**HFOV Charges and Reimbursement: Practices and Experience**

*Tom Bachman*

**Introduction**

Since its availability in the late 1960's, mechanical ventilation has led to dramatic improvements in treating infants with hyaline membrane disease (HMD). However, in today's economic environment, with each technological step taken, comes the justification of costs against the reimbursement attainable. High frequency oscillatory ventilation (HFOV) is one of those technologies whose charge and reimbursement components has not been systematically reviewed.

**Background**

We undertook a survey of centers using the 3100A HFOV to characterize their charge and reimbursement practices and experiences. Forty centers provided general data through a mailed questionnaire. More detailed interviews were subsequently conducted with twenty centers. In both surveys, the primary contact was a knowledgeable person in the Respiratory Care Department. In some cases, follow up discussions with people in finance, billing and accounting occurred. The practices varied widely between centers, but there was no obvious trend associated with geography or hospital ownership or payer mix (Medicaid, private insurance, etc.).

By way of background, prudent hospital management requires that all the activity and utilization of equipment and supplies has to be properly accounted for. In general, detailed coding of procedures, materials and labor is done in the NICU and Respiratory Care Department. Those items that have been designated to be chargeable by the hospital then make up the charges. A charge must, of course, cover the direct cost plus the overhead. The overhead includes direct patient care not charged for, as well as all administrative costs. Total charges for a patient or department reflect both of the resources utilized (labor and capital) and serve as a baseline for billing. While management will review this data to determine utilization and efficiency trends, the business office consolidates it into patient bills. The bills include daily room charges, and a long list of charges for procedures and disposables. The professional fees for physician services (neonatologist, radiologist, cardiologist, etc.) generally are billed separately. While these patient bills or accounting practices are standard, reimbursement on behalf of the patient varies, depending on regional government reimbursement approaches and third party insurance contracts with the hospital. This will be discussed later.

General care for a critically ill, unstable neonate is identified by CPT code 99295 for the day of admission and 99296 for subsequent days. When stable, the appropriate code is 99297. Mechanical ventilation can be part of the therapy of neonates classified by any of these three codes. The treatment codes for pressure and volume controlled ventilation are not differentiated by respiratory rate (i.e. high frequency ventilation versus conventional ventilation). Therefore, the CPT code for the first day of HFOV is 94656 and 94657 is used for subsequent days. There are separate codes for continuous positive pressure ventilation and negative pressure ventilation. CPT codes are also available for pulse oximetry, arterial blood gases, pulmonary function tests and many other tests and procedures. In contrast,
charges for disposable supplies, such as patient circuits, do not require CPT codes but should be billed and reimbursed for separately.

**Results**

It appears to be standard practice using CPT codes 94656 and 94657 to charge for HFOV. Only 10% of the centers surveyed did not and these centers included the cost of mechanical ventilation in the general treatment charges (CPT 99295, 99296, 99297). Most of the centers (75%) charge more for high frequency than for conventional ventilation. In addition, nearly half of the centers charged more for the first day of ventilation than for subsequent days. In one case, this first day charge was the only difference between HFOV and conventional ventilation charges. Those centers charging more for the first day, however, did not tend to charge less on subsequent days. The typical daily charge for HFOV was $564, a 20% premium over conventional ventilation.

Table 1 summarizes the charge for HFOV, incremental charge for HFOV and incremental first day charge. (Note: Some of the centers actually charged by the shift, rather than by the day, but all the reported charges have been converted to daily rates.)

Most centers (75%) also charge for patient circuits. However, only about a third charge more for HFOV circuits. Timing of circuit changes varied between 1 and 7 days being the most common. Recent clinical data suggests that all but the sickest neonates require less than 7 days of HFOV, thus charges for a circuit change are infrequent. Table 2 summarizes the charges for HFOV circuits as well as the incremental charge for HFOV circuits. With the benefits of HFOV reducing overall costs, it appears from the survey that many hospitals are undercharging for the circuit costs.

As indicated, the charging practices varied widely between centers. However, when looking at the range of $200-$1035 for ventilator charges or $22-$250 for ventilator circuits, it is important to remember that these are presented out of context of the total charges and reimbursement.

The method of charge development also varied. Some used the traditional comparison with competitive hospitals. However, many used rigorous cost accounting methods integrating labor and capital costs. One center used a variable system that changed the charges on a monthly basis, based on labor and equipment utilization (i.e., charges went down with increased utilization). Another did not include a capital allocation in charges associated with HFOV, because their three units had been donated through the proceeds of a telethon.

**Discussion**

Charging for neonatal services needs to be consistent within any institution. Charges should not be confused with reimbursement, as the method of determining reimbursement for different groups of patients varies dramatically. In the aggregate, the government, through state managed (federal and state funded) Medicaid programs, pays for the majority of NICU care. In our survey, the median was 60%, but the Medicaid share ranged between 24% - 95% in the different centers. Medicaid has traditionally paid on an audited cost basis. Unfortunately over the

<table>
<thead>
<tr>
<th>HFOV Charges</th>
<th>Median</th>
<th>Range</th>
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<tbody>
<tr>
<td>HFOV</td>
<td>$564/day</td>
<td>$200-$1035</td>
</tr>
<tr>
<td>∆ HFOV (&gt;CV)</td>
<td>$112/day</td>
<td>$60-$525</td>
</tr>
<tr>
<td>∆ 1st Day</td>
<td>$85</td>
<td>$30-$228</td>
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Table 1. Daily HFOV charges, differences between HFOV and conventional ventilation and differences on first day charges.

<table>
<thead>
<tr>
<th>HFOV Circuit Charges</th>
<th>Median</th>
<th>Range</th>
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<tbody>
<tr>
<td>HFOV</td>
<td>$89</td>
<td>$25-$250</td>
</tr>
<tr>
<td>∆ HFOV (&gt;CV)</td>
<td>$79</td>
<td>$22-$135</td>
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Table 2. HFOV circuit charges and difference between HFOV and conventional ventilation circuits.
years, as states faced mounting financial pressure, more overhead costs were "disallowed". This cost shifting has evolved until many receive reimbursement of less than one-third of their charges to Medicaid.

This financial crunch has not abated. Now many states are switching to competitively bid capitated Medicaid systems. Healthcare forecasters predict that by the year 2000, all urban Medicaid will be managed on a capitated basis. While this may seem draconian to some, it should stimulate an infusion of investment in equipment and care that is shown to improve outcomes and reduce total costs. Importantly, both initial hospitalization as well as long term costs will be equally important in a capitated system.

A recent multicenter randomized trial of early intervention with the 3100A demonstrated a $90,000 savings in costs for babies weighing less than 1 kilogram and $10,000 for larger premature babies. Furthermore, these are only hospital related costs; the study also showed a reduction in chronic lung disease which ought to result in significant savings in long term healthcare costs as well.

The balance of 40% of the patients not covered by Medicaid is covered by insurance, either indemnity, PPO or HMO. Only Kaiser and a few other large integrated delivery HMO’s "reimburse/fund" via capitation. Most insurance plans and HMO’s still reimburse NICU care based on a negotiated percent of charges (or per diem based on charges). However, with so many payers still reimbursing based on charges, there is an opportunity for income enhancement based on the charge optimization.

Table 3 shows the potential reimbursement enhancement that could be achieved by billing for the median incremental HFOV charges in a fortunate hospital with a mix of 80% insurance payers. The three columns represent a range of likely insurance discounts from standard charges.

<table>
<thead>
<tr>
<th>Percentage of Charges Realized</th>
<th>90%</th>
<th>80%</th>
<th>70%</th>
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<tbody>
<tr>
<td>HFOV</td>
<td>$14,717</td>
<td>$13,082</td>
<td>$11,446</td>
</tr>
<tr>
<td>Circuit</td>
<td>$1,596</td>
<td>$1,418</td>
<td>$1,241</td>
</tr>
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</table>

(Based on 50% HFOV utilization, 80% insurance, $112/day and $85/7 day incremental charges)

Table 3. Realized annual reimbursement enhancement from HFOV and circuit incremental charges at varying reimbursement levels.

Based on this typical approach, most of the revenue enhancement comes from HFOV charges.

In this case, the incremental cost of purchasing a HFOV above a conventional ventilator is paid back by insurance reimbursement alone in about one year. The pay back in our median hospital with 40% insurance coverage is about 2 years. This model is based on using the HFOV 50% of the time. Better utilization would also speed up pay back. While the circuit charges contribute insignificantly to total revenue, they can easily be adjusted to cover costs.

Conclusion

Clearly, the significant cost savings now shown to be associated with aggressive use of HFOV will accelerate its widespread utilization. In those centers already operating in a capitated environment, the treatment cost savings will easily justify increased investment. On the other hand, in those centers retaining a significant charge based reimbursement, the pay back period is quite reasonable.

The bottom line is that whether you are seizing declining opportunities for reimbursement enhancement or positioning yourself for capitated care, HFOV seems to fit.

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Tom Bachman is a principal of ECONOMEDTRX, a consultant firm specializing in development, analysis and communication of medical product economics. He has been involved in the respiratory care industry thirty years.

He has published several articles on high frequency ventilation and medical economics, including recent papers, "HFV: Applied Technology, Saving Both Lives and Costs" and "Emerging Financial and Legal Exposure of Off Label Use; Implications in Neonatal Practice". He also is President of the Board of Directors of Mountains Community Hospital, Lake Arrowhead, California.