

Patient Preferences for Treatment Selection in Non-Muscle Invasive Bladder Cancer: A Systematic Literature Review

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Introduction

Bladder cancer (BC) is a significant global health concern, ranking as the seventh most common malignancy worldwide.¹ Approximately 70-75% of newly diagnosed BC are classified as non-muscle invasive bladder cancer (NMIBC).

Although East Asian regions typically report lower incidence and mortality rates of BC compared to Western regions, Japan has the third-highest number of BC cases and the fourth-highest number of BC-related deaths worldwide.²

Patients with NMIBC may be classified as low-, intermediate-, or high-risk based on risk factors such as tumor size, grade, and disease recurrence. According to Japanese Urological Association guidelines, low-risk disease may be treated with single immediate intravesical chemotherapy instillation after transurethral resection of bladder tumour (TURBT).³ For intermediate- or high-risk disease, induction and maintenance intravesical chemotherapy or Bacillus Calmette-Guérin (BCG) are indicated. For patients relapsed after BCG, BCG rechallenge may be indicated; those unresponsive to BCG may require radical cystectomy (RC).³

Despite offering some level of disease control, current treatment options often fail to provide lasting freedom from disease or may have undesirable effects on health-related quality of life (HRQoL), prompting some patients to decline or abandon treatment. For instance, RC carries significant perioperative risks including high surgical complication rates, increased morbidity, frequent hospital readmissions, and risk of perioperative mortality.⁴ Additionally, urinary diversion can impact long-term HRQoL years after surgery.⁴

Understanding the factors that shape patients' treatment preferences in the management of NMIBC is essential for clinicians, as it supports informed, evidence-based discussions and enables shared decision-making that aligns therapeutic strategies with patients' individual goals and values. Shared decision-making is especially important for high-risk patients at risk of RC, as it promotes informed choices and encourages patient autonomy.

Aim

To conduct a systematic literature review (SLR) to identify evidence relating to patient preferences for treatment and associated factors in populations with NMIBC, with particular emphasis on identifying data from patients in Japan.

Methods

Searches of Embase, MEDLINE[®] (including Epub Ahead of Print, In-Process, and Other Non-Indexed Citations), Ovid MEDLINE[®] Daily, Cochrane Central Register of Controlled Trials, and the Cochrane Database of Systematic Reviews were conducted from 1 January, 2014 through 19 August, 2025 for relevant English- or Japanese-language studies.

Supplementary searches of the Japanese databases J-Stage[®] (English and Japanese language) and Ichushi Web[®] (Japanese language) were conducted. Reference lists of included studies were scanned for additional eligible studies.

Study selection was performed in duplicate and assessed according to the following eligibility criteria:

- Adult patients (aged ≥18 years) with NMIBC, irrespective of risk category, stage, eligibility for RC, line of therapy, or exposure to any therapy.
- Any intervention for NMIBC, including placebo.
- Outcomes of interest included patient preferences for treatment and factors associated with patient preferences for treatment.
- Study types of interest included any study capturing preferences, including but not limited to observational studies, time-trade off studies, discrete choice experiments, focus groups, standard gamble, and best-worst scaling.

Quality assessment was performed using the National Institute for Health and Care Excellence (NICE) Quality Assessment Checklist for Health State Utility Values (HSUVs)⁷ for studies reporting HSUVs (Table S1).

Results

Evidence Identified

Of 1,274 records identified in the database/registry searches and 25 records across grey literature sources, 12 records reporting on 12 unique studies were included in this review (Figure 1).

Key Study and Patient Characteristics

12 studies reported patient preference data (Table 1).⁸⁻¹⁹ Methods used to capture patient preferences among these studies included:

- Standard gamble (n = 2)^{8,9}
- Rank ordering (n = 1)¹⁸
- Choice experiments (n = 4)¹⁰⁻¹³
- Real life treatment choice (n = 1)¹⁷
- Focus groups or interviews (n = 3)¹⁴⁻¹⁶
- Documented reason for therapy refusal (n = 1)¹⁹

Studies were based in the US (n = 4)¹⁰⁻¹⁶ and Europe (n = 4),^{8,9,17,18} two studies were multinational,^{10,11} and two studies did not report location.^{12,19} Nine studies enrolled patients with NMIBC,^{8-15,19} one study enrolled patients with urothelial carcinoma,¹⁷ and two studies enrolled patients with any type of BC.^{16,18}

One study enrolled intermediate risk patients, two studies enrolled high-risk patients,^{13,19} one study enrolled patients with mixed risk categories,⁹ and eight studies did not report risk category.^{8,12-15,18} Mean/median age ranged from 63.0 to 76.3 years, and all studies had a majority of male patients (51% to 87%) (Table 3).

Abbreviations: AE: adverse effects; ANOVA: analysis of variance; BC: bladder cancer; BCG: Bacillus Calmette-Guérin; BMI: body mass index; CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Registry of Controlled Trials; CI: confidence interval; CIRS CI: Cumulative Illness Rating Scale Comorbidity Index; ECOG: Eastern Cooperative Oncology Group; EFS: event-free survival; Embase: Excerpta Medica Database; EQ-5D: EuroQoL 5 Dimension; HR-NMIBC: high-risk NMIBC; HRQoL: health-related quality of life; HSUV: health state utility value; IV: intravenous; J-STAGE: Japan Science and Technology Information Aggregator; LG-IR-NMIBC: low-grade intermediate-risk NMIBC; LUTS: lower urinary tract symptom; MAS: minimal accepted/minimally acceptable sensitivity; MEDLINE: Medical Literature Analysis and Retrieval System Online; MIBC: muscle invasive bladder cancer; min: minute; MMC: Mitomycin C; mo: month; n: number of patients; NMIBC: non-muscle invasive bladder cancer; OR: odds ratio; PD-(L1): programmed-death ligand 1; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PS: performance score; q: every; RAI: relative attribute importance; RC: radical cystectomy; SC: subcutaneous; SLR: systematic literature review; TURBT: transurethral resection of bladder tumor; UK: United Kingdom; US: United States; UTI: urinary tract infection; VAS: visual analogue scale; vs: versus; wk: week.

Figure 1. PRISMA Diagram

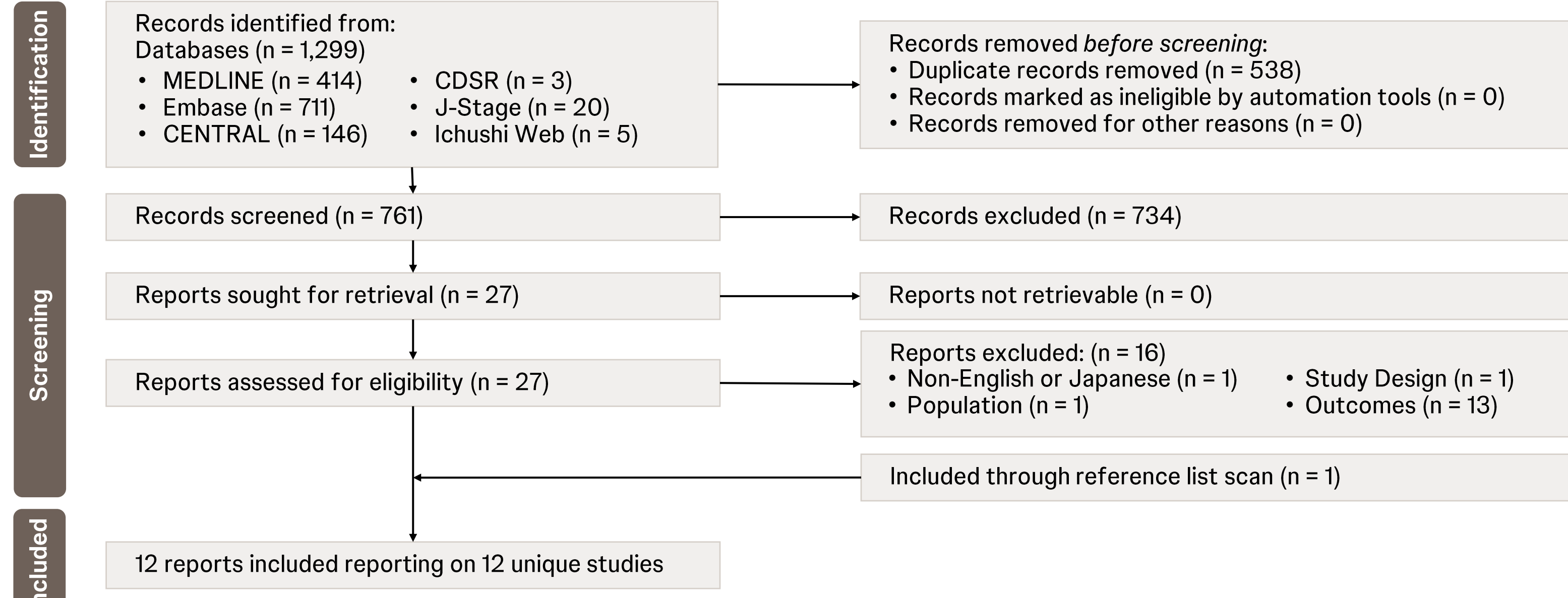


Table 1. Ranked order of attributes among included studies

Study	Patient population and disease stage	Attributes of choice experiments or details of elicitation of patient preferences	Ranked order of attributes
Studies investigating patient preferences for treatment			
Collacott, 2023 ⁹	Adults with NMIBC currently receiving BCG, unresponsive to BCG, or receipt of RC after BCG failure	Choice experiment for hypothetical treatment, with attributes including: • Time to RC (1 year, 3 years, 6 years) • Risk of progressing to MIBC while on medication (0%, 10%, 20%) • Risk of experiencing serious side effects (0%, 5%, 10%) • Administration (intravesically 1x/wk x6 wks; 1x/wk x6 wks then monthly x1 yr; q3mo; IV q3 wks, IV q6 wks)	• Time to RC (55%) • Risk of progression to MIBC (25%) • Treatment administration (12%) • Risk of serious side effects (8%)
Hallworth, 2025 ¹¹	Patients with HR-NMIBC	Discrete choice experiment for treatment with PD-(L1) inhibitors and BCG, with attributes including: • EFS in months (36, 27, or 22) • Bladder AEs (0%, 35%, 75%) • Serious immune AEs (0%, 10%, 20%) • Chronic endocrine conditions (0%, 5%, 10%) • PD-(L1) frequency in weeks (6, 4, 3) • PD-(L1) administration route and time (SC <1 min, SC 7-10 mins, IV 30-60 mins) • BCG schedule (induction, induction + maintenance)	• EFS (17.2%) • Bladder AEs (16.4%) • Serious immune AEs (14.0%) • Chronic endocrine conditions (12.6%) • PD-(L1) frequency (9.9%) • PD-(L1) administration route and time (9.5%) • BCG schedule (9.0%) • Short duration SC injections were preferred for PD-(L1) inhibitors and a shorter BCG schedule was preferred
Smith, 2025 ¹²	Patients with NMIBC experienced in BCG	Discrete choice experiment for bladder-sparing treatments, with attributes including: • Chances of recurrence of NMIBC (45%-69%) • Progression to MIBC in 1 year (2%-30%) • Administration (intravesical every week depending on response or every 3 months for 1 year, or IV every 6 weeks for up to 2 years) • Treatment-related fatigue (none to moderate-severe) • Discomfort/pain or UTI (0%-30%) • Developing immune-related AEs (0%-20%)	• Reduced risk of progression and disease recurrence were the most important attributes among participants • >70% of patients preferred bladder-sparing treatments to RC • Treatment-related AEs and administration burden were less important*
Rutten, 2024 ¹⁸	Older patients or those at risk for frailty with HR-NMIBC or MIBC	Rank ordering using the Outcome Prioritization Tool, with outcomes including: • Maintaining independence • Extending life • Reducing pain • Reducing other symptoms ⁸	• Extending life (44%) • Maintaining independence (40%) • Reducing other symptoms (9%) • Reducing pain (7%)
Decaestecker, 2016 ¹⁷	NMIBC patients with small (<1 cm) recurrences of papillary urothelial tumors	Real life treatment choice between TURBT and MMC for recurrent tumors. • Patients were provided the information that MMC provided a 50% chance that TURBT would not be necessary	• All 25 patients chose treatment with MMC over TURBT • Of 12 patients with multiple recurrences during the study period, all chose MMC again over immediate TURBT
Parisse, 2023 ¹¹	Patients with NMIBC who have had at least 1 TURBT	Hypothetical choice between TURBT and intravesical chemoablation. Attributes included: • Delivery method • Side effects • Effectiveness for initial complete response (with TURBT portrayed as more effective) • Risk of subsequent recurrence, with chemoablation as more effective in reducing this risk ⁸	• 60% of patients preferred repeat TURBT, with 63% indicating effectiveness as the reason for the choice • 40% preferred intravesical chemoablation, with 55% indicating risk of recurrence as the reason for the choice
Jacob, 2024 ¹⁹	Patients with BCG-unresponsive HR-NMIBC treated with TAR-200 in SunRISe-1	Reasons for refusal of RC were documented in case report forms	• Preference for bladder preservation (52%) • Concern about HRQoL (37%) • Mortality/morbidity concerns (4%) • Preservation of sexual function (2%)
Garg, 2018 ¹⁵	Adults with NMIBC stage <T2	Qualitative study exploring patient experience and care priorities	• None – treatments were not ranked or prioritized
Stover, 2025 ¹⁴	Patients with intermediate-risk LG-IR-NMIBC enrolled in the ENVISION trial	Qualitative study exploring impact of TURBT on patient experience and comparing TURBT to experimental therapy in the trial	• None – treatments were not ranked or prioritized
Berry, 2015 ¹⁶	Adults with any stage BC	Qualitative study exploring treatment decision-making	• None – treatments were not ranked or prioritized

Table 2. Associations of patient characteristics with treatment preferences

Study	Method of ascertaining associations between preferences/attributed and patient characteristics	Patient characteristics investigated	Key findings
Collacott, 2023 ⁹	Interaction effects between treatment attributes and patient characteristics	Age, sex, living status, dependents, treatment stage, ECOG PS, EQ-5D VAS	• Older (≥65) and younger (<65) patients placed similar value on delaying time to RC (RAI 53.2% vs 55.5%) • Reducing risk of disease progression was less important to women than men (RAI 20.9% vs 27.0%) • Reducing the risk of serious side effects was of less importance to patients currently on BCG than those who had undergone RC (RAI 4.3% vs 14.4%) • More value was placed on delaying time to RC as ECOG PS decreased (RAI 49.1% for a 1-unit increase vs 59.5% for a 1-unit decrease) • Less value was placed on risk of disease progression as the EQ-5D VAS score decreased (RAI 25.3% for a 1-unit increase vs 24.9% for a 1-unit decrease)
Rutten, 2024 ¹⁸	1-way ANOVA, Kruskal-Wallis tests, and multinomial logistic regression	Age, sex, smoking status, medication count, education level, housing, BMI, CIRS CI, comorbidities, T stage, treatment	• Patients who prioritized life extension were less likely to have musculoskeletal problems compared to those who prioritized reducing pain or reducing other symptoms (p = 0.02) • No associations between treatment preference and age, sex, T1 stage, or treatment were observed (all p > 0.05)
Parisse, 2023 ¹¹	Multivariate regression	Age, insurance status, marital status, US residency, number of prior TURBT, years since last TURBT, receipt of prior intravesical treatment, and reason for treatment preference	• Patients were more likely to prefer chemoablation to repeat TURBT if they were US residents (OR 2; 95% CI 1.1, 3.8) • Patients were more likely to prefer chemoablation if they had prioritized recurrence risk over treatment effectiveness (OR 14.6, 95% CI 7.4, 28.5) • No associations between treatment preference and age, number of prior TURBT, years since last TURBT, or receipt of prior intravesical treatment were observed
Tan, 2019 ⁸	Chi-squared test, t-test, and ANOVA	Age, sex, education level, number of previous cystoscopies, new or recurrent cancer, recurrence within 6 months, tumor grade, tumor stage, actual or presumed disease risk, any AE, haematuria, dysuria/LUTS, UTI requiring antibiotics, overall symptom experience, pain	• No difference in MAS according to any patient or treatment characteristic investigated (all p > 0.05)
van Osch, 2019 ⁹	Spearman rank correlation analysis	Age, general health, social support score	• No differences in patients willing to sacrifice sensitivity (<100%) and those who were not (100%) only based on age, general health, or social support score (all p > 0.05)

*This abstract-only publication did not provide an explicit rank order or quantitative metric (e.g., percent of patients) in the results. ⁸Other symptoms was not further elaborated in the paper. ⁹Details on exact attributes are purportedly available in the supplementary materials, which at the time of this SLR was not accessible.

Preferences for NMIBC treatment

Detailed results can be found in Table 1 and Table 3.

Treatment attributes

• Across seven studies,^{10-13,17-19} patients most often prioritized longevity and reduced risk of disease progression when considering treatment choice. Side effects and administration method, while important, did not tend to drive decision-making.

Method of treatment administration

• Three studies^{10,12,13} reported on preferences related to administration; patients generally preferred less invasive, less frequent, and less time-consuming modes of administration.

Preferences relating to RC and TURBT

• Patients appeared keen to avoid surgical procedures, including both TURBT and RC, if other options were available.^{10,12,14,15,17}

• Preferences related to RC were reported in four studies.^{10,12,15,19} Delaying RC as long as possible and preserving one's bladder if possible was of high importance to patients, with fears for reduced HRQoL, morbidity/mortality, and sexual function among reasons provided.

• Preferences relating to TURBT were reported in three studies.^{11,14,17} Pain, catheters, and anesthesia were among reasons cited for wishing to avoid TURBT.¹⁴ In a real choice situation, all patients selected an alternative (MMC) over TURBT;¹⁷ in a hypothetical choice scenario, 60% chose TURBT over intravesical chemoablation, citing efficacy as their reason.¹¹

Preferences for NMIBC routine surveillance

• Two studies^{8,9} in the UK compared patient preferences for a urinary biomarker test to cystoscopy for surveillance. In both studies, patients preferred the test with a higher sensitivity, and a urinary biomarker tended to only be acceptable with a similar sensitivity to cystoscopy.

Table 3. Key findings and conclusions for patient preferences

Study	Patient population and disease stage	Key findings and conclusions
Studies investigating patient preferences for treatment		
Collacott, 2023 ⁹	Adults with NMIBC currently receiving BCG, unresponsive to BCG, or receipt of RC after BCG failure	• In NMIBC, patients preferred bladder-sparing treatment over RC, and preferred treatments that delayed time to RC. Lower risk of progression was preferred • Intravesical administration cycles were favoured over IV administration
Hallworth, 2025 ¹¹	Patients with HR-NMIBC	• Patients valued prolongation of EFS, effective management of AEs, and reducing administration burden • Reduced risk of progression and disease recurrence were the most important attributes among participants • Treatment-related AEs and administration burden were less important • >70% of patients preferred bladder-sparing treatments over RC • Patients were willing to accept >25% risk of immune-related side effects requiring oral steroids to achieve maximum reductions in progression and recurrence
Smith, 2025 ¹²	Patients with NMIBC experienced in BCG	• Life extension and preserving independence were the top priority among patients or those at risk for frailty with HR-NMIBC or MIBC without distant metastases • Reducing other symptoms and reducing pain were less frequently prioritized • Discussion of priorities among older patients is essential for treatment planning and shared decision-making – most patients in this study had MIBC; these results are most applicable to HR-NMIBC patients who are facing RC
Rutten, 2024 ¹⁸	Older patients or those at risk for frailty with HR-NMIBC or MIBC without distant metastases	• All 25 patients chose treatment with MMC over TURBT • As all had recurrences, they understood the implications of TURBT (anesthesia and 1 night of hospitalization) • Of 12 patients with multiple recurrences during the study period, all chose MMC again over immediate TURBT • 60% of patients preferred repeat TURBT to treat recurrence while 40% preferred intravesical chemoablation • Preference for repeat TURBT was driven by effectiveness (63%) and for chemoablation was driven by risk of recurrence (55%) • Perceived benefits of chemoablative treatment included avoiding anesthesia, reducing need and cost of future surgery, an option for those in poor health, and peace of mind about recurrence • Perceived concerns included effectiveness, potential side effects, need for future treatment, administration, and transportation/cost
Decaestecker, 2016 ¹⁷	Patients with small (<1 cm) recurrences of papillary urothelial tumors	• Most patients refused RC, highlighting a need for bladder-sparing options for patients with HR-NMIBC treated with TAR-200 in SunRISe-1
Jacob, 2024 ¹⁹	Patients with BCG-unresponsive HR-NMIBC treated with TAR-200 in SunRISe-1	• Most patients would avoid RC at all costs, citing concerns for HRQoL, sexual performance, and difficulties with a bag • Those who would undergo RC cited avoiding death and being alive for family as other supersedes (preferring RC to be confident the cancer will not return)
Garg, 2018 ¹⁵	Adults with NMIBC stage <T2	• Patients felt that a nonsurgical primary treatment should be available for NMIBC • Negative aspects of surgery that patients wanted to avoid included pain, permanent bladder damage, scarring from multiple surgeries, catheter after surgery, and anesthesia
Stover, 2025 ¹⁴	Patients with intermediate-risk LG-IR-NMIBC enrolled in the ENVISION trial	• Patients with NMIBC did not perceive initial treatment (TURBT) as something about which a decision was to be made; they followed the recommendation of their physician • In contrast, MIBC patients considered life expectancy and substantial changes in HRQoL when considering RC
Berry, 2015 ¹⁶	Adults with any stage BC	• Patients in this study chose certainty over burden • The sensitivity demanded by patients to select biomarkers as a preferred choice is unlikely to be achievable with the urinary biomarkers available at the time of this study
Studies investigating patient preferences for urinary biomarker vs cystoscopy		
Tan, 2019 ⁸	NMIBC with minimum 6 months follow up	• Most patients prioritized the test with the highest sensitivity and only accept a urine test with a similar sensitivity to cystoscopy • Missing BC during surveillance was a significant concern, particularly for high grade patients; many considered it experimental and were not confident in the abilities of the test • Patients were open to interspersing biomarker with cystoscopy to increase the intervals between cystoscopies
van Osch, 2019 ⁹	Patients with NMIBC naïve to conventional cystoscopic surveillance	• No differences in MAS according to any patient or treatment characteristic investigated (all p > 0.05)

Conclusion

Preventing progression from NMIBC to MIBC and bladder preservation/delaying time to RC were among the most important considerations for patients with NMIBC. Non-surgical treatment options were preferred. Concerns about RC included HRQoL, morbidity, and sexual function, and concerns about TURBT included pain, anesthesia, and catheters. While patients preferred fewer side effects and less invasive, less frequent, and less time-consuming treatment administration modalities, these factors were secondary to disease progression and bladder preservation in decision-making. A key limitation is the lack of studies that evaluated treatment preferences among Japanese patients, indicating that further evidence is needed to address specific needs in Japanese patients with NMIBC. Our findings highlight the importance of integrating patient preference into shared decision-making, clinical guideline development, and health technology assessment.

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