



Current trends in the reimbursement of professional neuropsychological services

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Abstract

Professional members of the National Academy of Neuropsychology (NAN) completed a survey focusing on clinicians' time requirements for activities, number of yearly claims to funding sources, average reimbursement rates, reimbursement rates associated with specific current procedural terminology (CPT) codes, managed care tolerance, hourly reimbursement rates, and other relevant practice issues such as incident-to. Clinicians continue to offer neuropsychological services through traditional assessment and evaluation activities, receive referrals from other healthcare professionals (i.e., neurologists, other medical specialists), and answer traditional referral questions related to patient diagnoses and determination of neuropsychological deficits. Two-thirds of respondents disapprove of managed care, and clinicians engage in activities which appear to minimize the ongoing changes in, and detrimental effects of, managed-care-based funding, in the form of dropping managed care panels, opting for fee-for-service, requiring self-pay patients, or spending more time in clinical activities for which there is a higher percentage of time approved such as forensic evaluations and evaluations for private practice. Clinicians continue to rely on managed care for their referrals even though they are only being reimbursed at about 50%. Overall, across service providers, clinicians are only receiving 60% of their hourly rate, and only 22% report receiving full compensation for their hourly rate. These results suggest that the effects of managed care have, for better or worse, altered the practice of clinical neuropsychology.

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1. Introduction

The growth of clinical neuropsychology during the middle and latter parts of the 1980's resulted in promising employment opportunities for clinical practitioners in a wide variety of settings (Putnam & DeLuca, 1990). While the "neuropsychology boom" of the late 1980's and early 1990's may have slowed somewhat, growth continues, necessitating examination of the prevailing practices and beliefs of clinical neuropsychologists. Such examinations allow for the ongoing description of both the profession and the professionals, help to formulate guidelines and policies to provide appropriate expectations for practitioners, and ensure adequate sharing of practice information, which may help shape clinical practice in a positive and prospective manner (Sweet & Moberg, 1990). While survey data has contributed to our understanding of the status and nature of the field at a given point in time (Sweet, Moberg & Suchy, 2000), neuropsychology's brief history and rapidly evolving nature make it imperative to continue to develop instruments that assess the economic growth and changes within the field.

Psychologists have a long history of attempting to understand and document the "current state" of their profession. Early efforts were focused on the use of psychological tests in clinical practice (Lubin, Wallis, & Paine, 1971; Wade & Baker, 1977), as well as in specific work settings (Lubin, Larsen, Matarazzo, & Seever, 1985). Clinical neuropsychologists have also documented the nature of their profession with general practice surveys (Hartlage & Telzrow, 1980; Seretny, Dean, Gray, & Hartlage, 1986; Guilmette, Faust, Hart, & Arkes, 1990), as well as more specific surveys of neuropsychological test usage (Lees-Haley, Smith, Williams, & Dunn, 1996; Horowitz & Schatz, 1997; Camara, Nathan & Puente, 2000). More recently, Sweet et al. (2002) surveyed the members of the National Academy of Neuropsychology (NAN) and Division 40 of the American Psychological Association (APA) to document and examine current information on the professional practice of clinical neuropsychology within the United States. Results showed that the percentage of women in the field was rapidly increasing, and that private practice was the predominant employment setting. Practitioners working in private versus institutional settings reported a more diverse set of weekly clinical activities, were less likely to use assistants, and engaged in more forensic activities. As well, with the exception of forensic evaluations, clinicians using assistants invested a greater number of hours per evaluation, but billed approximately the same number of hours per evaluation.

1.1. Managed care and clinical neuropsychology

Managed care has received considerable attention in both the literature and clinicians in attendance at professional conferences (Puente, 2002, 2003; Sanchez & Turner, 2003). In this regard, Sweet et al. (2003) highlighted reimbursement experiences, practice economics (i.e., billing methods, use of Current Procedural Terminology (CPT) codes) and income of the professional practice of neuropsychology. Results indicated that neuropsychologists frequently had difficulty gaining access to membership on managed care panels. For those who gained access, managed care companies often limited provision of services, which was perceived as negatively affecting quality of patient care. Neuropsychologists reported feeling obligated to provide services to Medicare and managed care patients, even though such services exceeded

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1.2. Rationale/purpose

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2. Method

2.1. Participants

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2.2. Procedure

Institutional Review
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NAN conference and

the maximum billable amount by the insurance carrier. Numerous CPT codes were reported as commonly used to bill the same clinical service, and awareness of Medicare and Medicaid practice and billing expectations was quite variable among practitioners. Professional income was shown to be influenced by years of licensed practice, practice setting, gender, types and amounts of non-clinical professional activities, and types and amounts of reimbursement sources within one's clinical practice, with income having only a minimal relationship to percentage of clinical practice per week (Sweet et al., 2003).

1.2. Rationale/purpose of study

Partially driving the significant changes in reimbursement for neuropsychological services has been the application of specific codes for neuropsychological assessment, including interviewing and testing, as well as cognitive rehabilitation. The introduction of these codes began approximately a dozen years ago. Since that time, yearly presentations by Dr. Puente at the National Academy of Neuropsychology conferences, as well as less frequent presentations at other society meetings, including the American Psychological Association, has produced a more cohesive set of practice parameters regarding reimbursement practices. However, a great deal of misunderstanding of the application of these codes as well as their billing and documentation remains (Puente, 2002).

The purpose of the present survey was to continue the active measurement of the economic status of the clinical practice of neuropsychology, as few surveys conducted to date have focused on the impact of managed care and its effects on the practice and perceptions of clinical neuropsychologists. In addition to exploring similar variables as past surveys, we focused on as-yet unobserved practice variables, including billing trends for different CPT codes, reimbursement patterns from various funding sources, hourly rate reimbursed, and how the effects of managed care are perceived and felt by professionals. By incorporating new practice data, along with standard practice variables, we aimed to help broaden the perspective of economic evaluation and contribute to the understanding of issues that influence the clinical practice of neuropsychology.

2. Method

2.1. Participants

Participants were licensed clinical neuropsychologists, who were either members of the National Academy of Neuropsychology or attended the 2002 NAN annual conference. Individuals who were not licensed or in clinical practice were excluded from participation.

2.2. Procedure

Institutional Review Board (IRB) approval was obtained from Saint Joseph's University and approval was obtained from the NAN Board of Directors to distribute the survey at the NAN conference and subsequently post the survey on the NAN website.

In the first phase of the data collection, 500 surveys were distributed at the 2002 annual NAN conference in Miami, Florida to individuals attending a “Reimbursement for Clinical Neuropsychological Services” seminar (Puente, 2002). Participants completed the surveys and returned them to one of several response boxes provided at the conference.

In order to facilitate participation for those NAN members who were not in attendance at the 2002 conference, a second phase of data collection ensued in which all NAN Professional Members received an e-mail inviting them to complete the same survey which had since been posted on the NAN website. In order to insure that we did not receive duplicate responses, individuals who had already completed the survey at the NAN conference were instructed not to complete the on-line version of the survey.

3. Results

3.1. Response rates

Four hundred and fifty surveys were distributed at the NAN conference in Miami, of which 201 were returned (including 2 returned by postage mail following the conference), resulting in a response rate of 44.7%. E-mail invitations to complete an on-line version of the survey were then sent to a total of 3034 NAN members, of which a total of 129 surveys were completed for a response rate of 4.3%. However, 536 (18%) were deemed undeliverable or otherwise void due to invalid e-mail addresses, e-mail “auto replies” stating that the participant was away from their office/e-mail, and individual replies stating that they had technological difficulties. Five individuals replied that they had already filled out the survey at the conference or were not qualified to do so, resulting in an adjusted return rate of 13.7% (328 out of 2398).

3.2. Clinician characteristics

As seen in Table 1, respondents averaged approximately 47 years of age, represented both genders equally, possessed doctoral or equivalent degrees, and nearly 30% were board certified (i.e., ABPN, ABPP, and ABCN). With respect to employment settings, respondents were distributed across traditional employment settings of private practice, medical hospitals (includes VA’s), psychiatric facilities, colleges and universities, rehabilitation facilities, and other settings, such as special needs and other schools, specific consultation arrangements, criminal/juvenile settings. Respondents worked predominantly full-time and part-time positions, with others working a secondary part-time position, or dual part-time positions.

3.3. Practice characteristics

Respondents delegated their professional time to traditional clinical activities such as general practice, teaching/education, research, clinical supervision, legal/forensic, administrative duties, and other activities such as cognitive rehabilitation, psychotherapy, practice management, and neurobehavioral intervention. Within their clinical practice, they engaged in

Table 1
Characteristics of Respondents

Source
Gender
Male
Female
Highest degree earned
Ph.D.
Psy.D.
Ed.D.
M.D./Ph.D.
Board certified
Yes
No
Employment settings ^a
Private practice
Medical/hospital
College/university
Rehabilitation
Other
Psychiatric facility
Work status
Full-time
Part-time
Full-time w/part-time
Two part-time
Not presently working

^a As respondents were asked to select all that applied, the percentage of respondents who selected each setting is not necessarily equal to the percentage of respondents who worked in that setting.

traditional clinical activities such as teaching/education, forensic, and research (see Table 2).

3.4. Referral sources

Referrals from neurologists, medical specialists (such as family medicine, chiropractors), psychiatrists (such as family medicine, educational specialists), addiction therapists, cardiologists, and social workers (see Table 3). Overall rank order of referral sources was diagnosis first followed

Table 1
Characteristics of Respondents

Source	N	Percent
Gender		
Male	160	49.2
Female	165	50.8
Highest degree earned		
Ph.D.	260	80.0
Psy.D.	58	17.8
Ed.D.	6	1.8
M.D./Ph.D.	1	0.3
Board certified		
Yes	92	29.1
No	224	70.9
Employment settings ^a		
Private practice	192	58.54
Medical/hospital	148	45.12
College/university	52	15.85
Rehabilitation	52	15.85
Other	33	10.06
Psychiatric facility	12	3.69
Work status		
Full-time	131	39.94
Part-time	91	27.74
Full-time w/part-time	59	17.99
Two part-time	31	9.45
Not presently working	4	1.22

^a As respondents were able to denote more than one setting, the list of employment settings represents the percentage of respondents working in that setting and does not sum to 100%.

traditional clinical activities, with comparatively less time devoted to administrative, research, educational, forensic, and supervisory duties; overall practice activities can be seen in Table 2.

3.4. Referral sources

Referrals from neurologists were first in rankings of referral sources, followed by other medical specialists (such as hematologists, oncologists, gerontologists, trauma surgeons, chiropractors), psychiatrists, general medical practitioners, miscellaneous/other sources (such as family members, disability services, former patients, insurance companies, courts, educational specialists), psychiatrists, pediatric specialists, other referral sources (such as addiction therapists, case managers, counselors/therapists, neurosurgeons, other psychologists, and social workers), referrals from forensic sources, and from neurosurgeons (see Table 3). Overall rankings of the most frequent referral questions placed determination of diagnosis first followed by determining the effects of neuropsychological deficits, treatment

Table 2
Primary professional activities and delegation of time to practice activities

Practice activity	Percentage of respondents engaged in that activity
Report Writing	95.94
Neuropsychological Assessment	94.72
Personal History of Patient	93.94
Diagnostic Interview (no formal testing)	92.67
Psychological Assessment	88.51
Follow-up Assessment (w/patient or family)	85.36
Neurobehavioral Examination	83.52
Treatment Planning w/other Healthcare Providers	82.61
Psychotherapy with Patient	75.39
Clinical Supervision of students (or Post-Docs)	75.00
Clinical Research	61.34
Cognitive Rehabilitation	51.67
Reviews for Insurance Organizations	50.77
Other	19.12
Delegation of Time to Activities	Average percent of time delegated^a
Clinical Practice	63.47
Administrative Duties	15.41
Research	15.21
Teaching/Educational	14.02
Legal/Forensic	12.48
Clinical Supervision	10.57
Other	31.22

^a As respondents provided their own percent of time delegated to activities, the percentage values not sum to 100%.

planning, other/miscellaneous (such as psychotherapy, eligibility for vocational services, recommendations, competency evaluations), documentation of baseline functioning, educational evaluation/IEP, forensic activities, disability/worker's compensation, monitoring cognitive recovery, pre/post medical intervention/procedure, and Independent Medical Examinations.

3.5. Use of technicians

Approximately 50% of the respondents in the sample reported that they use neuropsychological technicians or assistants. Of those respondents who use technicians, nearly 90% stated that they allow their technicians to conduct assessments of patients. While practitioners were not specifically asked what tasks they assign to their technicians, we interpret those 10% of technicians not "conducting assessments" as administering only specific tests, coding or scoring tests in a clinical or research capacity, and/or working in a clerical capacity. The educational levels of technicians were Master's, Bachelor's, Post-Doctoral, Pre-Doctoral, Doctoral, student volunteers, and other neuropsychiatric technicians, practicum students, and unspecified psychometricians. Only 10% of respondents using technicians ($N=17$)

Table 3
Rankings of referral sources

Referral source
Neurology
Other medical special
Psychiatric medicine
General medicine
Other
Psychiatry
Pediatric medicine
Other mental health sp
Forensic/law
Neurosurgery
Referral question
Determination of diagn
Determination of effect
Treatment planning
Other
Documentation of basel
Educational evaluation/I
Forensic activities
Disability/workers comp
Monitoring cognitive rec
Pre/post medical proced
Independent medical exa

reported remaining in and 77% ($N=122$) reported. A small percentage of questions regarding billing at a different rate-to-technician billing-ratio. Table 4.

3.6. CPT code reimburse

The average reimbursement under Psychiatric CPT interviews billed under CPT codes, overall, we reported Psychiatric CPT codes of participants ($N=181$) CPT codes, 45% ($N=1$) Non-Neurological/Non-ment information avail:

Table 3
Rankings of referral sources and most frequent referral questions

	Rank	M	S.D.
Referral source			
Neurology	1	2.64	1.39
Other medical specialists	2	2.87	1.84
Psychiatric medicine	3	2.98	2.51
General medicine	4	3.14	1.84
Other	5	3.15	2.31
Psychiatry	6	3.22	1.75
Pediatric medicine	7	3.77	2.22
Other mental health specialists	8	3.97	2.22
Forensic/law	9	4.08	1.99
Neurosurgery	10	4.20	2.18
Referral question			
Determination of diagnosis	1	2.10	1.53
Determination of effects of deficits	2	2.79	1.52
Treatment planning	3	3.16	1.80
Other	4	3.29	2.80
Documentation of baseline functioning	5	4.30	2.14
Educational evaluation/IEP	6	4.35	2.33
Forensic activities	7	4.67	2.32
Disability/workers compensation	8	4.76	2.02
Monitoring cognitive recovery	9	4.78	2.23
Pre/post medical procedure	10	4.91	2.31
Independent medical examinations	11	5.23	2.38

reported remaining in the room while the assessment is being conducted by a technician, and 77% ($N=122$) reported billing the same rate as had they conducting the assessment. A small percentage of those participants using technicians ($N=19$, 10%) responded to questions regarding billing and reimbursement for technicians; for those respondents billing at a different rate for evaluations completed by technicians, the average clinician-to-technician billing-ratio was \$160–\$82. Means and standard deviations are provided in Table 4.

3.6. CPT code reimbursement

The average reimbursement rate for each CPT code is depicted in Table 5. Interviews billed under Psychiatric CPT code 90801 were reimbursed at a somewhat higher percentage than interviews billed under Neurological CPT code 96115. However Psychiatric and Neurological CPT codes, overall, were reimbursed at similar percentages, whereas Non-Neurological/Non-Psychiatric CPT codes were reimbursed at a somewhat lower percentage. Of note, only 55% of participants ($N=181$) responded to the question regarding reimbursement for Neurological CPT codes, 45% ($N=148$) regarding Psychiatric CPT codes, and only 12% ($N=39$) regarding Non-Neurological/Non-Psychiatric CPT codes, as many participants did not have reimbursement information available while completing the survey.

Table 4
Use of technicians and incident-to issues

	<i>M</i>	<i>S.D.</i>
Do you		
Use technicians? (<i>N</i> = 159)		48.5%
Of those:		
Allow tech. to conduct assessments? (<i>N</i> = 141)		89.7%
Remain in same room? (<i>N</i> = 17)		10.7%
Bill same if tech. conducts assessment? (<i>N</i> = 122)		76.7%
For those not billing the same if the technician conducts the assessment, approximate billing rate for clinicians versus technicians? (<i>N</i> = 19)		
Clinicians	\$160.37	30.74
Technicians	\$81.84	39.59
Levels of technician used		
Master's level (MA, MS)		26.36
Undergraduate level (BA, BS)		19.38
Predoctoral interns		15.50
Postdoctoral		10.85
Student volunteer		4.65
Doctoral		3.88
Other		1.55

3.7. Managed care tolerance

Opinions of managed care are delineated in Table 6. Overall, 66% of respondents held an absolute negative opinion of managed care, with only a small percentage of responses indicating a positive opinion of managed care. The overwhelming majority of respondents

Table 5
Reimbursement percentage by CPT code

Source	<i>M</i> (%)	<i>S.D.</i>
Neurological		
Neurobehavioral Status Exam (96115)	74.08	26.05
Testing/Assessment (96117)	74.19	22.14
Intervention (97532)	60.28	31.04
Average (<i>N</i> = 181)	73.28	22.05
Non-Psychiatric/Non-Neurological		
Interview/Assessment (96150/51)	68.83	33.71
Intervention (96152/55)	60.00	35.05
Average (<i>N</i> = 39)	66.96	33.83
Psychiatric		
Interview (90801)	80.13	23.13
Testing (96100)	67.57	24.46
Intervention (90806)	76.27	23.78
Average (<i>N</i> = 148)	74.80	20.56

Table 6
Overall opinions of an

Opinions of managed care
Negative
Negative/neutral
Neutral
Neutral/positive
Positive
Have already dropped services
Have dropped all managed care
Would consider dropping managed care

reported that they had already dropped all managed care services and would consider dropping managed care.

3.8. Time-approval

Times required for services were provided in Table 7. Mean ratings, and also required for interviews were ranked by source and private practice approval rates, followed by

3.9. Reimbursement

The average amount of reimbursement provided by each source are provided in Table 5. Private practice had the highest reimbursement rates.

Table 7
Time required (in minutes)

Evaluation for forensic
Diagnostic interview
Evaluation for referral source
Private practice (no specific)
Treatment/therapy
Follow-up evaluation

Note. "Percentage approval rates." ^a Standard deviation.

Table 6
Overall opinions of and responses to managed care

	Percent
Opinions of managed care	
Negative	65.5
Negative/neutral	12.0
Neutral	20.5
Neutral/positive	1.2
Positive	0.8
Have already dropped some managed care panels	84.2
Have dropped all managed care panels	44.9
Would consider dropping all managed care panels	69.2

reported that they have dropped some managed care panels, 45% reported that they have dropped all managed care panels and opted for a fee-for-service practice, and 70% would consider dropping all panels for a fee-for-service practice.

3.8. Time-approval rates for clinical activities

Times required and the approved percentages of amounts billed for clinical activities are provided in Table 7. Forensic evaluations were reported as having the highest time-approval ratings, and also required the most time to complete. Approval percentages for diagnostic interviews were ranked next, but took the shortest amount of time. Evaluations for referral sources and private practices were nearly identical with respect to time required and time-approval rates, followed by treatment/therapy and follow-up evaluations.

3.9. Reimbursement rates from managed care funding sources

The average amount of claims (per year) and percentage of reimbursement for each funding source are provided in Table 8. Self-pay clients and those with traditional forms of insurance had the highest reimbursement rates/percentages (83% and 67%, respectively), followed

Table 7
Time required (in minutes) and time-approval ratings for clinical practice activities

	Time required	Percentage approved
Evaluation for forensic	595.79 (300.52)	95.61 (15.30)
Diagnostic interview	80.42 (37.08) ^a	82.77 (21.28)
Evaluation for referral source	463.35 (216.43)	79.47 (18.77)
Private practice (no specific referral)	491.28 (240.89)	78.36 (20.92)
Treatment/therapy	205.61 (430.15)	76.86 (23.84)
Follow-up evaluation	85.82 (124.64)	65.09 (32.15)

Note. "Percentage approved" refers to the percentage of the original amount billed that was approved for reimbursement.

^a Standard deviation.

Table 8

Average number of yearly claims and percentage of reimbursement by funding source, and reported hourly rates and reimbursement rates

Source	Number of claims	Reimbursement rate
Self-pay	27.88 (51.00)	82.84% (27.31)
Traditional Insurance	48.23 (87.62)	67.06% (25.77)
Managed care	65.47 (141.99)	56.05% (23.52)
Medicare	70.96 (116.14)	47.07% (25.21)
Medicaid	38.57 (67.09)	35.42% (31.49)
Inability to pay	12.87 (32.14)	6.66% (18.92)
	<i>M</i>	<i>S.D.</i>
Average hourly rate (<i>N</i> = 272)	\$170.81	48.42
Average hourly reimbursement rate (<i>N</i> = 172) (%)	62.31	17.50
Respondents receiving full compensation for their hourly rate (1%)		22.1

by managed care, Medicare, and Medicaid (56%, 47% and 35%, respectively). However, respondents reported the highest number of yearly claims going to managed care and Medicare funding sources, or those which reimbursed approximately 50%. It must be noted that 60% of participants completed the survey during the course of a NAN conference symposium on CPT codes and reimbursement. In many instances, respondents noted that they did not have the information available, and approximately 55% of respondents did not respond to specific questions regarding the number of claims to insurance providers and reimbursement rates.

3.10. Hourly reimbursement rates

Respondents reported that they receive an average hourly rate of \$170.81 (*N* = 272, *S.D.* = 48.42), their average hourly reimbursement rate for neuropsychological services was 62.31% (*N* = 172, *S.D.* = 17.50), and only 18% indicated they receive full compensation for their hourly rate for neuropsychological services (Table 8). Of note, this average hourly rate reported here is based on a much larger sub-sample, and differs somewhat from the average hourly reported by only a small sub-sample of respondents reporting reimbursement rates when using technicians above.

4. Discussion

Clinicians continue to offer neuropsychological services through assessment and evaluation activities such as conducting neuropsychological assessments and documentation through clinical reports. For the most part, they receive referrals from other healthcare professionals (i.e., neurologists, other medical specialists) to answer traditional referral questions related to patient diagnoses and determination of neuropsychological deficits. Approximately 49% of respondents are using technicians and bill for the same amount as if they conducted the

testing themselves. codes billed and r disapproved of ma panels. Clinicians of time approved still rely on manag Overall, clinicians

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testing themselves. CNS Assessment and Psychiatric CPT codes remain the most common CPT codes billed and receive relatively the same rate of reimbursement. Two-thirds of respondents disapproved of managed care and a large percentage have dropped some or all managed care panels. Clinicians spend more time in clinical activities for which there is a higher percentage of time approved such as forensic evaluations and evaluations for private practice. Clinicians still rely on managed care for their referrals even though they are only being reimbursed at 47%. Overall, clinicians are only receiving 60% of their hourly rate rather than full compensation.

The sensitivity towards managed care among clinicians and the reality of poor reimbursement rates make it difficult to find clinicians who feel positive, or even neutral, about managed care. As it stands, many clinicians dislike the inconveniences presented by managed care panels. For instance, the most frequent responses to the open-ended question about how managed care hindered their practice, clinicians responded that managed care panels deny services, reimburse poorly, do not accept neuropsychological testing/services, require massive amounts of paperwork, limit the time needed to perform services, and employ personnel who are uneducated about the field of neuropsychology. Conversely, the only responses rendered for an open-ended question about how managed care has *assisted* clinicians' practice were the amount of referrals they receive, and access to patients they receive from managed care panels. Future studies assessing clinicians' perceptions of managed care should seek a larger sample, and perhaps solicit clinicians who perceive managed care in a more neutral or positive manner first.

In spite of their negative opinion towards managed care, clinicians continue to attempt to minimize its detrimental effects on their practice in a variety of ways. First, clinicians continue to be aware of ongoing effects and changes in managed-care-based funding, as evidenced by attendance at annual conference workshops related to reimbursement for clinical services. Second, clinicians have adapted to these ongoing effects and changes by dropping some managed care panels or opting for fee-for-service. Finally, clinicians also balance their clinical practice with some forensic work, requiring self-pay patients, and by using technicians in their practice.

This study was not without its limitations. A primary confounding variable is that many participants filled out their survey during the course of a NAN conference symposium on CPT codes and reimbursement. The nature of the questions regarding detailed billing and reimbursement patterns required respondents to estimate or recall information that was not readily available at the moment they completed the survey. In fact, in many instances, respondents noted that they did not have their information available because it was in their respective offices. As a result, many participants avoided responding to specific questions regarding the number of claims to insurance providers and reimbursement rates.

While the responses rate from clinicians attending the 2002 NAN conference was outstanding, as we were able to obtain about 40% of the sample distribution in the course of one evening, the response rate to e-mail requests were, by comparison, very poor (4%). As mentioned earlier, several participants had trouble accessing the website, were inaccessible via their e-mail, or were not qualified due to their occupation or membership status in NAN. These, along with members' lack of interest in the subject, may have been contributing factors to such a low response rate. Next, was the temporal proximity to a recent survey distributed by Sweet et al. (2002) to NAN members, which may have caused participants to

believe they had already completed the present survey. In fact, several NAN members who attended the conference stated that they had already completed the survey, erroneously believing that it was the survey previously distributed by Sweet and colleagues. A final factor to the participants' responses may be due to their employment in a hospital or rehabilitation center, which prevented access to managed care figures. Several participants responded that they did not handle the billing and managed care paperwork because of their employment setting.

This survey documents the economic challenges facing the clinical practice of neuropsychology and the perceived detrimental effects that managed care has on clinical practice. Despite their negative opinion towards managed care, clinical neuropsychologists continue to adapt to ongoing managed care-based funding issues in a variety of manners. In contrast, a small percentage of clinicians find managed care panels to be very helpful and straightforward.

Despite the overwhelmingly negative opinion of managed care held by the participants in this study, and majority of respondents reporting having dropped managed care panels, managed care remains the most common reimbursement source for clinical neuropsychologists (Sweet et al., 2002). While these data were not specifically tracked in all previous surveys of clinical neuropsychology, 58% of clinical neuropsychologists in our sample reported to be working in private practice settings, as compared to 18% in 1980 (Hartlage & Telzrow, 1980), 49% in 1985 (Guilmette et al., 1990), and 38% in 2002 (Sweet et al., 2002). While 21% of psychologists in APA Division 42 (Psychologists in Independent Practice) report having moved from solo practices to larger integrated networks (Murphy, Debernardo, & Shoemaker, 1998), it is not clear if this trend has carried over to the practice of clinical neuropsychology. While not all clinical practitioners in neuropsychology would agree, Sanchez and Turner (2003) appear to be somewhat accurate in stating that independent practitioners have successfully adapted to those demands posed by the current marketplace.

Future studies in survey research of the clinical practice of neuropsychology should examine a number of the following variables that may have an effect on the use of managed care: Geographical location of practitioners, forensic neuropsychologists' reimbursement trends, differences between private practice and institution practitioners (Sweet et al., 2002), differences in reimbursement among neuropsychological tests, and the use of computerized assessment measures as an alternative to paper and pencil methods for reimbursement. As managed care begins to take a smaller portion of the reimbursement picture, there is little question that practice parameters, ranging from CPT codes to the use of technicians, will continue to change. Empirical tracking of the evolution of practice parameters is a necessary prerequisite to practice and science of clinical neuropsychology.

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