Prostate-specific antigen testing has dramatically increased the incidence of localized prostate cancer. Most men with localized cancer attempt curative therapy, usually with surgery or radiation. However, there is uncertainty about whether and how to best treat these cancers. No published controlled trials have directly compared surgery against radiation or either treatment against active surveillance. Given the indolent nature of prostate cancer and the substantial risks of treatment-related harms, the effects of cancer and treatment on quality of life are important patient-centered outcomes. Comparative effectiveness research, using observational cohorts, claims data and simulation models, enables comparisons of treatments that have not been studied in controlled trials and captures real-world outcomes data to better support informed decision-making.

**KEYWORDS:** cohort studies ● comparative effectiveness research ● decision-making ● decision support techniques ● prostatectomy ● prostatic neoplasms ● quality of life ● radiotherapy

**Treating localized prostate cancer**

The Institute of Medicine designated prostate cancer treatment for localized (early-stage) disease as one of the 25 most important areas for comparative effectiveness research (Box 1) [101]. The advent of prostate-specific antigen (PSA) testing in the late 1980s has led to an epidemic of prostate cancer – an estimated 1.3 million additional cases [1] – with the lifetime risk of being diagnosed increasing from 9 to 16% [102]. Because PSA testing can detect cancers 5–10 years before clinical presentation [2], approximately 80% of PSA-detected cancers are diagnosed at localized stage [102]. Between 70 and 90% of men with localized prostate cancer attempt curative therapy with either surgery or radiation therapy [3–5]. However, PSA testing is associated with overdiagnosis; a modeling study suggests that 23–42% of cancers detected by screening would never have caused clinical problems during a man’s lifetime [2]. This implies that treatment might be unnecessary for some men and that men with low-risk cancers should consider observation.

While population data can characterize the risk for overdiagnosis, we lack sufficiently accurate tumor markers to confidently determine the risk for an individual patient. Consequently, active surveillance has recently emerged as a treatment option for mitigating the harms of overdiagnosis and unnecessary treatment. With active surveillance, men with low-risk cancers (defined by PSA <10 ng/ml, Gleason <7 and minimal tumor volume on biopsy) defer active treatment and undergo close monitoring with serial PSA testing and biopsies to determine whether cancer is progressing and requires treatment [6]. However, there is no consensus on the optimal criteria for selecting patients for active surveillance, the appropriate monitoring strategies or the best measures of progression [7].

Treatment selection is further complicated because the optimal therapy for men with potentially clinically important cancers is unknown – no adequately sized randomized trials have directly compared survival benefits between surgery and radiation therapy. However, we do have convincing data from observational and clinical
Box 1. Treatment options for localized prostate cancer.

- Radical surgery
- Open radical prostatectomy
- Robotic-assisted laparoscopic radical prostatectomy
- Laparoscopic radical prostatectomy
- Focal therapy
- Cryosurgery
- High-intensity focused ultrasound
- Radiotherapy
- External beam (conformal 3D, intensity-modulated radiation therapy, proton beam, stereotactic), which can be combined with androgen deprivation therapy for high-risk cancers
- Interstitial (brachytherapy)
- Active surveillance
- Watchful waiting

_trials, which used validated health-related quality of life (HRQOL) measures [8], documenting the frequent occurrence of treatment complications that adversely affect sexual, urinary and bowel function [9–11]. Indeed, treatment decisions are influenced by concerns over complication risks [12]. While newer surgical and radiation modalities, including robot-assisted laparoscopic prostatectomy, stereotactic radiation, intensity-modulated radiation therapy (IMRT) and proton-beam therapy, are considered to be safer and more effective than older modalities, supporting data are quite limited.

Thus, in 2013 there is uncertainty about whether, when and how to treat localized prostate cancers. Although specialists have been shown to believe that the treatment that they offer is superior to alternative therapies [13], treatment selection for localized prostate cancer is recognized as a preference sensitive decision [14]. The goal for physicians should be to inform their patients about the potential benefits and harms of treatment options and help them to select a treatment that is concordant with their values. However, finding the body of evidence on patient-centered outcomes, such as survival and prostate cancer quality of life, is challenging. This review will address the importance of comparative effectiveness research for supporting decision-making and critically appraise the strengths and limitations of current data from randomized controlled trials and observational studies.

Randomized controlled trials

- Comparisons of different treatment modalities
  Treatment decisions for localized prostate cancer should ideally be guided by randomized controlled trial data comparing different modalities. However, few such studies have been reported in the literature. A 2011 evidence synthesis document prepared for the Agency for Healthcare Research and Quality identified only four randomized trials reporting either all-cause or prostate cancer-specific mortality or harms associated with treatment compared with watchful waiting or active surveillance [13].

  Several studies attempting to compare surgery and radiation therapy have closed due to poor enrollment, including the SPIRIT trial [15] and the START trial [16]. The START trial was comparing early treatment (surgery, external beam radiotherapy and brachytherapy) with active surveillance. The only ongoing randomized trial of different modalities is the ProtecT study from the UK [16]. ProtecT is a multicenter trial that has enrolled over 3000 men, aged 50–69 years with PSA-detected localized cancer. The study aims to compare radical prostatectomy against conformal radiation therapy and active surveillance (Box 2). ProtecT closed to accrual in 2011 and quality of life and survival results are expected in 2015 when median follow-up will be approximately 10 years.

- Comparisons of surgery & watchful waiting
  Several randomized trials have compared surgery versus watchful waiting for men with localized prostate cancer. Watchful waiting is a palliative approach where men will only be offered treatment to relieve symptoms of disease progression and not for cure. The Veterans Administration Cooperative Urological Research Group randomized 142 patients diagnosed with localized cancer between 1967 and 1975 [17]. After a median follow-up of 23 years, investigators found no survival difference. However, the study was underpowered owing to the small sample size and substantial losses to follow-up. Furthermore, results are not applicable to current practice given advances in staging, grading and treatment.

  The SPCG-4 randomly assigned 695 men with localized prostate cancer, mean age of 65 years, to either surgery or watchful waiting [18–21]. During a median 12.8 years of follow-up, men undergoing radical prostatectomy were significantly less likely to die from prostate cancer than men in the watchful waiting group, with cumulative mortalities of 14.6 versus 20.7%, respectively [20]. The absolute prostate cancer mortality difference was 6.1 percentage points (95% CI: 0.2–12.0), providing a number
needed to treat of 15. However, the survival benefit was only observed among men younger than 65 years of age at diagnosis. Men in the radical prostatectomy group also had a reduced cumulative incidence of death (6.6 percentage points; 95% CI: -1.3–14.5) and distant metastasis (11.7 percentage points; 95% CI: 4.8–18.6). However, the majority of cancers in SPCG-4 were clinically detected (only 5.2% were detected by screening) so these results were not readily translated to US populations where most cancers are being detected through screening. PSA testing introduces both a lengthy lead-time and a considerable risk for overdiagnosis, which would increase the number needed to treat over a specific time frame [2].

The PIVOT trial randomly assigned 731 veterans with localized cancer, mean age of 67 years, to either surgery or watchful waiting (Box 3) [22]. In contrast to the SPCG-4, PIVOT was conducted in the era of PSA testing. Approximately 50% of the men enrolled in PIVOT had nonpalpable stage T1c cancer, indicating PSA detection, while approximately 75% of men in SPCG-4 had stage 2 (palpable) tumors. During a median follow-up of 10 years, 48.4% of the men died; the risk of dying from prostate cancer or treatment was 7.1% overall and there was no benefit for surgery. Planned post hoc analyses suggested that surgery could reduce the risks of dying from prostate cancer and developing bone metastases for men with more aggressive cancers, defined by PSA levels >10 ng/ml, Gleason scores ≥7 or those in the intermediate or high-risk categories (based on PSA level, Gleason score and tumor stage). Surgery was associated with a significantly reduced risk of incident metastases for men with intermediate and high-risk cancers, and a significantly reduced prostate cancer mortality for men with PSA levels >10 ng/ml (absolute risk reduction = 7.2 percentage points; 95% CI: 0.6–14.3). Notably, PIVOT did not come close to achieving its target enrollment of 2000 men.

While SPCG-4 and PIVOT were rigorously conducted, the results are less applicable to current practice because the comparison group was watchful waiting. Watchful waiting is considered to be most appropriate for men with limited life expectancy who are unlikely to live long enough to benefit from treatment – or to be healthy enough to endure aggressive treatment. While this represents a different population than the men being considered for active surveillance, watchful waiting is a relevant option given the substantial number of cancer cases arising from screening older men with multiple comorbidities [23,24]. However, even when the harms of treatment are likely to outweigh the benefits, many men are dissatisfied with being offered a palliative approach for a newly diagnosed cancer [25]. In the decades following the introduction of PSA testing, many elderly men with localized cancers who were not candidates for aggressive therapy opted for primary androgen deprivation therapy (ADT) [5]. While ADT can extend life in men...
Comparisons of active treatment with active surveillance

Active surveillance is a newer approach that has been suggested for healthy men with low-risk localized prostate cancers [6]. The ProtecT trial has an active surveillance arm [16] and numerous cohort studies suggest that active surveillance can reduce the likelihood of undergoing active treatment by over 60% [30–33]. Few prostate cancer deaths have been observed among men on these protocols and there is no certainty that early active treatment could have prevented these deaths. A NIH State-of-the-Science Conference concluded that active surveillance has emerged as a viable option for men with low-risk cancers [7].

Comparisons of different surgical techniques

Surgical techniques have evolved during the PSA era, including the refinement of the nerve-sparing prostatectomy to minimize postoperative erectile dysfunction [34]. More notably, robotic-assisted laparoscopic prostatectomy has largely overtaken open prostatectomy as the most popular treatment approach [35]. While robotic surgery has been widely publicized, there is little evidence that the technique provides meaningful benefits for cancer control or substantially reduces the risk for treatment complications [36,37]. Again, there are no published results from controlled trials comparing robotic surgery with open prostatectomy, although an ongoing Mayo Clinic study is expected to complete data collection by May 2016 [105].

Comparisons of external beam radiotherapy with other modalities

External beam radiotherapy and brachytherapy are widely used to treat localized prostate cancer. Radiation therapy techniques have progressed markedly in recent decades to deliver higher radiation doses in a more focused manner. However, there are little data from randomized controlled studies to determine the effectiveness of radiation therapy compared with other modalities. Randomized trials have shown an overall and disease-specific survival benefit for adding ADT to EBRT for men with higher-risk localized prostate cancers [27,38]. A Scandinavian study of men with locally advanced prostate cancer also found that adding EBRT to ADT improved disease-specific survival for the subset (21%) of men with high-risk localized prostate cancer [39]. However, recent overviews of randomized controlled trials for clinically localized prostate cancer found no survival comparisons of EBRT alone against either brachytherapy alone or surgery [40,41].

Comparisons of different radiation therapies with watchful waiting

Recent systematic reviews did not identify any eligible studies comparing radiation therapy with no treatment or no initial treatment [41,42]. A Scandinavian trial that randomized men with localized disease to either 3D conformal radiotherapy or watchful waiting has reported quality of life outcome data [9], but only published survival data in an abstract [107]. The study enrolled 214 patients between 1986 and 1997; after a minimum of 16 years of follow-up, men receiving EBRT had a reduced risk for distant progression but no overall or disease-specific survival benefit. Conducting randomized treatment trials is challenging. Because PSA testing is often
detecting microscopic cancers, follow-up of 10–15 years is needed to assess survival outcomes. Even then, interpreting results is problematic because selection criteria and treatments change over time. Biomarkers with better prognostic value than PSA progression could be useful surrogate end points for evaluating new treatments. While the importance of measuring patient-centered outcomes is now well acknowledged, few controlled trials have reported on prospectively collected HRQOL data.

Observational studies
In the absence of relevant randomized controlled trials, comparative effectiveness of treatments for localized prostate cancer is being addressed by retrospective analyses of databases, prospective cohort studies and simulation models. Each approach has important strengths and limitations.

- Surveillance Epidemiology & End Results–Medicare data set
One of the most widely used resources for conducting comparative effectiveness research has been the Surveillance Epidemiology and End Results (SEER)–Medicare data set, which links national tumor registry data with Medicare enrollment and claims. SEER collects information about demographics, cancer site, stage, histology and treatment for persons newly diagnosed with cancer in one of the SEER geographic areas. The data set provides claims data on covered healthcare services for Medicare beneficiaries in SEER that can be used to characterize treatments and comorbidity. SEER–Medicare data have been used to compare different treatment modalities for localized prostate cancer, including the examples shown in Box 4.

The advantages of using SEER–Medicare are the large national sample with many years of follow-up and extensive data on demographics and comorbidity. However, coding may be imprecise, for example, the study of minimally invasive radical prostatectomy could not identify robot-assisted laparoscopic procedures [43], and there may be limited data on the duration of hormonal therapy or on radiation dose delivered, both of which may affect survival. Comorbidity measures based on claims data, which were developed to predict relatively short-term mortality, are less applicable for modeling long-term survival in men with localized prostate cancer. Additionally, the occurrence and severity of complications that adversely affect HRQOL cannot be readily captured through claims data.

- Cohort studies
Prospective observational studies enable investigators to assemble large patient cohorts and obtain comprehensive outcome data that facilitates comparisons across treatment modalities. By surveying or interviewing patients, investigators can obtain data on patient-centered outcomes such as general and disease-specific HRQOL. Cohort studies enable comparisons of treatment options, such as surgery versus radiotherapy, that have not successfully been evaluated in randomized controlled trials. Cohort studies also allow timely evaluations of newer treatment options, including robotic-assisted laparoscopic prostatectomy, proton-beam radiotherapy, stereotactic radiotherapy or cryotherapy, which have not yet been evaluated in randomized trials. Cohort studies can provide longer-term outcomes data for larger patient samples, particularly through linkages with the National Death Index, than can be obtained in randomized trials. Multisite observational cohort studies can evaluate the effects of practice variation on outcomes across a wide range of healthcare delivery systems.

Among the large-scale prospective observational studies are PCOS [44], CaPSURE [45] and CEASAR [46]. The PCOS is a population-based...
study that enrolled over 3500 men newly diagnosed with prostate cancer in the mid-1990s at six SEER tumor registries (Box 5). Investigators reviewed medical records to obtain data on cancer diagnosis, tumor characteristics and treatment. Participants periodically completed mailed surveys beginning at 6 months until approximately 15 years after diagnosis. Surveys captured demographic, comorbidity, clinical and HRQOL data. Investigators have used propensity score methods to compare HRQOL outcomes for men with localized prostate cancer. PCOS analyses have shown that surgery is associated with substantially more impaired urinary and sexual function within 5 years of diagnosis than radiation therapy [47], although differences diminish with long-term follow-up [10]. Elderly men undergoing active treatment have greater functional impairment relative to those receiving conservative management [48], and primary ADT is also associated with greater functional impairment than watchful waiting [49]. Men undergoing radical prostatectomy had significantly lower overall and prostate cancer mortality at 15-year follow-up than men undergoing radiation therapy [50]. The most recent PCOS publication showed high other-cause mortality risks for men with low- or intermediate-risk prostate cancer and multiple major comorbidities [51].

CaPSURE is a multisite longitudinal observational study that has been following prostate cancer patients since 1995 [46]. Enrolling urologists provide clinical data and patients periodically complete questionnaires on HRQOL, resource utilization and satisfaction with care. CaPSURE investigators have shown that men undergoing radical prostatectomy, particularly those with higher risk cancers, have a substantially reduced risk for prostate cancer mortality compared with those receiving radiotherapy or primary ADT [52].

CEASAR used SEER tumor registries to enroll men under 80 years of age with a PSA <50 ng/ml diagnosed with clinically localized disease in 2011–2012. CEASAR also included a small convenience sample of men from CaPSURE to accrue approximately 3600 men onto the study. Similarly to PCOS, participants completed surveys at baseline, 6 and 12 months after enrollment and investigators performed a detailed medical record review 1 year after diagnosis. CEASAR differs from PCOS in several ways. First, the majority of the patients were enrolled before receiving treatment, generating a more accurate portrayal of baseline function. Second, the patient surveys included a number of nontraditional scales (such as participatory decision-making style and healthcare distrust) and a more detailed comorbidity scale (the total illness burden index for prostate cancer) that should allow for better risk adjustment [53]. Finally, CEASAR measured quality of care indicators, enabling analyses to adjust for differences in the quality of interventions, a rarely addressed factor in comparative effectiveness research. Data collection is ongoing in CEASAR, with planned follow-up through 5 years.

■ Selection bias

Cohort studies, particularly those using population-based sampling, may be more generalizable to real-world practice than randomized trials. However, treatment comparisons are highly susceptible to selection bias, where characteristics associated with treatment selection are also associated with clinical outcomes. For example, radical prostatectomy is more likely to be offered to younger, healthier men than radiation therapy, while radiation therapy will be more readily offered to men with high-risk or even potentially regionally advanced cancer. Healthy elderly men are more likely to undergo active treatment than observation. The SEER–Medicare study showing a survival benefit with active treatment for elderly men found a 13 percentage point absolute risk reduction for overall mortality, although only a 0.6 percentage point reduction in prostate cancer mortality [53]. The survival benefit thus seems more likely due to

Box 5. The PCOS study.

The PCOS is a landmark US population-based observational study designed to investigate how prostate cancer and treatment affect quality of life. Investigators at Surveillance, Epidemiology, and End Results (SEER) Cancer registries in six geographic regions enrolled approximately 3500 men newly diagnosed with prostate cancer between October 1994 and October 1995. Investigators abstracted medical records to obtain data about diagnostic evaluations, tumor characteristics and treatments. The centerpiece of the study was a survey that collected information about urinary, sexual and bowel function, as well as general health-related quality of life data shortly after diagnosis and again after 12 months, 24 months, 5 years and 15 years. Results have described practice patterns and outcomes, including quality of life and survival following diagnosis of localized cancer [44].
residual confounding in assessing comorbidity than a treatment effect [55]. Selection bias can be addressed through statistical techniques, including propensity scores and instrumental variables.

Propensity score methods use regression models of relevant baseline characteristics to determine a patient’s propensity for receiving a specific treatment [56]. This derived propensity score facilitates comparing outcomes across treatments by balancing patient characteristics. The propensity score can be used as a covariate in multivariable models, for stratified analyses of patients based on propensity scores, or for matching patients with identical propensity scores. These analyses are still subject to residual confounding because they can adjust only for measured confounding covariates.

Instrumental variable analysis uses an exogenous variable (instrument) that is hypothesized to affect treatment choice but not be related to outcomes. Variations in the instrument that are associated with variations in treatment are considered to be a random effect that addresses both measured and unmeasured confounding. A modeling study used SEER–Medicare data of treatment outcomes for localized prostate cancer to compare results from propensity score analysis with instrumental variable analysis [57]. The authors found that results from instrumental variable analyses, which were in the opposite direction of the propensity score analyses, actually more closely approximated clinical trial results. However, selecting an appropriate instrument can be challenging.

Simulation models

Another approach to comparative effectiveness research for treating localized prostate cancer has been the use of simulation models. The Cancer Intervention and Surveillance Modeling Network prostate cancer working group, an international consortium of investigators, uses statistical models to evaluate prostate cancer progression, detection and prognosis. Models incorporate data from randomized trials and observational data, including SEER, to enable investigators to estimate outcome probabilities for events that might not occur for decades—well beyond the follow-up period of randomized trials. Although numerous prostate cancer screening and treatment trials have over a decade of follow-up [20,22,58,59], this duration is insufficient to address the lifetime risks faced by a 50-year-old man with a screen-detected cancer.

Models for screening have estimated that the number needed to screen to prevent one death from prostate cancer decreases from over 1000 to less than 100 when projected over 25 years of follow-up, although results are sensitive to screening strategies and the harms of treating overdiagnosed cancers [60,61]. A Cancer Intervention and Surveillance Modeling Network modeling study has shown that failing to treat screen-detected cancers can be harmful for younger men and those with high Gleason scores [62]. Another modeling study demonstrated that active surveillance was associated with greater quality-adjusted life expectancy than surgery, radiotherapy or brachytherapy for men with low-risk, clinically localized cancers [63]. The same investigators also showed that observation (active surveillance or watchful waiting) was more effective and less costly than initial treatment, with watchful waiting consistently being the most effective and least expensive strategy [64]. Modeling may also allow tailoring of results to individual patient groups defined by their cancer risk. A major limitation for simulation modeling is the dearth of relevant comparative treatment data for outcome assumptions, either because there are no data from randomized trials, data are limited to specific patient characteristics defined by age or race, or data are based on outmoded treatment strategies.

Comparative effectiveness research is also needed to evaluate decision-making. Treatment selection for localized prostate cancer is recognized as a preference sensitive decision because there is uncertainty about whether and how to optimally treat prostate cancer and treatment options have differing risk profiles [14]. Unfortunately, studies suggest that decision processes for selecting treatment are often poorly informed, emotionally laden and occur under unwarranted perceptions of urgency [12,65]. Providing decision support tools, such as decision aids, is recognized as an effective strategy for improving decision quality [66]. Decision aids, which can be written, video or web-based, have been shown to increase knowledge and engagement in decision-making, reduce decisional conflict and decrease interest in aggressive treatments. However, few randomized studies have evaluated decision aids for prostate cancer treatment [66,67]. None of these studies used decision aids that provided information about active surveillance as an option for men with low-risk cancers. Evaluating whether receiving up-to-date decision aids for prostate cancer treatment affects treatment decisions and quality of life is an important agenda for comparative effectiveness research [68].

- Simulation models

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Models for screening have estimated that the number needed to screen to prevent one death
PSA testing has led to an epidemic of localized prostate cancer. While there is no certainty about how, or even whether, to treat men with screen-detected cancers, most undergo curative therapy. We have little guidance from randomized trials, because there have been no published head-to-head comparisons with different active treatment modalities. We do know that most deaths among men enrolled in clinical trials are due to causes other than prostate cancer and the chance of dying from prostate cancer within 10 years of a screening diagnosis is quite low. Men with high-risk localized cancers seem most likely to benefit from aggressive treatment, either radical prostatectomy or the combination of EBRT and ADT. Active treatment seems to provide little benefit for men with low-risk cancers.

However, definitively determining the optimal active treatment for a localized cancer is difficult because the lengthy time required for observing survival differences means that treatments will evolve and the applicability of survival results can always be challenged – particularly by proponents of the apparently less successful treatment. Complicating the issue is the emergence of active surveillance as an option for men with low-risk cancers. While the ProtecT trial will provide some guidance for treatment decisions, there will still be uncertainty as to the optimal selection criteria, monitoring strategies and the most clinically relevant outcomes. Furthermore, given that the risk of dying from a screen-detected cancer over a decade is relatively small, treatment decisions will be weighted heavily on complications and their adverse effects on quality of life, although there is also a need for better prognostic biomarkers to use for surrogate clinical end points. Given the practical limitations of cost, time and ability to enroll adequate sample sizes for conducting randomized trials to compare different treatment modalities, observational studies will be the most efficient strategy for conducting the comparative effectiveness research needed to support informed decision-making.

Conclusion

Prostate cancer will probably remain one of the most frequently diagnosed cancers in American men. Screen-detected cancers are often indolent, making it challenging to conduct efficacy trials. The emergence of new and expensive treatment technologies also means that current practice is a moving target. Results from comparative effectiveness research, using observational cohorts, claims data and modeling will have an increasingly important role in guiding treatment decisions. This research can efficiently address patient-centered outcomes, including HRQOL, across a spectrum of established and novel active treatments and active surveillance. Comparative effectiveness research can also evaluate the decision-making processes, suggesting strategies for better supporting informed decision-making. Another important role should be to evaluate the cost-effectiveness of new technologies [69]. Expensive treatments, including robot-assisted laparoscopic radical prostatectomy, IMRT and proton therapy, have been rapidly and widely disseminated into practice in the absence of compelling evidence for better cancer control or fewer side effects. Often decisions to introduce these technologies are driven by financial considerations that drive up the costs of healthcare without ensuring a commensurate quality improvement. Comparative effectiveness and cost-effectiveness analyses can be used to inform policy decisions outlining indications for using and reimbursing the new technologies.

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Localised prostate cancer treatment

Executive summary

**Treating localised prostate cancer**
- Prostate-specific antigen testing has led to a dramatic increase in the incidence of localised prostate cancer, although a substantial proportion of screen-detected cancers are considered to be overdiagnosed.
- Most men who are diagnosed with localised prostate cancer attempt curative therapy with surgery or radiation, although observation may be appropriate for men with low-risk cancers or limited life expectancy.

**Randomised controlled trials**
- Controlled trials suggest a survival benefit for treating men with high-risk screen-detected cancers with either radical prostatectomy or external beam radiotherapy combined with androgen deprivation. No controlled trials have published results comparing different treatment modalities, including comparisons of active treatment versus active surveillance.

**Observational studies**
- Comparative effectiveness research based on observational cohort studies, retrospective claims analyses and simulation models allows investigators to efficiently compare treatments that have not been studied in controlled trials and capture real-world patient-centered outcomes.

**Conclusion**
- Results from comparative effectiveness research can better support patient decision-making on whether and how to treat localised prostate cancer, as well as support policy decisions about disseminating and reimbursing new technologies.

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### Websites


