

wall morphology and function at 7 days in some preterm infants is indicative of elevated pressures seen in PH (2, 14). Emerging, noninvasive indices of PVD (e.g., RV systolic time intervals [7], measures of RV function [e.g., strain parameters (14)]) that more broadly capture components of RV performances and afterload (pressure, resistance, and compliance) may prove to be more informative than pressure estimates alone.

Early evidence of PVD in preterm infants adds to the growing list of complications of being born premature that may increase susceptibility or be a marker for greater risk of late pulmonary disease beyond the neonatal period and into early childhood, adolescence, and adulthood (8, 15). Adding these results to their previous work, Mourani and colleagues have now shown that echocardiographic evidence of PVD at 1 week of age is an early predictor of BPD, late PH, and late respiratory disease (11). Newborns with PVD may be particularly susceptible to secondary insults; future studies should use these early risk factors as predictive biomarkers toward enrolling the highest-risk infants into clinical intervention trials (6). ■

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Ⓜ Healing Pulmonary Rehabilitation in the United States A Call to Action for ATS Members

There is a paradox in the field of pulmonary rehabilitation (PR). There is now vast literature showing evidence that PR is safe, effective, and cost-effective (1, 2). Furthermore, PR improves

exercise tolerance, reduces dyspnea, and enhances quality of life likely better than any other available therapy (3), and has been shown to shorten hospital admissions in chronic obstructive pulmonary disease (COPD) (4). Despite the documented benefits of PR, the increasing prevalence of COPD, and the availability of Medicare and other insurance coverage, there is mounting concern that poor PR reimbursement in the United States may accelerate the decline in PR availability, further jeopardizing the limited availability of a key intervention in chronic lung disease. A recent analysis demonstrated that

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only ~3% of Medicare beneficiaries with COPD receive PR (5). In the United States, it would seem as though PR itself requires rehabilitation. We believe that the core problem in PR in the United States has been insufficient funding. The full effect of low reimbursement is hard to know with precision, but it has the potential to influence availability of what has been repeatedly acknowledged as the standard of care in chronic lung disease. Fortunately, there is a mechanism that is available to ATS members to rectify the situation. What follows is a trip through the weeds of how Medicare determines reimbursement, and suggested actions for the ATS and its members.

We believe that ATS members need to consider the information provided here and lend their efforts as advocates, much as the NHLBI Action Plan for COPD prescribes. There are only 220 ATS members who list PR as their primary assembly, only 72 of which are based in the United States. However, there are potentially thousands of ATS members who prescribe PR and whose patients will benefit from increased funding and availability of PR, but only if we all pull together, as you are about to learn.

The causes of the decline and stagnation of PR reimbursement in the United States are complex. The decline is at least in part tied to a change in Medicare PR reimbursement in 2010, when a new bundled payment code (healthcare common procedure coding system [HCPCS]), G0424, for COPD was introduced. This was accomplished through many years of lobbying by professional organizations, including the American College of Chest Physicians, the American Association of Cardiovascular and Respiratory Care, the National Association for Medical Directors of Respiratory Care, and the American Association for Respiratory Care. The growing evidence of clinical effectiveness of PR was highlighted by favorable outcomes for the patient group receiving PR in NETT (National Emphysema Therapy Trial) (6). These and a plethora of other data provided the scientific foundation for adoption of the National Coverage Determination Policy by the Centers for Medicare & Medicaid Services (7).

The new code, G0424, applied nationally, pays for 1 hour of PR, including all costs of staff, medical director, gym, hospital overhead, and so on, and has a 72-visit lifetime cap. G0424 was implemented to cover patients with Global Initiative for Chronic Obstructive Lung Disease spirometry stages 2, 3, and 4 COPD. A separate set of codes may be used to cover patients with non-COPD lung disease. Other than cardiac rehabilitation, G0424 is the only therapy designation in which individuals can be treated in a group setting.

In 2010, Medicare initially arbitrarily established a payment rate of approximately \$50.46 for 1 unit (1 h) of G0424. Medicare acknowledged in 2011 that failure to carefully construct the charge for G0424 that reports a combination of services previously reported separately under-represents the cost of providing the service described by G0424 and can have significant adverse impact on future payments (8). In plain English, what this means is that if providers throughout the country do not establish a fair charge for G0424 that reflects the complexity and actual expense of all components of the service, Medicare reimbursement would continue to be low. An

important context for setting the charge for G0424 is that most hospital charges are roughly fivefold greater than what is actually paid by Medicare and other insurance, a practice that cannot be ignored when considering fair reimbursement for PR (9).

Historically, the majority of PR providers and hospitals have never adequately modified PR charges to reflect the increase in time and resources used for the bundled G0424 1-hour billing code from the original model of billing separately for both exercise and education in 15-minute increments. The effect on reimbursement is a result of Medicare's use of PR charges (as well as information from the hospital cost report) to calculate annual changes in PR reimbursement. A recent review of charges for PR for patients with COPD submitted to Medicare in 2016 from claims billed by 1,350 US hospitals indicates that low charges for the PR bundled code continue to persist. This practice has likely contributed to the reality that cardiac rehabilitation reimbursement for 1 hour of treatment is now more than double that of PR (\$116.65 vs. \$55.96). It also might be relevant to consider what Medicare reimburses for other procedures: \$229 for a pulmonary function test and \$409 for an echocardiogram (9), which is four to seven times more than the cost of an hour of PR.

What can be done? ATS members need to meet with their hospital administrators and educate them about the benefits of PR for their patients and their institutions. The charge master, a comprehensive listing of items billable to a patient's health insurance provider, needs to be updated to include all resources used in a PR program: space, oxygen, therapists, exercise machines, educational materials, medical director time, overhead charges, and so on. All items used in the PR program should be listed and an accurate total charge calculated. Hospital administrators can then set the appropriate charge rates for PR services. If this is done throughout the country, the national average charge for PR will increase and the Medicare payment for each unit of G0424 will increase. If we are successful, reimbursement for PR will increase over a 3–5-year period as annual data are accumulated by the Centers for Medicare & Medicaid Services.

Fortunately, for those of us who do not understand how to read a medical bill, let alone navigate a charge master, there is an app. We refer you to the Pulmonary Rehabilitation Toolkit that details resources for PR billing (<https://www.aacvpr.org/Advocacy/Pulmonary-Rehabilitation-Toolkit>) (10).

It is time for the pulmonary medicine and lung disease scientific community to bring our concerns to hospital administrators. These administrators need to be made aware of the concerns regarding G0424 billing and the effect of undervalued charges on Medicare payment. It is also time for practitioners and scientists to partner with PR clinicians and administrators to determine whether charges for their PR program reasonably represent the complexity of the intervention, the acuity of the target population, and the value of this evidence based intervention. ■

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