Lessons Learned from the Reimbursement Profile of a Mature Private Medical Toxicology Practice: Office-Based Practice Pays

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Abstract We previously reported the financial data for the first 5 years of one of the author's medical toxicology practice. The practice has matured; changes have been made. The practice is increasing its focus on office-based encounters and reducing hospital-based acute care encounters. We report the reimbursement rates and other financial metrics of the current practice. Financial records from October 2009 through September 2013 were reviewed. This is a period of 4 fiscal years and represents the currently available financial data. Charges, payments, and reimbursement rates were recorded according to the type and setting of the medical toxicology encounter: forensic consultations, outpatient clinic encounters, nonpsychiatric inpatient consultations, emergency department (ED) consultations, and inpatient psychiatric consultations. All patients were seen regardless of ability to pay or insurance status. The number of billed Current Procedural Terminology (CPT) codes for office-based encounters increased over the study period; the number of billed CPT codes for inpatient and ED consultations reduced. Office-based encounters demonstrate a higher reimbursement rate and higher payments. In the fiscal year (FY) of 2012, office-based revenue exceeded hospital-based acute care revenue by over

\$140,000 despite a higher number of billed CPT encounters in acute care settings, and outpatient payments were 2.39 times higher than inpatient, inpatient psychiatry, observation unit, and ED payments combined. The average payment per CPT code was higher for outpatient clinic encounters than inpatient encounters for each fiscal year studied. There was an overall reduction in CPT billing volume between FY 2010 and FY 2013. Despite this, there was an increase in total practice revenue. There was no change in payor mix, practice logistics, or billing/collection service company. In this medical toxicology practice, office-based encounters demonstrate higher reimbursement rates and overall payments compared to inpatient and ED consultations. While consistent with our previous studies, these differences have been accentuated. This study demonstrates the results of changes to the practice—reduced inpatient/ED consultations and increased outpatient encounters. These practice changes resulted in higher overall revenue despite a lower patient volume. In this analysis, the office-based practice of medical toxicology has higher reimbursement rates, nearly 2.5 times higher, when compared to hospital-based acute care consultations.

Keywords Medical toxicology · Reimbursement · Practice model

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Introduction

The practice of medicine entered a new era with the passage of the Patient Protection and Affordable Care Act (ACA) in 2010 [1]. More patients will have access to health-care insurance [1]. The ACA also ushered changes in physician reimbursement for both primary care specialists and sub-specialists [2]. Medical toxicology is a small sub-specialty that focuses on the evaluation and treatment of all manners of potentially toxic exposures [3, 4].

We previously reported the reimbursement profile of one of the author's (JBL) first 2 years of experience in setting up a private medical toxicology practice [5]. Since that time, little has been published regarding the medical economics, financial metrics, or reimbursement profiles of the private practice of medical toxicology [6].

The information reported in the previous manuscript informed changes to this medical toxicology practice, and the practice has matured. The practice focuses on increasing outpatient clinical encounters and reducing inpatient and emergency department encounters. The primary objective of this study is to describe the reimbursement rates of the various aspects of this medical toxicology practice with a secondary aim of comparing point-of-service billing, charges, and revenue collected.

Methods

One of the authors (JBL) initiated a sole-practitioner, private medical toxicology practice in July 2001, as previously described [5]. There is full vacation coverage by a medical toxicologist for inpatient consultations but not for the outpatient clinical encounters. This medical toxicology practice comprises the author's primary, and only clinical, work. In this practice, all outpatients are seen regardless of ability to pay; the clinic accepts all insurance plans except for out-of-state public aid (Medicaid). Similarly, all inpatients are also seen regardless of ability to pay. It should be noted that the affiliated inpatient psychiatry service that provides medical toxicology consultation opportunities will not admit uninsured patients to their unit (but will admit public aid patients).

This medical toxicology practice has been a sole practice since inception and was previously evaluated [5]. The results of that first evaluation of this practice demonstrated that outpatient encounters reimburse at higher rates than inpatient and ED encounters [5]. That knowledge was used to effect changes to this medical toxicology practice. Since this is a single-provider practice, changes had to be feasible for a single practitioner. A deliberate effort was made to reduce inpatient and ED consultations while increasing and maximizing outpatient clinic encounters during the study period. The purpose of these efforts was to make the practice more logistically feasible for a sole practitioner and to enhance revenue generation.

We analyzed the financial records from October 1, 2009 to September 30, 2013, representing 4 fiscal years, of a private, sole-practitioner, full-time medical toxicology practice. This represents the most recent data available for the practice. The encounters were billed by Current Procedural Terminology (CPT) codes and included point-of-service evaluations pertaining to hospital-based acute care encounters (medical inpatient, psychiatry inpatient, observation unit, and

emergency department) and office-based encounters (outpatient clinic visits and forensic toxicology consultations). Forensic consultations are defined as nonclinical encounters where there was no direct patient-physician relationship but billing occurred for the event. Examples of forensic consultations include independent medical evaluations, medicolegal consultations, industry contracts, and private poison center consultations. Forensic encounters are billed directly to the contracting agency involved. Since all financial records for this medical toxicology practice are managed by the same billing company, forensic payments are recorded in financial records as CPT codes. Some patient consultations and encounters include more than one CPT code. Research grant money was not included in this analysis. We excluded no other types of encounters from analysis.

We recorded charges, payments, and reimbursement rates according to the type of medical toxicology encounter: outpatient clinic encounters, forensic consultations, nonpsychiatric inpatient (IP) consultations, emergency department (ED) consultations, observation unit-based consultations, and inpatient psychiatric (IP psych) consultations. The latter four categories are considered hospital-based acute care consultations. Nearly all IP psych consultations involved issues regarding medical clearance for psychiatric inpatient placement. Office-based reimbursement included outpatient clinic encounters and non-clinical forensic work as described above. We defined reimbursement rate (RR) as the amount collected for an encounter divided by the gross amount billed prior to any third party payor adjustments. In this medical toxicology practice, all patients are seen regardless of their ability to pay or insurance status. We used descriptive statistics to describe the data obtained.

This study was deemed exempt from the institutional review board (IRB) review by the IRBs of both authors' primary institutions.

Results

The results of this study are summarized in Tables 1, 2, and 3. Comparing FY 2010 to FY 2013, the number of office-based billed CPT codes increased 21 %. This increase was largely driven by a 23 % increase in outpatient clinic visits as the number of forensic consultations remained roughly the same. The number of CPT codes billed for hospital-based acute care decreased by 20 % between FY 2010 and FY 2013; this was fueled by a 30 % decrease in total inpatient (medical and psychiatric) CPT billing during this period. Office-based billing demonstrated higher reimbursement rates and payments as compared to hospital-based acute care billing (Table 1). For example, in FY 2012, office-based revenue exceeded IP consultation revenue by almost \$200,000 despite a similar number of CPT codes billed in both settings and exceeded all

Table 1 Point of service billing

	Point of service	No. of CPT codes billed	Charges (US\$)	Payments (US\$)	Reimbursement rate (%)
FY 2013	Office ^a	689	\$317,636.62	\$245,808.28	77.39
	Inpatient	710	\$136,753.00	\$70,011.11	51.20
	Observation unit	65	\$10,160.00	\$5710.59	56.21
	Emergency dept.	128	\$40,155.00	\$20,758.89	51.70
	Inpatient psych	174	\$36,369.00	\$22,109.30	60.79
Total		1766	\$541,073.62	\$364,398.17	67.35
FY 2012	Office ^a	715	\$330,320.75	\$250,049.41	75.70
	Inpatient	654	\$126,535.00	\$54,586.63	43.14
	Observation unit	52	\$10,400.00	\$5351.40	51.46
	Emergency dept.	127	\$41,352.00	\$22,684.01	54.86
	Inpatient psych	175	\$35,888.00	\$22,065.09	61.48
Total		1723	\$544,495.75	\$354,736.54	65.15
FY 2011	Office ^a	652	\$269,895.45	\$206,938.72	76.67
	Inpatient	806	\$145,064.00	\$63,559.29	43.81
	Observation unit	73	\$10,290.00	\$5971.43	58.03
	Emergency dept.	139	\$41,018.00	\$22,272.44	54.30
	Inpatient psych	136	\$26,238.00	\$16,416.61	62.57
Total		1806	\$492,505.45	\$315,158.49	63.99
FY 2010	Office ^a	571	\$241,124.10	\$197,339.13	81.84
	Inpatient	1135	\$160,415.00	\$74,119.15	46.20
	Observation unit	35	\$5251.00	\$2744.09	52.26
	Emergency dept.	158	\$45,144.00	\$23,777.01	52.67
	Inpatient psych	135	\$20,176.00	\$12,070.92	59.83
^a Combined clinical encounters and forensic consultations	Total	2034	\$472,110.10	\$310,050.30	65.67

hospital-based acute care consultation revenue by over \$140,000. Office-based payments were 2.39 times higher than all hospital-based acute care consultations combined in FY 2012. There was an overall reduction in total patient CPT (clinic and hospital based) billing of 14 % between FY 2010 and FY 2013. Despite this reduction, there was an increase in total practice revenue because of a 25 % increase (\$48,469.15) in office-based revenue. The breakdown of outpatient clinic revenue and forensic revenue as a component of office-based practice is described in Table 2. The payment per work relative

value unit (WRVU) between April 2012 and March 2013 averaged \$63.01 for all patient encounters (hospital-based and clinic-based patient care). The WRVU for forensic consultations over that same 12-month period averaged \$944.98.

The average payment per patient CPT code by encounter type is listed in the Table 3. In FY 2010, the average payment per CPT code for an office encounter (clinic/forensic) was almost five times that of a hospital-based acute care encounter. In FY 2013, office-based consultations accounted for 39 % of CPT codes billed and 67.5 % total revenue compared to FY

Table 2 Office-based clinic encounters and forensic consultation revenue

	Type of service	No. of CPT codes billed	Charges (US\$)	Payments (US\$)	Reimbursement rate (%)
FY 2013	Clinic	577	\$164,721.00	\$93,185.66	56.57
	Forensic	111	\$152,915.62	\$152,623.62	99.80
FY 2012	Clinic	603	\$175,576.00	\$95,644.66	54.47
	Forensic	112	\$154,744.75	\$154,404.75	99.78
FY 2011	Clinic	560	\$153,875.00	\$90,918.27	59.09
	Forensic	98	\$116,020.45	\$116,020.45	100
FY 2010	Clinic	469	\$121,043.00	\$77,258.03	63.83
	Forensic	102	\$121,043.00	\$120,081.10	100

Table 3 Payment per CPT code (US\$)

	Office-based (includes forensics)	Clinic only (excludes forensics)	Hospital-based
FY 2013	\$356.76	\$161.22	\$110.11
FY 2012	\$349.72	\$158.61	\$103.86
FY 2011	\$317.39	\$162.35	\$93.78
FY 2010	\$345.60	\$164.73	\$77.04

2010 when office-based encounters accounted for 28 % of CPT codes billed and 63.6 % total revenue. This represents a 17.5 % (\$54,347.87) increase in revenue. For each year studied, payment for CPT codes billed in the outpatient setting is higher than that billed for hospital-based acute care (Table 3). The CPT codes used in this practice are described in Table 4.

During the study period, there was no change in patient payor mix, practice logistics (except as described), or billing/collection service company. The payor mix of this practice has not changed appreciably over the study period. Table 5 lists the payor mix of the practice for FY 2013, representing the most recent fiscal year of available data.

Discussion

There are many options for the practice of medical toxicology [7]. These range from the full-time clinical practice of medical toxicology, a combination of the clinical practice of both emergency medicine and medical toxicology, working with

Table 4 CPT codes used in this practice

Outpatient	
99245	New consultation
99205	New patient
99214	Established patient
99215	Established patient
99358	Prolonged service without face to face contact
99359	Prolonged service without face to face contact
94010	Spirometry
99173	Visual acuity
Inpatient	
99255	Inpatient consultation
99231	Subsequent hospital visit
99232	Subsequent hospital visit
99233	Subsequent hospital visit
99291	Critical care services
99292	Critical care services
99358	Prolonged service without face to face contact
99359	Prolonged service without face to face contact
93042	Procedure interpretation and report only

Table 5 Payor mix for the fiscal year of 2013

Aetna	2 %
Blue Shield	28 %
Cigna	2 %
Commercial	2 %
HMO IL	3 %
Humana	2 %
Medicaid	7 %
Medicare	10 %
Self pay	36 %
United Healthcare	6 %
Worker's comp	2 %
Total	100 %

regulatory agencies and working in various industries. By and large, most medical toxicologists who are trained in emergency medicine as their primary specialty practice a combination of both emergency medicine and medical toxicology. Medical toxicology fellows spend 55 % of their fellowship time on clinical duties—34 % of their clinical time on inpatient encounters and 14 % of their clinical time on outpatient encounters [8]. A survey of board-certified medical toxicologists reported that 95 % of respondents were clinically active, defined as any amount of direct or consultative care provided within the past 24 months, and 88 % of those same respondents consulted on at least 11 patients over that same 2-year period [4]. In that same survey, 65 % of respondents spent more time on direct patient care in their primary specialty than in the practice of medical toxicology; most of the medical toxicology encounters involved inpatient overdose experiences and not outpatient encounters or environmental assessments [4]. The discordance between the allocation of types of clinical experiences both during and after fellowship is not unique to medical toxicology. There are discussions within, for example, specialties of general surgery and internal medicine regarding the experiences within residency, preparation for postresidency practice, and appropriate training models [9–11]. Though not unique to medical toxicology, this discussion is particularly important to the practice of medical toxicology. Are medical toxicologists practicing more in their primary specialty by choice or because the reimbursement profile of medical toxicology is not financially viable in their current practice model? Are the current training models for medical toxicology providing the training necessary for fellowship graduates to form or join financially viable medical toxicology practices? These questions cannot be answered by this study; however, studies such as this can contribute to the body of knowledge necessary to address the current situation.

This study describes the reimbursement rates and other financial metrics regarding a private, sole-practitioner medical toxicology practice. In this practice, a deliberate effort was

made to reduce inpatient and ED encounters while increasing outpatient encounters.

The reduction in hospital-based acute care consultations was facilitated by the development and use of electronic health record (EHR) order sets for certain clinical conditions and physician education regarding the use of those order sets. An example is the use of EHR order sets for *N*-acetylcysteine use in uncomplicated acetaminophen overdose [12]. Additionally, neonatal consults (primarily involving neonatal withdrawal issues) were suspended due to the low reimbursement rate (under 15 %) and the establishment of a clonidine-based order set to treat this condition [13]. There was no remuneration for the creation of these EHR order sets. The increase in outpatient visits was achieved by enhancing and promoting the practice website [14], outreach to poison centers in Illinois and surrounding states, and direct outreach and advertising to occupational medicine clinics and various medical groups and practices.

Outpatient clinical toxicology evaluations are infrequently encountered by medical toxicologists. Of over 30,000 cases entered in the Toxicology Investigator Consortium (ToxIC) Registry, a nationwide research and collaboration network, less than 10 % involve outpatient encounters [15]. Moreover, over 60 % of referrals to medical toxicologists originate from the emergency department while inpatient referrals account for approximately 30 % of referrals [15]. This information suggests that medical toxicology has not developed a mature outpatient referral network despite the relationship medical toxicologists have with a potentially robust referral network—poison control centers.

In this study, reducing hospital-based acute care consultations while increasing outpatient encounters and forensic work resulted in higher overall practice revenue, higher payments/WRVUs, and higher reimbursement rates despite a lower patient volume. The quantity of billed CPT codes decreased by 15 % between FY 2010 and 2013, yet revenue increased by almost 18 % (Table 1). There was a 35 % decrease in billed CPT codes for combined IP and ED visits (a total of 455 CPT codes) that was financially offset by a 21 % increase in office billing (118 CPT billing codes).

Generating revenue for bedside clinical toxicology evaluations remains an essential component to the advancement and maturation of the specialty [7, 15]. Financial metrics, however, must be evaluated in order to optimize reimbursement. While the results of this practice evaluation show a financial benefit to office-based medical toxicology practice, these results should not imply that financial remuneration is the sole concern for the practice of medical toxicology. Additional medical toxicology practices and practice models should be similarly evaluated. Best practices should be shared, and identified concerns should be addressed.

Limitations

There are several limitations to this study. This investigation looks at the financial practice of only one medical toxicology practice. The findings, therefore, may not be applicable to other practices or practice models. Similarly, the payor mix of the patients and paying habits of the insurance companies in Illinois may not apply to practices in other states. The location of this medical toxicology practice is in a location within Illinois with a favorable payor mix. The charting habits of the involved physician may also play a role in reimbursement rates both on the inpatient and outpatient bases. Recording financial data from forensics encounters as CPT codes is imperfect; however, this is how financial records are kept in this practice. It is important to report the details of this practice as they are. Finally, this medical toxicology practice does not include certain services—such as smoking cessation counseling, coordination of care, or inpatient/outpatient detox care—that could potentially be performed by a medical toxicologist.

Conclusion

In this analysis of a private, sole-practitioner medical toxicology practice, the office-based practice of medical toxicology has higher reimbursement rates, nearly 2.5 times higher, when compared to hospital-based acute care consultations.

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Conflict of Interest Trevonne Thompson has no financial disclosures to make. The medical toxicology practice described is the practice of Jerrold B. Leikin. There are no other disclosures to make.

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