Newborn Care by Pediatric Hospitalists in a Community Hospital

Effect on Physician Productivity and Financial Performance

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Objective: To describe financial outcomes and physician productivity associated with the inclusion of well-newborn services in a pediatric hospitalist program in a community hospital.

Design: Retrospective review of professional billing records and physician activity logs for newborn and inpatient care, consultations, and procedures.

Setting: Pediatric hospitalist program in a community hospital during a 24-month period from August 1, 2002, through July 31, 2004.

Main Exposures: Newborn care.

Main Outcome Measures: Financial productivity.

Results: Pediatric hospitalists provided daily rounds and on-call services for inpatients and newborns with an average daily census of 3.1 inpatients and 7.9 newborns. Annual work relative value units production was 1508, and gross charges were $162,920 per staffed full-time equivalent. With mean work relative value unit production of 13.8 relative value units per day and average payment rates of $45 per total relative value unit, professional fees from inpatient and newborn care ($873 per day) did not cover salary, benefit, and practice expenses ($1460 per day), necessitating hospital support to cover annual program deficits of $206,744. Without the professional fees derived from newborn care, annual program deficits would have been $345,100, or $95,861 per staffed full-time equivalent.

Conclusions: Community hospital pediatric hospitalist programs with dedicated 24-hour staffing and a low inpatient census can be expected to operate at a substantial financial deficit if hospitalist care is limited to inpatient care and procedures. Financial performance of these programs may be improved by expanding the role of the pediatric hospitalist to include newborn care.

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Traditionally, pediatric hospitalist programs in children’s hospitals or academic medical centers have focused on providing care to hospitalized children, with well-newborn care provided by community pediatricians in community hospitals. However, with increasing outpatient productivity demands, more pediatricians are reporting that care of inpatients takes too much time away from office practice or is an inefficient use of time. In the area of newborn care, because of requirements for medical staff to treat unassigned newborns and low reimbursement associated with healthy newborn care, many community pediatricians are increasingly turning to hospitalists to provide care for well newborns in community hospitals. Another important factor promoting the increase in hospitalist care for healthy newborns is nursery capacity. Both adult and pediatric hospitalist care systems decrease length of stay for inpatients, and for some community hospitals with high-volume nurseries, timely admission and early discharge is a high priority both for census management and for patient satisfaction.

Although hospitalists programs improve operational efficiency and financial performance for payers and the health care system, these savings may not be reflected in the financial performance of the hospitalist program. With fixed staffing costs, requirement for 24-hour care, poor reimbursement for time spent in the management of inpatients, and an unfavorable payer mix, many pediatric hospitalist programs operate at a substantial financial deficit. In contrast to adult community hospitalist programs, pediatric programs in community hospitals may operate with a low inpatient census with substantial seasonal fluctuations. While the
The performance of these programs may be enhanced through a variety of mechanisms,\textsuperscript{10} one approach to improve financial performance of community pediatric hospitalist programs has been to increase patient revenues by expanding the scope of hospitalist services to include newborn care.

Despite the meaningful growth in pediatric hospitalist programs in the last several years, there is a scarcity of data on hospitalist physician productivity and, specifically, the effect of newborn care on overall program financial performance. We studied the effect of a newborn service on hospitalist-physician productivity as measured by the Resource-Based Relative Value Scale.\textsuperscript{11} Patient encounters, and average daily census (ADC). We also describe our experience with the economic implications of including newborns in a community hospitalist practice.

**METHODS**

**STUDY DESIGN**

We performed a retrospective review of billing records and physician activity logs for a pediatric community hospitalist program during a 24-month period from August 1, 2002, through July 31, 2004.

**INPATIENT PRACTICE CHARACTERISTICS**

The hospitalist program is located in a suburban 244-bed community hospital with 4000 newborn deliveries per year, located 15 miles (to convert to kilometers, multiply by 1.6) from Seattle, Washington, and serving a population of 400 000. The hospital includes a 13-bed pediatric unit, a 21-bed neonatal intensive care unit, and 50 shared mother-newborn rooms. The pediatric hospitalist service provides 24-hour inpatient pediatric care, newborn nursery care, and pediatric consultation.

All unassigned newborns (approximately 50% of all newborns) are assigned to the pediatric hospitalist service. In addition, hospitalists provide outpatient phototherapy services. Pediatric hospitalists do not provide neonatal intensive care and are not expected to attend deliveries. Emergency medicine physicians not board certified in pediatrics provide all initial emergency department care, with hospitalists providing consultations on request. The hospitalists see all patients referred for consultations and those who are admitted, within 1 hour under a service agreement with the hospital, and, depending on the census and season, may take in-house calls, although this is not required.

During the study, the hospitalist program was staffed by five pediatric hospitalists providing 3.4 full-time equivalent (FTE) positions per year, with 1 FTE defined as 114 twenty-four-hour shifts per year. All hospitalists were board-certified pediatricians and at least 2 years postresidency. Hospitalists were not based in-house during evening hours; however, a response time of 1 hour was expected for all pediatric consultations and admissions. The providers were employed by Children’s Hospital and Regional Medical Center in Seattle under a contractual agreement with the community hospital.

**CALCULATION OF TOTAL RELATIVE VALUE UNITS AND CONVERSION FACTOR**

Using the Resource-Based Relative Value Scale,\textsuperscript{11} work relative value units (wRVUs) and total RVUs (tRVUs) were determined for each of the initial and subsequent hospital care, newborn care, and procedure and consultation Current Procedural Terminology (CPT) codes used by the providers. The tRVU value is derived by combining an assignment of a standard Centers for Medicare and Medicaid Services–determined numeric value for physician work, practice expenses, and malpractice expenses for each CPT code. The tRVU values were adjusted for geographic practice cost index using standard Centers for Medicare and Medicaid Services methods. The payment rate per TRVU, or conversion factor, was calculated by dividing the total cash collections by tRVUs.

**FINANCIAL PERFORMANCE AND PHYSICIAN PRODUCTIVITY**

Program financial performance and physician productivity were calculated for the 24-month period from August 1, 2002, through July 31, 2004. The tRVU and wRVU production, CPT codes, gross fees, and cash collections were determined by date of service from physician practice plan billing records. Average daily census and length of stay were calculated from daily provider activity logs and billing records that are updated by the provider daily and submitted weekly to the billing agency. These records are accurate measures of the daily census because they are also used for physician-to-physician sign-out and for billing submission. Expenses including physician salaries, benefits (malpractice insurance, health, and life insurance, and retirement benefits), billing fees, and administrative costs excluding office expenses were obtained from Children’s Hospital and Regional Medical Center annual budget and cost reports.

**CLINIC VISITS**

Pediatric hospitalists providing inpatient and newborn care reported 8294 CPT codes from August 1, 2002, through July 31, 2004. Of all reported codes, 5836 (70%) were for newborn care, 2124 (26%) were for inpatient care, and 334 (4%) were for consultations, procedures, and phototherapy supervision (Table 1). Providers billed 5585 well-newborn codes (CPT 99431–99435), 625 initial visit codes (CPT 99221–99223), 916 subsequent visit codes (CPT 99222–99223), 486 consult codes (CPT 99220–99221), 1407 inpatient visits (CPT 99224–99228), 125 phototherapy codes (CPT 99231–99239), 14 observation codes (CPT 99240–99243), 1666 follow-up codes (CPT 99251–99253, 99255–99256), and 99544–99545. Of the total charge of $10 279 879, $8 070 442 (79%) was for fee-for-service, $1 936 087 (19%) was for capitated, and $833 350 (8%) was for a combination of both fee-for-service and capitated.
codes (CPT 99231-99233), and 677 discharge day management codes (CPT 99238-99239). The most frequently reported CPT codes were for newborn care. Newborn initial and follow-up hospital care codes represented 37% and 30% of all CPT codes, respectively. The most frequently reported CPT codes for inpatient care were for initial and subsequent hospital care, accounting for 18.6% of all CPT codes.

During the study, the ADC for the combined newborn and inpatient service was 11 patients per day per provider. The inpatient service had a mean (SD) ADC of 3.1 (1.84) patients (median, 3 patients; range, 0-9 patients) and a mean (SD) length of stay of 3.1 (2.4) days (median, 3 days; range, 1-22 days). The newborn service had a mean (SD) ADC of 7.9 (3.2) patients (median, 8 patients; range, 1-17 patients) and a mean (SD) length of stay of 1.9 (0.8) days (median, 2 days; range, 1-5 days).

### PHYSICIAN PRODUCTIVITY, REVENUES, AND EXPENSES

Using Resource-Based Relative Value Scale metrics, the total productivity for physicians during the 2-year study was 10,254 wRVUs (Table 2). On a daily basis, the providers generated, on average, 13.8 wRVUs. Average RVU production per patient was 1.0 newborns and 2.6 for hospitalized inpatients.

The profit-loss statement for the hospitalist program is given in Table 3. Total gross professional charges for the hospitalists during the study period were $1,050,534, or $1439 per day. Average daily gross billings were $1518, and the overall collection rate on professional charges was 58%. The CPT codes for newborn care accounted for 40% of gross charges and 43% of cash collections. Cash collection rates varied by CPT code type, including 43% for procedures, 63% for newborn care, and 50% for hospital inpatient care services. The overall collection rate reflects the payer mix and deductions from revenue, including contractual allowances on government contracts, negotiated discounts from payers, bad debts, and free or partial-pay care. The payer mix included 25% Medicaid, 32% commercial, 40% health maintenance organizations, and 3% other payers.

Average physician salary was $119,205 for a 1.0 FTE. Benefits, including malpractice insurance, were approximately 23% of physician salary. The continuing medical education allocation was $1500 per year, and billing expenses totaled approximately 10% of collections.

Total salary, benefit, and billing expenses for the hospitalists were $1,050,534, or $1439 per day.

### FINANCIAL PERFORMANCE OF HOSPITALIST PROGRAM

We compared the financial performance of the program with and without professional fees derived from newborn care (Table 3). With the combined service including inpatient hospital care, newborn care, procedures, consultations, and phototherapy, professional fees derived from the combined inpatient and newborn practice covered 61% of salary, benefits, and practice expenses. With daily average reimbursement of $873 per day and average total expenses of $1439 per day, expenses exceeded revenue by $566 per day, or $207,000 per year. With staffing of 3.4 FTEs per year, program deficits for combined services were $60,807 per staffed FTE per year. These deficits were offset by hospital professional service and coverage fees. Excluding professional fees derived from newborn care from the business model, program deficits would have been $345,100 per year, or $95,861 per FTE.

We used a cash flow model to calculate the ADC and wRVUs needed for the program to break even without hospital subsidy. Assuming an equivalent conversion factor, we determined that to generate the additional $207,000 needed to break even, provider productivity would have to increase by 3500 wRVUs per year or 9.5 wRVUs per day, a nearly 70% increase. This volume would require the hospitalists to care for approximately 18 patients per day or, assuming proportional growth of the inpatient and newborn services and similar collection rates, 13 newborns and 5 inpatients.

### COMMENT

This study demonstrates that in a community hospitalist program with low inpatient volume (ADC of 3.1 patients), the addition of neonatal services with, on average, 8 patients per day can substantially improve program financial performance. In the program described, which requires 3.4 FTEs of hospitalist staff to provide care 24 hours per day, 7 days per week, professional fees derived from inpatient care, newborn care, procedures, and consultations failed to cover expenses, with a resultant deficit of $207,000 per year, or $61,000 per FTE. Without the professional fees from neonatal services, the deficit...
would have increased to $96,000 per staffed FTE. Therefore, the inclusion of neonatal services dramatically improved the financial performance of our program, reducing the pro forma deficit by 36%, from $96,000 to $61,000 per staffed FTE.

Despite this program’s financial shortcomings, the level of support required is consistent with published national benchmarks. In a 2004 compensation and productivity survey by the Society for Hospital Medicine,12 which included data in its 2004 survey from a cohort of 206 pediatric hospitalists in children’s hospitals, academic centers, and group practices, 64% of 300 adult and pediatric hospitalist programs reported receiving support, with mean and median support levels among all programs being $74,462 and $60,000 per FTE, respectively.

The additional productivity derived from newborn care services was a key factor in limiting program losses. By including newborns, our physicians were able to generate 1,508 wRVUs, 1,300 encounters, and gross charges of $163,000 annually per FTE. Without newborn care, the pediatric hospitalists would have produced only 618 wRVUs per FTE. Although there are limited data describing pediatric hospitalist productivity, the Society for Hospital Medicine Survey10 reported annual mean and median charges per pediatric hospitalist physician of $203,554 and $236,507 per year, respectively. Among pediatricians working as hospitalists, the mean and median annual wRVU production was 2,225 and 1,990, respectively. The hospitalist wRVU productivity we report is somewhat lower than Society for Hospital Medicine benchmarks, a finding that likely reflects the lower than average inpatient volume at this community hospitalist program.

The addition of newborn care to the hospitalist service offered other financial advantages compared with pediatric inpatient care. For example, we found that the collection rate for newborn services surpassed that of the inpatient services, although this benefit was partially offset in that each newborn encounter generated fewer RVUs compared with inpatient care. In addition, we were able to increase revenue by expanding our newborn services to include home phototherapy services and hearing screening evaluations, and the newborn population cared for by hospitalists provided a foundation for future referrals and growth of the inpatient service. We found that many families, pleased with their birthing experience, recognized the community hospital as a center of pediatric care and often returned if inpatient services were required later in life.

Clinically, we found few problems incorporating the well newborns into the hospitalist service, and there were distinct advantages in caring for newborns. Inpatient care is generally more complex and time-consuming than newborn care. Providing care for inpatients requires more time for arranging studies, planning discharge, and communicating with the primary care physician. We found newborn care to be more efficient and predictable, making the higher volume relatively easier to manage. In addition, the newborn cohort did not add a substantial amount to the call burden because they rarely needed urgent attention; when they did, a 24-hour in-house neonatologist was available to provide level I to level III care.

Our study, while providing a detailed financial perspective on a pediatric hospitalist program with physicians meeting national productivity benchmarks, may not be representative of a wide range of hospitalist programs. Some community hospitals with hospitalist programs may not be able to expand their programs to include newborn services because community physicians may want to retain these patients. Other hospitalist services may be unable to incorporate newborns because these patients are already under the care of contracted neonatologists, sometimes supplemented by neonatal nurse practitioners. Although our program primarily used hospitalists for well-newborn coverage of unassigned newborns, there are other models under which hospitalists can be used for sick-newborn care. For example, hospitalists can be used to supplement neonatologists in providing 24-hour coverage of the neonatal intensive care unit or can attend deliveries. These services, while they generally have higher reimbursement rates than routine newborn care, often increase the call burden substantially.

While the addition of revenue through newborn services is an effective method to improve program performance, there are also other practice management tools and techniques that can be used to maximize the financial outcomes of hospitalist programs that do not require expanding services or increasing volume. Improving financial performance of pediatric hospitalist programs can be

### Table 3. Pediatric Hospitalist Program Revenue and Expenses: Profit-Loss Statement for August 1, 2002, Through July 31, 2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total, $</th>
<th>Per Year, $</th>
<th>Per FTE-Year, $</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross charges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient care</td>
<td>668,827</td>
<td>334,314</td>
<td>98,328</td>
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<tr>
<td>Newborn care</td>
<td>439,236</td>
<td>219,613</td>
<td>64,592</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,107,853</td>
<td>553,927</td>
<td>162,262</td>
</tr>
<tr>
<td>Contractual allowances**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient care</td>
<td>(308,292)</td>
<td>(154,146)</td>
<td>(45,837)</td>
</tr>
<tr>
<td>Newborn care</td>
<td>(162,514)</td>
<td>(81,257)</td>
<td>(23,899)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>(470,806)</td>
<td>(235,403)</td>
<td>(69,269)</td>
</tr>
<tr>
<td>Cash collections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient care</td>
<td>360,335</td>
<td>180,167</td>
<td>52,990</td>
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<tr>
<td>Newborn care</td>
<td>276,712</td>
<td>138,356</td>
<td>46,093</td>
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<tr>
<td><strong>Total</strong></td>
<td>637,047</td>
<td>318,523</td>
<td>93,083</td>
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<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Salaries and benefits, 6.6 FTEs</td>
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<td></td>
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</tr>
<tr>
<td>Physician salaries</td>
<td>810,593</td>
<td>405,297</td>
<td>119,205</td>
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<tr>
<td>Benefits, 23%</td>
<td>188,436</td>
<td>93,218</td>
<td>27,417</td>
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<tr>
<td>Practice expenses c</td>
<td>53,505</td>
<td>26,752</td>
<td>7868</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,050,534</td>
<td>525,267</td>
<td>154,490</td>
</tr>
<tr>
<td><strong>Net profit/loss</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Including newborn care</td>
<td>(413,487)</td>
<td>(206,744)</td>
<td>(60,807)</td>
</tr>
<tr>
<td>Excluding newborn care</td>
<td>(690,199)</td>
<td>(345,100)</td>
<td>(95,661)</td>
</tr>
</tbody>
</table>

Abbreviations: FTE, full-time equivalent; tRVU, total relative value unit.

a $/tRVU (conversion factor) = $45.

b Includes government contracts, negotiated discounts from payers, bad debts, and free or partial-pay care.

c Includes continuing medical education allowance, billing, and insurance.
accomplished by paying close attention to physician coding and billing, charge capture, management of the revenue cycle, and hospital physician expenses. Charge capture is probably the most important practice management tool for the hospitalist. We recommend that physicians be formally trained in the appropriate reporting and documentation for the commonly used inpatient CPT codes, including initial and subsequent hospital and observation care and discharge day management. In addition, physicians should be familiar with the use of add-ons, modifiers, and non–face-to-face codes that allow the provider to report and be paid for additional work beyond the typical time for an inpatient service. These include codes for team conferences, medical report preparation, care via telephone, and prolonged services.

Pediatric hospitalist programs generally require some level of subsidy from their sponsoring organizations and, thus, represent financial challenges for hospitals, physician groups, and health plans. However, the inclusion of neonatal care by hospitalists has the potential to dramatically improve the financial performance of pediatric community-based hospitalist programs by increasing physician productivity and revenue, thereby decreasing the need for hospital subsidy.

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Author Contributions: Dr Tieder had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Tieder, Migita, Cowan, and Melzer. Acquisition of data: Tieder and Migita. Analysis and interpretation of data: Tieder, Migita, Cowan, and Melzer. Drafting of the manuscript: Tieder and Migita. Critical revision of the manuscript for important intellectual content: Tieder, Migita, Cowan, and Melzer. Statistical analysis: Tieder. Obtained funding: Tieder. Administrative, technical, and material support: Tieder, Migita, and Melzer. Study supervision: Tieder, Migita, and Melzer.

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REFERENCES


“You don’t pay back your parents. You can’t. The debt you owe them gets collected by your children, who hand it down in turn. It’s a sort of entailment. Or if you don’t have children of the body, it’s left as a debt to your common humanity.” — Lois McMaster Bujold, A Civil Campaign, 1999.