# Improving the quality of operative reports for transurethral resection of bladder tumor surgery in resident education

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**Introduction:** To assess the quality of resident dictations for transurethral resection of bladder tumor (TURBT). One indicator of surgical quality is the completeness of the operative report. Surprisingly, there is a paucity of standardized operative templates for TURBT and little formalized instruction for learners. The quality of TURBT dictations was assessed and areas of improvement were determined after implementation of a 10 item TURBT checklist.

Materials and methods: A retrospective review of the last 50 TURBT operative reports dictated by residents was performed. A "TURBT checklist" was used assessing 10 key factors in documentation. A formal training session regarding TURBT dictations was given with TURBT checklists handed out to each trainee. Fifty TURBT dictations were subsequently analyzed. **Results:** TURBT dictations improved across the board following checklist implementation. Total number of checklist items dictated increased to 7.0 from 2.6 prior (p < 0.05). When stratified by resident experience, TURBT dictations improved across different resident years (p < 0.05). Junior resident dictations statistically improved in every checklist item (p < 0.05). Senior resident dictations improved in almost every category but only two reached statistical significance. A regression model demonstrated checklist implantation to be a significant predictor of improvement in mean number of checklist items dictated independent of PGY level.

**Conclusions:** Our study demonstrates that prior to implementation, TURBT operative dictations performed by residents lacked many of the critical components required for a quality TURBT. However, once properly instructed, a relatively simple "checklist" can be easily implemented and serve as a teaching tool for residents in training to ensure critical procedural elements are documented.

**Key Words:** resident education, bladder cancer, transurethral resection of bladder tumor, surgical quality

# Introduction

Bladder cancer, the sixth most common cancer, is a disease commonly encountered by urologists emphasizing the importance of proficiency with management of this disease.<sup>1</sup> The initial diagnosis, primary tumor staging and outcome of patients with non-muscle invasive urothelial cell carcinoma of

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Address correspondence to Dr. Joseph A. Haddad, Department of Urology, University of Oklahoma, 920 Stanton L. Young Blvd., #3150, Oklahoma City, OK 73104 USA the bladder are predicated on a properly performed transurethral resection of the bladder tumor (TURBT).<sup>2,3</sup> Many of the decisions urologists make to treat bladder cancer patients are derived from the TURBT and restaging resection.

Surgical quality is receiving increasing attention across the healthcare continuum. One indicator of surgical quality is the completeness and accuracy of the operative report. There is a paucity of standardized operative templates in general among surgical specialties. This is especially true for TURBT where there is no established standardized reporting and little formalized instruction for learners. Given the commonality and frequency of the procedure, Improving the quality of operative reports for transurethral resection of bladder tumor surgery in resident education

coupled with the desire to improve the reporting of surgery in our trainees, we sought to employ a quality improvement project for our residents directed at TURBT. Our objective was to first assess the baseline quality of resident dictations for TURBT, and then to assess improvement in the operative reporting after implementation of a formal training session designed to enhance the quality of the operative report.

# Materials and methods

A "TURBT checklist" that was developed by Anderson et al was used to assess key factors that should be performed in documentation, Figure 1.<sup>4</sup> The checklist was developed to identify 10 factors, thought to be critical to the performance of a high quality TURBT including assessing tumor risk factors, clinical staging, adequacy of resection and the presence of complications. The checklist included several prognostic factors to assess bladder tumor aggressiveness were requested to be included in each operative dictation. This included number of tumors, size of largest tumor (resection loop was given as a size reference of 1 cm), recurrent versus primary lesions, presence of CIS, and 2010 AJCC clinical tumor stage. Residents were asked to be precise in their dictations per the checklist, Figure 1. Four intraoperative processes related to the adequacy of resection were commented on; bimanual exam under anesthesia, visually complete

TURBT Quality Audit						
A high quality TURBT includes						
1.	Obtaining the information necessary for accurate classification of clinical stage and cancer risk.					
2.	Complete resection of all visible tumors and suspicious areas when safe, feasible and bladder preservation is planned.					
3.	Careful assessment of bladder integrity after tumor resection					
Procedure Checklist						
As	sessment of prognostic factors	Acceptable responses				
1.	Describe number of tumors	1, 2-5, >5, diffuse				
2.	Describe size of largest tumor	For reference: end of cutting loop is approximately 1 cm wide				
3.	Describe characteristics of tumors	Sessile, nodular, papillary, flat				
4.	Describe recurrent versus primary tumors	Recurrent, primary				
5.	Assess for presence of carcinoma in situ	Suspicious, not suspicious				
6.	Report 2010 AJCC clinical tumor stage	cTis, cTa, cT1, cT2, cT3, cT4				
Intraoperative processes						
7.	Bimanual exam under anesthesia	Yes, no				
8.	Visually complete resection	Yes, no				
9.	Visualization of detrusor muscle in resection base	Yes, no				
10	. Visual evaluation for perforation	Yes, no				

**Figure 1.** TURBT checklist template used by trainees developed by Anderson et al.<sup>4</sup> Reprinted with permission.

resection, visualization of detrusor muscle in the resection base, and visual evaluation for perforation. All items were required to be dictated whether not a specific item occurred during surgery.

After obtaining IRB approval, to establish a reference point, a retrospective review of the last 50 TURBT operative reports dictated by residents was performed. For each procedure, we measured the number of critical elements from the TURBT checklist included in the operative report. We used strict criteria that followed the formatting of the TURBT checklist. Next, a solitary but formal didactic training session regarding TURBT dictations was subsequently presented to all of the residents and attending physicians participating in the study. This presentation reviewed the rationale for the key components of the TURBT checklist, and emphasized how to properly incorporate the TURBT checklist in an operative dictation. At that time, the TURBT checklist was given to each trainee in both hard copy and electronic form. The goal of 100% resident and attending participation was set. The next 50 resident TURBT operative dictations were prospectively analyzed for completeness as determined by the TURBT checklist. In order to preserve each subject's voluntary enrollment and the integrity of the study, there was no follow up done with individual residents in any way that was designed to improve compliance with the TURBT checklist or performance in the study.

A single surgeon was then tasked with tabulating the individual checklist items included in each dictated operative report. A strict grading criteria was used as per the above guidelines. Checklist items were considered incomplete for any missing variables. These items were then recorded in a de-identified database for further review and statistical analysis. TURBT's performed in the setting of concomitant upper tract disease and evaluation of non-urothelial cancers were excluded from final analysis.

Statistical review was performed by a blinded analyst. The checklist items were analyzed first by summing up the individual checklist items dictated overall before and after the formal checklist implementation and divided by the total number of checklist items possible. Then, the differences in individual checklist items dictated were averaged and compared before and after checklist implantation. We then stratified the difference in dictated items between post-graduate years (PGY); junior (PGY2-3) and senior (PGY4-6) residents, before and after checklist implantation. A simple student t-test was used for quantitative data and chi-square analysis was performed for categorical data. Statistical analysis was used using STATA 12.0.

#### Results

A total of 12 residents dictated a total of 100 TURBT reports, 50 pre and 50 post didactic intervention. Of the 12 residents 50% were junior residents and 50% were senior residents. Residents dictating the report were generally performing greater than 50% of the procedure. Junior residents dictated the majority of operative reports before and after checklist implementation 86% versus 76% respectively. The results of the baseline retrospective and the subsequent prospective checklist items dictated are displayed in Table 1. Overall, checklist item dictations statistically increased from 2.6 checklist items on average pre-checklist to 7.0 items post-checklist, an overall 4.5 item improvement from baseline (RR 2.7, 95% CI 2.3, 3.1). When comparing overall checklist items after implementation stratified by resident experience, both junior and senior residents dictated a mean of 7.0 checklist items, a statistically significant improvement (p < 0.05). Junior resident dictations improved by a mean increase of 4.4 items (RR 3.195% CI 2.6-3.7). Senior resident dictations improved by a mean increase of 2.3 items (RR 1.5 95% CI 1.1-1.9).

Figure 2 demonstrate differences between baseline and post-training TURBT dictations. TURBT dictations significantly improved across the board following implementation of the TURBT checklist (2.6 versus 7.0 items, p < 0.05). Every dictated checklist item was significantly improved after checklist implementation (p < 0.05). Tumor characteristics (52% versus 96%), tumor size (44% versus 82%), number of tumors (34% versus 96%), presence of CIS (10% versus 58%), and visualization of detrusor muscle (20% versus 64%)

TABLE 1. Total percentage of checklist items dictated before and after checklist training. Residents were stratified by PGY level; Junior resident (PGY2-3) and Senior resident (PGY4-6)

Percent of checklist items dictated	Total*	Junior resident*	Senior resident*
Prior to TURBT dictation training	26.20%	22.79%	47.14%
After TURBT dictation training	70.60%	70.53%	70.83%
*denotes p < 0.05			



**Figure 2.** Percentage of checklist items dictated before and after TURBT checklist implementation. Note all categories improved and reached statistical significance.

were areas which significantly improved after TURBT checklist implantation. In addition, bimanual exams were increased from 8% to 52% after implementation (p < 0.05). Presence or absence of bladder perforation was reported in 14% and 62% (p < 0.05), respectively.

When stratified by training level, the junior residents improved significantly more than the senior residents.

The junior residents statistically improved in every dictated category (p < 0.05), Table 2. The senior residents improved in 8 of 10 categories although only 2 of those were statistically significant: number of tumors (5.7 to 10.0, p < 0.05) and 2010 AJCC clinical stage (0.0 to 4.1, p < 0.05), Table 2. A regression model demonstrated checklist implantation to be a significant predictor

	Junior residents	performance	Senior residents performance			
	Prior to TURBT	After TURBT	Prior to TURBT	After TURBT		
	dictation training	dictation training	dictation training	dictation training		
n	43	38	7	12		
Number of tumors <sup>+</sup>	30.23%	94.74%	57.14%	100.00%		
Size of largest tumor*	39.53%	84.21%	71.43%	83.33%		
Tumor characteristic*	44.19%	97.37%	100.00%	91.67%		
Recurrent vs. primary*	25.58%	71.05%	57.14%	75.00%		
Presence of CIS*	6.98%	55.26%	28.57%	66.67%		
2010 AJCC clinical stage <sup>+</sup>	4.65%	47.37%	0.00%	41.67%		
Bimanual exam*	6.98%	52.63%	14.29%	58.33%		
Complete resection*	32.56%	76.32%	85.71%	66.67%		
Detrusor visualized*	18.60%	63.16%	28.57%	66.67%		
Perforation evaluated*	11.63%	63.16%	28.57%	58.33%		

TABLE 2.	Percentage	of individual	checklist items	dictated	stratified	bv resident	training	level
	I CICCIIII age	UT IIIMI TIMMU	checking herito	arctatea	ottattica	vy icolaciic	ti unini ing	IC V CI
	0					5		

\*denotes p < 0.05 only for junior resident group; <sup>+</sup>denotes p < 0.05 for both groups

of improvement in mean number of checklist items dictated. Of note, this was independent of PGY level.

### Discussion

The quality of surgery is a measure that is receiving increasing scrutiny, and yet the actual tools to measure this outcome are currently being designed and refined. TURBT checklists and quality measures have been developed in the past,<sup>5-9</sup> however, reporting of its implementation in real-world situation has not been done until recently. In a multi-institutional prospective evaluation of surgical quality, Anderson et al demonstrated the feasibility of implementing this TURBT checklist and demonstrated improvements in the quality of reporting for this operation. To our knowledge, the current study is the only article in the urologic literature evaluating operative report quality in operative dictations with implantation of either a template or checklist. Our study focused on the impact of this approach for resident trainees, with the hypothesis that, if properly instructed, the quality of the TURBT operative report in our cohort of urology residents would significantly improve in a short amount of time.

This study demonstrates that prior to TURBT checklist implementation, TURBT operative reports performed by residents lacked many of the critical components required for a quality TURBT. However, once properly instructed, a relatively simple "checklist" can be easily implemented and serve as a teaching tool for residents in training to ensure critical procedural elements are documented. The number of checklist items dictated increased significantly after this study across all resident years.

Residents likely performed a check for basic steps of TURBT surgery such as evaluating for bladder perforation or detrusor muscle in the specimen even when not documented in the operative report. However, some checklist items such as suspicion for CIS, AJCC clinical stage and performance of bimanual exam were not dictated as commonly before or after the training session. The question arises whether residents performed the checklist items but didn't document the findings or did not perform the item at all. This may result from non-compliance to the study, adherence to the template, or time constraints of operating in a busy tertiary referral center. Such information is important for feedback to clinical educators to identify areas of potential teaching opportunities and we have done so going forward at our institution.

While this quality improvement could be implemented any time in the career of a urologist, it seems intuitive that good habits in surgical reporting would be most impactful if learned early in an individual's career with the opportunity to make further refinements with increasing experience. It has already been shown that surgeon experience is associated with lower recurrence rates although cancer progression has not been shown to be affected.<sup>10</sup> The implementation of this checklist has not proven to improve surgical quality and further study would be needed to see if this checklist can affect surgical outcomes.

The association of surgical quality improvement with checklists has been reported previously. Safety checklists have been demonstrated to decrease postoperative morbidity and mortality.<sup>11</sup> Another study demonstrated the omission of key intraoperative details in the operative report has been associated with a higher incidence of intraoperative complications.<sup>12</sup> One institution in particular implemented a 10-step simple checklist for laparoscopic cholecystectomies and demonstrated an overall decrease in open conversion from 8.7% to 2.2%.<sup>13</sup> Others have shown checklists to improve patient safety especially when implemented early in surgical training.<sup>14</sup> It seems surgical residents can benefit from a more standardized introduction to safety checklists and implementation of surgical quality improvement.

Our study demonstrated a significant improvement in operative report quality for both junior and senior residents. Researchers in the non-urologic literature have published templates intending to improve dictation quality in the narrative operative report.<sup>15</sup> Dumitra el al reported that junior residents benefited the most from prewritten templates. Those same residents also felt more comfortable with their dictations after having used an operative template. These results are in line with our findings in which junior resident dictations improved significantly and much more so than senior resident dictations. Most surgical programs do not offer their residents any formal teaching of operative report dictation.<sup>16</sup> It stands to reason from prior research that residents would benefit the most from formal instruction using operative checklists. Consequently, adaptation of the TURBT checklist should result in a significant improvement in operative documentation at training institutions.

Recently, the creation of the computerized synoptic operative report has been studied to improve surgical documentation in the operative report. The idea behind synoptic operative reports is the inclusion of the necessary steps of an operation in a prepopulated document or form. The synoptic operative report would then include a complete list of surgical steps of a procedure with variable data then to be added by the surgeon. The general surgery literature shows a lack of inclusion of essential elements in narrative operative reports in basic procedures.<sup>17,18</sup> There have also been studies which show the adoption of synoptic operative reports may be superior to traditionally dictated narrative operative reports.<sup>19-21</sup> With the widespread inclusion of electronic medical records across the nation, we suspect the synoptic operative reports to become more prevalent. Further research needing to be done should include the use of synoptic operative reports in urologic surgery.

There are a few limitations to this study. The TURBT checklist was developed by consensus by a multi-institutional group of urologists with expertise in bladder cancer and has not been validated in association with patient outcomes. There may also be an unmeasurable aspect of the Hawthorne effect included in this study. Our trainees were briefed on the purpose of this study at its beginning which may have led to an unseen alteration in their behavior. The idea that they were being observed for inclusion in this study may also have led to an inclusion of checklist items in their dictations. The durability of our results at this point is unknown due to the infancy of this study. Further research would have to be done to determine if the results are likewise reproducible over an extended period of time.

## Conclusion

Implementation of a TURBT checklist at an academic institution can benefit resident education by highlighting the essential technical aspects of the operation and factors that impact clinical decision making for the patient. It is not known, whether implantation of the TURBT checklist leads to improved patient outcomes through improvement in TURBT technique or improved clinical decision-making. However, implementation of standardized training and inclusion of applicable checklists early in the training of future urologists establishes a framework for a higher quality of TURBT operation. Further research should be done with implementation of the TURBT checklist into a synoptic operative report.

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