

# Real-world management of advanced prostate cancer: A description of management practices of community-based physicians and prostate cancer specialists

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**Cite as:** Hotte SJ, Finelli A, Chi KN, et al. Real-world management of advanced prostate cancer: A description of management practices of community-based physicians and prostate cancer specialists. *Can Urol Assoc J* 2021;15(2):E90-6. <http://dx.doi.org/10.5489/cuaj.6779>

Published online August 18, 2020

Appendix available at [cuaj.ca](http://cuaj.ca)

## Abstract

**Introduction:** The Canadian Genitourinary Research Consortium (GURC) conducted a consensus development conference leading to 31 recommendations. Using the GURC consensus development questionnaire, we conducted a survey to measure the corresponding community-based practices on the management of metastatic castration-sensitive prostate cancer (mCSPC), metastatic castration-resistant prostate cancer (mCRPC) and non-metastatic castration-resistant prostate cancer (nmCRPC).

**Methods:** An 87-item online questionnaire was sent to 600 community urologists and oncologists involved in the treatment of prostate cancer.

**Results:** Seventy-two community physicians responded to the survey. Of note, 50% community physicians indicated they would treat nmCRPC with agents approved for this indication if advanced imaging showed metastases. Radiation to the prostate for low-volume mCSPC was identified as a treatment practice by 27% of community physicians, and 35% indicated docetaxel as the next line of treatment after use of apalutamide. Use of genetic testing was reported in 36% of community physicians for newly diagnosed metastatic prostate cancer.

**Conclusions:** There are several areas of community-based management of advanced prostate cancer that could represent potential areas for education, practice tools, and future research.

## Introduction

The Canadian Genitourinary Research Consortium (GURC) recently conducted a consensus development conference with 27 prostate cancer specialists leading to 31 practice recommendations (Appendix; available at [cuaj.ca](http://cuaj.ca)).<sup>1</sup> The GURC is a multidisciplinary scientific group of prostate cancer physicians across Canada who collaborate on scientific, education, and best practice initiatives. We subsequently conducted a survey using the same questionnaire to better understand the corresponding community-based practice in the management of metastatic castration-sensitive prostate cancer (mCSPC), metastatic castration-resistant prostate cancer (mCRPC), and non-metastatic castration-resistant prostate cancer (nmCRPC). This was conducted to draw insight into and understand variations in clinical practice that may exist across community and prostate cancer specialists to allow opportunities for research and/or education to optimize patient care.

## Methods

In the previous phase (Phase 1) of the study, a core scientific group of eight multidisciplinary physicians from the GURC designed a set of consensus development questions to query clinical management across a range of clinical scenarios where evidence is less conclusive or that require synthesis of multiple pieces of evidence to inform practice.<sup>1-3</sup>

The questionnaire covered the following main areas: biochemical recurrence following local definitive therapy; nmCRPC; mCSPC; sequencing of systemic treatments; mCRPC; oligometastatic prostate cancer; access and funding of treatments; genetic testing in prostate cancer; referrals for care; and imaging in advanced prostate cancer.

Completion of Phase 1, where the consensus questionnaire was administered to expert prostate cancer specialists (hereafter referred to as “prostate cancer specialists”) in an anonymous, online format within a one-day consensus development conference, led to the current Phase 2 study. In this second phase, the consensus questionnaire was administered as an anonymous, online survey to a national sample of community-based prostate cancer physicians (hereafter referred to as “community physicians”) to examine how clinical management practices in the community reflected the practices of the prostate cancer specialist group.

While the method to collect responses to the questionnaire differed for the prostate cancer specialist group and the community physician group, the actual data collection instrument (the consensus questionnaire) was common to both phases of the study and enabled a descriptive examination of the responses for the two physician groups, even though this cannot be viewed as a “comparative” study. The community physician survey responses for the 31 clinical consensus scenarios from the first phase of the study were analyzed descriptively by calculating the percentage agreement in responses among the community physician group. Similarly, the percentage agreement rates among the prostate cancer specialist group are also displayed in the tables included herein as reference.

## Results

The community physician survey was conducted over five weeks from May to June 2019. Six hundred physicians were invited to participate in the online survey and 72 physicians responded (12% response rate).

Approximately half of the community physicians had been in clinical practice for 10 or more years (Table 1). The practice setting of the community physicians was a mixed setting of community with academic affiliation in 63% (n=45) and fully community-based in 37% (n=27). On

average, community physicians reported seeing 14 patients with metastatic prostate cancer per month in their clinic and initiating next-generation androgen-receptor (AR) targeted therapy in an average of three patients per month.

The 31 areas of consensus practice arising from the earlier study with prostate cancer specialists are listed in Tables 2–8. Percentage agreement rates among the community physicians are reported and the corresponding agreement rates from the prostate cancer specialist group are displayed for reference. For eight of the 31 areas, percentage agreement was 75% or greater for both the prostate cancer specialists and the community physician group. In 15 of the 31 areas, the percentage agreement in the community group differed from the percentage agreement in the prostate cancer specialist group by 25% or greater.

## Biochemical recurrence

Community physicians reached 75% agreement in using absolute prostate-specific antigen (PSA) to guide them on when to initiate androgen deprivation therapy (ADT) and measuring PSA at a frequency of every 3–4 months after initiating ADT. This was similar to what was observed among the prostate cancer specialists in the earlier study.

Lower rates of agreement were observed in the type of ADT (intermittent or continuous) initiated in patients with biochemical recurrence following local radical therapy. Just over two-thirds of community physicians initiated ADT in an intermittent regimen (n=44, 68%), while a smaller proportion (n=16, 26%) preferred initiating ADT in a continuous regimen, and 6% (n=4) preferred to wait until metastases before beginning ADT. As reference, prostate cancer specialists reached a high level of agreement (93%) that ADT should be initiated on an intermittent schedule.

## nmCRPC

Community physicians reached 78% agreement that they would treat nmCRPC patients with PSA doubling time (PSADT) of  $\leq 10$  months who are negative on conventional imaging with nmCRPC-approved agents such as apalutamide or enzalutamide. This recommendation would be expected to extend to include darolutamide now that it is approved as a treatment option for nmCRPC in Canada. Community physicians also reached 82% agreement that surrogate endpoints likely correlated with overall survival, such as metastasis-free survival, provide sufficient evidence for treatment decision-making.

Lower rates of agreement among community physicians were observed in two areas. The PSADT threshold used to initiate second-generation AR targeted therapy in patients with nmCRPC and PSA 10–20 ng/mL showed variability. Sixty percent (n=41) of community physicians used a

**Table 1. Characteristics of community physician sample**

	Community n=72	
Clinical specialty		
Urologist	42	58%
Medical oncologist	23	32%
Radiation oncologist	6	8%
General practitioner in oncology	1	1%
Number of years in practice		
Less than 10 years	37	51%
10 or more years	35	49%
Region		
Western Canada	22	31%
Ontario	29	40%
Quebec and Atlantic Canada	21	29%

**Table 2. Biochemical recurrence percentage agreement among community physicians**

Biochemical recurrence	Community	Prostate cancer specialists*
Do you generally initiate intermittent or continuous ADT for PSA-only recurrence following local radical treatment in patients with no documented metastatic disease?		
Intermittent ADT	68%	93%
In general, when do you recommend initiating treatment with ADT following biochemical recurrence after local radical treatment?		
Absolute (PSA) is used to guide when to initiate ADT	75%	89%
On average, how often do you measure PSA for patients on ADT for PSA recurrence after local radical therapy?		
Once every 3–4 months	84%	93%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. ADT: androgen deprivation therapy; PSA: prostate-specific antigen.

threshold of  $\leq 10$  months, while 18% (n=12) waited until a threshold of  $\leq 8$  months. For reference, the prostate cancer specialist group reached 89% agreement to use a threshold of  $\leq 10$  months in these patients.

Lower rates of agreement among community physicians were also seen in the management of patients with PSADT  $\leq 10$  months who were negative for metastases on conventional imaging and positive for metastases on next-generation imaging. In this scenario, 50% (n=35) of community physicians used AR targeted therapy approved for nmCRPC and 37% (n=25) opted to use AR targeted therapy approved for mCRPC. For reference, 89% of the prostate cancer specialist group treated with second-generation AR targeted therapy approved for nmCRPC.

## mCRPC

Of the four clinical scenarios that reached consensus-level agreement among the prostate cancer specialists, community physicians did not reach high levels of agreement in any of the scenarios (Table 4).

In men with low-volume prostate cancer who are not symptomatic from the primary tumor, just over one-quarter (27%) of community physicians indicated treatment of the primary tumor in addition to systemic therapy. When asked the preferred treatment of the primary tumor, 64% of physicians indicated preferring radiation therapy for most of their patients. As reference, 74% of the prostate cancer specialists indicated they would treat the primary tumor with radiotherapy in addition to systemic therapy and 96% indicated using radiation therapy as the treatment modality to treat the primary tumor.

## mCRPC

Community physicians reached 89% agreement that abiraterone acetate + prednisone or enzalutamide was the preferred first-line treatment for mCRPC in asymptomatic or minimally symptomatic men who did not receive prior docetaxel or abiraterone acetate + prednisone in the castration-sensitive setting. High (100%) agreement was also observed among the prostate cancer specialists (Table 5).

**Table 3. nmCRPC: Percentage agreement among community physicians**

nmCRPC	Community	Prostate cancer specialists*
What systemic treatment approach do you recommend for the majority of your CRPC patients with PSADT $\leq 10$ months, who are non-metastatic on conventional imaging and have metastases on PET based imaging?		
Treatment with nmCRPC agents, such as apalutamide or enzalutamide	50%	89%
For your nmCRPC patients with PSA 10–20 ng/mL, what PSADT threshold do you use in the majority of these patients to initiate second-generation AR targeted therapy (apalutamide or enzalutamide)?		
$\leq 10$ months	60%	89%
What PSADT threshold do you use to start second-generation AR therapy for the majority of your patients with nmCRPC?		
$\leq 10$ months	60%	78%
For patients with non-metastatic CRPC on conventional imaging and PSADT $\leq 10$ months, what do you do?		
Treat with nmCRPC agents, such as apalutamide or enzalutamide	78%	96%
Do you feel that surrogate end points likely correlated with OS, such as MFS, provide sufficient evidence for treatment decision-making in nmCRPC?		
Yes, MFS is sufficient for my treatment decision-making	82%	100%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. AR: androgen receptor; MFS: metastasis-free survival; nmCRPC: non-metastatic castration-resistant prostate cancer; OS: overall survival; PSA: prostate-specific antigen; PSADT: PSA doubling time.

**Table 4. mCSPC: Percentage agreement among community physicians**

mCSPC	Community	Prostate cancer specialists*
In men with de novo metastatic castration-sensitive low-volume prostate cancer, who are not symptomatic from the primary tumor, do you recommend treatment of the primary tumor in addition to systemic therapy?		
Yes, in the majority of patients	27%	74%
In de novo metastatic castration-sensitive low-volume prostate cancer, what is your preferred treatment of the primary tumor in the majority of men?		
Radiation therapy	64%	96%
In men with de novo metastatic castration-sensitive high-volume prostate cancer, who are not symptomatic from the primary tumor, do you recommend treatment of the primary tumor in addition to systemic therapy?		
No	56%	78%
In general, what form of ADT do you recommend in the majority of men presenting with high-volume mCSPC?		
Continuous ADT by LHRH agonist alone ( $\pm$ short course first-generation AR antagonist)	61%	82%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. ADT: androgen deprivation therapy; AR: androgen receptor; LHRH: luteinizing hormone-releasing hormone; mCSPC: metastatic castration-sensitive prostate cancer.

Lower rates of agreement among community physicians was observed in the management of fatigue related to enzalutamide. Fifty-three percent of community physicians stated that they treat fatigue with a dose reduction of enzalutamide, while 20% used lifestyle measures alone for fatigue, and 19% treated fatigue with prednisone  $\pm$  lifestyle recommendations. As reference, 89% of prostate cancer specialists recommended dose reduction of enzalutamide as their primary management approach. Only 4% recommended lifestyle recommendations alone, or prednisone  $\pm$  lifestyle recommendations (7%).

### Sequencing of treatment across the disease spectrum

Low rates of agreement were seen among community physicians across the sequencing scenarios presented for the treatment of nmCRPC, mCSPC, and following first-line treatment for mCRPC.

In asymptomatic patients with mCRPC experiencing PSA-only progression on abiraterone or enzalutamide, only 24% of community physicians indicated they would continue

**Table 5. mCRPC: Percentage agreement among community physicians**

mCRPC	Community	Prostate cancer specialists*
In the mCRPC setting, how do you treat fatigue related to enzalutamide?		
Dose reduction of enzalutamide	53%	89%
Do you believe that chemotherapy re-sensitizes to further ARAT therapy?		
No	61%	74%
What is your preferred first line mCRPC treatment option in the majority of asymptomatic or minimally symptomatic men who did not receive docetaxel or abiraterone acetate + prednisone in the castration-sensitive setting?		
Abiraterone acetate + prednisone or enzalutamide	89%	100%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. ARAT: androgen receptor-axis-targeted therapy; mCRPC: metastatic castration-resistant prostate cancer.

current therapy and monitor. Community physicians were more likely to sequence to docetaxel (40%) or another AR targeted agent, such as abiraterone or enzalutamide (27%). As reference, the prostate cancer specialists reached 78% agreement that they would continue current therapy and monitor for further progression in this type of scenario.

In the setting of asymptomatic mCRPC patients experiencing rising PSA while on abiraterone acetate and prednisone, community physicians were divided between discontinuing abiraterone plus prednisone (39%) and starting a different systemic therapy vs. switching the prednisone component of the regimen to dexamethasone (35%). As reference, the prostate cancer specialists reached 85% agreement to switch the steroid component of an abiraterone regimen to dexamethasone in asymptomatic mCRPC patients experiencing rising PSA.

When asked about treatment selection following use of apalutamide or enzalutamide for nmCRPC, community physicians were more divided between sequencing to docetaxel (35–44%) or abiraterone plus prednisone (31–43%). As reference, most prostate cancer specialists would treat subsequent first-line mCRPC with docetaxel (82–85%).

In patients treated initially with abiraterone acetate plus prednisone in the castration-sensitive setting, 50% of community physicians preferred using docetaxel for first-line mCRPC and 39% preferred using enzalutamide. As reference, prostate cancer specialists reached consensus (78%) to sequence to docetaxel following AR therapy in the castration-sensitive setting.

In terms of second-line treatment for mCRPC, if first-line treatment was docetaxel, 72% of community physicians preferred sequencing to abiraterone acetate plus prednisone or

**Table 6. Sequencing: Percentage agreement among community physicians**

Sequencing of treatments across the disease spectrum	Community	Prostate cancer specialists*
In men treated with abiraterone acetate + prednisone or enzalutamide for first-line asymptomatic mCRPC who have an initial response followed by PSA only progression (secondary [acquired] resistance), what is your preferred second-line treatment for the majority of men? Continue on current therapy	24%	78%
In men with mCRPC who are asymptomatic and have rising PSA on abiraterone acetate plus prednisone, do you recommend a steroid switch to dexamethasone? Yes, when progression is PSA progression alone	35%	85%
In patients who receive apalutamide for nmCRPC and subsequently progress to mCRPC, what do you recommend for first-line treatment of mCRPC (with or without stereotactic body radiotherapy)? Docetaxel	35%	82%
In patients who receive enzalutamide for nmCRPC and subsequently progress to mCRPC, what next line of treatment do you recommend for first-line treatment of mCRPC (with or without stereotactic body radiotherapy)? Docetaxel	44%	85%
What is your preferred second line mCRPC treatment option in the majority of men progressing on or after docetaxel for mCRPC (without prior abiraterone acetate + prednisone or enzalutamide)? Abiraterone acetate + prednisone or enzalutamide	72%	100%
What is your preferred first-line mCRPC treatment option in the majority of asymptomatic or minimally symptomatic men who received abiraterone acetate + prednisone in the castration-sensitive setting? Docetaxel	50%	78%
In men treated with abiraterone acetate + prednisone or enzalutamide for first-line asymptomatic mCRPC who have an initial response followed by radiologic + PSA progression secondary [acquired] resistance), what is your preferred second-line treatment for the majority of men? Docetaxel	74%	100%
In men treated with abiraterone acetate + prednisone or enzalutamide for first-line symptomatic mCRPC who have an initial response followed by progression (secondary [acquired] resistance) what is your preferred second-line treatment for the majority of men? Docetaxel	73%	96%
What is your preferred first line mCRPC treatment option in the majority of symptomatic men who received abiraterone acetate + prednisone in the castration-sensitive setting? Docetaxel	74%	96%
What is your preferred first-line mCRPC treatment option in the majority of asymptomatic or minimally symptomatic men who received docetaxel in the castration-sensitive setting? Abiraterone acetate + prednisone or enzalutamide	94%	100%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. mCRPC: metastatic castration-resistant prostate cancer; PSA: prostate-specific antigen.

enzalutamide, while 13% also considered re-challenging with docetaxel as an option. As reference, 100% of prostate cancer specialists preferred sequencing to abiraterone acetate plus prednisone or enzalutamide. If first-line treatment was abiraterone acetate plus prednisone or enzalutamide, 100% of prostate cancer specialists preferred sequencing to docetaxel, while community physicians sequenced to either docetaxel (74%) or radium-223 (14%).

### Genetic testing and counselling

Of the four scenarios reaching consensus among prostate cancer specialists on the use of genetic testing in the management of advanced prostate cancer, the community physician group did not reach high levels of percentage agreement in any areas.

In men with mCRPC and DNA repair defects now progressing early on, with ADT, community physicians were divided in their approach to next-line therapy. Use of standard mCRPC first-line treatment was recommended in 18%, while 16% would add a poly-ADP ribose polymerase (PARP) inhibitor to standard therapy and 14% would use a PARP inhibitor alone. As reference, 78% of prostate cancer specialists recommended standard mCRPC first-line treatment and 15% recommended platinum-based combination chemotherapy.

Thirty-six percent (36%) of community physicians recommended genetic counselling and testing for a select minority of patients with newly diagnosed metastatic prostate cancer. Thirty-one percent (31%) did not recommend genetic testing for this patient group and 22% were uncertain about genetic testing. As reference, most of the prostate cancer specialist

**Table 7. Genetic testing and counselling: Percentage agreement among community physicians**

Genetic testing	Community	Prostate cancer specialists*
In men with mCRPC and a presence of DNA repair defects (germline or somatic) progressing early on ADT (castration-resistance), which first-line mCRPC treatment do you recommend? Standard mCRPC first-line treatment option	18%	78%
Would you recommend genetic counselling and testing for men with newly diagnosed metastatic (M1) prostate cancer? In a minority of selected patients, standard mCRPC first-line treatment option	36%	74%
If genetic counselling and testing is provided for men with newly diagnosed metastatic (M1) prostate cancer, what factors influence your decision? Positive family history for other cancer syndromes (e.g., hereditary breast cancer and ovarian cancer syndrome and/or pancreatic cancer, or Lynch syndrome)	56%	78%
Positive family history for prostate cancer/breast cancer/ovarian cancer	72%	93%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. ADT: androgen deprivation therapy; mCRPC: metastatic castration-resistant prostate cancer.

group (74%) agreed that they would recommend genetic counselling and testing in a minority of patients.

## Imaging

Approximately two-thirds (65%) of community physicians leaned towards use of computed tomography (CT) and/or magnetic resonance imaging (MRI) and bone scintigraphy to diagnose the oligometastatic recurrent state for men with CSPC after local treatment with curative intent. One-third (34%) cited using positron emission tomography (PET)-CT. As reference, the prostate cancer specialist group recommended use of PET-CT as a consensus recommendation (74%), and the remaining 26% recommended use of CT and/or MRI and bone scintigraphy.

## Discussion

We conducted a survey among community physicians to assess the degree of agreement and variation in their management of advanced prostate cancer. Several differences were found in community physician responses across the 31 areas of consensus previously identified by the prostate cancer specialists. It is important to mention that many of

these differences were indirectly observed since data collection occurred separately across the physician groups and are based on expert opinions and retrospective analysis of prospective studies rather than level 1 evidence. For some areas of difference, community physicians might have adapted their practice due to the lack of resource locally rather than theoretical knowledge of potential benefit. A good example of this situation is the question regarding the best imaging modality for recurrent prostate cancer after primary locoregional therapy. Because PSMA-PET is not widely available in Canada, the community physicians' responses might be biased by the lack of availability. Radiation oncologist and radiation therapy facilities might also be far away from community physicians' location, which might complicate their managements. Interestingly, differences were observed most in the sequencing of treatments across the disease spectrum and the role of radiotherapy in the management of mCSPC. The differences observed between prostate cancer specialists and community physicians in treatment sequencing are suggestive of preference of community physicians to use systemic oral agents where possible over treatments that require additional specialist referral, such as docetaxel chemotherapy, while prostate cancer specialists tend to switch mechanism of action as they sequence through treatments.

**Table 8. Imaging: Percentage agreement among community physicians**

Imaging	Community	Prostate cancer specialists*
What imaging modality do you recommend to diagnose the oligometastatic recurrent state for men with CSPC after local treatment with curative intent (+/- salvage radiation therapy)? PET-CT (PSMA, choline or FACBC [fluciclovine])	34%	74%
What kind of imaging do you recommend for the majority of men with mCSPC? CT and bone scintigraphy	93%	78%

\*Prostate cancer specialist responses (captured from earlier study using the same questionnaire) displayed as reference. CT: computed tomography; CSPC: castration-sensitive prostate cancer; PET: positron emission tomography; PSMA: prostate-specific membrane antigen.

Community physicians also seemed to be less likely to use radiotherapy for mCSPC, which reflects a potential lag in the uptake of evidence since the data for radiotherapy had been presented only several months earlier with the STAMPEDE study.<sup>4</sup> However, these insights should be confirmed in further studies.

Practice differences have been reported previously between prostate cancer specialists and community physicians. In a similar survey conducted by Trabulsi and colleagues, investigators found that academic urologists in the U.S. were 41% more likely to withhold therapy than community urologists for patients with increasing PSA after prostatectomy and radiotherapy.<sup>5</sup> In addition, they found that community urologists were more likely to rate patient comorbidities as a barrier to treatment than academic urologists.<sup>5</sup> While the nature of those differences differ from what was observed in our study, the presence of discrepancies between community and academic providers in the management of prostate cancer seems to be consistent with our study.

There are several strengths and limitations to our study. Our study reflects Canadian real-world practice across a multidisciplinary group of both community urologists and prostate cancer specialists in the management of advanced prostate cancer, including representation from across Canada's geographic regions. While the survey provided many recommendations and opportunities for education and research, the results are based on a small sample, and as evidence continues to emerge, some practices may have correspondingly changed since the study was conducted. In addition, physicians were able to volunteer to participate in the study and, thus, may not be representative of those that did not participate. Lastly, the sample size of physicians was not large enough to investigate subgroups, such as whether practices differ by region or specialty.

## Conclusions

Overall, the areas of difference between a national sample of community-based prostate cancer physicians and prostate cancer specialists should be confirmed in further studies and represent potential areas for education, practice tools, and future research.

**Competing interests:** Dr. Hotte has been an advisory board member for, received honoraria from and participated in clinical trials supported by Astellas, Bayer, and Janssen. Dr. Finelli has been an advisory board member for AbbVie, Astellas, Bayer, Ipsen, Janssen, Sanofi, and TerSera; and has participated in clinical trials supported by Astellas, Bayer, and Janssen. Dr. Chi has received grants and honoraria from Astellas, Bayer, Janssen, and Sanofi; and has participated in clinical trials supported by Astellas, AstraZeneca, Bayer, Eli Lilly, Essi, Janssen, Merck, Novartis, Pfizer, Roche, and Sanofi. Dr. Canil has received honoraria from Janssen; has had a consulting or advisory role with AstraZeneca, Bayer, Bristol-Myers Squibb, Eisai, EMD Serono, Ipsen, Janssen, Merck, Pfizer, and Roche; has received research funding from Eisai; and has received travel, accommodations, and expenses from Amgen, Pfizer, Sanofi, and Janssen. Dr. Fleshner has been an advisory board

member or consultant for AbbVie, Amgen, Astellas, Bayer, Ferring, Hybridyne Health, Janssen, and Sanofi. Dr. Kapoor has been an advisory board member for and participated in clinical trials supported by Amgen, Astellas, GSK, Janssen, Novartis, Pfizer, and Sanofi. Dr. Kolinsky has been a consultant for Janssen, has received honoraria (consulting fees and travel reimbursement) from Astellas, AstraZeneca, BMS, Janssen, Ipsen, Merck, and Novartis; and has participated in clinical trials supported by Astellas, AstraZeneca, BMS, GSK, Ipsen, Janssen, Merck, and Roche. Dr. Malone has been an advisory board member for and received honoraria from Astellas, Janssen, and Sanofi. Dr. Morash has been an advisory board member for Amgen, Astellas, Bayer, Ferring, Janssen, Sanofi, and TerSera. Dr. Niazi has received research grants and honoraria from AbbVie, Amgen, Astellas, AstraZeneca, Bayer, Janssen, and Sanofi; and has participated in clinical trials supported by Astellas, Ferring, Janssen, and Sanofi. Dr. Noonan has been an advisory board member for Astellas, BMS, Janssen, Pfizer, and Sanofi; and has participated in a clinical trial supported by Astellas. Dr. Ong has received payment from Astellas, AstraZeneca, Bayer, BMS, EMD Serono, Janssen, and Merck; and has received research grants from Astellas and AstraZeneca. Dr. Pouliot has been an advisory board member for and received payment from Amgen, Astellas, AstraZeneca, Bayer, Janssen, Sanofi, and TerSera; has been a speakers' bureau member for Astellas and Janssen; and has received honoraria/grants from Astellas, Bayer, and Janssen. Dr. Shayegan has been an advisory board member for Astellas, Bayer, and Janssen; and has received a research grant from Janssen. Dr. So has been an advisory board member for AbbVie, Amgen, Astellas, Bayer, Janssen, Ferring, and TerSera; and has participated in clinical trials supported by Astellas, Ferring, and Janssen. Ms. Sorabji, Ms. Hew, and Ms. Park-Wyllie are all employees of Janssen Inc. Dr. Saad has attended advisory boards for and received payment/honoraria from AbbVie, Amgen, Astellas, Bayer, Janssen, and Sanofi; and has participated in clinical trials supported by Amgen, Astellas, Bayer, Janssen, and Sanofi.

**Acknowledgements:** The authors would like to thank Sobia Khan (Janssen Inc.) for administrative support, writing assistance, technical editing, language editing, and proofreading.

**Funding:** Janssen Canada supported the GURC Canadian Consensus Forum and the GURC Canadian Consensus Forum Community Survey.

This paper has been peer-reviewed.

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