

# Perioperative chemotherapy for bladder cancer: A qualitative study of physician knowledge, attitudes, and behaviour

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## Abstract

**Introduction:** Use of chemotherapy for muscle-invasive bladder cancer (MIBC) is known to be low. To understand factors driving practice we use the Theoretical Domains Framework (TDF) to identify barriers and enablers of chemotherapy use.

**Methods:** A convenience sample of Canadian urologists, medical oncologists (MOs), and radiation oncologists (ROs) participated in individual, semi-structured, one-hour telephone interviews. An interview guide was developed using the TDF to assess potential barriers and enablers of chemotherapy use. Interviews were recorded and transcribed. Two investigators independently identified barriers and enablers and assigned them to specific themes. Participant recruitment continued until saturation.

**Results:** A total of 71 physicians were invited to participate and 34 (48%) agreed to be interviewed: 13 urologists, 10 MOs, and 11 ROs. We identified the following barriers to the use of chemotherapy (relevant TDF domains in parentheses): 1) belief that the benefits of chemotherapy are not clinically important (beliefs about consequences); 2) inadequate multidisciplinary collaboration (environmental context and resources); 3) absence of “champions” advocating the use of chemotherapy (social and professional role); and 4) a lack of organizational clarity/policy regarding the referral process (environmental context and resources). The predominant enablers identified included: 1) “champions” who believe in the value of chemotherapy (social and professional role); 2) urologists who refer all patients to MO (behavioural regulation; memory, attention, and decision-making); and 3) system-level factors, including automatic multidisciplinary referral (environmental context and resources).

**Conclusions:** We have identified several system-level factors associated with delivery of chemotherapy. Behaviour change interventions should optimize multidisciplinary care of patients with MIBC.

**Patient summary:** *Despite the fact that chemotherapy before or after surgery improves survival of patients with bladder cancer, several studies have shown that many patients in routine practice*

*are not treated. In this study, we identify important system-level and physician-level factors that must be considered in efforts to improve patient care.*

## Introduction

Bladder cancer is the fifth most common cancer in Canada.<sup>1</sup> International guidelines recommend use of neoadjuvant chemotherapy (NACT) for patients with muscle-invasive bladder cancer (MIBC)<sup>2-4</sup> based on clinical trials showing an absolute improvement in five-year survival of 5%.<sup>5-7</sup> In addition, there is emerging evidence that adjuvant chemotherapy (ACT) may provide comparable survival benefit.<sup>8-9</sup>

We have previously described patterns of referral to medical oncology (MO) and use of NACT/ACT among all patients with bladder cancer in Ontario, Canada.<sup>10,11</sup> From 1994–2008, only 6% and 22% of patients in Ontario received NACT or ACT, respectively. We also found that only 16% and 39% of patients were referred to MO for consideration of NACT or ACT. This previous work suggests barriers to treatment at both the upstream level of the urologist and downstream at the MO. Similar practice patterns have been described elsewhere.<sup>12-15</sup>

There is limited literature that evaluates barriers and enablers to chemotherapy for bladder cancer.<sup>11,16</sup> Most studies are surveys that describe self-reported practice patterns, but do not investigate underlying knowledge, attitude, and beliefs.<sup>17,18</sup> To our knowledge, there are no studies that use a knowledge translation (KT) conceptual framework.

Using a validated theoretical framework at the outset will optimize the design and execution of a future intervention study.<sup>19,20</sup> A four-step systematic approach for the development of theory-based behavioural change interventions has been described in the literature.<sup>19</sup> Specifically, this process guides: 1) identification of the gap in evidence based practice and the health professionals whose behaviour needs to change; 2) identification of the specific barriers and enablers

of implementation; 3) identification of behaviour and system change techniques to modify barriers and enhance enablers; and 4) evaluation of the implemented intervention.<sup>19</sup> Our earlier work addressed Step 1 of this process.<sup>10,11</sup> This study addresses Step 2 through the use of the Theoretical Domains Framework (TDF) to identify the barriers and enablers of chemotherapy use. The themes that emerge will allow us to link specific barriers and enablers in each relevant theoretical domain with appropriate behaviour change techniques in a future intervention study.

## Methods

### Study design and participants

This study used semi-structured interviews that were informed by domains and definitions of the TDF<sup>19</sup> (Supplementary Table 1). A convenience sample of practicing Canadian urologists, MOs, and radiation oncologists (ROs) who treat bladder

cancer were invited to participate. The study was approved by the Research Ethics Board of Queen's University.

### Procedure

Interviews were approximately one hour in duration. Participant recruitment within each specialist group continued until data saturation (i.e., two consecutive interviews that provided no new information).<sup>21</sup> All interviews were audio recorded using Audacity<sup>®</sup> software and subsequently transcribed.

### Interview guides

An interview guide was developed for each specialty to gain insight into their knowledge, attitudes, and beliefs about the use of chemotherapy for patients with MIBC. The interview guide addressed 13 domains of the TDF (Supplementary Table 1) in order to systematically identify barriers and enablers of chemotherapy delivery.<sup>20</sup> The interview guides included the presentation of two hypothetical patient cases

**Table 1. Estimated five-year overall survival from urologists, medical oncologists, and radiation oncologists for hypothetical case scenarios**

Case 1: MIBC patient pre-cystectomy with no clinical node involvement*				
		Cystectomy alone	NACT + cystectomy	Mean survival benefit with NACT
Urologists n=13	Mean	59.4	66.8	7.4
	Median	60	65	
	Range	(45–82.5)	(47.5–90)	
Medical oncologists n=10	Mean	53.1	57.9 (n=9)	5
	Median	50	55 (n=9)	
	Range	(45–67.5)	(45–75)	
Radiation oncologists n=11	Mean	63.2	70.7	7.5
	Median	70	75	
	Range	(35–77.5)	(40–87.5)	
All specialists combined n=34	Mean	58.8	65.7	6.9
	Median	60	65	
	Range	(35–82.5)	(40–90) (n=33)	
Case 2: MIBC patient post-cystectomy with advanced disease (T3 N1)*				
		Cystectomy alone	Cystectomy + ACT	
Urologists n=13	Mean	27.7 (n=12)	36.6 (n=10)	8.9
	Median	27.5 (n=12)	30 (n=10)	
	Range	(10–55)	(12–72.5)	
Medical oncologists n=10	Mean	31.9 (n=9)	39.6 (n=8)	7.7
	Median	30 (n=9)	40 (n=8)	
	Range	(25–37.5)	(30–49)	
Urologists and MOs combined n=23	Mean	29.5 (n=21)	37.9 (n=18)	8.4
	Median	30 (n=21)	36.8 (n=18)	
	Range	(10–55)	(12–72.5)	

Where a participant provided a survival estimate range, the average was used. \*Case scenarios: Case 1: A 65-year-old man presents to the emergency room with hematuria. Cystoscopy and biopsy shows evidence of muscle-invasive urothelial carcinoma. Staging computed tomography (CT) scan of the chest/abdomen/pelvis and bone scan does not show any evidence of metastatic disease. The patient has minimal comorbidity, normal renal function, and is willing to follow your recommendations. Case 2: A 65-year-old man was found to have muscle-invasive bladder cancer after investigations for pelvic pain. He wanted to have surgery as soon as possible in order to attend his daughter's wedding. It is now six weeks since his cystectomy and he has recovered well. Pathology showed evidence of a T3 tumour with two (N1) lymph nodes involved with metastatic disease. The surgical margins were clear and staging CT scan of the chest/abdomen/pelvis and bone scan is clear. The patient has minimal comorbidity, normal renal function, and is willing to follow your recommendations. ACT: adjuvant chemotherapy; MIBC: muscle-invasive bladder cancer; NACT: neoadjuvant chemotherapy.

(Table 1). Participants were asked to provide treatment recommendations and estimated survival for each of the hypothetical cases. The use of the TDF guided the inclusion of questions related to participants': a) awareness, agreement, and adoption of guidelines on the use of NACT/ACT in MIBC; b) knowledge, attitudes, and beliefs about the efficacy and toxicity of NACT/ACT; and c) perception of other factors at the level of the physician, patient and system level that may be barriers and enablers to the use of chemotherapy. The interview guides were developed by a multidisciplinary research team, including investigators with clinical expertise in the treatment of bladder cancer and those with expertise in qualitative research methodology and implementation science. The interview guides were piloted and further revised based on feedback from three physicians.

### Thematic analysis

Interview transcripts were analyzed using thematic analysis of the factors influencing three underlying health behaviours: 1) Are urologists referring MIBC patients to MO for NACT/ACT?; 2) Are MOs treating MIBC patients with NACT/ACT?; and 3) Are ROs referring MIBC patients to MO for NACT/ACT if not already done by urology? Two investigators (MW and RCD) independently reviewed each interview transcript and coded interview statements as barriers or enablers to the recommended behaviour, and then thematically mapped these to the specific domains of the TDF; results were compared and discrepancies were resolved through discussion.

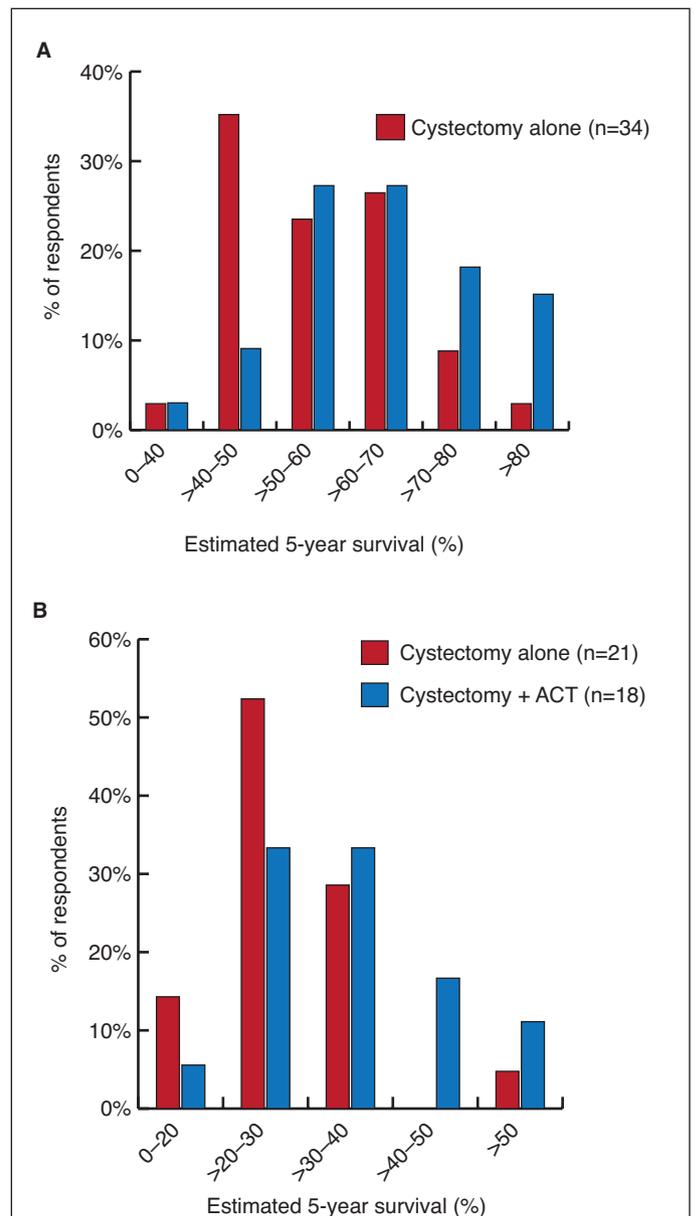
## Results

### Study participants

Seventy-one physicians were invited to participate in the study and 34 (48%) agreed to be interviewed, including 13 urologists, 10 MOs, and 11 ROs. Mean age and years of medical practice for urologists, MOs, and ROs was 44, 49, 48, and 11, 14, 14, respectively. Most participants were male (30/34, 88%). Only 23% of urologists and 18% of ROs treated 10+ MIBC patients/year; 70% of MOs treated 10+ patients/year.

### Case scenarios and survival estimates

Across physician groups, there was a range of survival estimates for the two hypothetical cases (Table 1). In Case 1 the range of survival estimates was wider among urologists (48–90%) and ROs (40–88%) compared to MOs; overall range across all participants was 40–90% (Fig. 1). MOs provided the most conservative mean estimate on the overall survival advantage provided with the addition of NACT in



**Fig. 1.** Estimates of the survival benefit with perioperative chemotherapy across specialists. **(A)** Case 1: Estimated five-year overall survival with cystectomy vs. neoadjuvant chemotherapy (NACT) + cystectomy. **(B)** Case 2: Estimated five-year overall survival with cystectomy vs. cystectomy + adjuvant chemotherapy (ACT).

Case 1 (5%) compared with urologists (7%) and ROs (8%). For Case 2, MO and urologists reported a mean 8% and 9% survival gain with ACT, respectively.

### Behaviours

The following is a descriptive summary of the identified barriers and enablers influencing behaviours associated with MO referral/chemotherapy delivery in MIBC. Relevant TDF domains are listed in parentheses. A summary of predominant barriers and enablers are shown in Table 2.

**Table 2. Predominant barriers and enablers across specialists**

Predominant barriers	Predominant enablers
Disbelief that the benefit of NACT/ACT is clinically important	Knowledge/belief that NACT/ACT is clinically important
Inadequate multidisciplinary collaboration	“Champions” who believe in NACT/ACT and advocate for its adoption
Absence of “champions” advocating for NACT/ACT	Urologists who adopt a universal referral pattern to MO
Lack of beliefs in the capabilities of colleagues in patient management	Beliefs by urologists that MOs should be the decision-maker for NACT/ACT
Patient refusal to be referred to MO to discuss chemotherapy	Systems-level factors (e.g., automatic multidisciplinary referral process; policy that MIBC patients are to be seen by urologists, MOs and ROs)

ACT: adjuvant chemotherapy; MIBC: muscle-invasive bladder cancer; MO: medical oncologist; NACT: neoadjuvant chemotherapy; RO: radiation oncologist.

### *Behaviour 1: Are urologists referring MIBC patients to MO for perioperative chemotherapy?*

#### Barriers

Five reasons (Fig. 2) were commonly cited by urologists for not referring MIBC patients to MO including: uncertainty about which patients benefit from chemotherapy (knowledge); lack of confidence that referred patients will receive chemotherapy (social and professional role); belief that they can determine chemotherapy eligibility (beliefs about capabilities; memory, attention, and decision-making); lack of organizational clarity regarding the referral process (environmental context and resources); and patient/family refusing referral (social influences).

The following quote highlights a common theme from urologists: “Our medical oncologists are less apt to use chemotherapy in anyone and, therefore, probably I would not be surprised if I found that our neoadjuvant chemotherapy delivery to referral ratio was substantially lower here than it was elsewhere.”

The perspective that urologists can appropriately determine chemotherapy eligibility was described by one participant: “My life is bladder cancer and none of our medical oncologists are 100% dedicated to bladder cancer so I would not rely on them, no.”

#### Enablers

The main factors enabling patient referral from urology to medical oncology for a discussion about chemotherapy options were an awareness of the evidence regarding the overall survival benefits of NACT/ACT (knowledge); an awareness

that all MIBC patients should be referred to MO (social and professional role); confidence in the decision-making by MO colleagues (beliefs about capabilities); having access to genitourinary MO expertise (environmental context and resources); and routine MO referral for all MIBC patients (behavioural regulation; memory, attention, and decision-making) (Fig. 2).

One urologist described the importance of having confidence in MO colleagues: “I think everybody with muscle-invasive disease on the way to a cystectomy should at least have an opinion from a med onc, because the reality is the med onc is the one who will know better as to who is going to respond, they also know better as to counselling the patient for the various complications and side effects of chemo as well.”

### *Behaviour 2: Are MOs treating MIBC patients with perioperative chemotherapy?*

#### Barriers

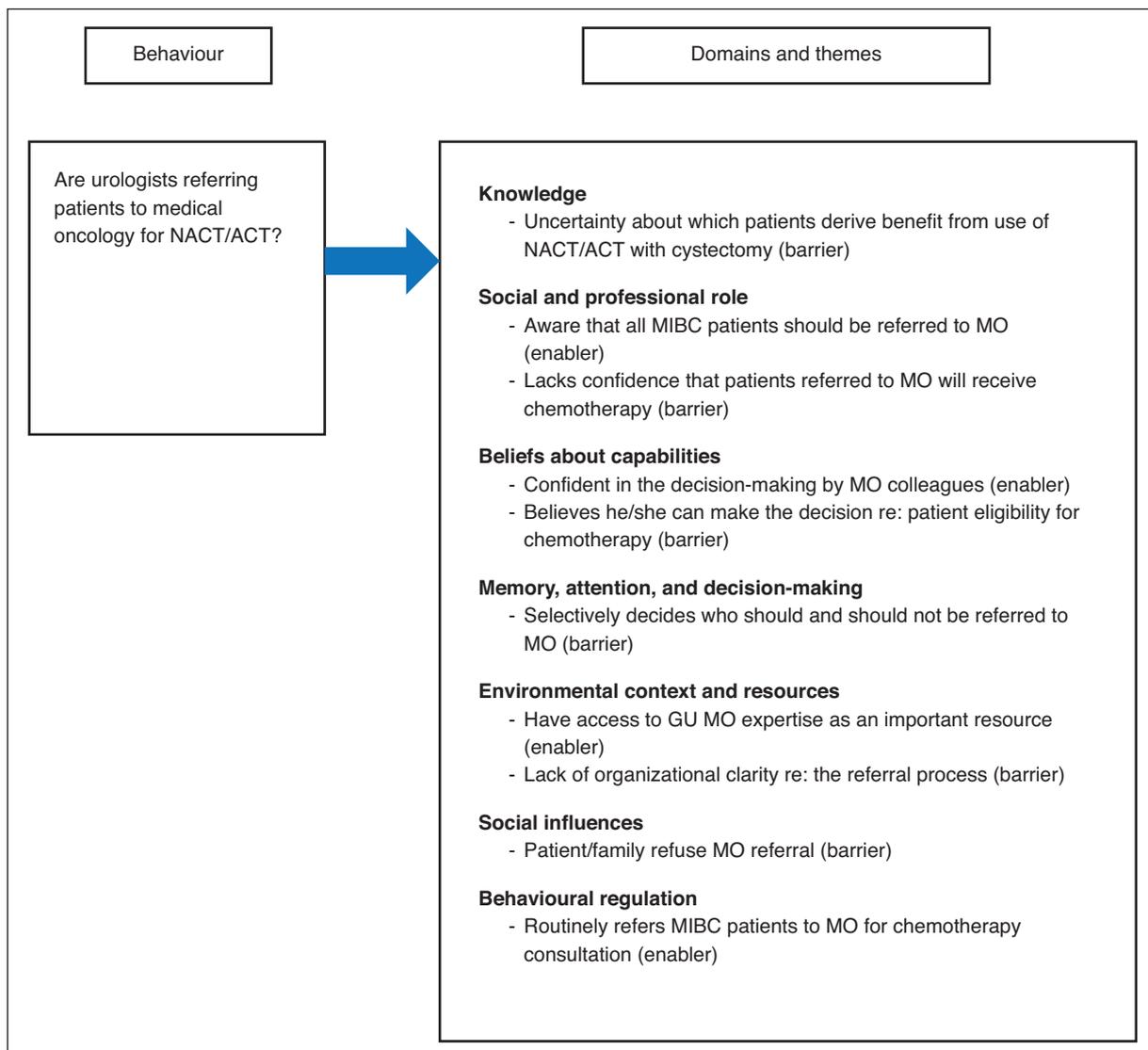
Lack of patient referral from urology to MO (social and professional role) was cited as a main barrier to providing the chemotherapy treatment. Other barriers to treating patients included uncertainty about which patients derive benefit from chemotherapy (knowledge); a perceived lack of skills in the subtleties of bladder cancer treatment (skills); lack of confidence that the survival benefit of NACT/ACT is clinically important (beliefs about consequences); lack of urology presence at multidisciplinary case conferences (environmental context and resources); and a lack of organizational clarity regarding the referral process (environmental context and resources) (Fig. 3).

A lack of confidence in the magnitude of clinical benefit associated with chemotherapy was described by one participant: “Let’s face it, if you are telling someone there is only a 5% absolute benefit, that means of 100 people, 50% will be cured with nothing and 55% will be cured with chemotherapy, it is not great. If you think about it, it is pretty poor and I am amazed anyone accepts it.”

#### Enablers

There were four main factors that enabled the treatment of patients with chemotherapy. These were having local MO “champions” for the use of NACT/ACT (social and professional role); routinely offering NACT/ACT to MIBC patients without contraindication (behavioural regulation; memory, attention, and decision-making); having access to a multidisciplinary clinic/case conferences (environmental context and resources); and working with urologists who routinely refer MIBC patients (behavioural regulation; memory, attention, and decision-making) (Fig. 3).

Having both MO and urology champions in MIBC as an enabler to increased chemotherapy use is illustrated by the following quote: “You needed a champion from the medi-



**Fig. 2.** Barriers and enablers to the use of chemotherapy in muscle-invasive bladder (MIBC) cancer identified by urologists. ACT: adjuvant chemotherapy; GU: genitourinary; NACT: neoadjuvant chemotherapy; MO: medical oncologist.

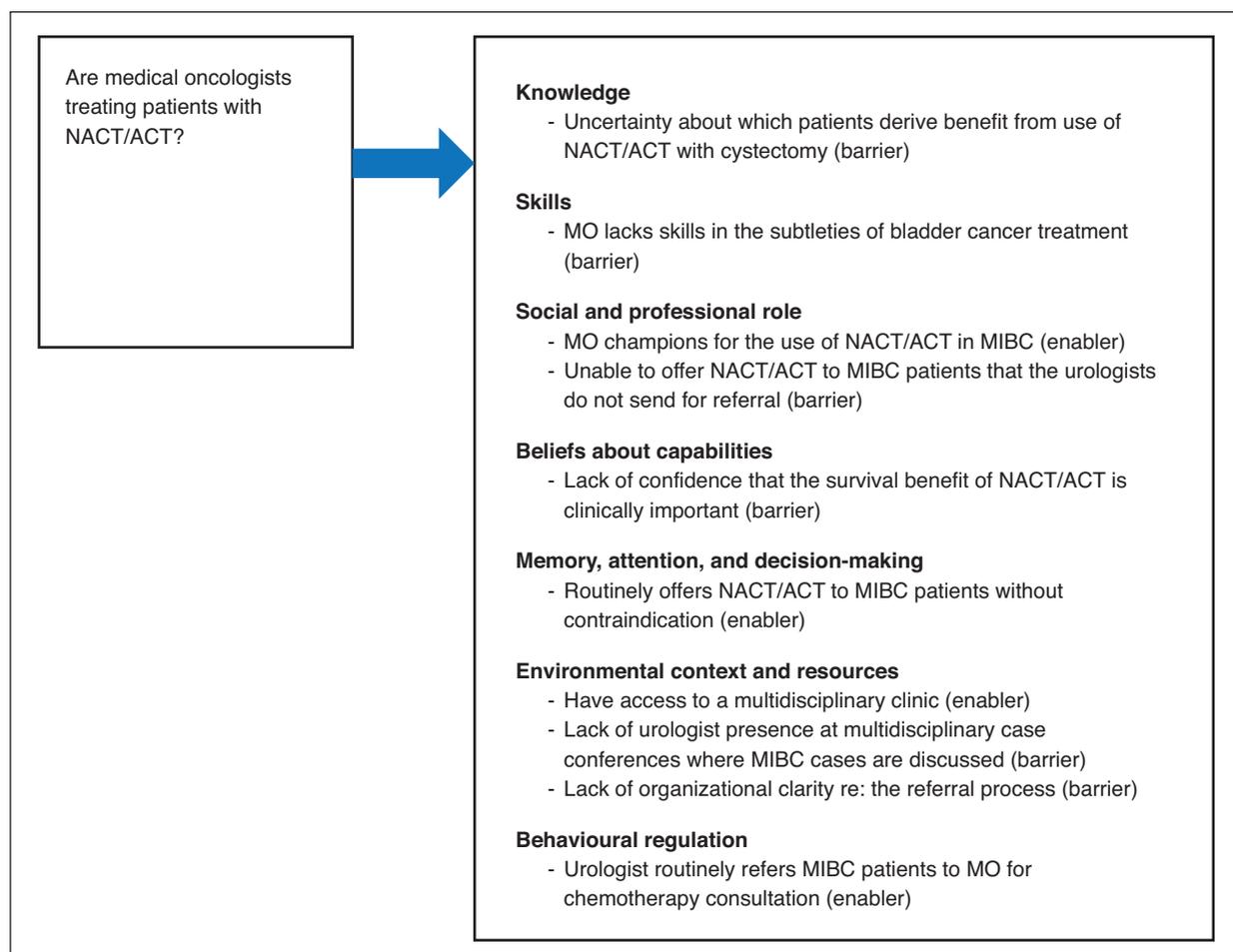
cal oncology standpoint and from the urology standpoint to actually believe that this was worth doing and they needed to then sort of spread the word amongst their own people.”

The availability of multidisciplinary case conferences to provide a venue for MIBC patient discussion was highly valued by many participating MOs: “The number of cases being presented at tumour boards have increased in the past five years because of our insistence of these cases being presented, so I would say that the degree of agreeability of urologists has increased in terms of at least discussing the cases and letting us [have] an opinion on whether we would like to see them or not.”

### ***Behaviour 3: Are ROs referring MIBC patients to MO for perioperative chemotherapy in the absence of urology referral?***

#### **Barriers**

The primary barriers identified by ROs in the referral to MO for chemotherapy treatment included a lack of routine referral when not done so by urology (behavioural regulation; memory, attention, and decision-making); an awareness that not all patients are referred from urology (social and professional role); a belief that not all MIBC patients should be referred to MO (beliefs about capabilities); and a lack of



**Fig. 3.** Barriers and enablers to the use of chemotherapy in muscle-invasive bladder (MIBC) cancer identified by medical oncologists (MO). ACT: adjuvant chemotherapy; NACT: neoadjuvant chemotherapy.

organizational policy regarding the referral process (environmental context and resources) (Fig. 4).

One participant illustrated the barriers to referral/treatment at a system level as follows: “Well, I think if there was legislation to say that you had to present a patient at a multidisciplinary clinic before you could operate on them, then I think a joint assessment clinic would work. But if it’s still left to the urologist deciding whether to bother referring them, then it won’t happen.”

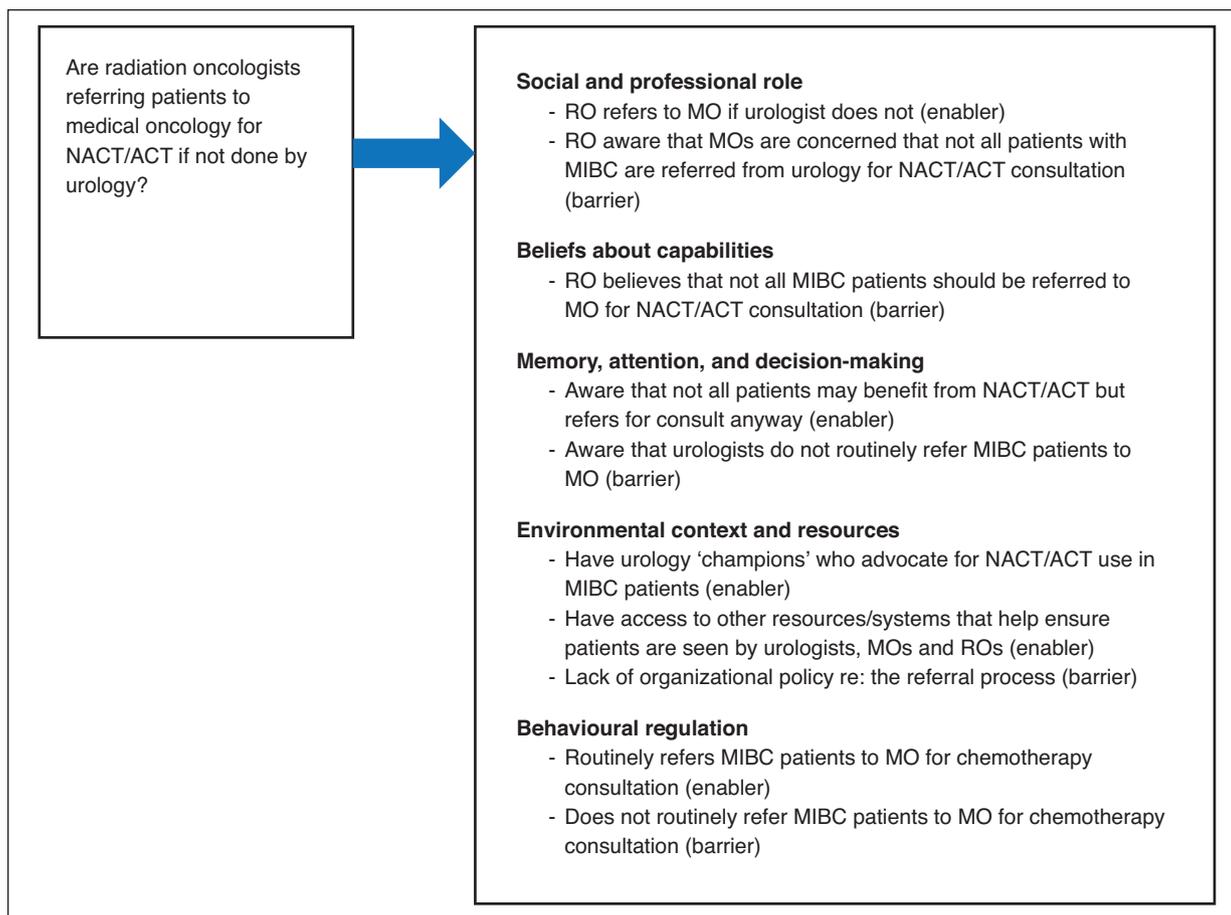
### Enablers

An awareness that ROs should refer to MO in absence of urology referral was identified as an enabler to chemotherapy use (social and professional role). Other enablers identified by ROs included a universal referral policy (behavioural regulation; memory, attention, and decision-making); having local urology “champions” who advocate for NACT/ACT (social and professional role); and having systems to help ensure patients are seen by multiple specialists (environmental context and resources) (Fig. 4).

### Discussion

Although numerous studies have described low use of chemotherapy for bladder cancer, the reasons for this gap between evidence and practice are not well-understood. In this study, we have explored barriers and enablers to use of NACT/ACT. A predominant enabler to the use of chemotherapy identified by participants was the presence of chemotherapy “champions” who advocate at the local level for the use of NACT/ACT in MIBC. Having a universal referral pattern to MO was identified as another important enabler. Lack of confidence in the magnitude of clinical benefit of NACT/ACT was a barrier to chemotherapy use. Among all TDF domains, environmental and social factors were consistently identified across interviews and across specialists as primary barriers to treatment. Specifically, inadequate multidisciplinary collaboration and a lack of confidence in the decision-making of colleagues with respect to patient management was a barrier to referral/treatment.

Participants also stressed the importance of system-level factors to optimize multidisciplinary care. This included hav-



**Fig. 4.** Barriers and enablers to the use of chemotherapy in muscle-invasive bladder (MIBC) cancer identified by radiation oncologists (RO). ACT: adjuvant chemotherapy; NACT: neoadjuvant chemotherapy.

ing centre policies related to mandatory multidisciplinary referral and attendance at multidisciplinary case conferences. Having appropriate resources in place (i.e., support staff to assist with the referral process and presence of multidisciplinary clinics) were also identified as important contributors to chemotherapy use for bladder cancer.

Apolo et al surveyed 83 MOs in 2011 to understand self-reported practice patterns for bladder cancer; 79% of respondents offered chemotherapy to all eligible patients with MIBC.<sup>17</sup> The study did not explore barriers and enablers of chemotherapy delivery. In a survey of 51 Canadian MOs and urologists, Hsu et al found that >88% of respondents reported offering NACT to patients with MIBC.<sup>18</sup> While the focus of Hsu's study was the impact of patient comorbidity on physician practice, the authors mention that provider- and system-level barriers to chemotherapy delivery included: belief that NACT does not improve survival; concern about disease progression during delivery of NACT; and lack of chemotherapy uptake in the community.

To date, interventions designed to improve the uptake of evidence into clinical practice in other disease settings have had limited and varied effects.<sup>22</sup> This may be due,

in part, to a lack of explicit rationale for the intervention choice and the use of inappropriate methods to design the interventions.<sup>19, 23</sup> The design of KT interventions requires a systematic approach with a strong rationale for design and one approach is to use theory to inform the intervention design.<sup>24-26</sup> We chose to use the TDF for analyzing this implementation problem because it is a comprehensive framework for designing KT interventions, as it offers broad coverage of potential change pathways.<sup>27</sup>

This study has several strengths and limitations. This study sought to identify the barriers and enablers to NACT/ACT in order to inform the design of a future KT intervention study. Delivery of perioperative chemotherapy involves close collaboration and communication between at least two physician subspecialties: the urologist who makes the initial diagnosis of bladder cancer and undertakes surgery, and the MO who delivers the chemotherapy. The urologist is the primary "gatekeeper" to NACT/ACT, as he/she makes the upstream decision about whether or not to refer the patient to a MO. ROs also receive referrals directly from urology for bladder-sparing treatment consultation and have the opportunity to refer patients to MO in absence of urology referral.

Inclusion of all three physician groups is a strength of this study, as it allowed us to capture each physician group's unique cultures, beliefs, and practices. Limitations of the current study include the concern for social desirability bias given the nature of the study interviews, and the fact that this study did not address patient preferences for chemotherapy.

Little is known from previous research about the specific barriers and enablers to the use of chemotherapy for MIBC and we are not aware of any studies that used a theoretical framework to guide investigation. Consistent with other reports, our results suggest that a multidisciplinary approach to MIBC management is critical to increase referral and rates of chemotherapy uptake.<sup>16,18,28</sup> Further, our results support the need for physician advocates and institutional support and policy to increase chemotherapy uptake.<sup>16,28</sup>

## Conclusion

Results from this qualitative study have informed the development of a quantitative survey that is being distributed to urologists, MOs, and ROs across Canada to determine the prevalence of identified barriers and enablers. Information obtained from both the qualitative and quantitative work will allow us to link the predominant barriers and enablers identified within the relevant theoretical domains to appropriate behaviour change techniques. This work will be critical to the future implementation of a theory-informed behaviour change intervention to increase use of chemotherapy among patients with MIBC.

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This paper has been peer-reviewed.

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**Supplementary Table 1. Theoretical domains framework: Domains, definitions, and constructs (Adapted from Cane, 2012)**

Domain	Definition	Constructs
Knowledge	An awareness of the existence of something	Knowledge (including knowledge of condition / scientific rationale) Procedural knowledge Knowledge of task environment
Skills	An ability or proficiency acquired through practice	Skills Skills development Competence Ability Interpersonal skills Practice Skill assessment
Social and Professional Role	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	Professional identity Professional role Social identity Identity Professional boundaries Professional confidence Group identity Leadership Organisational commitment
Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use	Self-confidence Perceived competence Self-efficacy Perceived behavioural control Beliefs Self-esteem Empowerment Professional confidence
Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	Beliefs Outcome expectancies Characteristics of outcome expectancies Anticipated regret Consequents
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus	Rewards (proximal / distal, valued/not valued, probable /improbable) Incentives Punishment Consequents Reinforcement Contingencies Sanctions
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way	Stability of intentions Stages of change model Transtheoretical model and stages of change

**Supplementary Table 1 (cont'd). Theoretical domains framework: Domains, definitions, and constructs (Adapted from Cane, 2012)**

Domain	Definition	Constructs
Goals	Mental representations of outcomes or end states that an individual wants to achieve	Goals (distal/proximal) Goal priority Goal/target-setting Goals (autonomous / controlled) Action-planning Implementation intention
Memory, attention and decision-making	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives	Memory Attention Attention control Decision-making Cognitive overload/tiredness
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	Environmental stressors Resources/material resources Organisational culture/climate Salient events/critical incidents Person x environment interaction Barriers and enablers
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours	Social pressure Social norms Group conformity Social comparisons Group norms Social support Power Intergroup conflict Alienation Group identity modelling
Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event	Fear Anxiety Affect Stress Depression Positive/negative affect Burnout
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions	Self-monitoring Breaking habit Action-planning