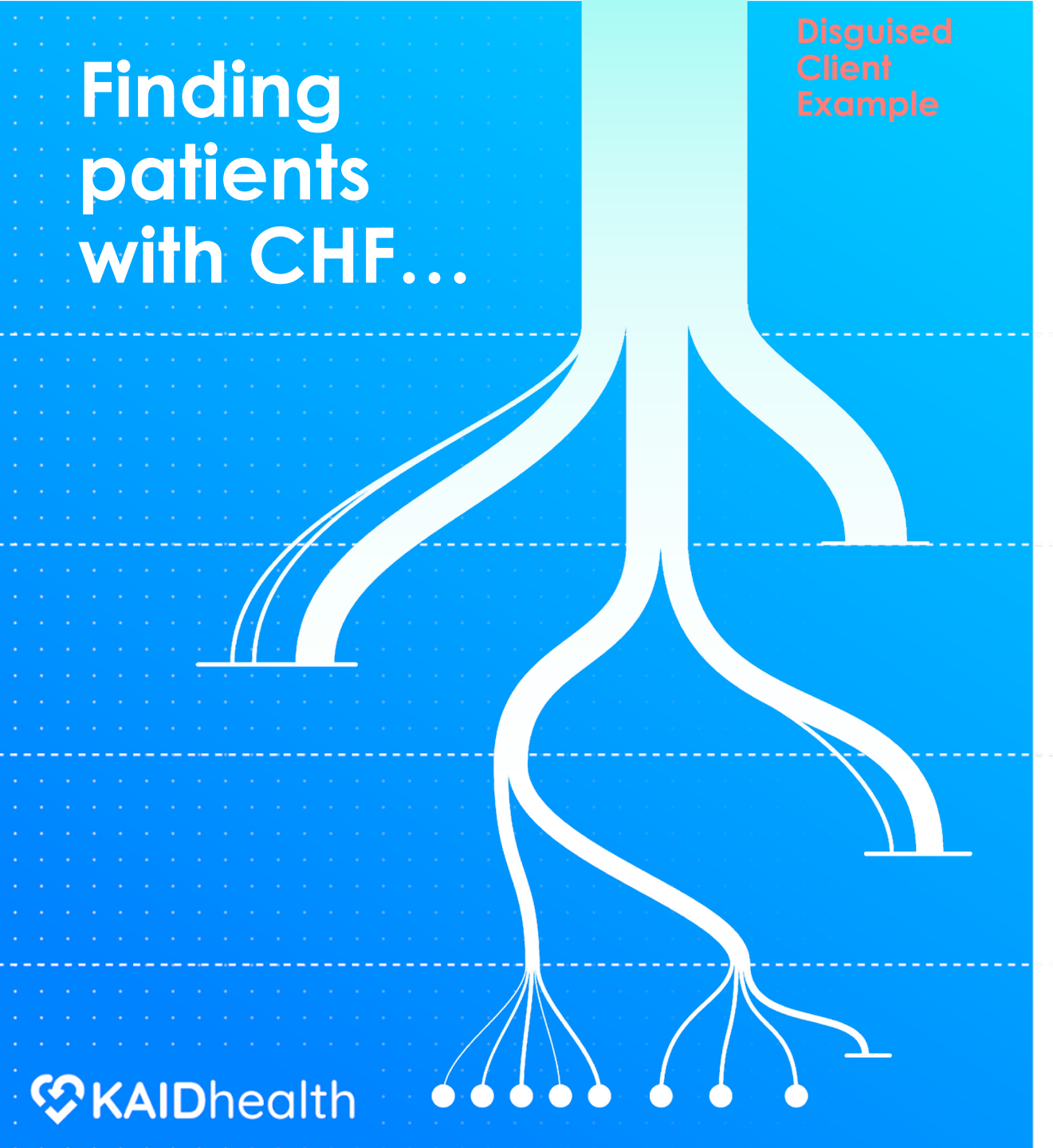
Templated text
“**CHF:** ” or “Patients with **obesity** at risk for **joint pain**…”

Acronyms
“dx of **HL** in 2021”

Ambiguous terms
“**Cortical atrophy**”

Finding patients with CHF…

Disguised Client Example



KAIDhealth

Accepts all data types

10,000 records in our search for CHF
Claims + EMR + Medical Notes from two sources

Aggregates similar concepts

441 different phrases found in notes describing heart failure

Finds all patients

977 patients with at least one phrases found in their notes

Ignores the “noise”

320 patients found with affirmative mention of CHF

Finds additional context

108 others found from lab/radiology findings

Three ways to change provider behavior…

01

Pay them money

Three ways to change provider behavior…

01

Pay them money

02

Save them time

Three ways to change provider behavior…

01

Pay them money

02

Save them time

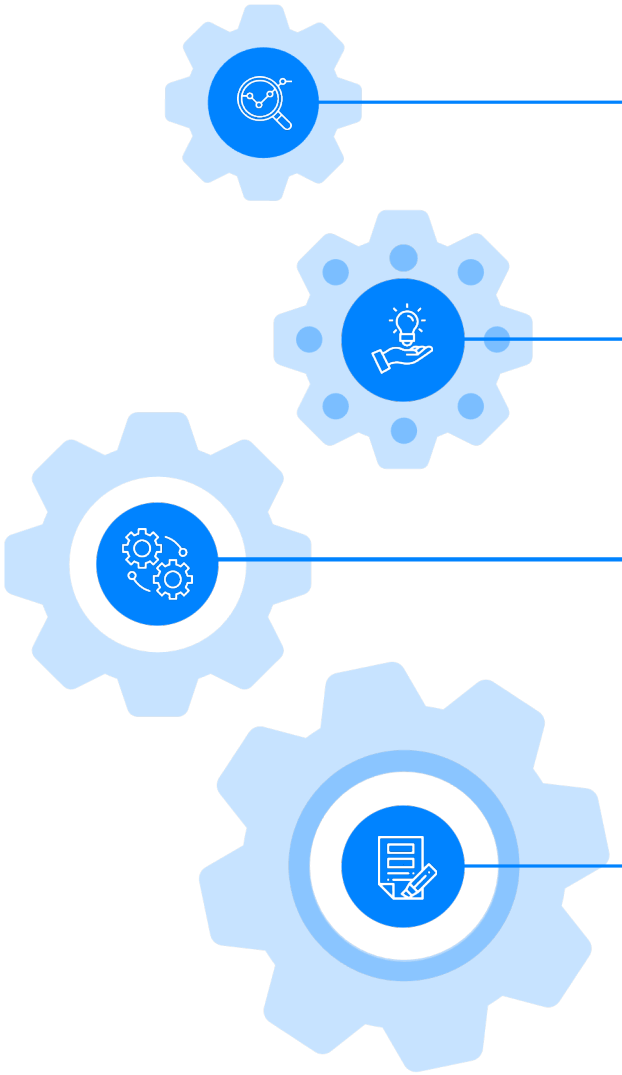
03

Marry them

…and really only two of these work at all

Source: Personal experience over 20 years in healthcare, and 13 years married to a doctor

For the analytics to be used, it has to be useful



NLP Model Accuracy & Precision

Using Structured Data Along Side NLP

Allowing each customer to define clinical rules

KAID's "Strength of Evidence" Score

Proprietary AI solution to rate each NLP finding in terms of overall utility to defining the patient

Multilevel AI for chart review

“

“It takes a village to raise a child ”

”

Bantu Proverb


“It takes a village to raise a child, but once grown, the children can have lots of fun at The Villages®”

A one-of-a-kind place

The Basics

140K Villagers (including 20K veterans)
51 square miles
250 new homes sold monthly

Community

3 Town Centers,
all with dancing every night
3,600 community organized clubs
100 tennis & **200** pickle ball courts,
& a polo field

Golf

729 golf holes
4M rounds played annually
60K "Golf Cars"

SOURCE: Insidethebubble.net, accessed on Oct 31, 2022, https://www.insidethebubble.net/the-villages-cool-facts/

The Villages Health®

Stay Healthy. Heal Quickly.

Patient-centric | **Primary care-driven** | **Community-based**

Structure

- Multi-specialty, employed group
- 26K (50%) of patients fully capitated
- ASC, employed-hospitalists

Systems

- Single ambulatory EMR (Athena®, transitioned in 2018 from eCW)
- Experience with off-the-shelf claims based-analytics as well as NLP
- Extensive chart review and visit preparation infrastructure

The Problem...

Insights buried within unstructured patient information from a past EMR was needed to improve care efficiency, clinical efficacy, and revenue capture, especially past diagnoses.

Revenue | **Cost** | **Quality**

- **Assure all captured and manage all diagnoses**
- **Act early on quality HEDIS® & other quality metrics**
- **Improve quality of patient care with increased revenue and reduced cost of care**

What only KAID's Modular SaaS can do. . .

&

Whole Chart Analysis™

Medical Notes | EMR Data | Claims Data

Empowering care teams

Integration | Workflow | Incentives

KAID's A.I. Centric Whole Chart Analysis™...

By analyzing hundreds of pages of medical text and thousands of rows of data in seconds

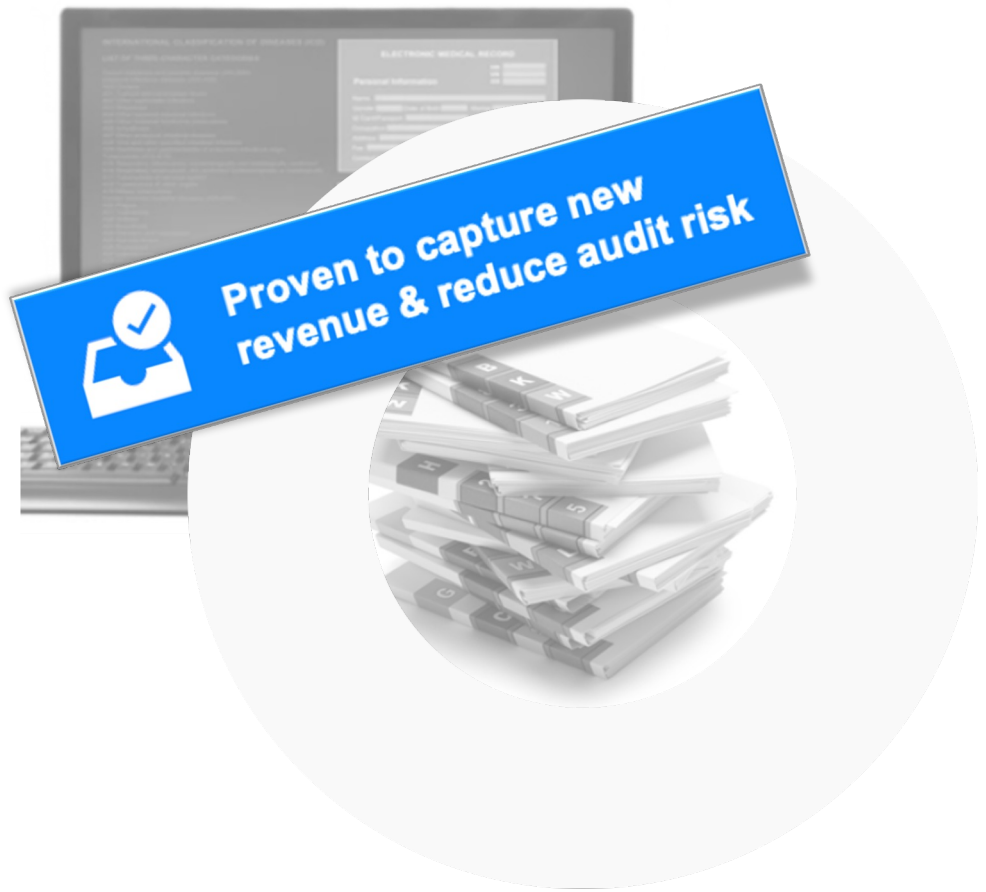
- Creates more complete & accurate coding
- Addresses care quality & safety issues
- Summarizes the entire patient for care team
- Ensures costly treatments used appropriately

KAID's A.I. Centric Whole Chart Analysis™...

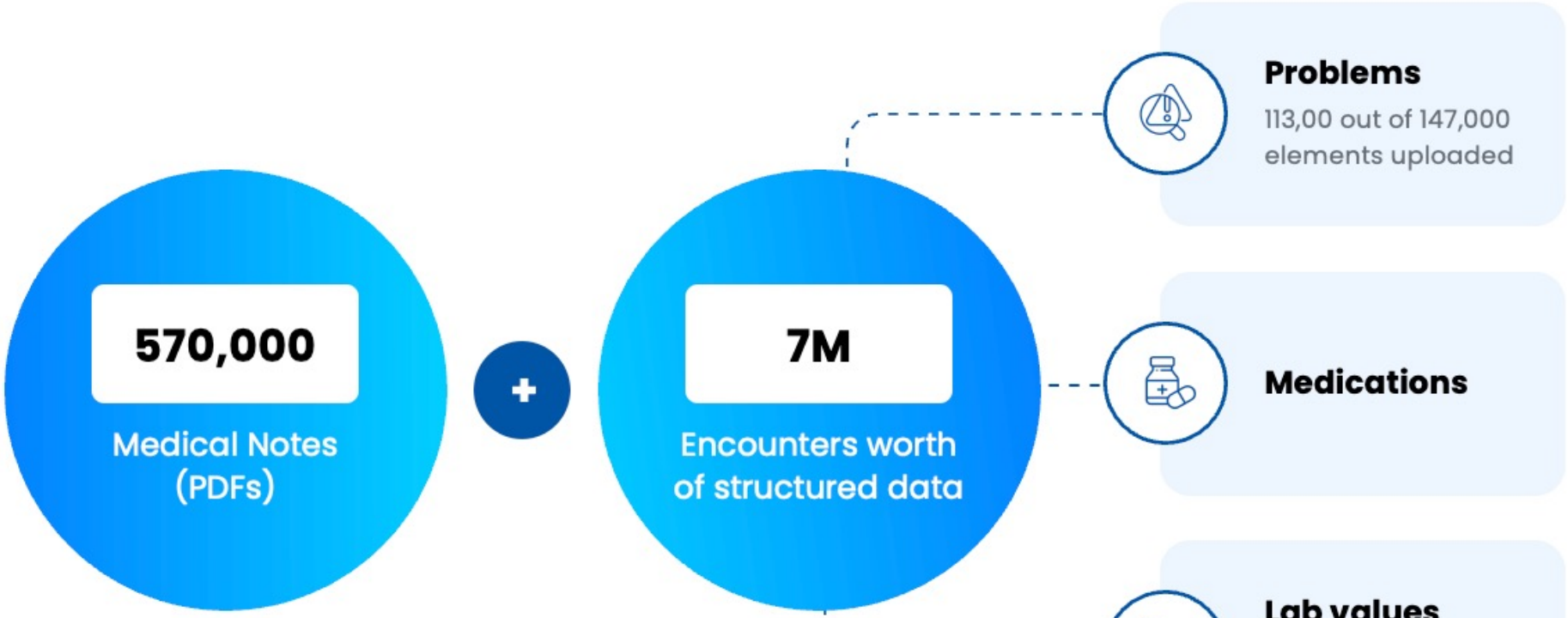
By analyzing hundreds of pages of medical text and thousands of rows of data in seconds

- Creates more complete & accurate coding
- Addresses care quality & safety issues
- Summarizes the entire patient for care team
- Ensures costly treatments used appropriately

Out-of-box retro- and prospective HCC coding



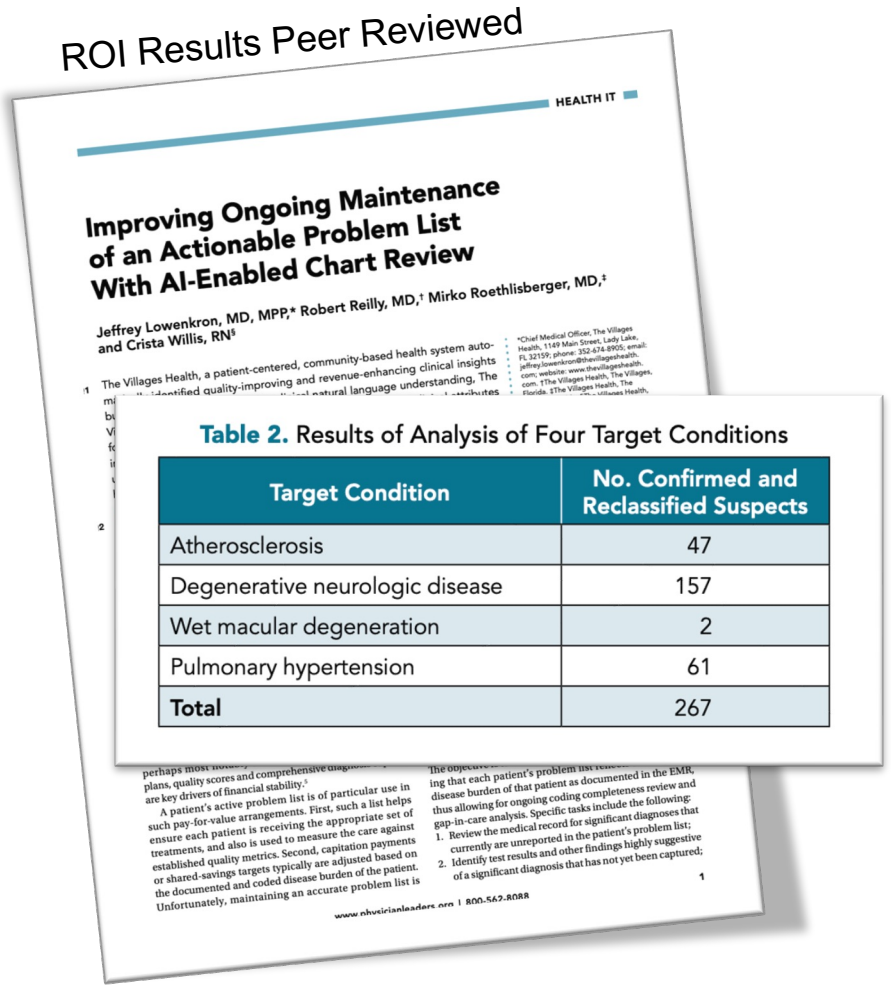
The Data Processed – 1st Pass



Almost all PDFs that were attempted to upload were processed. Structured data elements were rejected if they were (i) duplications, (ii) uncoded or coded with an unsupported code, (iii) mis-formatted

New Revenues for TVH with less audit risk

ROI Results Peer Reviewed



HEALTH IT

Improving Ongoing Maintenance of an Actionable Problem List With AI-Enabled Chart Review

Jeffrey Lowenkron, MD, MPP,* Robert Reilly, MD,† Mirko Roethlisberger, MD,‡ and Crista Willis, RN§

Table 2. Results of Analysis of Four Target Conditions

Target Condition	No. Confirmed and Reclassified Suspects
Atherosclerosis	47
Degenerative neurologic disease	157
Wet macular degeneration	2
Pulmonary hypertension	61
Total	267

15% Percent patients TVH was able to identify accurate suspect

$9 PMPM Increased reimbursement in first 4 months alone

↑ Data Supporting better management of chronic conditions

“KAID gives TVH the best opportunity to enhance outcomes”

Jeffrey Lowenkron, MD, MPP

CMO of The Villages Health

“He went to Paris, looking for answers, to questions that bothered him so...”

James “Jimmy” Buffet

Rest in peace


“Here comes AI, providing the insights, to questions that bother us so...”

KAIDhealth

Harnessing the power of AI to ensure all patient data cost-effectively supports high-quality, profitable patient care.

Contact Info

Additional Slides

One size does NOT fit all for EMR data exchange

→ Getting Data

EMR Interface (HL7, FHIR)
Data Ingestion API
Batch File Transfer
Manual Upload

← Sharing Insight

EMR Interface (HL7, FHIR)
Direct Messaging
Data Export API
User Interfaces
Data Exports
Analytic Environment

Out of box HCC optimization…

- Ready to use, fully-customizable, HCC suspecting rules
- Employed for retrospective and prospective analysis
- Automates coding accuracy reviews and audits
- NLP model optimized for risk-adjustment elements
- Supports both v24 (2020) and v28 (2024) models
- Proven to improve coding, AT SCALE, in multiple settings