



Automation to Augmentation: AI in Oncology Care

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Disclosure

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Financial Relationships

The presenter has no relevant financial relationships with companies to disclose.



AI Transparency Statement

Artificial intelligence tools assisted in organizing content and developing graphics.

All clinical recommendations, literature review, interpretation, and final content were independently reviewed and verified by the presenter.

Learning Objectives

By the end of this session, participants should be able to:



Differentiate automation, augmentation, and agentic AI



Recognize current AI applications throughout oncology care

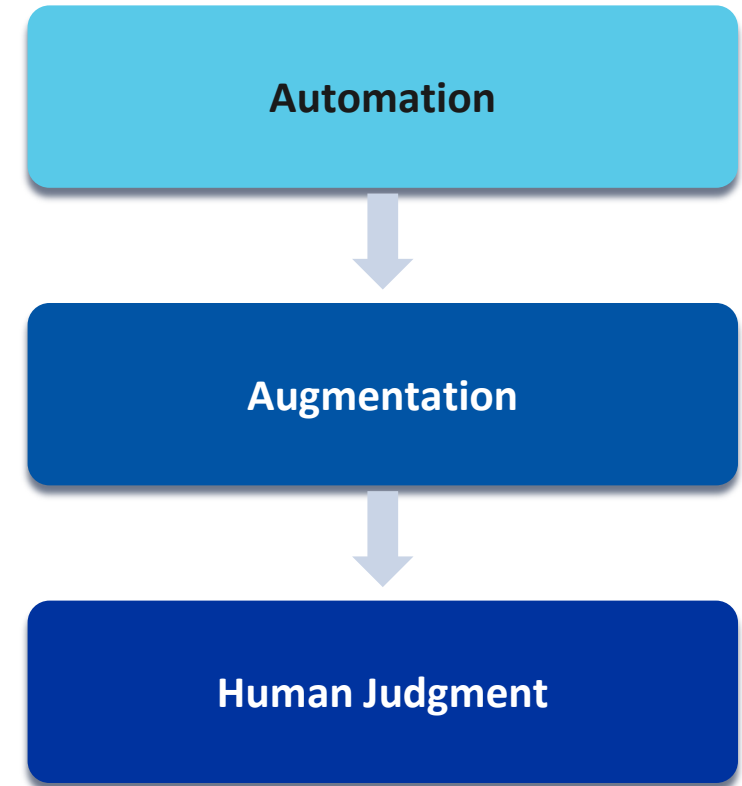


Evaluate opportunities and limitations of AI for oncology pharmacists



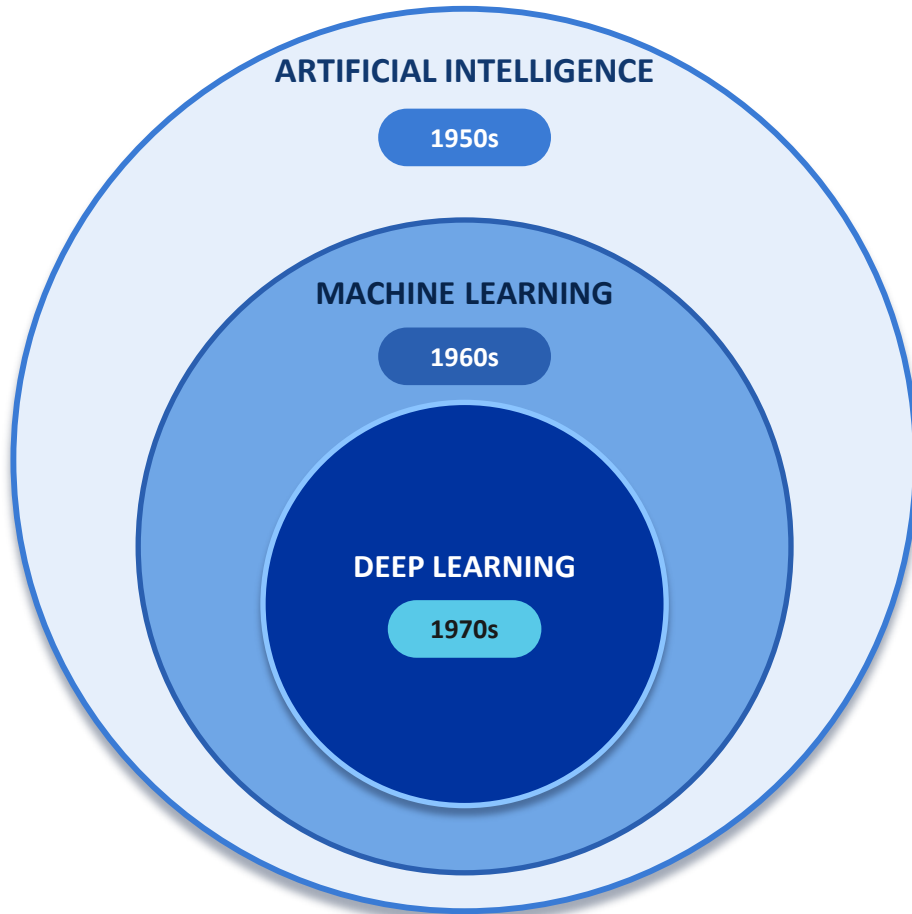
Apply principles for safe implementation of AI in clinical practice

THE THROUGH-LINE



Artificial Intelligence, Machine Learning & Deep Learning

The Russian-doll model — each one nests inside the last



1

Artificial Intelligence · since 1950s

Simulating human intelligence in machines — the aim is to build machines that can think like humans.

The whole field · a subset of data science

2

Machine Learning · since 1960s

Machines learn from data to make decisions without being explicitly programmed for each task.

A subset of Artificial Intelligence

3

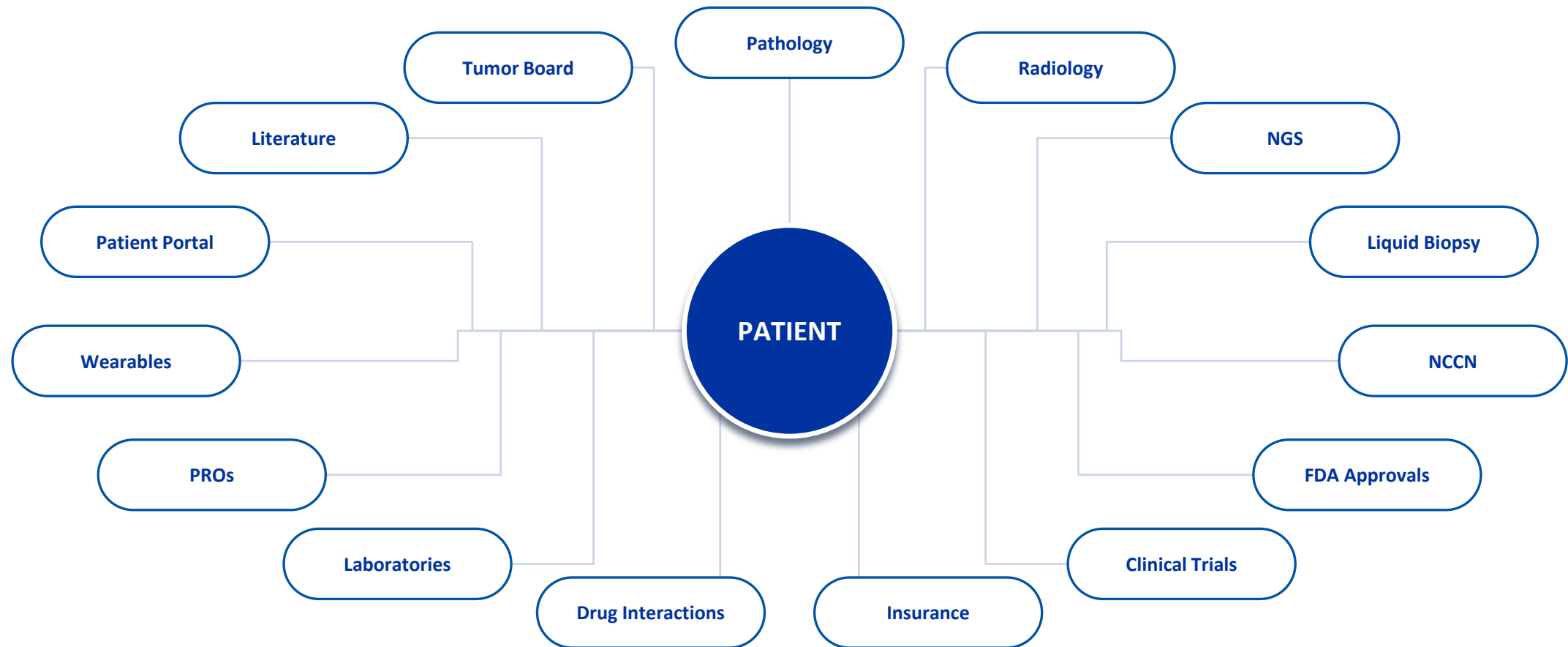
Deep Learning · since 1970s

Uses artificial neural networks to automatically discover patterns and solve complex problems.

A subset of Machine Learning

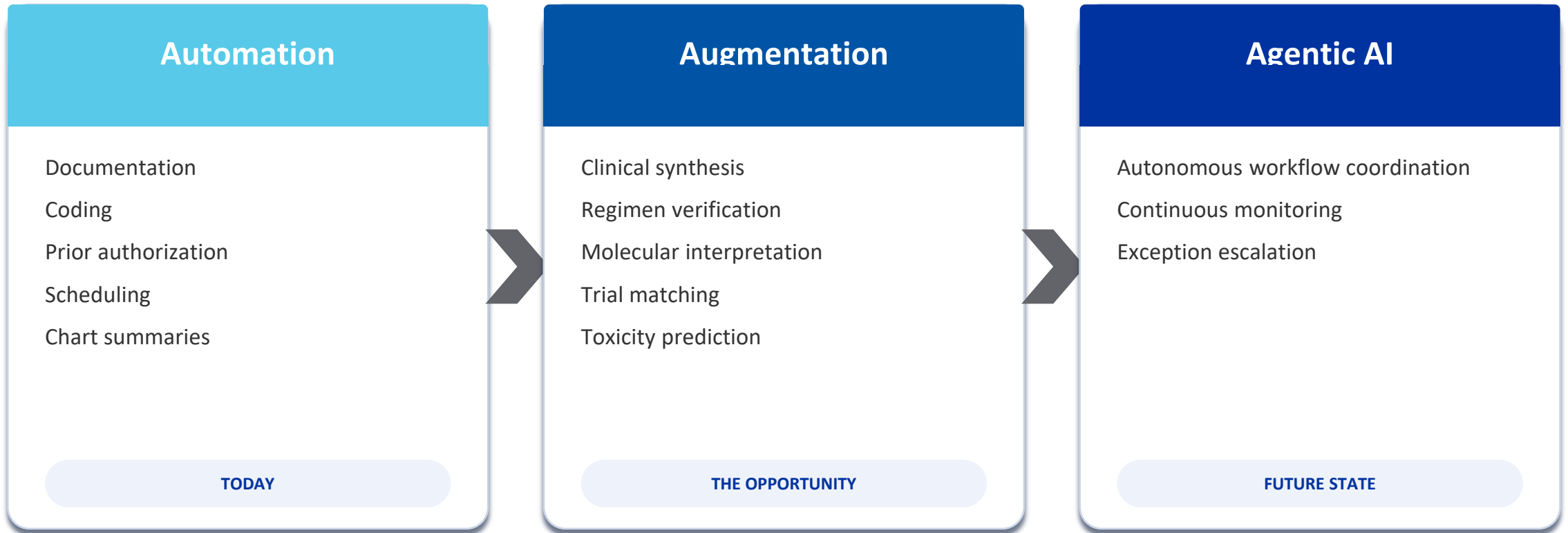
Like Russian nesting dolls: every Deep Learning model is Machine Learning, and every Machine Learning model is AI.

The Oncology Information Explosion



Every patient generates thousands of data points — clinicians must transform them into one decision.

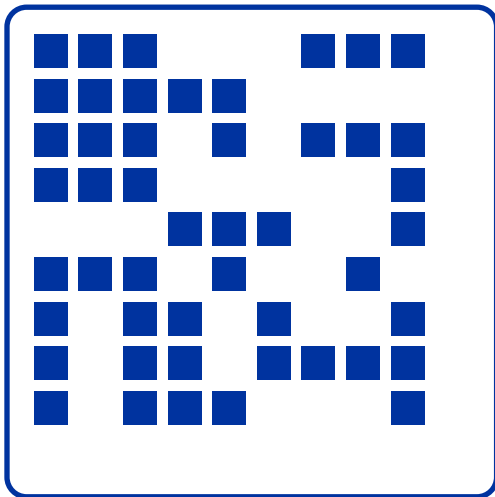
From Automation to Augmentation



*Automation replaces tasks. **Augmentation enhances expertise.***

Audience Poll

Which oncology workflow would you most like AI to improve?



Scan to vote live

1

Documentation

2

Prior Authorization

3

Regimen Verification

4

Drug Information

5

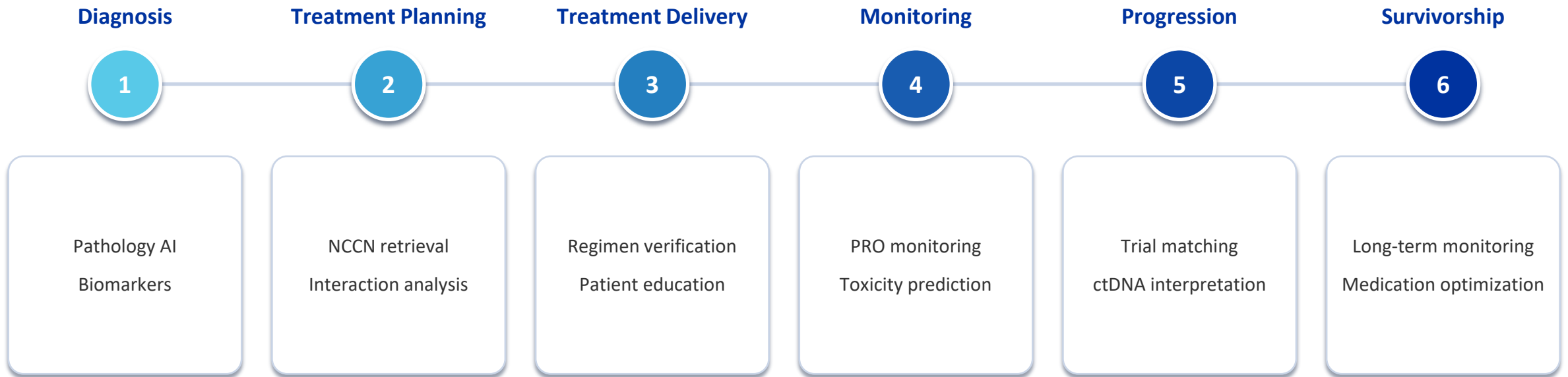
Clinical Trial Matching

6

Medication Safety

Discussion: "What task currently consumes the most valuable part of your day?"

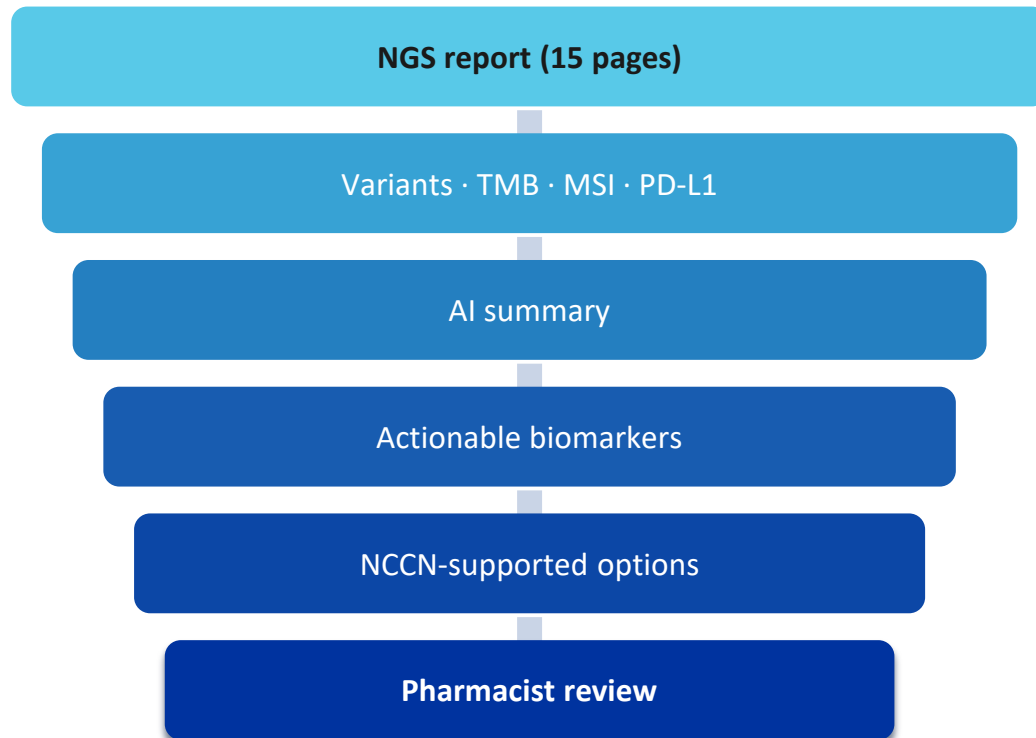
AI Across the Oncology Care Continuum



AI is not a single tool — it is becoming embedded throughout the entire oncology care journey.

Diagnosis — Biomarkers & Molecular Profiling

From 15-page reports to actionable summaries



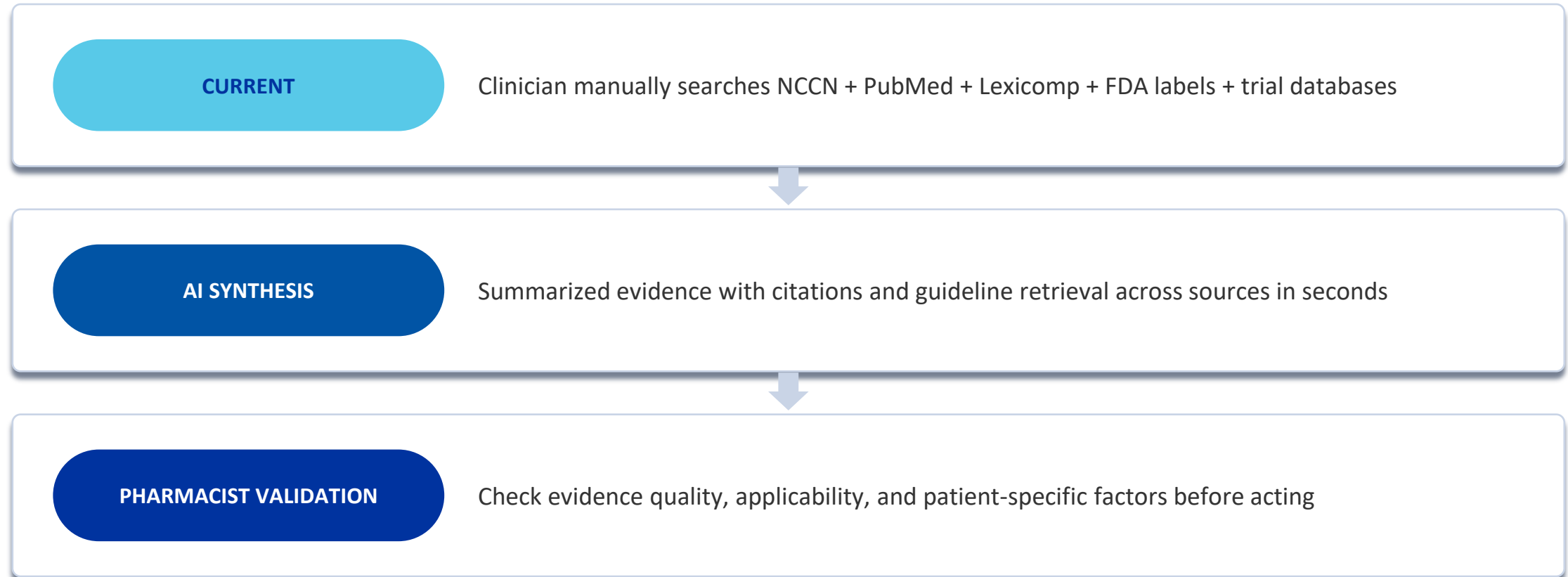
The pharmacist's role

- ✓ Confirm companion diagnostics
- ✓ Review biomarker–drug concordance
- ✓ Identify resistance mutations
- ✓ Verify guideline alignment
- ✓ Support patient counseling

AI organizes the information; pharmacists determine whether it is clinically actionable.

Treatment Planning — Evidence Synthesis

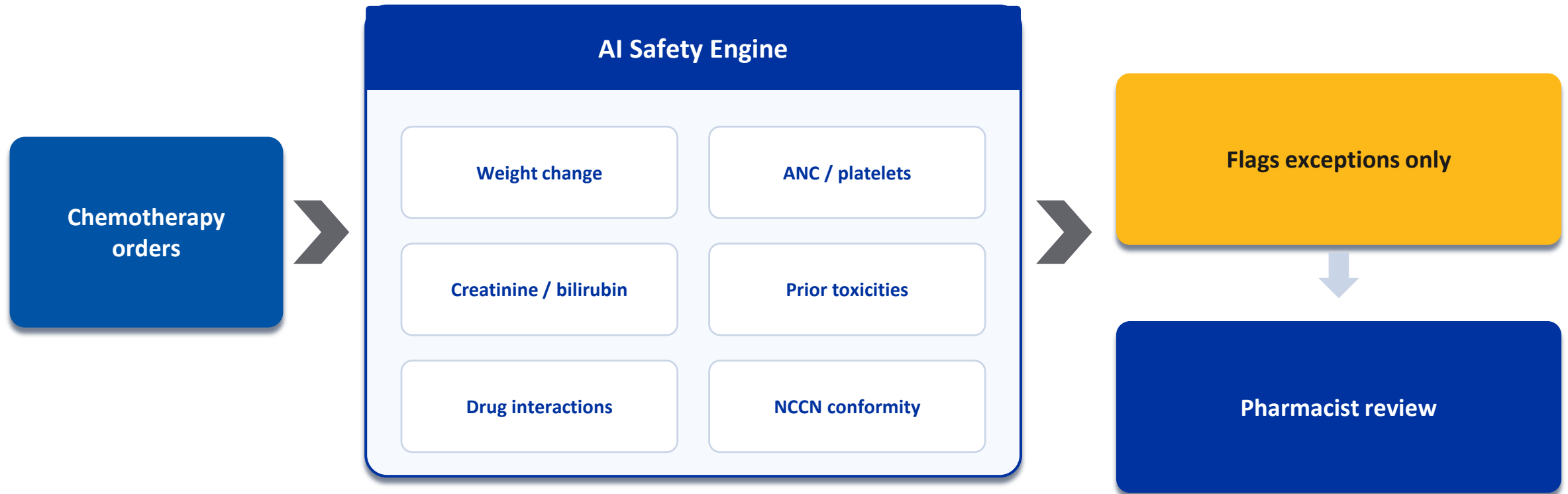
AI-assisted evidence synthesis



The future pharmacist spends less time searching and more time evaluating.

Treatment Delivery — Regimen Verification

AI-assisted regimen verification



AI checks hundreds of parameters in seconds; pharmacists focus on clinically meaningful exceptions.

Monitoring — From Reactive to Proactive Care

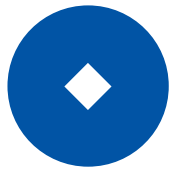
Catching toxicity earlier, before it becomes an emergency



Prediction is not diagnosis — it is earlier recognition of risk.

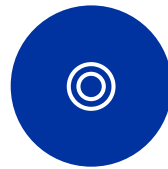
Progression, Trials & Survivorship

AI after progression and beyond active treatment



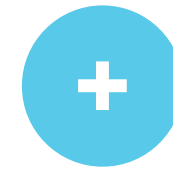
Progression

- ctDNA interpretation
- Resistance mutation review
- Emerging evidence summaries



Clinical Trials

- Eligibility screening
- Biomarker matching
- Research workflow support



Survivorship

- Long-term toxicity tracking
- Medication optimization
- Patient education & follow-up

AI can support the entire oncology journey — but pharmacists remain accountable for the decisions that affect patients.

Practical Oncology Pharmacy Workflows

Where AI augments the day-to-day operations of oncology pharmacy

1

Regimen Verification

Exception-based order review

2

Oral Chemotherapy & Adherence

Education and follow-up loops

3

Prior Authorization

Faster access to therapy

4

Pharmacovigilance

Earlier ADR signal detection

5

Clinical Trial Matching

Screening at the point of care

In every workflow, AI handles the repetitive scan — the pharmacist owns the clinical judgment.

Regimen Verification in Practice

Exception-based review — attention spent on judgment, not screening

Every chemotherapy order

AI pre-screens — automatic

- Dose / BSA recalculation and rounding
- Lab thresholds: ANC, platelets, creatinine, bilirubin
- Cumulative lifetime dose (e.g., anthracyclines)
- Drug–drug and drug–food interactions
- Guideline / protocol conformity

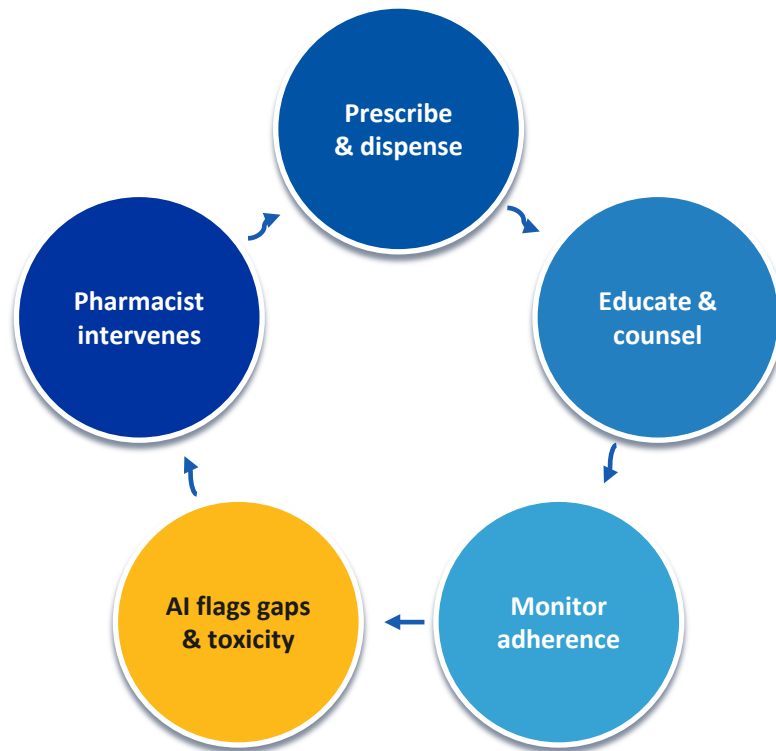
Pharmacist owns — judgment

- Clinical significance of each flag
- Patient-specific dose adjustments
- Organ function and performance status
- Goals of care and tolerability
- Final verification and documentation

Only exceptions reach the pharmacist — AI narrows the field, the pharmacist makes the call.

Oral Chemotherapy & Adherence

Extending pharmacy oversight beyond the infusion center



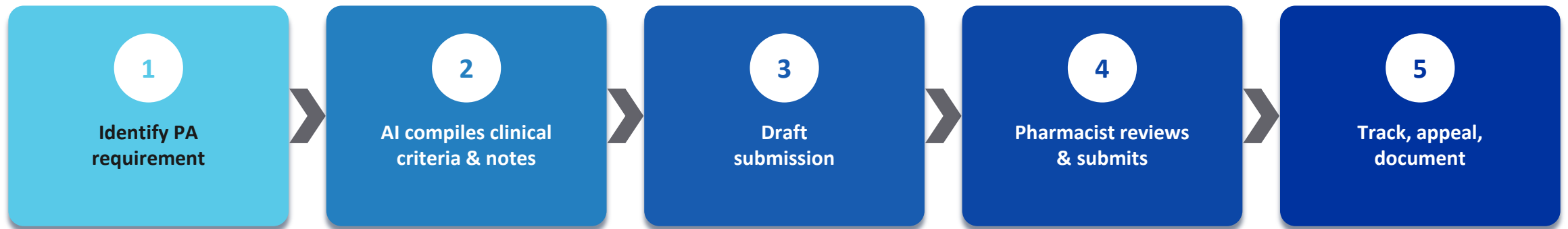
How AI supports the loop

- Refill-gap and missed-dose detection from pharmacy data
- Symptom and toxicity check-ins via patient-reported outcomes
- Interaction screening as new medications are added
- Prioritized worklist so pharmacists reach the right patients first

Adherence and toxicity are continuous — AI keeps the loop from going unwatched between visits.

Prior Authorization

Compressing the administrative path between decision and treatment



Fewer delays to therapy

Criteria and supporting notes assembled in minutes, not hours.

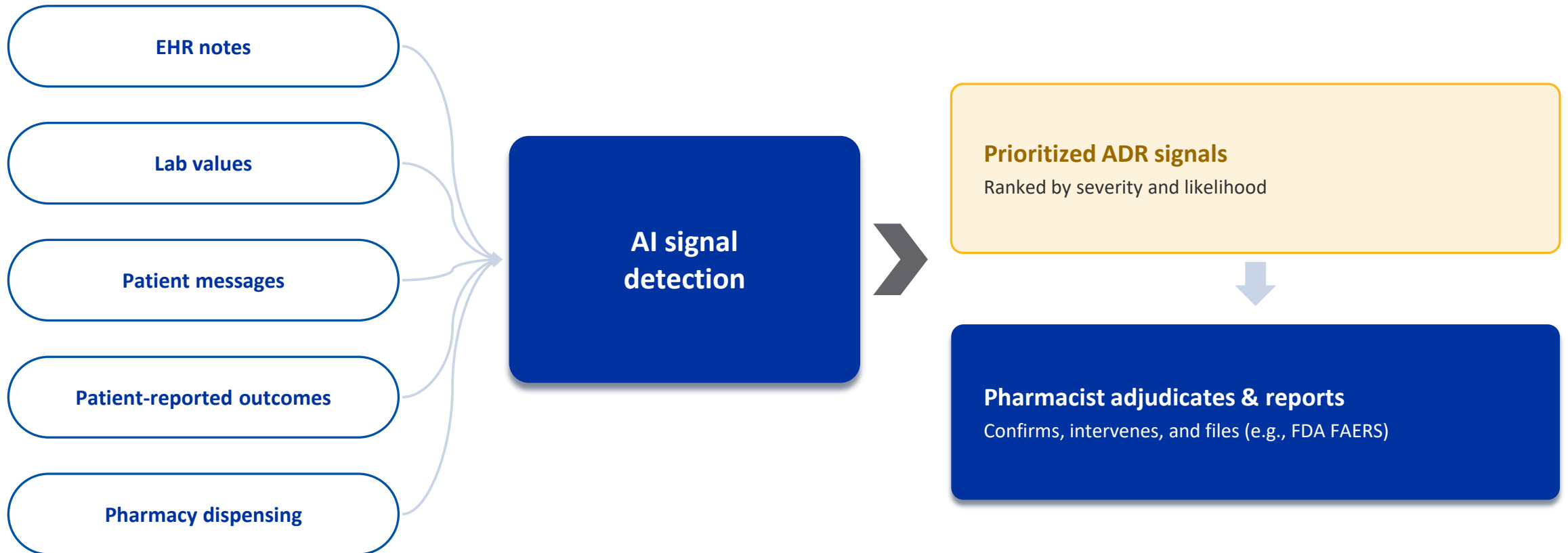
The pharmacist stays in the loop

Every submission is reviewed for accuracy before it goes out.

AI drafts the paperwork; the pharmacist ensures it is accurate, complete, and defensible.

Pharmacovigilance & Medication Safety

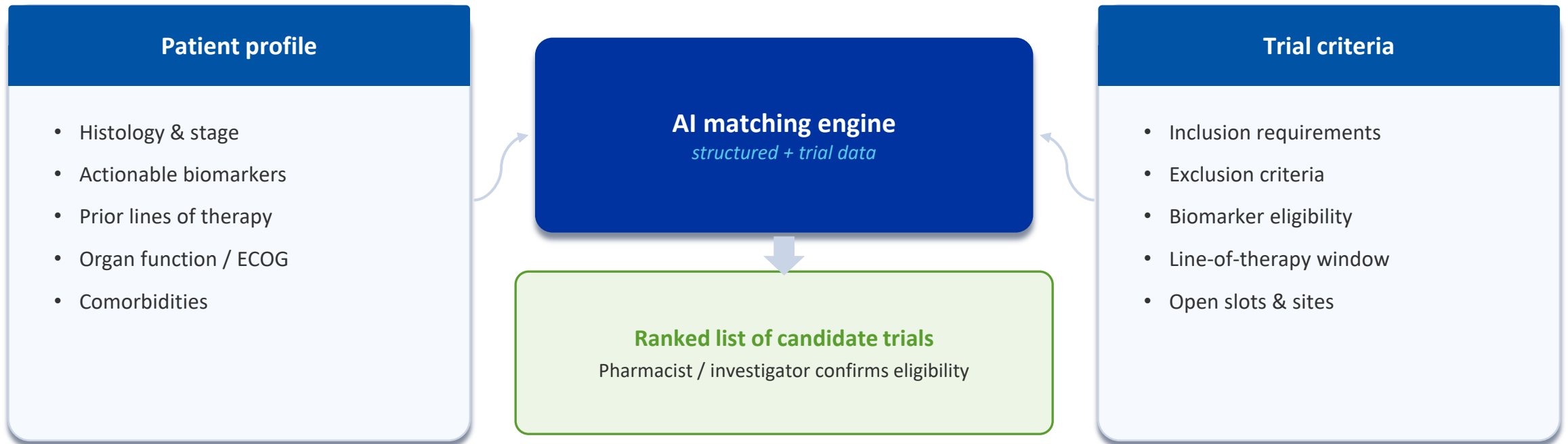
Turning scattered signals into earlier, actionable safety alerts



AI connects signals no single chart review would catch; the pharmacist confirms and acts.

Clinical Trial Matching

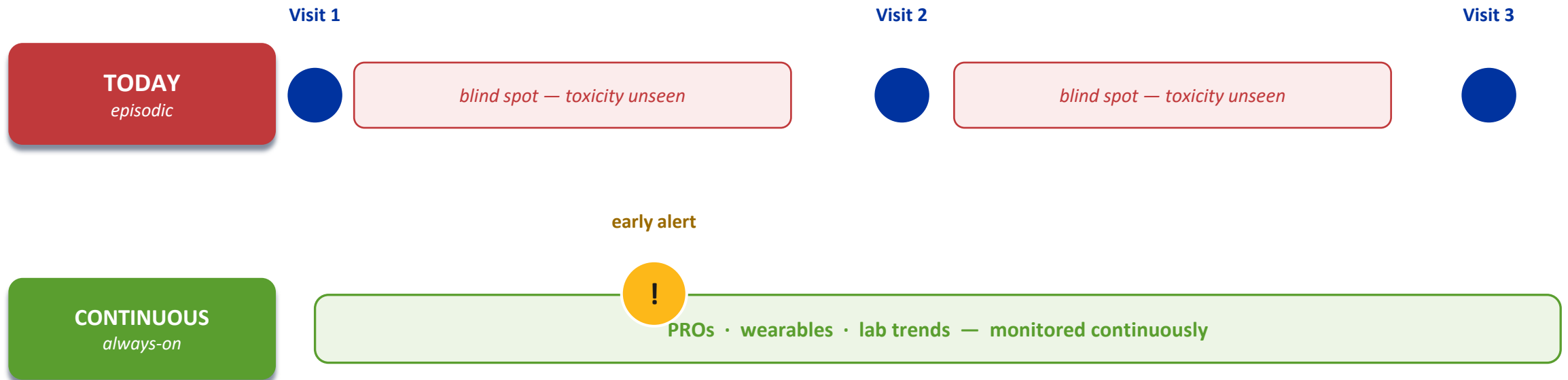
Bringing eligibility screening to the point of care



AI screens every patient against every open trial — the team confirms the true matches.

Predictive Toxicity Monitoring

Most toxicity develops at home — between clinic visits

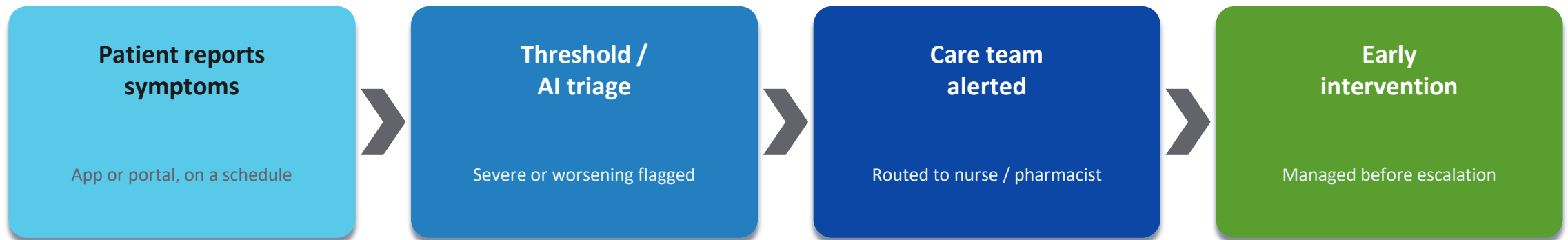


The clinic visit is a snapshot; continuous data lets us intervene before a problem becomes an emergency.

AI's role is to watch the gaps between visits and surface the patients who need attention now.

Patient-Reported Outcomes (PROs)

The most evidence-backed form of remote monitoring



Why PROs matter most

Randomized trials of electronic PRO monitoring (Basch et al.) have been associated with better symptom control, fewer emergency visits, and — in some studies — improved survival.

PROs are where remote monitoring already has the strongest evidence — the natural place to start.

Wearables & Passive Sensing

Continuous physiologic signals — with no extra effort from the patient



Still emerging: wearable signals are promising but less validated than PROs — treat as supportive, not definitive.

Wearables add an always-on layer — most useful when anchored to each patient's own baseline.

Risk-Stratification Dashboards

One screen that turns continuous monitoring into a prioritized workload

Illustrative view

High-risk today

4

New alerts

7

Awaiting review

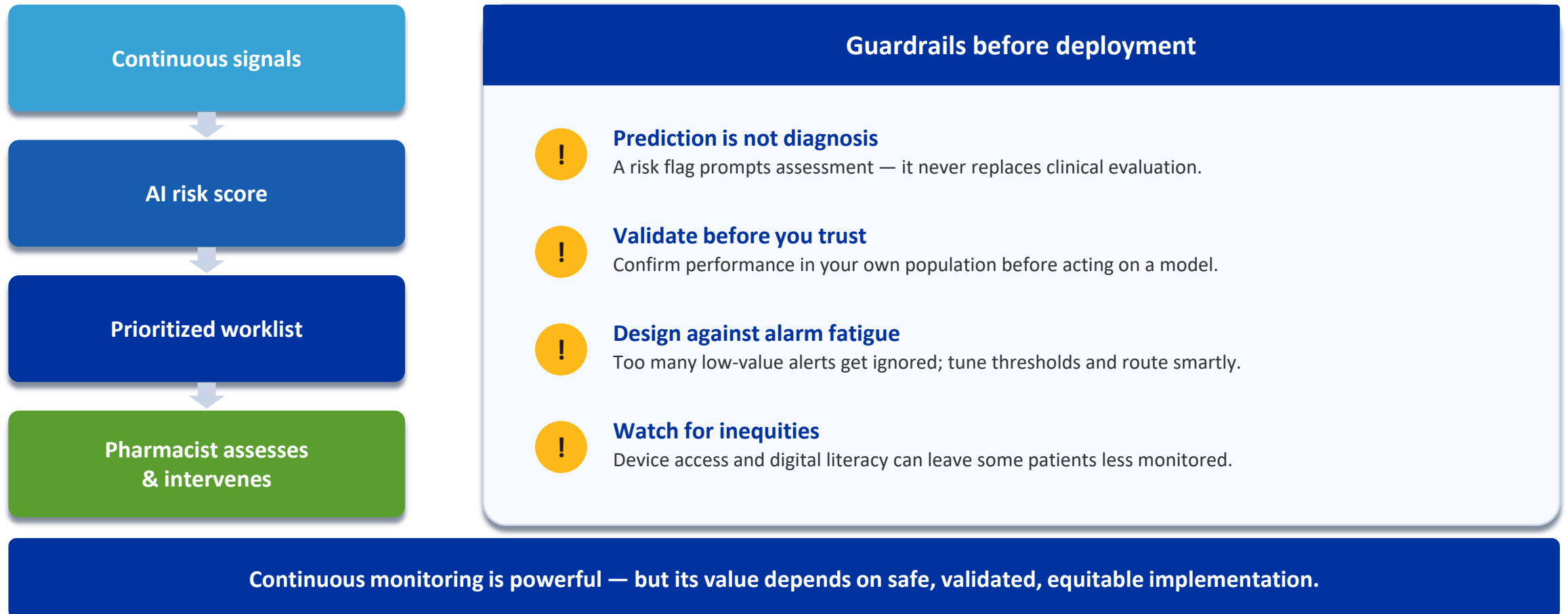
3

Patient	Regimen	Risk	Key driver	Suggested action
J.M.	FOLFOX	High	ANC falling + fever reported	Call today; assess neutropenia
S.P.	Pembrolizumab	High	Diarrhea grade rising	Rule out colitis; consider hold
R.K.	Osimertinib	Medium	New cough; PRO score up	Nurse check-in within 48h
T.W.	AC-T	Medium	Missed doses + fatigue	Adherence outreach
A.L.	Capecitabine	Low	Stable, adherent	Routine follow-up

The dashboard does not decide — it ranks, so the pharmacist's time goes to the patients who need it most.

From Signal to Intervention

Prediction earns trust only when it changes what we do — safely



Governance & Regulation

Every benefit so far assumes the tool is accurate, fair, and safe

The trust gap

Adoption is easy to imagine. Trust has to be earned.

Governance is how we make sure these tools are safe, accurate, and equitable before — and after — they touch a patient.



Hallucinations & accuracy

Confident output that is simply wrong



Bias & inequity

Worse performance for underrepresented patients



Privacy & security

Protected health information at risk



Model drift

Performance decays as practice changes



Accountability

Who is responsible when AI is wrong?

None of these are reasons to avoid AI — they are the reasons we govern it.

Hallucinations & Accuracy

The failure mode that matters most: confident, fluent, and wrong

The problem

- Generative models can produce fluent text that is factually wrong
- Fabricated citations, doses, or study results look authoritative
- In oncology, a wrong dose or interaction can cause real harm
- Errors are hardest to catch when the output sounds confident

Mitigations

- Ground answers in trusted sources (retrieval, not recall)
- Require citations that a human can open and verify
- Keep a clinician in the loop for every actionable output
- Scope tools to validated tasks; don't over-trust open-ended chat

Treat AI output as a well-read draft — never as a verified source.

Bias & Equity

AI learns from the past — including its gaps and its inequities

Where bias comes from

- Training data that under-represents some groups
- Historical disparities baked into records
- Sensor data less accurate for some patients
- Access gaps in who uses the tools

What can go wrong

- Lower accuracy for under-represented patients
- Missed toxicity or eligibility signals
- Existing disparities widen, not narrow
- False reassurance from a confident model

How we protect against it

- Representative, diverse training and test data
- Validate performance within subgroups
- Monitor real-world outcomes over time
- Ensure equitable access to the tools

ASCO's principles make equity explicit — guard against bias and ensure access to the tools.

The Regulatory & Guidance Landscape

Three layers of oversight — evolving quickly

U.S. — FDA

- Tools a clinician can independently verify may fall outside device regulation (Cures Act non-device CDS)
- Jan 2026 guidance broadened this to some single recommendations
- Higher-risk AI stays regulated: image analysis, time-critical prediction
- Model updates governed by predetermined change-control plans

Professional societies

- ASCO (2024): six principles — transparency, informed stakeholders, equity, accountability, oversight & privacy, human-centered
- ESMO (2025): guidance on large-language-model use in practice
- ESMO EBAI: basic requirements for AI-based biomarkers

Data & Europe

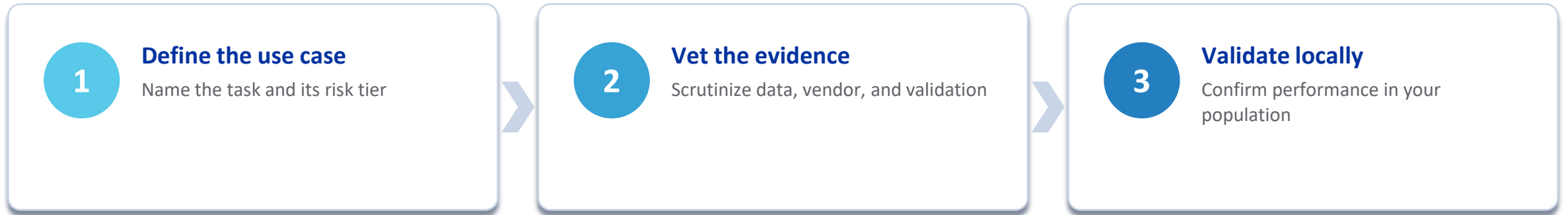
- HIPAA: privacy & security of protected health information (U.S.)
- EU AI Act: health AI classified high-risk — human oversight, transparency, conformity
- GDPR: data-protection obligations (EU)

The rules are still moving — treat compliance as ongoing, and keep a human accountable throughout.

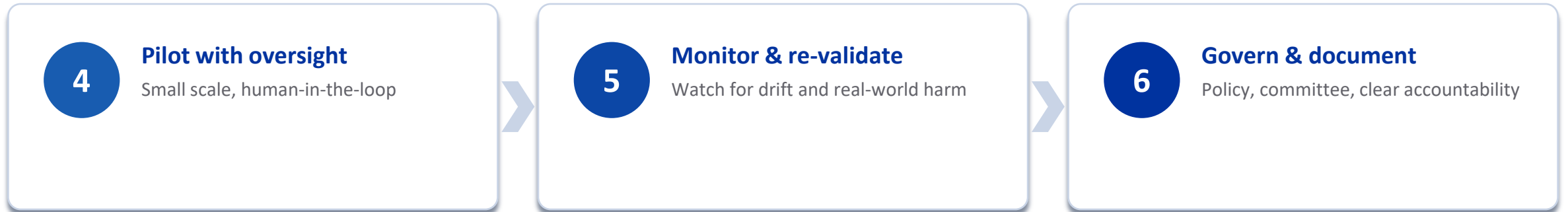
A Practical Implementation Roadmap

How an oncology pharmacy team adopts AI without losing control

BEFORE GO-LIVE — prove it



IN PRODUCTION — keep it safe



Adoption is not a purchase — it is a program: validate, pilot, monitor, and stay accountable.

AI Copilots in Oncology Pharmacy

From tools you operate to a partner that works alongside you

Copilot, not autopilot

The copilot surfaces, drafts, and checks in the background.

You stay in the left seat — setting direction, judging, and making the call.



Drafts

Notes, letters, patient instructions



Surfaces

Relevant evidence and guidelines



Checks

Interactions, doses, exceptions



Prepares

Prior-auth packets and summaries



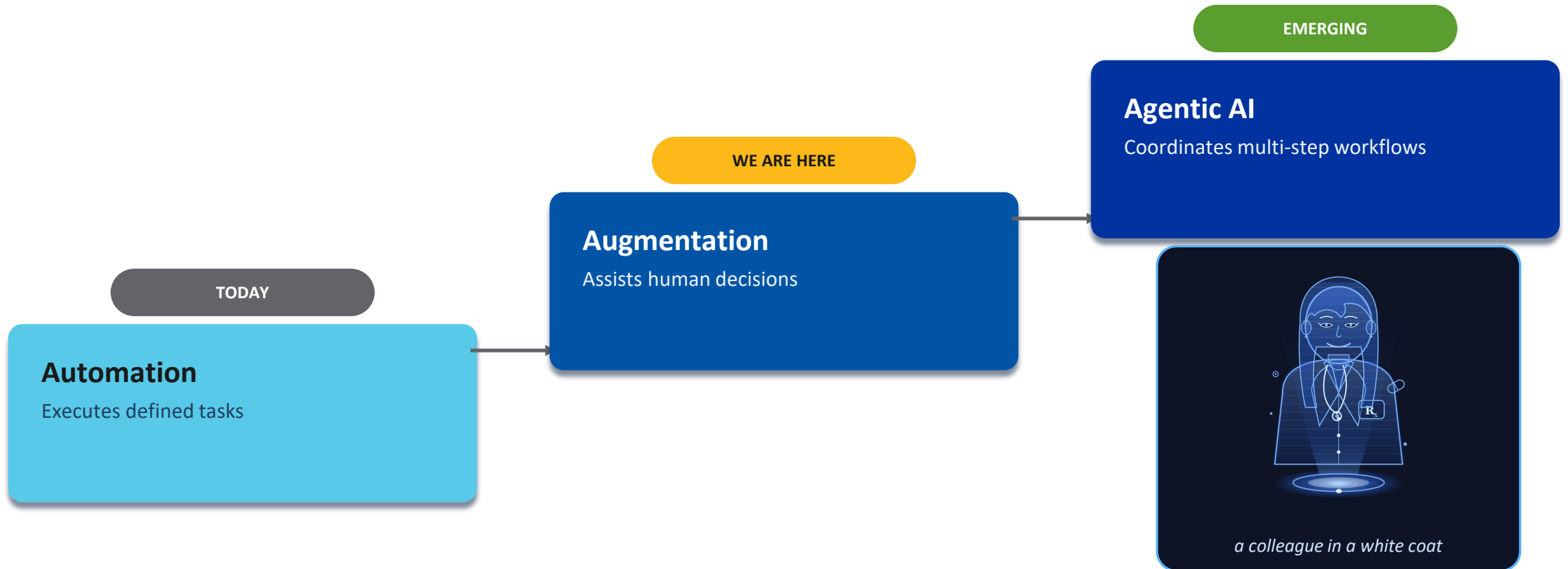
Watches

PROs and trends between visits

The copilot handles the busywork so the pharmacist can do the work only a pharmacist can do.

Agentic AI: The Next Frontier

From systems that assist to systems that act — under human oversight



Agentic ≠ unsupervised: bounded scope, a full audit trail, and escalation to a human are prerequisites.

A Realistic Horizon

Grounded, not hype — what is here, near, and further out

Here now

Proven and in use today

- Ambient documentation
- Evidence synthesis
- Regimen-verification support
- PRO symptom monitoring

Emerging (1–3 yr)

Maturing and spreading

- EHR-embedded copilots
- Predictive toxicity at scale
- Semi-automated prior auth
- Point-of-care trial matching

On the horizon

Promising, needs governance

- Agentic workflow coordination
- Continuously learning models
- Multimodal clinical reasoning
- Autonomous monitoring loops

The near-term wins are already here — capture those before chasing the horizon.

Tools to Know — by Category

Vendor-neutral categories — evaluate each against the guardrails from Section 5

1

General LLM assistants

Drafting, summarizing, Q&A

e.g., ChatGPT, Claude, Gemini

2

Clinical evidence tools

Cited, guideline-grounded answers

e.g., OpenEvidence

3

Ambient documentation

Note capture from the encounter

e.g., ambient scribes

4

EHR-embedded AI

Copilots inside the record

e.g., Epic-integrated AI

5

Drug information & CDS

Interactions, dosing, alerts

clinical reference + CDS

6

Clinical trial matching

Eligibility at the point of care

matching platforms

The Pharmacist's Evolving Role

The work shifts up the value chain — toward judgment and oversight

Less time on

- Manually retrieving information
- Line-by-line cross-checking
- Assembling paperwork
- Repetitive data entry



More time on

- Clinical judgment and complex cases
- Direct patient counseling
- Validating and governing AI
- Leading safe implementation

New skills to build: data literacy · critical appraisal of AI · verification habits · informatics collaboration

AI doesn't shrink the pharmacist's role — it moves it toward the judgment only humans provide.

Key Takeaways

Five things to carry out of this room

1 Augmentation, not replacement

AI's value is helping us manage complexity — not doing our job for us.

2 Pharmacists are central

Oncology pharmacists are positioned to lead safe AI adoption, not observe it.

3 Start where evidence is strongest

PROs, regimen verification, and evidence synthesis are ready today.

4 Keep a human accountable

Every actionable output needs a clinician who owns the decision.

5 Govern adoption as a program

Validate locally, pilot with oversight, monitor for drift — always.



Thank you

Questions & Discussion

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Let's revisit the opening poll — which workflow will you improve first?