A Society for Pediatric Urology Workforce Survey on the Current Perceptions of Oncology Care by Pediatric Urologists: A Report from the Pediatric Urologic Oncology Working Group of the Society for Pediatric Urology

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Abbreviations and Acronyms

COG = Children's Oncology Group

VA = vascular access

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Purpose: Data are lacking on the current perception of oncology care among pediatric urologists. Thus, we developed, pilot tested and administered a survey on this topic to SPU (Society for Pediatric Urology) members.

Materials and Methods: Approval for this proposal was granted by SPU leadership prior to developing or distributing the survey instrument. The survey was developed and pilot tested by the PUOWG (Pediatric Urologic Oncology Working Group). Response data were collected and descriptive statistics were used for analysis. Logistic regression analysis was performed to correlate surgeon reported factors with higher volumes of reported oncology surgery.

Results: A total of 426 surveys were distributed via email to SPU members and 212 individual surveys (49.8%) were returned with the background/introduction section completed. Of these surveys 200 (94.3%) were completed by practicing pediatric urologists. Overall, 155 respondents (77.5%) reported performing 5 or fewer oncology related surgeries per year and 74.9% reported that less than 25% of renal tumor surgery at their institution was performed through the pediatric urology service. On multivariate analysis the self-reported factors significantly associated with increased oncology surgical volume (more than 5 cases per year) were greater than 50% attendance at institutional tumor board meetings (OR 4.8, 95% CI 1.4–16.9) and practicing at a hospital with a higher volume of renal tumor surgery (OR 2.6, 95% CI 1.2–5.8).

Conclusions: Few surveyed pediatric urologists reported performing a high volume of oncology surgery. Respondents expressed interest in ways to increase pediatric urology involvement in oncology care, including opportunities for increased education. Self-reported factors that correlated with higher volume were regular attendance at the institutional pediatric tumor board and practice at a higher volume institution.

Key Words: urology; pediatrics; surgical oncology; practice patterns, physicians'; questionnaires

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ANECDOTALLY, oncology care makes up a limited portion of the practice of most pediatric urologists. However, to our knowledge there are no data on the perception of oncology education during fellowship training, current patterns of oncology practice among pediatric urologists and general perceptions of pediatric urology involvement in the care of oncology cases. To our knowledge no survey of pediatric urologists on this topic has been previously performed. Therefore, the PUOWG of SPU developed a survey for SPU members to explore the current state of oncology practice by pediatric urologists. An additional objective of the survey was as a needs assessment of SPU members as it relates to oncology issues.

The PUOWG was recently formalized and recognized by SPU. It is charged with supporting oncology education and research among pediatric urologists. In terms of education, this includes oncology focused courses as well as online modules for SPU members and pediatric urology fellows. Additionally, the PUOWG wishes to foster multi-institutional research studies by connecting interested investigators for collaboration and providing logistic support.

The specific aims of this survey were to 1) describe the reported volume of oncology referrals/surgery by pediatric urologists, 2) describe pediatric urology involvement with institutional pediatric tumor boards and their membership in pediatric oncology cooperative groups, 3) describe institutional practice patterns as they relate to renal tumor surgery, 4) report perceived barriers to pediatric urology involvement in oncology care, 5) report perceptions of oncology education during fellowship and interest in ongoing oncology education and 6) identify factors that correlate with reporting higher volumes of oncology surgery.

METHODS

Study Design

A 34-question survey was developed collaboratively by the executive committee of the PUOWG. It was refined by expert review after cognitive interviews and pilot testing by 10 fellowship trained pediatric urologists to ensure that questions were clear and responses were comprehensive (supplementary Appendix, http://jurology.com/). Before distribution this study was granted exempt status by the Colorado Multiple Institutional Review Board. SPU leadership approved this survey prior to its distribution via e-mail to SPU members on July 1, 2014. The survey was open to online responses for 6 months. To encourage participation e-mail reminders were sent on October 1 and December 1 before survey closure on December 31.

Only survey data from practicing pediatric urologists were included in the subsequent analysis. Each specific survey domain was analyzed independently. Some domains were not answered by all respondents, thus, accounting for the varying denominators among domains. Only 1 response was collected from each e-mail address to prevent repeat responses from the same person. Results were collected through Zoomerang™.

Statistical Analysis

Survey data were analyzed for self-reported surgeon specific factors, including practice type, setting, membership in oncology societies, volume and type of oncology referrals and surgeries, and institutional practices related to pediatric tumor boards and oncology referral patterns. Nonparametric descriptive statistics were used to evaluate survey data. By applying logistic regression surgeon reported factors were analyzed for an association with a higher oncology case volume, defined a priori as more than 5 oncology cases per year. These data were reported as the OR and presented with the 95% CI. Factors that were statistically significant on univariate analysis were included in a multivariate logistic regression analysis. In all analyses 2-sided $p < 0.05$ or a 95% CI not crossing 1.0 were considered significant.

RESULTS

A total of 426 surveys were e-mailed, 233 e-mails (54.7%) were opened and 225 surveys (52.5%) were initiated. Background data were completed on 212 surveys (49.8%), including 200 (46.9%) from practicing pediatric urologists. The remaining data referred only to responses from practicing pediatric urologists. Practices reported by 191 (95.5%) pediatric urologists who were fellowship trained included academic practice (123, 61.5%), private practice (40, 20%) and hybrid practice (37, 18.5%). As it related to years of experience in practice 51 respondents (25.5%) reported 0 to 5, 29 (14.5%) reported 6 to 10, 32 (16.0%) reported 11 to 15, 27 (13.5%) reported 16 to 20 and 12 (6.0%) reported more than 20 years while 9 (4.5%) did not respond. In terms of practice setting 33 respondents (16.5%) reported being in solo practice and 167 (83.5%) were part of a group practice. In assessing the proportion with "super subspecialized" oncology care 50 respondents (29.9%) reported that their group specialized this care to specific providers with 30 (17.9%) reporting that they were the provider of subspecialty oncology care.

In terms of region of practice 195 (97.5%), 3 (1.5%) and 2 respondents (1.0%) reported practicing in North America, South America and Europe, respectively. Of those who were self-reported members of an AUA (American Urological Association) regional section there were 12 (6.2%) in the Northeast, 7 (3.6%) in the New England, 15 (7.7%) in the New York, 22 (11.3%) in the Mid-Atlantic, 31 (15.9%) in the Southeast, 27 (13.8%) in the South Central, 43 (22.1%) in the North Central and 38

(19.5%) in the Western Section. Only 22 respondents (11.1%) reported being a member of a pediatric oncology cooperative group, including 20 members (10.1%) of COG, 4 (2.0%) of SIOP (International Society of Paediatric Oncology) and 3 (1.5%) of IPSO (International Society of Paediatric Surgical Oncology).

Table 1 lists the number and type of oncology referrals and surgeries reported by those responding to the survey. Of note, 113 respondents (56.8%) reported seeing 5 or fewer oncology referrals and 155 (77.5%) reported performing 5 or fewer oncology surgeries per year. The most common types of oncology referrals were testicular/paratesticular mass, renal mass and oncology related voiding dysfunction. The most common types of oncology surgery were testicular/paratesticular mass, renal mass and reconstructive surgery related to prior oncology care.

In terms of the related institutional pediatric oncology factors 148 respondents (74.0%) reported that a pediatric oncology group practice was associated with their institution. Similarly, 149 respondents (74.5%) reported that there was a regularly scheduled pediatric oncology tumor board.

Table 1. *Volume and type of oncology referrals and surgery reported by survey respondents*

Estimated No. referrals/yr (%):		
None	32	(16.1)
1—5	81	(40.7)
6—10	49	(24.6)
11—20	31	(15.6)
Greater than 20	6	(3.0)
Median % referrals (range):		
Surgical	70	(0—100)
Testicular/paratesticular mass	20	(0—88)
Renal mass	15	(0—100)
Voiding dysfunction	5	(0—70)
Reconstruction after oncology care	5	(0—50)
Hemorrhagic cystitis	5	(0—30)
Bladder/prostate mass	5	(0—25)
Oncofertility	0	(0—80)
Adrenal/retroperitoneal mass	0	(0—20)
Vaginal/uterine/ovarian mass	0	(0—10)
Estimated No. surgeries/yr (%):		
None	44	(22.0)
1—5	111	(55.5)
6—10	32	(16.0)
11—20	10	(5.0)
Greater than 20	3	(1.5)
Median % surgeries (range):		
Testicular or paratesticular mass (biopsy, testis sparing, radical orchiectomy)	35	(0—100)
Renal mass	20	(0—65)
Reconstructive surgery related to prior oncology care	5	(0—100)
Bladder/prostate mass	5	(0—40)
Hemorrhagic cystitis	4	(0—40)
Testis or paratesticular mass retroperitoneal lymph node dissection	1	(0—25)
Oncofertility	0	(0—80)
Oncology vascular access	0	(0—25)
Adrenal or retroperitoneal (nontestis) mass	0	(0—25)
Vaginal/uterine/ovarian mass	0	(0—15)

In describing patterns of tumor board attendance 73 respondents (36.5%) reported that they never attended and 104 (52.0%) only attended when a case of theirs was presented. The remaining 23 respondents (11.5%) reported attending regardless of whether a case of theirs was presented. Of those respondents 9 (4.5%) attended monthly, 9 (4.5%) attended more than 50% of the time and 5 (2.5%) attended more than 75% of the time. Table 2 lists response data related to institutional practices as it relates to managing pediatric and adolescent renal tumor surgery.

One factor commonly discussed as a hurdle to increased urology involvement in pediatric oncology was the ability to offer concurrent VA procedures (ie placement of a central venous catheter, Port-a-Cath® or Mediport®) necessary for chemotherapy. Thus, we queried respondents on these issues specifically and 50 (25.0%) responded that they had had VA training during residency or fellowship. However, only 26 respondents (13.0%) reported having active surgical privileges for VA procedures and even fewer (9 or 4.5%) reported performing at least 1 VA surgery per year.

Respondents also ranked perceived barriers to increased pediatric urological involvement in oncology care. "Current institutional referral patterns" was listed as the highest barrier by 66.9% of respondents, followed by "a lack of emphasis on oncology by pediatric urology" by 18.2% and "an inability to offer concurrent VA procedures" by 14.9%.

Table 3 shows response data on opinions about the emphasis on oncology training in fellowship and personal feelings about current levels of involvement in oncology care. Overall, 119 of 154 respondents (77.3%) indicated that they were interested in attending an educational course on pediatric and adolescent urological oncology.

There was a specific content question included in the survey, "Based on current standard surgical protocols, when is lymph node sampling indicated

Table 2. *Reported institutional experience with pediatric or adolescent renal tumor surgery*

	No. Respondents (%)
Estimated No. surgeries/yr:	
0	2 (1.3)
1—2	20 (12.7)
3—5	41 (26.1)
6—10	44 (28.0)
11—15	28 (17.8)
Greater than 15	22 (14.0)
Estimated % pediatric urology service involvement:	
Less than 10	65 (41.4)
25	53 (33.8)
50	22 (14.0)
75	10 (6.4)
Greater than 90	7 (4.5)

Table 3. *Reported opinions on state of pediatric urologic oncology*

	No. Respondents (%)
How would you describe emphasis on oncology training during your pediatric urology fellowship?	
None	7 (4.5)
Not enough	73 (47.4)
Just right	59 (38.3)
Too much	1 (0.6)
Not sure but not issue	14 (9.1)
How comfortable do you feel managing pediatric + adolescent urological oncology issues and cases?	
Not comfortable	4 (2.6)
Not comfortable but want to learn more	15 (9.7)
Somewhat comfortable	39 (25.3)
Somewhat comfortable but want to learn more	62 (40.3)
Very comfortable	34 (22.1)
Which of following describes your feeling toward your involvement in oncology care at your institution?	
Would like less involvement	6 (3.2)
Sufficient	55 (35.7)
Would like to be more involved but do not have time	47 (30.5)
Would like to be more involved + looking for ways to increase my involvement	47 (30.5)

with renal tumor surgery for children or adolescents?" Six respondents (3.8%) answered "never," 34 (21.7%) answered "only when enlarged on imaging or when found enlarged intra-operatively," 6 (3.8%) answered "only with radical nephrectomy but not with partial nephrectomy" and 111 (70.7%) answered correctly that it is indicated "always with radical or partial nephrectomy." On univariate logistic regression certain surgeon reported factors were associated with a correct response on the content question, including those in academic practice (OR 2.3, 95% CI 1.0–5.4) and those who described themselves as providing subspecialty oncology care (OR 5.1, 95% CI 1.2–22.9). Respondents who were solo practitioners were less likely to provide a correct response (OR 0.39, 95% CI 0.17–0.92). However, none of these factors retained significance on multivariate analysis.

Table 4 presents data on the logistic regression analysis correlating surgeon reported factors to a higher volume of oncology surgery, defined as more than 5 oncology surgeries per year. On multivariate analysis only greater than 50% attendance at institutional tumor board meetings (OR 4.8, 95% CI 1.4–16.9) and practicing at a hospital with a higher volume of renal tumor surgery (OR 2.6, 95% CI 1.2–5.8) significantly correlated with higher volume.

DISCUSSION

In surveying a cross-section of pediatric urologists we collected data on the current state of oncology care in pediatric urology. The survey was successful in obtaining responses from nearly half of those who received the survey. Recent surveys of SPU members report responses from approximately 25% to 30% of those queried.[1–3] To our knowledge only 1 such survey has reported a higher response rate.[4] This was a survey of the combined memberships of SPU and AAP (American Academy of Pediatrics) Section on Urology about issues related to fellowship and their impact on subsequent practice, which had a 56% response rate. Comparatively, a survey of neurosurgeons about the management of pediatric brain tumors yielded a 3.4% response rate.[5] Therefore, our survey appears to have achieved the goal of identifying a representative cross section of pediatric urologists.

As suspected, the survey confirmed the general sense that oncology care comprises a small part of the practice of most pediatric urologists. Accordingly, few pediatric urologists are active in areas related to oncology care. Specifically, only 11.1% of those who responded were members of an oncology specialty society such as COG or SIOP and only 11.5% reported regularly attending their institutional pediatric tumor board.

While survey responses may not be the gold standard for what occurs in real life practice, the survey provides some subjective data on current practice patterns as they relate to pediatric and adolescent renal tumor surgery. Only 39 respondents (24.9%) reported that the pediatric urology service was involved in any manner with 50% or more of the renal tumor surgeries at their institution. Interestingly, 65 respondents (41.4%) reported that pediatric urology is involved in less than 10% of such cases at their institution. While this only represents 1 specific oncology case and one that is commonly shared between the urology and surgery services, it provides insight into the responses about "current referral patterns" posing the greatest barrier to increasing urology involvement in oncology care.

A goal of this survey was to identify modifiable factors that correlate with higher reported oncology volume. Such data could be used on an individual level to increase personal involvement for pediatric urologists seeking increased involvement. We noted that 30.5% of survey respondents reported being actively interested in increasing their oncology involvement. Super subspecialization of the oncology care in a pediatric urology group and regular attendance at the local pediatric tumor board were observed on logistic regression analysis to be significant factors that correlated with higher oncology volume. This may speak to the personal nature of referral patterns. Potentially, by having 1 person serve as the "face of pediatric urology" to regularly interact with the oncology service there is an avenue to increased clinical volume.

VA training, privileges and surgery were significant on univariate logistic regression analysis but

Table 4. *Logistic regression analysis of surgeon reported factors related to reporting oncology surgery higher volume (more than 5 cases per year)*

	Univariate		Multivariate	
	OR (95% CI)	p Value	OR (95% CI)	p Value
Experience (yrs):			—	—
0—5	1			
6—10	1.01 (0.36—2.8)	0.99		
11—15	0.89 (0.32—2.4)	0.81		
16—20	0.76 (0.25—2.3)	0.62		
Greater than 20	0.55 (0.22—1.4)	0.22		
Practice type:			—	—
Group	1			
Solo	0.91 (0.37—2.3)	0.85		
Practice setting:			—	—
Private or hybrid	1			
Academic	1.47 (0.60—3.6)	0.39		
Self-described subspecialty oncology care provider:				
No	1			
Yes	3.4 (1.5—7.9)	0.004	2.6 (0.89—7.3)	0.78
National oncology group member:			—	—
No	1			
Yes	1.7 (0.65—4.5)	0.29		
Vascular access training:				
No	1			
Yes	2.1 (1.02—4.4)	0.04	1.1 (0.41—2.8)	0.88
Vascular access privileges:				
No	1			
Yes	2.6 (1.1—6.1)	0.036	0.94 (0.26—3.3)	0.92
Reported performing vascular access cases:				
No	1			
Yes	4.7 (1.2—18.4)	0.025	1.8 (0.28—11.5)	0.54
Attended tumor board more than 50% of time:				
No	1			
Yes	7.3 (2.3—23.3)	0.001	4.8 (1.4—16.9)	0.014
Estimated pediatric or adolescent renal tumor surgery hospital vol (No. cases/yr):				
10 or Less	1			
Greater than 10	2.5 (1.2—5.2)	0.013	2.6 (1.2—5.8)	0.015
Lymph node sampling content question response:			—	—
Incorrect	1			
Correct	1.4 (0.64—3.1)	0.39		

lost significance on multivariate analysis. We suspect that this was due to an overlap in correlation with the other significant factors. However, seeking additional training to obtain VA privileges is a potential option that may be pursued by pediatric urologists interested in increasing oncology volume.

In an attempt to tie together these data, it appears that a unifying theme is that factors that increase direct interaction with the pediatric oncology team through a variety of channels may increase personal oncology volume. These points were also well summarized in a recently published editorial on the topic.[6]

The survey also identified a desire for increased oncology education among pediatric urologists with more than 75% of those reporting that they were interested in a course on pediatric and adolescent urological oncology. Similarly, with more than half reporting that there was "none" or "not enough" emphasis on oncology training during fellowship, there appears to be an appetite for avenues of increased oncology education among pediatric urologists.

Current PUOWG educational efforts include a 2-hour teaching session at the SPU meeting every 18 months as well as a dedicated educational session at each fall and spring meeting of PUOWG. Future efforts include a day-long separate educational course potentially to be held the day prior to a national meeting to focus on issues such as COG protocol review and surgical techniques, including VA surgery. Other future efforts include a survey specific to renal tumor surgery to be distributed to pediatric urologists and surgeons via SPU and APSA (American Pediatric Surgical Association). This will elucidate differences and similarities in the renal tumor volume between pediatric urologists and surgeons, and what individual factors correlate with volume.

While many other areas could have been explored with this survey, we were limited by time and the ability to obtain a sufficient sample size to adequately answer all such questions. Obtaining a nearly 50% response rate is encouraging but there was likely an inherent bias toward respondents who were especially interested in issues of oncology. As

a result, this may have led to conclusions that are not generalizable.

There was also a skew toward respondents from academic and group practices, who represented 61.5% and 83.5% of respondents, respectively. Nevertheless, the data represent the practice patterns of 200 pediatric urologists with a large range of experience. Additionally, with almost 40% of respondents practicing outside a strictly academic environment, we believe that these data represent both academic and private practice. A larger sample would be unlikely to contradict the observed results. However, the results must be interpreted with potential biases in mind.

Additional limitations of our study include logistics in the survey design and implementation. This survey was not externally validated for content and accuracy prior to distribution. Therefore, errors in interpreting the questions and responses may have led to inaccuracies in the observed data.

One of the stated goals of this investigation was to identify modifiable, surgeon specific factors associated with increasing oncology volume. Unfortunately, not all potentially relevant data could be collected. For example, details on surgeon training, areas of research and subspecialty clinical expertise are likely associated with increased involvement in oncology care but they were not available in this data set.

As for future directions concerning this investigation, these survey data will be used to develop oncology education plans for current and future pediatric urologists.

CONCLUSIONS

Few pediatric urologists surveyed reported high levels of clinical oncology care. However, the survey identified modifiable factors, such as super subspecialization in oncology care, offering concurrent VA surgery, regular attendance at tumor boards and practicing at a higher volume center, which correlated with greater reported oncology clinical volume. Such data are useful for those who are interested in increasing their involvement in oncology care. Additionally, the survey identified a significant interest in oncology education among pediatric urologists in practice.

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EDITORIAL COMMENT

The authors report the results of a comprehensive survey on several aspects related to involvement in cancer care by pediatric urologists. Overall the response rates were modest, although in keeping with similar initiatives in the surgical arena.

Regular attendance to tumor boards positively correlated with a higher volume of oncologic cases, which is likely a proxy of the existence of a thriving relationship with the oncology service. It is challenging to define this as a cause or as a consequence of becoming the primary surgical provider for pediatric oncology cases.

Undoubtedly, not every pediatric urologist will become a cancer expert. PUOWG has the unique opportunity to pave the way for the development of a true pediatric uro-oncologist versed in the treatment of all urological malignancies in children using minimally invasive techniques when appropriate, as well as participating in vascular access and fertility initiatives. This will unequivocally ease the process of inclusion in the somewhat restricted pediatric oncology circles.

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