A survey of Canadian urologists' and radiologists' perspectives regarding the use of prostate MRI in biopsy-naive patients

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ABSTRACT

Introduction: In biopsy-naive men, guidelines now support magnetic resonance imaging (MRI) to improve detection of clinically significant prostate cancer (PCa), reduce overdiagnosis of insignificant PCa, and avoid biopsy in low-risk cases; however, the demand for MRI will be difficult to meet within the Canadian universal healthcare system. We evaluated Canadian urologists' and radiologists' practices, perceptions, and anticipated barriers to MRI implementation in this setting.

KEY MESSAGES

- Uncertainty exists regarding the feasibility and resource implications of adding pre-biopsy mpMRI to the diagnostic algorithm for biopsy-naive men suspected of having clinically significant prostate cancer in Canada
- This national survey of Canadian urologists and radiologists highlights broad support for pre-biopsy mpMRI in this context, but also revealed significant barriers to implementation, including inadequate imaging infrastructure, variable interpretive expertise, and projected increases in MRI-associated wait times
- Our findings underscore the urgent need for coordinated health system planning to achieve equitable, guideline-concordant PCa care across Canada.

Methods: Separate surveys were iteratively developed for urologists and radiologists to inquire about the use/expected use of pre-biopsy MRI across common patient vignettes, barriers and facilitators to implementation, views on streamlining high-risk patients, and effect on wait times.
Results: Respondents included 175 urologists and 84 radiologists. Only 19% of urologists currently requested MRI for the majority of their patients vs. 59% who anticipated they would do so after guideline implementation. Most respondents (90%) felt that some high-risk patients could proceed directly to biopsy, but this varied by risk threshold. The highest-rated barrier to implementing guidelines was inadequate infrastructure, staffing, or MRI equipment, followed by lack of volume/expertise and reimbursement; 59% of respondents felt that pre-biopsy MRI would lead to an additional long delay (1−3 months) in diagnosis.
Conclusions: This national survey of urologists and radiologists highlights broad support for using pre-biopsy mpMRI to diagnose PCa in biopsy-naive men; however, significant barriers to implementation exist, including inadequate imaging infrastructure, variable interpretive expertise, and projected increases in mpMRI-associated wait times. Our findings underscore the urgent need for coordinated health system planning to achieve equitable, guideline-concordant PCa care across Canada.

INTRODUCTION

Prostate cancer remains the most commonly diagnosed malignancy among Canadian men. The historical diagnostic pathway involves prostate-specific antigen (PSA) testing, followed by systematic biopsy in men deemed high-risk for prostate cancer.[1] However, conventional approaches carry notable limitations, including the risk of unnecessary invasive biopsies and overdiagnosis of indolent cancers.[2,3] Landmark clinical trials, such as PROMIS and PRECISION, have demonstrated the effectiveness of multiparametric magnetic resonance imaging (mpMRI) in improving the detection of clinically-significant prostate cancer (csPCa) while reducing unnecessary biopsies.[4,5] Following this, the PRECISE trial demonstrated analogous findings in a pan-Canadian context, affirming the improved detection of csPCa while avoiding biopsy in 37% of men.[6]

Reflecting the emerging evidence, Cancer Care Ontario (CCO) published updated guidelines in 2021[7], subsequently endorsed by the Canadian Urological Association (CUA), recommending the use of mpMRI prior to biopsy in biopsy-naive men at elevated risk of csPCa who are potential candidates for curative treatment. However, there remains uncertainty regarding the feasibility and resource implications of widespread implementation of these guidelines across Canada. The CCO guideline panel explicitly highlighted the limited MRI infrastructure nationally and stressed the need for further investigation into resource and logistical barriers.[8]

Currently, there is no comprehensive national data assessing how these updated guidelines are interpreted and operationalized by frontline clinicians. Effective implementation is

dependent on collaboration between members of the healthcare team, particularly urologists and radiologists who jointly manage the diagnostic process. Understanding the perceptions, practices, and challenges faced by these specialists is therefore essential for the successful translation of guideline recommendations into clinical practice.

This study aimed to evaluate Canadian urologists' and radiologists' current practices, perceptions, and anticipated barriers regarding the integration of mpMRI into the diagnostic algorithm for biopsy-naive men suspected of prostate cancer. Our findings seek to ultimately optimize patient outcomes and resource allocation in prostate cancer care across Canada.

METHODS

This study was approved by the UHN Research Ethics Board (#20-6184). The study team (including urologists, radiologists and health services researchers) used an iterative process to develop two surveys (one for urologists and one for radiologists) based on previous work,[9] the Clinician Guideline Determinants Questionnaire[10], and specialty expertise. The surveys were then pre-tested by additional urologists and radiologists (2 fellows and 2 staff for each specialty) and modified based on feedback received regarding content and readability. The surveys were translated into French by a certified translator and uploaded to SurveyMonkey (www.surveymonkey.com).

Survey questions (formatted as multiple-choice, rating scale, or short answer) asked about the use/expected use of pre-biopsy MRI across a series of common patient vignettes, barriers and facilitators to MRI implementation, views on streamlining high risk patients directly to biopsy, and whether the increased MRI usage would lengthen wait-times for PCa patients and/or patients requiring imaging for other reasons. Patient vignettes represented different risk profiles/thresholds, and respondents were asked whether they would be likely to recommend MRI, refer straight to biopsy, or neither (monitoring only). In addition, demographic characteristics including age, sex, practice location, hospital type, specialty training, years in practice, and patient volume were collected.

We sent the survey link directly to all members of the Canadian Urological Association by email using the membership directory (956 members) in August 2021, followed by a reminder email in September 2021. For radiologists, the survey was promoted (survey link provided) through the Canadian Association of Radiologists (2500 members) newsletter distributed by email in June 2021. Potential respondents were invited to answer a questionnaire in their language of preference (English or French).

Categorical variables and most survey responses are presented as proportions/percentages. Continuous variables are reported as medians (interquartile range [IQR]). Chi-square or Fisher's exact test was used to assess differences in responses between geographical regions or between urologists and radiologists.

Likert rating scales results are presented as proportions for each level of response and as mean(SD). Differences in responses to rating scales between urologists and radiologists were assessed by the Mann-Whitney U test.

RESULTS

Respondent demographics

A total of 259 (7.5%) urologists and radiologists responded to the survey. The urologist-specific response rate was 18.3% (175/956), while the radiologist-specific response rate was approximately 3.4% (84/2,500) (Table 1). Urologist respondents predominantly practiced in Ontario (53%) and Quebec (25%), whereas radiology respondents were distributed across the country: Alberta and British Columbia (39%), Ontario (33%), and Quebec (24%). 55% of the urologists and 40% of radiologists had been practicing for more than 10 years. The majority of respondents in both specialties were based in academic practices (urologists 57%, radiologists 65%) and had completed fellowship training (urologists 69%, radiologists 79%).

Practices of urologist respondents prior to guideline implementation

Urologists reported receiving a median of 150 patient referrals annually (IQR 50, 250) for evaluation or management of suspected prostate cancer. Prior to the release of the updated guidelines, most respondents answered that they rarely requested an MRI for biopsy-naive patients (<25% of the time) (Figure 1a). However, following implementation, over half anticipated using MRI in a majority of cases following guideline implementation, including 35% that would consider using MRI in nearly all (76-100%) of new case presentations. A further 32% of urologists expected a significant (51–100%) increase in prostate MRI volume in their practice.

Practices of radiologist respondents prior to guideline implementation

Radiologists reported a wide variation in the total yearly number of prostate MRIs performed with the most common estimating between 251-500 annually. Individually, 41% of respondents stated that they had not interpreted any prostate MRIs in the past year. 56% felt either somewhat comfortable or very comfortable in their ability to read and report prostate MRI, while 24% felt very uncomfortable (Figure 1b). The most frequently performed prostate MRI was multi-parametric at 3T, typically requiring less than 30 minutes per scan. 63% of respondents could not estimate how many cases per hour they could complete if they were to only perform bi-parametric MRI.

94.7% of radiologists agreed that, if prostate MRI were to be approved and funded, there should be accredited Continuing Medical Education (CME) training. Further, 72% stated they would attend these training sessions. Only 47% of radiologists reported that a formal quality assurance program or regular meetings/tumor boards with urologists was in place for review of prostate MRI results. For 74%, technical parameters for prostate MRI image acquisition at their site was compliant with PIRADS v2.1 and 56% used structured reporting for prostate MRI.

Urologists' opinion on streamlining patients to expedite diagnosis

Almost all (90%) of urologists agreed that some “high risk” patients, as determined by (at least one of) PSA, DRE, and/or a risk calculator, could proceed directly to systematic biopsy without MRI (Figure 2a), though this varied slightly by metric (Figure 2b & 2c). For the majority of

respondents in each case, patients with an elevated PSA >10-15 ng/mL or palpable EPE/cT3+ could proceed directly to biopsy over MRI. Conversely, for patients with a PSA between 4-10 ng/mL, respondents preferred pre-biopsy MRI. While there was an increasing trend towards upfront biopsy as risk calculator score increased, clinicians still preferred an MRI-guided approach at thresholds to 10%. In thresholds below these (low risk scenarios), physicians preferred monitoring alone. For patients with palpable extra-prostatic extension/cT3+, 89% of physicians would recommend proceeding directly to biopsy (Figure 2d). Responses did not differ when stratified based on geographic region ($p>0.05$).

Barriers to implementing guideline recommendations

Figure 3 characterizes the overall level of agreement regarding perceived barriers to implementing guideline recommendations. Urologists and radiologists most strongly believed that inadequate infrastructure, staffing or MRI equipment is a barrier to implementing guideline recommendations (83% somewhat or strongly agreed; mean score 4.3, SD 1.0). Lack of volume and expertise, and lack of reimbursement were also identified as important barriers over adequate MRI technology.

Patient experience and system effects

Figure 4 characterizes the overall level of agreement regarding the patient experience and effects on the system. There was overall agreement that the introduction of mpMRI screening in the recent guidelines would reduce anxiety and discomfort for patients (84% somewhat or strongly agreed; mean score 4.2, SD 0.9) and complications by avoiding unnecessary biopsy if the MRI result is negative (90% somewhat or strongly agreed; mean score 4.3, SD 0.82), but at an increased overall cost to the system (69% somewhat or strongly agreed; mean score 3.8, SD 1.1).

Perceptions regarding evidence to recommend MRI in the biopsy-naive population

Most respondents felt that there was sufficient evidence to recommend MRI in the biopsy-naive population (70%). Of the respondents who disagreed, urologists perceived insufficient evidence specific to the Canadian context to be the biggest limitation (12%).

Wait times

The most frequent change in wait time for patients at risk of prostate cancer to undergo mpMRI was perceived to be an (additional) long delay of 1-3 months (59%) (Figure 5). 31% of respondents felt that there would be a small delay (<1 month), while 10% thought there would be no delay or faster diagnosis as a result of the new guidelines. However, this finding differed by specialty as urologists felt more strongly that there would be long delays compared to radiologists (66% vs. 27%, respectively). This difference in perceived wait times between urologists and radiologists was consistent when examined within individual regions (Ontario: 63% vs 30%; Alberta and British Columbia: 58% vs 18%; Quebec: 50% vs 35%), suggesting

that the observed specialty-level divergence is not attributable to differences in the geographic distribution of respondents.

For all other patients requiring MRI (indications other than prostate cancer), 64% of respondents anticipated a long delay of 1-3 months, 28% a small delay of <1 month, and 8% perceived no delay or faster diagnosis. Once again, more urologists perceived there to be a longer delay than radiologists (67% vs. 45%, respectively).

DISCUSSION

Perceived burden on the healthcare system and effect on wait times

Respondents expressed mixed opinions regarding the impact of implementing mpMRI-based guidelines on the healthcare system, reflecting uncertainty about balancing increased MRI demand with potential reductions in unnecessary biopsies and associated complications. Specifically, although respondents strongly agreed that mpMRI implementation would reduce patient morbidity by avoiding biopsies in MRI-negative cases (mean score: 4.32, SD = 0.82), their neutral stance on the overall system burden (mean score: 3.46) suggests ambivalence driven by concerns about capacity constraints. This sentiment is consistent with existing data highlighting significant imaging-resource limitations in Canada. For instance, recent data from Ontario Health reported a median MRI wait time of 99 days, with only 32% of patients scanned within the recommended 28-day target (Supplement Table 1)[11]. Nationally, Canadian medical practitioners in a 2022 survey reported median MRI wait times of 10.6 weeks, ranging between 12 and 20 weeks across provinces.[12] These systemic delays align with concerns expressed by respondents in our survey, wherein 59% anticipated additional delays of 1–3 months for patients requiring prostate MRI as a result of guideline adoption. Similarly, 66% expected analogous delays for all other patients requiring MRI.

Lack of infrastructure, equipment, and expertise

Our findings identified inadequate infrastructure, staffing, and MRI equipment as significant barriers to implementing current prostate MRI guidelines (mean score = 4.20, SD = 0.999). Only 56% of radiologists reported feeling somewhat or very comfortable interpreting prostate MRI, whereas 24% expressed significant discomfort, and just 41% had interpreted prostate MRI scans within the past year. These observations highlight national disparities in prostate cancer diagnostic capabilities, with potential implications for patient outcomes. Similar variability was demonstrated in the ASIST trial, a multicenter randomized study comparing targeted MRI-guided biopsy to systematic biopsy. Substantial site-to-site variation in positive predictive value for clinically significant cancer (GG ≥2) detection was reported (33% at experienced sites vs. 8–10% at less experienced centers), emphasizing the impact of experience and training on diagnostic yield. This is in agreement with external studies as well, such as the PROBASE Trial, a German study which found that expert reading led to detection of 24% additional csPCa cases at a cutoff of PI-RADS ≥4, and warned that local reading may mean that patients may be at risk of delayed PCa detection or failure to detect PCa.[13] Current guidelines explicitly advocate for

MRI and biopsy operators to demonstrate consistent experience and proficiency to ensure reliable clinical outcomes.[1] However, limited standardized quality assurance program for prostate MRI currently exists in Canada,[7] highlighting a potential area of improvement and standardization. Encouragingly, nearly 95% of radiologists in our survey supported the introduction of accredited CME programs alongside mpMRI funding, and 72% indicated willingness to participate. Therefore, structured CME initiatives represent a practical and evidence-based solution to enhance diagnostic accuracy, reduce variability, and facilitate standardized adoption of mpMRI guidelines nationwide.

Perceived impact on patient burden

Respondents strongly agreed that implementation of the guideline recommendations would reduce patient anxiety and enhance overall comfort. These perceptions are consistent with data from clinical trials[4-6] which demonstrated that the use of pre-biopsy MRI and MRI-targeted biopsy significantly reduces unnecessary and invasive biopsy procedures, thereby minimizing associated physical discomfort and psychological distress. Further, decreasing biopsy-related complications and avoiding overdiagnosis of indolent cancers, guideline-concordant mpMRI use could markedly improve patient experience and quality of life.

Strong agreement with guidelines

Our results indicate strong clinician agreement regarding the sufficiency of evidence supporting mpMRI use in biopsy-naive patients with suspected prostate cancer. Specifically, 70% of respondents indicated they believed current evidence adequately supports these guideline recommendations. Notably, urologists who expressed disagreement primarily cited insufficient Canadian-specific data as their rationale. Nevertheless, this broad consensus aligns with the clinical recommendations of Cancer Care Ontario and the Canadian Urological Association, both endorsing mpMRI prior to biopsy based on robust level 1 data. Collectively, our study findings underscore widespread clinical readiness to adopt mpMRI-driven diagnostic pathways, emphasizing the need to overcome identified logistical and resource-related barriers to optimize nationwide implementation.

Strengths and limitations

An important strength of our study is its national scope and participation from all Canadian provinces and regions, which provided a geographically diverse snapshot of prostate cancer care across the country. Additionally, the survey included a broad cohort of respondents, including attending physicians, residents, and fellowship-trained practitioners from academic and community-based practices. Notably, the inclusion of both urologists and radiologists allowed for a comprehensive assessment of perspectives critical to the implementation of prostate mpMRI guidelines.

Nevertheless, this study has several limitations. The voluntary nature of survey participation introduces potential response bias, as clinicians with stronger opinions or greater familiarity with mpMRI may have been more likely to respond, limiting generalizability.

Additionally, the data reflect self-reported practices and perceptions, which are subject to recall and reporting bias. It is also important to note that the survey instrument did not include a question evaluating participants' knowledge or awareness of the specific guideline recommendations. As the survey was administered shortly after Cancer Care Ontario guideline publication (February 2021), varying clinician familiarity with recommendations may have influenced both reported practices and perceptions of implementation barriers. Further, our study sample over-represents academic practitioners and fellowship-trained physicians relative to the broader Canadian practice landscape. This may have biased findings toward more favourable perceptions of mpMRI adoption, as these clinicians are likely to have greater exposure to and familiarity with advanced imaging modalities. Additionally, the geographic distribution of respondents differed by specialty, with urologists concentrated in Ontario (53%) and Quebec (25%), while radiologists were more broadly distributed across provinces, including a substantial proportion from Alberta and British Columbia (39%). Given that provincial healthcare delivery models, imaging resource availability, funding structures, and workforce composition vary considerably across Canada, this discrepancy may have influenced comparative responses between specialties. However, within-region analyses of key findings, such as perceived wait times, demonstrated consistent patterns across provinces, suggesting that the observed specialty-level differences are robust to geographic variation. Analysis of interactions between region and specialty were not performed across all survey domains given the limited sample sizes within certain provincial subgroups (e.g., Atlantic Canada, n=3 radiologists), which would preclude meaningful interpretation; instead, we focused on identifying broad, consistent trends across regions and specialties for perceived barriers, patient experience, and system effects.

While the study achieved broad geographic representation, the survey was not designed to capture granular, region-specific analyses of infrastructure, funding models, or workforce distribution, which may further inform the feasibility of mpMRI guideline implementation across diverse practice settings. Future studies incorporating administrative system-level data, including MRI utilization rates, wait time trends, and biopsy volumes, alongside patient-level diagnostic and oncologic outcomes, will be essential to comprehensively evaluate the real-world impact of mpMRI guideline implementation and to identify ongoing gaps between guideline recommendations and clinical practice across Canada.

CONCLUSIONS

This national survey of urologists and radiologists highlights broad support for the integration of pre-biopsy mpMRI into the diagnostic pathway for biopsy-naive men with suspected prostate cancer, consistent with the updated 2022 CUA recommendations on prostate cancer screening and early diagnosis. Clinicians recognized the potential of mpMRI to reduce unnecessary biopsies and patient morbidity, aligning with international evidence. However, significant barriers to implementation persist, including inadequate imaging infrastructure, variable interpretive expertise, and projected increases in mpMRI-associated wait times.

Our findings underscore the urgent need for coordinated health system planning, including investments in mpMRI capacity, standardized quality assurance protocols, and the rollout of accredited CME programs to support consistent and accurate mpMRI interpretation across practice settings. Addressing these challenges is essential to achieving equitable, guideline-concordant prostate cancer care across Canada.

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FIGURES AND TABLES

Figure 1A. In what proportion of patients with suspicion of prostate cancer who have never had a prostate biopsy, would you request magnetic resonance imaging (MRI)?

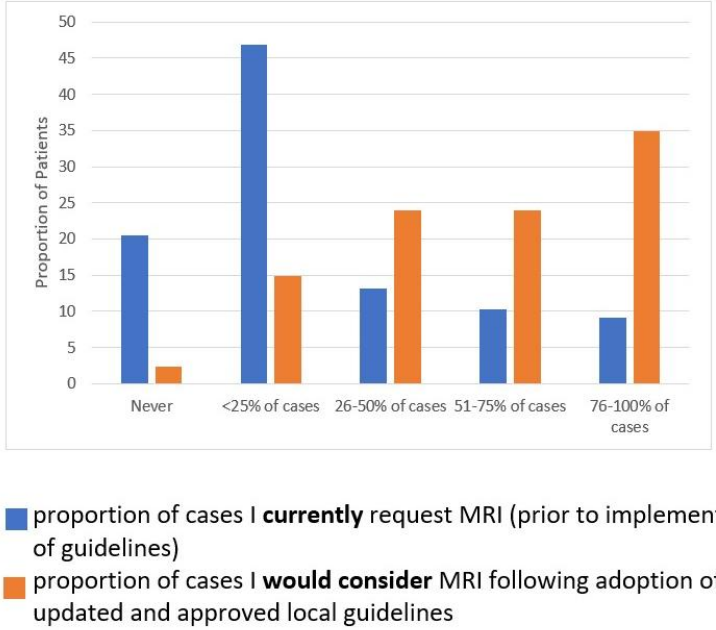

Figure 1B. How comfortable are you in your ability to read and report prostate magnetic resonance imaging (MRI)?

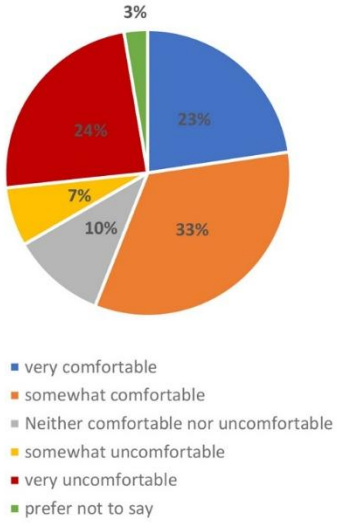

Figure 2A. Urologists' opinions on streamlining patients to expedite diagnosis. DRE: digital rectal exam; MRI: magnetic resonance imaging; PCa: prostate cancer; PSA: prostate-specific antigen.

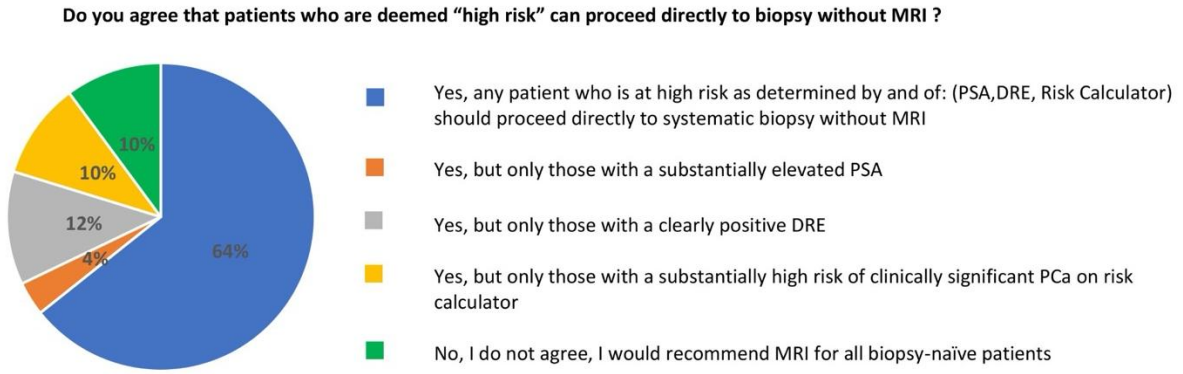

Figure 2B. Physician recommendations based on prostate-specific antigen (PSA).

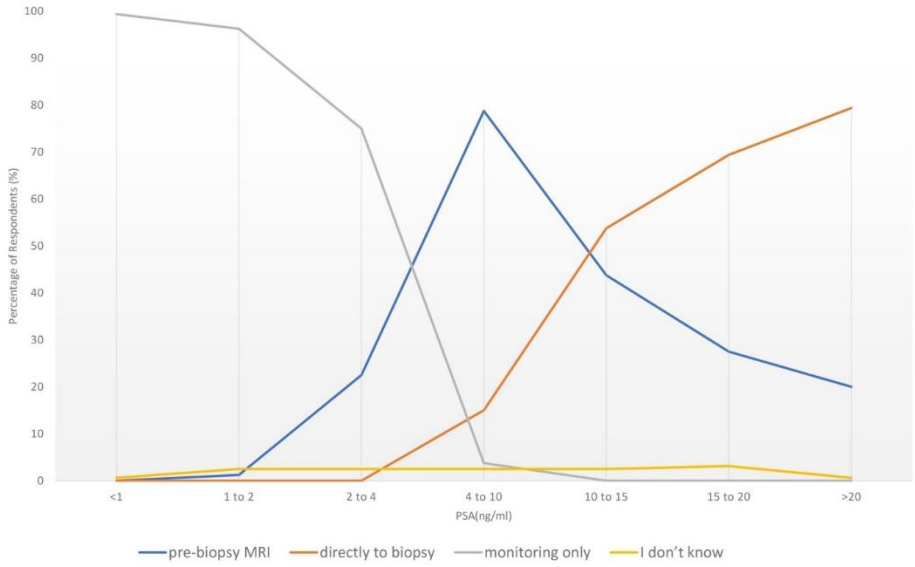

Figure 2C. Physician recommendations based on risk calculator score. MRI: magnetic resonance

imaging.

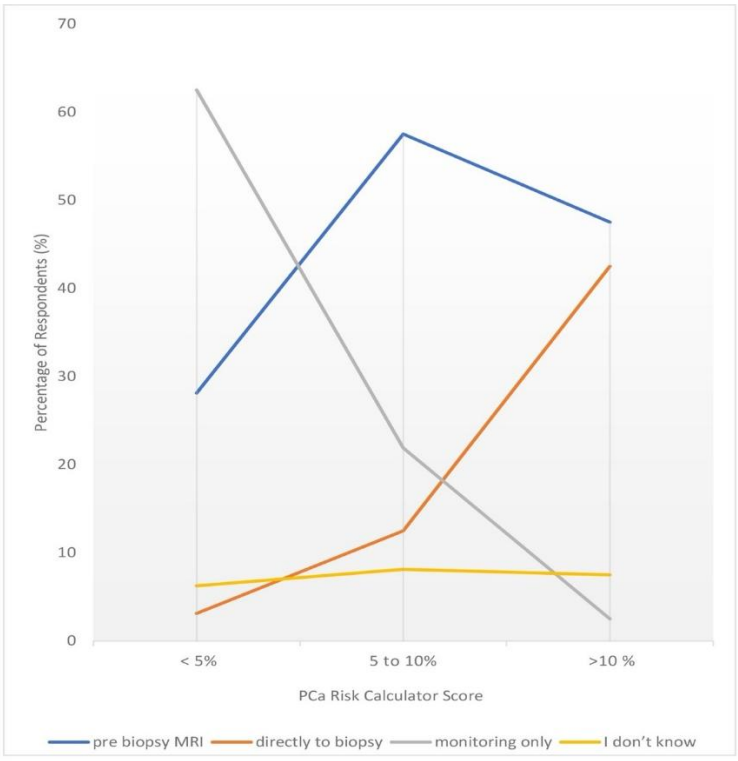

Figure 2D. Physician recommendation based on palpable extra-prostatic extenstion/cT3+. MRI: magnetic resonance imaging.

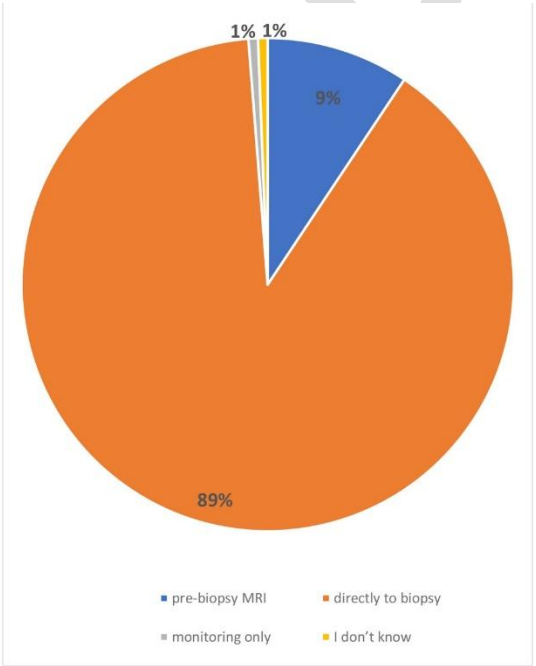

Figure 3. Agreement regarding perceived barriers to implementation of pre-biopsy multiparametric magnetic resonance imaging (mpMRI) in biopsy-naive patients.

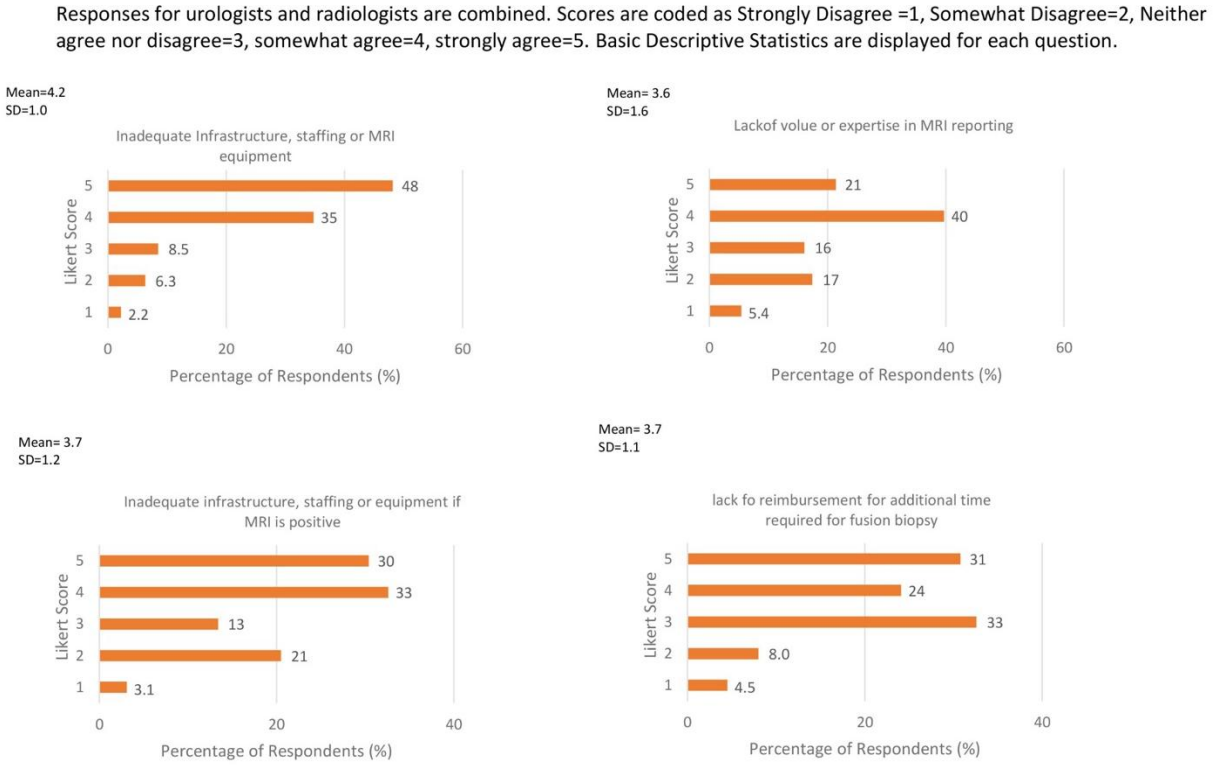

Figure 4. Agreement regarding effect of implementation of pre-biopsy multiparametric magnetic resonance imaging (mpMRI) in biopsy-naive patients on patient experience and system effects.

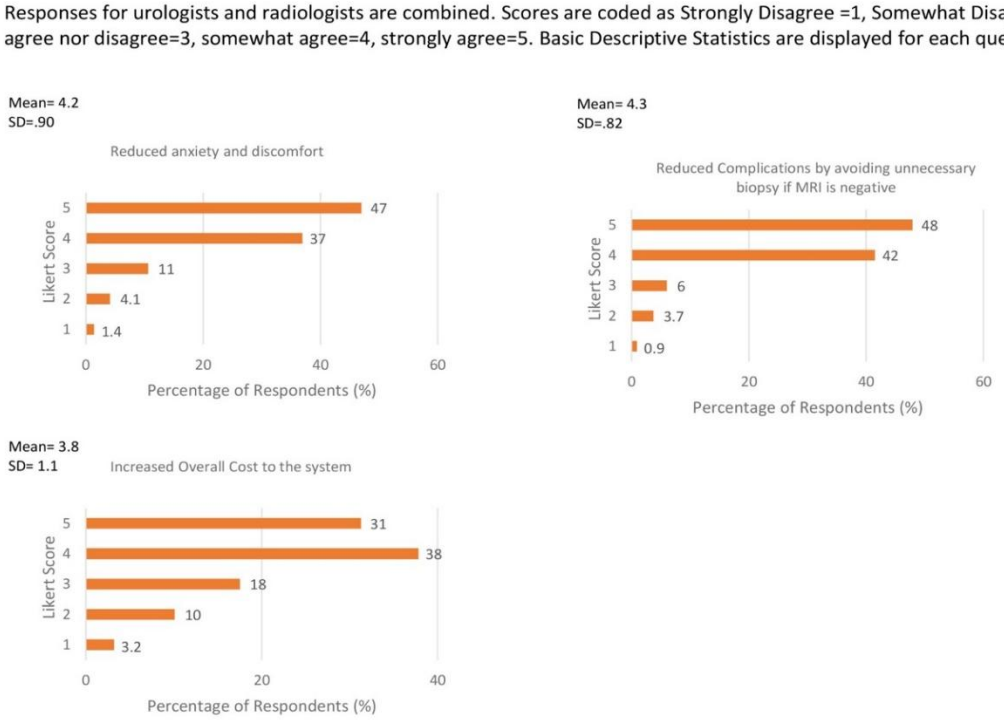

Figure 5. Expected change in wait times with implementation of pre-biopsy multiparametric magnetic resonance imaging (mpMRI) for biopsy-naive men suspected of having prostate cancer.

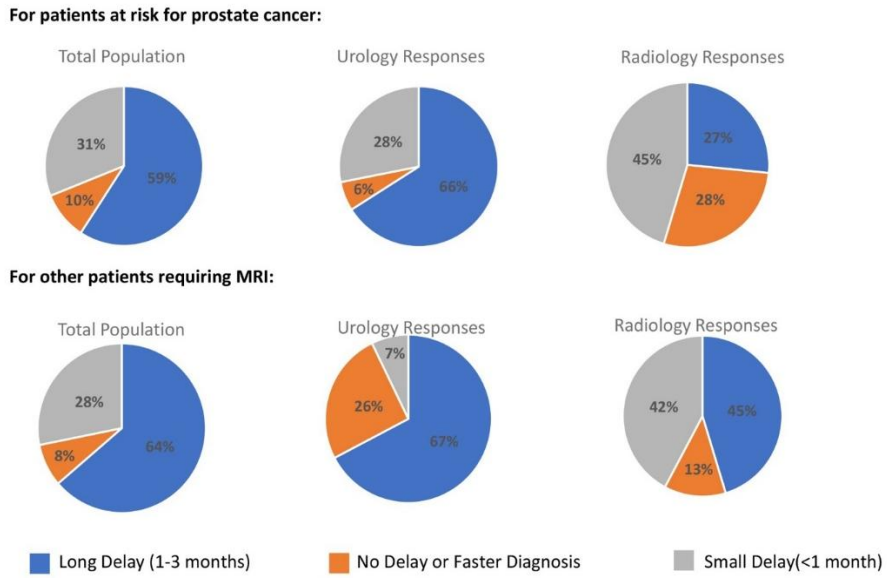

Table 1. Demographic characteristics of urologists and radiologists, n, (%)		
	Urologists (n=175)	**Radiologists (n=84)**
Location		
Alberta & British Columbia	25 (14%)	33 (39%)
Atlantic Canada	13 (7.4%)	3 (3.6%)
Ontario	93 (53%)	28 (33%)
Quebec	44 (25%)	20 (24%)
Years in profession		
0−10	78 (45%)	50 (60%)
>10	97 (55%)	34 (40%)
Type of practice		
Academic	99 (57%)	55 (65%)
Non-academic	76 (43%)	29 (34%)
Professional status		
Staff urologist/radiologist	156 (89%)	70 (83%)
Urology/radiology resident or fellow	11 (6.3%)	13 (16%)
Other[a]	8 (4.6%)	1 (1.2%)

[a]Other includes: For urology: Other medical specialty or not currently in practice, predominantly pediatric urologist. For radiology: Other medical specialty or not currently in practice.