Funding of Graduate Medical Education[1]

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Funding of radiology residency and fellowship programs has become an increasingly complex and vital component of the graduate medical education (GME) enterprise. Almost all revenue is directed to the hospital, not individual residency programs. Therefore, program directors need to understand how GME is funded and how changes in funding may affect their programs. In the past, for example, a program director could have residents complete rotations at another hospital or participating institution, and everyone would be pleased. The resident was getting an improved educational experience. The sponsoring institution or main teaching hospital would get less money from the government, but the participating institution that was now getting more reimbursement from the government would pay the resident's stipend and benefits. This situation can still occur, but it has become more difficult for non–sponsoring institutions to accept residents, because of new limits on reimbursement. Now there are caps on the number of residents for which Medicare will reimburse the hospital, and the hospital is paid only for residents who are performing on-site rotations at the hospital and/or its clinics. To aggravate matters, most hospitals are at or above their caps for residents. In addition, hospitals are scrutinizing each line of their budgets, including the cost of residents. In some cases, this has resulted in a decreased number of residents for some programs and great resistance to increasing those numbers even though the clinical workload is increasing.

This article provides an overview of the different sources of revenue to hospitals and programs that support GME. In particular, it will discuss contributions from the federal government, state government, industry, faculty practice plans, hospital patient care revenues, and philanthropy. It also includes a brief description of expenses for program directors to consider when determining their program's budget.

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FEDERAL SOURCES OF FUNDING

The federal government is the largest contributor to GME through its Medicare and Medicaid (matching) programs, the Departments of Veterans Affairs and Defense, and the Public Health Service.

Medicare

The largest source of governmental funding for GME is Medicare reimbursement to the hospital. Although the amount of payment and the way it is figured have changed since the initial Medicare legislation in 1965, the government has continued to bear part of the net cost of educating residents, to maintain a supply of physicians for the public good. In fiscal year 2001, Medicare payments with an educational label reflecting direct GME (DGME) and indirect graduate medical education (IME) payments, associated with Medicare fee-for-service and managed-care enrollees, totaled $8.2 billion (1). This money was distributed through Medicare Part A, providing about $2.6 billion in DGME and about $5.6 billion in IME. The DGME supports the cost of residents.

The DGME payment dates back to 1965 when Congress acknowledged that educational activities enhanced the quality of care at teaching hospitals and recognized the need to support residency programs as a way to help meet the nation's need for fully trained health professionals. DGME payments reimburse the hospital for costs directly related to educating residents: resident stipends and fringe benefits, supervisory faculty salaries and fringe

benefits, costs associated with providing GME programs, and allocated institutional overhead costs.

Since its inception, the method of DGME payment has evolved from an open-ended, cost-reimbursement system (Medicare paid GME reimbursement at the same percentage as Medicare patient use) to a hospital-specific, per-resident amount after Congress passed the Consolidated Omnibus Reconciliation Act in 1986. This act not only changed the payment to a capitated (or per-resident) rate but also limited the number of years for which Medicare supports a resident's training. Currently, in general, Medicare provides reimbursement for one full-time equivalent (FTE) per year for each resident in his or her initial period of board eligibility, which is determined when the trainee enters the residency program and cannot exceed 5 years. For a resident who remains in training past the 5-year limit, Medicare compensates the hospital for only 0.5 FTE per year.

The DGME payment is calculated yearly for each specific teaching hospital by adjusting for inflation the 1984 base per-resident amount that the Health Care Financing Administration (now the Centers for Medicare and Medicaid Services) calculated for that hospital. This amount is then multiplied by the total number of residents (FTEs) in that hospital (adjusted according to whether the resident is in the initial residency period or beyond). Subsequently, the resulting aggregate amount is multiplied by Medicare's proportion of total inpatient days in that specific hospital (Medicare utilization rate), which often averages near 30%. The result is the amount that Medicare will pay the hospital for DGME. The DGME per-resident amount varies greatly by geographic location, with the highest payments in the northeast (eg, New York City). The payment per resident for teaching hospitals ranges from under $40,000 to $120,000, with most hospitals receiving between $60,000 and $80,000 per resident per year as of 2002 (2). The DGME Medicare payment typically is 30% of this amount (Medicare share). Since the 1990s, when Congress and others recognized a need for more primary care physicians, payments for primary care residents have been consistently slightly higher than for non–primary care residents.

The IME adjustment compensates teaching hospitals for their higher Medicare inpatient hospital operating costs due to disease severity that is not fully captured by the diagnosis-related group (DRG) patient classification system. It also compensates for the lower productivity and the ordering of more diagnostic tests associated with residency programs, as well as the high standby costs incurred by teaching hospitals.

The DRG is the payment unit of the prospective payment system implemented in 1983, which defines a single lump-sum rate for the entire hospital stay of Medicare patients according to the diagnosis at admission. The DRG rates are adjusted for location, area wages, types of patients, and in some cases IME (for teaching hospitals), and for disproportionate share for hospitals (DSH) that treat large numbers of low-income and uninsured patients.

The IME add-on payment is based on a statistical analysis that uses the ratio of interns and residents to beds (IRB). The formula used to calculate the percentage add-on or IME adjustment is as follows: $M \cdot [(1 + IRB)^{0.405} - 1]$, where M is the multiplier for the given fiscal year. For fiscal year 2001, the multiplier is 1.6, which results in an IME level of approximately 6.5% for every 10% increase in the intern/resident-to-bed ratio.

The resulting percentage is then used to calculate the IME payment per case. For example, the IME percentage add-on for *X* hospital was calculated to be 15%. For a coronary bypass with cardiac catheterization (DRG 106) reimbursed by Medicare at $23,228, the hospital received an extra $3,484.20 for IME, added to the base DRG payment. If a hospital receives DSH payments, a different formula is used to calculate the percentage add-on to the DRG payment, depending primarily on hospital size.

Medicare funding of GME changed markedly with the passage of the 1997 Balanced Budget Act (3), which resulted in less money reimbursed to hospitals. Major changes are outlined below.

Reimbursement for clinical time.—Resident counts are capped for each hospital at the number of residents reported on or before December 31, 1996, and these counts are based on a 3-year rolling average for IME and DGME payments. IME payments are decreasing by a reduction in the IME level from 7.7% to 5.5% per 0.1 intern/resident-to-bed ratio over a 4-year period. According to the formula above, a 5.5% IME level would lower the multiplier to 1.35, which, absent legislation in 2002, is predicted to happen in federal fiscal year 2003.

DGME (but not IME) payments may go to nonhospital providers if they are responsible for training costs. Members of affiliated groups may combine their limits to create an aggregate limit. By redistributing the number of slots to reflect FTE numbers more accurately, hospitals can increase their Medicare reimbursement. Hospitals must meet the definition of *affiliated hospital group* outlined in the Balanced Budget Act and complete an affilia-

tion/aggregation agreement before July 1 (the start of the new academic year); this agreement is sent to the Medicare fiscal intermediary and the Centers for Medicare and Medicaid Services.

A subsequent important regulation, not included in the Balanced Budget Act, is that time at nonhospital ambulatory care sites is reimbursed only if the hospital is responsible for training costs (4). This responsibility must be documented in a letter of agreement between the hospital and the clinic; verbal agreements or proof of who pays the resident do not count. Direct payment is made to hospitals for managed-care enrollees.

In summary, the 1997 Balanced Budget Act limits the funds available to hospitals. Hospitals generally are not only receiving less money for each resident but also cannot obtain funds for additional residents above the number hired in 1996, although exceptions are granted to rural or new teaching hospitals. Also, the hospital where the resident performs rotations, not the hospital responsible for the resident's costs, receives both the DGME and IME Medicare reimbursements.

The planned reduction of IME payments by 28.57% over 4 years, set in motion by the 1997 Balanced Budget Act, was modified by the Balanced Budget Refinement Act of 1999 and the Benefits Improvement and Protection Act of 2000. An IME adjustment of 6.5% was maintained for fiscal years 2000–2002, and a reduction to 5.5% will take effect starting in fiscal year 2003. Only new legislation can change this level. In addition, the Balanced Budget Refinement Act and the Benefits Improvement and Protection Act implemented "floor" and "ceiling" provisions for the DGME per-resident amount. Under these provisions, hospitals with per-resident amounts below 85% of a locality-adjusted national average will have their amounts raised to the 85% level. Hospitals with per-resident amounts above 140% of the locality-adjusted national average received no inflation increases for fiscal years 2001 and 2002 and will have reduced updates through 2005.

Wray and Sadowski (5) assessed the financial challenges presented to teaching hospitals by the Balanced Budget Act. To develop a GME strategy responsive to an organization's mission and patients, they ranked institution-specific program criteria by which an institution could base its decisions regarding the funding of GME programs. They described strategic, organizational or operational, and financial criteria for ranking programs in order of relative importance. Financial criteria included (*a*) the percentage of residents disallowed for IME reimbursement, (*b*) the number of FTEs who are residents, (*c*) the program's contribution to the primary care–specialty care mix, (*d*) the percentage of residents beyond the initial eligibility period for Medicare reimbursement, and (*e*) the percentage of international medical graduates in the program. If institutions develop and use such criteria for making decisions about program funding, individual program recruitment strategies will be affected. The radiology program director and any designated radiology recruitment director must be familiar with how their institutions make funding decisions.

Reimbursement for research time.—Hospitals can receive payment for residents performing research. DGME will be paid as long as research training is required (ie, mandatory, not elective) for that approved program and is performed anywhere in the hospital complex. Bench research time is allowed. For IME, the hospital will be paid as long as the research is part of an approved program, but the research must be associated with the treatment or diagnosis of a particular patient. Bench research is not acceptable. A complete explanation of this policy is found in the *Federal Register* (6).

Workforce Implications of Medicare Reimbursement

Counting residents for DGME.—The Office of Inspector General (OIG) has recently begun auditing certain GME programs. In its reports (available at *oig.hhs.gov*), the office set forth key requirements relating to the counting of residents for Medicare reimbursement. These requirements (7) (as adapted to radiology residents) are summarized below.

1. Radiology residents must be in programs accredited by the ACGME or the American Osteopathic Association. Medicare does not reimburse institutions for residents in fellowship programs that are not ACGME accredited. Radiology specialties currently approved for ACGME accreditation are pediatric radiology, neuroradiology, vascular and interventional radiology, abdominal radiology, musculoskeletal radiology, nuclear radiology, cardiothoracic radiology, and endovascular surgical neuroradiology.

2. A resident in the "initial residency period" is eligible to be counted as 1.0 FTE. This period is the minimum length of time that it takes the resident to be eligible for board certification. All residents who have exceeded this period (and all fellows) are reimbursed at 0.5 FTE. The internship year determines the number of

years allowed in the initial residency period. If the resident completes a transitional year, all 4 years of the radiology residency are reimbursable at 1.0 FTE. If the resident begins in any other program, the length of that program determines the initial residency period. Thus, trainees who complete 1 year of residency in internal medicine, even if they have clearly notified their program directors that they plan to transfer the next year to radiology, will be allowed only 3 years in the radiology program at full reimbursement. In their 4th year of training, reimbursement will be at 0.5 FTE. Any resident who is already board certified or board eligible for any specialty will be reimbursed at 0.5 FTE throughout any additional residency or fellowship.

3. All residents who have graduated from a foreign medical school must have a current Educational Commission for Foreign Medical Graduates certificate in order to be included in the GME reimbursement count.

4. Residents' time in nonhospital outpatient settings is allowable as long as there is a written agreement between the hospital and the nonhospital provider stating that the costs of training the resident will be paid by the hospital.

5. Research must be a requirement of the approved residency program to be reimbursed.

Factors for counting FTEs are the same for IME as for DGME except that (*a*) research time can count for IME only if it relates to the direct care of a hospital patient and (*b*) residents must work for the inpatient services of the hospital (where resident reimbursement is included in the DRG payment coverage), the outpatient department, or a nonhospital provider (provided there is a written agreement between the hospital and outside provider).

In addition to the Office of Inspector General audit, information and clarification about the DGME and IME regulatory requirements can be found in the Code of Federal Regulations, at 42 CFR §413.86 (DGME) and 42 CFR §105 (IME). It is imperative that program directors maintain written documentation of compliance with these requirements. Hospitals are audited by Medicare intermediaries on a yearly basis and request specific information (eg, rotation schedules, contracts, and résumés) to help with verification.

Increasing the resident cap per hospital.—Methods to increase the number of funded residents through DGME are very limited. Although the reimbursement amounts are decreasing, the following are ways to increase the resident cap:

1. Urban hospitals that can place at least one-third of their residents at a newly established program in a rural hospital are allowed to increase their FTE cap (8). Under the Balanced Budget Refinement Act, resident limits for rural hospitals were increased by 30%.

2. Hospitals that meet the definition of *affiliated hospital group* may combine their limits to create an aggregate limit. To qualify as an affiliated group, hospitals must be under common ownership or located in the same area or contiguous areas, or jointly listed as sponsors or primary clinical sites although not located in the same area. An agreement must be signed by the participating hospitals and sent to the fiscal intermediary and Center for Medicare Management before July 1 of each year. Additional instructions can be found in the *Federal Register* (9).

3. If an entire hospital closes and/or a program closes within a hospital, the hospital accepting transfer of residents can receive a temporary adjustment to its FTE cap until the residents complete their training program (10).

4. New teaching hospitals have 3 years before their limits are established (11).

Department of Veterans Affairs

With approximately 1,300 sites of care, including 163 hospitals and more than 850 outpatient clinics, the Department of Veterans Affairs is the largest single provider of GME training sites in the United States (12), providing financial support for approximately 8,900 positions, representing about 10% of all residents in training (13). These sites train physicians to care for patients who are veterans, while giving the facilities increased house staff that they otherwise could not afford. The Department of Veterans Affairs funds the resident's stipend and benefits through the Office of Academic Affiliations.

Department of Defense

The Department of Defense provides funding for active military personnel to obtain medical training, as they will be the first called up in the event of a war or national emergency. Residents continue to receive their military pay and benefits during residency. Programs may be responsible for the resident's malpractice insurance costs. Starting in 2000 the military offered to fund about 30

positions in radiology residency programs nationwide, if the programs can prove they have adequate faculty and cases to meet the program requirements of the ACGME Residency Review Committee for Diagnostic Radiology.

Public Health Service

The U.S. Public Health Service offers scholarships, grants, and loans to residents working in underserved areas in exchange for loan repayment. National Research Service awards through the National Institutes of Health are available to institutions (T32 awards) or individuals (F32 awards) for postdoctoral training. Applications for these training grants are available either from the university's grant office or on the Web at *grants1.nih.gov/grants/funding/funding.htm*.

STATE SOURCES OF FUNDING

Medicaid

In addition to funding undergraduate medical education at public medical schools, most state governments allocate funds to GME via fee-for-service Medicaid programs. Such funding is voluntary, as there is no federal legislation equivalent to Medicare mandating that states support GME. For states that choose to distribute funds to teaching hospitals, matching funds are available from the federal government. All but five states (Alaska, Idaho, Illinois, Montana, and South Dakota) and Puerto Rico distribute Medicaid funding for GME purposes (14). With payments for both DGME and IME totaling more than $2.3 billion in 1998, Medicaid is the second-largest funding source for GME (12), although the state of Colorado uses GME data only to calculate funding for patient care expenses, not for GME.

Most states follow the same method as Medicare in reimbursing DGME and IME education and service expenses by teaching hospitals. At least 42 states and the District of Columbia have implemented some type of capitated managed-care system, nearly 20 of which allocate payments specifically to teaching hospitals and other education sites (14). Unlike the federal government, more and more states are linking Medicaid GME payments with state policy goals, hoping to affect the size or the distribution of the workforce.

Specific State Appropriations

Several states appropriate funds for family medicine or primary care residency training. This is estimated nationally to represent a small amount, less than $200 million (T Henderson, unpublished data, 2002).

NONGOVERNMENTAL FUNDING

Philanthropy

Hospitals and residency programs regularly solicit donations from grateful patients, corporations, and residency alumni. Many of those contacted are pleased to have an opportunity to give back to the institution that provided their care or training. For this reason, programs should not underestimate the importance of promoting ongoing relationships with former trainees.

Industry Grants and Contracts

Subspecialty fellowship programs may find funding opportunities through industry grants and contracts. It is best that individual grants not be used to fund a specific individual but instead be placed in an account containing funds from various sources and used to benefit a group (eg, fellowship trainees).

Associations

The Radiological Society of North America offers Research Fellow grants to fellows who plan to devote 1 or 2 years to research, Holman Pathway Research Resident seed grants for 2 years of residency training in research, and an Institutional Clinical Fellowship in Cardiovascular Imaging grant (new in 2002) for one fellow per year. Details can be found at *www.rsna.org*.

Faculty Practice Plans

In many institutions, a percentage of the funds generated by clinical faculty within academic medical centers goes to the medical school dean and individual departments. These funds can be used to help support the cost of GME at the program level.

Foreign Governments

Occasionally, a foreign government may want to subsidize the training of a foreign physician in a residency or fellowship training program with the intent of bringing him or her back to that country. The resident must have an Educational Commission for Foreign Medical Graduates certificate and must be enrolled in an ACGME-accredited or equivalent program.

EXPENSES

Every program director should prepare a budget for the cost of running the program. As discussed above, hospi-

Main Program Office Costs	
Personnel:	Faculty and staff salaries and benefits
Supplies:	Office supplies, computers, software, fax machine
Furnishings:	Desks, chairs
Printing and photocopying:	Brochures, stationery, pictures, reports, copy machine
Travel and registration:	National program meetings
Dues/fees:	Accreditation fees, membership dues
Postage:	Stamps, metered mail
Telephone and computers:	Line charges, long-distance charges, network jacks
Food/catering:	Resident events (orientation, picnics, parties, graduation, journal club)
Resident Costs	
Stipend	
Health, dental, life, and disability insurance	
Malpractice insurance	
Parking	
Pagers	
Education fund	
Travel	

Items that can be included in a GME program budget.

tals receive funds from the government to support the cost of GME. How that money flows to the individual programs depends on the institution. In many community hospitals, the program director negotiates directly with hospital management. In academic centers, the program director may only be able to ask his or her department chairperson, who then can go to the hospital administration. The multi-institutional GME office might bill the individual hospitals for resident stipends and benefits as well as accreditation fees, educational funds, parking, pagers, and so forth. Program directors should learn as much as possible about how the flow of funds works and what is paid for by which of the available funding sources. The Figure lists examples of items to include in a budget.

In summary, program directors need to know how their hospital receives payment for GME-related costs and how those funds are made available to administer the program. The current methods of governmental funding of GME (federal and state) could change, especially in times of governmental deficits; therefore, staying as informed as possible will be beneficial. The hospital Medicare cost analyst and/or the finance person in the central GME office are resources for understanding the specifics of a hospital's model of reimbursement.

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