Cost-effectiveness of adding darolutamide to docetaxel and androgen deprivation therapy in the treatment of metastatic hormone-sensitive prostrate cancer

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Background

- Among US adult men, prostate cancer is the second most common cancer and the second leading cause of cancer-related deaths, accounting for ~35,000 deaths and 6% of all cancers in 2022[1]
- Metastatic hormone-sensitive prostate cancer (mHSPC) is an advanced form of prostate cancer associated with poor quality of life and an estimated 5-year survival of 30%[2]
- Darolutamide was recently approved in the United States (US) for the treatment of mHSPC based on results from the ARASENS trial[3]

Objective

- To evaluate the cost-effectiveness of adding darolutamide to androgen deprivation therapy (ADT) plus docetaxel for the treatment of mHSPC in older adults from a US healthcare sector perspective.

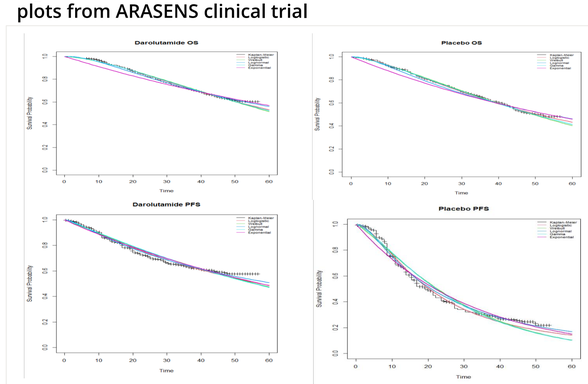
Methods

- **Target population:**
  Cohort of US adult men with an average age of 67 years diagnosed with mHSPC
- **Intervention:**
  - Darolutamide + Docetaxel + ADT (Leuprolide)
- **Comparator:**
  - Placebo + Docetaxel + ADT (Leuprolide)
- **Analytical model:**
  - Partitioned-survival model (PSM) with monthly cycles and lifetime time horizon
- **Perspective:**
  - US healthcare sector
- **Health states:**
  - Progression-free, progressed, and death
- **Discount rate**:
  - 3% for both costs and benefits
- **Clinical data:**
  - Overall and progression-free survival data was extracted from interim results from the phase III, randomized, double-blind, placebo-controlled ARASENS trial[4]
  - For base case analysis, the Weibull distribution was used based on AIC, visual inspection, and clinical plausibility
  - Background mortality was incorporated from a life table for males beginning with age 67

Methods Continued

- **Costs and utilities:**
  - Cost of drugs and administration were obtained from IBM REDBOOK® (darolutamide), CMS Drug Payment Table (docetaxel and leuprolide [ADT]), and CMS Physician Fee Schedule. The cost of clinical encounters for mHSPC, cost of progression, and utility values were sourced from published literature
- **Analyses:**
  - Cost and utilities were assigned to the corresponding health state, accounting for proportion of individuals in each health state at a given cycle
  - ICER per QALY was calculated for darolutamide versus placebo
  - One-way sensitivity and probability sensitivity analyses were performed

Figure 1. Parametric distributions for OS and PFS fitted to KM plots from ARASENS clinical trial



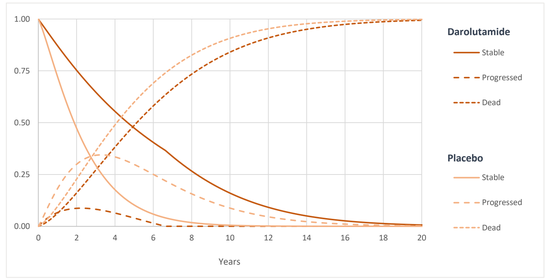
OS: overall survival, **PFS**: progression-free survival, **KM**: Kaplan-Meier

Table 1. Model inputs

Parameters	Base case estimate	Sources
Monthly cost (2022 USD)		
Darolutamide	12,253	RED BOOK® MICROMEDEX[5]
Docetaxel	75	CMS Drug Payment Table[6]
ADT (Leuprolide)	88	
Administration (Docetaxel)	140	CMS Physician Fee Schedule[7]
Administration (Leuprolide)	34	
Clinical encounters (mHSPC)	4,200	Wang et al[8]
CRPC treatment	14,160	
Annual utility		
mHSPC	0.80	Chi et al[9]
mCRPC	0.716	Lloyd et al[10]

mHSPC: metastatic hormone-sensitive prostate cancer, mCRPC: metastatic castration-resistant prostate cancer, ADT: androgen deprivation, US: United States, CMS: Center for Medicare & Medicaid Services, ASP: Average selling price

Figure 2. Base case state probability trace



Results

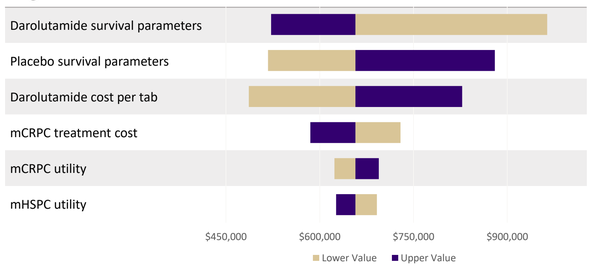
Table 2. ICER results

	Cost	LYs	QALYs	ICER
Darolutamide	$1,054,926	5.27	4.19	
Placebo	$487,474	4.38	3.33	
Incremental	$567,452	0.89	0.86	**$657,200**

QALYs: quality-adjusted life years; **LYs**: life years; **ICER:** incremental cost-effectiveness ratio

- Compared to treatment with docetaxel plus ADT, the inclusion of darolutamide was associated with incremental QALYs and LYs of 0.86 and 0.89 respectively, at an additional cost of $567,500, yielding an **ICER of $657,200 per QALY gained**

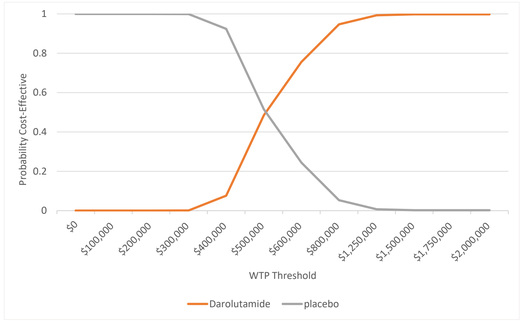
Figure 3. Base case OWSA



OWSA: one-way sensitivity analysis, **mCRPC**: metastatic castration-resistant prostate cancer, **mHSPC**: metastatic hormone-sensitive prostate cancer

- The ICER was most sensitive to darolutamide cost and survival parameters and robust to changes in utility values for mHSPC and mCRPC.

Figure 4. Cost effectiveness Acceptability Curve



WTP: willingness to pay

- Treatment with darolutamide was estimated to be cost-effective 50% of the time at a WTP of $500,000/QALY.

Discussion

Strengths

- First CEA examining the economic value of darolutamide in mHSPC
- PSM allowed for exploration of costs and outcomes beyond clinical trial time cutoff
- Conduct and reporting consistent with CHEERS guidelines

Limitations/Future work

- Lack of real-world evidence on treatment outcome and safety
- Efficacy vs effectiveness
- Clinical trial population may not be representative of US population
- Strict eligibility criteria of RCT
- Leuprolide as the only ADT considered

Conclusion

- Despite demonstrating superior survival benefits, the addition of darolutamide to docetaxel and ADT may not be cost-effective for mHSPC treatment from a US healthcare sector perspective.

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Disclosures

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