ONCOSCOPE
REAL-TIME ONCOLOGY LIBRARY

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# Beyond BRCA and PSMA

## Mapping the emerging biomarker landscape in metastatic prostate cancer (mPC) using living evidence

## BACKGROUND

Precision oncology has transformed several cancer types through biomarker-driven treatment strategies that improve patient outcomes while reducing unnecessary toxicity. In metastatic prostate cancer (mPC), currently established biomarker-driven approaches primarily include prostate-specific membrane antigen (PSMA)-targeted radiopharmaceuticals and poly(ADP-ribose) polymerase (PARP) inhibitors for homologous recombination repair (HRR)-altered tumors. More recently, capivasertib received regulatory approval for PTEN-deficient metastatic castration-resistant prostate cancer (mCRPC), signaling expansion of biomarker-directed treatment strategies.

## OBJECTIVES

To characterize the evolving biomarker landscape in metastatic prostate cancer and identify emerging populations relevant to future health technology assessment (HTA) and Joint Clinical Assessment (JCA) planning using the **Oncoscope** Real-Time AI-Assisted Living SLR (**REAL-SLR) database.**

## METHODS

Oncoscope REAL-SLR is a **PRISMA-compliant**, continuously updated systematic literature review conducted using protocol-driven searches. Evidence from interventional trials, regulatory sources, clinical guidelines, and health technology assessments is systematically identified and structured. Studies are stratified by clinical stage, castration status, biomarker, risk, treatment pathway, and intervention category. The prostate cancer REAL-SLR was used to identify evidence relevant to this analysis.

Table1. **Oncoscope REAL-SLR PICOS & JCA mapping**

| PICOS | REAL-SLR PICOS | JCA Mapping |
|---|---|---|
| Patient population | Patients diagnosed with prostate cancer at any stage | Disease stage: **metastatic;** Biomarker**: specified** |
| Interventions and Comparators | Any intervention used for the treatment of prostate cancer (surgery, radiotherapy, drugs, biologics, cell treatments, vaccines, etc.) | Same as REAL-SLR PICOS |
| Outcomes measures | Efficacy (OS, PFS, other progression, response), PROs, safety | Same as REAL-SLR PICOS |
| Study design | RCTs, non-RCTs, single arm, Phase 1, Phase 1/2, Phase 2, Phase 2/3, Phase 3, Phase 4; Pooled analyses of RCTs; ECTs | Same as REAL-SLR PICOS |

## KEY TAKEAWAYS

Oncoscope REAL-SLR database IDENTIFIED a rapidly expanding biomarker landscape in metastatic prostate cancer BEYOND established PSMA- and HRR-directed treatment paradigms.

The emergence of PTEN-, AR-, and RB1-defined populations suggests FUTURE CHANGES in treatment sequencing, comparator selection, and evidence requirements.

Continuous evidence monitoring may support EARLIER IDENTIFICATION of emerging biomarker populations and inform HTA, JCA, and reimbursement planning.

Figure 1. **Continuously updated PRISMA (REAL-SLR framework) in prostate cancer** (updated Jun 19, 2026)

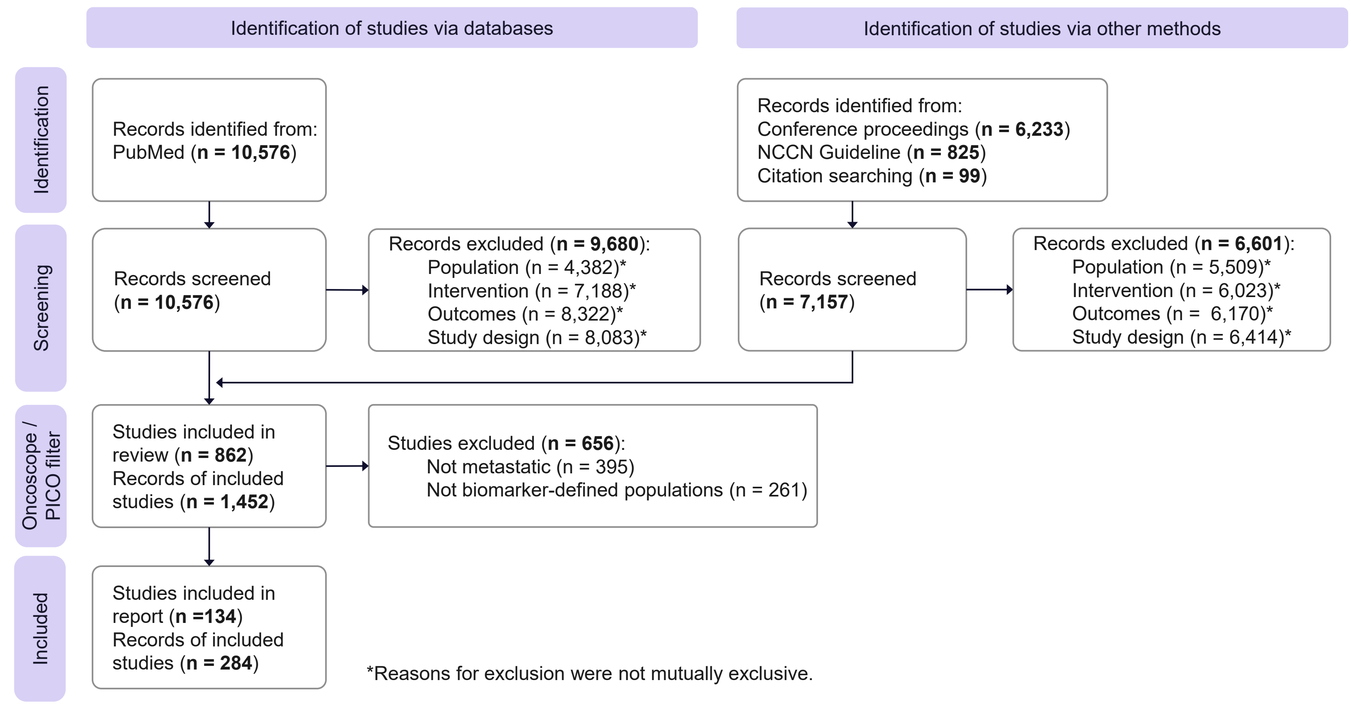
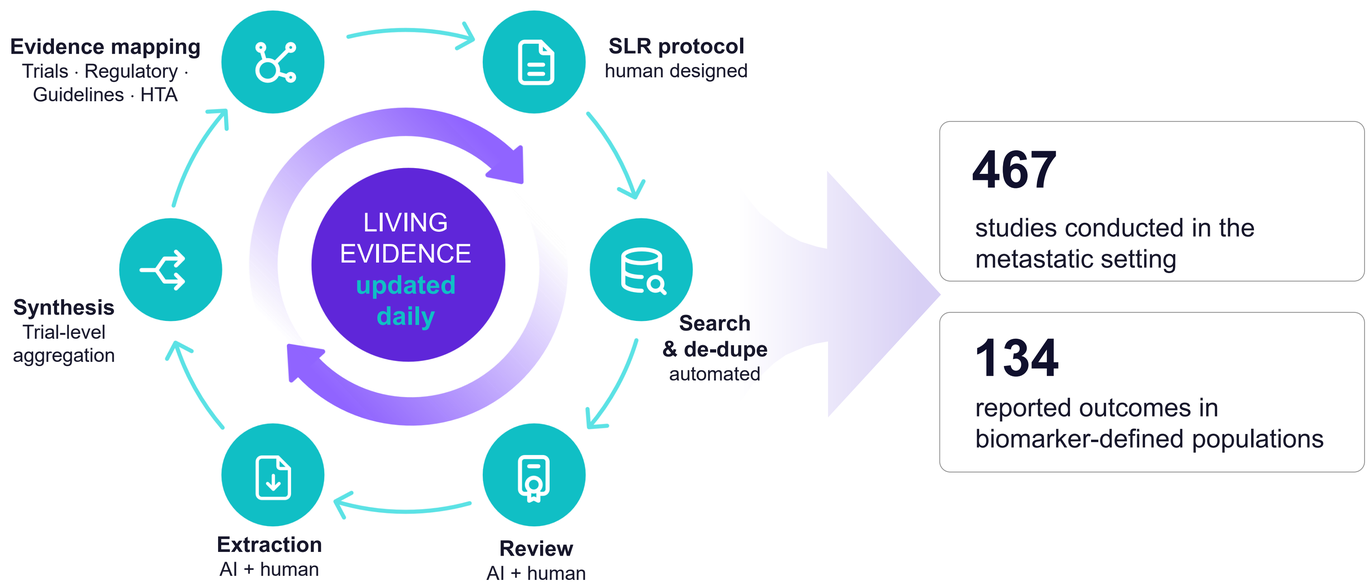
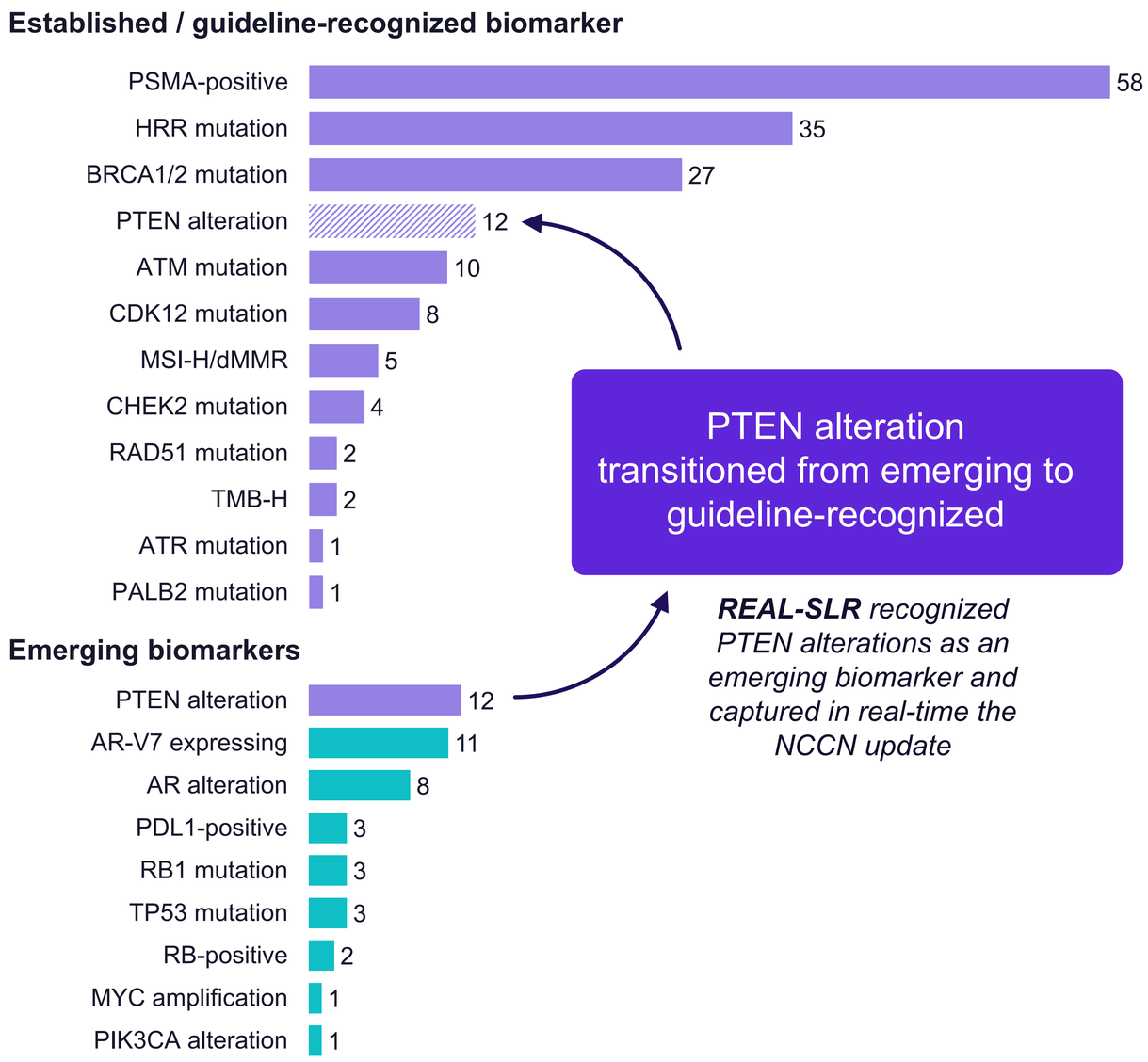



Figure 2. **REAL-SLR evidence capture summary (as of June 19, 2026)**




- Beyond tumor-agnostic biomarkers such as microsatellite instability-high (MSI-H) and tumor mutational burden-high (TMB-H), most studies focused on PSMA-targeted population and HRR pathway alterations including BRCA1/2, PALB2, ATM, and ATR.
- Emerging biomarker-defined populations included androgen receptor (AR) alterations, AR-v7 splice variants, PTEN alterations, PDL1 expression, RB1-positive populations evaluating CDK4/6 inhibitors, and PIK3CA-mutated tumors.

Figure 3. **Studies evaluating biomarker-defined populations (n=134)**

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## ABBREVIATIONS

**ADT**, androgen deprivation therapy; **AR**, androgen receptor; **ARPI**, androgen receptor pathway inhibitor; **AR-V7**, androgen receptor splice variant 7; **dMMR**, deficient mismatch repair; **ECT**, external control trial; **EU**, European Union; **HRR**, homologous recombination repair; **HTA**, health technology assessment; **JCA**, Joint Clinical Assessment; **mCRPC**, metastatic castration-resistant prostate cancer; **mPC**, metastatic prostate cancer; **MSI-H,** microsatellite instability-high; **NCCN,** National Comprehensive Cancer Network; **OS**, overall survival; **PD-L1**, programmed death-ligand 1; **PFS,** progression-free survival; **PICOS,** population, intervention, comparator, outcomes, and study design; **PRISMA,** Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **PSMA,** prostate-specific membrane antigen; **RCT,** randomized controlled trial; **REAL-SLR,** Real-Time AI-Assisted Living Systematic Literature Review; **SLR**, systematic literature review; **TMB-H,** tumor mutational burden-high.