

Artificial Intelligence in Cancer Pain Management: Clinical Applications and Barriers to Translation

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SCAN FOR FULL PAPER

Methods & references (5 total)

MAIN FINDING

AI predicts cancer pain outcomes well in single-center studies — but almost none of it has been tested anywhere else.

Why it matters

60% of patients with advanced cancer have moderate-to-severe pain

Pain physicians decide across the whole pathway: opioid titration, interventional escalation (neurolytic blocks, intrathecal pumps, radiofrequency ablation), and rehabilitation. AI is proposed at every step.

CLINICIAN BARRIERS · N = 13

- Distrust of "black-box" outputs
- Resource constraints
- Workflow resistance

METHODS

5 publications examined from 2023–2026: a **44-study systematic review** (PROBAST / TRIPOD), 2 narrative reviews, a methods review, and interviews with 13 providers.

Where AI is applied

I · ASSESSMENT

Objective pain phenotyping

Facial expression, wearables, EEG biomarkers

II · PHARMACOLOGIC

Opioid risk stratification

Predicts nonadherence and adverse events — the most developed area

III · INTERVENTIONAL

Image-guided procedure planning

Most relevant to interventional practice — and **almost entirely conceptual**

IV · LONGITUDINAL

Telehealth triage

Fills gaps in symptom data; guides follow-up

Promise vs. readiness

0.81 median AUC, random-forest models — strong accuracy

BUT OF THE 44 STUDIES

77% high risk of bias

14% externally validated

5% reported calibration

Most data come from small, single-institution cohorts or healthy volunteers — not oncology patients.

Evidence maturity

- Externally validated — *No application yet*
- Internally validated — Opioid risk
- Single-center — Phenotyping · Telehealth
- Conceptual — Interventional planning

Read bottom to top.

NEXT STEP

Cancer pain registries with external validation built in.