Physician Training Rotations in a Large Urban Health Department

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Hospitals are the normal setting for physician residency training within the United States. When a hospital cannot provide the specific training needed, a special rotation for that experience is arranged. Linkages between clinical and public health systems are vital to achieving improvements in overall health status in the United States. Nevertheless, most physicians in postgraduate residency programs receive neither training nor practical experience in the practice of public health. For many years, public health rotations have been available within the Los Angeles County Department of Public Health (and its antecedent organizations). Arrangements that existed with local medical schools for residents to rotate with Los Angeles County Department of Health hospitals were extended to include a public health rotation. A general model for the rotation ensured that each resident received education and training relevant to the clinician in practice. Some parts of the model for experience have changed over time while others have not. Also, the challenges and opportunities for both trainees and preceptors have evolved and varied over time. A logic model demonstrates the components and changes with the public health rotation. Changes included alterations in recruitment, expectations, evaluation, formal education, and concepts related to the experience. Changes in the rotation model occurred in the context of other major environmental changes such as new electronic technology, changing expectations for residents, and evolving health services and public health systems. Each impacted the public health rotation. The evaluation method developed included content tests, assessment of competencies by residents and preceptors, and satisfaction measures. Results from the evaluation showed increases in competency and a high level of satisfaction after a public health rotation. The article includes examples of challenges and benefits to a local health department in providing a public health rotation for physicians-in-training and how these challenges were overcome.

KEY WORDS: physician education, physician rotation in large urban health department, public health rotation

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There is renewed interest in providing public health knowledge to those training to be clinicians.[1,2] As pointed out by Levy and Wegman,[3] without public health education and training, practicing physicians will miss opportunities to improve the health of their individual patients and communities. Public health educational efforts can occur across a wide spectrum of target groups including school children, undergraduates, medical students, postgraduates, and practitioners.[4-6] One of the most important times for public health training is during the postgraduate residency, and there are many efforts to achieve this training.[7-11] This article focuses on the postgraduate residency training period.

Physician residency consists of rotations that provide learning through experience. When the experience is outside the accredited educational institution, the ACGME (Accreditation Council for Graduate Medical Education) Common Program Requirements specify that there must be a letter of agreement between the program and each participating site and that this letter of agreement must be reviewed at least every 5 years.[12] Los Angeles County (LAC) has a long history of affiliation with medical schools at the University of

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California at Los Angeles (UCLA, founded in 1951), the University of Southern California (USC, founded in 1885), and the Charles R. Drew University of Medicine and Science (established in 1966). In his 1934-1935 Departmental Report, John L. Pomeroy,[13] LAC health officer, stated that the goal of affiliation is to raise the standard of work in the Health Department with material benefit to the citizens. Between 1972 and 2006, the LAC Department of Health Services (DHS) was a combined department, including hospitals, ambulatory care and public health. Affiliation agreements approved by the LAC Board of Supervisors applied to all components of the department. The UCLA agreement, prior to 2006, included funds for consultation from the UCLA School of Public Health. Beginning in July 2006, the Department of Public Health (DPH) was established as a separate department.

The DHS is a major public health training site. A survey conducted in 2000 noted that 297 students from 40 institutions had an educational experience at the DHS that year, with a mean time in the department of 6 weeks.[14] Although 92 (one-third of the 297) were nursing students gaining their public health experience in 2000, by 2011, a total of 275 undergraduate nursing students rotated through DPH programs.[15]

Public health rotations for physicians at the LAC DHS/LAC DPH

Over the years, the approach to public health rotations by physicians at LAC DHS has changed. Prior to 2000, experiences were afforded on an ad hoc basis and were dependent upon locating a willing preceptor.

In 2000, the LAC DHS established a program for public health training of primary care residents called Public Health Education for Physicians (PHEP).* A senior physician was the founding director of this program. All physicians-in-training with an interest in having public health experience were referred to the PHEP program. This article describes only the rotation for primary care residents and does not describe the additional tasks of the PHEP office that included increasing public health education at the primary care training site and training medical students and preventive medicine residents.

The focus of PHEP was the department's training hospitals. In 2000, there were 4 county hospitals providing primary care residencies for their affiliated medical school. One hospital (Martin Luther King, Jr, Medical Center) lost accreditation in 2007, leaving 3 (Harbor-UCLA Medical Center, Olive View-UCLA Medical Center, and LAC-USC Medical Center). Requests for public health rotations from other institutions were handled on a case-by-case basis. Initial efforts included outreach and invitations to all physicians training to become internists, pediatricians, family practitioners, or obstetricians/gynecologists. The invitation was favorably accepted by the internal medicine, pediatrics, and family medicine programs.

The goal of the rotation was that upon completion of the program, the resident would have an increased understanding of the functions of a local health department and how these interact with clinical medicine. Each resident was expected to demonstrate their public health role by being able to list some of the functions of a public health department, explain what health departments do when a disease case is reported, and describe the intersection of clinical and public health practice in relation to the 3 core functions of public health. When the common program competencies were promulgated by the ACGME, the sending hospitals included these competencies in their expectation for the rotation.

Description of the Rotation Including Major Changes

The Figure shows a logic model for the primary care physician public health rotation. Each component is discussed in the following text.

Resources for the Rotation

The appointment of a *physician leader* for the program allowed concentrated effort on development of the rotation. The same physician leader was in place full-time (2000-2006) and then part-time in 2006-2010. Limited volunteer time continued through 2012.

Preceptors were recruited by the physician leader. Of the 36 line programs currently listed by the LAC DPH, 32 provided at least one training session, and, of these, only 3 explicitly withdrew from such training. One withdrew because of heavy workload and demands for productivity, one because of low priority for teaching, and one pending a new affiliation agreement.

Time had to be allocated by the sending program for the rotation. The resident continued to receive support, including their salary, from their sending program. The 10 DHS primary care training programs had different and varying approaches for time allocation. The initial expectation of an uninterrupted month for all rotating physicians-in-training had to be adjusted in accordance with the hospital program realities. While some programs allocated 1-month blocks that could be sequestered from the ongoing hospital

*The program was the concept of James Haughton, MD, MPH, the then Medical Director for Public Health.

FIGURE ● Logic Model for Physician Training Rotations in a Large Urban Public Health Department

Inputs	Outputs: Public Health Activities	Outputs: Rotator Activities	Outcomes — Impact: Short	Outcomes — Impact: Intermediate	Outcomes — Impact: Long
- Physician leader - Preceptors - Time - Location and equipment - Administration -Affiliation agreement	- Recruitment - Curriculum development - Identification and development of learning materials - Teaching - Supervision - Assessment	- Learning - Observation - Participation - Assessment	- Utilization - Knowledge - Competency - Satisfaction	- Recruitment to public health practice - Improved coordination between primary care physicians and public health	- Improved population health outcomes

experience, others permitted only shorter time blocks and several required intermittent (mostly scheduled) ongoing participation in hospital activities. By 2007, a total of 4 of the DHS primary care residencies had closed, leaving 6.

Administrative efforts were needed. Initially, since the hospitals and public health were all part of one large department, there was no need for residents to have a sign-in process and residents from elsewhere were handled as volunteers. At first, volunteers signed in with the PHEP program and their hours were tabulated and reported. Over time, as needs for increased accountability and assurance of training in special areas of concern (eg, HIPAA) were identified, the Human Resources Department assumed responsibility for on-boarding each resident including "live scan" fingerprint processing and clearance. These on-boarding activities needed to be completed sufficiently in advance to allow clearance before the start of the rotation. Because sign-in privileges to local computer systems were allowed only for individuals who were assigned employee identification numbers, completing these activities in advance and on time became increasingly important.

From 1972 to 2006, the LAC DHS was a combined department inclusive of hospitals and public health, with *affiliation agreements* with the USC, the UCLA, and the Charles R. Drew University of Medicine and Science. Hence, during this period, the affiliation agreements included rotations in public health. In 2006, the LAC DPH became a separate department. Initially, all DHS contracts also applied to the DPH, but that is no longer in effect. The DPH developed an affiliation agreement that is currently being reviewed by the county counsel and, when approved, will go to the governing body for final approval. In the meantime, no county-approved affiliation agreements are in place. Instead, a resident participating in a public health rotation is administratively on-boarded as a volunteer, using a less formal affiliation memorandum of understanding with the residency programs.

Location and equipment for the resident are provided. Residents are provided a space to work within the assigned programs. As computer access became necessary, this was provided. Generally, the logistics of space and equipment are provided at the site of the rotation.

Activities of the PHEP Program

PHEP and collaborator's activities

Recruitment of preceptors and rotators required different activities, especially as preceptors are from within the DPH and rotators are part of residency programs outside the DPH. Preceptors were recruited through visits to each of the program offices to explain the rotation and encourage participation. These meetings clarified expectations on the part of the programs and identified potential preceptors. Since there are no external incentives for participation in the program, it is important to identify staff with an expressed interest in teaching and the potential to serve as champions for the program. With turnover in program leadership, repeated recruitment is necessary.

Recruitment of rotators first involved meeting with the Graduate Medical Education director at each hospital and then with each of the targeted residency directors both to inform them of the program and to officially add the public health rotation as an option for residents. After these meetings, it was possible to develop flyers targeted to each type of primary care residency and to circulate them at the program level. After several years, a printed pamphlet was developed. Another way of reaching potential residents was to inform them of the availability of a public health rotation when providing public health lectures or technical assistance at the hospital. After the department improved its Web page, the PHEP office could post the fliers on the Web page.

Curriculum development occurred simultaneously with the aforementioned recruitment efforts. The initial residency-specific flyers assumed that each resident

would spend 1 to 2 weeks in each of 3 to 4 assignments and gain much experience. Residents spent 2 weeks in disease control activities either at the central level or at the health center level. At the central level, they participated in disease control activities, learning through performing surveillance, disease investigation, hypothesis generation, and analysis. At the health center level, they participated in the team approach used in tuberculosis and sexually transmitted disease clinics and in the community and conducted home and community visits with public health nurses and/or environmental health specialists. The next 2 weeks provided a wide spectrum of activities, primarily observations appropriate to their interest, so pediatric residents visited child health programs and internal medicine residents visited chronic disease prevention programs. The objectives for all these experiences included being able to describe the approaches used and knowing where to refer patients. There are various types of experiences that achieve the goals and expectations of the rotation. Initially, all residents were interviewed, and an individual plan was developed on the basis of their requests and prioritization among offered possibilities. This was labor-intensive for the PHEP director, as each experience had to be individually planned, arranged, calendared, and communicated. By 2010, a single site for a more in-depth experience became the format, with fewer choices offered.

PowerPoint presentations were developed to meet the expectations of the rotation. These presentations included introductions to public health, communicable disease control, chronic disease prevention, public health nursing, public health systems, and social marketing. To the extent possible, the presentations were interactive and included content questions. These materials required updating and modification over time. Other *learning materials* were identified from ongoing departmental training as well as the excellent training materials on the Internet, especially those of the Centers for Disease Control and Prevention.

Teaching of residents was both formal and informal. All rotators were introduced to public health through the PowerPoint presentations on public health and communicable disease control at or before the beginning of the rotation. Even the 10 residents who had completed an MPH program before participating in this rotation needed to be reminded about the 10 essential functions of public health, and all needed to know how LAC performed these functions.

Residents might attend further formal training sessions at the PHEP office, in their program, or as provided by various departmental programs. In addition, preceptors provided informal ongoing training.

Supervision of the resident was the responsibility of the preceptor, with overview by the PHEP director. In 2006, the DHS developed a policy on county physician monitoring that required no modification in the existing close supervision.

The PHEP director developed *assessment* tools that supplemented any tools required by the sending program. The assessment tools were developed in 2000 and used throughout the rest of the period to have comparability. Residents completed a self-assessment of competency on the basis of expectations for experiences at entry and completion of the program and a satisfaction questionnaire at the end of the rotation. In addition, preceptors completed a standard report on the resident as well as the sending institution form.

The *activities of the resident* taking part in the rotation provided learning and skill-building opportunities through observation and participation. Residents were expected to actively participate and contribute to the work of units in which they were placed for more than a brief observational period (ie, for a week or more).

Learning happens throughout the rotation. Residents were assigned readings and self-tests as available to ensure that knowledge transfer occurred.

Observation is one of the ways that residents learn. This can occur through attending a departmental or community meeting, watching a public health activity, or shadowing a public health professional. This approach is particularly useful for residents who have very limited time and is combined with participation whenever possible.

Participation occurs when a resident contributes to a project or program. This can be accomplished by becoming a member of a team for a limited period of time or by an activity of assistance to the program. The classic participation is taking part in a disease investigation, but such opportunities were not always available; there were many other ways for residents to have a participatory experience. Resident outcomes included new knowledge and skills in the following areas: outbreak investigations, literature searches and reviews, article drafts, disease control reports, surveys, action plans, analyses of data or policy proposals, educational fact sheets presentations, and invitations to talk at the resident's home program.

Evaluation is a shared responsibility between the preceptor, the resident, and PHEP director. Residents and preceptors complete assessment tools mentioned earlier. The PHEP director summarized results.

Short-term outcomes included utilization of the rotation opportunities, increased public health knowledge, increased public health competency, and satisfaction with the experience.

Utilization of the program was measured by participation. In the 2000-2010 period, 104 primary care residents rotated to the DHS/DPH, 86% of whom were LAC DHS residents.

Knowledge assessment was performed throughout the rotation. Residents answered and discussed questions in the introductory session and used existing materials with tests of knowledge; also, through ongoing discussions, there were informal assessments of knowledge. There was not a uniform measure used for increase in knowledge.

There was, however, a uniform self-assessment of *competency*. The tool, developed by the PHEP director, listed 18 competencies to reflect potential resident experiences during the rotation (available at http://publichealth.lacounty.gov/phep/index.htm). The resident rated their self-assessment on a Likert scale ranging from 1 to 5 for each of the 18 competencies at the beginning and the completion of the rotation. They judged where they were on the scale, with 1 indicating "no competency at all" and 5 indicating "excellent competency." The scores were compared to assess the increase in self-assessed competency. The metric used by the PHEP program was the proportion of trainees who reported a greater than 50% increase in self-assessed public health competency at the end of the rotation. All residents showed an increase in self-assessed competency, and for 80%, there was at least a 50% increase.

Another program metric was the proportion of residents with *satisfaction* shown by a mean score of more than 4 (of 5). This satisfaction questionnaire, completed at the end of the rotation, had residents rate the following characteristics: understanding of the goals and objectives of the program, feeling welcome, learning experience, and whether they would recommend the rotation to a colleague. Each item was rated on a scale of 1 to 5 (1 = "not satisfied" and 5 = "fully satisfied"). After the first year, more than 90% of responses were either 4 or 5.

Intermediate- and long-term outcomes were not formally assessed; but there were indications of impact. Residents were given the PowerPoint presentations, and some reported using them with or without modification with their fellow residents in the hospital. Three of the residents returned to complete a residency in preventive medicine, with the DHS/DPH as their field site. Some residents continued contact with their preceptors regarding public health issues. The long-term goal of the program was to inspire and train practicing primary physicians to improve care through a population focus. While stated during the rotation, the achievement of this goal was not formally measured. Although informal contacts were maintained with some of the residents after the completion of their rotation, there was no formal follow-up, so it is not known whether others, except than the 3 who completed a preventive medicine residency with the DPH, pursued further public health training. None of the rotators were permanently employed by the DPH. A mechanism for long-term outcome assessment is needed.

Discussion: Benefits and Challenges

Benefits

Beyond the benefits to the resident of gaining experience in a public health department, there are also benefits to the department. Having a learning environment is good for all staff members, and those who are teaching are motivated to read the literature, analyze operations, and model professional behavior. This can lead to improved quality within the department. Another benefit of having clinicians in training in the department is that this creates an immediate bridge between the clinical sending institution and the host public health department, providing opportunities for each to learn about the other. Although this linkage is focused on education, it can lead to joint planning or formal partnerships in other areas, such as a 2004 joint action that improved immunization rates among DHS hospital patients.

Challenges for the residency rotation program

The major challenges for the residency rotation are limited resources and environmental changes.

Limited Resources are a constant challenge within a local health department, and the recession retrenchment of local governmental agencies impacted Los Angeles significantly. Currently, there is no funding for a program leader. Prioritization of resources usually goes to short-term urgent needs rather than other long-term, less urgent needs. However, committed people can find time and new resources are possible. The DPH actively searches for new resources through grants either by itself or in collaboration with others, but thus far it has not found external funding for this program. When the program was set up, some of the residency program directors asked whether the residents could be paid by the site of public health rotation, as occurred with other rotation sites, so they were not approached for PHEP funding. Until designated funding is located, the leadership of programs such as PHEP will need to come from reprioritization of existing funds. Local health departments with limited resources may find economies of scale by aligning support for the public health rotation from within existing educational programs, especially those that focus on the needs of internal physicians or provide support to external physicians or other members of the health care workforce.

Environmental changes provide both challenges and opportunities. These changes include the

technological revolution, continuing and new public health problems, new concepts of medical education, and major health system changes. Technology can be used in a variety of ways to enhance the residency experience (eg, provide materials available on the Internet). The DPH has a continually expanding Web-based learning site available for staff and others. As public health problems are identified, they are often addressed by shifting existing resources and sometimes by identification of new resources. Educational concepts change, such as the evolving ACGME standards and recognition that future improvements in health must increasingly rely on changes in the physical and social environment of communities. National changes in health systems that occur as part of health care reform—including increased investments in primary care, prevention, the public health system, and population health—provide new opportunities to renew and extend training opportunities for primary care physicians in local health departments.

Conclusion

The goal of training clinicians who are informed and skilled at participating in the public health system is an important element of improving the nation's health. This requires firsthand participation in public health during clinicians' residency training. If clinicians are to have a population focus, programs such as public health rotations are vital. The LAC example provides a successful and evolving model to add to other recorded examples. However, the example also shows that the resources to support such training opportunities are under constant pressure. The challenge for the future is to build on successes and continue to develop cost-effective, sustainable approaches.

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