

Primary Care Nurse Practitioner Management of Adolescent Behavioral Health

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Nearly a quarter of adolescents have a behavioral health diagnosis, yet few receive treatment.¹ Recent analysis of National Survey on Drug Use and Health data found a dramatic increase in behavioral health conditions among adolescents and young adults.² Twenge et al found that rates of major depressive episodes for those aged 12 to 17 years rose from 8.7% in 2005 to 13.2% in 2017 (a 52% increase), and increases were more pronounced among girls (from 13.1% to 19.9%).² Rates of serious psychological distress for those aged 18 to 25 years had also increased 71% from 2008 (7.7%) to 2017 (13.1%). Suicide rates among adolescents and young adults have also increased in the past decade.³ Theories suggested to explain the rising incidence of adolescent behavioral health conditions and suicide include increased detection due to increased societal awareness and some national and local efforts to better integrate mental health in pediatric well care,⁴⁻⁷ leading to improved screening in primary care and school settings, and increasing use of digital media and concomitant decreases in outdoor activity and sleep.^{2,8}

Despite the increasing prevalence of behavioral health disorders and suicide, access to behavioral health care remains problematic. Only about 25% to 50% of adolescents receive any treatment for behavioral health conditions.^{1,9} Reasons for low treatment rates include lack of behavioral health providers, long waiting times for access, providers who do not take insurance, and the burden and stigma of accessing mental health care.^{8,10} In part due to these barriers to accessing specialty behavioral health care, conditions such as depression and anxiety are frequently identified and managed in primary care.^{11,12} However, primary care providers (PCPs) lack the time and training to do this work.^{13,14}

The shift toward accountable care organizations (ACOs) is an impetus to change models of behavioral health care delivery. Kathol et al suggest that “behavioral health specialists will need to become core ACO member providers. This will allow them to be deployed along with other member providers using value-added delivery approaches in the medical setting to integrate medical and behavioral health service delivery and to achieve synergistic health and cost improvement.”¹⁵ The integration and colocation of medical

ABSTRACT

OBJECTIVES: To determine the personnel costs and revenue generated by embedding a behavioral health nurse practitioner (BHNP) in primary care clinics to evaluate and manage adolescent behavioral health needs.

STUDY DESIGN: We estimated personnel costs and revenue from a quality improvement project undertaken at 4 clinic sites between August 1, 2016, and July 31, 2018, at a large multispecialty medical group in northern California.

METHODS: Costs were estimated by identifying the actual hours spent by the BHNP and for medical assistant (MA) support and using Bureau of Labor Statistics national data on wages and benefits. Revenue was estimated by analyzing Current Procedural Terminology (CPT) codes for BHNP visits from the Epic electronic health record and corresponding relative value units (RVUs), based on 135% of 2018 nationally unadjusted Medicare rates.

RESULTS: We estimate 2-year revenue of \$144,449 and personnel costs (salary + benefits) of \$90,431. The BHNP work totaled 1083 hours, and MA support totaled 312 hours. Using a nurse practitioner wage of \$53.70/hour and an MA wage of \$16.95/hour, total salary costs were \$63,451; we then added benefits costs. Using the CPT codes assigned to the 768 encounters with 207 unique patients, we estimated generation of 1640 RVUs and total revenue of \$144,449.

CONCLUSIONS: This analysis found that personnel costs (\$90,514) of a primary care–embedded BHNP are 63% of the potential revenue generated (\$144,449). This analysis suggests that a primary care BHNP could be a cost-saving and patient-centered way to reduce the burden on primary care providers while meeting the growing needs of adolescents with behavioral health needs.

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TAKEAWAY POINTS

Adolescent behavioral health care is primarily managed in primary care, despite the lack of time and training for primary care providers (PCPs). Embedding a behavioral health nurse practitioner to evaluate and manage adolescent behavioral health in primary care may be effective, but costs and revenue are unknown. We analyzed potential costs, based on personnel time and Bureau of Labor Statistics national data, and revenue, based on Current Procedural Terminology codes and using 135% of Medicare rates. Personnel costs (\$90,514) of a primary care-embedded adolescent behavioral health nurse practitioner over 2 years were 63% of the potential revenue generated (\$144,449).

- ▶ The benefits of collaborative care for behavioral health have been tested in research trials, but costs and revenue potential in real-world implementation are unknown.
- ▶ Embedding a behavioral health nurse practitioner in primary care to evaluate and manage adolescent behavioral health covers its own costs, generates revenue, and decreases the burden on PCPs.
- ▶ Given difficulties accessing timely specialty behavioral health care, this approach could increase adolescent treatment initiation and improve outcomes.

and behavioral health providers has many advantages. Research trials have shown that embedding behavioral health care within primary care improves treatment initiation and patient outcomes for children with attention-deficit/hyperactivity disorder (ADHD) and adults with depression.^{16,17} In real-world practice, embedding a nurse practitioner (NP) trained in behavioral health in primary care may improve access to care and mitigate the burden on PCPs. However, the question of cost is a key concern to health systems, and it is currently unknown whether the revenue generated would cover the personnel costs for an NP and medical assistant (MA) support.

METHODS

We analyzed a quality improvement project undertaken between August 1, 2016, and July 31, 2018, in a large multispecialty medical group in northern California. The quality improvement project and its evaluation were funded by a grant including private donors and in-kind support from the organization. The health system hired a trained behavioral health NP (BHNP) to help develop and lead an integrated behavioral health program for adolescents in primary care. The majority of the BHNP's time was spent on training and supervising mental health navigators¹⁸; training pediatricians and family medicine clinicians to screen, identify, and begin to offer treatment for behavioral health conditions in adolescents; and supporting efforts to evaluate the quality improvement project, whereas the direct patient care described here represented approximately one-fourth of her time.

The BHNP was introduced into 4 primary care clinics to provide behavioral health evaluation and management services and worked at 2 sites at a time for approximately 18 months each. In 2017, at these 4 pediatric clinics, the number of PCPs at each site ranged from 12 to 18, and the mean primary care panel of patients aged 12 to 18 years per PCP was 289. Although the BHNP began direct patient care in September 2015, the organization required a period of coding review, reassessment, and evaluation as part of its launch of this new role. Coding was finalized after multiple rounds of feedback

by August 1, 2016. Given this slow start, our analysis categorizes September 3, 2015, to July 31, 2016, as a “ramp-up” period and focuses analysis on the 2-year time period of August 1, 2016, to July 31, 2018.

The BHNP was a Primary Care Pediatric NP with a Primary Care Mental Health Specialty certification. The BHNP provided the following services: evaluation, treatment planning, medication management, and a cognitive behavioral skills-building intervention. Patients were referred directly from PCPs in the clinics where the BHNP was embedded. The majority of patients referred were referred for depression, stress, anxiety, academic issues, psychiatric and medical comorbidities, and ADHD. The

most common requested service was the cognitive behavioral skills-building intervention,¹⁹ due to PCP desire for specialty behavioral health management.

Estimating Costs

The BHNP position was grant-funded as part of the larger integrated behavioral health quality improvement project. This funding allowed patients to receive BHNP services without being billed directly. However, the BHNP completed standard medical documentation and assigned appropriate Current Procedural Terminology (CPT) codes to all visits to allow for tracking of services within the electronic health record (EHR). To estimate marginal costs for this role, we first estimated hours worked by retrieving Epic EHR data, including duration of BHNP office visits, and asked the BHNP for an estimate of time spent outside of face-to-face visits.

The BHNP estimated spending 1 hour on care coordination/documentation for each hour of direct patient care. Although no published studies have reported estimates of time spent by an NP in integrated behavioral health, the BHNP's estimate aligns with benchmarks provided for primary care physician time allocation, indicating that PCPs spend as many hours on care coordination and documentation as they do in face-to-face encounters,¹⁴ as do other physicians.²⁰ Another analysis of integrating psychologists into primary care found that they spent 35.28% of their overall time on direct patient care.²¹ This estimate of non-face-to-face time is applicable to the BHNP, whose patient care-related tasks performed outside of visits included documentation, records review, parental psychoeducation, initiating and pursuing referrals to community services, collaborating with care team members, and 1 hour weekly of clinical supervision by a child psychiatrist. The MA assigned to the BHNP was also asked to provide an estimate of how much time she spent per week assisting with scheduling and other administrative work for BHNP appointments and related patient care activities.

Using these estimates of BHNP and MA total hours worked, we then calculated total estimated personnel costs using Bureau of Labor Statistics (BLS) national data to find hourly mean wage

information at outpatient care centers for an NP (\$53.70/hour) and for an MA (\$16.95/hour). BLS data also indicate that for private industry, 70.1% of total personnel costs were wages and 29.9% were benefits (ie, total compensation is 142.65% of salary costs).²²

Estimating Revenue

Revenue was estimated by analyzing CPT codes for BHNP visits from the Epic EHR and corresponding relative value units (RVUs). To approximate commercial insurance rates, we leveraged an analysis comparing Medicare with commercial insurance payment rates using 2014 data, which found primary care checkups to be reimbursed at 117.5% and other primary care visits to be reimbursed at 135% of Medicare rates.²³ We chose to use a rate of 135% of 2018 nationally unadjusted Medicare rates as a multiplier, given that services provided by the BHNP were not checkups. All the patients seen by the BHNP had commercial insurance, because publicly insured patients received direct referrals to county-based behavioral health services. Due to grant funding, neither insurers nor patients were billed for BHNP visits, so the organization received no actual revenue for these services. We estimated revenue using Medicare total nonfacility prices multiplied by 1.35 for each CPT code.

To establish whether inclusion of the ramp-up period, September 3, 2015, to July 31, 2016, would change our overall results, we conducted a sensitivity analysis to compare results from the selected time period with the entire implementation period.

This research was approved by our organization's institutional review board.

RESULTS

Our estimates show that embedding the BHNP resulted in a 2-year revenue of \$144,449 and personnel costs (salary + benefits) of \$90,514 (Table 1^{22,24}). During the 2-year time period, patients had a mean (SD) of 6.5 (3.4) visits with the BHNP, and the mean (SD) visit length was 42.3 (17.4) minutes across all visit types. The BHNP had 541.5 hours of face-to-face patient care; another 541.5 hours were added for documentation and care coordination, for total BHNP hours of 541.5 × 2 = 1083 hours (\$58,155 for 1083 hours). We estimated MA time of 312.4 hours (3 hours/week for 2 years) (\$5296 for 312.4 hours). Total salary costs were \$63,451, and after adding the cost of benefits, total personnel costs were \$90,514.

The BHNP had 768 encounters with a total of 207 unique patients during the 2-year period. Using the CPT codes assigned to each encounter, we estimated generation of 1640 RVUs. We estimated a total revenue of \$144,449 (Table 2). Given BHNP work time of 1083 hours, this equates to \$133.37/hour or \$88.08/RVU. The most common

TABLE 1. Estimated Personnel Costs for Nurse Practitioner and Medical Assistant Support^{22,24}

	Behavioral health nurse practitioner	Medical assistant
Number of patient encounters	768	–
Number of scheduled hours in Epic	541.5	–
Number of care coordination/documentation hours	541.5	–
Estimated total hours spent over 2-year period	1083.0	312.4
Total FTE per year (based on 2080-hour work year)	0.260	0.075
Wages ^a (estimated hours worked × BLS hourly wage)	\$58,155	\$5295
Benefits ^c (29.9% of total employer costs per BLS data)	\$24,805	\$2259
Total 2-year personnel costs (wages + benefits)	\$82,960	\$7554
Total personnel costs	\$90,514	

BLS, Bureau of Labor Statistics; FTE, full-time equivalents.

^aNumber and duration of encounters are based on Epic electronic health record data for the 2-year time period from August 1, 2016, to July 31, 2018. Number of care coordination/documentation hours are inferred based on recent research.²⁴

^bNational average professional specific hourly wage information was retrieved from the BLS: hourly mean wage at outpatient care centers for a nurse practitioner, \$53.70/hour; for a medical assistant, \$16.95/hour.

^cBenefits were calculated using BLS March 2019 estimates for private industry personnel costs (70.1% wages, 29.9% benefits²²). In other words, total compensation is 142.65% of salary.

CPT codes used were 99214 (established patient evaluation and management, level 4; n = 560), 99203 (new patient evaluation and management, level 3; n = 168), and 90792 (new patient psychiatric diagnostic evaluation; n = 159).

We excluded a ramp-up and training period to better estimate total running costs and revenue. Our sensitivity analysis shows that analyzing the entire implementation period of September 3, 2015, through July 31, 2018, did not dramatically change our overall findings; it found an estimated revenue of \$174,118 and estimated personnel costs of \$119,450 (69% of revenue compared with 63% in our primary analysis) (eAppendix [available at [ajmc.com](#)]).

DISCUSSION

This analysis estimated that the personnel costs of a primary care-embedded BHNP are \$90,514 (63%) of the estimated revenue generated of \$144,449. We may have underestimated or overestimated revenue potential, given the substantial variation in commercial insurance payments. For example, Riley et al found that for 2012 primary care office visits using CPT code 99213, private insurance payments ranged from \$76 to \$199.²⁵ Our estimates come from 1 health system; however, using national salary and revenue estimates increases generalizability. Health care organizations may generate their own estimates based on their payment rates and local salary information. Working 26% of the time on direct care for adolescent patients with behavioral health needs and with 7.5% of MA time as support, the BHNP was able to meet the needs of 2 clinics at a time, with clinics having from 12 to 18 PCPs per site and a mean panel of 289 adolescent patients per PCP.

There are multiple barriers to successfully embedding a BHNP in primary care clinics. Administrative reluctance to hire a BHNP without evidence of financial benefit is a challenge. This analysis and others like it²¹ should help demonstrate that financial benefit.

TRENDS FROM THE FIELD

TABLE 2. CPT Codes and Estimated Revenue for the Time Period of August 1, 2016, to July 31, 2018*

CPT code	Code description	Number of CPT codes	% of all CPT codes	Estimated revenue, \$ (total nonfacility price × 1.35)	% of all estimated revenue
BH services					
99214	Office/outpatient visit, established patient, level 4	560	59.6%	\$82,737	57.3%
99203	Office/outpatient visit, new patient, level 3	168	17.9%	\$24,903	17.2%
90792	Psychiatric diagnostic evaluation with medical services	159	16.9%	\$32,764	22.7%
99484	Care management services for behavioral health conditions	29	3.1%	\$1903	1.3%
90791	Psychiatric diagnostic evaluations without medical services	5	0.5%	\$921	0.6%
99202	Office/outpatient visit, new patient, level 2	3	0.3%	\$309	0.2%
90785	Psychiatric services — interactive complexity	1	0.1%	\$20	0.0%
99201	Office/outpatient visit, new patient, level 1	1	0.1%	\$61	0.0%
99204	Office/outpatient visit, new patient, level 4	0	0.0%	\$0	0.0%
99205	Office/outpatient visit, new patient, level 5	1	0.1%	\$284	0.2%
99212	Office/outpatient visit, established patient, level 2	0	0.0%	\$0	0.0%
99213	Office/outpatient visit, established patient, level 3	1	0.1%	\$100	0.1%
Add-on services during BH visit					
Assorted codes ^b	Immunizations (n=9) and pregnancy tests (n=1)	10	1.1%	\$113	0.1%
Total		940	100%	\$144,449	100%

BH, behavioral health; CPT, Current Procedural Terminology.

*Based on 135% 2018 nationally unadjusted Medicare rates for total nonfacility price from CMS.gov and CPT code from electronic charges data. Data represent 768 encounters with a total of 207 unique patients from August 1, 2016, to July 31, 2018. The BH nurse practitioner changed which new patient CPT codes were documented midway through the work from 99203 to 90792, following organizational advice.

^bAdd-on services during BH visits included vaccines and pregnancy tests (CPT codes 90471, 90651, 90460, 90620, 90686, 90734, and 81025). Six of these add-on services had no associated Medicare rate, so no costs were estimated for them.

Office and exam room space for the BHNP could be a barrier. Creative utilization of facilities during off-peak times could address this concern while also making behavioral health services more accessible to working families. Another concern is that a single clinic could not support a full-time BHNP for this work. However, a BHNP may split time between multiple clinics, including pediatric and adult practice, and could also adopt other work beneficial to the clinic (including training of PCPs around adopting or standardizing screening for common psychiatric conditions). The supply of trained BHNPs in the workforce may be an issue. Health systems may want to partner with local advanced practice nursing schools as training sites for clinical practice, which may also facilitate their entry to practice in these health systems upon graduation.

CONCLUSIONS

Given the increasing burden on PCPs to manage behavioral health care and increasing burnout among pediatricians and family medicine physicians,²⁶ meeting adolescent behavioral health needs within primary care practice poses many challenges. However, introducing an embedded BHNP to evaluate and manage adolescents within primary care clinics may be advantageous to adolescent patients and their families and may reduce the burden on PCPs. Future research could measure the impact of an embedded BHNP on patients, families, and PCPs. This analysis suggests that a primary care BHNP could be a cost-saving and patient-centered way to

reduce the burden on PCPs while meeting the growing needs of adolescents with behavioral health needs. ■

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eAppendix Table 1. Comparison of estimated reimbursement over three time periods – sensitivity analysis

CPT® code	Code description	Restricted time period: 8/1/2016 - 7/31/2018		Ramp-up period: 9/3/2015-7/31/2016		Entire time period: 9/3/2015 - 7/31/2018	
		Number of CPT® codes	Estimated Revenue \$ (Total non- facility price*1.35)	Number of CPT® codes	Estimated Revenue \$ (Total non- facility price*1.35)	Number of CPT® codes	Estimated Revenue \$ (Total non- facility price*1.35)
<i>Behavioral health (BH) services</i>							
99214	Office/outpatient visit established, level 4	560	\$82,737	43	\$6,353	603	\$89,090
99203	Office/outpatient visit new, level 3	168	\$24,903	39	\$5,781	207	\$30,684
90792	Psychiatric diagnostic evaluation with medical services	159	\$32,764	10	\$2,061	169	\$34,825
99484	Care management services for behavioral health conditions	29	\$1,903	0	\$0	29	\$1,903
90791	Psychiatric diagnostic evaluations without medical services	5	\$921	0	\$0	5	\$921
99202	Office/outpatient visit new patient, level 2	3	\$309	5	\$515	8	\$824
90785	Psychiatric services - interactive complexity	1	\$20	0	\$0	1	\$20
99201	Office/outpatient visit new patient, level 1	1	\$61	0	\$0	1	\$61
99204	Office/outpatient visit new patient, level 4	0	\$0	12	\$2,712	12	\$2,712
99205	Office/outpatient visit new patient, level 5	1	\$284	1	\$284	2	\$569
99212	Office/outpatient visit established patient, level 2	0	\$0	2	\$121	2	\$121
99213	Office/outpatient visit established patient, level 3	1	\$100	118	\$11,814	119	\$11,914
99215	Office/outpatient visit established patient, level 5	1	\$199	0	\$0	1	\$199
99355	Prolonged evaluation & management or psychotherapy services	1	\$136	0	\$0	1	\$136
<i>Add-on services during BH visit</i>							
Assorted codes ^a	Immunizations, pregnancy tests, etc.	10	\$113	2	\$28	12	\$141
Total			\$144,449		\$29,668		\$174,118

Note: Based on 135% 2018 nationally unadjusted Medicare rates for total non-facility price from CMS.gov and CPT® code from EHR Charges data. Data represents 768 encounters with a total of 207 unique patients 8/1/2016 - 7/31/2018. The BHNP changed which new patient CPT® codes were documented midway through the work from 99203 to 90792, following organizational advice.

^aAdd-on services during BH visits included vaccines and pregnancy tests, CPT® codes: 90471, 90651, 90460, 90620, 90686, 90734, 81025. Six of these add-on services had no associated Medicare rate so no costs were estimated for them.

eAppendix Table 2. Comparison of encounters, estimated personnel costs, and estimated personnel costs compared to estimated revenue over three time periods – sensitivity analysis

	Restricted time period: 8/1/2016 - 7/31/2018	Ramp-up period: 9/3/2015-7/31/2016	Entire time period: 9/3/2015 - 7/31/2018
	Number	Number	Number
Unique patients with BHNP encounters	207	81	271
BHNP total encounters	768	231	999
Face-to-face time with BHNP	541.5	166.3	707.8
BHNP non face-to-face time	541.5	166.3	707.8
MA estimated hours (3 hrs/week)	312.9	142.3	455.1
Weeks in time period	104	47	152
MA total hours	312	142	455
MA wage/hr	17	17	17
MA total salary	\$5,295.7	\$2,411.7	\$7,714.7
BHNP total hours	1083.0	332.7	1415.6
BHNP wage/hr	\$53.70	\$53.70	\$53.70
BHNP salary	\$58,155	\$17,864	\$76,020
Total salary (MA + BHNP)	\$63,451	\$20,276	\$83,735
Benefits (29.9% of personnel costs)	\$27,064	\$8,648	\$35,716
Total salary + benefits	\$90,514	\$28,924	\$119,450
Estimated reimbursement (see Table 1)	\$144,449	\$29,668	\$174,118
Estimated personnel cost/reimbursement	63%	97%	69%