

CHARLES E. SCHUMER
NEW YORK

United States Senate

WASHINGTON, DC 20510

July 20, 1999

The President
The White House
Washington, DC 20500

Dear President Clinton:

I write to share my concerns about the devastating cuts the Balanced Budget Act of 1997 (BBA) is imposing on New York health care facilities and to ask for your help. New York facilities face a staggering \$545 million in reduced reimbursements over five years if the proposed outpatient prospective payment system (PPS) is fully instituted. While the BBA did address some problems with Medicare, many New York facilities will be forced to provide lower quality care if the full BBA cuts are implemented.

For example, the Medicare cuts threaten Rochester's Strong Memorial Hospital's ability to fund the Poison Control and Information Center. The center, which receives 30,000 calls each year, prevents numerous unnecessary emergency room visits and has saved thousands of lives. Because of BBA cuts, Long Island College Hospital in Brooklyn, which serves a diverse, low-income community, may be unable to meet its operating costs in the near future. I am convinced that, with your leadership, the Health Care Financing Administration (HCFA) can ameliorate some of the most damaging Medicare cuts facing New York's health care facilities.

In the ten years before the BBA was enacted, New York health care facilities engaged in a momentous effort to cut waste and fat. In 1997, the BBA required all U.S. health care facilities to cut out waste and unnecessary treatments in order to strengthen Medicare, but I have visited numerous hospitals across the State and I know there is no more fat to cut. If faced with additional cuts, the facilities will have to cut muscle and bone, that is, vital programs and staff. New York now needs the Administration's help in making administrative changes in four key areas.

Most importantly, I believe HCFA's proposal to adjust the amount Medicare beneficiaries pay for hospital outpatient services is, as 78 Senators recently wrote Administrator DeParle, "a misrepresentation of Congressional intent and threatens the integrity of a broadly supported compromise." HCFA's proposal, which would reduce hospital payments by 5.7 percent, alone will cost New York's hospitals about \$200 million over five years. I request HCFA address this administratively by implementing the adjustment as intended by Congress. Additionally, to help ensure good health care in New York, HCFA administratively should:

- Eliminate the volume and expenditure caps. Developed to cut out fraud and waste, they should not limit payments to efficient hospitals focusing on the special needs of their communities.

this is not a new issue -

there are losers & they would
sue; & this is why we CAN'T do it:
statute is silent.

operational problems that would
arise,

\$100s of millions

- SNFs that lose and in low wage
areas.

President Clinton
July 20, 1999
Page Two

HHS needs to get GC on phone to talk to us about this; there may be flexibility here & we should have a mtg.

Adjust the caps for inpatient psychiatric and rehabilitation reimbursements to reflect the high wage costs that hospitals face in expensive areas such as New York. This would save New York hospitals about \$65 million over five years.

Ease the transition to the nursing facility PPS for states participating in the "Nursing Home Case Mix and Quality Demonstration," by providing additional compensation to these facilities. This would provide New York skilled nursing facilities as much as \$40 million in relief through 2002.

I look forward to continue to work with you and your staff to improve Medicare and strengthen the nation's health care system. Your recently proposed Medicare proposal is a good start and I plan to work in the Congress to see that it is enacted. I do ask, however, that you work with me to ensure that New York health care systems are able to provide the excellent level of care for which they are known around the world.

Sincerely,

Charles Schumer

Charles E. Schumer
United States Senator

③ estimate of \$ part B add-on NY add on
no. statute is very specific in how demo facilities are to be reimbursed under PPS. needs legislation - & these facilities are already being reimbursed at higher rates b/c that was their inducement to participate in the first place.

However, BBA didn't provide for an add-on for the services they provide under part B (these rates only include Part A); we would need legislation but this actually has a policy rationale

is \$31M
retroactively
\$ 63M all
3 years
of demo

for
just
NY

National
score
slightly
higher

who gets screwed
less money
thank you
where
how much

345

5512

3

410 786 8060

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Arthur R. Traugott, M.D.
Cedars Clinic Association

September 14, 1999

Chairman William V. Roth, Jr.
Senate Finance Committee
Dirksen 219
Washington, DC 20510

Dear Chairman Roth:

The American Medical Group Association represents approximately 45,000 physicians in more than 250 medical groups from across 40 states. AMGA members are among the largest and most prestigious medical groups in the country and include such renowned organizations as the Mayo Foundation, the Palo Alto Medical Foundation, the Lahey Clinic, the Henry Ford Health System, the Cleveland Clinic, and the Permanente Federation, Inc. AMGA's mission is to shape the health care environment by advancing high quality, cost-effective, patient-centered and physician-directed health care.

The Balanced Budget Act of 1997 (BBA) was the most significant reform of the Medicare program since its inception in 1965. The BBA encompasses over 300 changes that have had, and continue to have, significant implications and consequences for medical groups and the patients we serve. Multi-specialty medical groups are unique in that they are comprehensively involved in all aspects of health care delivery affected by the Balanced Budget Act: physician services, inpatient and outpatient hospital care, Medicare+Choice health plans, skilled nursing facilities, teaching hospitals, and home health care. Consequently, multi-specialty groups have sustained, and continue to sustain, dramatic revenue reductions which interfere with capital budgeting and patient care.

AMGA understands the need to eliminate unnecessary and wasteful services and inefficiencies. However, the reimbursement reductions imposed in BBA '97 are having a significant negative impact on the ability of medical group practices to continue to deliver quality care to beneficiaries and are threatening the financial viability of many groups. AMGA members are struggling to make up for the shortfalls caused by the BBA, yet, rather than compromise the quality of services they provide, groups are finding it necessary to cut back on beneficial services and uncompensated care. For your review, we have attached a few real examples of the estimated net revenue impact of specific items in the BBA 97.

It is our understanding that this fall Congress is likely to consider a package that would provide BBA relief to providers who have been severely hampered in their ability to serve Medicare patients. Medical groups need both administrative and

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legislative remedies if they are going to continue delivering quality care. Relief from the Balanced Budget Act should include:

- Relief from reductions for teaching hospitals and academic medical centers. BBA limits payments for IME, interfering with teaching hospitals' ability to provide quality care to the poorest and sickest individuals. AMGA supports legislation introduced by Rep. Charles Rangel (H.R. 1785) and Senators Moynihan and Kerrey (S. 1023) that would freeze IME payments at current levels and prevent future scheduled BBA cuts.
- Repeal the patient transfer provision. Under the expanded transfer definition, the government pays less for the shorter stay but does not increase payment for longer-stay patients. AMGA supports legislation proposed by Senator Grassley (S. 37) and Rep. Jim Nussle (H.R. 405) which would repeal this provision.
- Fix the way Medicare pays Medicare+Choice plans by:
 - Requiring HCFA to implement the risk adjustment process on a budget neutral basis. The "risk adjustment" process was intended to distribute funds based on the health status of M+C enrollees, however, HCFA has proposed a model that would impose deep spending cuts in the M+C program. AMGA supports H.R. 2419, the "Medicare+Choice Risk Adjustment Amendments of 1999," introduced by Congressman Michael Bilirakis.
 - Speed up implementation of the risk adjustment mechanism, permitted that it uses a reliable database that takes into account the beneficiary's health status and medical costs. Many of our medical groups care for a disproportionate number of the sicker Medicare population and have faced a sharp reduction in Medicare payments.
- Require HCFA to modify the Sustainable Growth Rate (SGR) expenditure target. Currently, there are significant flaws in the formula that is used to calculate this annual payment update for physician services. Absent significant modifications in the SGR, physicians face payment constraints that are far more severe than Congress intended.
- Delay implementation of the prospective payment system for outpatient departments so that HCFA can address and amend the proposed rule. The proposed rule has numerous problems and would severely impact medical groups across the country. As proposed, the rule does not recognize that integrated systems have moved many services to ambulatory sites. We support legislation introduced by Senator Jeffords (S. 1263) and Rep. Mark Foley (H.R. 2441) that would provide for a transition period and limit payments reductions over three years.
- Restore the budget neutrality on the new prospective payment system's reimbursement methodology. The 5.7% across the board reduction in payment to outpatient departments imposes an \$850 million per year reduction in payment to hospitals that was not intended by Congress in the BBA. Congress intended that payments to hospitals should remain budget neutral under the new PPS system. We support the steps taken by Reps. Johnson and Cardin, and Senators Cochran, Kerry, and Rockefeller urging HCFA to restore the budget neutrality.

In addition, AMGA commends President Clinton for taking the steps to introduce a Medicare reform proposal that seeks to modernize the program, introduce private sector innovations, and help seniors pay for prescription drugs. In particular, we strongly support the creation of a demonstration project of bonus payments for physician group practices who reduce excessive use of services and demonstrate positive medical outcomes for their patients. Based on our members' experience, medical group practices are leading the way to cost-effective, high quality health care through integrated financing and delivery of medical services. A shared commitment and an underlying patient care mission by all involved have produced superior results in quality health care service and satisfaction for both patients and providers. Through organized delivery systems, providers save time, money, and resources, and improve patient care.

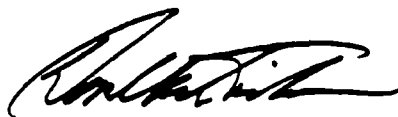
At the same time, we are disappointed that the President's proposal continues the pattern of cutting payments to providers as a way to maintain Medicare solvency. President Clinton's Medicare reform would cost hospitals and health plans \$70 billion over 10 years. The potential for additional Medicare cuts to medical groups will be disastrous because, as integrated practices, they carry the burden of the full scope of reductions.

While we recognize the need to eliminate inefficiencies and wasteful services, the Federal government cannot finance and expand the Medicare system by cutting provider reimbursements. The President's proposed reductions come on the heels of Medicare spending reductions contained in the Balanced Budget Act of 1997, and will reduce our ability to provide quality services that the elderly depend on. While the President's establishment of a \$7.5 billion provider set-aside fund appears to recognize that the BBA 97 reductions were too harsh, this funding level is insufficient to address reimbursement inadequacies and does little to ensure that Medicare beneficiaries will continue to have stable access to health care providers. More importantly, the \$7.5 billion would result in battles among the provider community to determine who is most worthy of relief.

Rather than implement further reductions at the expense of health care delivery, Congress needs to do two things: First, Congress needs to fix the unintended consequences of the Balanced Budget Act. This will ensure that Medicare beneficiaries will continue to receive quality and cost-effective care from providers and medical groups. Second, if solvency of the Medicare program is to be sustained, Congress needs to fundamentally restructure and modernize the Medicare program. Such a system should be based on the principles of patient choice, competition, innovation, a defined role for the government, and should adopt marketplace innovations. Continuing to reduce provider reimbursements as a part of reform is not a viable option.

We appreciate your taking our views into consideration. We look forward to working with Congress on Medicare reform and adjustments to the Balanced Budget Act of 1997. Please do not hesitate to contact AMGA if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read 'Donald W. Fisher', with a stylized, flowing script.

Donald W. Fisher, Ph.D., CAE
Chief Executive Officer

Cc: Majority Leader Trent Lott
Minority Leader Tom Daschle
Speaker Dennis Hastert
Minority Leader Dick Gephardt
Majority Leader Dick Armey
Senator Daniel Patrick Moynihan
Congressman Bill Archer
Congressman Bill Thomas
Congressman Charles Rangel
Congressman Fortney Pete Stark
Senate Finance Committee
Ways and Means Committee
Administrator Nancy-Ann DeParle
Mr. Christopher Jennings
Dr. Robert Berenson

Mayo Foundation

Rochester, Jacksonville, and Scottsdale

BBA Reductions	1998	1999	2000	2001	2002	2003	Total
(in millions of dollars)							
Reduction to IME payment Rate	6.4	13.9	20.5	26.5	28.5	30.7	120.1
PPS-exempt unit TEFRA rates	--	1.0	1.0	0.9	0.8	0.7	4.3
Reduction to Federal capital Payments	5.1	5.6	6.0	6.5	6.7	6.8	31.7
Transfer DRGs	0.6	2.5	2.5	2.5	2.5	2.5	12.6
Outpatient PPS (assume 5% reduction)	0.3	0.7	0.7	0.7	0.7	0.7	3.5
Outpatient formula-driven overpayments	1.1	1.7	1.8	1.9	2.0	2.1	9.4
Eliminate IME payment on outliers	3.4	3.8	3.6	3.6	3.8	4.1	19.0
SNF prospective payment	--	3.0	6.0	9.0	12.0	12.0	42.0
Reduction to bad debts	--	0.1	0.1	0.1	0.1	0.1	0.4
HHA reduction to limits and PPS0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5
Medicare Part B physician fee schedule	--	3.0	6.0	9.0	12.0	12.0	42.0
Total Reductions	18.3	35.6	45.5	54.9	60.4	63.0	259.3

Henry Ford Health System
Detroit, MI

BBA Reductions **1998** **1999** **2000** **2001** **2002** **Total**
(in millions of dollars)

PPS-Hospital Payment Update	5.2	8.9	12.5	14.7	17.0	58.3
IME Adjustments	3.2	5.7	8.2	10.7	10.7	38.5
Capital Payment for PPS Hospitals	3.3	3.3	3.3	3.3	3.3	16.5
Transfer DRG Provision	--	3.1	3.1	3.1	3.1	12.4
Disproportionate Share Payments	0.1	0.2	0.2	0.3	0.4	1.2
Bad Debt Payments	0.5	0.8	0.9	0.9	0.9	4.0
Formula Driver Overpayments	2.9	2.9	2.9	2.9	2.9	14.5
Outpatient PPS	--	--	4.8	9.6	9.6	24.0
Physicians Single Conversion Factor	1.0	1.0	1.0	1.0	1.0	5.0
Physician Practice Expense RVUs	--	0.6	1.0	1.4	1.8	4.8
Home Health Interim Payment System	1.0	--	--	--	--	1.0
Sustainable Growth	--	1.2	1.7	1.2	1.2	5.3
HMO 2% Cap	2.2	4.6	TBD	TBD	TBD	6.8 +
Risk Adjusting Scheme	N/A	N/A	TBD	TBD	TBD	TBD
User Fees	\$525,000	620,000	651,000	684,000	718,000	3.2
Total Reduction	19.9	32.9	39.3	49.8	52.6	195.5+

Lahey Clinic
Burlington, MA

BBA Cuts	1998	1999	2000	2001	2002	Total
PPS Hospital Updates	1,295,081	2,466,203	3,379,178	3,964,511	4,578,043	15,683,016
Formula Driven Overpayment	850,000	850,000	850,000	850,000	850,000	4,250,000
IME	1,322,000	2,555,000	3,266,000	4,199,000	4,199,000	15,241,000
IME Managed Care	562,500	1,500,000	2,200,000	2,900,000	3,480,000	10,642,500
Transfer Policy	--	1,000,000	1,000,000	1,000,000	1,000,000	4,000,000
APC	--	--	1,00,000	2,000,000	2,000,000	5,000,000
Single Conversion Factor	750,000	1,000,000	1,000,000	1,000,000	1,000,000	4,750,000
Resource-Based Practice Expense RVU	--	300,000	700,000	1,100,000	1,500,000	3,600,000
Total Reduction	3,654,581	6,371,203	8,995,178	11,213,511	11,647,043	41,881,516



AMERICAN ASSOCIATION FOR RESPIRATORY CARE

11030 Ables Lane, Dallas, TX 75229-4593, (972) 243-2272, Fax (972) 484-2720

<http://www.aarc.org>, E-mail: info@aarc.org

September 10, 1999

Christopher C. Jennings
Deputy Assistant to the President for Health Policy
216 Old Executive Office Building
17th & Pennsylvania Avenue
Washington DC 20050

Dear Mr. Jennings:

The American Association for Respiratory Care (AARC), a 37,000-member professional organization of respiratory therapists, is responding to the August 13, 1999 memorandum to Interested Parties regarding the impact of the Balanced Budget Act of 1997.

There are two critical concerns the respiratory therapy community has about the implementation of the Prospective Payment System (PPS) for Medicare Skilled Nursing Facilities (SNFs).

Respiratory Therapy Services are under represented in RUGS III Payment Calculations and Classification System.

The May 12, 1998 interim final regulations for SNF PPS do not accurately capture the extent of respiratory therapy services provided to SNF patients. The AARC commissioned Muse & Associates (Attachment #1) to analyze HCFA's 1994 and 1996 Standard Analytical Beneficiary Encrypted Public Use Files, the database HCFA used to calculate the RUGS III Classification and Payment System.

1. Respiratory therapy was omitted as an identifiable service under RUGS III rehabilitation categories. HCFA maintained that only a limited amount, 3%, of nursing home patients required respiratory therapy rehabilitation. Muse & Associates' data analysis documented that the actual percentage was 24%. Therefore, a significant number of Medicare beneficiaries requiring respiratory rehabilitation simply will not receive the services.
2. The RUGS III categories that purport to capture respiratory therapy services as part of "non-therapy ancillaries" are underestimated and thus underfunded. The PPS structure does not provide adequate resources for the approximate 80,000 to 90,000 Medicare beneficiaries requiring extensive respiratory therapy services. Both the Muse & Associates report and the AARC's comments to the interim final rule (Attachment # 2) provide more detailed analysis. As a result of the misallocation of and payment for respiratory therapy services, nursing homes are increasingly reluctant to admit high-cost, extensive care respiratory therapy patients. The access issue has been raised by other government agencies such as MedPac and, in a recent report, the HHS Office of Inspector General.

HCFA's July 1999 final regulations for SNF PPS do not alter the manner in which respiratory therapy services are considered within the PPS structure.

Respiratory Therapy Professionals are being substituted in SNFs by other personnel who have no documented competency in Respiratory Therapy

As a consequence of the inaccurate payment structure under SNF PPS, SNFs are substituting other personnel to perform respiratory therapy services in lieu of the respiratory therapist. The AARC's attempts to convince HCFA to include documentation requirements for competency in respiratory therapy services by those who are not certified respiratory therapists have been unsuccessful. HCFA staff continues to maintain that other personnel can adequately provide respiratory therapy services without requiring competency documentation.

The AARC commissioned a second Muse & Associates study (Attachment #3) that focuses on clinical outcomes for Medicare patients who received respiratory therapy from qualified respiratory therapists versus those who received the services from other health care personnel. Muse & Associates analyzed 1996 HCFA data. Muse & Associates found:

- 31% more SNF beneficiaries receiving respiratory therapy services from non-respiratory therapy personnel required emergency room visits than those receiving therapy from respiratory therapists. The cost of treatment for the two groups were \$2.7 and \$ 2.2 million, respectively, a difference of 23%.
- 14% more SNF beneficiaries were readmitted to a SNF when their initial SNF stay did not include services from a respiratory therapist.
- Respiratory therapy involvement in the care of SNF patients resulted in a 3.6-day shorter average length of stay in SNFs, thus a savings to Medicare of \$97.9 million.

Respiratory therapy services when provided by respiratory therapists clearly enhances the quality of care for the Medicare beneficiary and is cost effective to the Medicare program. Because of HCFA's continuing reluctance to require competency documentation requirements for non-respiratory therapy personnel, the AARC is advocating that this requirement be enacted by Congress.

If you or your staff have any questions regarding the content of the two Muse & Associates studies, or any other inquiries regarding respiratory therapy services, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Dianne N. Kimball". The signature is written in a cursive, flowing style.

Dianne N. Kimball, RTT
President

Attachment #1

Muse & Associates

Respiratory Care Services in Medicare

June, 1998



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Washington, DC 20006
(202) 496-0200
(202) 496-0201 (fax)

EXECUTIVE SUMMARY

Respiratory therapy is an important and growing component of Medicare Inpatient Hospital and Skilled Nursing Facility (SNF) care. Congress has directed the Health Care Financing Administration (HCFA) to develop and implement a Prospective Payment System (PPS) for Medicare SNFs effective July 1, 1998. The SNF PPS design has been based on data collected in the Nursing Home Case-Mix and Quality (NHCMQ) Demonstration.

The American Association for Respiratory Care (AARC) and others have met with HCFA staff over the last year concerning the design of the SNF PPS system. Based on those briefings, AARC has become concerned regarding the position of respiratory therapy in the SNF PPS system. Muse & Associates was commissioned by AARC to:

1. Examine and outline the HCFA methodology regarding respiratory therapy;
2. Determine the scope and extent of respiratory care services in Medicare inpatient settings using the most recently data;
3. Determine if there are significant numbers of Medicare beneficiaries who are intense users of respiratory services; and
4. Speculate on how these intense users might be dealt with in the SNF PPS system.

The results of the analysis are summarized as follows.

How many Medicare beneficiaries who are admitted to a SNF or Inpatient Hospital setting receive respiratory therapy services and at what cost?

HCFA data show that approximately 4.2 million (33 percent) of the 13 million Medicare beneficiaries who were in a SNF or Inpatient Hospital setting in 1996 received respiratory therapy services at a cost to Medicare of \$3.2 billion.

How many Medicare beneficiaries who are admitted to a SNF received respiratory therapy services and at what cost?

HCFA data show that approximately 363 thousand (24 percent) of the 1.6 million Medicare beneficiaries who were in a SNF setting in 1996 received respiratory services at a cost to Medicare of \$386 million.

How much and in what way have Medicare respiratory therapy services grown in recent years?

Medicare received 300,320 claims and \$493 million in charges for respiratory therapy services from Medicare SNFs in 1994. By 1996, Medicare was receiving 580,940 claims and \$1.1 billion in charges from Medicare SNFs for respiratory therapy services, a growth of 280,620 claims and \$658 million in charges. In the same period, claims from Inpatient Hospitals for respiratory therapy services decreased by 531,860 and charges decreased by \$417 million. These data clearly show that hospitals were shifting beneficiaries with respiratory care needs to the SNF setting during the 1994 to 1996 period. Industry data suggest that this trend has continued.

Do certain diagnoses account for the majority of respiratory therapy payments?

The top 100 diagnoses account for 98.6 percent of all respiratory care services. The top 10 account for approximately half of all respiratory payments and the top five diagnoses account for one-third of all payments.

Did the top diagnoses differ between SNF and Inpatient Hospital settings?

No significant differences were found between SNF and Inpatient Hospital diagnoses patterns.

Were there intense users of respiratory care services?

Yes. Intense users of respiratory therapy services, defined as those with paid claims of more than \$1,000, comprised only 18 percent of all Medicare beneficiaries who received respiratory therapy services but accounted for 74 percent of all Medicare expenditures for respiratory care services.

Did the top diagnoses for intense utilizers differ between SNF and Inpatient Hospital settings?

No significant differences were found between SNF and Inpatient Hospital diagnoses patterns for the intense utilizers.

What were the differences in gender and age between Medicare beneficiaries with the top 5 diagnosis who did and did not receive respiratory therapy treatment in the SNF setting?

The data show that slightly more than half of those who used respiratory therapy services in SNFs were female. However, females consist of approximately two-thirds of all SNF patients. Conversely, 44.5 percent of respiratory therapy users are males, even though males comprise only 33 percent of the SNF population. Therefore, a higher proportion of males relative to their presence in the overall SNF population appear to use respiratory therapy services.

Users of respiratory services in SNFs also tend to be significantly younger. Only 19 percent of those who used respiratory services were over 85 years of age, whereas 33 percent of all SNF patients are over 85 years of age.

How do the length of stays and costs for the top diagnoses compare to national averages?

The average length of stay for SNF patients who receive respiratory therapy services was 22.6 days. This is significantly less than the 1996 average length of stay for all 1.6 million Medicare SNF patients of 26.2 days. Costs per day just for respiratory care services for the top ten diagnosis ranged from \$39 to \$85, with the average of all diagnosis being \$47. More importantly, the top 5 diagnoses, which ranged in cost from \$58 to \$85 per day for respiratory care only, were all diseases of the lung.

I INTRODUCTION

Respiratory therapy is an important and growing component of Medicare Inpatient Hospital and Skilled Nursing Facility (SNF) care. Congress has directed the Health Care Financing Administration (HCFA) to develop and implement a Prospective Payment System (PPS) for Medicare SNFs effective July 1, 1998. The SNF PPS design has been based on data collected in the Nursing Home Case-Mix and Quality (NHCMQ) Demonstration.

The American Association for Respiratory Care (AARC) and others have met with HCFA staff over the last year concerning the design of the SNF PPS system. Based on those briefings, AARC has become concerned regarding the position of respiratory therapy in the SNF PPS system. AARC specifically feels that the SNF PPS system underestimates the role, cost effectiveness¹ and scope of respiratory care. Muse & Associates was commissioned by AARC to:

- Examine and outline the HCFA methodology regarding respiratory therapy;
- Determine the growth, scope and extent of respiratory care services in Medicare inpatient settings with the most recent data;
- Determine if there are significant numbers of Medicare beneficiaries that are intense users of respiratory services; and
- Speculate on how these intense users might be better dealt with in the SNF PPS system.

This report begins with a description of the methodology HCFA is likely to employ and then describes the data and methodology used. The results of the analysis are then reported.

¹ Appendix 1 contains sections from No substitutes for the RCP published by AARC which outline the unique role and cost effectiveness of respiratory care.

Respiratory Services in the SNF PPS System (This Section will be revised and expanded when the proposed regulation becomes available.)

Based on our most recent understanding of HCFA's methodology, the following is how we believe respiratory therapy services will be treated in the new SNF PPS system.

The respiratory component of the Medicare SNF rate was estimated by HCFA based on PPS demonstration data collected in 1995. These data included extremely limited instances of respiratory therapy in the Rehabilitation Groups. For example, for new admissions to the Demonstration in 1995, it was found that in the Rehabilitation Groups, 65% received Physical Therapy, 49% received Occupational Therapy, and 7% received Speech-Language Pathology services while only 3% received Respiratory Therapy. It was felt that if Respiratory Therapy was combined with these other types of therapies in the Rehabilitation Groups, the receipt of Respiratory Therapy might be lost as the other more prevalent therapies would be stronger in assuring receipt of their own therapeutic interventions and treatments. Further analyses showed that Respiratory Therapy was more common in other groups.

Respiratory Therapy was shown to follow nursing time, i.e., in groups where there is a large amount of nursing time, there is also a greater amount of time recorded for Respiratory Therapy. For example, more nursing time is found in the Special Care and Extensive Care Groups as more time is required to perform the nursing tasks required by nursing home residents in these groups. When Vent use was analyzed, it was found that 75% of vent residents were in the Extensive Care and Special Care Groups. Similarly, more Respiratory Therapy was found in these groups. Thus, financial incentives (more dollars) were put into the routine component of these categories than into the therapy component of the Rehabilitation Groups. Therefore, the dollars for respiratory therapy are and will be included in the **routine component** of the SNF PPS rate.

Data

Our analyses is based on data compiled from HCFA's 1994 and 1996 Standard Analytical Beneficiary Encrypted Public Use Files. These data bases contain all Medicare services delivered to a sample of beneficiaries and are widely accepted in HCFA as valid data sources. The files contain final action claims data with all adjustments resolved for all Medicare beneficiaries. They capture 99 percent of the claims for a given calendar year. The 5% Sample Standard Analytical Files are created by extracting all of the claims for a 5 percent sample of beneficiaries for a particular year.

The 5% Standard Analytical Files consist of 7 separate files, including inpatient, SNF, outpatient, hospice, home health agency, DME and Part B physician/suppliers. All files were used for this study.

Study Design

The study design was straightforward and consisted of four steps.

Step 1: All persons who received respiratory services in the Inpatient Hospital or SNF setting were identified. The 041X revenue codes were used as the definition of respiratory care services.

Step 2: All of the claims in the file for these individuals were extracted.

Step 3: The data were sorted to identify Medicare beneficiaries that had intense respiratory therapy utilization in SNFs. Based on an inspection of the distribution of respiratory therapy services, \$1000⁺ in total respiratory therapy services was used as the definition of intense utilization.

Step 4: Detailed statistics on the diagnoses, costs, utilization and demographics of the intense users were generated.

All data were weighted to the full Medicare beneficiary population.

Results

Detailed tables of the results of the study can be found in Appendix 2. The following sections extract data from those tables and address the study's research questions.

Magnitude and Growth of Medicare Respiratory Services

Respiratory services are primarily delivered in Medicare SNF and Inpatient Hospital settings. Table 1 shows detailed data for 1994 comparative summary data for 1996 in these settings.

Table 1
Comparison of Respiratory Care Services
in Medicare SNF and Inpatient Settings in 1996

Provider Type	Number of Claims	Total Charge	Total Paid
SNF			
SKILLED NURSING FACILITY	272,280	\$467,143,060	\$154,634,800
SHORT TERM / ACUTE CARE			
SB* HOSPITAL	26,500	\$23,245,700	\$6,551,840
DEMONSTRATIONS AND OTHER SETTINGS	1,480	\$2,898,400	\$1,041,600
REHABILITATION SB HOSPITAL	40	\$14,960	\$3,240
RURAL PRIMARY CARE SB HOSPITAL	20	\$15,400	\$0
1994	300,320	\$493,317,520	\$162,231,480
1996	580,940	\$1,151,006,319	\$385,781,050
Difference	280,620	\$657,688,799	\$223,549,570
Percent Growth	93%	133%	138%
INPATIENT			
SHORT TERM HOSPITAL	6,669,900	\$6,702,920,140	\$2,719,571,640
LONG TERM HOSPITAL	44,020	\$320,026,640	\$76,649,720
REHABILITATION HOSPITAL	59,340	\$68,651,920	\$31,384,920
REHABILITATION UNIT	49,560	\$55,400,500	\$22,692,440
PSYCHIATRIC HOSPITAL	26,080	\$11,600,720	\$5,113,560
CHILDREN'S HOSPITAL	1,500	\$5,081,820	\$1,226,540
OTHER	2060	\$4,962,820	\$335,820
1994	6,852,460	\$7,168,644,560	\$2,856,974,640
1996	6,320,600	\$6,751,319,890	\$2,857,836,084
Difference	-531,860	-417,324,670	861,444
Percent Growth	-8%	-6%	0%

* Swing Bed

Approximately 33 percent of all Medicare SNF and Inpatient Hospital patients received at least one respiratory care service.² SNF and Inpatient Hospital respiratory care services totaled \$3.2 billion in Medicare payments in 1996 or 3.8 percent of all SNF and Inpatient Hospital payments. SNF and Inpatient Hospital billing experts indicate that a significant amount of respiratory care services are bundled in other lines in the typical bill. For example, respiratory supplies may be billed as simply as supplies. Hence, the 3.8 percent should be viewed as the minimum being spent on respiratory care services. Actual

² The comparative data used to contrast the general Medicare population and those who received respiratory services in this study are drawn from the "Medicare and Medicaid Statistical Supplement, 1997," Health Care Financing Review, 1997, Health Care Financing Administration.

expenditures may be as high as 8 percent of total SNF and Inpatient Hospital payments according to some sources.

Medicare received 300,320 claims and \$493 million in charges for respiratory care services from Medicare SNFs in 1994. By 1996, Medicare was receiving 580,940 claims and \$1.1 billion in charges from Medicare SNFs for respiratory therapy services, a growth of 280,620 claims and \$658 million in charges. In the same period, claims from hospitals for respiratory therapy services decreased by 531,860 and charges decreased by \$417 million.³ These data clearly show that hospitals were shifting beneficiaries with respiratory care needs to the SNF setting during the 1994 to 1996 period.

This finding is congruent with SNF and respiratory industry experts' analyses of trends in the marketplace, who argue that the real beginning of respiratory therapy in Medicare SNFs began in 1996 and has expanded considerably since then. These experts argue that such services can be provided more cost effectively for patients with higher levels of acuity in the SNF versus hospital setting. Proprietary company level data shared with the authors shows that respiratory therapy services in SNFs have probably doubled between 1996 and 1998. This finding substantiates the AARC concern that the 1995 data upon which SNF PPS rates are based do not reflect the current level of respiratory care in Medicare SNF settings.

Primary Diagnosis in SNF and Inpatient Settings

The top 100 diagnoses account for 98.6 percent of all respiratory care services in SNF and Inpatient Hospital settings, hence, it was decided to limit the analysis and presentation in this study to the top 100 diagnoses (See Appendix 2, Table RT-3).

The top 100 diagnoses involving respiratory care services in SNF and Inpatient Hospital settings accounted for approximately 4.2 million (33 percent) Medicare beneficiaries out of the approximately 13 million beneficiaries who had a SNF or Inpatient Hospital stay in 1996.

Table 2 shows the top ten diagnoses, in terms of paid dollar volume, for patients receiving respiratory care in 1996 in SNFs and Inpatient Hospital settings. These top ten diagnoses account for 49 percent of all respiratory Medicare payments. Six of the top ten diagnoses are directly related to lung diseases. The remaining four, such as heart failure, have high incidence rates in the Medicare population.

3. The charge data shown in these tables reflect line item billing for respiratory services. Medicare SNF and Inpatient claims show line item costs for respiratory services and the total paid for the bill. We have imputed the amount paid for the respiratory line by using the ratio of the total paid to the total charge. This is a standard technique used in Medicare research.

Table 2

**Summary of SNF & Inpatient Claims for Respiratory Services by
Primary Diagnosis: Top 10 Diagnoses Sorted by Total Paid in 1996**

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services
	ALL DIAGNOSES	4,170,160	\$7,902	\$3,244	6,901,540
518	OTHER DISEASES OF LUNG	114,540	\$770	\$293	169,620
486	PNEUMONIA	319,940	\$515	\$218	400,480
428	HEART FAILURE	387,240	\$477	\$193	540,160
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE	294,380	\$400	\$178	359,020
491	CHRONIC BRONCHITIS	210,420	\$381	\$169	296,060
482	OTHER BACTERIAL PNEUMONIA	149,160	\$356	\$160	186,360
410	ACUTE MYOCARDIAL INFARCTION	234,540	\$331	\$138	289,020
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	86,440	\$205	\$94	112,320
38	SEPTICEMIA	128,560	\$206	\$81	151,500
496	CHRONIC AIRWAY OBSTRUCTION	59,260	\$203	\$76	89,900

Primary Diagnosis of Intense Utilizers in SNF and Inpatient Settings

Table 3 shows the top ten diagnoses, in terms of paid dollar volume, for patients receiving respiratory care in 1996 in SNFs and Inpatient Hospital settings whose paid claims were more than \$1,000. As was the case with the total population, these top ten diagnoses account for approximately half, 51 percent, of all Medicare payments.

Table 3

**Summary of SNF & Inpatient Claims for Respiratory Services by Primary Diagnosis:
Top 10 Diagnoses sorted by Total Paid for Patients with Total Paid of \$1000 or More in 1996**

Diag. Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services
	ALL DIAGNOSES	744,580	\$5,757	\$2,405	2,218,240
518	OTHER DISEASES OF LUNG	76,960	\$717	\$279	125,900
486	PNEUMONIA	105,460	\$359	\$152	156,300
482	OTHER BACTERIAL PNEUMONIA	74,020	\$291	\$132	101,280
428	HEART FAILURE	109,760	\$312	\$127	195,700
491	CHRONIC BRONCHITIS	88,420	\$276	\$125	151,760
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE	70,340	\$271	\$122	95,200
410	ACUTE MYOCARDIAL INFARCTION	55,560	\$215	\$94	78,140
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	42,480	\$168	\$79	62,140
496	CHRONIC AIRWAY OBSTRUCTION	34,720	\$177	\$69	60,280
38	SEPTICEMIA	40,360	\$149	\$58	53,620

As Table 3 shows, Medicare beneficiaries with more than \$1,000 in paid respiratory therapy claims account for only 18 percent (744,580 out of 4,170,160) of all Medicare beneficiaries who received respiratory services. However, these intense users of respiratory therapy services accounted for 74 percent (\$2,405 million out of \$3,244 million) of all Medicare expenditures for respiratory services.

Primary Diagnosis in SNFs

Table 4 shows the top ten diagnoses, in terms of paid dollar volume, for patients receiving respiratory care in 1996 in SNFs.

When the analysis is limited to just Medicare SNFs, the results closely mirror those when SNF and Inpatient Hospital are combined. The top 100 diagnoses involving respiratory services in SNFs accounted for 363,160 Medicare beneficiaries, 24 percent, out of the approximately 1.6 million beneficiaries who had a SNF stay in 1996. As outlined earlier, these data clearly underestimate the scope of respiratory care services in SNFs by some unknown factor.

Table 4
Summary of SNF Only Claims for Respiratory Services by Primary Diagnosis:
Top 10 Diagnoses sorted by Total Paid in 1996

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days
ALL	ALL DIAGNOSES	363,160	\$1,151	\$386	580,940	8,196,360
486	PNEUMONIA	30,780	\$103	\$35	45,740	604,320
496	CHRONIC AIRWAY OBSTRUCTION	18,060	\$90	\$30	32,240	448,380
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR DISEASE	19,420	\$70	\$23	31,980	531,940
428	HEART FAILURE	25,260	\$65	\$23	37,180	513,540
V57	CARE INVOLVING USE OF REHABILITATION PROCEDURES	35,920	\$56	\$19	43,040	508,980
820	FRACTURE OF NECK OF FEMUR	19,620	\$48	\$18	27,860	454,000
518	OTHER DISEASES OF LUNG	7,660	\$60	\$15	12,880	175,260
491	CHRONIC BRONCHITIS	8,020	\$21	\$9	10,400	110,460
250	DIABETES MELLITUS	7,140	\$23	\$8	11,600	189,000
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	6,240	\$24	\$7	8,880	124,280

The top ten diagnoses accounted for 48 percent of all respiratory care service expenditures in SNFs and the top five diagnoses accounted for 33 percent of all respiratory care expenditures. Six of the top ten diagnoses are directly related to lung diseases. The remaining four, such as heart failure, have high incidence rates in the Medicare population.

Primary Diagnosis of Intense Users in SNF Settings

Table 5 shows the top ten diagnoses, in terms of paid dollar volume, for patients receiving respiratory care in 1996 in SNFs whose paid claims were more than \$1,000.

Intense users accounted for only 30 percent (109,240 out of 363,160) of SNF patients who received respiratory care services, but these 109,240 consumed 82 percent (\$315 million out of \$386 million) of all SNF Medicare expenditures for respiratory care services. This analysis clearly demonstrates that there are a small number of Medicare patients that need extensive respiratory care services. The top ten diagnoses for these intense users closely reflect the combined SNF and Inpatient Hospital top 10 diagnoses.

Table 5

**Summary of SNF Only Claims for Respiratory Care Services by Primary Diagnosis:
Top 10 Diagnoses sorted by Total Paid for Patients with Total Paid of \$1000 or More in 1996**

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days
ALL	ALL DIAGNOSES	109,240	\$935	\$315	257,440	4,296,520
486	PNEUMONIA	12,900	\$87	\$30	24,540	397,880
496	CHRONIC AIRWAY OBSTRUCTION	9,880	\$82	\$27	21,460	328,800
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR DISEASE	7,680	\$59	\$20	16,320	305,860
428	HEART FAILURE	8,740	\$52	\$18	16,700	276,100
820	FRACTURE OF NECK OF FEMUR	6,020	\$38	\$14	11,600	208,160
518	OTHER DISEASES OF LUNG	4,280	\$56	\$14	8,440	133,260
V57	CARE INVOLVING USE OF REHABILITATION PROCEDURES	6,920	\$37	\$12	9,940	144,680
491	CHRONIC BRONCHITIS	3,520	\$19	\$7	5,220	69,540
250	DIABETES MELLITUS	2,660	\$19	\$7	5,600	100,160
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	2,960	\$21	\$6	5,020	83,640

Utilization of Respiratory Care Services Per Day

The results in the foregoing sections clearly establish that substantial respiratory therapy services are delivered to a small number of SNF patients with a very limited set of diagnoses. Tables 6 and 7 examine Medicare costs per day in the SNF setting.

Table 6 contains the average days, payments, and paid amounts per day for all SNF patients who received respiratory care services.

The average length of stay for SNF patients who receive respiratory care services was 22.6 days. This is significantly less than the 1996 average length of stay for all 1.6 million Medicare SNF patients of 26.2 days. Costs per day just for respiratory care services for the top 10 diagnoses ranged from \$39 to \$85, with the average of all diagnoses being \$47. More importantly, the top 5 diagnoses, which ranged in cost per day from \$58 to \$85 per day for respiratory care only, were all diseases of the lung.

Table 6

**Summary of SNF Only Claims for Respiratory Services by Primary Diagnosis:
All Diagnoses and Top 10 Diagnoses Sorted by Paid per Day in 1996**

Diag Code	Diagnosis Description	Average Days	Average Paid	Paid per Day
518	OTHER DISEASES OF LUNG	22.9	\$1,939	\$85
491	CHRONIC BRONCHITIS	13.8	\$1,063	\$77
496	CHRONIC AIRWAY OBSTRUCTION	24.8	\$1,644	\$66
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	19.9	\$1,195	\$60
486	PNEUMONIA	19.6	\$1,146	\$58
	AVERAGE ALL DIAGNOSES	22.6	\$1,062	\$47
599	OTHER DISORDERS OF URETHRA AND URINARY TRACT	24.1	\$1,105	\$46
428	HEART FAILURE	20.3	\$899	\$44
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR DISEASE	27.4	\$1,181	\$43
250	DIABETES MELLITUS	26.5	\$1,116	\$42
820	FRACTURE OF NECK OF FEMUR	23.1	\$901	\$39

Table 7 focuses on those Medicare SNF patients who were intense users, i.e., spent more than \$1,000, of respiratory therapy services. The results mirror those of Table 6 which showed that for all SNF patients, four of the top five diagnoses were diseases of the lung. Not surprisingly, the intense users had significantly longer stays, 39.3 days versus 22.6 days, and a higher average per diem, \$73 per day versus \$47 per day.

Table 7

**Summary of SNF Only Claims for Respiratory Services by Primary Diagnosis:
Top 10 Diagnoses sorted by Paid Per Day for Patients with total Paid of \$1000 or More in 1996**

Diag Code	Diagnosis Description	Average Days	Average Paid	Paid per Day
518	OTHER DISEASES OF LUNG	31.1	\$3,222	\$103
491	CHRONIC BRONCHITIS	19.8	\$1,978	\$100
V57	CARE INVOLVING USE OF REHABILITATION PROCEDURES	20.9	\$1,730	\$83
496	CHRONIC AIRWAY OBSTRUCTION	33.3	\$2,739	\$82
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	28.3	\$2,192	\$78
486	PNEUMONIA	30.8	\$2,319	\$75
	AVERAGE ALL DIAGNOSES	39.3	\$2,881	\$73
250	DIABETES MELLITUS	37.7	\$2,579	\$69
820	FRACTURE OF NECK OF FEMUR	34.6	\$2,350	\$68
599	OTHER DISORDERS OF URETHRA AND URINARY TRACT	33.5	\$2,261	\$67
428	HEART FAILURE	31.6	\$2,093	\$66

Tables 8 and 9 address the question of the demographics of those with lung diseases who use respiratory care services. The analysis was focused on the top 5 lung diseases since the policy question being addressed is how the proposed SNF PPS might be modified in the area of respiratory care.

Those who use respiratory care services tend to be significantly younger and include a higher proportion of males than the overall Medicare SNF population. The data show that 55.5 percent of those who used respiratory therapy services in SNFs were female. This is very close to the 57.2 percent of all Medicare beneficiaries who are female but significantly lower than the 66 percent of all SNF patients who are female. Similarly, only 19 percent of those who used respiratory care services were over 85 years of age whereas 33 percent of all SNF patients are over 85 years of age. One possible explanation of these differences is that those in need of respiratory care are more likely to be on the way to rehabilitation than the typical SNF patient.

Table 8
Patient Count and Percentage by Age and Gender
SNF Claims for Respiratory Care
 Claims with a Primary Diagnosis from (518.xx, 491.xx, 496.xx, 507.xx and 486.xx)
 Extrapolated to 100%

Age Band	Gender		
	Female	Male	All
<u>Patient Count</u>			
0 to 64	1,480	1,900	3,380
65 to 69	3,020	3,160	6,180
70 to 74	5,100	4,760	9,860
75 to 79	6,820	5,960	12,780
80 to 84	7,960	6,320	14,280
85+	13,080	7,920	21,000
All	37,460	30,020	67,480
<u>Percent of Patient Count</u>			
0 to 64	2.19%	2.82%	5.01%
65 to 69	4.48%	4.68%	9.16%
70 to 74	7.56%	7.05%	14.61%
75 to 79	10.11%	8.83%	18.94%
80 to 84	11.80%	9.37%	21.16%
85+	19.38%	11.74%	31.12%
All	55.51%	44.49%	100.00%

Table 9
Patient Count and Percentage by Age and Gender
SNF Claims for Respiratory Care
Claims with a Primary Diagnosis from
(518.xx, 491.xx, 496.xx, 507.xx and 486.xx)
Patients with \$1,000 or more in Total Paid for the year only;
Extrapolated to 100%

Age Band	Gender		All
	Female	Male	
<u>Patient Count</u>			
0 to 64	580	740	1,320
65 to 69	1,460	1,300	2,760
70 to 74	2,080	1,740	3,820
75 to 79	2,660	2,420	5,080
80 to 84	2,940	2,340	5,280
85+	5,460	3,100	8,560
All	15,180	11,640	26,820
<u>Percent of Patient Count</u>			
0 to 64	2.16%	2.76%	4.92%
65 to 69	5.54%	4.85%	10.29%
70 to 74	7.76%	6.49%	14.24%
75 to 79	9.92%	9.02%	18.94%
80 to 84	10.96%	8.72%	19.69%
85+	20.36%	11.56%	31.12%
All	56.60%	43.40%	100.00%

Alternative SNF PPS Policies

The purpose of this section is to suggest how HCFA might alter its SNF PPS proposal to take into account the data presented in this study. As discussed in the Baltimore meeting, we will draft this section after we have received reviewer comments and the Notice of Proposed Rule Making is published.

Personally, we believe that the results of the study make a strong case for some type of exceptions policy for respiratory care services in SNFs.

Appendix 1

Role and Cost-Effectiveness of Respiratory Care Services



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The Potential Savings to the Medicare Program of Using Skilled Nursing Facilities for Respiratory Therapy:

An Economic Analysis

1 September 1995

Prepared for
American Health Care Association
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The Potential Savings to the Medicare Program of Using Skilled Nursing Facilities for Respiratory Therapy: An Economic Analysis

Introduction

The Congressional Budget Office (CBO) has estimated the effect on Medicare expenditures of allowing skilled nursing facilities (SNFs) to provide respiratory therapy for patients who are not dependent on ventilators. The CBO estimated that Medicare expenditures for treating these patients would increase by \$20-25 million per year. The CBO apparently did not specify its assumptions in generating this estimate, but it is presumed that expenditures were assumed to increase because the number of patients receiving treatment would increase.¹

In its report, the CBO considered but did not estimate the savings that Medicare could realize if ventilator-dependent patients were treated in SNFs. Although ventilator-dependent patients represent a relatively small number of total Medicare hospital discharges (about 77,000 in 1992), they are among the most costly of patients covered by Medicare: in 1992, the average reimbursement for these patients was \$62,969 per discharge. This study shows that Medicare could realize savings of at least \$142 million per year if these patients were treated in the subacute care units of SNFs rather than hospitals when clinically appropriate.

There are several groups of ventilator-dependent patients. The first group is patients in DRG 475 (respiratory system diagnosis with ventilator support) for which there were 73,562 discharges in 1992. Using the assumptions developed in an earlier analysis of the potential of freestanding SNFs to provide subacute care,² we estimate that Medicare could have saved at least \$99.3 million per year by treating these patients in SNFs. A second group of patients who could be treated in SNFs that provide ventilator services are those in other DRGs whose treatment includes the use of ventilation devices. There were 3,587 such patients in 1992, half of whom were in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses). If we focus only on the tracheostomy patients, our estimate is that

¹ Under present law, respiratory therapy in SNFs is provided by employees of hospitals. The CBO did not include any savings that could be realized if SNFs directly provided these services and did not pay a markup for the services provided by hospitals. This report also does not address this source of savings, although it is likely to be a substantial offset to the utilization increases anticipated by the CBO.

² Subacute Care in Freestanding Skilled Nursing Facilities: An Analysis of Savings to Medicare by Daniel Sherman and Laura Walker. This study, prepared by Abt Associates, was published by the American Health Care Association in 1994.

Medicare could have saved at least \$29.7 million per year if these patients had been treated in SNFs. Excluding the Medicare savings potential from other patients who also receive ventilator treatment but are not in DRGs 475 or 483, Medicare could therefore have saved at least \$129 million per year by using SNFs instead of hospitals. We have also estimated below that Medicare could have saved \$12.8 million if ventilator patients outside of DRGs 475 and 483 were treated in SNFs.

We believe that Medicare could also realize significant savings if patients who require respiratory therapy other than ventilator support were treated in SNFs. Based on the input of clinicians who developed assumptions for this report, at least 327,000 hospital patients could have potentially been treated in SNFs for 1.5 million days in 1992. For these patients, Medicare would conservatively have realized total annual savings of \$302 million annually by treating these patients in a SNF rather than hospital setting.

The potential savings to Medicare treating ventilator patients in SNFs (at least \$142 million annually) easily outweigh the CBO's estimate of increases in expenditures to Medicare of treating patients who do not require ventilator therapy. We believe, however, that Medicare could realize substantial additional savings if these other patients were treated in SNFs as well. In combination with the savings of treating ventilator patients, potential total annual savings to Medicare of using SNFs to treat patients who require respiratory therapy are estimated to be at least \$444 million.

For our analyses, we have used data from the 1992 Medicare Provider Analysis and Review (MEDPAR) file of hospital discharges. This file contains information on patient DRG, ICD-9 primary diagnosis code, length of stay, and reimbursement amount. We have combined these data with the judgement of clinicians familiar with respiratory therapy regarding the share of hospital patients who could be treated at a SNF to obtain an estimate of the total days that patients might be treated in a SNF rather than a hospital. We have then applied estimates of the per-day savings to Medicare of treating different patients in the subacute unit of a freestanding SNF rather than a hospital to estimate total savings to the Medicare program. These estimates of savings assume that hospital DRG payments are appropriately adjusted to account for the early discharge to freestanding SNFs.

Treatment of Ventilator-Dependent Patients

There are two groups of Medicare patients we have identified as requiring ventilator treatment. The first group consists of those patients in DRG 475, respiratory system diagnosis with ventilator support. In 1992, there were a total of 73,572 discharges from this DRG. The second group is those patients outside of DRG 475 whose ICD-9 procedure codes indicated that mechanical ventilation was

used to treat the patient.¹ There were a total of 3,587 discharges in this second group, about half of whom were classified in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses).

Table 1 provides basic information on patients in DRG 475, including a breakdown of the types of conditions from which these patients suffered (in terms of admitting diagnosis). Medicare reimbursements to hospitals were, on average, \$63,704; the mean length of stay for these patients was 14.4 days. In general, the average reimbursement amount and length of stay are similar across the conditions included in this DRG.

As part of Abt Associates' earlier study on the potential of freestanding SNFs to provide subacute care to Medicare patients, a panel of clinicians estimated that half of hospital inpatients in DRG 475 could be transferred to SNFs for subacute care after nine days of hospitalization. In the judgement of clinicians, these patients would be clinically stable and could be treated in the SNF for time that would otherwise be spent in an acute-care hospital setting.

Combining the above assumptions, we estimate that, in 1992, 36,781 patients could have been treated at SNFs for an average of 5.4 days each, or 198,600 days total. As part of Abt's earlier study, it was estimated that hospitals would charge \$900 per day (based on resource costs) to treat these patients during the subacute period, and that SNFs for this same period would charge \$400 per day. Therefore, using properly staffed and equipped SNFs for subacute treatment of ventilator patients in DRG 475 in 1992 would have saved the Medicare program \$500 per day per patient, for a total of \$99.3 million per year.

The estimate that half of patients in DRG 475 could be treated in SNFs is likely to be conservative. As part of this study, a group of clinicians from Integrated Health Services reviewed the conditions listed in Table 1 and made their own judgements on the share of patients who could be treated in subacute SNFs. In making these judgements, they referred to the established treatment protocols currently used by Integrated Health Services in treating of these patients. In addition to three respiratory therapists, these clinicians included two nurse clinical coordinators, a director of nursing and a pulmonologist. The clinicians focused on the eight largest groups of patients (defined in terms of ICD-9 diagnosis) who account for 72 percent of the discharges in the DRG 475. For these patients, the clinicians felt that between 90 and 100 percent of patients in individual groups could be treated in SNFs after five to seven days of hospitalization. If we assume that 90 percent of patients

¹ The codes considered in this report are V46.1 (Other dependence on machines - respirator), 96.70 (continuous mechanical ventilation of unspecified duration), and 96.72 (continuous mechanical ventilation for 96 consecutive hours). The vast majority of these patients (98 percent) were in the V46.1 group.

Table 1
Admitting ICD-9 Codes of Medicare Patients
in DRG 475 (Respiratory System Diagnosis with Ventilator Support)

ICD-9 Code	Description of Admitting ICD-9	Total Number of Medicare Discharges	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
518.81	Respiratory failure	22,658	\$54,230	13.9
486	Pneumonia, organism unspecified	12,703	72,672	15.5
496	Chronic airway obstruction, not elsewhere classified	5,525	72,306	16.4
428.0	Congestive heart failure	3,022	68,626	14.5
799.1	Respiratory arrest	2,763	63,662	11.1
507.0	Pneumonitis due to inhalation of food or vomitus	2,452	56,816	14.1
786.09	Other dyspnea & respiratory abnormalities	2,248	61,081	14.4
518.82	Other pulmonary insufficiency, not elsewhere classified	1,547	65,033	13.6
518.4	Acute edema of lung, unspecified	1,289	60,493	10.4
491.21	Obstructive chronic bronchitis, with mention of acute exacerbation	1,247	59,929	16.6
427.5	Cardiac arrest	1,230	62,636	8.5
389	Hearing loss	877	95,595	16.6
514	Pulmonary congestion & hypostasis	822	64,444	11.3
482.8	Pneumonia due to other specified bacteria	786	55,464	16.8
482.4	Pneumonia due to Staphylococcus	651	56,771	17.1
466.0	Acute bronchitis	634	60,168	15.4
482.1	Pneumonia due to Pseudomonas	630	52,181	19.0
493.90	Asthma, unspecified	584	93,635	15.3
481	Pneumococcal pneumonia [Streptococcus pneumoniae pneumonia]	576	63,175	14.9
415.1	Pulmonary embolism & infarction	492	67,739	10.8
485	Bronchopneumonia, organism unspecified	485	37,976	13.4
493.91	Asthma, unspecified (493.9)	447	66,005	12.3
276.5	Volume depletion (disorders of fluid, electrolyte, & acid based balance)	411	100,328	17.2
786.50	Chest pain, unspecified	406	52,606	13.7
492.8	Other emphysema	401	66,798	15.7
	Other patients in DRG 475	8,676	68,521	14.9
TOTAL		73,562	\$63,704	14.4

in the eight diagnosis groups could be transferred to SNFs for subacute care after seven days of treatment, then Medicare could save \$177 million per year by using SNFs to treat these patients, even assuming that none of the other patients in this DRG could be treated in SNFs. This provides some indication as to how conservative our original estimate of \$99.3 million for this DRG is.

The second group of ventilator dependent patients are those patients outside of DRG 475 whose ICD-9 treatment codes indicated that they received ventilator support; data on these patients by DRG are presented in Table 2. In terms of number of discharges and total days of hospitalization, the largest group of patients are those in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses). Although tracheostomy patients represented half of the discharges included in the table, they represented 65 percent of the overall days of stay for patients in the table and 84 percent of total Medicare reimbursements.⁴

The earlier study by Abt Associates was not able to consider DRG 483.⁵ For this study, the clinicians from Integrated Health Services estimated that 95 percent of tracheostomy patients could be moved to a SNF for subacute care after 13 days at a hospital. Using these assumptions, we estimate that patients in this DRG could have received a total of 98,133 days of treatment at SNFs. Medicare could save \$9.8 million dollars for each \$100 per day reduction in cost by treating these patients in SNFs rather than hospitals. We believe that it would cost hospitals at least \$900 per day to treat these patients and that it would cost SNFs (based on the experience of Integrated Health Services) between \$500 and \$600 per day to treat these patients. Medicare could therefore save at least \$29.7 million per year in treating these tracheostomy patients if we assume that the use of SNFs would cost at least \$300 per day.

In addition to the tracheostomy patients, there were 1,806 other patients outside of DRG 475 whose treatment involved the use of ventilation equipment. These patients were treated for a total of about 68,300 days in hospitals, with an average length of stay of 37.8 days. If 95 percent of these patients could have been moved to a SNF after 13 days of hospital treatment (the same as tracheostomy patients), Medicare would realize an additional total savings of \$12.8 million if the daily savings in using SNFs were \$300.

⁴ Tracheostomy patients have long average lengths of stay (71 days) compared to the other patients included in Table 2 (for whom average length of stay was 38 days).

⁵ The DRG is relatively new and was not included in the 1991 data available for that study. Data for patients who had undergone a tracheostomy would have been included in other DRGs.

Table 2
DRGs of Hospital Patients Who Required Ventilator Support
(ICD-9 Codes V46.1, 96.70, 96.72) Exclusive of Those in
DRG 475 (Respiratory System Diagnosis with Ventilator Support)

DRG Number	DRG Description	Frequency	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
483	Tracheostomy except for face, mouth, & neck diagnoses	1,781	\$81,303	71.0
87	Pulmonary edema & respiratory failure	325	17,946	64.5
88	Chronic obstructive pulmonary disease	136	12,771	70.8
14	Specific cerebrovascular disorders except TIA	130	6,976	15.6
127	Heart failure & shock	106	4,803	13.5
76	Other resp system O.R. procs with cc	88	19,287	42.3
416	Septicemia age > 17	75	6,327	17.3
462	Rehabilitation	73	17,769	51.6
468	Extensive O.R. proc unrelated to principal diagnosis	71	25,719	45.0
148	Major small & large bowel procs with CC	67	20,835	30.3
79	Respiratory infections & inflammations age > 17 with CC	64	9,024	15.5
320	Kidney & urinary tract infections age > 17 with CC	61	4,388	12.7
296	Nutritional & misc metabolic disorders age > 17 with CC	55	3,929	8.0
154	Stomach, esophageal & duodenal procs age > 17 with CC	49	27,049	28.0
1	Craniotomy, age > 17 except for trauma	45	18,695	25.7
107	Coronary bypass without cardiac cath	39	43,651	34.0
89	Simple pneumonia & pleurisy age > 17 with CC	39	7,482	30.4
75	Major chest procedures	35	14,536	20.7
106	Coronary bypass with cardiac cath	34	37,018	29.4
121	Circulatory disorders with AMI & CV comp disch alive	34	6,433	13.0
12	Degenerative nervous system disorders	33	9,742	133.1
101	Other respiratory system diagnosis with CC	23	7,052	47.9
	Other patients requiring ventilator support	224	16,323	23.4
TOTAL		3,587	\$47,902	54.3

Source: Calendar Year 1992 MEDPAR Hospital Database

Patients Requiring Respiratory Therapy Other Than Ventilator Support

For the purposes of this study, clinicians from Integrated Health Services identified specific medical conditions within DRGs (listed in Table 3) that would likely include patients who could be treated in subacute units of SNFs and receive respiratory therapy other than ventilator support. Nearly all of these patients were in DRGs associated with respiratory conditions as chronic obstructive pulmonary disease (DRG 88) and pneumonia (DRGs 79-81, 89-91).⁶

To estimate the share of these patients who could potentially be treated at the subacute unit of a freestanding SNF, the clinicians from Integrated Health Services reviewed data on the six largest groups of patients in the table, which together represented 379,602 discharges in 1992 (88 percent of the total in the table). Based on their experience and review of treatment protocols, the clinicians estimated that between 85 and 95 percent of these patients could be receive subacute SNFs after 4 or 5 days of hospitalization. If we assume that 85 percent of these patients (322,662 discharges) could be transferred to SNFs after 5 days of hospitalization, they could be treated for 1.51 million days at SNFs that provided respiratory therapy as part of subacute care. Medicare could potentially realize substantial savings by transferring these patients to SNFs at an appropriate point in their hospital stay. Based on our earlier estimates of differences in daily treatment costs across sites of service, we believe that savings of \$200 per day or \$302 million annually would be conservative for these patients.

Conclusion

This report has examined the potential for Medicare to realize savings by using freestanding SNFs that could provide care to patients whose treatment would include respiratory therapy. Estimate of these savings are presented in Table 4 for different groups of patients. The patients who could be treated at SNFs include those requiring ventilator support, whose cost of treatment is among the highest among Medicare patients. We have estimated under conservative assumptions that Medicare could save at least \$142 million per year if these patients were treated in SNFs. The potential annual savings to Medicare in treating non-ventilator patients in SNFs rather than hospitals are conservatively estimated to be \$302 million. These savings estimates, either individually or in combination, represent a source of potential savings to Medicare that is more than sufficient to offset the increase in expenditures for treating non-ventilator patients estimated by the Congressional Budget Office.

⁶ The following DRGs were included: 68 (otitis media and URI age >17 w cc), 69 (otitis media and URI age >17 w/o cc), 70 (otitis media and URI age 0-17), 79 (respiratory infections and inflammations age >17 w cc), 80 (respiratory infections and inflammations age >17 w/o cc), 81 (respiratory infections and inflammations age 0-17), 87 (pulmonary edema and respiratory failure), 88 (chronic obstructive pulmonary disease), 89 (simple pneumonia and pleurisy age >17 w cc), 90 (simple pneumonia and pleurisy age >17 w/o cc), 91 (simple pneumonia and pleurisy age 0-17).

Table 3
DRG & ICD-9 Codes of Hospital Patients
(Exclusive of Those Requiring Ventilator Support)
Who Could Potentially be Treated by Respiratory Therapists in SNFs

DRG Numbers	ICD-9 Code	ICD-9 Description	Total Number of Medicare Discharges	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
88	491.20	Obstructive chronic bronchitis, w/o mention of acute exacerbation	130,277	\$3,443	7.6
88	491.21	Obstructive chronic bronchitis, with mention of acute exacerbation			
88	494	Bronchiectasis			
88	496	Chronic airway obstruction, not elsewhere classified	105,970	3,678	7.7
79-81	507.0	Pneumonitis due to inhalation of food or vomitus	58,018	6,860	11.7
87	518.81	Respiratory failure	45,244	5,122	9.3
79-81	482.1	Pneumonia due to Pseudomonas	20,088	6,388	12.2
89-91	482.2	Pneumonia due to Hemophilus influenza (H. influenza)			
79-81	482.4	Pneumonia due to Staphylococcus			
79-81	482.0	Pneumonia due to Klebsiella pneumoniae	13,255	6,329	10.7
89-91	482.9	Bacterial pneumonia, unspecified	10,559	4,045	8.6
68-70	487.1	Influenza with pneumonia, with other respiratory manifestations	5,827	2,258	5.8
89-91	480.9	Viral pneumonia, unspecified	4,713	3,768	7.5
89-91	487.0	Influenza with pneumonia	3,262	3,620	7.9
88	491.1	Mucopurulent chronic bronchitis	2,564	3,675	8.1
88	491.8	Other chronic bronchitis			
88	491.9	Unspecified chronic bronchitis			
88	492.1	Other emphysema			
88	493.2	Chronic obstructive asthma (493.2)			
79-81	513.0	Abscess of lung	1,582	6,771	14.8
79-81	510.9	Empyema without mention of fistula	1,524	6,949	15.8
		Other patients requiring respiratory therapy	5,191	4,136	8.3
TOTAL			428,079	\$4,555	9.0

Source: Calendar Year 1992 MEDPAR Hospital Database

Table 4
Estimates of Savings to Medicare of Using SNFs for Respiratory Therapy

Type of Patient	Total 1992 Hospital Discharge	Annual Savings (\$ million)
Ventilator Patients in DRG 475	73,562	\$99.3 - \$177.0
Tracheostomy Patients (DRG 483)	1,781	\$29.7
Other Patients Requiring Ventilator Support	1,806	\$12.8
Other Patients Requiring Respiratory Therapy (No Ventilator Support)	428,079	\$ 302.0
TOTAL	505,228	\$443.8 - \$521.5

The Effect of Home Respiratory Therapy on Hospital Readmission Rates of Patients with Chronic Obstructive Pulmonary Disease

Sue Roselle ACSW and Frank J D'Amico PhD

The South Hills Health System Home Health Agency, Homestead, Pennsylvania, studied the effect of home respiratory therapy on hospital readmission rates in 418 patients with chronic obstructive pulmonary disease (COPD). Respiratory therapists evaluated and followed referred patients in their homes. Oxygen, breathing equipment, and supplies were provided, and patients were educated in use, cleaning, and maintenance of equipment. Data for the study were taken from hospital records, home assessments, and discharge summaries. All patients studied had been hospitalized in the year prior to receiving home respiratory therapy. After 12 months of follow-up, 64% had not been rehospitalized. In the year prior to home respiratory therapy, the average number of hospital admissions per patient had been 1.28, with the average length of hospital stay being 18.25 days. During the home respiratory therapy study period of 12 months, the average number of hospital admissions was 0.48, with the average length of hospital stay being 6.09 days. These results indicate that home care provided by respiratory therapists can significantly reduce the rehospitalization of COPD patients. Prevention of rehospitalization in the study group resulted in estimated average hospital costs savings of \$2,625 per patient for the year. As a result of this study, two large local industrial employers, the Federal Black Lung program, and Blue Cross of Western Pennsylvania have added respiratory therapy to their home health benefits. (Roselle S, D'Amico FJ. The Effect of Home Respiratory Therapy on Hospital Readmission Rates of Patients with Chronic Obstructive Pulmonary Disease. *Respir Care* 1982;27:1194-1199. Key words: Home care services, Hospitalization, Respiratory therapy.)

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The work was completed at the South Hills Health System Home Health Agency, Homestead, Pennsylvania. Research was funded by the Appalachian Regional Commission, Washington DC, with the technical assistance of the Southwestern Pennsylvania Economic Development District; the grant was administered by the United States Department of Health and Human Services. The pilot study of this project was funded by the Christmas Seal League of Southwestern Pennsylvania and by the American Association for Respiratory Therapy.

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Received March 31, 1982; revision received July 8, 1982.

Introduction

As the cost of health care has risen over the past decade, emphasis has emerged on home health services as a humane and cost-effective alternative to acute care. This paper reports the cost-effective provision of home respiratory therapy to patients with chronic obstructive pulmonary disease (COPD) under the auspice of a certified home health agency.

Home respiratory care is not a new concept; traditionally the care has been provided by a home health nurse as a follow-up to education conducted in the acute-care setting.¹ Malkus reported that hospital readmissions were prevented through the provision of nursing care to respiratory patients in their homes but there was no statistical analysis of this finding. Most research on this subject has focused on specific therapeutic modalities applied in the home, such as

Is Respiratory Care Cost Effective?



AMERICAN ASSOCIATION FOR RESPIRATORY CARE
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COST-EFFECTIVENESS OF RESPIRATORY CARE

Increased Need for Respiratory Care Outside of the Acute Care Hospital

Respiratory care is an allied health specialty performed under medical direction for the assessment, treatment, management, diagnostic evaluation, and care of patients with deficiencies, abnormalities, and diseases of the cardiopulmonary system. Respiratory care practitioners care for patients ranging from the premature infant whose lungs are underdeveloped to the elderly patient whose lungs are diseased. Individuals who suffer from such diseases as emphysema, bronchitis and lung cancer; children who suffer from asthma or are afflicted with cystic fibrosis; and patients of all ages who require the use of a ventilator to breathe—they are all often cared for by the respiratory care practitioner.

Home care services have proven to be an integral part of the health care delivery system and a cost-effective alternative to expensive acute care hospital stays. The aging population, the spread of AIDS and tuberculosis, the increasing incidence of asthma, and advances in medical technology allowing technology-dependent patients to lead more productive lives outside the hospital, will increase the need for the services of trained and educated respiratory care practitioners. Respiratory patients will continue to be discharged from the hospital still requiring care, thereby increasing the demand for respiratory care services in alternate sites.

Overall, government health care policy has not kept pace with the advancement of medical technology and procedures. In particular, this has been the case for respiratory care services. When the Medicare/Medicaid program was first developed, respiratory care was fully recognized as a viable component of hospital services. Coverage and reimbursement for this service in the hospital have never been in question. However, Medicare/Medicaid policy has barely advanced in the past 25 years for respiratory care services rendered outside acute care settings. The scope of respiratory care services has developed significantly beyond the hospital setting. Where respiratory patients were once confined to a hospital bed, the same patients may now be cared for in a skilled nursing facility or in the patient's own home. It is the respiratory care community's

recommendation that Congress recognize the role that respiratory care plays in the provision of cost-effective health care in alternate sites.

Respiratory Rehabilitation: A Cost-Effective Alternative

The purpose of rehabilitation is to ameliorate physical and cognitive impairments resulting from illness or injury, and to restore or improve functional ability so that individuals can return to work and lead independent and fulfilling lives. Pulmonary rehabilitation is designed to stabilize or reverse the effects of pulmonary diseases, such as emphysema, bronchitis, or chronic obstructive pulmonary disease (COPD) (i.e. those suffering from a degenerative disease of the lungs). One federal program, the Black Lung Program, has, since 1978, recognized the importance of structured outpatient pulmonary rehabilitation programs. The Coal Mine Procedure Manual states,

"Further, DCMWC (Division of Coal Mine Workers Compensation) believes that properly administered pulmonary rehabilitation will reduce the need for future medical treatment, which would eventually prove more costly to the program."

Respiratory Care Saves Money

The scientific evidence on the cost-effectiveness and efficacy of providing respiratory care in alternate care sites continues to grow. The studies documenting cost-effectiveness of respiratory care have varied in methodology, scope, and time frame. The conclusion, however, is still the same: **respiratory care saves money.**

- A 1991 Lewin/ICF economic analysis focused on the effect of the availability of home medical equipment services on the cost of care for patients in three separate diagnostic categories. One of the categories studied was patients suffering from COPD. Lewin/ICF determined that \$520 per patient per episode would be saved if a COPD patient was to receive care in the home rather than in the hospital. With an estimated patient population of 93,000 COPD patients per year, savings to the health care system amount to over \$48 million per year.
- A recent Gallup survey studied the cost of providing hospital care to chronic ventilator patients. The survey estimates that there are over 11,500 chronic ventilator patients currently in U.S. hospitals costing an estimated \$789 per patient per day. This totals over \$9 million a day! Once a patient is medically able to be discharged, it takes an average of 35 days to place a chronic ventilator-dependent

patient in an alternative care site such as the home or skilled nursing facility. That translates to an excess of \$27,000 per patient in unnecessary hospital costs. Outdated reimbursement policies, which limit patients' access to respiratory care services outside the hospital, contribute to discharge delays and their subsequent excess cost.

- In the early 1980s, the Department of Health, Education and Welfare (HEW) sponsored a study that tracked 775 COPD patients, who received home respiratory services from a qualified respiratory therapist. The results of the study shows that hospital re-admissions for these patients were reduced from 1.28 per year to .55 per year. Furthermore, for those patients who were re-admitted to the hospital, the length of stay was decreased from 18.2 days to 5.7 days. The savings estimated for these 775 patients totaled \$1,097,250 (1980 dollars).
- A 1982 conference headed by former Surgeon General C. Everett Koop on home care alternatives resulted in the initiation of three pilot home care studies. One pilot program in Maryland provided home care to respirator-dependent children and compared hospital costs and home care costs. The savings provided by home respiratory care were more than \$15,000 per patient per month. Over the 34 month period of the pilot program, \$3.1 million in savings were realized due to the availability of home care for these children.
- A 1991 Illinois-based study on ventilator-dependent infants receiving home respiratory care versus hospital-based care saved the state over \$4 million during the four-year course of the program.
- A 1989 consensus conference co-sponsored by the AARC, the Food and Drug Administration (FDA), and the Health Resource Services Administration (HRSA) (attended by representatives from more than 60 national organizations and associations) studied the problems associated with the introduction of respiratory care equipment into the home. Practitioners, consumers, and representatives of the federal government that recommended that third-party reimbursement policies should allow home-bound respiratory patients to receive, when necessary, care from respiratory professionals.

- Aetna Life & Casualty developed an Individual Care Management Program for patients suffering from catastrophic illness. The following chart summarizes cost-effectiveness data for home care for these individuals:

Cost Per Month of Hospital Care Compared to Home Care, Selected Conditions

Condition	Cost of Hospital Care	Cost of Home Care	Dollar Savings	Difference
Infant born w/breathing & feeding problems	\$60,970	\$20,209	\$40,761	66.8%
Respiratory distress/oxygen dependency	\$36,000	\$11,500	\$24,500	68.0%
Ventilator-dependent children	\$15,742	\$ 9,153	\$ 6,589	41.9%
Patient requiring respiratory support	\$24,715	\$ 9,267	\$15,448	62.5%
Oxygen-dependent children with a tracheostomy	\$12,236	\$ 5,304	\$ 6,932	56.7%
AIDS patient care	\$23,190	\$ 2,820	\$20,370	87.8%
Pediatric AIDS	\$70,153	\$16,461	\$53,692	76.5%

- Norwalk Hospital in Connecticut conducted a four year study to evaluate the effectiveness of a hospital-based home care program for patients with severe COPD. A comprehensive home care service program was provided to 17 pulmonary patients who previously required frequent hospitalization. The COPD patients participated in a comprehensive respiratory home care program and showed significant decreases in the following:

Hospitalization Admissions	88 pre-program	53 on-program
Hospital Days	1,181 pre-program	667 on-program
Emergency Room Visit	105 pre-program	64 on-program

Costs for hospitalization, emergency room visits, and home care fell from \$908,031 to \$802,999 resulting in a savings of \$105,032 or \$328 per patient per month over the course of 48 months.

- Several research studies conducted in the past several years have compared inpatient care to home care costs for a specific group of patients. The cost savings data for these studies is summarized in the chart below. The information has been aggregated at a monthly level for purposes of comparison.

Conditions	Per Month Hospital Costs	Per Month Home Care Costs	Per Month Dollar Savings
a. Ventilator dependent adults	\$21,570	\$ 7,050	\$14,520
b. Oxygen dependent children	\$12,090	\$ 5,250	\$ 6,810

(a) Bach, J.R., Intinola, P., Alba, A.S., & Holland, I.E., (1992). The ventilator-assisted individual: cost analysis of institutionalization vs. rehabilitation and in-home management. *Chest*, 101 (2), 26-30.

(b) Fields, A.I., Rosenblatt, A., Pollack, M.M. & Kaufman, J. (1991). Home care cost-effectiveness for respiratory technology-dependent children. *American Journal of Diseases of Children*, 145, 729-733.

**Can Other Health Care Professionals be
Trained to Perform Respiratory Care
Services?**



AMERICAN SOCIETY OF ANESTHESIOLOGISTS

STATEMENT OF SUPPORT FOR RESPIRATORY CARE PRACTITIONERS OCTOBER 1996

Health care organizations have sought to implement the use of substitute caregivers. The American Society of Anesthesiologists is particularly concerned about this trend in the area of respiratory care.

Respiratory care is a highly specialized allied health profession. Respiratory Care Practitioners (RCPs) are trained to care for patients under the supervision of a qualified medical director in multiple clinical settings including home care, subacute care and hospitalized patients. The patients under their care frequently include a disproportionately sicker population than is the case for most other allied health practitioners and RCPs have responsibility for the control of life support equipment in critically-ill patients. RCPs also play an indispensable role in the coordination and utilization of respiratory care services in these multiple settings.

RCPs undergo unique and rigorous formalized training, the programs of which are nationally accredited. They are qualified by a valid and reliable national testing system. They work under the leadership and guidance of a qualified medical director and have done so for many years.

ASA is deeply concerned about the use of other practitioners delivering respiratory care services. The standard of care to patients could be compromised unless these other individuals received the same extensive education, training and competency testing as required of RCPs.

ASA strongly supports the continued use of nationally credentialed Respiratory Care Practitioners working under the supervision of a qualified medical director as they are the most highly qualified health care personnel to deliver respiratory care services to patients.

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NAMDRRC Statement

Non Physician Providers of Respiratory Care Services

In the changing health care system that is currently in progress, NAMDRRC unequivocally supports the premise that respiratory care practitioners are the non-physician care givers who are best qualified by both education and examination to render respiratory care services in the hospital and at alternate sites, including the home. Due to the complex nature of these services and the patient risks involved, respiratory care services should be provided under the direction of a qualified medical director. NAMDRRC has confidence that outcome studies, which are currently in progress, will provide further scientific validation of the benefits attributable to respiratory care practitioners.

The hours of education and the curriculum required for credentialing of a respiratory care practitioner should be the standard for all non-physician providers of respiratory care services. Verification of the knowledge and skills acquired through this educational process should be documented by appropriate testing, which includes input from physicians who specialize in respiratory medicine in the preparation of certifying examinations.

The current educational process required for credentialing of respiratory care practitioners makes them best qualified to carry out orders for respiratory care clinical interventions. Therefore, respiratory care practitioners play a critical and unique role in the coordination and utilization of respiratory care services at all sites, which is essential for appropriate patient care.

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American College of Chest Physicians
Section on Respiratory Care

RESOLUTION

Role of Respiratory Care Practitioners in the Delivery of
Respiratory Care Services

In today's ever-changing health-care field, efforts have been made to decrease costs by having a variety of health-care providers deliver respiratory care services. We are concerned that the quality of these services may be inferior if the health-care provider has not had adequate training and experience. Respiratory care practitioners (RCPs) are particularly qualified to assess patients with respiratory problems and to deliver the various modalities of respiratory care because of their unique educational background and training. Their profession has assured practitioner competence by requiring national accreditation of all training programs. This is supplemented by a national credentialing mechanism, often linked with state licensure. Continued competence is bolstered in almost every state by the legal requirement for continuing education in respiratory care. Further, RCPs provide these services under the direction of a qualified medical director.

Because RCPs have specialized training and experience, they play a vital role in the coordination and utilization of respiratory care services. This role is particularly pertinent in this era of managed care, which has resulted in an increased severity of illness in hospitalized patients, as well as in those cared for in their homes and other out-of-hospital sites. Although other health-care providers may possess the necessary training and experience to deliver simple modalities of respiratory care, the RCP is uniquely qualified to assist the physician in assessing the overall respiratory needs of patients, and in recommending and delivering the necessary care. Respiratory care modalities can be most beneficial and cost-effective when the RCP functions within the guidelines of physician-approved respiratory care protocols.

In order to assure the safety, quality, and appropriateness of respiratory care services delivered to the patients in need, the American College of Chest Physicians strongly endorses the essential role of the competent RCP in providing respiratory care under the direction of a qualified medical director.

CALIFORNIA THORACIC SOCIETY

POSITION PAPER

Respiratory Care At Alternate (Out Of Hospital) Sites

INTRODUCTION

With the changes that are occurring in the health care delivery system increasingly complex care is being delivered to more severely ill patients in settings other than the acute care hospital. These sites include transitional care units, skilled nursing facilities, nursing homes and the patient's home. The ancillary healthcare personnel delivering these services have varying degrees of training. The California Thoracic Society is concerned that some of these personnel are being asked to assess and deliver respiratory care to patients who have problems and needs that the personnel have not been adequately trained to address, presenting a potential risk to the patient. This statement addresses those concerns.

ROLE OF RESPIRATORY CARE PRACTITIONERS

Respiratory Care Practitioners (RCPs) are qualified to assess patients with respiratory problems and to deliver the modalities of respiratory care because of their educational background and training. Although other healthcare providers may possess the necessary training and experience to deliver simple modalities of respiratory care, the RCP is qualified to assist the physician in assessing the overall needs of patients, and recommending and delivering necessary care. This care can be both beneficial to the patient and cost-effective, particularly when done within guidelines of physician-approved respiratory care protocols.

The patients under the care of the RCP are frequently a sicker population than are generally cared for by most other allied healthcare practitioners. RCPs have responsibility for the control of artificial life support equipment and for the assessment of patients with compromised respiratory status. While many of these patients may appear stable, their lack of pulmonary reserve places them in constant jeopardy. The training and the experience of RCPs ensure appropriate care of this fragile patient group.

CONCLUSIONS AND RECOMMENDATIONS

1. Respiratory Care Practitioners are trained to render respiratory care services both in the hospital and at alternate (out of hospital) sites.
2. Respiratory Care Practitioners should function under the direction of a qualified medical director both in the hospital and at alternate sites.*
3. Simple respiratory care services sometimes can be administered by other healthcare practitioners, but these practitioners should be held to the same standards of practice that apply to RCPs.
4. Complex respiratory services should be administered by or under the supervision of RCPs. Any alternative personnel delivering such care should be subject to:
 - a. verification of their education and training,
 - b. demonstration of their knowledge and skills by appropriate testing of competency,
 - c. licensure under their scope of practice to deliver such care.

*Refer to CTS Position Statement "Medical Director of Respiratory Care Services and Pulmonary Function Laboratories" 1996.

Developed for the CTS Clinical Practice Assembly (CPA) Steering Committee Prepared by Jerrold A. Kram, MD May, 1997 Approved by CTS Executive Committee, 1997

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Questions are often raised as to why Respiratory Care Practitioners need to be utilized when nurses could perform the services just as well.

The Indiana University conducted a survey comparing the curriculums of nursing and respiratory therapy educational programs. The study was to compare the number of hours nurses and Respiratory Care Practitioners were trained in respiratory care subjects. The following two documents report the results.





CENTER FOR
SURVEY RESEARCH

Report on the Health Professions Curriculum Study

Survey Description

The Indiana University Center for Survey Research (CSR) in Bloomington, Indiana conducted the Health Professions Curriculum Study for the American Association for Respiratory Care (AARC). The main purpose of the survey was to determine the number of contact hours in nursing schools and respiratory therapy programs dedicated to specific aspects of respiratory care training. The survey was pretested from December 2, 1993, through January 5, 1994. Twenty-five nursing schools and 15 respiratory therapy programs were randomly selected to serve as the pretest respondents. The information gathered from those pretest surveys led to minor modifications to the final questionnaire.

The nursing sample was put together using a computer diskette purchased from the National League for Nursing (NLN). The NLN database contained 1621 institutions. In the process of assuring that the mailing information met United States Postal Service standards, it was determined that there was a great deal of duplication. If the same institution was listed more than once but had some differing information, the institution was called to determine the person and address to whom the questionnaire should be sent. Following the telephone calls, the correct information was entered into the database.

and duplicate programs were removed. After these procedures, the list was reduced to 1504 institutions. The respiratory therapy program list of 323 institutions was provided by AARC.

The survey was conducted from February 14, 1994, through June 24, 1994. Of the 1504 institutions sent nursing questionnaires, four turned out to be part of another eligible institution and thus were duplicates. Six were ineligible because their nursing program was closed or in the process of closing. A total of 23 institutions turned out not to have an entry-level nursing program resulting in an Associate, Three-Year, or Baccalaureate Degree. The result was that a total of 1471 institutions were eligible for participation in the survey. Of the eligible programs, 1077 surveys were returned. Repeated attempts were made to convince the remaining institutions to return their surveys. At the end of the survey, 73.2% of eligible programs had returned their questionnaires. This is a very good response rate for a mail survey. Of the respondents to the nursing phase of the survey, 637 offered an Associate Degree Nursing Program, 79 had a Three-Year Nursing Degree Program, 360 had a Baccalaureate Degree Program, one had a program that could not be classified into any of the three groups.

Of the 323 respiratory therapy programs sent questionnaires, one did not have either a Respiratory Therapy Technician Program or a Certified Respiratory Therapy Program and was thus ineligible. Three other programs were closed or in the process of closing. This left 319 programs eligible for participation in the survey. Of those eligible programs, 223 returned questionnaires. The other 96 failed to return their questionnaires despite repeated attempts to get them to do so. Of the eligible programs 70% returned their questionnaires. This, too, is a good response rate for this type of survey. Of the programs responding, 96 offered Respiratory Therapy Technician Programs and 182 offered Respiratory Therapist

Programs. The total number adds up to more than 223 because 55 offered both types of programs.

Results

The survey attempted to elicit the number of contact hours spent by each program on various subjects in three different settings. Results for these questions are outlined in Tables 1 through 3. These tables contain information on the mean number of hours spent on each subject. The tables also include the number of programs that provided a valid response for each question. There is a great deal of variation in the number of programs responding to different questions. Many respondents did not fill in an answer for numerous questions that applied to their programs.

From the responses that were provided, Tables 1 and 2 show that the mean number of hours spent on various subjects having to do with respiratory care was considerably higher in the respiratory therapy programs than in the nursing programs. Nursing programs spend an average of less than an hour of classroom time on all subjects except oxygen therapy, mechanical ventilators, arterial blood gas analysis, intubation and extubation, and hemodynamic monitoring. They spend even less time on the examined respiratory care subjects in a nonclinical laboratory setting. In a number of subjects, respiratory therapy students spend well over ten times more contact hours than nursing students.

Table 3 mostly follows the patterns in Tables 1 and 2. Overall, both nursing schools and respiratory therapy programs that answer the questions indicate that they spend more time on respiratory care procedures in a clinical experience/practice setting than in either a classroom or nonclinical laboratory setting. There are some subjects in which the means for Three-

Year Nursing Programs are higher than the means for respiratory therapy programs. A closer examination of the responses for these questions reveals that part of the reason for this is due to a small number of programs indicating that they spend a large number of hours on these subjects in a clinical experience/practice setting. In all cases in which Three-Year Nursing Programs have a higher mean than respiratory therapy programs, the standard deviation is greater than the mean. This indicates that most of the programs are offering considerably fewer hours than the mean, but a handful are offering considerably more than the mean. For example, in the area of chest physiotherapy, three of the Three-Year Nursing Programs gave the responses 215, 416, and 960 contact hours to the question. Of the other 21 programs answering the question, the next highest was 32 hours, and the next one after that was 16 hours. The means of the respiratory therapy programs were a better indicator of what the typical program was doing. Respiratory therapy programs had standard deviations lower than the mean and were determined far less by the extreme values of a few programs. Thus, the exception does not really challenge the general finding that respiratory therapy programs spend considerably more time on subjects having to do with respiratory care than nursing programs in a variety of pedagogical settings.

The general findings in Tables 1 through 3 are reinforced by an examination of Tables 4 through 6. As noted above, many respondents did not answer questions that applied to their programs. Tables 4 through 6 list the percentage and number of respondents leaving blank a question that applied to their program. In computing the percentages, programs that failed to answer any of the questions regarding the amount of contact hours spent on particular subjects in any of the three settings were excluded. Twenty of the Associate Degree Nursing Programs left the entire section on contact hours blank. This left 617 respondents who

answered some of the questions. Six of the respondents with Three-Year Nursing Programs left all questions on contact hours blank, leaving 73 that answered some of the questions. Of the respondents with a Bachelor's Degree Nursing Program, 37 did not answer any of the contact hour questions, while 323 answered some. Far fewer of the respiratory care programs left these sections totally blank. Two of the Respiratory Therapy Technician Programs left the contact hour section blank, leaving 94 that answered some of them. Only one of the respondents with a Respiratory Therapist Programs left the relevant section blank, while 181 answered some of the questions.

Because of the ambiguity of leaving a question blank, the programs that did this were not included when means were computed. Given that the relevant questions about contact hours were all located on a single page, it is likely the case that many of the respondents who provided an answer to one of the questions left other ones blank because their program did not provide any training in that area. Thus, the mean number of hours in Tables 1 through 3 is probably an overestimate of the mean number of hours for all the programs that responded to the study. A look at Tables 4 through 6 shows that nursing programs were far more likely to leave answers to questions unanswered than were respiratory therapy programs. The percent left blank exceeds ten percent for respiratory therapy programs in only three categories and only for Respiratory Therapy Technician Programs. For the nursing programs, the percent left blank exceeds ten percent in all subjects and all settings except for a few subjects in the didactic or classroom setting. It is important to reiterate that these cases are not included when the mean is calculated in Tables 1 through 3. In a number of areas, the number of nursing programs leaving a question blank exceeds half of the total respondents.

In sum, the results of the survey show that respiratory therapy programs spend considerably more time training people in respiratory care than nursing programs. The survey also indicates that many nursing programs provide little or no training in many respiratory care subject areas.

Table 1. Mean Time Spent Teaching 15 Selected Subjects (in hours). Didactic or Classroom Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	2.1 (525)	2.4 (67)	2.1 (263)	20.3 (88)	18.7 (168)
Mechanical Ventilators	1.3 (484)	2.1 (62)	1.3 (254)	41.3 (85)	44.9 (164)
Chest Physiotherapy	.9 (460)	.7 (60)	.9 (255)	8.0 (84)	6.1 (166)
Intermittent Positive Pressure Breathing (IPPB)	.6 (402)	.5 (51)	.5 (100)	9.4 (84)	6.5 (165)
Continuous Positive Airway Pressure (CPAP)	.5 (393)	.6 (57)	.5 (226)	6.1 (82)	6.0 (164)
Incentive Spirometry	.6 (452)	.5 (61)	.6 (195)	4.3 (84)	3.2 (165)
Aerosolized Drug Administration	.7 (406)	.4 (53)	.6 (218)	14.7 (83)	12.2 (160)
Metered Dose Inhalers	.4 (390)	.4 (55)	.5 (219)	4.7 (79)	4.0 (154)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	.8 (467)	.9 (59)	.7 (239)	5.1 (84)	6.0 (168)
Pulmonary Function Testing	.8 (451)	.7 (61)	.6 (247)	15.1 (87)	20.9 (169)
Respiratory Home Care	.4 (357)	.4 (43)	.7 (205)	7.2 (85)	10.4 (165)
Arterial Puncture	.3 (322)	.3 (50)	.4 (205)	5.7 (84)	4.5 (160)
Arterial Blood Gas Analysis	2.0 (513)	2.2 (64)	2.0 (272)	14.1 (82)	12.0 (164)
Intubation and Extubation	.8 (435)	1.0 (57)	1.0 (230)	7.6 (85)	8.0 (166)
Hemodynamic Monitoring	1.5 (469)	2.2 (61)	1.9 (262)	5.4 (85)	17.0 (172)

Table 2. Mean Time Spent Teaching 15 Selected Subjects (in hours). Nonclinical Laboratory Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	1.6 (349)	1.4 (43)	1.5 (209)	16.5 (86)	13.2 (165)
Mechanical Ventilators	.7 (262)	1.3 (33)	.7 (152)	31.0 (84)	33.0 (167)
Chest Physiotherapy	.7 (248)	.7 (26)	.7 (160)	7.7 (83)	5.8 (166)
Intermittent Positive Pressure Breathing (IPPB)	.2 (213)	.8 (20)	.2 (123)	9.4 (83)	6.3 (165)
Continuous Positive Airway Pressure (CPAP)	.2 (206)	.3 (20)	.2 (123)	6.2 (79)	4.6 (160)
Incentive Spirometry	.5 (264)	.7 (28)	.6 (156)	5.2 (81)	3.2 (160)
Aerosolized Drug Administration	.6 (228)	.2 (20)	.2 (125)	9.3 (83)	6.2 (159)
Metered Dose Inhalers	.3 (219)	.3 (26)	.4 (133)	4.2 (78)	2.9 (145)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	.3 (229)	.2 (27)	.4 (146)	4.6 (81)	3.8 (157)
Pulmonary Function Testing	.1 (198)	.2 (15)	.2 (123)	9.9 (82)	11.8 (163)
Respiratory Home Care	.1 (206)	0 (16)	.2 (117)	3.7 (73)	3.2 (142)
Arterial Puncture	.2 (216)	.3 (18)	.2 (130)	7.5 (83)	5.1 (159)
Arterial Blood Gas Analysis	.9 (248)	.9 (29)	.7 (136)	4.8 (70)	4.2 (146)
Intubation and Extubation	.3 (235)	.7 (26)	.4 (136)	8.5 (82)	7.0 (166)
Hemodynamic Monitoring	.6 (231)	1.0 (31)	1.0 (143)	3.8 (70)	5.9 (156)

Table 3. Mean Time Spent Teaching 15 Selected Subjects (in hours). Clinical Experience/Practice Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	20.1 (231)	68.7 (31)	23.6 (153)	57.3 (74)	67.4 (142)
Mechanical Ventilators	9.7 (246)	41.6 (36)	14.3 (148)	127.5 (74)	227.8 (142)
Chest Physiotherapy	6.4 (199)	70.3 (24)	9.3 (116)	34.7 (72)	42.4 (142)
Intermittent Positive Pressure Breathing (IPPB)	3.2 (180)	2.4 (19)	3.2 (104)	29.5 (72)	30.9 (140)
Continuous Positive Airway Pressure (CPAP)	3.4 (181)	19.0 (26)	6.9 (110)	22.6 (71)	41.0 (132)
Incentive Spirometry	11.9 (216)	79.7 (27)	12.7 (126)	32.1 (72)	39.0 (142)
Aerosolized Drug Administration	6.1 (184)	48.5 (22)	3.6 (111)	72.6 (70)	80.2 (136)
Metered Dose Inhalers	7.3 (177)	66.8 (25)	4.2 (105)	33.5 (70)	48.2 (135)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	8.8 (225)	115.4 (32)	14.3 (140)	29.1 (73)	55.0 (136)
Pulmonary Function Testing	1.3 (180)	55.9 (23)	1.3 (100)	21.2 (74)	41.2 (151)
Respiratory Home Care	.8 (183)	22.7 (23)	3.0 (100)	12.7 (80)	25.1 (155)
Arterial Puncture	1.8 (191)	18.3 (25)	1.5 (114)	35 (68)	50.3 (135)
Arterial Blood Gas Analysis	8.4 (223)	91.1 (29)	9.7 (133)	34.2 (66)	52.9 (136)
Intubation and Extubation	3.4 (190)	16.5 (29)	6.7 (109)	22.7 (72)	40.9 (141)
Hemodynamic Monitoring	7.6 (197)	45.5 (36)	14.7 (134)	11.7 (69)	49.0 (141)

Table 4. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Didactic or Classroom Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	6.8 % (42)	4.1 % (3)	11.1 % (36)	3.1 % (3)	3.9 % (7)
Mechanical Ventilators	11.3 % (70)	9.6 % (7)	14.2 % (46)	3.1 % (3)	5.0 % (9)
Chest Physiotherapy	14.1 % (87)	12.3 % (9)	13.9 % (45)	4.1 % (4)	4.4 % (8)
Intermittent Positive Pressure Breathing (IPPB)	16.2 % (100)	17.8 % (13)	19.8 % (64)	4.1 % (4)	4.4 % (8)
Continuous Positive Airway Pressure (CPAP)	18.5 % (114)	16.4 % (12)	18.9 % (61)	4.1 % (4)	3.9 % (7)
Incentive Spirometry	12.2 % (75)	11.0 % (8)	15.5 % (50)	3.1 % (3)	5.5 % (10)
Aerosolized Drug Administration	16.5 % (102)	16.4 % (12)	20.1 % (65)	3.1 % (3)	4.4 % (8)
Metered Dose Inhalers	19.0 % (117)	12.3 % (9)	19.5 % (63)	4.1 % (4)	4.4 % (8)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	12.6 % (78)	15.1 % (11)	17.3 % (56)	4.1 % (4)	4.4 % (8)
Pulmonary Function Testing	13.5 % (83)	13.7 % (10)	15.2 % (49)	3.1 % (3)	3.9 % (7)
Respiratory Home Care	25.0 % (154)	31.5 % (23)	25.8 % (81)	5.2 % (5)	6.1 % (11)
Arterial Puncture	22.0 % (136)	19.2 % (14)	25.4 % (82)	5.2 % (5)	6.1 % (11)
Arterial Blood Gas Analysis	6.5 % (40)	5.5 % (4)	10.2 % (33)	5.2 % (5)	5.0 % (9)
Intubation and Extubation	17.8 % (110)	13.7 % (10)	21.1 % (68)	3.1 % (3)	5.0 % (9)
Hemodynamic Monitoring	14.1 % (87)	12.3 % (9)	13.3 % (43)	4.1 % (4)	3.3 % (6)

Table 5. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Nonclinical Laboratory Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	37.4% (231)	38.4% (28)	31.0% (100)	4.1% (4)	6.1% (11)
Mechanical Ventilators	48.8% (301)	46.6% (34)	43.7% (141)	4.1% (4)	5.0% (9)
Chest Physiotherapy	51.5% (318)	52.1% (38)	43.3% (140)	4.1% (4)	5.0% (9)
Intermittent Positive Pressure Breathing (IPPB)	54.1% (334)	56.2% (41)	49.5% (160)	4.1% (4)	5.0% (9)
Continuous Positive Airway Pressure (CPAP)	55.1% (340)	57.5% (42)	51.4% (166)	6.2% (6)	5.5% (10)
Incentive Spirometry	48.8% (301)	49.3% (36)	44.3% (143)	6.2% (6)	6.1% (11)
Aerosolized Drug Administration	52.7% (325)	61.6% (45)	50.8% (164)	6.2% (6)	5.5% (10)
Metered Dose Inhalers	54.9% (339)	54.8% (40)	49.2% (159)	6.2% (6)	8.3% (15)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	53.3% (329)	53.4% (39)	45.5% (147)	7.2% (7)	6.6% (12)
Pulmonary Function Testing	59.0% (364)	60.3% (44)	51.4% (166)	6.2% (6)	5.0% (9)
Respiratory Home Care	56.7% (350)	65.8% (48)	52.6% (170)	9.3% (9)	9.4% (17)
Arterial Puncture	55.8% (344)	64.4% (47)	50.5% (163)	6.2% (6)	6.1% (11)
Arterial Blood Gas Analysis	51.5% (318)	52.1% (38)	47.1% (152)	12.4% (12)	9.4% (17)
Intubation and Extubation	52.8% (326)	56.2% (41)	48.3% (156)	6.2% (6)	5.0% (9)
Hemodynamic Monitoring	54.3% (335)	50.7% (37)	46.7% (151)	11.3% (11)	5.5% (10)

Table 6. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Clinical Experience/Practice Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	25.1% (155)	23.3% (17)	20.1% (65)	7.2% (7)	7.2% (13)
Mechanical Ventilators	27.9% (172)	20.5% (15)	23.5% (76)	6.2% (6)	7.2% (13)
Chest Physiotherapy	34.6% (214)	32.9% (24)	35.0% (113)	7.2% (7)	7.7% (14)
Intermittent Positive Pressure Breathing (IPPB)	38.2% (236)	38.4% (28)	36.8% (119)	8.2% (8)	7.2% (13)
Continuous Positive Airway Pressure (CPAP)	37.6% (232)	30.1% (22)	35.0% (113)	6.2% (6)	8.3% (15)
Incentive Spirometry	29.8% (184)	26.0% (19)	30.7% (99)	7.2% (7)	7.7% (14)
Aerosolized Drug Administration	36.1% (223)	34.2% (25)	34.7% (112)	7.2% (7)	7.7% (14)
Metered Dose Inhalers	37.3% (230)	30.1% (22)	35.6% (115)	7.2% (7)	8.8% (16)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	28.8% (178)	20.5% (15)	27.9% (90)	7.2% (7)	8.8% (16)
Pulmonary Function Testing	41.0% (253)	32.9% (24)	39.6% (128)	7.2% (7)	7.2% (13)
Respiratory Home Care	42.8% (264)	45.2% (33)	41.5% (134)	4.1% (4)	7.2% (13)
Arterial Puncture	40.8% (252)	38.4% (28)	39.0% (126)	9.3% (9)	8.3% (15)
Arterial Blood Gas Analysis	30.3% (187)	26.0% (19)	28.5% (92)	12.4% (12)	9.9% (18)
Intubation and Extubation	39.5% (244)	30.1% (22)	36.2% (117)	7.2% (7)	8.3% (15)
Hemodynamic Monitoring	33.4% (206)	24.7% (18)	28.8% (93)	9.3% (9)	7.2% (13)

Medical Personnel's Knowledge of and Ability To Use Inhaling Devices. Metered-Dose Inhalers, Spacing Chambers, and Breath-Actuated Dry Powder Inhalers—Hanania NA, Wittman R, Kesten S, Chapman KR. Chest 1994;105(1):111-116

BACKGROUND: Current treatment strategies for asthma and chronic obstructive pulmonary disease (COPD) emphasize the inhalation route, yet patients often misuse metered-dose inhalers (MDI). To address this problem, patient education by medical personnel has been recommended and a variety of alternate inhaler devices have been developed. **METHODS:** We surveyed medical personnel to assess their knowledge of and ability to use three widely used inhaler devices; MDI, MDI with a spacing chamber (Aerochamber, Trudell Medical, Canada), and a breath-actuated multidose dry powder inhaler (Turbuhaler, Astra Pharmacy, Inc., Canada). Thirty respiratory therapists (RT), 30 registered nurses (RN), and 30 medical house staff physicians (MD) were asked to demonstrate the use of each device using placebo inhalers and to answer 11 clinically relevant questions related to the use and maintenance of the tested devices. **RESULTS:** The RT's percent mean knowledge score ($67 \pm 5\%$) was significantly higher than those achieved by either the RNs ($39 \pm 7\%$) or the MDs ($48 \pm 7\%$) (for all $p < 0.0001$). Similarly, percent mean demonstration scores for each device were significantly higher for RTs than either RN or MD groups; for MDI, $97 \pm 3\%$ versus $82 \pm 13\%$ and $69 \pm 24\%$, respectively ($p < 0.0001$); for the Aerochamber, $98 \pm 2\%$ versus $78 \pm 20\%$ and $57 \pm 31\%$ ($p < 0.0001$); and for the Turbuhaler, $60 \pm 30\%$ versus $12 \pm 23\%$ and $21 \pm 30\%$ ($p < 0.0001$). Knowledge of and practical skills with the devices were roughly proportional to the length of time the device had been in clinical use, Turbuhaler demonstration scores being lower than either MDI or Aerochamber scores ($p = 0.05$ and $p = 0.09$, respectively). More RTs (77%) had received formal instruction on the use of devices at school than either RNs (30%) or MDs (43%) ($p < 0.05$). **CONCLUSION:** We conclude that (1) many

medical personnel responsible for monitoring and instructing patients in optimal inhaler use lack rudimentary skills with these devices, (2) nurses and physicians seldom receive formal training in the use of inhaling devices, and (3) newer inhaling devices designed to obviate problems of technique are at present less likely to be used well by medical personnel soon after their introduction.

Incorrect Use of Metered Dose Inhalers by Medical Personnel—Guidry GG, Brown WD, Stogner SW, George RB. Chest 1992;101(1):31-33

We administered a questionnaire and observed usage of a placebo metered dose inhaler (MDI) among 35 physicians, 14 nurses, and 12 respiratory therapists. Ninety-two percent of the respiratory therapists performed at least four of seven steps correctly, compared with 65% of house staff physicians, 57% of nurses, and 50% of nonpulmonary faculty. Most participants followed package insert instructions, while only 18% followed recent recommendations for proper MDI use. We conclude that (1) medical personnel should have additional instruction in proper MDI usage and (2) respiratory therapists and nurses can play a prominent role in instructing patients in their proper use.

Short- and Long-Term Retention of a Nursing Home Education Program on Metered-Dose Inhaler Technique—O'Connell MB, Hewitt JM, Lackner TE, Pastor JD 3d, Wong MT, Bishop AL. Ann Pharmacother 1992;26(7-8):980-984

OBJECTIVE: To evaluate an education program on metered-dose inhaler (MDI) technique designed for nurses and trained medication aides (TMAs). **DESIGN:** The education program included a handout, a lecture incorporating a videotape on correct inhaler and device technique, and hands-on experience with placebo inhalers. The participants' ability to verbalize and demonstrate correct MDI technique was assessed by the same two-person

teams before, immediately after, and two months after the program. SETTING: Five nursing homes. PARTICIPANTS: Fifty-six nurses and TMAs practicing in nursing homes. MAIN OUTCOME MEASURES: Learning and retention. RESULTS: The participants' mean ($\pm$ SD) verbal and demonstration scores increased immediately after the program by 68 ± 18 points for verbalization and 47 ± 16 points for demonstration. The participants were always better at demonstrating than verbalizing MDI technique. The participants' baseline verbal and demonstration scores correlated with the amount learned. Learning was influenced by the individual nursing home (verbal and demonstration) and personal use (demonstration only), but not by academic degree, previous training, past instruction of a patient, or current care of a patient who was receiving inhaler therapy. After two months, the scores were lower than immediately after the program test by 0-92 points for verbalization and 10-80 points for demonstration; however, the mean scores were still significantly greater ($p < 0.05$) than the baseline scores. Retention of knowledge on the correct technique was greater for the demonstration component. Retention was influenced only by the nursing home in which the participant worked, and not any of the other variables. CONCLUSIONS: Our structured education program significantly improved inhaler technique; however, to maintain retention of the material, the program should be frequently repeated.

Metered-Dose Inhalers. Do Health Care Providers Know What To Teach?—

Intenano B, Guntupalli KK. Arch Intern Med 1993;153(1):81-85

OBJECTIVE: The specific aim of this investigation was to evaluate the proficiency of health care providers and patients in the proper use of metered-dose inhalers. DESIGN, SETTING, AND PARTICIPANTS: Health care providers, which include house staff, nurses, and respiratory care practitioners who provide care to patients with asthma in the primary general medicine clinic or the pulmonary medicine clinic of a university-county

hospital in which patients were referred, were surveyed and assigned a performance score regarding the knowledge base of the appropriate use of metered-dose inhalers. Patients who attended the primary care general medicine and pulmonary subspecialty clinic were also assessed as to their proficiency in the use of metered-dose inhalers. RESULTS: A significant percentage of patients had a poor understanding of the technique used with the metered-dose inhaler. House staff and nursing staff were also less proficient in the proper use of the metered-dose inhaler. The respiratory care practitioners were the most knowledgeable of the health care providers. CONCLUSIONS: This study confirms that a large percentage of patients use metered-dose inhalers improperly. It also demonstrates a significant lack of understanding by health care providers of the proper use of metered-dose inhalers. Furthermore, this study supports the use of respiratory care practitioners in the outpatient setting, since they were the most proficient among all the health care providers in the proper use of metered-dose inhalers.

Importance of Assessment of Metered-Dose Inhaler Technique in the Elderly—Daniels S, Meuleman J. J Am Geriatr Soc 1994;42(1):82-84.

Metered-dose inhalers (MDIs) are effective in the treatment of chronic obstructive pulmonary disease. There is evidence, however, that the majority of patients have poor technique and, therefore, are not receiving optimal drug therapy. The following case illustrates the importance of patient instruction in the use of MDI by healthcare providers who deal with the aged.

Appendix 2

Detailed Tables Regarding Respiratory Services

RT-1 Summary of SNF Claims for Respiratory Services by Primary Diagnosis: Top 100 Diagnoses in 1996 by Total Paid Only

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days	Average # of Secondary Diagnoses	Cumulative % of Days	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Days	% of Patients	% of Services	% of Charges	% of Paid	Rank	Average Days	Average Paid	Paid per Day
ALL	ALL DIAGNOSES	363,160	\$1,151	\$386	580,940	8,195,360	3.7	0%	0%	0%	0%	100%	100%	100%	100%	100%	0	22.6	\$1,062	\$47
486	PNEUMONIA	30,780	\$103	\$35	45,740	604,320	3.4	7%	8%	9%	9%	7%	8%	8%	9%	9%	1	19.6	\$1,148	\$58
496	CHRONIC AIRWAY OBSTRUCTION	18,060	\$90	\$30	32,240	448,380	2.7	13%	13%	17%	17%	5%	5%	6%	8%	8%	2	24.8	\$1,644	\$66
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR D	19,420	\$70	\$23	31,980	531,940	2.5	19%	19%	23%	23%	6%	5%	6%	6%	6%	3	27.4	\$1,181	\$43
428	HEART FAILURE	25,260	\$65	\$23	37,180	513,540	3.4	26%	25%	28%	29%	6%	7%	6%	6%	6%	4	20.3	\$899	\$44
V57	CARE INVOLVING USE OF REHABILITATION PROC	35,920	\$56	\$19	43,040	508,980	5.7	32%	33%	33%	34%	8%	10%	7%	5%	5%	5	14.2	\$624	\$37
820	FRACTURE OF NECK OF FEMUR	19,620	\$48	\$18	27,860	454,000	3.4	37%	38%	37%	38%	6%	5%	5%	4%	5%	6	23.1	\$901	\$39
518	OTHER DISEASES OF LUNG	7,660	\$60	\$15	12,880	175,260	3.4	39%	40%	43%	42%	2%	2%	2%	5%	4%	7	22.9	\$1,939	\$85
491	CHRONIC BRONCHITIS	8,020	\$21	\$9	10,400	110,460	4.2	41%	42%	45%	44%	1%	2%	2%	2%	2%	8	13.8	\$1,063	\$77
250	DIABETES MELLITUS	7,140	\$23	\$8	11,600	189,000	3.2	43%	44%	47%	47%	2%	2%	2%	2%	2%	9	26.5	\$1,116	\$42
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	6,240	\$24	\$7	8,880	124,280	4.7	45%	45%	49%	48%	2%	2%	2%	2%	2%	10	19.9	\$1,195	\$60
599	OTHER DISORDERS OF URETHRA AND URINARY	6,460	\$18	\$7	9,600	155,440	3.3	47%	47%	50%	50%	2%	2%	2%	2%	2%	11	24.1	\$1,105	\$46
780	GENERAL SYMPTOMS	7,260	\$19	\$7	10,140	151,600	3.2	48%	48%	52%	52%	2%	2%	2%	2%	2%	12	20.9	\$926	\$44
482	OTHER BACTERIAL PNEUMONIA	7,880	\$21	\$6	9,540	110,620	5.0	50%	50%	54%	53%	1%	2%	2%	2%	2%	13	14.0	\$808	\$58
V68	ENCOUNTER FOR OTHER AND UNSPECIFIED PRO	14,360	\$21	\$6	16,900	193,360	5.5	52%	53%	56%	55%	2%	4%	3%	2%	2%	14	13.5	\$426	\$32
162	MALIGNANT NEOPLASM OF TRACHEA	5,760	\$18	\$5	7,940	99,280	3.6	53%	54%	57%	56%	1%	2%	1%	2%	1%	15	17.2	\$949	\$55
707	CHRONIC ULCER OF SKIN	4,200	\$16	\$5	6,200	109,800	3.9	55%	55%	59%	58%	1%	1%	1%	1%	1%	16	28.1	\$1,087	\$42
276	DISORDERS OF FLUID	5,400	\$21	\$5	7,320	106,520	3.2	56%	57%	60%	59%	1%	1%	1%	1%	1%	17	19.7	\$840	\$43
799	OTHER ILL-DEFINED AND UNKNOWN CAUSES OF	3,240	\$13	\$4	5,280	70,360	2.4	57%	58%	61%	60%	1%	1%	1%	1%	1%	18	21.7	\$1,328	\$61
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART D	5,940	\$11	\$4	7,900	98,020	3.8	58%	59%	62%	61%	1%	2%	1%	1%	1%	19	16.5	\$708	\$43
38	SEPTICEMIA	5,340	\$15	\$4	6,800	89,080	4.9	59%	60%	63%	62%	1%	1%	1%	1%	1%	20	18.7	\$753	\$45
427	CARDIAC DYSRHYTHMIAS	3,960	\$10	\$4	5,440	74,340	3.5	60%	61%	64%	63%	1%	1%	1%	1%	1%	21	18.8	\$895	\$48
410	ACUTE MYOCARDIAL INFARCTION	4,820	\$9	\$3	6,060	77,980	4.1	61%	62%	65%	64%	1%	1%	1%	1%	1%	22	16.2	\$709	\$44
401	ESSENTIAL HYPERTENSION	2,700	\$10	\$3	4,540	73,960	2.3	62%	63%	66%	65%	1%	1%	1%	1%	1%	23	27.4	\$1,254	\$46
434	OCCCLUSION OF CEREBRAL ARTERIES	4,160	\$9	\$3	4,920	75,380	5.1	63%	64%	66%	65%	1%	1%	1%	1%	1%	24	18.1	\$641	\$35
715	OSTEOARTHRITIS AND ALLIED DISORDERS	5,440	\$7	\$3	6,380	89,480	3.5	64%	65%	67%	66%	1%	1%	1%	1%	1%	25	12.8	\$475	\$37
733	OTHER DISORDERS OF BONE AND CARTILAGE	3,080	\$7	\$3	4,220	63,320	4.0	64%	66%	67%	67%	1%	1%	1%	1%	1%	26	20.8	\$826	\$40
787	SYMPTOMS INVOLVING DIGESTIVE SYSTEM	2,220	\$7	\$3	3,300	51,760	3.1	65%	66%	68%	67%	1%	1%	1%	1%	1%	27	23.3	\$1,132	\$49
578	GASTROINTESTINAL HEMORRHAGE	2,380	\$7	\$2	3,500	50,060	3.4	66%	67%	69%	68%	1%	1%	1%	1%	1%	28	21.2	\$1,056	\$50
438	LATE EFFECTS OF CEREBROVASCULAR DISEASE	2,200	\$7	\$2	3,380	59,840	3.4	66%	67%	69%	68%	1%	1%	1%	1%	1%	29	27.2	\$1,105	\$41
786	SYMPTOMS INVOLVING RESPIRATORY SYSTEM A	1,900	\$7	\$2	2,800	40,320	3.2	67%	68%	70%	69%	0%	1%	0%	1%	1%	30	21.2	\$1,252	\$59
493	ASTHMA	1,780	\$7	\$2	2,340	32,120	3.6	67%	68%	71%	70%	0%	0%	0%	1%	1%	31	18.0	\$1,336	\$74
290	SENILE AND PRESENILE ORGANIC PSYCHOTIC C	2,120	\$7	\$2	3,020	56,900	2.7	68%	69%	71%	71%	1%	1%	1%	1%	1%	32	26.8	\$1,105	\$41
821	FRACTURE OF OTHER AND UNSPECIFIED PARTS	2,240	\$6	\$2	3,240	55,020	3.3	69%	69%	72%	71%	1%	1%	1%	1%	1%	33	24.6	\$1,043	\$42
805	FRACTURE OF VERTEBRAL COLUMN WITHOUT M	1,980	\$6	\$2	2,920	46,300	3.2	69%	70%	72%	72%	1%	1%	1%	0%	1%	34	23.4	\$1,123	\$48
808	FRACTURE OF PELVIS	2,400	\$5	\$2	3,260	52,840	3.5	70%	70%	73%	72%	1%	1%	1%	0%	1%	35	22.0	\$839	\$38
466	ACUTE BRONCHITIS AND BRONCHIOLITIS	1,480	\$5	\$2	2,120	25,460	3.3	70%	71%	73%	73%	0%	0%	0%	0%	0%	36	17.2	\$1,136	\$66
530	DISEASES OF ESOPHAGUS	780	\$4	\$2	1,340	23,140	4.0	70%	71%	73%	73%	0%	0%	0%	0%	0%	37	29.7	\$2,069	\$71
V66	CONVALESCENCE	3,480	\$5	\$2	4,220	52,980	5.0	71%	72%	74%	73%	1%	1%	1%	0%	0%	38	15.2	\$466	\$31
682	OTHER CELLULITIS AND ABSCESS	2,420	\$4	\$2	3,300	48,400	3.7	72%	72%	74%	74%	1%	1%	1%	0%	0%	39	19.2	\$638	\$33
560	INTESTINAL OBSTRUCTION WITHOUT MENTION O	2,300	\$5	\$2	3,240	45,480	3.7	72%	73%	75%	74%	1%	1%	1%	0%	0%	40	19.8	\$684	\$34
431	INTRACEREBRAL HEMORRHAGE	1,500	\$5	\$2	2,220	36,540	3.4	73%	73%	75%	75%	0%	0%	0%	0%	0%	41	24.4	\$1,012	\$42
511	PLEURISY	1,400	\$4	\$2	1,900	28,800	3.4	73%	74%	75%	75%	0%	0%	0%	0%	0%	42	20.6	\$1,081	\$53
586	RENAL FAILURE	1,320	\$4	\$1	2,140	30,160	2.6	73%	74%	76%	75%	0%	0%	0%	0%	0%	43	22.8	\$1,122	\$49
728	DISORDERS OF MUSCLE	1,320	\$4	\$1	2,040	32,820	3.2	74%	74%	76%	76%	0%	0%	0%	0%	0%	44	24.9	\$1,084	\$44
492	EMPHYSEMA	1,300	\$4	\$1	2,000	24,340	2.9	74%	75%	76%	76%	0%	0%	0%	0%	0%	45	18.7	\$1,062	\$57
585	CHRONIC RENAL FAILURE	1,680	\$4	\$1	2,420	33,300	3.3	74%	75%	77%	77%	0%	0%	0%	0%	0%	46	19.8	\$815	\$41
435	TRANSIENT CEREBRAL ISCHEMIA	1,360	\$3	\$1	1,840	32,120	3.3	75%	75%	77%	77%	0%	0%	0%	0%	0%	47	23.6	\$1,001	\$42
348	OTHER CONDITIONS OF BRAIN	840	\$5	\$1	1,380	21,440	3.5	75%	76%	78%	77%	0%	0%	0%	0%	0%	48	25.5	\$1,819	\$63
263	OTHER AND UNSPECIFIED PROTEIN-CALORIE MA	1,080	\$4	\$1	1,680	25,160	4.2	75%	76%	78%	78%	0%	0%	0%	0%	0%	49	23.3	\$1,203	\$52
332	PARKINSON'S DISEASE	1,160	\$4	\$1	1,700	27,460	3.5	76%	76%	78%	78%	0%	0%	0%	0%	0%	50	23.7	\$1,114	\$47
490	BRONCHITIS	1,000	\$4	\$1	1,340	18,240	2.7	76%	76%	78%	78%	0%	0%	0%	0%	0%	51	18.2	\$1,257	\$69
812	FRACTURE OF HUMERUS	1,260	\$4	\$1	1,800	30,440	3.1	76%	77%	79%	79%	0%	0%	0%	0%	0%	52	24.2	\$984	\$40
781	SYMPTOMS INVOLVING NERVOUS AND MUSCULO	1,440	\$3	\$1	1,800	25,140	3.6	77%	77%	79%	79%	0%	0%	0%	0%	0%	53	17.5	\$817	\$47
485	BRONCHOPNEUMONIA	1,300	\$4	\$1	1,780	20,180	3.3	77%	77%	79%	79%	0%	0%	0%	0%	0%	54	15.5	\$905	\$58
481	PNEUMOCOCCAL PNEUMONIA [STREPTOCOCCU	1,340	\$3	\$1	1,660	20,380	3.8	77%	78%	80%	79%	0%	0%	0%	0%	0%	55	15.2	\$845	\$56
331	OTHER CEREBRAL DEGENERATIONS	1,320	\$3	\$1	2,100	33,280	2.7	78%	78%	80%	80%	0%	0%	0%	0%	0%	56	25.2	\$840	\$33
730	OSTEOMYELITIS	860	\$3	\$1	1,260	24,880	3.8	78%	78%	80%	80%	0%	0%	0%	0%	0%	57	28.9	\$1,268	\$44
443	OTHER PERIPHERAL VASCULAR DISEASE	1,180	\$3	\$1	1,580	24,940	3.4	78%	78%	81%	80%	0%	0%	0%	0%	0%	58	21.1	\$916	\$43

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days	Average # of Secondary Diagnoses	Cumulative % of Days	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Days	% of Patients	% of Services	% of Charges	% of Paid	Rank	Average Days	Average Paid	Paid per Day
413	ANGINA PECTORIS	520	\$3	\$1	980	12,820	3.5	78%	79%	81%	81%	0%	0%	0%	0%	0%	59	24.7	\$2,027	\$82
198	SECONDARY MALIGNANT NEOPLASM OF OTHER	1,580	\$3	\$1	1,880	28,800	4.8	79%	79%	81%	81%	0%	0%	0%	0%	0%	60	18.2	\$658	\$36
402	HYPERTENSIVE HEART DISEASE	1,060	\$3	\$1	1,280	16,820	4.6	79%	79%	81%	81%	0%	0%	0%	0%	0%	61	15.9	\$943	\$59
441	AORTIC ANEURYSM	1,020	\$3	\$1	1,320	17,360	3.4	79%	79%	82%	81%	0%	0%	0%	0%	0%	62	17.0	\$981	\$56
437	OTHER AND ILL-DEFINED CEREBROVASCULAR D	720	\$4	\$1	1,320	20,660	1.8	79%	80%	82%	82%	0%	0%	0%	0%	0%	63	28.7	\$1,331	\$46
823	FRACTURE OF TIBIA AND FIBULA	680	\$2	\$1	1,240	23,640	3.1	80%	80%	82%	82%	0%	0%	0%	0%	0%	64	34.8	\$1,385	\$40
415	ACUTE PULMONARY HEART DISEASE	1,380	\$3	\$1	1,800	21,520	4.5	80%	80%	82%	82%	0%	0%	0%	0%	0%	65	15.8	\$682	\$44
453	OTHER VENOUS EMBOLISM AND THROMBOSIS	980	\$3	\$1	1,240	19,540	3.6	80%	80%	83%	82%	0%	0%	0%	0%	0%	66	19.9	\$955	\$48
480	VIRAL PNEUMONIA	440	\$2	\$1	960	13,520	1.5	80%	80%	83%	83%	0%	0%	0%	0%	0%	67	30.7	\$2,086	\$68
197	SECONDARY MALIGNANT NEOPLASM OF RESPIR	1,780	\$3	\$1	2,100	24,840	4.7	81%	81%	83%	83%	0%	0%	0%	0%	0%	68	14.0	\$508	\$36
239	NEOPLASMS OF UNSPECIFIED NATURE	780	\$2	\$1	1,060	13,880	3.0	81%	81%	83%	83%	0%	0%	0%	0%	0%	69	17.8	\$1,142	\$64
719	OTHER AND UNSPECIFIED DISORDERS OF JOINT	1,040	\$2	\$1	1,340	18,880	3.5	81%	81%	83%	83%	0%	0%	0%	0%	0%	70	18.1	\$851	\$47
161	MALIGNANT NEOPLASM OF LARYNX	380	\$3	\$1	540	9,160	3.0	81%	81%	84%	84%	0%	0%	0%	0%	0%	71	25.4	\$2,371	\$93
153	MALIGNANT NEOPLASM OF COLON	1,840	\$2	\$1	1,860	22,440	4.3	81%	82%	84%	84%	0%	0%	0%	0%	0%	72	13.7	\$502	\$37
342	HEMIPLEGIA AND HEMIPARESIS	1,220	\$3	\$1	1,660	28,440	4.0	82%	82%	84%	84%	0%	0%	0%	0%	0%	73	23.3	\$670	\$29
440	ATHEROSCLEROSIS	1,320	\$2	\$1	1,520	21,320	5.4	82%	82%	84%	84%	0%	0%	0%	0%	0%	74	16.2	\$604	\$37
514	PULMONARY CONGESTION AND HYPOSTASIS	700	\$3	\$1	1,020	12,700	3.0	82%	82%	84%	84%	0%	0%	0%	0%	0%	75	18.1	\$1,137	\$63
584	ACUTE RENAL FAILURE	1,360	\$2	\$1	1,600	19,900	5.3	82%	83%	85%	85%	0%	0%	0%	0%	0%	76	14.6	\$581	\$40
807	FRACTURE OF RIB(S)	1,320	\$2	\$1	1,620	19,600	3.2	83%	83%	85%	85%	0%	0%	0%	0%	0%	77	14.8	\$596	\$40
562	DIVERTICULA OF INTESTINE	1,220	\$2	\$1	1,480	18,520	4.4	83%	83%	85%	85%	0%	0%	0%	0%	0%	78	15.2	\$638	\$42
154	MALIGNANT NEOPLASM OF RECTUM	900	\$2	\$1	1,280	17,720	3.5	83%	83%	85%	85%	0%	0%	0%	0%	0%	79	19.7	\$851	\$43
V44	ARTIFICIAL OPENING STATUS	820	\$3	\$1	960	17,000	3.1	83%	84%	85%	85%	0%	0%	0%	0%	0%	80	27.4	\$1,224	\$45
997	OTHER COMPLICATIONS OF INTERNAL PROSTHE	800	\$2	\$1	1,080	16,000	5.4	83%	84%	86%	86%	0%	0%	0%	0%	0%	81	20.0	\$939	\$47
897	TRAUMATIC AMPUTATION OF LEG(S)(COMPLETE	760	\$2	\$1	1,180	19,180	2.7	84%	84%	86%	86%	0%	0%	0%	0%	0%	82	25.2	\$977	\$39
558	OTHER NONINFECTIOUS GASTROENTERITIS AND	520	\$2	\$1	900	15,820	2.4	84%	84%	86%	86%	0%	0%	0%	0%	0%	83	30.4	\$1,412	\$46
789	OTHER SYMPTOMS INVOLVING ABDOMEN AND P	480	\$2	\$1	700	10,600	3.8	84%	84%	86%	86%	0%	0%	0%	0%	0%	84	22.1	\$1,514	
531	GASTRIC ULCER	660	\$2	\$1	900	13,340	4.1	84%	84%	86%	86%	0%	0%	0%	0%	0%	85	20.2	\$1,084	\$54
785	SYMPTOMS INVOLVING CARDIOVASCULAR SYST	740	\$2	\$1	880	14,840	2.9	84%	85%	87%	86%	0%	0%	0%	0%	0%	86	20.1	\$967	\$48
424	OTHER DISEASES OF ENDOCARDIUM	880	\$2	\$1	1,120	13,520	3.7	85%	85%	87%	87%	0%	0%	0%	0%	0%	87	15.4	\$806	\$52
V55	ATTENTION TO ARTIFICIAL OPENINGS	720	\$3	\$1	1,060	15,520	3.8	85%	85%	87%	87%	0%	0%	0%	0%	0%	88	21.8	\$981	\$45
998	COMPLICATIONS PECULIAR TO CERTAIN SPECIFI	1,500	\$2	\$1	1,740	24,580	4.9	85%	85%	87%	87%	0%	0%	0%	0%	0%	89	16.4	\$447	\$27
824	FRACTURE OF ANKLE	800	\$2	\$1	1,240	21,140	3.8	85%	85%	87%	87%	0%	0%	0%	0%	0%	90	26.4	\$837	\$32
515	POSTINFLAMMATORY PULMONARY FIBROSIS	600	\$2	\$1	960	13,100	3.6	85%	86%	88%	87%	0%	0%	0%	0%	0%	91	21.8	\$1,115	\$51
429	ILL-DEFINED DESCRIPTIONS AND COMPLICATION	640	\$2	\$1	820	12,340	2.8	86%	86%	88%	88%	0%	0%	0%	0%	0%	92	19.3	\$1,030	\$53
V54	OTHER ORTHOPEDIC AFTERCARE	1,080	\$2	\$1	1,280	18,700	4.1	86%	86%	88%	88%	0%	0%	0%	0%	0%	93	17.6	\$818	\$35
724	OTHER AND UNSPECIFIED DISORDERS OF BACK	1,100	\$2	\$1	1,380	20,500	4.0	86%	86%	88%	88%	0%	0%	0%	0%	0%	94	18.6	\$588	\$32
298	OTHER NONORGANIC PSYCHOSES	820	\$1	\$1	960	14,740	2.4	86%	86%	88%	88%	0%	0%	0%	0%	0%	95	18.0	\$786	\$44
340	MULTIPLE SCLEROSIS	280	\$2	\$1	520	9,380	3.2	86%	86%	88%	88%	0%	0%	0%	0%	0%	96	33.5	\$2,287	\$88
783	SYMPTOMS CONCERNING NUTRITION	420	\$2	\$1	600	12,460	3.6	87%	87%	88%	88%	0%	0%	0%	0%	0%	97	29.7	\$1,489	\$50
998	OTHER COMPLICATIONS OF PROCEDURES	1,320	\$2	\$1	1,560	23,100	5.7	87%	87%	89%	89%	0%	0%	0%	0%	0%	98	17.5	\$472	\$27
430	SUBARACHNOID HEMORRHAGE	480	\$2	\$1	860	17,220	2.6	87%	87%	89%	89%	0%	0%	0%	0%	0%	99	35.9	\$1,278	\$36
185	MALIGNANT NEOPLASM OF PROSTATE	1,140	\$2	\$1	1,480	19,160	3.6	87%	87%	89%	89%	0%	0%	0%	0%	0%	100	16.8	\$529	\$31

RT 2- Summary of SNF Services for Respiratory Services by Primary Diagnosis: Top 100 Diagnoses In 1996 Sorted by Total Paid; Patients with \$1000 or More in Total Paid

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days	Average #											Average				Paid per Day
							of Secondary Diagnoses	Cumulative % of Days	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Days	% of Patients	% of Services	% of Charge	% of Paid	Rank	Days	Paid			
ALL	ALL DIAGNOSES	109,240	\$935	\$315	257,440	4,296,520	3.3	0%	0%	0%	0%	100%	100%	100%	100%	100%	0	39.3	\$2,881	\$73		
488	PNEUMONIA	12,900	\$87	\$30	24,540	397,880	3.2	9%	10%	9%	10%	9%	12%	10%	9%	10%	1	30.8	\$2,319	\$75		
498	CHRONIC AIRWAY OBSTRUCTION	9,880	\$82	\$27	21,460	328,800	2.6	17%	18%	18%	18%	8%	9%	8%	9%	2	33.3	\$2,739	\$82			
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR D	7,680	\$59	\$20	18,320	305,860	2.4	24%	24%	24%	24%	7%	7%	6%	6%	3	39.8	\$2,587	\$84			
428	HEART FAILURE	8,740	\$52	\$18	18,700	276,100	3.1	30%	31%	30%	30%	6%	8%	6%	6%	4	31.8	\$2,093	\$68			
820	FRACTURE OF NECK OF FEMUR	8,020	\$38	\$14	11,600	208,180	3.1	35%	35%	34%	35%	5%	8%	5%	4%	5	34.6	\$2,350	\$68			
518	OTHER DISEASES OF LUNG	4,280	\$56	\$14	8,440	133,260	3.1	38%	38%	40%	39%	3%	4%	3%	6%	4%	6	31.1	\$3,222	\$103		
V57	CARE INVOLVING USE OF REHABILITATION PROC	8,920	\$37	\$12	9,940	144,680	5.8	42%	42%	44%	43%	3%	6%	4%	4%	7	20.9	\$1,730	\$83			
491	CHRONIC BRONCHITIS	3,520	\$19	\$7	5,220	69,540	4.1	43%	44%	46%	45%	2%	3%	2%	2%	8	19.8	\$1,978	\$100			
250	DIABETES MELLITUS	2,660	\$19	\$7	5,800	100,160	2.7	46%	47%	48%	47%	2%	2%	2%	2%	9	37.7	\$2,579	\$69			
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	2,960	\$21	\$8	5,020	83,840	4.6	48%	48%	50%	49%	2%	3%	2%	2%	10	28.3	\$2,192	\$78			
599	OTHER DISORDERS OF URETHRA AND URINARY	2,700	\$15	\$8	4,820	90,460	3.0	50%	50%	52%	51%	2%	2%	2%	2%	11	33.5	\$2,281	\$87			
780	GENERAL SYMPTOMS	2,580	\$16	\$6	4,460	72,220	3.2	51%	52%	53%	53%	2%	2%	2%	2%	12	28.0	\$2,164	\$77			
482	OTHER BACTERIAL PNEUMONIA	2,400	\$15	\$5	3,680	60,080	4.8	53%	54%	55%	54%	1%	2%	1%	2%	13	25.0	\$1,924	\$77			
182	MALIGNANT NEOPLASM OF TRACHEA	1,880	\$15	\$4	3,420	54,740	3.3	54%	55%	57%	56%	1%	2%	1%	2%	14	29.1	\$2,340	\$80			
707	CHRONIC ULCER OF SKIN	1,860	\$13	\$4	3,440	67,380	3.6	56%	56%	58%	57%	2%	2%	1%	1%	15	36.2	\$2,103	\$58			
799	OTHER ILL-DEFINED AND UNKNOWN CAUSES OF	1,580	\$12	\$4	3,220	45,380	2.2	57%	57%	59%	58%	1%	1%	1%	1%	16	28.7	\$2,437	\$85			
278	DISORDERS OF FLUID	1,940	\$10	\$4	3,280	54,780	3.0	58%	59%	60%	60%	1%	2%	1%	1%	17	28.2	\$1,910	\$88			
V58	ENCOUNTER FOR OTHER AND UNSPECIFIED PRO	2,500	\$12	\$3	3,500	52,180	5.5	59%	60%	62%	61%	1%	2%	1%	1%	18	20.9	\$1,358	\$65			
38	SEPTICEMIA	1,520	\$11	\$3	2,800	41,700	4.3	60%	61%	63%	62%	1%	1%	1%	1%	19	27.4	\$2,011	\$73			
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART DI	1,580	\$8	\$3	2,500	40,820	3.4	61%	62%	64%	63%	1%	1%	1%	1%	20	25.8	\$1,903	\$74			
401	ESSENTIAL HYPERTENSION	1,300	\$9	\$3	2,480	47,880	2.7	62%	63%	65%	63%	1%	1%	1%	1%	21	36.8	\$2,308	\$63			
427	CARDIAC DYSRHYTHMIAS	1,840	\$8	\$3	2,780	42,400	3.4	63%	64%	66%	64%	1%	2%	1%	1%	22	25.9	\$1,812	\$70			
410	ACUTE MYOCARDIAL INFARCTION	1,320	\$8	\$3	2,000	31,700	3.4	64%	65%	66%	65%	1%	1%	1%	1%	23	24.0	\$1,949	\$81			
787	SYMPTOMS INVOLVING DIGESTIVE SYSTEM	1,080	\$6	\$2	1,900	32,480	3.0	65%	66%	67%	66%	1%	1%	1%	1%	24	30.6	\$2,044	\$87			
578	GASTROINTESTINAL HEMORRHAGE	780	\$8	\$2	1,400	25,160	3.5	65%	66%	67%	67%	1%	1%	1%	1%	25	33.1	\$2,788	\$84			
438	LATE EFFECTS OF CEREBROVASCULAR DISEASE	960	\$8	\$2	1,800	35,340	3.1	66%	67%	68%	67%	1%	1%	1%	1%	26	36.8	\$2,142	\$58			
788	SYMPTOMS INVOLVING RESPIRATORY SYSTEM A	960	\$6	\$2	1,570	26,400	3.2	67%	67%	69%	68%	1%	1%	1%	1%	27	27.5	\$2,140	\$78			
290	SENILE AND PRESENILE ORGANIC PSYCHOTIC C	940	\$8	\$2	1,700	34,520	2.5	68%	68%	69%	69%	1%	1%	1%	1%	28	36.7	\$2,184	\$59			
493	ASTHMA	880	\$8	\$2	1,340	22,040	3.3	68%	69%	70%	69%	1%	1%	1%	1%	29	25.0	\$2,328	\$93			
733	OTHER DISORDERS OF BONE AND CARTILAGE	880	\$5	\$2	1,500	28,140	4.1	69%	69%	71%	70%	1%	1%	1%	1%	30	32.0	\$2,306	\$72			
821	FRACTURE OF OTHER AND UNSPECIFIED PARTS	900	\$5	\$2	1,720	29,060	3.3	69%	70%	71%	71%	1%	1%	1%	1%	31	32.3	\$2,250	\$70			
434	OCCCLUSION OF CEREBRAL ARTERIES	1,000	\$6	\$2	1,340	26,320	4.9	70%	70%	72%	72%	1%	1%	1%	1%	32	26.3	\$1,924	\$73			
805	FRACTURE OF VERTEBRAL COLUMN WITHOUT M	800	\$5	\$2	1,460	26,820	3.1	71%	71%	72%	72%	1%	1%	1%	0%	33	33.5	\$2,336	\$70			
715	OSTEOARTHRITIS AND ALLIED DISORDERS	800	\$5	\$2	1,440	19,780	2.5	71%	72%	73%	72%	0%	1%	1%	0%	34	24.7	\$2,120	\$88			
808	FRACTURE OF PELVIS	780	\$4	\$2	1,400	23,880	3.3	72%	72%	73%	73%	1%	1%	1%	0%	35	30.6	\$2,041	\$87			
530	DISEASES OF ESOPHAGUS	400	\$4	\$2	860	16,740	3.8	72%	72%	74%	73%	0%	0%	0%	0%	36	41.9	\$3,845	\$92			
466	ACUTE BRONCHITIS AND BRONCHIOLITIS	800	\$4	\$1	1,180	16,540	2.7	72%	73%	74%	74%	0%	1%	0%	0%	37	27.8	\$2,397	\$87			
431	INTRACEREBRAL HEMORRHAGE	540	\$4	\$1	1,100	21,080	3.1	73%	73%	74%	74%	0%	0%	0%	0%	38	39.0	\$2,514	\$84			
586	RENAL FAILURE	520	\$4	\$1	1,100	17,460	2.7	73%	74%	75%	75%	0%	0%	0%	0%	39	33.6	\$2,546	\$78			
511	PLEURISY	520	\$3	\$1	960	17,080	3.0	74%	74%	75%	75%	0%	0%	0%	0%	40	32.8	\$2,363	\$72			
348	OTHER CONDITIONS OF BRAIN	420	\$5	\$1	920	15,820	3.3	74%	74%	76%	75%	0%	0%	0%	1%	41	37.7	\$2,925	\$78			
728	DISORDERS OF MUSCLE	460	\$4	\$1	1,000	17,460	3.2	75%	75%	76%	76%	0%	0%	0%	0%	42	38.0	\$2,523	\$86			
263	OTHER AND UNSPECIFIED PROTEIN-CALORIE MA	460	\$3	\$1	900	13,880	3.4	75%	75%	78%	76%	0%	0%	0%	0%	43	30.1	\$2,522	\$84			
435	TRANSIENT CEREBRAL ISCHEMIA	440	\$3	\$1	800	15,820	2.9	75%	75%	77%	76%	0%	0%	0%	0%	44	35.5	\$2,831	\$74			
585	CHRONIC RENAL FAILURE	520	\$3	\$1	1,080	16,540	2.8	76%	76%	77%	77%	0%	0%	0%	0%	45	31.8	\$2,210	\$89			
490	BRONCHITIS	500	\$3	\$1	680	11,800	2.3	76%	76%	77%	77%	0%	0%	0%	0%	46	23.6	\$2,230	\$95			
492	EMPHYSEMA	800	\$4	\$1	1,140	18,740	2.6	76%	77%	78%	78%	0%	1%	0%	0%	47	27.9	\$1,856	\$87			
682	OTHER CELLULITIS AND ABSCESS	580	\$3	\$1	1,080	17,280	3.1	77%	77%	78%	78%	0%	1%	0%	0%	48	29.8	\$1,899	\$84			
560	INTESTINAL OBSTRUCTION WITHOUT MENTION O	580	\$3	\$1	1,080	19,080	3.2	77%	77%	78%	78%	0%	1%	0%	0%	49	32.9	\$1,894	\$58			
332	PARKINSON'S DISEASE	440	\$3	\$1	800	14,960	3.0	77%	78%	79%	79%	0%	0%	0%	0%	50	34.0	\$2,483	\$73			
812	FRACTURE OF HUMERUS	440	\$3	\$1	840	15,540	3.7	78%	78%	79%	79%	0%	0%	0%	0%	51	35.3	\$2,284	\$85			
413	ANGINA PECTORIS	280	\$2	\$1	680	10,100	3.7	78%	78%	79%	79%	0%	0%	0%	0%	52	36.1	\$3,494	\$97			
730	OSTEOMYELITIS	280	\$3	\$1	500	10,100	3.4	78%	79%	80%	80%	0%	0%	0%	0%	53	38.8	\$3,758	\$97			
485	BRONCHOPNEUMONIA	500	\$3	\$1	840	11,940	3.1	79%	79%	80%	80%	0%	0%	0%	0%	54	23.9	\$1,890	\$79			
781	SYMPTOMS INVOLVING NERVOUS AND MUSCULO	500	\$2	\$1	800	13,200	2.7	79%	79%	80%	80%	0%	0%	0%	0%	55	26.4	\$1,841	\$70			
V68	CONVALESCENCE	720	\$3	\$1	1,040	13,020	4.5	79%	80%	81%	80%	0%	1%	0%	0%	56	18.1	\$1,237	\$68			
437	OTHER AND ILL-DEFINED CEREBROVASCULAR DI	320	\$4	\$1	780	12,820	1.5	79%	80%	81%	81%	0%	0%	0%	0%	57	39.4	\$2,778	\$70			
480	VIRAL PNEUMONIA	300	\$2	\$1	720	11,120	1.5	80%	80%	81%	81%	0%	0%	0%	0%	58	37.1	\$2,907	\$78			
823	FRACTURE OF TIBIA AND FIBULA	320	\$2	\$1	680	11,940	4.0	80%	80%	81%	81%	0%	0%	0%	0%	59	37.3	\$2,858	\$71			
443	OTHER PERIPHERAL VASCULAR DISEASE	380	\$2	\$1	800	10,820	2.8	80%	81%	82%	81%	0%	0%	0%	0%	60	27.9	\$2,192	\$78			
481	PNEUMOCOCCAL PNEUMONIA (STREPTOCOCCUS	420	\$3	\$1	660	10,000	3.1	80%	81%	82%	82%	0%	0%	0%	0%	61	23.8	\$1,983	\$83			
331	OTHER CEREBRAL DEGENERATIONS	420	\$2	\$1	900	17,640	2.7	81%	81%	82%	82%	0%	0%	0%	0%	62	42.0	\$1,980	\$47			
161	MALIGNANT NEOPLASM OF LARYNX	200	\$3	\$1	380	7,320	2.7	81%	81%	82%	82%	0%	0%	0%	0%	63	36.6	\$4,017	\$110			
239	NEOPLASMS OF UNSPECIFIED NATURE	340	\$2	\$1	560	8,200	3.4	81%	82%	83%	83%	0%	0%	0%	0%	64	24.1	\$2,291	\$95			
402	HYPERTENSIVE HEART DISEASE	280	\$2	\$1	420	8,300	4.2	81%	82%	83%	83%	0%	0%	0%	0%	65	29.6	\$2,776	\$84			
441	AORTIC ANEURYSM	360	\$2	\$1	580	8,380	2.7</															

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Days	Average #		Cumulative % of Days	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Days	% of Patients	% of Services	% of Charge	% of Paid	Rank	Average Days	Average Paid	Paid per Day
							Average # of Secondary Diagnoses	% of Days													
514	PULMONARY CONGESTION AND HYPOSTASIS	360	\$3	\$1	860	8,080	3.2	82%	82%	83%	83%	83%	0%	0%	0%	0%	0%	87	22.4	\$2,102	\$94
453	OTHER VENOUS EMBOLISM AND THROMBOSIS	240	\$2	\$1	400	9,740	3.6	82%	82%	84%	83%	83%	0%	0%	0%	0%	0%	88	40.6	\$3,098	\$78
198	SECONDARY MALIGNANT NEOPLASM OF OTHER	380	\$2	\$1	540	11,640	5.2	82%	83%	84%	84%	84%	0%	0%	0%	0%	0%	89	30.8	\$1,931	\$63
719	OTHER AND UNSPECIFIED DISORDERS OF JOINT	360	\$2	\$1	540	9,280	3.1	83%	83%	84%	84%	84%	0%	0%	0%	0%	0%	70	25.7	\$2,018	\$78
558	OTHER NONINFECTIOUS GASTROENTERITIS AND	280	\$2	\$1	620	11,840	1.8	83%	83%	84%	84%	84%	0%	0%	0%	0%	0%	71	42.3	\$2,382	\$56
V44	ARTIFICIAL OPENING STATUS	300	\$2	\$1	540	11,020	3.3	83%	83%	85%	84%	84%	0%	0%	0%	0%	0%	72	36.7	\$2,214	\$60
789	OTHER SYMPTOMS INVOLVING ABDOMEN AND P	200	\$2	\$1	360	6,420	4.4	83%	83%	85%	85%	85%	0%	0%	0%	0%	0%	73	32.1	\$3,247	\$101
897	TRAUMATIC AMPUTATION OF LEG(S) (COMPLETE	200	\$2	\$1	480	8,320	2.7	83%	84%	85%	85%	85%	0%	0%	0%	0%	0%	74	41.6	\$3,146	\$78
415	ACUTE PULMONARY HEART DISEASE	380	\$2	\$1	600	9,480	4.0	84%	84%	85%	85%	85%	0%	0%	0%	0%	0%	75	26.3	\$1,737	\$66
V55	ATTENTION TO ARTIFICIAL OPENINGS	340	\$2	\$1	560	10,620	3.3	84%	84%	85%	85%	85%	0%	0%	0%	0%	0%	76	31.2	\$1,802	\$58
785	SYMPTOMS INVOLVING CARDIOVASCULAR SYST	260	\$2	\$1	380	7,240	2.1	84%	84%	86%	85%	85%	0%	0%	0%	0%	0%	77	27.8	\$2,331	\$84
582	DIVERTICULA OF INTESTINE	400	\$2	\$1	580	9,400	4.0	84%	84%	86%	86%	86%	0%	0%	0%	0%	0%	78	23.5	\$1,498	\$84
342	HEMIPLEGIA AND HEMIPARESIS	380	\$2	\$1	560	11,040	3.3	85%	85%	86%	86%	86%	0%	0%	0%	0%	0%	79	29.1	\$1,573	\$54
154	MALIGNANT NEOPLASM OF RECTUM	340	\$1	\$1	600	8,380	3.1	85%	85%	86%	86%	86%	0%	0%	0%	0%	0%	80	24.6	\$1,733	\$70
340	MULTIPLE SCLEROSIS	100	\$1	\$1	280	4,960	3.6	85%	85%	86%	86%	86%	0%	0%	0%	0%	0%	81	49.6	\$5,872	\$118
997	OTHER COMPLICATIONS OF INTERNAL PROSTHE	220	\$1	\$1	360	7,320	4.9	85%	85%	86%	86%	86%	0%	0%	0%	0%	0%	82	33.3	\$2,668	\$80
531	GASTRIC ULCER	180	\$2	\$1	340	5,780	3.1	85%	85%	87%	86%	86%	0%	0%	0%	0%	0%	83	32.0	\$3,237	\$101
584	ACUTE RENAL FAILURE	320	\$2	\$1	500	8,120	4.4	85%	85%	87%	87%	87%	0%	0%	0%	0%	0%	84	25.4	\$1,610	\$71
515	POSTINFLAMMATORY PULMONARY FIBROSIS	320	\$2	\$1	620	9,580	3.9	86%	86%	87%	87%	87%	0%	0%	0%	0%	0%	85	29.9	\$1,759	\$59
298	OTHER NONORGANIC PSYCHOSES	300	\$1	\$1	400	6,700	2.6	86%	86%	87%	87%	87%	0%	0%	0%	0%	0%	86	22.3	\$1,858	\$83
424	OTHER DISEASES OF ENDOCARDIUM	220	\$2	\$1	320	6,000	3.5	86%	86%	87%	87%	87%	0%	0%	0%	0%	0%	87	27.3	\$2,483	\$91
783	SYMPTOMS CONCERNING NUTRITION	180	\$1	\$1	320	7,340	3.3	86%	86%	87%	87%	87%	0%	0%	0%	0%	0%	88	40.8	\$3,024	\$74
430	SUBARACHNOID HEMORRHAGE	240	\$2	\$1	560	12,520	2.3	86%	86%	88%	88%	88%	0%	0%	0%	0%	0%	89	52.2	\$2,238	\$43
429	ILL-DEFINED DESCRIPTIONS AND COMPLICATION	220	\$2	\$1	380	6,880	4.0	86%	86%	88%	88%	88%	0%	0%	0%	0%	0%	90	31.3	\$2,435	\$78
153	MALIGNANT NEOPLASM OF COLON	280	\$1	\$1	360	6,460	3.1	87%	87%	88%	88%	88%	0%	0%	0%	0%	0%	91	23.1	\$1,897	\$82
824	FRACTURE OF ANKLE	220	\$2	\$1	440	8,960	4.3	87%	87%	88%	88%	88%	0%	0%	0%	0%	0%	92	40.7	\$2,381	\$58
807	FRACTURE OF RIB(S)	340	\$1	\$1	480	7,540	3.3	87%	87%	88%	88%	88%	0%	0%	0%	0%	0%	93	22.2	\$1,529	\$69
784	SYMPTOMS INVOLVING HEAD AND NECK	260	\$1	\$1	380	7,280	2.3	87%	87%	88%	88%	88%	0%	0%	0%	0%	0%	94	28.0	\$1,987	\$71
197	SECONDARY MALIGNANT NEOPLASM OF RESPIR	340	\$2	\$1	460	7,160	4.2	87%	87%	89%	89%	89%	0%	0%	0%	0%	0%	95	21.1	\$1,495	\$71
440	ATHEROSCLEROSIS	280	\$2	\$0	360	5,740	4.8	87%	87%	89%	89%	89%	0%	0%	0%	0%	0%	96	22.1	\$1,923	\$87
294	OTHER ORGANIC PSYCHOTIC CONDITIONS (CHRO	160	\$1	\$0	400	6,160	1.9	88%	88%	89%	89%	89%	0%	0%	0%	0%	0%	97	38.5	\$3,081	\$80
724	OTHER AND UNSPECIFIED DISORDERS OF BACK	300	\$1	\$0	410	7,980	4.2	88%	88%	89%	89%	89%	0%	0%	0%	0%	0%	98	28.6	\$1,639	\$62
411	OTHER ACUTE AND SUBACUTE FORMS OF ISCHE	160	\$1	\$0	340	4,640	2.6	88%	88%	89%	89%	89%	0%	0%	0%	0%	0%	99	29.0	\$2,872	\$99
571	CHRONIC LIVER DISEASE AND CIRRHOSIS	200	\$1	\$0	340	5,440	4.5	88%	88%	89%	89%	89%	0%	0%	0%	0%	0%	100	27.2	\$2,272	\$84

RT-3 Summary of SNF and Inpatient Claims for Respiratory Services by Primary Diagnosis: Top 100 Diagnoses in 1996 by Total Paid Only

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Average # of Secondary Diagnosis	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Patients	% of Services	% of Charge	% of Paid	Rank	Average Paid
	ALL DIAGNOSES	4,170,160	\$7,902	\$3,244	6,901,540	5.1	0%	0%	0%	100%	100%	100%	100%	0	\$778
518	OTHER DISEASES OF LUNG	114,540	\$770	\$293	169,620	5.3	2%	10%	9%	3%	2%	10%	8%	1	\$2,558
466	PNEUMONIA	319,940	\$515	\$218	400,480	5.0	8%	16%	16%	8%	6%	7%	7%	2	\$682
428	HEART FAILURE	387,240	\$477	\$193	540,160	5.5	16%	22%	22%	9%	8%	6%	6%	3	\$499
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE	294,380	\$400	\$178	359,020	5.4	21%	27%	27%	7%	5%	5%	5%	4	\$606
491	CHRONIC BRONCHITIS	210,420	\$381	\$169	296,060	4.2	26%	32%	32%	5%	4%	5%	5%	5	\$804
482	OTHER BACTERIAL PNEUMONIA	149,160	\$356	\$160	186,360	5.7	28%	37%	37%	4%	3%	5%	5%	6	\$1,075
410	ACUTE MYOCARDIAL INFARCTION	234,540	\$331	\$138	289,020	5.7	32%	41%	42%	6%	4%	4%	4%	7	\$589
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	86,440	\$205	\$94	112,320	6.2	34%	43%	45%	2%	2%	3%	3%	8	\$1,089
38	SEPTICEMIA	128,560	\$206	\$81	151,500	6.5	36%	46%	47%	3%	2%	3%	2%	9	\$629
496	CHRONIC AIRWAY OBSTRUCTION	59,260	\$203	\$76	89,900	3.4	38%	49%	49%	1%	1%	3%	2%	10	\$1,285
820	FRACTURE OF NECK OF FEMUR	162,660	\$150	\$62	199,120	5.0	40%	51%	51%	4%	3%	2%	2%	11	\$380
162	MALIGNANT NEOPLASM OF TRACHEA	62,820	\$131	\$56	80,160	5.1	42%	52%	53%	2%	1%	2%	2%	12	\$883
V57	CARE INVOLVING USE OF REHABILITATION PROCEDURES	90,820	\$129	\$54	108,220	5.9	43%	54%	55%	2%	2%	2%	2%	13	\$597
441	AORTIC ANEURYSM	37,060	\$111	\$49	43,800	5.7	44%	55%	56%	1%	1%	1%	2%	14	\$1,335
434	OCCCLUSION OF CEREBRAL ARTERIES	94,000	\$110	\$43	107,220	5.7	45%	57%	58%	2%	2%	1%	1%	15	\$454
493	ASTHMA	59,160	\$93	\$41	78,920	3.7	47%	58%	59%	1%	1%	1%	1%	16	\$700
436	ACUTE, BUT ILL DEFINED, CEREBROVASCULAR DISEASE	57,180	\$112	\$40	78,780	3.7	48%	59%	60%	1%	1%	1%	1%	17	\$700
427	CARDIAC DYSRHYTHMIAS	143,260	\$92	\$34	165,080	5.0	50%	60%	61%	3%	2%	1%	1%	18	\$236
424	OTHER DISEASES OF ENDOCARDIUM	26,960	\$69	\$33	31,100	5.6	51%	61%	62%	1%	0%	1%	1%	19	\$1,225
560	INTESTINAL OBSTRUCTION WITHOUT MENTION OF HERNIA	55,000	\$84	\$31	64,580	5.6	51%	62%	63%	1%	1%	1%	1%	20	\$566
996	COMPLICATIONS PECULIAR TO CERTAIN SPECIFIED PROCEDURES	81,660	\$76	\$29	98,040	5.0	53%	63%	64%	2%	1%	1%	1%	21	\$353
153	MALIGNANT NEOPLASM OF COLON	48,060	\$30	\$28	54,380	5.5	54%	64%	65%	1%	1%	1%	1%	22	\$579
250	DIABETES MELLITUS	62,100	\$73	\$27	78,040	5.5	55%	65%	66%	1%	1%	1%	1%	23	\$433
276	DISORDERS OF FLUID	81,580	\$63	\$25	91,320	5.8	56%	66%	66%	2%	1%	1%	1%	24	\$304
431	INTRACEREBRAL HEMORRHAGE	23,840	\$51	\$24	28,300	4.7	57%	66%	67%	1%	0%	1%	1%	25	\$1,003
715	OSTEOARTHRITIS AND ALLIED DISORDERS	144,820	\$54	\$24	162,960	3.3	59%	67%	68%	3%	2%	1%	1%	26	\$164
440	ATHEROSCLEROSIS	45,400	\$55	\$23	53,920	5.6	60%	68%	69%	1%	1%	1%	1%	27	\$506
599	OTHER DISORDERS OF URETHRA AND URINARY TRACT	64,460	\$58	\$22	74,860	5.6	61%	69%	69%	2%	1%	1%	1%	28	\$348
760	GENERAL SYMPTOMS	75,740	\$51	\$21	85,820	4.8	62%	69%	70%	2%	1%	1%	1%	29	\$279
574	CHOLELITHIASIS	78,500	\$52	\$21	85,840	4.7	63%	70%	71%	2%	1%	1%	1%	30	\$268
481	PNEUMOCOCCAL PNEUMONIA [STREPTOCOCCUS PNEUMONIAE PNEUMONIA]	26,900	\$48	\$21	30,880	5.1	64%	70%	71%	1%	0%	1%	1%	31	\$778
197	SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND DIGESTIVE SYSTEMS	32,880	\$40	\$19	38,520	5.8	64%	71%	72%	1%	1%	1%	1%	32	\$589
562	DIVERTICULA OF INTESTINE	44,620	\$45	\$18	50,840	5.4	65%	72%	72%	1%	1%	1%	1%	33	\$402
433	OCCCLUSION AND STENOSIS OF PRECEREBRAL ARTERIES	70,240	\$42	\$17	79,620	4.4	66%	72%	73%	2%	1%	1%	1%	34	\$248
707	CHRONIC ULCER OF SKIN	17,800	\$49	\$17	25,620	4.9	67%	73%	73%	0%	0%	1%	1%	35	\$951
492	EMPHYSEMA	14,820	\$40	\$17	18,800	4.1	67%	73%	74%	0%	0%	1%	1%	36	\$1,141
402	HYPERTENSIVE HEART DISEASE	39,600	\$40	\$16	47,320	5.3	67%	74%	74%	1%	1%	1%	1%	37	\$414
415	ACUTE PULMONARY HEART DISEASE	28,100	\$38	\$16	32,760	5.4	68%	74%	75%	1%	0%	0%	0%	38	\$568
786	SYMPTOMS INVOLVING RESPIRATORY SYSTEM AND OTHER CHEST SYMPTOMS	90,260	\$38	\$15	99,460	4.2	69%	75%	75%	2%	1%	0%	0%	39	\$161
998	OTHER COMPLICATIONS OF PROCEDURES	23,960	\$35	\$14	27,940	5.7	70%	75%	76%	1%	0%	0%	0%	40	\$589
532	DUODENAL ULCER	19,660	\$35	\$14	22,420	6.1	70%	76%	76%	0%	0%	0%	0%	41	\$695
584	ACUTE RENAL FAILURE	27,340	\$35	\$12	31,140	6.8	71%	76%	77%	1%	0%	0%	0%	42	\$448
411	OTHER ACUTE AND SUBACUTE FORMS OF ISCHEMIC HEART DISEASE	58,840	\$31	\$12	68,520	4.4	72%	76%	77%	1%	1%	0%	0%	43	\$207
557	VASCULAR INSUFFICIENCY OF INTESTINE	12,500	\$34	\$12	14,520	6.5	72%	77%	77%	0%	0%	0%	0%	44	\$973
577	DISEASES OF PANCREAS	21,220	\$35	\$12	25,480	5.6	72%	77%	78%	1%	0%	0%	0%	45	\$566
466	ACUTE BRONCHITIS AND BRONCHIOLITIS	33,080	\$29	\$12	38,040	4.3	73%	78%	78%	1%	1%	0%	0%	46	\$357
578	GASTROINTESTINAL HEMORRHAGE	35,100	\$29	\$11	40,000	5.9	73%	78%	78%	1%	1%	0%	0%	47	\$317
997	OTHER COMPLICATIONS OF INTERNAL PROSTHETIC DEVIC	20,580	\$27	\$11	23,740	5.9	74%	78%	79%	0%	0%	0%	0%	48	\$536
511	PLEURISY	19,840	\$25	\$11	23,740	5.4	74%	79%	79%	0%	0%	0%	0%	49	\$532
569	OTHER DISORDERS OF INTESTINE	19,880	\$27	\$11	22,800	6.0	74%	79%	79%	0%	0%	0%	0%	50	\$531
531	GASTRIC ULCER	24,360	\$30	\$11	27,500	6.0	75%	79%	80%	1%	0%	0%	0%	51	\$432
430	SUBARACHNOID HEMORRHAGE	5,540	\$23	\$10	7,160	4.8	75%	80%	80%	0%	0%	0%	0%	52	\$1,865
799	OTHER ILL-DEFINED AND UNKNOWN CAUSES OF MORBIDITY AND MORTALITY	8,720	\$26	\$10	13,200	2.9	75%	80%	80%	0%	0%	0%	0%	53	\$1,139

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Average # of Secondary Diagnosis	Cumulative % of Services	Cumulative % of Charges	Cumulative % % of Paid	% of Patients	% of Services	% of Charge	% of Paid	Rank	Average Paid
444	ARTERIAL EMBOLISM AND THROMBOSIS	18,360	\$24	\$10	20,940	5.7	75%	80%	81%	0%	0%	0%	0%	54	\$535
733	OTHER DISORDERS OF BONE AND CARTILAGE	31,460	\$25	\$10	36,780	5.0	76%	81%	81%	1%	1%	0%	0%	55	\$309
485	BRONCHOPNEUMONIA	16,520	\$24	\$10	20,960	4.5	76%	81%	81%	0%	0%	0%	0%	56	\$587
852	SUBARACHNOID	7,460	\$20	\$9	8,260	5.6	76%	81%	82%	0%	0%	0%	0%	57	\$1,244
151	MALIGNANT NEOPLASM OF STOMACH	8,180	\$20	\$9	9,640	5.7	76%	81%	82%	0%	0%	0%	0%	58	\$1,056
512	PNEUMOTHORAX	9,040	\$21	\$9	11,460	4.9	77%	82%	82%	0%	0%	0%	0%	59	\$948
V58	ENCOUNTER FOR OTHER AND UNSPECIFIED PROCEDURES AND AFTERCARE	22,120	\$28	\$9	26,740	5.3	77%	82%	82%	1%	0%	0%	0%	60	\$385
198	SECONDARY MALIGNANT NEOPLASM OF OTHER SPECIFIED SITES	21,600	\$20	\$8	24,540	5.6	77%	82%	83%	1%	0%	0%	0%	61	\$391
530	DISEASES OF ESOPHAGUS	31,300	\$20	\$8	34,000	5.3	78%	82%	83%	1%	0%	0%	0%	62	\$264
396	DISEASES OF MITRAL AND AORTIC VALVES	5,440	\$17	\$8	6,160	6.5	78%	83%	83%	0%	0%	0%	0%	63	\$1,475
682	OTHER CELLULITIS AND ABSCESS	24,660	\$20	\$8	28,840	5.3	78%	83%	83%	1%	0%	0%	0%	64	\$319
552	OTHER HERNIA OF ABDOMINAL CAVITY	13,840	\$17	\$8	15,180	4.9	78%	83%	84%	0%	0%	0%	0%	65	\$556
154	MALIGNANT NEOPLASM OF RECTUM	16,740	\$19	\$8	19,360	5.2	79%	83%	84%	0%	0%	0%	0%	66	\$459
404	HYPERTENSIVE HEART AND RENAL DISEASE	17,260	\$22	\$7	20,560	5.6	79%	84%	84%	0%	0%	0%	0%	67	\$423
821	FRACTURE OF OTHER AND UNSPECIFIED PARTS OF FEMU	13,240	\$19	\$7	16,400	5.1	79%	84%	84%	0%	0%	0%	0%	68	\$551
432	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE	6,840	\$13	\$7	8,220	4.9	79%	84%	84%	0%	0%	0%	0%	69	\$1,051
805	FRACTURE OF VERTEBRAL COLUMN WITHOUT MENTION OF SPINAL CORD INJURY	8,480	\$17	\$7	10,440	5.0	80%	84%	85%	0%	0%	0%	0%	70	\$817
571	CHRONIC LIVER DISEASE AND CIRRHOSIS	12,380	\$18	\$7	16,140	6.3	80%	85%	85%	0%	0%	0%	0%	71	\$558
403	HYPERTENSIVE RENAL DISEASE	16,780	\$15	\$6	19,220	5.6	80%	85%	85%	0%	0%	0%	0%	72	\$383
348	OTHER CONDITIONS OF BRAIN	5,400	\$18	\$6	6,840	5.2	80%	85%	85%	0%	0%	0%	0%	73	\$1,159
807	FRACTURE OF RIB(S)	10,260	\$16	\$8	11,700	5.2	80%	85%	86%	0%	0%	0%	0%	74	\$610
515	POSTINFLAMMATORY PULMONARY FIBROSIS	8,300	\$12	\$6	9,900	4.8	80%	85%	86%	0%	0%	0%	0%	75	\$724
453	OTHER VENOUS EMBOLISM AND THROMBOSIS	16,960	\$14	\$6	18,900	5.1	81%	86%	86%	0%	0%	0%	0%	76	\$328
150	MALIGNANT NEOPLASM OF ESOPHAGUS	3,180	\$14	\$5	3,920	5.5	81%	86%	86%	0%	0%	0%	0%	77	\$1,714
435	TRANSIENT CEREBRAL ISCHEMIA	34,680	\$13	\$5	37,620	4.6	81%	86%	86%	1%	1%	0%	0%	78	\$151
112	CANDIDIASIS	6,340	\$13	\$5	7,300	5.8	81%	86%	86%	0%	0%	0%	0%	79	\$822
42	HUMAN IMMUNODEFICIENCY VIRUS (HIV) DISEASE	5,980	\$11	\$5	9,300	5.8	82%	86%	87%	0%	0%	0%	0%	80	\$834
787	SYMPTOMS INVOLVING DIGESTIVE SYSTEM	9,460	\$13	\$5	11,220	4.8	82%	86%	87%	0%	0%	0%	0%	81	\$522
728	DISORDERS OF MUSCLE	4,120	\$12	\$5	5,780	3.9	82%	86%	87%	0%	0%	0%	0%	82	\$1,180
535	GASTRITIS AND DUODENITIS	25,000	\$13	\$5	26,880	5.7	82%	87%	87%	1%	0%	0%	0%	83	\$187
808	FRACTURE OF PELVIS	8,960	\$12	\$5	11,300	5.0	82%	87%	87%	0%	0%	0%	0%	84	\$517
345	EPILEPSY	6,160	\$18	\$5	7,440	4.9	83%	87%	87%	0%	0%	0%	0%	85	\$751
785	SYMPTOMS INVOLVING CARDIOVASCULAR SYSTEM	8,280	\$11	\$5	9,320	5.1	83%	87%	87%	0%	0%	0%	0%	86	\$555
516	OTHER ALVEOLAR AND PARIETOALVEOLAR PNEUMONOPATHY	5,640	\$11	\$5	6,480	5.3	83%	87%	88%	0%	0%	0%	0%	87	\$804
290	SENILE AND PRESENILE ORGANIC PSYCHOTIC CONDITION	11,260	\$12	\$4	12,940	4.8	83%	87%	88%	0%	0%	0%	0%	88	\$388
296	AFFECTIVE PSYCHOSES	12,980	\$11	\$4	15,660	4.5	83%	87%	88%	0%	0%	0%	0%	89	\$336
553	OTHER HERNIA OF ABDOMINAL CAVITY WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	16,780	\$10	\$4	18,000	4.0	83%	88%	88%	0%	0%	0%	0%	90	\$260
401	ESSENTIAL HYPERTENSION	11,220	\$12	\$4	13,620	3.4	84%	88%	88%	0%	0%	0%	0%	91	\$388
510	EMPHYEMA	2,860	\$13	\$4	3,740	6.1	84%	88%	88%	0%	0%	0%	0%	92	\$1,485
161	MALIGNANT NEOPLASM OF LARYNX	2,980	\$10	\$4	3,880	4.3	84%	88%	88%	0%	0%	0%	0%	93	\$1,404
550	INGUINAL HERNIA	10,860	\$9	\$4	11,740	4.0	84%	88%	88%	0%	0%	0%	0%	94	\$384
189	MALIGNANT NEOPLASM OF KIDNEY AND OTHER AND UNSPECIFIED URINARY ORGANS	10,280	\$9	\$4	11,280	4.7	84%	88%	89%	0%	0%	0%	0%	95	\$399
585	CHRONIC RENAL FAILURE	8,500	\$10	\$4	10,580	5.1	84%	88%	89%	0%	0%	0%	0%	96	\$481
724	OTHER AND UNSPECIFIED DISORDERS OF BACK	22,440	\$10	\$4	24,000	3.9	85%	89%	89%	1%	0%	0%	0%	97	\$179
730	OSTEOMYELITIS	7,300	\$11	\$4	9,440	5.5	85%	89%	89%	0%	0%	0%	0%	98	\$531
851	CEREBRAL LACERATION AND CONTUSION	2,320	\$8	\$4	2,540	6.0	85%	89%	89%	0%	0%	0%	0%	99	\$1,661
437	OTHER AND ILL-DEFINED CEREBROVASCULAR DISEASE	6,500	\$10	\$4	7,500	4.5	85%	89%	89%	0%	0%	0%	0%	100	\$592

RT-4 Summary of SNF and Inpatient Claims for Respiratory Services by Primary Diagnosis: Top 100 Diagnoses in 1996 by Total Paid Only; Patients With \$1000 or More in Total Paid

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Services	Average # of Secondary Diagnoses	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Patients	% of Services	% of Charge	% of Paid	Rank	Average Paid
	ALL DIAGNOSES	744,580	\$5,757	\$2,405	2,218,240	5.3	0%	0%	0%	100%	100%	100%	100%	0	\$3,230
518	OTHER DISEASES OF LUNG	76,960	\$717	\$279	125,900	5.2	6%	12%	12%	10%	6%	12%	12%	1	\$3,830
486	PNEUMONIA	105,460	\$359	\$152	158,300	5.0	13%	19%	18%	14%	7%	6%	6%	2	\$1,442
482	OTHER BACTERIAL PNEUMONIA	74,020	\$291	\$132	101,280	5.8	17%	24%	23%	10%	5%	5%	5%	3	\$1,788
428	HEART FAILURE	109,760	\$312	\$127	195,700	5.4	26%	29%	29%	15%	9%	5%	5%	4	\$1,154
491	CHRONIC BRONCHITIS	88,420	\$276	\$125	151,760	4.4	33%	34%	34%	12%	7%	5%	5%	5	\$1,417
414	OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE	70,340	\$271	\$122	95,200	5.9	37%	39%	37%	9%	4%	5%	5%	6	\$1,740
410	ACUTE MYOCARDIAL INFARCTION	55,560	\$215	\$94	78,140	6.1	41%	42%	43%	7%	4%	4%	4%	7	\$1,689
507	PNEUMONITIS DUE TO SOLIDS AND LIQUIDS	42,480	\$168	\$79	62,140	8.3	44%	45%	46%	8%	3%	3%	3%	8	\$1,856
496	CHRONIC AIRWAY OBSTRUCTION	34,720	\$177	\$89	60,280	3.3	46%	48%	48%	5%	3%	3%	3%	9	\$1,974
38	SEPTICEMIA	40,360	\$149	\$58	53,820	6.5	49%	51%	51%	5%	2%	3%	2%	10	\$1,432
V57	CARE INVOLVING USE OF REHABILITATION PROCEDURES	43,080	\$111	\$47	56,540	6.0	51%	53%	53%	6%	3%	2%	2%	11	\$1,097
162	MALIGNANT NEOPLASM OF TRACHEA	22,040	\$97	\$42	32,680	5.1	53%	55%	55%	3%	1%	2%	2%	12	\$1,916
441	AORTIC ANEURYSM	14,820	\$92	\$42	18,240	6.2	54%	56%	57%	2%	1%	2%	2%	13	\$2,809
820	FRACTURE OF NECK OF FEMUR	29,000	\$97	\$38	48,060	4.8	56%	58%	58%	4%	2%	2%	2%	14	\$1,318
436	ACUTE, BUT ILL. DEFINED, CEREBROVASCULAR DISEASE	18,520	\$92	\$32	34,320	3.0	57%	59%	60%	2%	2%	2%	1%	15	\$1,736
434	OCCCLUSION OF CEREBRAL ARTERIES	20,280	\$70	\$30	28,000	5.9	58%	61%	61%	3%	1%	1%	1%	16	\$1,459
493	ASTHMA	20,340	\$61	\$29	32,460	3.9	60%	62%	62%	3%	1%	1%	1%	17	\$1,403
424	OTHER DISEASES OF ENDOCARDIUM	11,500	\$58	\$27	14,040	5.6	61%	63%	63%	2%	1%	1%	1%	18	\$2,383
560	INTESTINAL OBSTRUCTION WITHOUT MENTION OF HERNIA	14,320	\$82	\$23	19,300	5.9	61%	64%	64%	2%	1%	1%	1%	19	\$1,809
250	DIABETES MELLITUS	15,460	\$52	\$20	23,700	5.2	62%	65%	65%	2%	1%	1%	1%	20	\$1,297
998	COMPLICATIONS PECULIAR TO CERTAIN SPECIFIED PROCEDURES	15,580	\$50	\$19	20,680	6.0	63%	66%	66%	2%	1%	1%	1%	21	\$1,233
431	INTRACEREBRAL HEMORRHAGE	6,200	\$39	\$19	8,540	5.2	64%	66%	67%	1%	0%	1%	1%	22	\$3,091
153	MALIGNANT NEOPLASM OF COLON	9,280	\$39	\$17	11,900	6.3	64%	67%	67%	1%	1%	1%	1%	23	\$1,878
427	CARDIAC DYSRHYTHMIAS	22,820	\$47	\$17	29,380	5.4	66%	68%	68%	3%	1%	1%	1%	24	\$756
440	ATHEROSCLEROSIS	10,760	\$39	\$16	14,220	6.0	66%	69%	69%	1%	1%	1%	1%	25	\$1,516
276	DISORDERS OF FLUID	21,140	\$39	\$16	26,160	5.6	67%	69%	70%	3%	1%	1%	1%	26	\$735
481	PNEUMOCOCCAL PNEUMONIA [STREPTOCOCCUS PNEUMONIAE PNEUMONIA]	10,260	\$35	\$15	12,540	5.5	68%	70%	70%	1%	1%	1%	1%	27	\$1,501
599	OTHER DISORDERS OF URETHRA AND URINARY TRACT	16,640	\$39	\$15	22,660	5.3	69%	70%	71%	2%	1%	1%	1%	28	\$918
707	CHRONIC ULCER OF SKIN	7,520	\$42	\$15	13,740	4.4	70%	71%	71%	1%	1%	1%	1%	29	\$2,030
492	EMPHYSEMA	8,180	\$34	\$15	11,360	4.2	70%	72%	72%	1%	1%	1%	1%	30	\$1,799
780	GENERAL SYMPTOMS	13,980	\$33	\$14	18,760	4.8	71%	72%	73%	2%	1%	1%	1%	31	\$1,003
197	SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND DIGESTIVE SYSTEMS	8,880	\$25	\$13	11,380	5.7	72%	73%	73%	1%	1%	0%	1%	32	\$1,529
562	DIVERTICULA OF INTESTINE	8,560	\$28	\$12	10,780	6.0	72%	73%	74%	1%	0%	0%	0%	33	\$1,366
998	OTHER COMPLICATIONS OF PROCEDURES	7,760	\$28	\$12	10,080	6.2	72%	74%	74%	1%	0%	0%	0%	34	\$1,483
532	DUODENAL ULCER	5,460	\$27	\$11	8,740	6.8	73%	74%	75%	1%	0%	0%	0%	35	\$2,077
415	ACUTE PULMONARY HEART DISEASE	8,080	\$28	\$11	10,560	5.7	73%	75%	75%	1%	0%	0%	0%	36	\$1,344
557	VASCULAR INSUFFICIENCY OF INTESTINE	4,200	\$28	\$10	5,160	7.0	73%	75%	75%	1%	0%	0%	0%	37	\$2,418
574	CHOLELITHIASIS	8,320	\$26	\$10	9,900	5.9	74%	76%	76%	1%	0%	0%	0%	38	\$1,213
402	HYPERTENSIVE HEART DISEASE	10,420	\$23	\$10	14,440	5.5	75%	76%	76%	1%	1%	0%	0%	39	\$957
430	SUBARACHNOID HEMORRHAGE	2,400	\$20	\$9	3,540	5.0	75%	76%	77%	0%	0%	0%	0%	40	\$3,835
577	DISEASES OF PANCREAS	3,880	\$25	\$9	5,700	6.2	75%	77%	77%	1%	0%	0%	0%	41	\$2,359
789	OTHER ILL-DEFINED AND UNKNOWN CAUSES OF MORBIDITY AND MORTALITY	4,820	\$24	\$9	8,440	2.8	75%	77%	77%	1%	0%	0%	0%	42	\$1,891
433	OCCCLUSION AND STENOSIS OF PRECEREBRAL ARTERIES	7,500	\$20	\$9	9,280	5.5	76%	77%	78%	1%	0%	0%	0%	43	\$1,183
584	ACUTE RENAL FAILURE	8,220	\$23	\$8	10,180	6.8	76%	78%	78%	1%	0%	0%	0%	44	\$1,027
997	OTHER COMPLICATIONS OF INTERNAL PROSTHETIC DEVICE	6,540	\$20	\$8	8,340	6.3	77%	78%	79%	1%	0%	0%	0%	45	\$1,290
786	SYMPTOMS INVOLVING RESPIRATORY SYSTEM AND OTHER CHEST SYMPTOMS	10,820	\$20	\$8	14,120	4.5	77%	79%	79%	1%	1%	0%	0%	46	\$737
852	SUBARACHNOID	2,380	\$15	\$8	2,700	6.2	77%	79%	79%	0%	0%	0%	0%	47	\$3,349
589	OTHER DISORDERS OF INTESTINE	5,600	\$19	\$8	7,320	6.6	78%	79%	80%	1%	0%	0%	0%	48	\$1,420
531	GASTRIC ULCER	4,740	\$20	\$8	6,200	6.1	78%	80%	80%	1%	0%	0%	0%	49	\$1,635
511	PLEURISY	7,200	\$18	\$8	9,680	5.4	78%	80%	80%	1%	0%	0%	0%	50	\$1,066
512	PNEUMOTHORAX	3,780	\$18	\$7	5,400	5.4	79%	80%	80%	1%	0%	0%	0%	51	\$1,933
444	ARTERIAL EMBOLISM AND THROMBOSIS	4,380	\$17	\$7	5,380	6.2	79%	80%	81%	1%	0%	0%	0%	52	\$1,851
578	GASTROINTESTINAL HEMORRHAGE	8,000	\$19	\$7	10,320	5.7	79%	81%	81%	1%	0%	0%	0%	53	\$903
715	OSTEOARTHRITIS AND ALLIED DISORDERS	6,740	\$17	\$7	9,800	4.2	80%	81%	81%	1%	0%	0%	0%	54	\$1,058
151	MALIGNANT NEOPLASM OF STOMACH	2,260	\$14	\$7	3,040	6.2	80%	81%	82%	0%	0%	0%	0%	55	\$3,101
396	DISEASES OF MITRAL AND AORTIC VALVES	2,520	\$15	\$7	3,020	6.9	80%	82%	82%	0%	0%	0%	0%	56	\$2,779
V58	ENCOUNTER FOR OTHER AND UNSPECIFIED PROCEDURES AND AFTERCARE	8,820	\$21	\$7	11,340	5.1	81%	82%	82%	1%	1%	0%	0%	57	\$766
411	OTHER ACUTE AND SUBACUTE FORMS OF														

Diag Code	Diagnosis Description	Patients	Charge Millions \$	Paid Millions \$	Average # of Secondary Diagnoses	Cumulative % of Services	Cumulative % of Charges	Cumulative % of Paid	% of Patients	% of Services	% of Charge	% of Paid	Rank	Average Paid
	ISCHEMIC HEART DISEASE	9,040	\$16	\$7	10,820	4.8	81%	82%	83%	1%	0%	0%	58	\$719
485	BRONCHOPNEUMONIA	5,440	\$16	\$6	7,340	4.8	81%	82%	83%	1%	0%	0%	59	\$1,141
733	OTHER DISORDERS OF BONE AND CARTILAGE	7,020	\$16	\$6	9,460	5.3	82%	83%	83%	1%	0%	0%	60	\$884
805	FRACTURE OF VERTEBRAL COLUMN WITHOUT MENTION OF SPINAL CORD INJURY	2,260	\$14	\$6	3,460	4.6	82%	83%	83%	0%	0%	0%	61	\$2,648
432	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE	2,220	\$11	\$6	3,040	4.9	82%	83%	84%	0%	0%	0%	62	\$2,670
348	OTHER CONDITIONS OF BRAIN	2,400	\$15	\$6	3,540	4.6	82%	83%	84%	0%	0%	0%	63	\$2,355
821	FRACTURE OF OTHER AND UNSPECIFIED PARTS OF FEMUR	3,120	\$14	\$6	4,900	4.9	83%	84%	84%	0%	0%	0%	64	\$1,801
552	OTHER HERNIA OF ABDOMINAL CAVITY	2,780	\$12	\$6	3,160	6.2	83%	84%	84%	0%	0%	0%	65	\$2,002
466	ACUTE BRONCHITIS AND BRONCHIOLITIS	6,280	\$13	\$5	8,120	4.4	83%	84%	84%	1%	0%	0%	66	\$869
682	OTHER CELLULITIS AND ABSCESS	6,080	\$13	\$5	8,280	5.2	83%	84%	85%	1%	0%	0%	67	\$884
530	DISEASES OF ESOPHAGUS	5,340	\$13	\$5	6,840	5.7	84%	85%	85%	1%	0%	0%	68	\$982
198	SECONDARY MALIGNANT NEOPLASM OF OTHER SPECIFIED SITES	4,460	\$11	\$5	5,640	5.7	84%	85%	85%	1%	0%	0%	69	\$1,168
150	MALIGNANT NEOPLASM OF ESOPHAGUS	1,400	\$13	\$5	1,860	5.8	84%	85%	85%	0%	0%	0%	70	\$3,648
404	HYPERTENSIVE HEART AND RENAL DISEASE	5,120	\$13	\$5	6,880	5.8	84%	85%	86%	1%	0%	0%	71	\$981
571	CHRONIC LIVER DISEASE AND CIRRHOSIS	2,900	\$12	\$5	4,620	6.1	85%	85%	86%	0%	0%	0%	72	\$1,659
154	MALIGNANT NEOPLASM OF RECTUM	3,280	\$12	\$5	4,380	5.7	85%	86%	86%	0%	0%	0%	73	\$1,420
807	FRACTURE OF RIB(S)	2,180	\$10	\$5	2,840	5.6	85%	86%	86%	0%	0%	0%	74	\$2,130
728	DISORDERS OF MUSCLE	2,000	\$11	\$5	3,340	3.6	85%	86%	86%	0%	0%	0%	75	\$2,251
515	POSTINFLAMMATORY PULMONARY FIBROSIS	3,260	\$9	\$4	4,380	4.9	85%	86%	86%	0%	0%	0%	76	\$1,376
403	HYPERTENSIVE RENAL DISEASE	4,660	\$11	\$4	5,820	5.9	86%	86%	87%	1%	0%	0%	77	\$913
112	CANDIDIASIS	2,940	\$10	\$4	3,620	5.9	86%	87%	87%	0%	0%	0%	78	\$1,443
787	SYMPTOMS INVOLVING DIGESTIVE SYSTEM	3,820	\$11	\$4	5,140	4.2	86%	87%	87%	1%	0%	0%	79	\$1,093
161	MALIGNANT NEOPLASM OF LARYNX	1,660	\$9	\$4	2,440	4.5	86%	87%	87%	0%	0%	0%	80	\$2,305
510	EMPYEMA	1,820	\$12	\$4	2,240	6.3	86%	87%	87%	0%	0%	0%	81	\$2,359
453	OTHER VENOUS EMBOLISM AND THROMBOSIS	4,180	\$9	\$4	5,100	5.0	86%	87%	87%	1%	0%	0%	82	\$912
42	HUMAN IMMUNODEFICIENCY VIRUS (HIV) DISEASE	1,620	\$8	\$4	3,220	5.7	86%	87%	88%	0%	0%	0%	83	\$2,314
345	EPILEPSY	1,480	\$9	\$4	2,140	5.8	87%	88%	88%	0%	0%	0%	84	\$2,505
808	FRACTURE OF PELVIS	2,540	\$9	\$4	4,080	4.7	87%	88%	88%	0%	0%	0%	85	\$1,411
806	FRACTURE OF VERTEBRAL COLUMN WITH SPINAL CORD INJURY	480	\$10	\$4	680	4.9	87%	88%	88%	0%	0%	0%	86	\$7,465
785	SYMPTOMS INVOLVING CARDIOVASCULAR SYSTEM	2,560	\$8	\$3	3,200	4.8	87%	88%	88%	0%	0%	0%	87	\$1,365
516	OTHER ALVEOLAR AND PARIETOALVEOLAR PNEUMONOPATHY	2,160	\$8	\$3	2,560	5.6	87%	88%	88%	0%	0%	0%	88	\$1,612
851	CEREBRAL LACERATION AND CONTUSION	880	\$7	\$3	1,080	6.3	87%	88%	89%	0%	0%	0%	89	\$3,943
401	ESSENTIAL HYPERTENSION	2,660	\$10	\$3	4,280	2.8	87%	88%	89%	0%	0%	0%	90	\$1,287
290	SENILE AND PRESENILE ORGANIC PSYCHOTIC CONDITIONS	2,900	\$9	\$3	4,180	3.8	87%	89%	89%	0%	0%	0%	91	\$1,121
296	AFFECTIVE PSYCHOSES	3,560	\$8	\$3	4,920	4.9	88%	89%	89%	0%	0%	0%	92	\$912
437	OTHER AND ILL-DEFINED CEREBROVASCULAR DISEASE	1,420	\$8	\$3	2,120	4.2	88%	89%	89%	0%	0%	0%	93	\$2,235
443	OTHER PERIPHERAL VASCULAR DISEASE	1,920	\$9	\$3	2,600	4.4	88%	89%	89%	0%	0%	0%	94	\$1,840
730	OSTEOMYELITIS	2,220	\$9	\$3	3,600	5.4	88%	89%	89%	0%	0%	0%	95	\$1,396
357	INFLAMMATORY AND TOXIC NEUROPATHY	380	\$8	\$3	780	5.6	88%	89%	89%	0%	0%	0%	96	\$8,152
550	INGUINAL HERNIA	1,580	\$7	\$3	1,860	5.3	88%	89%	90%	0%	0%	0%	97	\$1,950
585	CHRONIC RENAL FAILURE	3,040	\$7	\$3	4,360	4.8	88%	90%	90%	0%	0%	0%	98	\$1,013
519	OTHER DISEASES OF RESPIRATORY SYSTEM	1,700	\$8	\$3	2,500	4.7	89%	90%	90%	0%	0%	0%	99	\$1,766
438	LATE EFFECTS OF CEREBROVASCULAR DISEASE	1,600	\$8	\$3	2,560	3.3	89%	90%	90%	0%	0%	0%	100	\$1,782

Attachment #2



AMERICAN ASSOCIATION FOR RESPIRATORY CARE

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August 26, 1998

Health Care Financing Administration
Department of Health and Human Services
Attention: HCFA-1913-IFC
P.O. Box 26688
Baltimore, MD 21207-0488

To Whom It May Concern:

The American Association for Respiratory Care (AARC), has reviewed and analyzed the interim final regulations on the Prospective Payment System (PPS) and Consolidated Billing for Skilled Nursing Facilities (SNFs), published in the Federal Register on May 12, 1998, and respectfully submits the following comments. The AARC is a professional association representing 37,000 respiratory therapists, or respiratory care practitioners, across the nation.

OVERVIEW

On July 1, 1998, the Medicare structure for Part A SNFs began a dramatic transition from a cost/charge reimbursement system to one of prospective payment. The prospective payment transition, which will occur over 3 years, includes a Federal rate and a facility-specific rate. The Federal payment rate will cover all the costs of furnishing covered skilled nursing services with the exception for educational costs. This includes Part B services furnished under an arrangement with the SNF to SNF inpatients. Thus, except for physicians' services, and other practitioners exempted under the law, unbundling of services allowed under the previous payment mechanism will no longer be permitted.

The data used to develop the rates were taken from the cost and claims reports of 1995, a wage index, a case-mix index, and a market basket inflation index. The facility-specific rate is based on the 1995 cost report (which includes routine, ancillary and capital related costs) plus an estimate of the amount that would be payable under Part B for covered SNF services. Version III of the Resource Utilization Groups (RUG-III) case-mix classification system will capture

resource use (nursing and treatment time) of nursing home patients and is intended to provide an improved method of tracking quality of care. The RUG-III groups are used in determining the payment scheme. SNFs must prepare a Minimum Data Set (MDS) clinical assessment by day 5 of a patient's admission to a SNF, as well as ongoing assessments within certain time frames. The outcome of all the patient data derived from the extensive MDS fields will determine what RUG-III category the patient will fall into, and therefore, what the per diem rate will be during that time frame.

In today's complex and ever-changing health care system, the need for more cost effective measures in the delivery of health care, while preserving the quality of care to patients, is ever-present. The AARC recognizes the need for prospective payment for SNFs and commends HCFA staff on its efforts to develop such a system, including consolidated billing provisions, as required by the Balanced Budget Act of 1997. However, we have serious concerns regarding the treatment of respiratory services in the development of this significant new Medicare payment mechanism.

While we are committed to implementing prospective payment for SNFs, we are concerned that there are no separate cost calculations for respiratory therapy services included in the cost of ancillary services. The new per diem PPS squarely places the financial risk of providing services on the individual nursing facility. Individual facilities will have the discretion to determine what professional will provide a given health service. Because the new PPS will result in the overall reduction in SNF reimbursement, nursing homes will have an apparent financial incentive to utilize the least costly and unqualified personnel. The AARC has serious concerns that the use of persons with inadequate training and competency testing in respiratory care to provide respiratory rehabilitation services to SNF inpatients will contribute to inadequate quality of care for such patients.

ISSUES

In its overall assessment of the new SNF PPS rules, the AARC has identified several substantive issues that HCFA needs to address: 1) respiratory therapy as a rehabilitation service; 2) outlier policy in developing Federal rates; 3) quality issues affecting patient care; and, 4) time frame for implementation. In addition to these substantive comments, AARC has also two areas of concern relative to resource materials that long-term facilities use in evaluating patient assessments; namely the Long Term Care Resident Assessment Instrument (RAI) User's Manual, and the MDS. With respect to these issues, we have provided additional technical comments which relate to the definition of "respiratory therapy" and MDS assessment fields. The discussion that follows identifies the issues, provides a summary of AARC's concern and sets forth recommendations and/or options for HCFA's consideration.

SUBSTANTIVE COMMENTS

1. RESPIRATORY THERAPY AS A REHABILITATION SERVICE

Issue:

The new SNF PPS rates do not include specific cost calculations for respiratory therapy services. The RUG–III case-mix classification system, which is used, in part, to develop the Federal prospective payment rates, designates only physical therapy, occupational therapy, and speech therapy as rehabilitation services. Respiratory therapy has been omitted without apparent reason or adequate justification.

Comments:

The preamble of the interim final rules describes the data sources used in developing the Federal SNF PPS rates. One data source is the Medicare Provider Analysis and Review (MEDPAR) case mix analog (Section II., A, 2, e., 63 FR 26257). HCFA concludes that, although there are certain limitations in using this data source, the MEDPAR file is a reasonable tool to use in approximating the RUG–III categories related to Medicare SNF claims and appropriate for use in rate standardization. One limitation in using MEDPAR data is the fact that rehabilitation therapy provided in the SNF is covered under Part A (thereby having claims data in MEDPAR), but such services provided by an independent agency may be billed under Part B. Thus, the MEDPAR proxy may not reflect a complete record of all the services a SNF patient may receive during a course of stay. For example, respiratory therapy is not specifically identified as a rehabilitation therapy service.

Access to Quality Care

In other benefit categories, the Medicare payment does provide for respiratory rehabilitation. The Comprehensive Outpatient Rehabilitation Facility (CORF) benefit recognizes the clinical appropriateness and efficacy of respiratory rehabilitation by including this service as a Medicare benefit. Further, in order to assure that quality care is given, the CORF conditions of participation specify at 42 CFR 485.70 the qualifications a respiratory therapist and a respiratory therapy technician must meet. Thus, by not including respiratory therapy within the RUG–III rehabilitation category, HCFA will, first and foremost, deny access to quality respiratory rehabilitation services to persons with respiratory impairments. But more importantly, persons with the potential to benefit from these services to improve the length and quality of their life, and to decrease the incidence and cost of these illnesses, will not have access to the beneficial effects of respiratory rehabilitation. For some patients, this may also contribute to longer hospital stays.

The RUG–III system is the clinical assessment tool which will be used to classify Medicare SNF patients for reimbursement purposes under the new PPS system. Patients will be required to

undergo a detailed assessment within the first 5 days of being admitted to a facility. RUG-III classifies patients by medical conditions, rehabilitation needs, and their ability to perform activities of daily living. The RUG-III rehabilitation category covers physical therapy, occupational therapy, and speech therapy. Reimbursement for rehabilitation services over and above the routine PPS payment is provided for those patients in an amount dependent upon classification into five rehabilitation subcategories. The subcategories are derived from the intensity required for rehabilitation. Respiratory therapy is not included as a RUG-III rehabilitation classification service.

AARC strongly opposes the omission of respiratory therapy services as a designated rehabilitation service as part of the RUG-III system. This omission will disadvantage Medicare beneficiaries with respiratory rehabilitation potential by denying them needed services. For example, under this system, a patient with a broken hip and in need of respiratory services, such as pneumonia or chronic obstructive pulmonary disease (as indicated in the MDS), would be placed in a rehabilitation RUG-III category. Resources for this patient would be high enough to include the provision of physical therapy to care for the broken hip, but not sufficient enough to provide reimbursement for necessary respiratory therapy. Respiratory, physical, occupational and speech deficiencies each impact an individual's quality of life. However, rehabilitative respiratory deficiencies, much more so than the others, will also directly impact the life expectancy of a patient if untreated or not treated properly.

Data Analysis

The respiratory component of the Medicare SNF rate was estimated by HCFA based on PPS demonstration data collected in 1995. These data included extremely limited instances of respiratory therapy in the Rehabilitation Groups. For example, for new admissions to the demonstration in 1995, it was found that in the Rehabilitation Groups, 65 percent received physical therapy, 49 percent received occupational therapy, and 7 percent received speech-language pathology services, while only 3 percent received respiratory therapy. Because of its minimal use, HCFA apparently concluded that respiratory therapy rehabilitation was insignificant to include it in the RUG-III classification groups as a rehabilitation service along with physical therapy, occupational therapy, and speech therapy.

AARC recently commissioned Muse & Associates, an independent health care consulting firm, to conduct a study which 1) determined the growth, scope and extent of respiratory care services in Medicare inpatient settings using the most recent data; 2) determined if there are significant numbers of Medicare beneficiaries who are intense users of respiratory care services; and 3) speculated on how these intense users might be dealt with in the SNF PPS system.¹

¹

Muse & Associates, *Respiratory Care Services in Medicare*, June 1998. (Copy enclosed.)

Muse & Associates' analysis is based on data compiled from HCFA's 1994 and 1996 Standard Analytical Beneficiary Encrypted Public Use Files. These data bases contain all Medicare services delivered to a sample of beneficiaries and are widely accepted in HCFA as valid data sources. The files contain final action claims data with all adjustments resolved for all Medicare beneficiaries. They capture 99 percent of the claims for a given calendar year. The 5 percent Sample Standard Analytical Files, which consist of 7 separate files, are created by extracting all of the claims for a 5 percent sample of beneficiaries for a particular year. All files were used for the Muse & Associates study. The findings indicate the following:

In 1994, Medicare received 300,000 claims and \$493 million in submitted charges for respiratory therapy services from Medicare skilled nursing facilities. In 1996, the number of claims for such services had grown to almost 581,000 claims, almost double the 1994 figure. And the submitted charges for such services had more than doubled (133 percent) to \$1.1 billion. The growth in charges paid between 1994 and 1996 was 138 percent. HCFA data show that 24 percent of the 1.6 million Medicare beneficiaries who were in skilled nursing facilities during 1996 received respiratory therapy. This is eight-fold the 3 percent figure HCFA obtained from the 1995 SNF PPS demonstrations.

The data also show that 30 percent of the Medicare SNF patients who receive respiratory therapy have medical conditions which necessitate the intense use of such therapy. However, this sub-population accounted for **82 percent** of the expenditures for respiratory care in the SNF setting. (NOTE: A detailed discussion on this issue is provided in the following item 2., Outlier Policy in Developing Federal Rates.)

Summary

The AARC believes that the above discussion clearly demonstrates that respiratory therapy services are:

- 1) an integral and increasingly used service for many Medicare beneficiaries in SNFs;
- 2) medically necessary for a subset of Medicare beneficiaries in SNFs who are intense users of such therapy; and
- 3) cost effective when provided to SNF patients by qualified personnel.

Therefore, we strongly recommend that HCFA recognize respiratory rehabilitation as a distinct medical service, not a subset of other therapy services. Other therapy providers cannot assume the clinical responsibility of the respiratory therapist when providing respiratory rehabilitation. Respiratory rehabilitation cannot, and should not, be rendered without a physician's plan of care, which must include measurable improvement goals for each patient.

Currently, nursing homes can and do offer respiratory rehabilitation to their patients. Without

including respiratory therapy as a category under RUG-III, this valuable service may no longer be available to a Medicare patient unless the SNF provides the service "under arrangement." As a result, nursing homes faced with a limited reimbursement, which will not include respiratory rehabilitation, will be reluctant to accept patients with compromised respiratory systems. We acknowledge that HCFA is revising its rules at section 409.27 (Section VI, 63 FR 26301 - 26302) to permit coverage of respiratory therapy services under an arrangement between the SNF and a respiratory therapist, regardless of whether the therapist is employed by the SNF's transfer agreement hospital. However, this amendment alone does not go far enough in ensuring patient access to critically needed services by qualified personnel.

Recommendation #1:

HCFA should act immediately to amend the RUG-III classification system to include respiratory therapy in the rehabilitation classification group and develop a factor for establishing the SNF payment rates to appropriately account for respiratory services in all groups.

2. OUTLIER POLICY IN DEVELOPING FEDERAL RATES

Issue:

A significant number of Medicare beneficiaries in SNFs require extensive respiratory care services. Although the proposed regulation deals with some of these beneficiaries through the RUG-III categorization, adequate resources for approximately 80,000 to 90,000 Medicare beneficiaries requiring extensive respiratory services are not provided for by the interim final regulations.

Comments:

Our comments are divided into two sections. The first section documents the existence of those Medicare beneficiaries in need of respiratory services. The second subsection examines the characteristics of the group of intense users whose needs are not dealt with by the interim final regulations. Our comments and the statistics provided below are drawn from the previously mentioned Muse & Associates' study.

Overall Need

HCFA data show that approximately 4.2 million (33 percent) of the 13 million Medicare beneficiaries who were in a SNF or inpatient hospital setting in 1996 received respiratory therapy services. Approximately 363,000 (24 percent) of the 1.6 million Medicare beneficiaries who were in a SNF setting in 1996 received respiratory therapy services. The top 100 diagnoses account for 98.6 percent of all respiratory care services. The top 10 diagnoses account for approximately half of all respiratory therapy payments and the top five diagnoses account for one-third of all payments.

In 1996, the average length of stay for SNF patients who received respiratory therapy services was 22.6 days. This is significantly less than the 1996 average length of stay of 26.2 days for all 1.6 million Medicare SNF patients. Costs per day for respiratory care services² for the top 10 diagnoses ranged from \$39 to \$85, with the average of all diagnoses being \$47. More importantly, within this category, the top 5 primary diagnoses for respiratory care services, which ranged in cost from \$58 to \$85 per day, were all diseases of the lung.³ These data clearly show a group of Medicare beneficiaries that have high respiratory care needs and relatively short SNF stays.

Intense Users

The Medicare data base available for commenting on the SNF PPS interim final rule, the Medicare 5 percent statistical file, did not have measures of the number of minutes of respiratory therapy provided to Medicare beneficiaries in the nursing home setting. Hence, it was necessary to use dollars as a proxy for resources. After examining the distribution of allowed payments for respiratory care, \$1,000 of respiratory services per stay was selected as the definition of an “intense user.”

Medicare beneficiaries with more than \$1,000 in paid respiratory therapy claims account for only 18 percent (744,580 out of 4,170,160) of all Medicare beneficiaries who received respiratory services in 1996.

Most importantly, the top four diagnoses (excluding a generic category of “other diseases of the lung”) – chronic bronchitis, chronic airway obstruction, pneumonia due to solids or liquids, and pneumonia – average between \$75 and \$100 per day in respiratory services. This amount of dollars is far more than the dollars available to SNFs in the 42 RUG–III categories that do not have respiratory adjustments. These extraordinary respiratory care needs of the 98,540 Medicare beneficiaries that fall into this category warrant an outlier policy to insure adequate care for these beneficiaries.

Because of the limits of the data base available to Muse & Associates in conducting its study,

² Due to the nature of the Medicare 5% Public Use File, it is impossible to break out the varying components (labor, overhead, oxygen, etc.) from the total payments recorded for respiratory care services.

³ Muse & Associates, *Respiratory Care Services in Medicare*, Table 6, page 10, June 1998.

they were unable to determine how many of these respiratory patients would fall into the two RUG-III categories that have explicit adjustments for respiratory services. Based on some exploratory analysis of the records, it is estimated that no more than between 10,000 and 20,000 of the 98,540 will fall into these two RUG-III categories. Data bases available to HCFA could produce more precise estimates. One data base would be the SNF PPS demonstration data that should soon be available as a Public Use File. Another data base would be the future combined MDS and PPS fiscal intermediary data. We assume that new data bases would not be available until the year 2000.

Recommendation #2:

HCFA should initiate an outlier policy for approximately 80,000 to 90,000 Medicare beneficiaries with specific diagnoses that require intensive respiratory care services, i.e., chronic bronchitis, chronic airway obstruction, pneumonia due to solids or liquids, and pneumonia. This subset of Medicare beneficiaries who have high respiratory needs do not fall within the two RUG-III categories that have explicit adjustments for respiratory services for the four diagnoses identified above. Based on our clinical practice guidelines, it is recommended that the outlier policy should require that nursing homes document patient needs and the provision of respiratory services in excess of 30 minutes per day. The outlier policy could be made budget neutral. The budget neutrality could be made relative to either therapies and/or nursing resources.

Our membership's technical experts, the AARC staff and our contractor, Muse & Associates, are available to assist HCFA in the data and policy development for such an outlier policy.

3. QUALITY OF CARE AFFECTING PATIENT OUTCOMES

Issue:

The new SNF PPS, as outlined by HCFA in the interim final rules, provides nursing homes with an apparent financial incentive to utilize the least costly personnel who may not be qualified to provide appropriate care to patients. As stated earlier, AARC has serious concerns that this may result in respiratory services being provided to Medicare patients by personnel who may be inadequately trained and who do not have the necessary competency testing in respiratory care to perform such services.

Comments:

The AARC recognizes that the cost-based system under which the Medicare Part A SNF benefit has been reimbursed for over 30 years requires change. The PPS, as proposed, will clearly require the facility to assume financial risk in providing services. However, we believe the flaws in PPS addressed above will have the result of impeding the Medicare beneficiary's access to clinically appropriate respiratory therapy. Because PPS will result in the overall reduction in SNF reimbursement, nursing homes will have an apparent financial incentive to utilize the least

costly respiratory services by unqualified professionals in providing respiratory therapy. In fact, some nursing facilities may fail to provide a full range of services. We believe this translates into use of unqualified personnel which, in turn, will adversely affect the quality of patient care and health outcomes.

In past discussions, HCFA contends that the scope of practice provisions contained in state licensure or certification laws prevent unqualified personnel from rendering health care services without appropriate training or education. However, by design and by definition, scopes of practice are typically non-exclusionary. In certain circumstances, crossover skills among professionals are efficient and effective and do not endanger patient care. On the other hand, some facilities, driven by financial motives to maximize their per diem, may use unqualified personnel and justify their decision as based on open-ended “scope of practice” definitions. HCFA cannot abandon its duty to ensure quality care that maximizes patient outcomes by relying on states’ scopes of practice to provide a firewall against inappropriate personnel decisions.

In the case of respiratory therapy, 42 states, Puerto Rico, and the District of Columbia have respiratory therapy licensure or certification laws. There are 8 states without any state-based regulations. Unscrupulous providers in any state, but in particular those 8 states without respiratory regulations, could very well employ unqualified personnel to assume the duties of the respiratory therapist. It is HCFA’s responsibility to have program safeguards in place that will protect Medicare beneficiaries from receiving services by unqualified and untrained personnel, whether they be in states with or without licensure laws. There is no basis for including respiratory care services as a “routine nursing” practice. Moreover, we believe the current design of the SNF PPS rules will only continue to perpetuate this problem.

Respiratory Care Services

Respiratory care is a highly specialized allied health discipline focused on the management and treatment of lung disease and illness. Respiratory therapists treat patients with acute and complex respiratory problems in a broad spectrum of settings. They also assess and develop patient care plans as part of their scope of practice. Respiratory therapists initiate, conduct and modify prescribed therapeutic procedures, assist physicians performing special procedures and conduct pulmonary rehabilitation. They select, assemble, and assure that equipment will not contribute to nosocomial infections. Additionally, they verify proper equipment operation and correct malfunctioning equipment. Respiratory therapists maintain patient records and communicate relevant information to other members of the health care team.

Moreover, respiratory therapists utilize clinical decision-making skills to assess resident health, analyze pathophysiology, recommend medications, and design, implement and modify respiratory care treatment plans. They implement protocol-based care, in which respiratory therapists work with physicians to develop the most appropriate treatment plan to meet a resident’s changing respiratory care needs. Respiratory therapists rely upon a combination of intervention and clinical thinking skills developed through experience in actual clinical practice.

They utilize their training in and knowledge of the latest complex respiratory care technology to make resident care decisions.

Specialized Training and Education

The key to successful patient outcomes, and protection of the patient, is to ensure that a respiratory therapist is available at the SNF to oversee the diagnostic evaluation, therapy, and education of the patient, family and the public. We acknowledge that there may be cases in which some registered nurses may be able to administer certain rudimentary respiratory procedures after undergoing specialized post-licensure education. However, that is not necessarily an indication that they are qualified to 1) deliver *all* forms of such care; 2) that the respiratory care they give is of the same acceptable quality as that provided by respiratory therapists, or 3) that they are qualified to assess the appropriateness and continued need for a particular modality of respiratory care. For example, to qualify as a "trained nurse," we believe one should not only receive specific training and education in the administration of respiratory treatments and procedures, but should also be tested for competency based on task performance. Nurses may not necessarily learn appropriate respiratory care therapy as part of their formal nursing training program. On the other hand, respiratory therapists undergo more advanced, specialized training and education focused on the provision of respiratory care than any other health professional. More importantly, they *are* tested on their competency.

For respiratory therapists, "formal training" is defined as a supervised, deliberate and systematic continuing educational activity in the affective, psychomotor, and cognitive domains. The training must be approved by a local, regional, or national accrediting entity. In the allied health field, this training includes supervised preclinical and clinical activities, as well as documentation of competence through tests determined to be valid and reliable. The facility providing the training must also meet accreditation standards.

Respiratory therapists must pass a rigorous examination administered by the National Board for Respiratory Care (NBRC) in order to be credentialed. The NBRC examination is the only examination which tests the competency of health professionals to render respiratory care services. The test is based on job requirements. The NBRC competency examination specifically focuses on skills and knowledge related to respiratory care. (A copy of the examination content outline is enclosed.) Often the national credentialing is linked with state licensure. And, respiratory therapists update their skills and knowledge through continuing education courses, which many states require as a condition of licensure.

The AARC has developed 13 separate competency areas that we strongly believe must be demonstrated prior to providing respiratory therapy services. (A copy of the formal training and competency testing requirements is enclosed for further reference.) However, we would point out that there are several organizations that have standards for developing competency tests. Among those are the Joint Standards of the American Psychological Association and the American Educational Research Association, the Uniform Guidelines on Employee Selection

Procedures⁴, and the National Commission for Certifying Agencies (NCCA). The NCCA was originally created as a Federal initiative to develop regional competency tests. Thus, if any competency tests meet the standards established by these organizations, the AARC considers them to be valid in fully meeting the requirements for respiratory therapy.

Respiratory Therapy Treatment

Physicians routinely order respiratory therapy services for patients with severely compromised pulmonary systems. Implicit in the physician's order is the expectation that the patient will receive high quality specialized respiratory therapy treatment rendered by a credentialed respiratory therapist. Physicians rely on the respiratory therapist's expertise not just to carry out their orders, but to assess the continued need and appropriateness of respiratory therapy orders and recommend changes to each patient's plan of care. This is especially true today with the prevalence of protocol-based care. Under protocols, respiratory therapists work with physicians to develop the most appropriate treatment plan to meet a patient's changing respiratory care needs. It is the respiratory therapists' combination of assessment skills and clinical savvy in respiratory care that allow them to make critical decisions and recommend medications and treatment plan changes.

Support of the Professional Medical Community

The high standards of the NBRC credentialing process have been recognized within the medical community. For example, the National Association for Medical Direction of Respiratory Care (NAMDRRC) supports the fact that "The hours of education and the curriculum required for credentialing of a respiratory care practitioner [therapist] should be the standard for all non-physician providers of respiratory care services." (See enclosed statement.) In addition to NAMDRRC, several state and national associations and societies have gone on record in support of the continued use of nationally credentialed respiratory therapists working under the supervision of a qualified medical director as being the most highly qualified health care personnel to deliver respiratory care services to patients. These organizations include the American College of Chest Physicians, the American Society of Anesthesiologists, and the California Thoracic Society. (See enclosed statements of support.) We would note that these are all physicians' groups who are concerned that patients receive quality care.

Lastly, other national associations, together with AARC, have recently expressed concerns to the HCFA Administrator about the effectiveness of implementing a prospective payment for SNFs that does not fully account for the crucial role that respiratory care plays in SNFs with respect to

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Developed by the U.S. Department of Labor, the U.S. Department of Justice, the Equal Employment Opportunity Commission, and the Civil Service Commission.

the required professionals, the services and their costs. These organizations include the American Health Care Association, Health Industry Distributors Association, Health Industry Manufacturers Association, and the National Association for the Support of Long Term Care. We are providing a copy of that letter as part of our official comments on the SNF PPS interim final rule to ensure that the concerns expressed therein are considered as part of the record. (See copy enclosed.)

Outcomes Data

Studies have concluded that respiratory care programs spend significantly more time training people in respiratory care than nursing programs and that “many nursing programs provide little or no training in many respiratory care subject areas.”⁵ Studies have also found that respiratory therapists receive far more classroom instruction on respiratory care than do nurses. The respiratory care certification examinations cover significantly more respiratory care material than the certification exams in other allied health disciplines. Studies comparing the number and the range of content of respiratory-related questions on certification or licensure examinations have found that there are greater numbers of respiratory-related questions on the respiratory therapist examination than on the registered nurse practice exams.⁶ These studies demonstrate that

⁵ Indiana University Center for Survey Research, *Health Professions Curriculum Study*, Report on the Health Professions Curriculum Study (1994). (See copy enclosed.)

⁶ See Benjamin Interiano, M.D & Kalpalatha K. Guntupalli, M.D., *Metered-Dose Inhalers: Do Health Care Providers Know What to Teach?*, 153 Arch. Intern. Med 81 (1993); Sophia Daniels, PharmD & John Meuleman, M.D., *Importance of Assessment of Metered Dose Inhaler Technique in the Elderly*, 42 JAGS 82 (1994); Mary Beth O’Connell, et.al., *Short-and Long-Term Retention of A Nursing Home Education Program on Metered-Dose Inhaler Technique*, 26 The Annals of Pharmacotherapy 980 (1992); G. Gary Guidry, M.D., et al, *Incorrect Use of Metered Dose Inhalers by Medical Personnel*, 101:1 Chest 31 (1992); and Indiana University Center for Survey Research, *Health Professions Curriculum Study*, Report on the Health Professions Curriculum Study (1994). (Complete copies of these articles and/or abstracts are enclosed for review.)

respiratory therapists have a stronger educational background in respiratory care services than nurses. Nurse practitioners who studied on-the-job training of nurses for metered-dose inhaler technique found that the registered nurses were unable to verbalize or demonstrate proper technique over time.⁷ Metered-dose inhalers are the simplest procedures to use. This suggests that the effectiveness of on-the-job training for registered nurses is inadequate to deliver respiratory care to patients under the guise of routine nursing. Respiratory therapists are the most qualified, and therefore the most appropriate, health professionals to deliver respiratory care services.

Summary

Simply put, respiratory therapists are best qualified to render respiratory care services just as physical therapists, occupational therapists, and speech therapists are superior in their roles. Respiratory patients should expect to be assured that they are going to receive appropriate quality care.

Recommendation #3:

HCFA should recognize that respiratory therapy **must** be provided by trained, skilled and experienced professionals who have been competency tested, and that the respiratory care service **must** be fully funded in order to ensure that positive patient outcomes are achieved and savings to the Medicare program are maintained.

4. TIME FRAME FOR IMPLEMENTATION

Issue:

By extending the comment period until September 11, 1998, HCFA has acknowledged the complexity and scope of the interim final rule published in May 1998 and the need for the industry and professional associations to assess adequately its consequences. Thus, the effective date of July 1, 1998, for implementing the SNF PPS provisions does not provide sufficient time for HCFA to properly take into account issues raised by the AARC during the extended comment period. (It should be noted that HCFA has delayed implementation of other BBA provisions due to resource and data systems constraints, including the consolidated billing provisions of the interim final rule.)

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Mary Beth O'Connell, et al., *Short-and Long-Term Retention of A Nursing Home Education Program on Metered-Dose Inhaler Technique*, 26 The Annals of Pharmacotherapy, 980 (1992).

Comments:

The major issues, comments and recommendations we have articulated above are based on our deep-seated concern for patient safety, quality of care and equity. While we clearly voice our concerns on behalf of respiratory therapists and respiratory care practitioners, we are no less concerned about the welfare of our patients. The revolutionary changes HCFA is proposing will have a profound effect on the nursing home industry. We believe that the recommendations we have made must be accepted by HCFA and implemented in order to minimize any untoward effect of the new payment and billing procedures that will be imposed upon Medicare skilled nursing facilities. These changes will take time to put in place and we, accordingly, believe it will be time well-spent.

Recommendation #4:

HCFA should extend the effective date for implementing the skilled nursing facility prospective payment system for at least six months following the close of the comment period (i.e., September 11, 1998) in order to incorporate fully the AARC recommendations.

TECHNICAL COMMENTS

In addition to the substantive comments discussed above, the AARC has several concerns regarding the RAI User's Manual and the MDS assessment fields. Our comments are discussed below:

5. DEFINITION OF "RESPIRATORY THERAPY"

Issue:

There are several areas in the RAI Manual that are problematic. First, the RAI Manual fails to define correctly the profession of "respiratory therapy" and the qualifications of a "respiratory therapist." Second, the RAI Manual states that a "trained nurse" can provide respiratory therapy services. However, there is no elaboration or definition of what the term "trained" means. Third, the RAI Manual fails to recognize the qualifications and skills required to perform respiratory therapy assessment and treatment care planning. Fourth, certain competency testing based on task performance is critical to successful patient outcomes in the area of respiratory care services. The RAI fails to take into account the validity of competency testing, in addition to training and education, as a measure of qualification in the administration of respiratory treatments and procedures.

Comments:

The definition of "respiratory therapy" in the RAI Manual is not only inconsistent with general

medical practice, it is also inconsistent with the definitions given to the other therapies in the RAI manual – physical therapy, occupational therapy, and speech therapy. Also, because of future planned changes in the respiratory therapist/technician curriculum, we believe the definition of “respiratory therapist” also needs to be updated. Lastly, because there is no definition of “trained nurse” in the RAI Manual, AARC is concerned that some nurses may provide respiratory care services who have not received specific training, education, and competency in the administration of respiratory treatments and procedures. As we have discussed throughout this document, respiratory therapy is a highly specialized skill requiring intensive formal education and training and competency requirements. Therefore, we believe such skills should be reflected in the RAI definitions.

We have had ongoing discussions with HCFA staff over our concern in this area. The primary issue is one of training, education and competency. We believe *the most qualified* professionals should perform respiratory therapy services, especially with respect to competency testing. This includes respiratory therapy assessment and treatment care planning. The AARC advocates that all persons delivering respiratory care services be competent to do so in order to ensure that patients requiring such services receive a standard level of care. To that end, HCFA should add a new definition to the RAI Manual that defines “validated competency examination”, which incorporates some measure of competency for those professionals providing respiratory care services based on established competency standards. We believe the standards established by the organizations identified elsewhere in our comments represent valid competency requirements one must meet to perform respiratory care services. Also, as mentioned previously, the AARC has developed 13 separate competency areas that we believe must be demonstrated prior to providing respiratory care services.

On a separate track, we intend to pursue similar changes in definitions to the “Interpretative Guidelines” for long-term care facilities regarding the training, education and competency requirements for respiratory care services.

Recommendation #5:

HCFA should revise the definitions of “respiratory therapy”, “respiratory therapist”, and “trained nurse” contained in the RAI Users Manual (Version 2.0) and add a new definition of “validated competency examination” to reflect current accepted medical, educational and competency standards for respiratory care services. These changes should include the requirement that respiratory therapy assessment and treatment care planning be performed by a physician or respiratory therapist. Similar changes should also be included in the “Interpretive Guidelines” for long-term care facilities and HCFA’s published “Questions and Answers” on the MDS.

6. MINIMUM DATA SET ASSESSMENT FIELDS

Issue:

The assessment fields in the Minimum Data Set (MDS) (2.0) do not provide categories to adequately document the complex needs of patients suffering from heart and lung disease and their therapeutic, diagnostic, and pharmaceutical respiratory requirements. Also, there are current data items in the MDS that are not considered in the RUG-III classification groupings determination that need to be taken into account in order to appropriately recognize patient acuity and payment.

Comments:

At public briefings and meetings over the past several years, HCFA reported the need for parsimony and efficiency in the final design of the Minimum Data Set (MDS version 2.0). As a result of the efficiency efforts, several sections that document the need for respiratory therapy services were combined or even omitted.

A thorough review of the MDS, which is instrumental in determining the SNF levels of payment, reveals that cardiopulmonary issues are not given much emphasis in the proposed RUG-III classification groupings. For example, MDS items I.2.e., Pneumonia; P.1.a.g., Oxygen Therapy; P.1.a.i., Suctioning; P.1.a.j., Tracheotomy care; and P.1.a.l., Ventilator or Respirator, are the only respiratory diagnoses and services or treatments that are used in the RUG-III classifications methodology out of 109 items. Many forms of aggressive respiratory care (e.g., incentive spirometry, deep breathing and coughing, exercise conditioning, chest physical therapy) are not even included in the Extensive Services portion of the RUG-III categorization.

As was detailed in previous sections, when the MDS was developed in the early 1990s, the volume of respiratory services was very low. Thus, it is easy for AARC to understand that the low volume of respiratory services, coupled with the need for reduction in the number of items in the MDS, resulted in the reduction in respiratory therapy items. However, we believe the tremendous increase in the respiratory services received by Medicare beneficiaries over the last several years necessitates modifications on future versions of the MDS. Specifically, AARC requests HCFA consider the following modifications to the MDS.⁸

Section I. "Disease Diagnoses" - the primary pulmonary or respiratory diagnoses have been omitted from the list of diagnoses included in MDS Section I, "Disease Diagnoses." These diagnoses are: Chronic Bronchitis, Chronic Airway Obstruction, Pneumonia Due

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Industry experts believe that these categories should be incorporated into the MDS. It is expected that these are high cost categories; however, HCFA data are insufficient to make such a determination, since it is likely that most of these items are currently categorized as "Other."

to Solids and Liquids, and Pneumonia. In addition, we request that the current category, "Emphysema/COPD" be expanded to two categories. We also request that the additional diagnoses and infection in part 2 be added. Additional diagnoses are: Pulmonary Edema, Atelectasis, Pneumonitis, and Tracheitis. Additional infections are Pseudomonas and MRSA in the sputum.

Section O. "Medications" - there are no pulmonary medications listed. Therefore, we request that the following be added: oxygen, bronchodilators, mucolytic agents, anti-asthmatic prophylactics, anti-infective agents and corticosteroid.

Section P. "Special Treatments and Procedures" section 1.a. subsection 1 - we recommend expanding the category "Ventilator and Respiratory" into separate categories and expanding the "Respiratory" category to include Continuous Positive Airway Pressure (CPAP) and BIPAP.

Section T. "Supplement" section 1., subsections b. c. and d "Ordered Therapies" - we request "Respiratory Therapy" be added to the list of rehabilitation therapies.

In addition to the above modifications, there are several data entries in the *existing* MDS 2.0 that are related to respiratory care but are not considered in the RUG-III classification groupings determination. We believe HCFA must take these items into account and revise the RUG-III classification groupings to appropriately recognize patient acuity and payment for respiratory care services. The data entries include the following:

Section I., Disease Diagnoses:

- 1.hh. Asthma
- 1.ii. Emphysema/COPD
- 2. f. Respiratory infection
- 2. i. Tuberculosis

Section J., Health Conditions

- 1.b. Inability to lie flat due to shortness of breath
- 1.k. Recurrent lung aspirations in last 90 days
- 1.j. Shortness of breath

Section P., Special Treatments and Procedures

- 1.a.e. Monitoring acute medical condition
- 1.a.r. Training in skills required to return to the community
- 1.b.d.(B) Minutes of Respiratory Care

Recommendation #6.

Any future revisions to the Minimum Data Set (MDS) (2.0) should be modified to expand fields

of data collection to capture critical respiratory therapy diagnoses and medication requirements. Also, certain data items in the current MDS related to respiratory care should be taken into consideration in revising the RUG-III classifications so that patient acuity and payment will be appropriately recognized.

SUMMARY OF RECOMMENDATIONS

The respiratory therapists and respiratory care practitioners represented by AARC appreciate the opportunity to comment on the SNF PPS interim final rule. The issues we have presented above are those with which we have had ongoing communications with HCFA staff. We appreciate the time and attention given to our concerns. To assist HCFA staff in reviewing our recommendations, we provide the following summary:

Recommendation #1:

HCFA should act immediately to amend the RUG-III classification system to include respiratory therapy in the rehabilitation classification group and develop a factor for establishing the SNF payment rates to appropriately account for respiratory services in all groups.

Recommendation #2:

HCFA should initiate an outlier policy for approximately 80,000 to 90,000 Medicare beneficiaries with specific diagnoses that require intensive respiratory care services, i.e., chronic bronchitis, chronic airway obstruction, pneumonia due to solids or liquids, and pneumonia.

Recommendation #3:

HCFA should recognize that respiratory therapy must be provided by trained, skilled and experienced professionals who have been competency tested, and that the service must be fully funded in order to ensure that positive patient outcomes are achieved and savings to the Medicare program are maintained.

Recommendation #4:

HCFA should extend the effective date for implementing the skilled nursing facility prospective payment system for at least six months following the close of the comment period (i.e., September 11, 1998) in order to incorporate fully the AARC recommendations.

Recommendation #5:

HCFA should revise the definitions of “respiratory therapy”, “respiratory therapist” and “trained nurse” contained in the RAI Users Manual (Version 2.0) and add a new definition of “validated competency examination” to reflect current accepted medical, educational and competency standards for respiratory care services. These changes should include the requirement that respiratory therapy assessment and treatment care planning be performed by a physician or respiratory therapist. Similar changes should also be included in the “Interpretive Guidelines” for long-term care facilities and HCFA’s published “Questions and Answers” on the MDS.

Recommendation #6:

Any future revisions to the Minimum Data Set (2.0) should include an expansion of data collection fields to capture critical respiratory therapy diagnoses and medication requirements. Also, certain data items in the current MDS related to respiratory care should be considered in revising the RUG-III classifications so that patient acuity and payment will be appropriately recognized.

In reviewing the above comments, if additional clarification is needed, please contact Cheryl A. West, MHA, Director of Government Relations, at (703) 548-8506.

Sincerely,

A handwritten signature in black ink, appearing to read "SP Giordano", written in a cursive style.

Sam P. Giordano, MBA, RRT
Executive Director

Enclosures

Attachment #3



Muse & Associates

A Comparison of Medicare Nursing Home Residents Who Receive Services from a Respiratory Therapist With Those Who Do Not

August 1999

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EXECUTIVE SUMMARY

Respiratory Therapy (RT) is an integral component of Medicare Skilled Nursing Facility (SNF) care. On July 1, 1998, the Health Care Financing Administration (HCFA) implemented a Prospective Payment System (PPS) for Medicare SNFs. Since SNF PPS implementation, the American Association for Respiratory Care (AARC) estimates that approximately 75 percent of SNF respiratory therapists are no longer employed.

AARC and its members believe that services provided by RTs improve patient outcomes as demonstrated by numerous studies. AARC believes that the reimbursement driven decrease in utilization of RTs in Medicare SNFs produces poorer outcomes and higher costs.

Given these developments, Muse & Associates was commissioned by the AARC to use Medicare data to:

1. Test the hypothesis that Medicare beneficiaries with major respiratory diagnoses in SNFs who receive services from respiratory therapists have better outcomes and lower costs than those who did not receive services from RTs.
2. Compare cost and utilization patterns between beneficiaries who, during an initial SNF stay, received RT treatment with those that did not and investigate subsequent encounters with the Medicare system for both of these groups.

The analysis found that Medicare beneficiaries treated by RTs had better outcomes and lower costs than those not treated by RTs. A multivariate analysis and subsequent analyses further showed that these findings were true regardless of age or sex, the presence of comorbidities, or the incidence of stroke. The primary results of the analysis are summarized below. The detail of methodology and analyses then follow.

How many Medicare beneficiaries who are admitted to a SNF setting on an initial encounter with a diagnosis of Diseases of the Lung received respiratory therapy services?

An analysis of 1996 HCFA data shows that 137,300 Medicare beneficiaries were treated in SNFs on an initial visit for Diseases of the Lung. Diseases of the Lung include: chronic bronchitis, chronic airway obstruction, pneumonitis due to solids and liquids, other diseases of the lung and pneumonia.

How many of these beneficiaries were treated by a respiratory therapist?

Approximately 73,540 (53.6 percent) of beneficiaries received services from a respiratory therapist during an initial SNF stay. In comparison, 63,760 (46.4 percent) beneficiaries did not receive services from a respiratory therapist on an initial SNF stay.

In comparing those receiving respiratory therapy from RTs and those not treated by RTs, what were the utilization rates and associated costs for hospital emergency room/outpatient visits after an initial SNF encounter?

About 31 percent more beneficiaries who were not treated by RTs but still received respiratory therapy from other health care practitioners during an initial SNF stay subsequently required services in a hospital emergency room/outpatient setting. In hospital ER/outpatient settings, Medicare spent 23 percent more to treat beneficiaries that did not initially receive services from RTs compared to those who did (\$2.7 million vs. \$2.2 million). For this group of ER treated first encounter¹ beneficiaries, on a per capita basis, it cost approximately 11 percent more (\$386 vs. \$349) to serve a non-RT-treated patient as one who received RT services during the initial SNF stay.

What proportion of beneficiaries from the treated and not treated groups had to be readmitted to the SNF setting on their second encounter with the Medicare system during 1996?

A significantly higher proportion (14 percent) of Medicare beneficiaries who did not receive services from a RT during an initial SNF stay were readmitted to a SNF.

What proportion of beneficiaries had to be readmitted to the SNF setting on their third encounter with the Medicare system during 1996? How much less was spent on additional SNF stays for those beneficiaries who received RT services when compared to those who did not?

Those beneficiaries who received respiratory therapy services during an initial SNF stay are approximately 29 percent less likely to end up in a SNF on their third encounter. For third encounters, a lower proportion (25 percent) of dollars was spent on SNF care for RT-treated beneficiaries (24 percent RT-treated vs. 30 percent non-RT-treated).

Excluding physician visits, what is the most common treatment pattern for beneficiaries as they "flow" through the Medicare system?

¹ An encounter is defined as a set of chronologically contiguous claim records occurring in a single setting.

For the most common flow pattern, after an initial SNF visit, the largest portion of Medicare beneficiaries have a first encounter in the hospital emergency room/outpatient setting, a second encounter back in the SNF setting, and a third encounter in the emergency room/outpatient setting. However, the RT treated group with an initial SNF stay appeared to have better outcomes and cost less than the non-RT treated group.

Were the better outcomes and lower costs for Medicare beneficiaries treated by RTs due to age, gender, and comorbidity differences between the groups?

No. A multivariate analysis showed that the better outcomes and lower cost findings were not due to age or sex differences between the groups. A comparison analysis of the two groups showed that the both groups had a similar number of comorbidities. Also, the incidence of stroke was about the same in both groups.

Do findings from this study support the conclusions of the earlier AARC-sponsored analyses that RT treated Medicare beneficiaries had shorter SNF lengths of stay (LOS)? If so, what are the Medicare savings associated with this shorter LOS?

Yes, subsequent analyses support the argument that shorter LOS for the RT-treated group can be attributed to the added expertise of a respiratory therapist and the efficacy of the clinical intervention. As a result of a 3.6 day shorter average length of stay for RT-treated beneficiaries in the SNF setting, RT care produced savings to Medicare of approximately \$97.9 million.

Do RT-treated beneficiaries have lower death rates on subsequent contacts with the health care system than beneficiaries who did not receive RT services during their initial SNF stay?

Yes, for both the first and second contact beyond their initial SNF stay, RT treated beneficiaries had lower death rates than those who did not receive RT services during their initial SNF stay. At the time of first contact beyond the initial stay, the death rate for non-RT treated beneficiaries was 8.3 per 1,000. For the group of beneficiaries who received RT services during the initial SNF stay, the death rate was 4.8 per 1,000, 42 percent lower than for non-RT treated beneficiaries. At the second contact, the death rate was 14 percent lower than for non-RT treated beneficiaries.

B ACKGROUND

By July 1998, the Health Care Financing Administration (HCFA) instituted a Prospective Payment System (PPS) for Skilled Nursing Facilities (SNF) who bill Medicare. Because of the timing and methodology used to calculate SNF PPS rates, actual utilization of respiratory therapy (RT) services was under-recognized in the "rehabilitation" category under the PPS Resource Utilization Groupings (RUG). The SNF PPS design is based on data collected in the Nursing Home Case-Mix and Quality (NHCMQ) Demonstration.

During 1998, Muse & Associates completed a report for the American Association of Respiratory Care (AARC) outlining cost and use patterns of RT services for Medicare beneficiaries in SNF settings. The main conclusion drawn from that study is that between 1994 and 1996 Medicare claims for RT services delivered in SNFs grew while claims for RT services delivered in acute care hospitals declined. More importantly, RT service charges grew by \$658 million in SNFs and declined in inpatient hospitals by \$417 million between 1994 and 1996.

Based on these findings, it became clear that under-recognition of RT services in the SNF PPS has resulted in insufficient payments for RTs. This has led to a dramatic decrease in RT services in SNFs. The AARC estimates that 75 percent of SNF respiratory therapists are no longer employed. AARC and its members² believe that services provided by RTs improve patient outcomes as demonstrated by numerous studies.³ AARC believes that the reimbursement driven decrease in utilization of RTs in Medicare SNFs produces poorer outcomes and higher costs.

The current study builds on the previous work completed for the AARC. This study analyzes the outcomes of RTs who provide respiratory therapy care versus non-RT provided respiratory therapy care in the SNF setting. It also compares Medicare utilization patterns between two groups: 1) beneficiaries who received RT treatment in a SNF on an initial encounter and 2) beneficiaries who did not receive RT treatment in a SNF on an initial encounter. The study draws conclusions that clearly indicate the outcome and cost efficacy of RT services.

² AARC members include individual respiratory therapists in addition to respiratory therapist provider groups and educators.

³ See Appendix 2, "The Potential Savings to the Medicaid Program of Using Skilled Nursing Facilities for Respiratory Therapy", Abt Associates, Inc., September 1995, for a list of such studies.

D ATA SOURCES AND METHODOLOGY

Data

The data presented in this report were compiled from HCFA's 1996 Medicare 5 % Standard Analytic File (SAF). The SAF sample is created by selecting all records in the Medicare 100 percent claims file with Social Security numbers ending in 05, 20, 45, 70, or 95.⁴ The SAF files are based on all Medicare provider claims records submitted during calendar year 1996. HCFA separates the SAF by provider and services into seven distinct files. This study required the consolidation of all seven SAF files including the physician/supplier part B, DME, outpatient, inpatient, home health agency, hospice, and skilled nursing facility files. The seven SAF files were merged and sorted by patient identification number to create an analytic database. The analytic database provided information on demographics, submitted claims, payments, claims adjustment, date of claim, principal diagnosis, facility type rendering service, procedures performed, length of stay, and other related information.

Methodology

This study employed a longitudinal methodology that has been used and tested in a number of previous Muse & Associates and other nationally recognized research organization reports. Criteria were instituted to match encounters across multiple data sets and an algorithm defined for tracking claims records on the 1996 SAF files (See Appendix 1 for additional information). An encounter is defined as a set of chronologically contiguous claim records occurring in a single setting. For example, SNFs generally bill monthly. If a Medicare beneficiary had a SNF claim for contiguous days for May and June, that stay became their first encounter.

Protocols were established to avoid double counting of rehabilitation services. Edits were applied to eliminate extreme outliers and to identify likely reporting errors. Results were carefully cross-walked to ensure data validity.

Using established statistical standards, findings from the 5% SAF files were extrapolated to the universe of Medicare beneficiaries.

⁴ Data source and description taken from the Health Care Financing Administration's Public Use File Catalog.

HYPOTHESIS

Beneficiaries who receive RT services during an initial SNF stay ultimately have more favorable outcomes⁵

The focus of the investigation was to assess whether Medicare beneficiaries who receive RT services during an initial SNF stay have more favorable outcomes than those who do not. After rigorous analysis of these data, it was determined that Medicare beneficiaries with major respiratory diagnoses that received services from RTs during an initial SNF stay had significantly better outcomes and lower costs than those who did not receive services from RTs during an initial SNF stay (hereafter, these two groups are referred to as RT-treated and non-RT-treated).

Comparative Baseline: RT-Treated Beneficiaries versus Non-RT-Treated Beneficiaries

In 1996, there were 137,300 Medicare beneficiaries with primary diagnoses of Diseases of the Lung⁶ who received their initial encounter⁷ with the Medicare system in the SNF setting. Approximately 73,540 (53.6 percent) of beneficiaries received services from a respiratory therapist during an initial SNF stay. In comparison, 63,760 (46.4 percent) beneficiaries did not receive services from a respiratory therapist during an initial SNF stay.

Some Medicare beneficiaries died during the initial SNF encounter. Others were discharged and had no further services in 1996. Therefore, the final subset of beneficiaries included in the analysis who had at least one additional encounter with the health care system is 110,620 (50,980 not receiving RT during an initial encounter and 59,640 who received RT during an initial encounter).

First Encounter after Initial SNF Stay

After an initial SNF stay, a Medicare beneficiary could have gone to any one of a number of different settings ranging from a hospital emergency room (ER)/outpatient, to inpatient

⁵ Favorable outcomes is defined as proportional differences greater than 10 percent between the two groups for outpatient hospital utilization rates and readmission to SNF rates.

⁶ Diseases of the lung include: chronic bronchitis, chronic airway obstruction, pneumonitis due to solids and liquids, other diseases of the lung, and pneumonia.

⁷ An encounter is defined as a set of chronologically contiguous claim records occurring in a single setting.

hospital setting to physician visit, etc. The majority of beneficiaries in both the RT and non-RT treated groups received care in physician office settings after an initial SNF stay. This accounted for approximately 70 percent of beneficiaries and 17 percent of the dollars paid for both groups.

Despite these similarities, some significant differences between the RT treated and non-RT treated groups can be seen by analyzing utilization patterns for the first encounter. For both groups, the next largest group of beneficiaries received treatment in the hospital ER/outpatient setting on a first encounter. More importantly, those RT-treated beneficiaries experienced lower rates of utilization during 1996. Approximately 12.3 percent of non-RT treated beneficiaries had a first encounter with a hospital ER/outpatient setting during 1996. In contrast, only 9.4 percent of RT-treated beneficiaries had a first encounter in this setting. Thus, the proportion of beneficiaries who did not receive services from a RT during an initial SNF stay and subsequently went to an ER/outpatient setting was 31 percent higher than for those beneficiaries who received RT services.

Another conclusion that can be drawn from examination of first encounter data is that RT-treated beneficiaries account for lower costs in the hospital ER/outpatient setting than non-RT treated beneficiaries. In hospital ER/outpatient settings, Medicare spent 23 percent more to treat beneficiaries that did not initially receive services from RTs compared to those who did (\$2.7 million vs. \$2.2 million). For this group of ER treated first encounter beneficiaries, on a per capita basis, it cost approximately 11 percent more (\$386 vs. \$349) to serve a non-RT-treated patient than one who received RT services during the initial SNF stay.

For most other first encounters, both groups had similar utilization and payments. For example, approximately 4 percent of both groups received first encounter treatment in a Home Health Agency (HHA). Similarly, 5 percent of total first encounter payments for both groups were for HHA care.

Second and Third Encounters after Initial SNF Stay

For both groups, the highest proportion of second encounters occurred in the hospital ER/outpatient department (20.2 percent non-RT-treated vs. 18.0 percent RT-treated). Despite these similarities, approximately 12.2 percent more non-RT-treated beneficiaries had a second encounter in a hospital ER/outpatient department.

On the second encounter in the hospital ER/outpatient department, Medicare paid approximately \$5.1 million for non-RT-treated beneficiaries and \$4.9 million to care for RT-treated beneficiaries (a four percent difference). Non-RT-treated beneficiaries are slightly more expensive to care for in the outpatient setting on the second encounter. The average cost to care for a non-RT-treated beneficiary in this setting was \$437.87 while the average cost for RT treated beneficiaries was \$410.16 (a seven percent difference).

About 20.3 percent of non-RT-treated and 16.5 percent of RT-treated beneficiaries had a second encounter in a SNF. This indicates that a significantly higher proportion (23 percent) of Medicare beneficiaries who were readmitted to a SNF on the second encounter were non-RT-treated during an initial SNF stay.

On the second encounter in the SNF setting, Medicare paid approximately \$3.4 million to care for non-RT-treated beneficiaries and \$4.3 million for RT-treated beneficiaries. The average cost to care for a non-RT-treated beneficiary in this setting was \$5,852 versus \$7,945 for RT treated beneficiaries.

This higher SNF readmission rate trend for non-RT-treated beneficiaries also holds true for third encounters. RT-treated beneficiaries are approximately 29 percent less likely to be admitted to a SNF on a third encounter with the Medicare system. Similarly, for third encounters, a lower proportion (25 percent) of dollars was spent on SNF care for RT-treated beneficiaries (24 percent RT-treated vs. 30 percent non-RT-treated). In the aggregate though, Medicare paid slightly more for RT-treated beneficiaries (\$29.5 million vs. \$27.2 million).

Were the findings a function of clinical differences between the RT and Non-RT-Treated groups?

Both groups appear to have a similar mix of beneficiaries. An analysis of the two sample populations indicated that the RT treated group has similar aggregate comorbidity rates (21) to the non-RT-treated group (20). We ran an additional analysis that controlled for the primary diagnosis (reason for being included in the study). The five diagnosis codes classified as Diseases of the Lung were omitted from this second analysis to see if this effected the results. This analysis confirmed our finding that the both populations are comparable (average of 19 comorbidities) as compared to 18 comorbidities for the non-RT-treated group.

Stroke is a prevalent condition among Medicare beneficiaries who are treated in SNFs. For both groups, an almost identical number of beneficiaries who had a diagnosis of Diseases of the Lung also were diagnosed with Stroke. Approximately 24 percent of non-RT-treated beneficiaries were also diagnosed with stroke versus 23 percent of RT-treated beneficiaries.

The results of these calculations support the assertion that RT treated beneficiaries have more favorable outcomes than their non-RT-treated counterparts. This analysis demonstrates that while the two populations are clinically similar, the outcomes real differences between receiving or not receiving RT services.

Were the findings a function of age and sex differences between the RT and Non-RT groups?

A reasonable hypothesis that could invalidate the findings of this study is that the differences observed between the groups are due to systematic differences in the type of Medicare beneficiary who receives RT services when compared to those who do not receive RT services. Systematic differences by age and gender have been demonstrated in a wide variety of studies. In particular, these two variables are widely used in risk adjustment and outcome research. Hence, using multivariate analysis, we tested this hypothesis using age and gender against two of the most significant findings from the study. These findings are:

1. About 31 percent more beneficiaries who did not have services from RTs during an initial SNF stay subsequently went to a hospital ER/Outpatient facility.
2. On the second and third encounters, there are significantly lower SNF readmission rates for RT-treated beneficiaries.

The multivariate calculations were used to test whether age and/or gender could explain these two findings. First, for each group (RT/ non-RT) gender and age were regressed for those beneficiaries who did and did not have a first encounter in the hospital ER/outpatient setting. Secondly, for each group (RT/ non-RT) gender and age were regressed for those beneficiaries who did and did not have a readmission to a SNF on the second or third encounter. Dummy variables were created for age (Under 75/75 and over). Results did not vary when age was used as a continuous variable.

As demonstrated in Tables 1 and 2, the multivariate analysis showed no significant relationship between age and/or gender and either of the dependent variables (ER/no-ER, SNF Readmit/ no-SNF readmit).

Table 1
Multivariate Analysis: Age and Gender by Depending Variable –
ER/No ER Services on First Encounter. Comparing RT and Non-RT
Treated Groups using Coefficient of Variables.

	Age 74 and Below	Age 75 and Above
RT Treated	$R^2 = .000$	$R^2 = .002$
Non-RT Treated	$R^2 = .000$	$R^2 = .000$

$p \leq .10$

Table 2
Multivariate Analysis: Age and Gender by Depending Variable –
Readmission to SNF after First Encounter. Comparing RT and Non-RT
Treated Groups using Coefficient of Variables.

	Age 74 and Below	Age 75 and Above
RT Treated	$R^2 = .001$	$R^2 = .000$
Non-RT Treated	$R^2 = .001$	$R^2 = .001$

$p \leq .10$

The measure contained in Tables 1 and 2 is R^2 . R^2 indicates the amount of variation that can be accounted for in one variable if we know the value of the other variable. None of these coefficients are significant at $p \leq .10$. Similarly the standardized beta coefficients for these analysis are not significant at $p \leq .10$.

Group Similarities Support Findings From Past AARC Study

By controlling for comorbidity, gender and sex, our analysis was able to show that there were few differences between the RT and non-RT treated groups that could be used as counter explanations to the efficacy of RTs. A June 1998 Muse & Associates study that was commissioned by the AARC⁸ found that the average length of stay for SNF patients who receive respiratory therapy services was 22.6 days. This is significantly less than the 1996 average length of stay for all 1.6 million Medicare SNF patients of 26.2 days.

These findings support the hypothesis that the expert care provided by RTs in SNFs led to Medicare savings. During 1996, there were 109,240 beneficiaries who received respiratory care services in the SNFs. *As a result of a 3.6 day shorter average length of stay for RT-treated beneficiaries in this setting, RT care produced a savings to Medicare of approximately \$97.9 million.*⁹

Although the scope of this study is more narrowly focused on a subset of this population, the new findings (that the groups are similar clinically and demographically) helps support the argument that shorter lengths of stay for the RT treated group can be attributed to the added expertise of a respiratory therapist and the efficacy of the clinical intervention.

⁸ *Respiratory Care Services in Medicare*, p.9, June 1998.

⁹ Calculated by multiplying: number of RT treated SNF beneficiaries * difference in LOS * Medicare SNF per diem. The actual numbers are as follow $109,240 * 3.6 * \$250 = \$97.9$ million.

After an Initial SNF Stay, RT-Treated Beneficiaries Have Lower Death Rates

For both the first and second contact beyond their initial SNF stay, RT treated beneficiaries had lower death rates than those who did not receive RT services during their initial SNF stay. At the time of first contact beyond the initial stay, the death rate for non-RT-treated beneficiaries was 8.3 per 1,000. For the group of beneficiaries who received RT services during the initial SNF stay, the death rate was 4.8 per 1000, 42 percent lower than for non-RT-treated beneficiaries. At the second contact, the death rate for the RT treated group of beneficiaries (25.4 per 1,000) was 14 percent lower than for non-RT treated beneficiaries (29.5 per 1,000). For the third encounter, the death rates are almost identical, 13.6 per 1,000 for the RT treated group and 13.9 per 1,000 for the non-RT-treated beneficiaries.

An Analysis on Select Beneficiary "Flow" Patterns

The previous section highlights how RT and non-RT-treated beneficiaries in the aggregate use healthcare services after an initial SNF stay, but does not follow the individual paths beneficiaries take through the Medicare system. Therefore, in this section we track how individual beneficiaries "flow" through the Medicare system.

Because of the complexities of this analysis, it is necessary to reiterate the concept of encounter. An encounter is defined as a set of chronologically contiguous claim records occurring in a single setting. For example, a beneficiary left the SNF after an initial stay and then had the next encounter with the Medicare system in an ER. Two months later, the same beneficiary required additional medical attention and this time required readmission to a SNF for his/her second encounter.

Tracking "flow" patterns of individual beneficiaries allows us to take a more detailed look at usage patterns of RT and non-RT-treated beneficiaries. Excluding the physician office setting, the second largest group of both RT-treated and non-RT-treated beneficiaries received their first encounter care in a hospital ER/Outpatient setting. A total of 9 percent of RT-treated beneficiaries had a first encounter in the ER/Outpatient setting. In comparison, 12 percent of non-RT-treated beneficiaries had a first encounter in the ER/Outpatient setting. Table 3 illustrates how this subgroup of beneficiaries flowed through the Medicare system.

Table 3
1996 Most Prevalent Flow for Both RT and Non-RT Services*

	Setting	# of Beneficiaries	% of Total
<u>RT Encounters</u>			
First	ER/Outpatient	6,220	9%
Second	SNF	2,229	3%
Third	ER/Outpatient	1,269	2%
Total Beneficiaries Receiving RT in SNF		66,240	
<u>Non-RT Encounters</u>			
First	ER/Outpatient	7,100	12%
Second	SNF	2,694	5%
Third	ER/Outpatient	1,533	3%
Total Beneficiaries NOT Receiving RT in SNF		57,700	

* Excluding physician office visits. See Appendix 1 for greater detail.

About 3 percent and 5 percent respectively of RT and non-RT-treated beneficiaries had a first encounter in an ER/Outpatient setting and a second encounter in the SNF setting. Furthermore, only 2 percent of RT treated beneficiaries had a first encounter with an ER/Outpatient facility, second encounter with a SNF and third encounter back in an ER/Outpatient Facility while 3 percent of non-RT treated beneficiaries followed the same "flow" pattern.

Table 3 illustrates the most prevalent "flow" patterns¹⁰ for both RT and non-RT-treated beneficiaries who had an initial stay in a SNF. Clearly, the RT-treated group had a more favorable outcome than the non-RT-treated group on all three encounters (i.e., 9 percent versus 12 percent for the first encounter).

A similar proportion of dollars was spent treat both groups. RT-treated beneficiaries who followed this flow pattern from hospital outpatient/ER to SNF to hospital outpatient/ER accounted for approximately 7 percent of all dollars spent. Similarly, non-RT-treated beneficiaries who followed an identical flow pattern accounted for about 6 percent of all dollars spent on all three encounters.

While there are literally hundreds of different possible "flow" patterns, the examples described help reinforce the idea that RT-treated beneficiaries have more positive

¹⁰ Excluding any physician "flow" patterns.

outcomes (i.e., less use of additional health care services) than non-RT-treated beneficiaries.

C

ONCLUSIONS, CAVEATS AND ADDITIONAL RESEARCH QUESTIONS

The results of this analysis demonstrate that Medicare beneficiaries who receive RT treatment during an initial SNF stay tend to have more positive outcomes and lower costs (i.e., use fewer health care services) than non-RT-treated beneficiaries as they flow through the Medicare system.

Given this baseline study, analysis of a more current data file (like the 1999 5 % SAF, which will not be released until late 2000) at a future date may help quantify how severe the effects of SNF PPS have been. Unfortunately, by then the new study will most likely indicate that Medicare beneficiaries and the Medicare program have suffered poorer outcomes and higher costs due to a loss of the majority of respiratory therapists in nursing homes.

The results of this study show that those who had services from RTs had better outcomes and lower costs vis-à-vis emergency room services and SNF readmission's than those who did not receive such services. The multivariate analysis results in conjunction with the comorbidity comparison analysis also showed that the characteristics of the beneficiaries in the two groups did not account for the differences in outcomes.

A

PPENDIX 1

The study divides and compares beneficiaries with a diagnosis of Diseases of the Lung into two groups, those who received RT and those who did not receive RT during their initial SNF stay. The Medicare 1996 5% SAF SNF dataset was analyzed to identify all patients with a primary diagnosis of lung disease. The ICD-9 CM diagnosis codes used for this process included: 518.xx, 491.xx, 496.xx, 507.xx, and 486.xx. This resulted in a list of 137,300 beneficiaries with a primary diagnosis of Diseases of the Lung in the SNF dataset. All records for these beneficiaries were then extracted from the entire 1996 5% SAF.

Of this subset of beneficiaries, those that received RT during an initial stay were differentiated from those that did not by using revenue codes in the range 410-419. This process identified 73,540 patients with RT and 63,760 without RT. Using a methodology developed in previous rehabilitation care studies, a flow analysis was performed on each of the patients in the subset that tracks how beneficiaries progress through the Medicare system. The flow analysis consists of chronologically ordering the claims data and summarizing the information by "encounter." Each encounter is defined as a chronologically contiguous episode of care at a particular provider type from a single SAF file.

The chronological ordering is performed by using the incurred quarter (date is not available) and HCFA claim receipt date. Patients are identified as dead using the disposition code found on all records except the Part-B physician/supplier and DME records. Conflicts in the ordering of records from different files are resolved using a pre-determined collating sequence of files (SNF, inpatient, HHA, outpatient, hospice, part-B physician/supplier, and DME). SNF is ranked at the top of the collating sequence to ensure that a maximum number of post-SNF contacts are captured.

Only contacts after the initial SNF admission contact are used for this analysis. Since some patients died during this initial SNF contact, the analysis includes 66,240 RT patients and 57,700 non-RT patients.

For analysis of beneficiary specific flow patterns, one final data revision was made. Because of HCFA billing requirements and anomalies, Part-B Physician Supplier and DME contacts were not counted as a possible encounter site of service for this study. Instead the payments associated with these contacts were collapsed into the cost of the previous contact.



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The Potential Savings to the Medicare Program of Using Skilled Nursing Facilities for Respiratory Therapy:

An Economic Analysis

1 September 1995

Prepared for
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The Potential Savings to the Medicare Program of Using Skilled Nursing Facilities for Respiratory Therapy: An Economic Analysis

Introduction

The Congressional Budget Office (CBO) has estimated the effect on Medicare expenditures of allowing skilled nursing facilities (SNFs) to provide respiratory therapy for patients who are not dependent on ventilators. The CBO estimated that Medicare expenditures for treating these patients would increase by \$20-25 million per year. The CBO apparently did not specify its assumptions in generating this estimate, but it is presumed that expenditures were assumed to increase because the number of patients receiving treatment would increase.¹

In its report, the CBO considered but did not estimate the savings that Medicare could realize if ventilator-dependent patients were treated in SNFs. Although ventilator-dependent patients represent a relatively small number of total Medicare hospital discharges (about 77,000 in 1992), they are among the most costly of patients covered by Medicare: in 1992, the average reimbursement for these patients was \$62,969 per discharge. This study shows that Medicare could realize savings of at least \$142 million per year if these patients were treated in the subacute care units of SNFs rather than hospitals when clinically appropriate.

There are several groups of ventilator-dependent patients. The first group is patients in DRG 475 (respiratory system diagnosis with ventilator support) for which there were 73,562 discharges in 1992. Using the assumptions developed in an earlier analysis of the potential of freestanding SNFs to provide subacute care,² we estimate that Medicare could have saved at least \$99.3 million per year by treating these patients in SNFs. A second group of patients who could be treated in SNFs that provide ventilator services are those in other DRGs whose treatment includes the use of ventilation devices. There were 3,587 such patients in 1992, half of whom were in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses). If we focus only on the tracheostomy patients, our estimate is that

¹ Under present law, respiratory therapy in SNFs is provided by employees of hospitals. The CBO did not include any savings that could be realized if SNFs directly provided these services and did not pay a markup for the services provided by hospitals. This report also does not address this source of savings, although it is likely to be a substantial offset to the utilization increases anticipated by the CBO.

² Subacute Care in Freestanding Skilled Nursing Facilities: An Analysis of Savings to Medicare by Daniel Sherman and Laura Walker. This study, prepared by Abt Associates, was published by the American Health Care Association in 1994.

Medicare could have saved at least \$29.7 million per year if these patients had been treated in SNFs. Excluding the Medicare savings potential from other patients who also receive ventilator treatment but are not in DRGs 475 or 483, Medicare could therefore have saved at least \$129 million per year by using SNFs instead of hospitals. We have also estimated below that Medicare could have saved \$12.8 million if ventilator patients outside of DRGs 475 and 483 were treated in SNFs.

We believe that Medicare could also realize significant savings if patients who require respiratory therapy other than ventilator support were treated in SNFs. Based on the input of clinicians who developed assumptions for this report, at least 327,000 hospital patients could have potentially been treated in SNFs for 1.5 million days in 1992. For these patients, Medicare would conservatively have realized total annual savings of \$302 million annually by treating these patients in a SNF rather than hospital setting.

The potential savings to Medicare treating ventilator patients in SNFs (at least \$142 million annually) easily outweigh the CBO's estimate of increases in expenditures to Medicare of treating patients who do not require ventilator therapy. We believe, however, that Medicare could realize substantial additional savings if these other patients were treated in SNFs as well. In combination with the savings of treating ventilator patients, potential total annual savings to Medicare of using SNFs to treat patients who require respiratory therapy are estimated to be at least \$444 million.

For our analyses, we have used data from the 1992 Medicare Provider Analysis and Review (MEDPAR) file of hospital discharges. This file contains information on patient DRG, ICD-9 primary diagnosis code, length of stay, and reimbursement amount. We have combined these data with the judgement of clinicians familiar with respiratory therapy regarding the share of hospital patients who could be treated at a SNF to obtain an estimate of the total days that patients might be treated in a SNF rather than a hospital. We have then applied estimates of the per-day savings to Medicare of treating different patients in the subacute unit of a freestanding SNF rather than a hospital to estimate total savings to the Medicare program. These estimates of savings assume that hospital DRG payments are appropriately adjusted to account for the early discharge to freestanding SNFs.

Treatment of Ventilator-Dependent Patients

There are two groups of Medicare patients we have identified as requiring ventilator treatment. The first group consists of those patients in DRG 475, respiratory system diagnosis with ventilator support. In 1992, there were a total of 73,572 discharges from this DRG. The second group is those patients outside of DRG 475 whose ICD-9 procedure codes indicated that mechanical ventilation was

used to treat the patient.¹ There were a total of 3,587 discharges in this second group, about half of whom were classified in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses).

Table 1 provides basic information on patients in DRG 475, including a breakdown of the types of conditions from which these patients suffered (in terms of admitting diagnosis). Medicare reimbursements to hospitals were, on average, \$63,704; the mean length of stay for these patients was 14.4 days. In general, the average reimbursement amount and length of stay are similar across the conditions included in this DRG.

As part of Abt Associates' earlier study on the potential of freestanding SNFs to provide subacute care to Medicare patients, a panel of clinicians estimated that half of hospital inpatients in DRG 475 could be transferred to SNFs for subacute care after nine days of hospitalization. In the judgement of clinicians, these patients would be clinically stable and could be treated in the SNF for time that would otherwise be spent in an acute-care hospital setting.

Combining the above assumptions, we estimate that, in 1992, 36,781 patients could have been treated at SNFs for an average of 5.4 days each, or 198,600 days total. As part of Abt's earlier study, it was estimated that hospitals would charge \$900 per day (based on resource costs) to treat these patients during the subacute period, and that SNFs for this same period would charge \$400 per day. Therefore, using properly staffed and equipped SNFs for subacute treatment of ventilator patients in DRG 475 in 1992 would have saved the Medicare program \$500 per day per patient, for a total of \$99.3 million per year.

The estimate that half of patients in DRG 475 could be treated in SNFs is likely to be conservative. As part of this study, a group of clinicians from Integrated Health Services reviewed the conditions listed in Table 1 and made their own judgements on the share of patients who could be treated in subacute SNFs. In making these judgements, they referred to the established treatment protocols currently used by Integrated Health Services in treating of these patients. In addition to three respiratory therapists, these clinicians included two nurse clinical coordinators, a director of nursing and a pulmonologist. The clinicians focused on the eight largest groups of patients (defined in terms of ICD-9 diagnosis) who account for 72 percent of the discharges in the DRG 475. For these patients, the clinicians felt that between 90 and 100 percent of patients in individual groups could be treated in SNFs after five to seven days of hospitalization. If we assume that 90 percent of patients

¹ The codes considered in this report are V46.1 (Other dependence on machines - respirator), 96.70 (continuous mechanical ventilation of unspecified duration), and 96.72 (continuous mechanical ventilation for 96 consecutive hours). The vast majority of these patients (98 percent) were in the V46.1 group.

Table 1
Admitting ICD-9 Codes of Medicare Patients
In DRG 475 (Respiratory System Diagnosis with Ventilator Support)

ICD-9 Code	Description of Admitting ICD-9	Total Number of Medicare Discharges	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
518.81	Respiratory failure	22,658	\$54,230	13.9
486	Pneumonia, organism unspecified	12,703	72,672	15.5
496	Chronic airway obstruction, not elsewhere classified	5,525	72,306	16.4
428.0	Congestive heart failure	3,022	68,626	14.5
799.1	Respiratory arrest	2,763	63,662	11.1
507.0	Pneumonitis due to inhalation of food or vomitus	2,452	56,816	14.1
786.09	Other dyspnea & respiratory abnormalities	2,248	61,081	14.4
518.82	Other pulmonary insufficiency, not elsewhere classified	1,547	65,033	13.6
518.4	Acute edema of lung, unspecified	1,289	60,493	10.4
491.21	Obstructive chronic bronchitis, with mention of acute exacerbation	1,247	59,929	16.6
427.5	Cardiac arrest	1,230	62,636	8.5
389	Hearing loss	877	95,595	16.6
514	Pulmonary congestion & hypostasis	822	64,444	11.3
482.8	Pneumonia due to other specified bacteria	786	55,464	16.8
482.4	Pneumonia due to Staphylococcus	651	56,771	17.1
466.0	Acute bronchitis	634	60,168	15.4
482.1	Pneumonia due to Pseudomonas	630	52,181	19.0
493.90	Asthma, unspecified	584	93,635	15.3
481	Pneumococcal pneumonia (Streptococcus pneumoniae pneumonia)	576	63,175	14.9
415.1	Pulmonary embolism & infarction	492	67,739	10.8
485	Bronchopneumonia, organism unspecified	485	37,976	13.4
493.91	Asthma, unspecified (493.9)	447	66,005	12.3
276.5	Volume depletion (disorders of fluid, electrolyte, & acid based balance)	411	100,328	17.2
786.50	Chest pain, unspecified	406	52,606	13.7
492.8	Other emphysema	401	66,798	15.7
	Other patients in DRG 475	8,676	68,521	14.9
TOTAL		73,562	\$63,704	14.4

in the eight diagnosis groups could be transferred to SNFs for subacute care after seven days of treatment, then Medicare could save \$177 million per year by using SNFs to treat these patients, even assuming that none of the other patients in this DRG could be treated in SNFs. This provides some indication as to how conservative our original estimate of \$99.3 million for this DRG is.

The second group of ventilator dependent patients are those patients outside of DRG 475 whose ICD-9 treatment codes indicated that they received ventilator support; data on these patients by DRG are presented in Table 2. In terms of number of discharges and total days of hospitalization, the largest group of patients are those in DRG 483 (tracheostomy except for face, mouth, and neck diagnoses). Although tracheostomy patients represented half of the discharges included in the table, they represented 65 percent of the overall days of stay for patients in the table and 84 percent of total Medicare reimbursements.⁴

The earlier study by Abt Associates was not able to consider DRG 483.⁵ For this study, the clinicians from Integrated Health Services estimated that 95 percent of tracheostomy patients could be moved to a SNF for subacute care after 13 days at a hospital. Using these assumptions, we estimate that patients in this DRG could have received a total of 98,133 days of treatment at SNFs. Medicare could save \$9.8 million dollars for each \$100 per day reduction in cost by treating these patients in SNFs rather than hospitals. We believe that it would cost hospitals at least \$900 per day to treat these patients and that it would cost SNFs (based on the experience of Integrated Health Services) between \$500 and \$600 per day to treat these patients. Medicare could therefore save at least \$29.7 million per year in treating these tracheostomy patients if we assume that the use of SNFs would cost at least \$300 per day.

In addition to the tracheostomy patients, there were 1,806 other patients outside of DRG 475 whose treatment involved the use of ventilation equipment. These patients were treated for a total of about 68,300 days in hospitals, with an average length of stay of 37.8 days. If 95 percent of these patients could have been moved to a SNF after 13 days of hospital treatment (the same as tracheostomy patients), Medicare would realize an additional total savings of \$12.8 million if the daily savings in using SNFs were \$300.

⁴ Tracheostomy patients have long average lengths of stay (71 days) compared to the other patients included in Table 2 (for whom average length of stay was 38 days).

⁵ The DRG is relatively new and was not included in the 1991 data available for that study. Data for patients who had undergone a tracheostomy would have been included in other DRGs.

Table 2
DRGs of Hospital Patients Who Required Ventilator Support
(ICD-9 Codes V46.1, 96.70, 96.72) Exclusive of Those in
DRG 475 (Respiratory System Diagnosis with Ventilator Support)

DRG Number	DRG Description	Frequency	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
483	Tracheostomy except for face, mouth, & neck diagnoses	1,781	\$81,303	71.0
87	Pulmonary edema & respiratory failure	325	17,946	64.5
88	Chronic obstructive pulmonary disease	136	12,771	70.8
14	Specific cerebrovascular disorders except TIA	130	6,976	15.6
127	Heart failure & shock	106	4,803	13.5
76	Other resp system O.R. procs with cc	88	19,287	42.3
416	Septicemia age > 17	75	6,327	17.3
462	Rehabilitation	73	17,769	51.6
468	Extensive O.R. proc unrelated to principal diagnosis	71	25,719	45.0
148	Major small & large bowel procs with CC	67	20,835	30.3
79	Respiratory infections & inflammations age > 17 with CC	64	9,024	15.5
320	Kidney & urinary tract infections age > 17 with CC	61	4,388	12.7
296	Nutritional & misc metabolic disorders age > 17 with CC	55	3,929	8.0
154	Stomach, esophageal & duodenal procs age > 17 with CC	49	27,049	28.0
1	Craniotomy, age > 17 except for trauma	45	18,695	25.7
107	Coronary bypass without cardiac cath	39	43,651	34.0
89	Simple pneumonia & pleurisy age > 17 with CC	39	7,482	30.4
75	Major chest procedures	35	14,536	20.7
106	Coronary bypass with cardiac cath	34	37,018	29.4
121	Circulatory disorders with AMI & CV comp disch alive	34	6,433	13.0
12	Degenerative nervous system disorders	33	9,742	133.1
101	Other respiratory system diagnosis with CC	23	7,052	47.9
	Other patients requiring ventilator support	224	16,323	23.4
TOTAL		3,587	\$47,902	54.3

Source: Calendar Year 1992 MEDPAR Hospital Database

Patients Requiring Respiratory Therapy Other Than Ventilator Support

For the purposes of this study, clinicians from Integrated Health Services identified specific medical conditions within DRGs (listed in Table 3) that would likely include patients who could be treated in subacute units of SNFs and receive respiratory therapy other than ventilator support. Nearly all of these patients were in DRGs associated with respiratory conditions as chronic obstructive pulmonary disease (DRG 88) and pneumonia (DRGs 79-81, 89-91).⁶

To estimate the share of these patients who could potentially be treated at the subacute unit of a freestanding SNF, the clinicians from Integrated Health Services reviewed data on the six largest groups of patients in the table, which together represented 379,602 discharges in 1992 (88 percent of the total in the table). Based on their experience and review of treatment protocols, the clinicians estimated that between 85 and 95 percent of these patients could be receive subacute SNFs after 4 or 5 days of hospitalization. If we assume that 85 percent of these patients (322,662 discharges) could be transferred to SNFs after 5 days of hospitalization, they could be treated for 1.51 million days at SNFs that provided respiratory therapy as part of subacute care. Medicare could potentially realize substantial savings by transferring these patients to SNFs at an appropriate point in their hospital stay. Based on our earlier estimates of differences in daily treatment costs across sites of service, we believe that savings of \$200 per day or \$302 million annually would be conservative for these patients.

Conclusion

This report has examined the potential for Medicare to realize savings by using freestanding SNFs that could provide care to patients whose treatment would include respiratory therapy. Estimate of these savings are presented in Table 4 for different groups of patients. The patients who could be treated at SNFs include those requiring ventilator support, whose cost of treatment is among the highest among Medicare patients. We have estimated under conservative assumptions that Medicare could save at least \$142 million per year if these patients were treated in SNFs. The potential annual savings to Medicare in treating non-ventilator patients in SNFs rather than hospitals are conservatively estimated to be \$302 million. These savings estimates, either individually or in combination, represent a source of potential savings to Medicare that is more than sufficient to offset the increase in expenditures for treating non-ventilator patients estimated by the Congressional Budget Office.

* The following DRGs were included: 68 (otitis media and URI age >17 w cc), 69 (otitis media and URI age >17 w/o cc), 70 (otitis media and URI age 0-17), 79 (respiratory infections and inflammations age >17 w cc), 80 (respiratory infections and inflammations age >17 w/o cc), 81 (respiratory infections and inflammations age 0-17), 87 (pulmonary edema and respiratory failure), 88 (chronic obstructive pulmonary disease), 89 (simple pneumonia and pleurisy age >17 w cc), 90 (simple pneumonia and pleurisy age >17 w/o cc), 91 (simple pneumonia and pleurisy age 0-17).

Table 3
DRG & ICD-9 Codes of Hospital Patients
(Exclusive of Those Requiring Ventilator Support)
Who Could Potentially be Treated by Respiratory Therapists in SNFs

DRG Numbers	ICD-9 Code	ICD-9 Description	Total Number of Medicare Discharges	Mean Medicare Reimbursement (\$)	Mean Medicare Length of Stay (days)
88	491.20	Obstructive chronic bronchitis, w/o mention of acute exacerbation	130,277	\$3,443	7.6
88	491.21	Obstructive chronic bronchitis, with mention of acute exacerbation			
88	494	Bronchiectasis	105,970	3,678	7.7
88	496	Chronic airway obstruction, not elsewhere classified			
79-81	507.0	Pneumonitis due to inhalation of food or vomitus	58,018	6,860	11.7
87	518.81	Respiratory failure	45,244	5,122	9.3
79-81	482.1	Pneumonia due to Pseudomonas	20,088	6,388	12.2
89-91	482.2	Pneumonia due to Hemophilus influenza (H. Influenza)			
79-81	482.4	Pneumonia due to Staphylococcus	20,005	6,604	12.8
79-81	482.0	Pneumonia due to Klebsiella pneumoniae	13,255	6,329	10.7
89-91	482.9	Bacterial pneumonia, unspecified	10,559	4,045	8.6
68-70	487.1	Influenza with pneumonia, with other respiratory manifestations	5,827	2,258	5.8
89-91	480.9	Viral pneumonia, unspecified	4,713	3,768	7.5
89-91	487.0	Influenza with pneumonia	3,262	3,620	7.9
88	491.1	Mucopurulent chronic bronchitis	2,564	3,675	8.1
88	491.8	Other chronic bronchitis			
88	491.9	Unspecified chronic bronchitis			
88	492.1	Other emphysema			
88	493.2	Chronic obstructive asthma (493.2)			
79-81	513.0	Abscess of lung	1,582	6,771	14.8
79-81	510.9	Empyema without mention of fistula	1,524	6,949	13.8
		Other patients requiring respiratory therapy	5,191	4,136	8.3
TOTAL			428,079	\$4,555	9.0

Table 4
Estimates of Savings to Medicare of Using SNFs for Respiratory Therapy

Type of Patient	Total 1992 Hospital Discharge	Annual Savings (\$ million)
Ventilator Patients in DRG 475	73,562	\$99.3 - \$177.0
Tracheostomy Patients (DRG 483)	1,781	\$29.7
Other Patients Requiring Ventilator Support	1,806	\$12.8
Other Patients Requiring Respiratory Therapy (No Ventilator Support)	428,079	\$ 302.0
TOTAL	505,228	\$443.8 - \$521.5

The Effect of Home Respiratory Therapy on Hospital Readmission Rates of Patients with Chronic Obstructive Pulmonary Disease

Sue Roselle ACSW and Frank J D'Amico PhD

The South Hills Health System Home Health Agency, Homestead, Pennsylvania, studied the effect of home respiratory therapy on hospital readmission rates in 418 patients with chronic obstructive pulmonary disease (COPD). Respiratory therapists evaluated and followed referred patients in their homes. Oxygen, breathing equipment, and supplies were provided, and patients were educated in use, cleaning, and maintenance of equipment. Data for the study were taken from hospital records, home assessments, and discharge summaries. All patients studied had been hospitalized in the year prior to receiving home respiratory therapy. After 12 months of follow-up, 64% had not been rehospitalized. In the year prior to home respiratory therapy, the average number of hospital admissions per patient had been 1.28, with the average length of hospital stay being 18.25 days. During the home respiratory therapy study period of 12 months, the average number of hospital admissions was 0.48, with the average length of hospital stay being 6.09 days. These results indicate that home care provided by respiratory therapists can significantly reduce the rehospitalization of COPD patients. Prevention of rehospitalization in the study group resulted in estimated average hospital costs savings of \$2,625 per patient for the year. As a result of this study, two large local industrial employers, the Federal Black Lung program, and Blue Cross of Western Pennsylvania have added respiratory therapy to their home health benefits. (Roselle S, D'Amico FJ. The Effect of Home Respiratory Therapy on Hospital Readmission Rates of Patients with Chronic Obstructive Pulmonary Disease. *Respir Care* 1982;27:1194-1199. Key words: Home care services, Hospitalization, Respiratory therapy.)

Ms Roselle is Executive Director, Emergency Medical Service Institute, Pittsburgh, Pennsylvania. When this study was performed Ms Roselle was Director of Allied Health Services, the South Hills Health System Home Health Agency, Homestead, Pennsylvania. Dr D'Amico is Assistant Professor, Department of Statistics, University of Pittsburgh, Pittsburgh, Pennsylvania.

The work was completed at the South Hills Health System Home Health Agency, Homestead, Pennsylvania. Research was funded by the Appalachian Regional Commission, Washington DC, with the technical assistance of the Southwestern Pennsylvania Economic Development District; the grant was administered by the United States Department of Health and Human Services. The pilot study of this project was funded by the Christmas Seal League of Southwestern Pennsylvania and by the American Association for Respiratory Therapy.

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Received March 31, 1982; revision received July 8, 1982.

Introduction

As the cost of health care has risen over the past decade, emphasis has emerged on home health services as a humane and cost-effective alternative to acute care. This paper reports the cost-effective provision of home respiratory therapy to patients with chronic obstructive pulmonary disease (COPD) under the auspice of a certified home health agency.

Home respiratory care is not a new concept. Traditionally the care has been provided by a health nurse as a follow-up to education conducted in the acute-care setting.¹ Malkus reported that hospital readmissions were prevented through the provision of nursing care to respiratory patients in their homes but there was no statistical analysis of this finding.² Most research on this subject has focused on specific therapeutic modalities applied in the home, such

Is Respiratory Care Cost Effective?



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COST-EFFECTIVENESS OF RESPIRATORY CARE

Increased Need for Respiratory Care Outside of the Acute Care Hospital

Respiratory care is an allied health specialty performed under medical direction for the assessment, treatment, management, diagnostic evaluation, and care of patients with deficiencies, abnormalities, and diseases of the cardiopulmonary system. Respiratory care practitioners care for patients ranging from the premature infant whose lungs are underdeveloped to the elderly patient whose lungs are diseased. Individuals who suffer from such diseases as emphysema, bronchitis and lung cancer, children who suffer from asthma or are afflicted with cystic fibrosis; and patients of all ages who require the use of a ventilator to breathe—they are all often cared for by the respiratory care practitioner.

Home care services have proven to be an integral part of the health care delivery system and a cost-effective alternative to expensive acute care hospital stays. The aging population, the spread of AIDS and tuberculosis, the increasing incidence of asthma, and advances in medical technology allowing technology-dependent patients to lead more productive lives outside the hospital, will increase the need for the services of trained and educated respiratory care practitioners. Respiratory patients will continue to be discharged from the hospital still requiring care, thereby increasing the demand for respiratory care services in alternate sites.

Overall, government health care policy has not kept pace with the advancement of medical technology and procedures. In particular, this has been the case for respiratory care services. When the Medicare/Medicaid program was first developed, respiratory care was fully recognized as a viable component of hospital services. Coverage and reimbursement for this service in the hospital have never been in question. However, Medicare/Medicaid policy has barely advanced in the past 25 years for respiratory care services rendered outside acute care settings. The scope of respiratory care services has developed significantly beyond the hospital setting. Where respiratory patients were once confined to a hospital bed, the same patients may now be cared for in a skilled nursing facility or in the patient's own home. It is the respiratory care community's

recommendation that Congress recognize the role that respiratory care plays in the provision of cost-effective health care in alternate sites.

Respiratory Rehabilitation: A Cost-Effective Alternative

The purpose of rehabilitation is to ameliorate physical and cognitive impairments resulting from illness or injury, and to restore or improve functional ability so that individuals can return to work and lead independent and fulfilling lives. Pulmonary rehabilitation is designed to stabilize or reverse the effects of pulmonary diseases, such as emphysema, bronchitis, or chronic obstructive pulmonary disease (COPD) (i.e. those suffering from a degenerative disease of the lungs). One federal program, the Black Lung Program, has, since 1978, recognized the importance of structured outpatient pulmonary rehabilitation programs. The Coal Mine Procedure Manual states,

"Further, DCMWC (Division of Coal Mine Workers Compensation) believes that properly administered pulmonary rehabilitation will reduce the need for future medical treatment, which would eventually prove more costly to the program."

Respiratory Care Saves Money

The scientific evidence on the cost-effectiveness and efficacy of providing respiratory care in alternate care sites continues to grow. The studies documenting cost-effectiveness of respiratory care have varied in methodology, scope, and time frame. The conclusion, however, is still the same: **respiratory care saves money.**

- A 1991 Lewin/ICF economic analysis focused on the effect of the availability of home medical equipment services on the cost of care for patients in three separate diagnostic categories. One of the categories studied was patients suffering from COPD. Lewin/ICF determined that \$520 per patient per episode would be saved if a COPD patient was to receive care in the home rather than in the hospital. With an estimated patient population of 93,000 COPD patients per year, savings to the health care system amount to over \$48 million per year.
- A recent Gallup survey studied the cost of providing hospital care to chronic ventilator patients. The survey estimates that there are over 11,500 chronic ventilator patients currently in U.S. hospitals costing an estimated \$789 per patient per day. This totals over \$9 million a day! Once a patient is medically able to be discharged, it takes an average of 35 days to place a chronic ventilator-dependent

patient in an alternative care site such as the home or skilled nursing facility. That translates to an excess of \$27,000 per patient in unnecessary hospital costs. Outdated reimbursement policies, which limit patients' access to respiratory care services outside the hospital, contribute to discharge delays and their subsequent excess cost.

- In the early 1980s, the Department of Health, Education and Welfare (HEW) sponsored a study that tracked 775 COPD patients, who received home respiratory services from a qualified respiratory therapist. The results of the study shows that hospital re-admissions for these patients were reduced from 1.28 per year to .55 per year. Furthermore, for those patients who were re-admitted to the hospital, the length of stay was decreased from 18.2 days to 5.7 days. The savings estimated for these 775 patients totaled \$1,097,250 (1980 dollars).
- A 1982 conference headed by former Surgeon General C. Everett Koop on home care alternatives resulted in the initiation of three pilot home care studies. One pilot program in Maryland provided home care to respirator-dependent children and compared hospital costs and home care costs. The savings provided by home respiratory care were more than \$15,000 per patient per month. Over the 34 month period of the pilot program, \$3.1 million in savings were realized due to the availability of home care for these children.
- A 1991 Illinois-based study on ventilator-dependent infants receiving home respiratory care versus hospital-based care saved the state over \$4 million during the four-year course of the program.
- A 1989 consensus conference co-sponsored by the AARC, the Food and Drug Administration (FDA), and the Health Resource Services Administration (HRSA) (attended by representatives from more than 60 national organizations and associations) studied the problems associated with the introduction of respiratory care equipment into the home. Practitioners, consumers, and representatives of the federal government that recommended that third-party reimbursement policies should allow home-bound respiratory patients to receive, when necessary, care from respiratory professionals.

- Aetna Life & Casualty developed an Individual Care Management Program for patients suffering from catastrophic illness. The following chart summarizes cost-effectiveness data for home care for these individuals:

Cost Per Month of Hospital Care Compared to Home Care, Selected Conditions

Condition	Cost of Hospital Care	Cost of Home Care	Dollar Savings	Difference
Infant born w/breathing & feeding problems	\$60,970	\$20,209	\$40,761	66.8%
Respiratory distress/oxygen dependency	\$36,000	\$11,500	\$24,500	68.0%
Ventilator-dependent children	\$15,742	\$ 9,153	\$ 6,589	41.9%
Patient requiring respiratory support	\$24,715	\$ 9,267	\$15,448	62.5%
Oxygen-dependent children with a tracheostomy	\$12,236	\$ 5,304	\$ 6,932	56.7%
AIDS patient care	\$23,190	\$ 2,820	\$20,370	87.8%
Pediatric AIDS	\$70,153	\$16,461	\$53,692	76.5%

- Norwalk Hospital in Connecticut conducted a four year study to evaluate the effectiveness of a hospital-based home care program for patients with severe COPD. A comprehensive home care service program was provided to 17 pulmonary patients who previously required frequent hospitalization. The COPD patients participated in a comprehensive respiratory home care program and showed significant decreases in the following:

Hospitalization Admissions	88 pre-program	53 on-program
Hospital Days	1,181 pre-program	667 on-program
Emergency Room Visit	105 pre-program	64 on-program

Costs for hospitalization, emergency room visits, and home care fell from \$908,031 to \$802,999 resulting in a savings of \$105,032 or \$328 per patient per month over the course of 48 months.

- Several research studies conducted in the past several years have compared inpatient care to home care costs for a specific group of patients. The cost savings data for these studies is summarized in the chart below. The information has been aggregated at a monthly level for purposes of comparison.

Conditions	Per Month Hospital Costs	Per Month Home Care Costs	Per Month Dollar Savings
a. Ventilator dependent adults	\$21,570	\$ 7,050	\$14,520
b. Oxygen dependent children	\$12,090	\$ 5,250	\$ 6,810

(a) Bach, J.R., Intinola, P., Alba, A.S., & Holland, I.E., (1992). The ventilator-assisted individual: cost analysis of institutionalization vs. rehabilitation and in-home management. *Chest*, 101 (2), 26-30.

(b) Fields, A.L., Rosenblatt, A., Pollack, M.M. & Kaufman, J. (1991). Home care cost-effectiveness for respiratory technology-dependent children. *American Journal of Diseases of Children*, 145, 729-733.

**Can Other Health Care Professionals be
Trained to Perform Respiratory Care
Services?**



AMERICAN SOCIETY OF ANESTHESIOLOGISTS

STATEMENT OF SUPPORT FOR RESPIRATORY CARE PRACTITIONERS OCTOBER 1996

Health care organizations have sought to implement the use of substitute caregivers. The American Society of Anesthesiologists is particularly concerned about this trend in the area of respiratory care.

Respiratory care is a highly specialized allied health profession. Respiratory Care Practitioners (RCPs) are trained to care for patients under the supervision of a qualified medical director in multiple clinical settings including home care, subacute care and hospitalized patients. The patients under their care frequently include a disproportionately sicker population than is the case for most other allied health practitioners and RCPs have responsibility for the control of life support equipment in critically-ill patients. RCPs also play an indispensable role in the coordination and utilization of respiratory care services in these multiple settings.

RCPs undergo unique and rigorous formalized training, the programs of which are nationally accredited. They are qualified by a valid and reliable national testing system. They work under the leadership and guidance of a qualified medical director and have done so for many years.

ASA is deeply concerned about the use of other practitioners delivering respiratory care services. The standard of care to patients could be compromised unless these other individuals received the same extensive education, training and competency testing as required of RCPs.

ASA strongly supports the continued use of nationally credentialed Respiratory Care Practitioners working under the supervision of a qualified medical director as they are the most highly qualified health care personnel to deliver respiratory care services to patients.

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NAMDRRC Statement

Non Physician Providers of Respiratory Care Services

In the changing health care system that is currently in progress, NAMDRRC unequivocally supports the premise that respiratory care practitioners are the non-physician care givers who are best qualified by both education and examination to render respiratory care services in the hospital and at alternate sites, including the home. Due to the complex nature of these services and the patient risks involved, respiratory care services should be provided under the direction of a qualified medical director. NAMDRRC has confidence that outcome studies, which are currently in progress, will provide further scientific validation of the benefits attributable to respiratory care practitioners.

The hours of education and the curriculum required for credentialing of a respiratory care practitioner should be the standard for all non-physician providers of respiratory care services. Verification of the knowledge and skills acquired through this educational process should be documented by appropriate testing, which includes input from physicians who specialize in respiratory medicine in the preparation of certifying examinations.

The current educational process required for credentialing of respiratory care practitioners makes them best qualified to carry out orders for respiratory care clinical interventions. Therefore, respiratory care practitioners play a critical and unique role in the coordination and utilization of respiratory care services at all sites, which is essential for appropriate patient care.

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American College of Chest Physicians
Section on Respiratory Care

RESOLUTION

Role of Respiratory Care Practitioners in the Delivery of
Respiratory Care Services

In today's ever-changing health-care field, efforts have been made to decrease costs by having a variety of health-care providers deliver respiratory care services. We are concerned that the quality of these services may be inferior if the health-care provider has not had adequate training and experience. Respiratory care practitioners (RCPs) are particularly qualified to assess patients with respiratory problems and to deliver the various modalities of respiratory care because of their unique educational background and training. Their profession has assured practitioner competence by requiring national accreditation of all training programs. This is supplemented by a national credentialing mechanism, often linked with state licensure. Continued competence is bolstered in almost every state by the legal requirement for continuing education in respiratory care. Further, RCPs provide these services under the direction of a qualified medical director.

Because RCPs have specialized training and experience, they play a vital role in the coordination and utilization of respiratory care services. This role is particularly pertinent in this era of managed care, which has resulted in an increased severity of illness in hospitalized patients, as well as in those cared for in their homes and other out-of-hospital sites. Although other health-care providers may possess the necessary training and experience to deliver simple modalities of respiratory care, the RCP is uniquely qualified to assist the physician in assessing the overall respiratory needs of patients, and in recommending and delivering the necessary care. Respiratory care modalities can be most beneficial and cost-effective when the RCP functions within the guidelines of physician-approved respiratory care protocols.

In order to assure the safety, quality, and appropriateness of respiratory care services delivered to the patients in need, the American College of Chest Physicians strongly endorses the essential role of the competent RCP in providing respiratory care under the direction of a qualified medical director.

CALIFORNIA THORACIC SOCIETY

POSITION PAPER

Respiratory Care At Alternate (Out Of Hospital) Sites

INTRODUCTION

With the changes that are occurring in the health care delivery system increasingly complex care is being delivered to more severely ill patients in settings other than the acute care hospital. These sites include transitional care units, skilled nursing facilities, nursing homes and the patient's home. The ancillary healthcare personnel delivering these services have varying degrees of training. The California Thoracic Society is concerned that some of these personnel are being asked to assess and deliver respiratory care to patients who have problems and needs that the personnel have not been adequately trained to address, presenting a potential risk to the patient. This statement addresses those concerns.

ROLE OF RESPIRATORY CARE PRACTITIONERS

Respiratory Care Practitioners (RCPs) are qualified to assess patients with respiratory problems and to deliver the modalities of respiratory care because of their educational background and training. Although other healthcare providers may possess the necessary training and experience to deliver simple modalities of respiratory care, the RCP is qualified to assist the physician in assessing the overall needs of patients, and recommending and delivering necessary care. This care can be both beneficial to the patient and cost-effective, particularly when done within guidelines of physician-approved respiratory care protocols.

The patients under the care of the RCP are frequently a sicker population than are generally cared for by most other allied healthcare practitioners. RCPs have responsibility for the control of artificial life support equipment and for the assessment of patients with compromised respiratory status. While many of these patients may appear stable, their lack of pulmonary reserve places them in constant jeopardy. The training and the experience of RCPs ensure appropriate care of this fragile patient group.

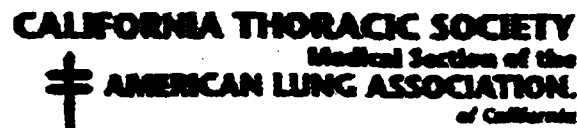
CONCLUSIONS AND RECOMMENDATIONS

1. Respiratory Care Practitioners are trained to render respiratory care services both in the hospital and at alternate (out of hospital) sites.
2. Respiratory Care Practitioners should function under the direction of a qualified medical director both in the hospital and at alternate sites.*
3. Simple respiratory care services sometimes can be administered by other healthcare practitioners, but these practitioners should be held to the same standards of practice that apply to RCPs.
4. Complex respiratory services should be administered by or under the supervision of RCPs. Any alternative personnel delivering such care should be subject to:
 - a. verification of their education and training,
 - b. demonstration of their knowledge and skills by appropriate testing of competency,
 - c. licensure under their scope of practice to deliver such care.

*Refer to CTS Position Statement "Medical Director of Respiratory Care Services and Pulmonary Function Laboratories" 1996.

Developed for the CTS Clinical Practice Assembly (CPA) Steering Committee Prepared by Jerrold A. Kram, MD May, 1997 Approved by CTS Executive Committee, 1997

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Questions are often raised as to why Respiratory Care Practitioners need to be utilized when nurses could perform the services just as well.

The Indiana University conducted a survey comparing the curriculums of nursing and respiratory therapy educational programs. The study was to compare the number of hours nurses and Respiratory Care Practitioners were trained in respiratory care subjects. The following two documents report the results.



CENTER FOR
SURVEY RESEARCH

Report on the Health Professions Curriculum Study

Survey Description

The Indiana University Center for Survey Research (CSR) in Bloomington, Indiana conducted the Health Professions Curriculum Study for the American Association for Respiratory Care (AARC). The main purpose of the survey was to determine the number of contact hours in nursing schools and respiratory therapy programs dedicated to specific aspects of respiratory care training. The survey was pretested from December 2, 1993, through January 5, 1994. Twenty-five nursing schools and 15 respiratory therapy programs were randomly selected to serve as the pretest respondents. The information gathered from those pretest surveys led to minor modifications to the final questionnaire.

The nursing sample was put together using a computer diskette purchased from the National League for Nursing (NLN). The NLN database contained 1621 institutions. In the process of assuring that the mailing information met United States Postal Service standards, it was determined that there was a great deal of duplication. If the same institution was listed more than once but had some differing information, the institution was called to determine the person and address to whom the questionnaire should be sent. Following the telephone calls, the correct information was entered into the database.

and duplicate programs were removed. After these procedures, the list was reduced to 1504 institutions. The respiratory therapy program list of 323 institutions was provided by AARC.

The survey was conducted from February 14, 1994, through June 24, 1994. Of the 1504 institutions sent nursing questionnaires, four turned out to be part of another eligible institution and thus were duplicates. Six were ineligible because their nursing program was closed or in the process of closing. A total of 23 institutions turned out not to have an entry-level nursing program resulting in an Associate, Three-Year, or Baccalaureate Degree. The result was that a total of 1471 institutions were eligible for participation in the survey. Of the eligible programs, 1077 surveys were returned. Repeated attempts were made to convince the remaining institutions to return their surveys. At the end of the survey, 73.2% of eligible programs had returned their questionnaires. This is a very good response rate for a mail survey. Of the respondents to the nursing phase of the survey, 637 offered an Associate Degree Nursing Program, 79 had a Three-Year Nursing Degree Program, 360 had a Baccalaureate Degree Program, one had a program that could not be classified into any of the three groups.

Of the 323 respiratory therapy programs sent questionnaires, one did not have either a Respiratory Therapy Technician Program or a Certified Respiratory Therapy Program and was thus ineligible. Three other programs were closed or in the process of closing. This left 319 programs eligible for participation in the survey. Of those eligible programs, 223 returned questionnaires. The other 96 failed to return their questionnaires despite repeated attempts to get them to do so. Of the eligible programs 70% returned their questionnaires. This, too, is a good response rate for this type of survey. Of the programs responding, 96 offered Respiratory Therapy Technician Programs and 182 offered Respiratory Therapist

Programs. The total number adds up to more than 223 because 55 offered both types of programs.

Results

The survey attempted to elicit the number of contact hours spent by each program on various subjects in three different settings. Results for these questions are outlined in Tables 1 through 3. These tables contain information on the mean number of hours spent on each subject. The tables also include the number of programs that provided a valid response for each question. There is a great deal of variation in the number of programs responding to different questions. Many respondents did not fill in an answer for numerous questions that applied to their programs.

From the responses that were provided, Tables 1 and 2 show that the mean number of hours spent on various subjects having to do with respiratory care was considerably higher in the respiratory therapy programs than in the nursing programs. Nursing programs spend an average of less than an hour of classroom time on all subjects except oxygen therapy, mechanical ventilators, arterial blood gas analysis, intubation and extubation, and hemodynamic monitoring. They spend even less time on the examined respiratory care subjects in a nonclinical laboratory setting. In a number of subjects, respiratory therapy students spend well over ten times more contact hours than nursing students.

Table 3 mostly follows the patterns in Tables 1 and 2. Overall, both nursing schools and respiratory therapy programs that answer the questions indicate that they spend more time on respiratory care procedures in a clinical experience/practice setting than in either a classroom or nonclinical laboratory setting. There are some subjects in which the means for Three-

Year Nursing Programs are higher than the means for respiratory therapy programs. A closer examination of the responses for these questions reveals that part of the reason for this is due to a small number of programs indicating that they spend a large number of hours on these subjects in a clinical experience/practice setting. In all cases in which Three-Year Nursing Programs have a higher mean than respiratory therapy programs, the standard deviation is greater than the mean. This indicates that most of the programs are offering considerably fewer hours than the mean, but a handful are offering considerably more than the mean. For example, in the area of chest physiotherapy, three of the Three-Year Nursing Programs gave the responses 215, 416, and 960 contact hours to the question. Of the other 21 programs answering the question, the next highest was 32 hours, and the next one after that was 16 hours. The means of the respiratory therapy programs were a better indicator of what the typical program was doing. Respiratory therapy programs had standard deviations lower than the mean and were determined far less by the extreme values of a few programs. Thus, the exception does not really challenge the general finding that respiratory therapy programs spend considerably more time on subjects having to do with respiratory care than nursing programs in a variety of pedagogical settings.

The general findings in Tables 1 through 3 are reinforced by an examination of Tables 4 through 6. As noted above, many respondents did not answer questions that applied to their programs. Tables 4 through 6 list the percentage and number of respondents leaving blank a question that applied to their program. In computing the percentages, programs that failed to answer any of the questions regarding the amount of contact hours spent on particular subjects in any of the three settings were excluded. Twenty of the Associate Degree Nursing Programs left the entire section on contact hours blank. This left 617 respondents who

answered some of the questions. Six of the respondents with Three-Year Nursing Programs left all questions on contact hours blank, leaving 73 that answered some of the questions. Of the respondents with a Bachelor's Degree Nursing Program, 37 did not answer any of the contact hour questions, while 323 answered some. Far fewer of the respiratory care programs left these sections totally blank. Two of the Respiratory Therapy Technician Programs left the contact hour section blank, leaving 94 that answered some of them. Only one of the respondents with a Respiratory Therapist Programs left the relevant section blank, while 181 answered some of the questions.

Because of the ambiguity of leaving a question blank, the programs that did this were not included when means were computed. Given that the relevant questions about contact hours were all located on a single page, it is likely the case that many of the respondents who provided an answer to one of the questions left other ones blank because their program did not provide any training in that area. Thus, the mean number of hours in Tables 1 through 3 is probably an overestimate of the mean number of hours for all the programs that responded to the study. A look at Tables 4 through 6 shows that nursing programs were far more likely to leave answers to questions unanswered than were respiratory therapy programs. The percent left blank exceeds ten percent for respiratory therapy programs in only three categories and only for Respiratory Therapy Technician Programs. For the nursing programs, the percent left blank exceeds ten percent in all subjects and all settings except for a few subjects in the didactic or classroom setting. It is important to reiterate that these cases are not included when the mean is calculated in Tables 1 through 3. In a number of areas, the number of nursing programs leaving a question blank exceeds half of the total respondents.

In sum, the results of the survey show that respiratory therapy programs spend considerably more time training people in respiratory care than nursing programs. The survey also indicates that many nursing programs provide little or no training in many respiratory care subject areas.

Table 1. Mean Time Spent Teaching 15 Selected Subjects (in hours). Didactic or Classroom Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	2.1 (525)	2.4 (67)	2.1 (263)	20.3 (88)	18.7 (168)
Mechanical Ventilators	1.3 (484)	2.1 (62)	1.3 (254)	41.3 (85)	44.9 (164)
Chest Physiotherapy	.9 (460)	.7 (60)	.9 (255)	8.0 (84)	6.1 (166)
Intermittent Positive Pressure Breathing (IPPB)	.6 (402)	.5 (51)	.5 (100)	9.4 (84)	6.5 (165)
Continuous Positive Airway Pressure (CPAP)	.5 (393)	.6 (57)	.5 (226)	6.1 (82)	6.0 (164)
Incentive Spirometry	.6 (452)	.5 (61)	.6 (195)	4.3 (84)	3.2 (165)
Aerosolized Drug Administration	.7 (406)	.4 (53)	.6 (218)	14.7 (83)	12.2 (160)
Metered Dose Inhalers	.4 (390)	.4 (55)	.5 (219)	4.7 (79)	4.0 (154)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	.8 (467)	.9 (59)	.7 (239)	5.1 (84)	6.0 (168)
Pulmonary Function Testing	.8 (451)	.7 (61)	.6 (247)	15.1 (87)	20.9 (169)
Respiratory Home Care	.4 (357)	.4 (43)	.7 (205)	7.2 (85)	10.4 (165)
Arterial Puncture	.3 (322)	.3 (50)	.4 (205)	5.7 (84)	4.5 (160)
Arterial Blood Gas Analysis	2.0 (513)	2.2 (64)	2.0 (272)	14.1 (82)	12.0 (164)
Intubation and Extubation	.8 (435)	1.0 (57)	1.0 (230)	7.6 (85)	8.0 (166)
Hemodynamic Monitoring	1.5 (469)	2.2 (61)	1.9 (262)	5.4 (85)	17.0 (172)

Table 2. Mean Time Spent Teaching 15 Selected Subjects (in hours). Nonclinical Laboratory Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	1.6 (349)	1.4 (43)	1.5 (209)	16.5 (86)	13.2 (165)
Mechanical Ventilators	.7 (262)	1.3 (33)	.7 (152)	31.0 (84)	33.0 (167)
Chest Physiotherapy	.7 (248)	.7 (26)	.7 (160)	7.7 (83)	5.8 (166)
Intermittent Positive Pressure Breathing (IPPB)	.2 (213)	.8 (20)	.2 (123)	9.4 (83)	6.3 (165)
Continuous Positive Airway Pressure (CPAP)	.2 (206)	.3 (20)	.2 (123)	6.2 (79)	4.6 (160)
Incentive Spirometry	.5 (264)	.7 (28)	.6 (156)	5.2 (81)	3.2 (160)
Aerosolized Drug Administration	.6 (228)	.2 (20)	.2 (125)	9.3 (83)	6.2 (159)
Metered Dose Inhalers	.3 (219)	.3 (26)	.4 (133)	4.2 (78)	2.9 (145)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	.3 (229)	.2 (27)	.4 (146)	4.6 (81)	3.8 (157)
Pulmonary Function Testing	.1 (198)	.2 (15)	.2 (123)	9.9 (82)	11.8 (163)
Respiratory Home Care	.1 (206)	0 (16)	.2 (117)	3.7 (73)	3.2 (142)
Arterial Puncture	.2 (216)	.3 (18)	.2 (130)	7.5 (83)	5.1 (159)
Arterial Blood Gas Analysis	.9 (248)	.9 (29)	.7 (136)	4.8 (70)	4.2 (146)
Intubation and Extubation	.3 (235)	.7 (26)	.4 (136)	8.5 (82)	7.0 (166)
Hemodynamic Monitoring	.6 (231)	1.0 (31)	1.0 (143)	3.8 (70)	5.9 (156)

Table 3. Mean Time Spent Teaching 15 Selected Subjects (in hours). Clinical Experience/Practice Setting (Number of Programs Answering Question).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	20.1 (231)	68.7 (31)	23.6 (153)	57.3 (74)	67.4 (142)
Mechanical Ventilators	9.7 (246)	41.6 (36)	14.3 (148)	127.5 (74)	227.8 (142)
Chest Physiotherapy	6.4 (199)	70.3 (24)	9.3 (116)	34.7 (72)	42.4 (142)
Intermittent Positive Pressure Breathing (IPPB)	3.2 (180)	2.4 (19)	3.2 (104)	29.5 (72)	30.9 (140)
Continuous Positive Airway Pressure (CPAP)	3.4 (181)	19.0 (26)	6.9 (110)	22.6 (71)	41.0 (132)
Incentive Spirometry	11.9 (216)	79.7 (27)	12.7 (126)	32.1 (72)	39.0 (142)
Aerosolized Drug Administration	6.1 (184)	48.5 (22)	3.6 (111)	72.6 (70)	80.2 (136)
Metered Dose Inhalers	7.3 (177)	66.8 (25)	4.2 (105)	33.5 (70)	48.2 (135)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	8.8 (225)	115.4 (32)	14.3 (140)	29.1 (73)	55.0 (136)
Pulmonary Function Testing	1.3 (180)	55.9 (23)	1.3 (100)	21.2 (74)	41.2 (151)
Respiratory Home Care	.8 (183)	22.7 (23)	3.0 (100)	12.7 (80)	25.1 (155)
Arterial Puncture	1.8 (191)	18.3 (25)	1.5 (114)	35 (68)	50.3 (135)
Arterial Blood Gas Analysis	8.4 (223)	91.1 (29)	9.7 (133)	34.2 (66)	52.9 (136)
Intubation and Extubation	3.4 (190)	16.5 (29)	6.7 (109)	22.7 (72)	40.9 (141)
Hemodynamic Monitoring	7.6 (197)	45.5 (36)	14.7 (134)	11.7 (69)	49.0 (141)

Table 4. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Didactic or Classroom Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	6.8 % (42)	4.1% (3)	11.1% (36)	3.1% (3)	3.9% (7)
Mechanical Ventilators	11.3 % (70)	9.6% (7)	14.2% (46)	3.1% (3)	5.0% (9)
Chest Physiotherapy	14.1 % (87)	12.3% (9)	13.9% (45)	4.1% (4)	4.4% (8)
Intermittent Positive Pressure Breathing (IPPB)	16.2 % (100)	17.8% (13)	19.8% (64)	4.1% (4)	4.4% (8)
Continuous Positive Airway Pressure (CPAP)	18.5 % (114)	16.4% (12)	18.9% (61)	4.1% (4)	3.9% (7)
Incentive Spirometry	12.2 % (75)	11.0% (8)	15.5% (50)	3.1% (3)	5.5% (10)
Aerosolized Drug Administration	16.5 % (102)	16.4% (12)	20.1% (65)	3.1% (3)	4.4% (8)
Metered Dose Inhalers	19.0 % (117)	12.3% (9)	19.5% (63)	4.1% (4)	4.4% (8)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	12.6 % (78)	15.1% (11)	17.3% (56)	4.1% (4)	4.4% (8)
Pulmonary Function Testing	13.5 % (83)	13.7% (10)	15.2% (49)	3.1% (3)	3.9% (7)
Respiratory Home Care	25.0 % (154)	31.5% (23)	25.8% (81)	5.2% (5)	6.1% (11)
Arterial Puncture	22.0 % (136)	19.2% (14)	25.4% (82)	5.2% (5)	6.1% (11)
Arterial Blood Gas Analysis	6.5 % (40)	5.5% (4)	10.2% (33)	5.2% (5)	5.0% (9)
Intubation and Extubation	17.8 % (110)	13.7% (10)	21.1% (68)	3.1% (3)	5.0% (9)
Hemodynamic Monitoring	14.1 % (87)	12.3% (9)	13.3% (43)	4.1% (4)	3.3% (6)

Table 5. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Nonclinical Laboratory Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	37.4% (231)	38.4% (28)	31.0% (100)	4.1% (4)	6.1% (11)
Mechanical Ventilators	48.8% (301)	46.6% (34)	43.7% (141)	4.1% (4)	5.0% (9)
Chest Physiotherapy	51.5% (318)	52.1% (38)	43.3% (140)	4.1% (4)	5.0% (9)
Intermittent Positive Pressure Breathing (IPPB)	54.1% (334)	56.2% (41)	49.5% (160)	4.1% (4)	5.0% (9)
Continuous Positive Airway Pressure (CPAP)	55.1% (340)	57.5% (42)	51.4% (166)	6.2% (6)	5.5% (10)
Incentive Spirometry	48.8% (301)	49.3% (36)	44.3% (143)	6.2% (6)	6.1% (11)
Aerosolized Drug Administration	52.7% (325)	61.6% (45)	50.8% (164)	6.2% (6)	5.5% (10)
Metered Dose Inhalers	54.9% (339)	54.8% (40)	49.2% (159)	6.2% (6)	8.3% (15)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	53.3% (329)	53.4% (39)	45.5% (147)	7.2% (7)	6.6% (12)
Pulmonary Function Testing	59.0% (364)	60.3% (44)	51.4% (166)	6.2% (6)	5.0% (9)
Respiratory Home Care	56.7% (350)	65.8% (48)	52.6% (170)	9.3% (9)	9.4% (17)
Arterial Puncture	55.8% (344)	64.4% (47)	50.5% (163)	6.2% (6)	6.1% (11)
Arterial Blood Gas Analysis	51.5% (318)	52.1% (38)	47.1% (152)	12.4% (12)	9.4% (17)
Intubation and Extubation	52.8% (326)	56.2% (41)	48.3% (156)	6.2% (6)	5.0% (9)
Hemodynamic Monitoring	54.3% (335)	50.7% (37)	46.7% (151)	11.3% (11)	5.5% (10)

Table 6. Programs Responding to Questionnaire that Left Blank the Number of Hours Spent Teaching 15 Selected Subjects. Clinical Experience/Practice Setting (Number of Programs that Left the Question Blank).

Subjects	Associate Degree Nursing	Three-Year Nursing Program	Bachelor's Degree Nursing	Respiratory Therapy Technician	Respiratory Therapist
Oxygen Therapy	25.1% (155)	23.3% (17)	20.1% (65)	7.2% (7)	7.2% (13)
Mechanical Ventilators	27.9% (172)	20.5% (15)	23.5% (76)	6.2% (6)	7.2% (13)
Chest Physiotherapy	34.6% (214)	32.9% (24)	35.0% (113)	7.2% (7)	7.7% (14)
Intermittent Positive Pressure Breathing (IPPB)	38.2% (236)	38.4% (28)	36.8% (119)	8.2% (8)	7.2% (13)
Continuous Positive Airway Pressure (CPAP)	37.6% (232)	30.1% (22)	35.0% (113)	6.2% (6)	8.3% (15)
Incentive Spirometry	29.8% (184)	26.0% (19)	30.7% (99)	7.2% (7)	7.7% (14)
Aerosolized Drug Administration	36.1% (223)	34.2% (25)	34.7% (112)	7.2% (7)	7.7% (14)
Metered Dose Inhalers	37.3% (230)	30.1% (22)	35.6% (115)	7.2% (7)	8.8% (16)
Pulse Oximetry/ Transcutaneous O ₂ and CO ₂ Monitoring	28.8% (178)	20.5% (15)	27.9% (90)	7.2% (7)	8.8% (16)
Pulmonary Function Testing	41.0% (253)	32.9% (24)	39.6% (128)	7.2% (7)	7.2% (13)
Respiratory Home Care	42.8% (264)	45.2% (33)	41.5% (134)	4.1% (4)	7.2% (13)
Arterial Puncture	40.8% (252)	38.4% (28)	39.0% (126)	9.3% (9)	8.3% (15)
Arterial Blood Gas Analysis	30.3% (187)	26.0% (19)	28.5% (92)	12.4% (12)	9.9% (18)
Intubation and Extubation	39.5% (244)	30.1% (22)	36.2% (117)	7.2% (7)	8.3% (15)
Hemodynamic Monitoring	33.4% (206)	24.7% (18)	28.8% (93)	9.3% (9)	7.2% (13)

Medical Personnel's Knowledge of and Ability To Use Inhaling Devices. Metered-Dose Inhalers, Spacing Chambers, and Breath-Actuated Dry Powder Inhalers—Hanania NA, Wittman R, Kesten S, Chapman KR. *Chest* 1994;105(1):111-116

BACKGROUND: Current treatment strategies for asthma and chronic obstructive pulmonary disease (COPD) emphasize the inhalation route, yet patients often misuse metered-dose inhalers (MDI). To address this problem, patient education by medical personnel has been recommended and a variety of alternate inhaler devices have been developed. **METHODS:** We surveyed medical personnel to assess their knowledge of and ability to use three widely used inhaler devices; MDI, MDI with a spacing chamber (Aerochamber, Trudell Medical, Canada), and a breath-actuated multidose dry powder inhaler (Turbuhaler, Astra Pharmacy, Inc., Canada). Thirty respiratory therapists (RT), 30 registered nurses (RN), and 30 medical house staff physicians (MD) were asked to demonstrate the use of each device using placebo inhalers and to answer 11 clinically relevant questions related to the use and maintenance of the tested devices. **RESULTS:** The RT's percent mean knowledge score ($67 \pm 5\%$) was significantly higher than those achieved by either the RNs ($39 \pm 7\%$) or the MDs ($48 \pm 7\%$) (for all $p < 0.0001$). Similarly, percent mean demonstration scores for each device were significantly higher for RTs than either RN or MD groups; for MDI, $97 \pm 3\%$ versus $82 \pm 13\%$ and $69 \pm 24\%$, respectively ($p < 0.0001$); for the Aerochamber, $98 \pm 2\%$ versus $78 \pm 20\%$ and $57 \pm 31\%$ ($p < 0.0001$); and for the Turbuhaler, $60 \pm 30\%$ versus $12 \pm 23\%$ and $21 \pm 30\%$ ($p < 0.0001$). Knowledge of and practical skills with the devices were roughly proportional to the length of time the device had been in clinical use, Turbuhaler demonstration scores being lower than either MDI or Aerochamber scores ($p = 0.05$ and $p = 0.09$, respectively). More RTs (77%) had received formal instruction on the use of devices at school than either RNs (30%) or MDS (43%) ($p < 0.05$). **CONCLUSION:** We conclude that (1) many

medical personnel responsible for monitoring and instructing patients in optimal inhaler use lack rudimentary skills with these devices, (2) nurses and physicians seldom receive formal training in the use of inhaling devices, and (3) newer inhaling devices designed to obviate problems of technique are at present less likely to be used well by medical personnel soon after their introduction.

Incorrect Use of Metered Dose Inhalers by Medical Personnel—Guidry GG, Brown WD, Stogner SW, George RB. Chest 1992;101(1):31-33

We administered a questionnaire and observed usage of a placebo metered dose inhaler (MDI) among 35 physicians, 14 nurses, and 12 respiratory therapists. Ninety-two percent of the respiratory therapists performed at least four of seven steps correctly, compared with 65% of house staff physicians, 57% of nurses, and 50% of nonpulmonary faculty. Most participants followed package insert instructions, while only 18% followed recent recommendations for proper MDI use. We conclude that (1) medical personnel should have additional instruction in proper MDI usage and (2) respiratory therapists and nurses can play a prominent role in instructing patients in their proper use.

Short- and Long-Term Retention of a Nursing Home Education Program on Metered-Dose Inhaler Technique—O'Connell MB, Hewitt JM, Lackner TE, Pastor JD 3d, Wong MT, Bishop AL. Ann Pharmacother 1992;26(7-8):980-984

OBJECTIVE: To evaluate an education program on metered-dose inhaler (MDI) technique designed for nurses and trained medication aides (TMAs). **DESIGN:** The education program included a handout, a lecture incorporating a videotape on correct inhaler and device technique, and hands-on experience with placebo inhalers. The participants' ability to verbalize and demonstrate correct MDI technique was assessed by the same two-person

teams before, immediately after, and two months after the program. SETTING: Five nursing homes. PARTICIPANTS: Fifty-six nurses and TMAs practicing in nursing homes. MAIN OUTCOME MEASURES: Learning and retention. RESULTS: The participants' mean ($\pm$ SD) verbal and demonstration scores increased immediately after the program by 68 ± 18 points for verbalization and 47 ± 16 points for demonstration. The participants were always better at demonstrating than verbalizing MDI technique. The participants' baseline verbal and demonstration scores correlated with the amount learned. Learning was influenced by the individual nursing home (verbal and demonstration) and personal use (demonstration only), but not by academic degree, previous training, past instruction of a patient, or current care of a patient who was receiving inhaler therapy. After two months, the scores were lower than immediately after the program test by 0-92 points for verbalization and 10-80 points for demonstration; however, the mean scores were still significantly greater ($p < 0.05$) than the baseline scores. Retention of knowledge on the correct technique was greater for the demonstration component. Retention was influenced only by the nursing home in which the participant worked, and not any of the other variables. CONCLUSIONS: Our structured education program significantly improved inhaler technique; however, to maintain retention of the material, the program should be frequently repeated.

Metered-Dose Inhalers. Do Health Care Providers Know What To Teach?—

Intenano B, Guntupalli KK. Arch Intern Med 1993;153(1):81-85

OBJECTIVE: The specific aim of this investigation was to evaluate the proficiency of health care providers and patients in the proper use of metered-dose inhalers. DESIGN, SETTING, AND PARTICIPANTS: Health care providers, which include house staff, nurses, and respiratory care practitioners who provide care to patients with asthma in the primary general medicine clinic or the pulmonary medicine clinic of a university-county

hospital in which patients were referred, were surveyed and assigned a performance score regarding the knowledge base of the appropriate use of metered-dose inhalers. Patients who attended the primary care general medicine and pulmonary subspecialty clinic were also assessed as to their proficiency in the use of metered-dose inhalers. RESULTS: A significant percentage of patients had a poor understanding of the technique used with the metered-dose inhaler. House staff and nursing staff were also less proficient in the proper use of the metered-dose inhaler. The respiratory care practitioners were the most knowledgeable of the health care providers. CONCLUSIONS: This study confirms that a large percentage of patients use metered-dose inhalers improperly. It also demonstrates a significant lack of understanding by health care providers of the proper use of metered-dose inhalers. Furthermore, this study supports the use of respiratory care practitioners in the outpatient setting, since they were the most proficient among all the health care providers in the proper use of metered-dose inhalers.

Importance of Assessment of Metered-Dose Inhaler Technique in the Elderly—Daniels S. Meuleman J. J Am Geriatr Soc 1994;42(1):82-84.

Metered-dose inhalers (MDIs) are effective in the treatment of chronic obstructive pulmonary disease. There is evidence, however, that the majority of patients have poor technique and, therefore, are not receiving optimal drug therapy. The following case illustrates the importance of patient instruction in the use of MDI by healthcare providers who deal with the aged.