

Professional Relationships in Sexually Transmitted Diseases Research

Thomas Parran Award Lecture

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THE RECEIPT OF the Parran Award is a great honor, and something for which I am deeply grateful. For a scientist, there is no professional reward more fulfilling than the recognition by your peers that your labors have been fruitful and the quality of your work acceptable. For that I am deeply indebted, and I thank all of you.

The receipt of this award also provides an occasion to look back over one's professional career, and to review the accomplishments, failures, and factors that contributed to both. As I did this, I came to the conclusion that one of the things that has mattered the most to me has been my professional relationships, including those with many of you here today. This subject is not often discussed within scientific or medical circles, at least not in any formal sense, although in the field of nursing, professional relationships have been explored fairly extensively. However, the focus there has been primarily on issues related to health care delivery in a nursing venue. Because of the importance of these interactions to me and, I believe, to most of us in the field of sexually transmitted diseases (STD) research, I decided to make them the subject of this acceptance speech today.

The relationships that have been most important in my own career are mentoring relationships and collaborative relationships, both formal and informal. I have been fortunate to have had some truly outstanding mentors. Among them have been my graduate professor at the University of North Carolina, Dr. J. Logan Irvin; Dr. Lutz Kiesow, a biochemist at the Naval Medical Research Institute in Bethesda, Maryland; and during my fellowship training at the University of Washington and afterward, Dr. King K. Holmes. Dr. Holmes' support and mentoring does not stop

when one completes his training program, but instead continues throughout one's career. That is one of the reasons I believe that he has been so successful in creating a network of scientific disciples throughout North America and, indeed, the world.

In addition to these individuals, I received guidance and support at critical points in my career from Dr. Ted Kuo at the University of Washington, Dr. Harland Caldwell at the Rocky Mountain National Laboratory and National Institutes of Health (NIH), and Dr. Bill Sawyer at the Indiana University School of Medicine. Finally, for whatever reason, the 800-lb gorilla of the chlamydia world, Dr. Julius Schachter, of the University of California at San Francisco, took an early interest in my work, and provided me with a tremendous amount of guidance, support, and thoughtful criticism over many years. I also have had the pleasure being a mentor to a number of individuals who have enriched my life immeasurably; among them are Drs. Jim Newhall, Byron Batteiger, Mary Nettleman, Janet Arno, Kara Wools, Diane Stothard, and Ms. Barbara Van Der Pol.

The critical role that mentors play in professional career development in the medical sciences is being increasingly recognized, and a more robust literature has begun to develop.^{1,2} Much of what I shall present to you is derived from a faculty mentoring guide from the Medical College of Virginia, published in 1977.²

Mentoring relationships can be viewed from the perspective of the person who is doing the mentoring and is usually senior, or the person who is being mentored and is usually junior. One definition of mentoring is "A multifaceted collaboration between a junior professional and a senior professional with the primary goal being the nurturing of the junior professional's development."³ This definition can apply whether the relationship is between a faculty member or other senior person and a graduate student, medical student, postdoctoral fellow, or another faculty member.

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TABLE 1. Responsibilities of a Mentor*

- Encourage and demonstrate confidence in the mentored
- Recognize the mentored as an individual with a private life and value him or her as a person
- Ensure a positive and supportive professional environment for the mentored
- Do not deny ignorance (to my mind, nothing can kill one's confidence in a mentor faster than to have him or her pretend to know something when they really don't)
- Be liberal with constructive feedback, both positive and negative
- Encourage independent thought and behavior, but invest ample time in the mentoring process
- Provide accessibility and exposure for the mentored within professional circles, within your own institution and the larger scientific community
- Illustrate the importance and methodology of networking
- Allow the mentored to assist with projects, papers, and research, and be generous with credit

* Adapted from Waugh.²

Obviously, the relationship is not dependent on the age of either party.

Some of the responsibilities that accrue to the mentor are listed in Table 1. Most of these responsibilities may seem self evident, but it is surprising at times how often they are forgotten.

Fairly predictable stages occur in the relationship between a mentor and the person being mentored. Understanding these stages as a natural part of a process can help one deal with them as they occur. These stages are 1) tentativeness, 2) eagerness to please, 3) identification with the mentor, 4) dependence, 5) comfort in communication with the mentor (when the sharing of ideas becomes more of a sharing among equals), and 6) independence.⁴ Clearly, the goal is to reach the last stage. Gaye Mowbray, Chair of the Johns Hopkins University Women's Forum (1996), described this point well when she stated that, "What debt do we owe those below us on the ladder? The most successful mentoring occurs when the mentor guides the mentored in such a way as to become competitive for the mentor's position."⁵

Academic health centers in the United States today face enormous challenges, brought on in large part by changes in health care reimbursement. As a consequence, pressures on medical school faculty to be productive and generate their own financial support have never been higher. For faculty to be successful and to achieve financial support requires guidance. It is not enough to simply supply someone with laboratory resources and say, "Okay, you have what you need. Get a grant within the next two or three years, or you are out of here." Examples of areas in which guidance is needed include 1) adoption of academic values, 2) managing an academic career, and 3) establishing and maintaining a productive network of colleagues.²

The structures of collegial networks and their informal collaborations are as varied as the individuals involved.

These networks can range from a simple sharing of ideas and techniques with another scientist down the hall to supplying reagents to someone halfway around the world. The benefits derived from these professional interactions vary with the individuals involved, but there are some common themes. Collaborations often lead to substantial enhancement of an individual scientist's research capabilities because of access to reagents or techniques, validation of results, or provision of an objective, friendly critique.

From my own experience, it has been immensely valuable to have had friends doing work similar to my own, and to whom I could turn in confidence for comparative data or objective criticism when some of my observations did not quite fit conventional wisdom. Collaborations also lead to deep and lasting friendships with colleagues who one may see only at meetings, and yet with whom one may fully share the joys and frustrations associated with true scientific inquiry. In addition, informal collaborations can provide a framework or a network for more formal collaborations with industry, foundations, or government agencies. For example, a number of us with clinical chlamydial laboratories who have shared reagents, strains, and protocols over the years also have frequently found ourselves working together on industry or government-sponsored studies. The benefit of a network to the sponsor is a study or product for which there is excellent quality control, because discrepancies among laboratories usually can be resolved in an amicable manner.

The informal network of investigators in chlamydial research has been successful in avoiding some of the factiousness that has divided investigators in other fields. As a consequence, this network in collaboration with public health officials has been successful in advancing a public health agenda to improve the health and reproductive capabilities of the general populace. Genital *Chlamydia trachomatis* infections have all but disappeared from some countries, and from regions of others.^{6,7} In part, this has been a result of aggressive public health programs in those areas.

Most collaborations tend to be informal arrangements among investigators with common interests, although some are more formal and may involve team building. Many of these formal collaborations result from programs fostered by funding agencies such as the NIH Cooperative STD Research Centers, and the Centers for Disease Control Collaborative Studies for evaluation of public health initiatives. However, team building as a discipline is not something that most of us focus on professionally. In fact, team building, or team play, is almost antithetical to our training and background.

Those of us who are physicians have been taught that we should assess a problem or situation fairly quickly, bring to bear all of the knowledge that we have or that is accessible, and then make a decision that commits us to an action. We then are responsible for the consequences of that decision.

There usually is not time for extensive consultation or for group decision making. Clearly, there are exceptions to the "captain of the ship" philosophy, but it exerts a strong influence on the manner in which we think and behave. Similarly, training in basic research, at least in the biological sciences, emphasizes a form of rugged individualism. Typically, a scientist develops a new insight into the structure of our environment and the laws that govern it. He or she then develops a hypothesis to explain this observation, and designs an experiment to test it. The observations and hypothesis may be shared along the way, but the process and the achievement are largely individual.

Why should we develop teams? The need derives from the complexity of the world in which we live and from the need to accomplish specific tasks. Teams, when properly constructed, are good at accomplishing tasks.⁸ Moreover, many of the scientific and public health questions we face are incredibly complex, as are potential solutions. Consequently, few people have the breadth of knowledge and expertise necessary to accomplish such tasks alone, and a multidisciplinary approach is required. The business literature contains considerably more information on teams and team building than does the medical or scientific literature, and we should learn from it.

A distinction can be drawn between teams and teamwork. Teams are a discrete unit of performance, designed to accomplish a task or tasks. Teamwork represents a set of values that encourage behavior such as active listening, providing support to other team members, and recognizing the achievements of others. Teamwork values help teams perform.

Katzenbach and Smith provide insight into the advantages that teams can offer.⁸ When properly constructed, teams should bring together complementary skills and experiences that exceed those of any member on the team. Teams establish communication among the individual members, allowing the group as a whole to analyze and respond to changing conditions more quickly than is often possible for an individual. Teams provide a social structure that facilitates the reduction of artificial barriers that stand in the way of collective performance. Finally, teams simply have more fun; there is a satisfaction that comes from having been part of something larger than oneself, which makes team participation a very gratifying experience. Most of these benefits that teams offer are intuitive, but because we usually do not think about them in any kind of organized fashion, we often fail to appreciate and use their characteristics.

A further distinction can be drawn between working groups and teams. Many of the groups or organizations we tend to think of as teams are, in fact, working groups. A working group is defined as "A group for which there is no significant incremental performance need or opportunity that would require it to become a team."⁸ The members

TABLE 2. Key Ingredients for a Successful Research Team

- Shared, understood goals
- Competence
- Enlightened self interest
- Mutual respect, tolerance, and trust
- Appropriate honest communication
- Discipline and process
- Selective use of outsiders

share information and help each other, but there are no joint work products that call for a team approach or for mutual accountability. In contrast, a real team is performance and goal driven. Typically, a team is "a small number of people with complementary skills who are equally committed to a common purpose, goals, and working approach for which they hold themselves mutually accountable."⁸ However, not all teams perform at the same level. In a study of team performance, in-industry teams were characterized as high-performance teams if they outperformed all reasonable expectations and all other similarly situated teams.⁸ The difference between these high-performance teams and other teams was that while these were groups that met all the conditions of real teams, they had members who were "also deeply committed to one another's personal growth and success."⁸

With these general principles in mind, we can look at the research teams within our own institutions, and ask if they are real teams or just working groups; and if they are real teams, are they or can they become high-performance teams? There are several ingredients that, from my own experience, I believe are necessary for successful multidisciplinary research teams (Table 2).

Shared, understood goals are usually easily defined for those of us in STD research, because our work relates to the prevention and cure of disease. However, other agendas, such as institutional or personal advancement, may also be present. If so, these agendas need to be explicit for the team to work effectively. Competence of team members should be a given, but often is not. This may occur when a team tries to carry weaker players, often because of local politics or other similar considerations. This is usually a mistake, in that it produces discord within the team. However, whether we consider ourselves scientists, caregivers, or both, we are humane in the manner in which we treat our colleagues. That is part of what characterizes our professions. Enlightened self-interest can be a powerful motivating force. However, to harness this force for the purposes of a group effort, each member needs to attempt to adopt the perspective of every team member, and then to try to facilitate individual efforts. To expect the other members of team to further one's personal objectives simply for "the good of science," without credit or other benefit, is unrealistic.

Mutual respect, tolerance, and trust are the attractants that allow productive relationships to form, and the glue that

TABLE 3. Additional Ingredients for a Successful STD-CRC

- Multidisciplinary group of talented investigators that work together well as a team
- Clinical venue, preferably with a public health connection
- Local institutional support
- Extramural advisory board
- Supportive project officers

holds them together. Too often, we hear members of one discipline denigrating members of another. For example, basic biological scientists may characterize behavioral research as "soft and imprecise," whereas the behavioral scientists may suggest that some of the questions addressed by the bench scientists have little relevance to human behavior or disease. Such attitudes are counterproductive to team building and group accomplishment. Appropriate and honest communication simply means that the real issues have to come to the table, or else real work is not accomplished. Disagreements can and should occur if the process is valid. However, civility among the participants can be maintained if the principles of mutual respect and tolerance are followed.

Discipline means that performance objectives have to be set for individual members and for the group as a whole, and both have to be accountable for meeting those objectives. However, the process by which performance is measured and accountability is enforced must be open and fair to all participants. Some form of peer review frequently fulfills this need. Finally, the selective use of outsiders, often in the form of an advisory board, can bring to internal problems an objectivity and perspective that insiders may lack.

One particular form of research team with which many of us have been involved over a number of years is that of the STD Research Center of Excellence or, more recently, the STD Collaborative Research Center (CRC), supported by the National Institute for Allergy and Infectious Diseases (NIAID) of the NIH. Again, based primarily on my own experience, some additional ingredients that facilitate the success of a STD-CRC team are presented in Table 3.

The ability to conduct translational research between the laboratory and patient requires access to patients, or a clinical venue. For most of us, this access has been facilitated by an affiliation with a local public health department. In Indianapolis, we have been especially fortunate to have had the cooperation of our City-County health department under the leadership of Dr. Virginia Caine. Local institutional

support beyond that which is normally associated with federal research funding is becoming almost a necessity. Federal agencies appear to be trying to stretch available resources by capping awards while requesting research, the scope of which exceeds feasibility in a competitive environment. In the short term, this increases the amount of research being performed. However, in the long run, it may make it impossible for investigators to compete if they reside at institutions that cannot afford to supplement the research budgets of capped federal programs.

In addition to advocating in government councils the public health imperatives associated with STDs, a supportive NIH project officer can affect in a very positive manner the overall conduct of a research program. This requires keeping the program focused on the objective for which it was funded in the first place, the health and well-being of the populace, while not stifling local scientific creativity. We in STD research have been especially fortunate to have had a succession of such project officers at the NIAID. During my time in the field, these project officers have been Drs. Milton Puziss, Judy Wasserheit, and Penny Hitchcock.

Finally, I would like to leave you with a thought on what I think leadership means in the context of team building. The author is unknown to me, but I thought it an appropriate citation for someone from Indiana: "A farmer doesn't grow crops. He or she merely creates an environment in which the crops can grow."

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