

# Agricultural Medicine: The Missing Component of the Rural Health Movement

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Agricultural medicine encompasses the anticipation, recognition, diagnosis, treatment, prevention, and community health aspects of health problems peculiar to agricultural populations. Members of the agricultural population have been heretofore ignored in organized health efforts unless they happened to also be a member of a social, racial, or economic minority. However, members of the agricultural population encounter daily a variety of occupational and environmental health hazards, such as toxic chemicals and zoonotic infectious agents. The health status of the agricultural subgroup of the rural population is poorer than is commonly believed. For example, compared with other populations, members of this subgroup have excess rates of chronic illness, excess disability from respiratory conditions, and the highest death rate from occupationally related accidents. If a true improvement in the health of the agricultural population is to be realized, then its unique health problems must be recognized, and specific clinical, preventive, and community health aspects of its problems must be dealt with.

The 1960s and early 1970s were a period of intense humanistic concern throughout the United States. Problems of numerous social and racial minority groups were brought to the public's eye, resulting in the formation of movements to correct social inequalities. One such movement, the "Ru-

ral Health Movement," was directed toward improving the inadequate health care services of rural areas.

Unfortunately, as this movement developed, efforts came to be limited to only a segment of the rural population, primarily those social, economic, and racial minority subgroups such as southern rural blacks and Appalachian families. The picture presented of these groups has been that of individuals dressed in rags and living in isolated, substandard housing. Rural Health Movement advocates have capitalized on this picture in order to appeal to governmental and private funding agencies. The

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Rural Health Movement also has limited itself by concentrating on rural health care delivery and by emphasizing treatment of acute episodic illness rather than elimination of causes of health problems.

This approach to improving the health of rural populations has been too limited for two reasons. First, the rural population is very complex and consists of many subgroups, only a fraction of which are socially or economically deprived or belong to a racial minority. Second, each rural subgroup may have its own peculiar set of health problems. Thus a variety of actions, not just improvement of health care delivery, is required to solve these problems.

Concern about health, not just disease, in rural populations requires examination of the total rural population in perspective. Each rural subgroup and its particular set of problems must be addressed. Health care providers must be taught how to diagnose and treat specific health problems they encounter, and how to prevent these problems on an individual and community basis.

This article concentrates on the health problems of one important rural subgroup that has received little attention: the agricultural population, including farmers, farm family members, farm operators or managers, and hired farm workers. Four topics will be discussed: (1) general characteristics of the rural population, with special reference to the agricultural subpopulation and the demographic, technological, behavioral, and sociometric factors that influence its health; (2) the health status of the agricultural population; (3) specific occupational and environmental health problems of agricultural workers; and (4) weaknesses in present training programs for rural practitioners, with suggestions for alternative training programs.

### Rural Population in Perspective

A rural person is defined as anyone living in an incorporated or unincorporated area with a population of less than 2500.<sup>1,2</sup> By this definition, the 1970 census indicates that 26.5 percent (54 million people) of the US population is rural.<sup>1,3</sup> However, 55 percent of the rural population (30 million people) live either within or immediately adjacent to counties that are part of a standard metropolitan

statistical area (SMSA).<sup>\*</sup> Even though these people live in a rural area by strict definition, the surrounding area is more urban in character. Many of these people are suburbanites who may work in the nearby city. This population also includes 2.3 million farm residents who remain at the urban-rural interface to till their encroached-upon farms. These inhabitants do not suffer problems of severe isolation or lack of accessibility to health care. They do, however, have occupational and environmental health problems that differ from those of the general urban or general rural populations.

Seventeen percent of the rural population (9.2 million people) live in poverty.<sup>4</sup> The rural poor often have several characteristics in common, including isolation, lack of power, social and cultural deprivation, and membership in a racial minority group.<sup>2,5</sup> This rural subgroup is the one pictured by most people when the term *rural health* is used. Most of the attention and dollars related to rural health problems have been focused on this subgroup.

The agricultural subgroup includes about 19.6 percent (10.4 million people) of the rural population<sup>6</sup> and is composed of farm residents, farm operators or managers, hired agricultural workers, and migrant workers. Most members of this subgroup (8.25 million people, 79.1 percent of the agricultural population) are farm residents.<sup>7</sup> Nonfarm-resident, hired agricultural workers account for 18.9 percent, or 2 million people.<sup>8</sup> The migrant farm worker population is only 2 percent (213,000 people) of the agricultural population.<sup>8</sup> With the exception of the migrants and a small portion of the nonmigrant hired agricultural work force, this large and very important minority group has been relatively silent in the Rural Health Movement. Silence has been particularly true of farm residents and of nonmigrant hired farm workers who work for the smaller, noncorporate farm operations. These segments of the agricultural population have had no internal organized voice to make their concerns known, and there has been no outside group to represent them.

The importance of this subpopulation is measured not only in terms of the large number of peo-

<sup>\*</sup>An SMSA is an arbitrary demographic unit that is designed to designate an area of metropolitan character consisting of a central city of 50,000 or more plus surrounding counties that are economically and socially integrated with the central city.

ple involved but also in terms of its economic significance. Each farmer annually produces food for an average of 54 people.<sup>9</sup> Individual farmers involved in modern commercial operations, such as those of the Midwest, may produce enough food for 350 people or more annually. An additional allotment of agricultural products has been available for export in recent years. Valued at over \$20 billion annually, agriculture exports have helped the United States' balance of trade. Agriculture compared with other industries is one of the largest employers in the United States.\* In some highly agricultural states such as Iowa, 80 percent of all jobs are directly or indirectly dependent on agriculture.<sup>9</sup>

Three other facts characterize this subpopulation: the increasing age of the farmer, the decreasing number of farmers, and the decrease in the amount of land being farmed. The average farm owner and operator is 49.7 years old.<sup>10</sup> This average age has been increasing every decade for the past 30 years. The total farm population and the total number of acres farmed have been decreasing by over 1 percent annually during the past 20 years. Thus, the United States finds itself depending on an older, smaller population to produce more food on a smaller amount of land.

The importance of maintaining the health of the agricultural subpopulation is clear, yet the population's health problems have not been dealt with in any systematic way by the Rural Health Movement.

Four major aspects influence the health of the agricultural population: (1) the diverse nature of agriculture, (2) the dynamic nature of agricultural technology, (3) the behavioral patterns of the agricultural population, and (4) the nature of agricultural work.

### *The Diversity of Agriculture*

From orange groves in Florida to wheat farms in eastern Washington, agriculture varies tremendously with changes in topography, climate, economy, and social factors. Health problems vary as well, with specific health problems being related to specific agricultural practices. It is therefore important for all rural health practitioners to be familiar

with agriculture in their local area. For example, one common problem with the use of pesticides in midwestern agriculture is skin sensitization to herbicides used to control weeds in row crops. Although insecticides also are used a great deal in the Midwest, insecticide poisonings are not common when compared with the number that occur in the Southeast, Southwest, and Far West, where systemic poisoning results from contact with foliage of citrus trees or other fruit crops sprayed with insecticides. Herbicides are seldom used in these locations.

### *Dynamics of Agriculture*

Technologic advances are occurring in all areas of agriculture, with health problems common to older technologies rapidly being replaced by new problems. For instance, in the past a common corn harvest injury was massive crushing or amputation of hands or arms resulting from a farmer getting his hand caught in snapping rolls or the husking bed of a cornpicker. "Cornpicker hand" is now rare. Today, most corn is harvested by combines, the primary hazard being "combine fingers," occurring when people get their fingers in the V-belt drives of the machine, which then lacerates or amputates one or more fingers.

### *Behavioral Characteristics of the Farmer*

Farmers make very little issue of their health problems individually or collectively. They are stoic and independent, accepting that there are certain risks associated with their occupation. Work comes first; illness and injury are just part of farm life.

### *Nature of Agricultural Work*

When compared with industry, agriculture has a unique set of characteristics resulting in health problems entirely different from those seen in other types of employment. These characteristics, listed in Table 1, are a result of many factors, some of the major ones being economics, the seasonal nature of farming, the farmer's self-employment status, and lack of a unified representative body. It

\*Personal communication, Earl R. Glover, Agricultural Research Service, Peoria, Ill, December 1981.

is crucial that the differences and related concepts are realized by personnel at all levels of rural health care delivery and planning systems.

**Health Status of the Farmer in Relation to That of the General Rural Population**

If one looks at data comparing the general health status of the urban population with that of the rural population, very little difference can be detected. This is primarily because the diversity of the rural population dilutes unique health problems of the rural subpopulations such as the farm population. Also, there are very few data available on specific health problems of farmers.

Accepted cliches suggest that farmers must be healthy because good clean air, sunshine, hard work, and good food are enjoyed every day. On the contrary, when compared with those of other occupational groups, farmers have the highest rate of hospital discharges and the lowest rate of physician visits,<sup>10</sup> suggesting that farmers may suffer serious illnesses more frequently but tend not to seek medical care for more minor ailments. Several possible reasons why farmers do not see physicians frequently include lack of convenient access to health care services, stoic behavior, and lack of sick leave or other medical benefits.<sup>11</sup> Table 2 lists standard mortality ratios for causes of death in agriculture. Any figure above 100 indicates a risk greater than that of the general population. Underlined maladies are those with a statistically significant difference, with accidents, suicide, malignant skin tumors, and leukemia showing the greatest risk.<sup>12</sup> A study by Milham (Table 3) comparing proportionate mortality ratios for various types of agriculture supports the evidence of an excess of leukemia among farmers.<sup>13</sup> This study also points out that different agricultural subgroups have different risks.

A summary of occupational disease rates in California shows that the highest disease rates are among agricultural workers.<sup>14</sup> Agricultural workers have the highest number of restricted days of activity due to illness or injury, yet they have the lowest number of bed disability days. This phenomenon is probably a reflection of the numerous occupational hazards in agriculture, where medical benefits and workmen's compensation are rare, and the self-employed farmer is forced by

**Table 1. Important Characteristics of Agricultural Work**

1. Women, children, and elderly in farm family are exposed to occupational and environmental hazards
2. Difficult to change jobs if medically not suited to farming
3. Farmer not medically selected for jobs
4. Emergency medical services distant
5. Farmer often works alone
6. Rehabilitation often left to the individual
7. Very few personal hygiene facilities
8. No limits to work hours, which are often erratic and affected by weather and machinery breakdowns
9. Little formal training; most farmers self-taught
10. Farmers usually must do own repairs
11. Vacations limited
12. Migrant or seasonal labor force also included
13. No particular person to look after health problems
14. Medical benefits and workmen's compensation rare

From Berry CM: Rural employment. *Am J Public Health* 12:2474-2746, 1971

economic constraints to work with minor ailments. One survey indicated that musculoskeletal problems account for 42 percent of the disabilities, the highest rate when compared with other occupations.<sup>15</sup> These data were supported by a survey which demonstrated that farmers had the highest rates for impairment of the back and spine and for arthritis.<sup>10</sup> This same survey also revealed that chronic heart disorders were more frequently reported by farmers than by those in other occupations. Other surveys indicate that respiratory and mental disorders are also significant chronic disease problems resulting in disability.<sup>15</sup>

In summary, the available data suggest that farmers may not be so healthy as commonly assumed and that occupational exposures may account for many of these health problems.

	Standard Mortality Ratio	
	20 to 64 years	25 to 59 years
Diseases of blood and blood forming organs	114*	114*
Diseases of the heart (other than arteriosclerotic heart disease and hypertension)	113*	107*
Congenital malformations	111*	105
Accidents	115*	113*
Suicide	136*	139*
Malignant neoplasms of the skin	125*	120*
Leukemia and aleukemia	116*	114*
Hodgkin's disease	105	112*

From Milham S (1976)<sup>13</sup>  
 Note: Figures above 100 indicate a risk greater than that of the general population  
 \*Statistically significant

**Specific Problem Areas in Agricultural Medicine**

*Farm Accidents*

Probably the primary cause of documented morbidity and mortality among farmers is farm related accidents. Over 2,000 accidental deaths and over 200,000 disabling injuries occur annually.<sup>16</sup> Farming is the most hazardous occupation in the United States, based on occupationally-related death rates.<sup>16</sup> Agricultural technology increasingly has emphasized mechanization, and machines, designed to squeeze, cut, pound, grind, pull, shake, separate, or otherwise manipulate agricultural commodities, but unable to distinguish between such commodities and human flesh, have been responsible for the majority of farm traumas.<sup>17</sup>

Farm accidents present a unique challenge to the emergency medical system. The farmer often works alone, and many times an accident victim may not be discovered until hours after the accident. The accident often occurs in a field, barnyard, or some place not easily reached by conventional

emergency rescue vehicles. Equipment and knowledge of the emergency medical team may not always be adequate to get a person out from under a tractor or to release a part of his body from a machine.

Farm accidents also present a unique challenge to the practicing rural physician. The physician may be called directly to the accident scene to help rescue a person and is often involved in primary treatment of the accident victim. Open wounds may be severely contaminated from contact with soil or manure. Often the physician must accept the brunt of the rehabilitation effort because other rehabilitation services are not available. In many instances the farmer will start working as soon as possible after an accident, often sooner than normally would be recommended, and the physician must prescribe treatment regimens with this fact in mind. Rehabilitation may extend to helping the person return to work with a prosthesis or even counseling the patient in changing jobs, which often is very difficult for the farmer to do. The physician can become involved in accident prevention activities by conversing with patients

Table 3. Proportionate Mortality Ratio and Cancer Deaths for Agricultural Subgroups in the States of Washington and Oregon						
	Proportionate Mortality Ratio					
	Stomach	Pancreas	Lung	Kidney	Brain	Leukemia
Farmers	117					
Orchardists			133			
Nurserymen		258				
Cattle ranchers				211	176	
Dairy farmers	143				187	
Wheat farmers						147
Poultry farmers						269

From Milham S (1976)<sup>13</sup>  
 Note: Only those excessively high and significant (P = .05) are recorded

as they are examined, by promoting community educational programs, or by consulting with governmental agencies or industry.

*Infectious Diseases Transmitted from Livestock or the Environment*

There are approximately 25 diseases common to animals and humans (zoonotic diseases) that are of occupational significance to agricultural workers (Table 4). These diseases may be acquired through direct or indirect contact with infected livestock. Several of the diseases are maintained in the natural environment (the work place of the farmer) and may be transmitted through contact with soil, water, wild animals, or insects. Leptospirosis, for example, may be acquired through direct or indirect contact with urine from infected swine or cattle. This disease also is maintained in raccoons, mice, rats, and squirrels; direct or indirect contact with water or moist soil contaminated by infected animals of these species can result in infection.

Many zoonotic diseases including leptospirosis are difficult to diagnose because they have no pathognomonic signs or symptoms and because they may mimic other diseases such as influenza. Thus, few reliable data are available on the incidence of

these diseases in the farming population, but evidence suggests that they are much more common than is generally recognized.<sup>18-20</sup>

*Respiratory Diseases*

The agricultural work environment, like the urban environment and many industrial work environments, is contaminated with particulates and gases that may cause acute or chronic lung disease. The farm environment is laden with pollens, mold spores, grain dusts, and animal danders, which are excellent agents for producing asthma in susceptible individuals.<sup>21</sup> Because it is difficult for farmers to avoid these allergens, the most severely affected individuals are often self-selected out of the agricultural population. Thus, it is difficult to get a true picture of the significance of chronic respiratory diseases among farm workers.

Another allergic respiratory disease of farmers is hypersensitivity pneumonitis, commonly called farmer's lung. This is differentiated from asthma by involvement of the alveoli rather than the bronchioles and by occurrence of acute episodes four to six hours after exposure rather than immediately following exposure. Farmer's lung is caused by inhalation of large quantities of allergenic particles less than 5 μm in diameter. Spores of the mold

genera *Micropolyspora* and the bacterium *Thermoactinomyces* commonly have been incriminated.<sup>21</sup> Acute symptoms are manifested by a tightness in the chest, with associated pain, cough, severe malaise, fever, and an elevated white blood cell count with a neutrophilia. Spontaneous recovery usually occurs in 24 to 48 hours. Chronic farmer's lung may result from multiple exposures over a long period of time, with interstitial pulmonary fibrosis as a sequela.

Livestock confinement buildings recently have been recognized as an environment that can be damaging to the lungs.<sup>22</sup> Numerous irritating gases that can damage the respiratory epithelium are present, including ammonia and hydrogen sulfide. Particulate matter is important in the livestock confinement environment because particles are present in high numbers, the majority of particles are less than 5  $\mu\text{m}$  and thus can be inhaled into the alveoli, and the particles are antigenic. Also, irritating gases present in the work environment may be adsorbed to particulate surfaces. A variety of acute and chronic health problems have been recognized in farmers working in livestock confinement buildings, but the problem is relatively new and its full potential is yet to be determined.

*Agricultural Chemicals*

Pesticides probably have received more publicity than other agricultural hazards. Actually, the majority of hospitalized pesticide poisonings in the United States are a result of accidental ingestion or suicide attempts. Between 1971 and 1973, it has been estimated that a yearly average of 272 farmers and agricultural workers were hospitalized for pesticide poisonings out of a total yearly estimate of 908 such poisonings for the same period.<sup>23</sup> For the same period, it has been estimated that an average of 8 out of a total estimate of 64 occupationally related pesticide poisonings resulted in death. Most of these occurred in citrus, grape, and cotton growing areas of the Southeast, Southwest, and Far West.<sup>23</sup> Thus, in comparison with some of the other agricultural hazards, the acute health effects of pesticides are relatively minor. However, the question of chronic health problems has not been answered, even though this has been an active area of research in recent years.

**Table 4. Zoonoses Occupationally Significant to Agricultural Workers<sup>18</sup>**

- Brucellosis
- Leptospirosis
- Toxoplasmosis
- Rabies
- Tetanus
- Anthrax
- Erysipeloid
- Q fever
- Histoplasmosis
- Blastomycosis
- Ringworm
- Equine encephalitis
- Newcastle disease
- Pseudocowpox
- Vesicular stomatitis
- Contagious ecthyma
- Staphylococcal infections
- Echinococcosis
- Colibacillosis
- Tularemia
- Acariasis
- Pasteurellosis
- Rocky Mountain spotted fever
- Sporotrichosis
- Balantidiasis

From Donham (1975)<sup>18</sup>

*Agricultural Dermatoses*

A variety of skin problems have been recognized as occupational risks for farmers,<sup>24</sup> the major causes including contact with irritating or sensitizing substances, infections, damage from the sun, and arthropod induced problems. The many chemicals common in modern agriculture have increased the risk for contact dermatitis. That the work place is outdoors also increases the risk for dermatoses induced by sun and arthropods.

*Cancer*

As a whole, cancer rates are low in farm populations because the most common cancers (lung

and breast) are less common in farm populations than in the general population. There are, however, certain cancers for which farmers are at greater risk than the general population. Milham noted significant increases in cancer of the stomach, brain, and kidney, and in leukemia.<sup>1,3</sup> Burmeister noted increases in mortality in Iowa farmers due to kidney, bladder, prostate, leukemia, lymphoma, and large bowel cancers.<sup>25</sup> The increase of leukemia in farmers has been noted by several authors.<sup>26-29</sup>

### Education of the Rural Practitioner

Special health problems demand special education for the physicians dealing with them. For several reasons, few physicians entering rural practice have received training in how to deal with agricultural health problems. Most future physicians are trained in tertiary care units in urban centers. Agricultural workers with health problems unique to their occupation and rural residence are not seen in such centers unless these problems require sophisticated diagnostic procedures or intensive care. Few instructional materials on agricultural health problems are presently available; even medical journal articles on such problems are sparse. Although several programs in recent years have provided firsthand patient contact experience in rural areas, such experience is only part of the answer, for in most cases these programs tend to result in application of urban practice techniques and philosophies to rural areas. To be most effective in actually improving the health of a rural community, the practitioner must take a comprehensive view of health and disease and learn to consider the interactions of the patient, the patient's family, the community, and the environment. Training physicians to do this demands a major change in educational emphasis.

To meet these educational needs, the University of Iowa initiated a Rural Health Training Program in 1974. The program is the only one of its kind in the United States. The Rural Health Training Program will be described as a model of the type of educational program which could be profitably adopted by other medical schools that con-

centrate on training physicians for rural areas.

The program applies practical philosophy and didactic material relevant to agricultural health problems to the traditional medical curriculum. Preventive and community medicine are emphasized. The trainee is encouraged to go beyond the traditional one-to-one relationship between physician and patient to view a patient in the context of his or her environment. The trainee then is encouraged to apply preventive and community medicine techniques to agricultural health problems, using available local, regional, and national resources.

The program is founded on three concepts that differentiate a rural physician from one in a specialized urban practice. First, a rural physician needs to understand the occupational and environmental roots of agricultural health problems. This need is especially pronounced when dealing with zoonotic diseases. Since mild cases of many of these have protean and nonpathognomonic symptoms, they may mimic influenza. Correct diagnosis frequently depends on analyzing the circumstances under which the disease was contracted. This in turn depends on a knowledge of occupational exposure to specific zoonoses. For example, a physician dealing with an influenzalike illness might suspect Q fever if the patient were a dairy farmer or brucellosis if the patient were a swine farmer. Medical training must include life cycles of zoonotic infectious agents and mechanisms of transmission to humans in addition to symptoms, signs, laboratory confirmation, and treatment of zoonoses. Only with this complete profile will a physician be able to take a meaningful patient history.

Second, a rural physician needs to keep abreast of emerging agricultural technologies and anticipate new health problems that may develop. Agricultural workers are continually exposed to new chemical substances and new technologies, such as the livestock confinement system described previously. The physician who understands the exposures of confinement-house workers will be able to trace complaints of confinement-house workers to their source and recommend corrective measures to the worker. Thus, the preparation of physicians for rural practice should include fundamentals of modern agriculture and information on how to keep informed about changes in agricultural practices that may result in human health hazards.



Third, the rural physician needs to expand his or her role beyond diagnosis and treatment of a specific disease or lesion to involvement with the total patient and the rural community. The many needs for such extended involvement are outlined in the section on Farm Accidents: simply stated, the rural physician is called on to assist in rehabilitation of the patient and assist in readaptation to farm work because the physician is the only one in the rural environment to do this. In addition, community programs on preventive medicine often exist only if initiated by the local physician. Such extended involvement requires instilling in medical students both motivation and specific skills. Students must understand the agricultural work environment sufficiently to trace health problems to their roots and then recommend preventive measures. They must understand what personal protective devices can be used by farmers and how to use available community resources to obtain additional information. Often these efforts must be made even though the rural physician may have fewer resources to rely on; there may not be a local health department, adequate social services, occupational health specialists, and the like.

How can these concepts be incorporated into medical training? The University of Iowa has adopted a four-pronged approach in its Rural Health Training Program. First, a preceptorship is offered to medical students between their freshman and sophomore years, which is a student directed research effort designed to introduce the student to specific agricultural health problems. The student is given an overview of the problems and a description of present ongoing research at the Institute of Agricultural Medicine and Environmental Health, a branch of the University's Department of Preventive Medicine and Environmental Health. The student then picks a topic of his or her interest to pursue in a research effort. This program is intended to work in cooperation with the Medical Early Community Orientation Program,\* which also is offered to second-year students.

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\*The Medical Community Orientation Program (MECO) is designed to give students exposure early in their training to clinical medicine at the community level by placing them in small offices, clinics, or hospitals.

Second, a course titled Rural Health is offered for senior medical students. This course covers specific information on unique agricultural health problems. Emphasis, however, is on discussing the roots of these health problems (ie, environmental exposures, peculiar behavior of farmers, agricultural practices and technologies, and mechanism of transmission of zoonoses). The philosophy behind a comprehensive approach to rural medicine, including preventive and community aspects of rural health problems, is discussed. Although the course is oriented toward midwestern agriculture, it is conceptual in nature so that the prospective physician can apply many of the principles regardless of the particular area of the country in which he or she chooses to practice.

Third, a rotation is offered for family practice residents. Residents spend one month at the Institute of Agricultural Medicine and Environmental Health getting specific training in health problems unique to agriculture. Major areas covered are toxicology of agricultural chemicals, infectious diseases transmissible to humans from nature and livestock, farm accidents, agricultural respiratory diseases, and occupational medicine. The training method is by case and field study. Cases of specific agriculturally related illnesses are identified through the University Hospitals, one of the rural model offices of the Department of Family Practice, one of the community hospitals in the state, or referral from a practicing physician in the state. Each case is studied by in-depth patient interview, physical examination, and collection of appropriate laboratory data. A field trip is made to the patient's farm to investigate the environment where the illness was contracted or injury took place. The resident is encouraged to design preventive procedures for each case and, when appropriate, to recommend them to the patient.

Fourth, family practice residents have the opportunity to complete their required research project on a specific agricultural health problem using the facilities of the Institute of Agricultural Medicine and Environmental Health. Institute faculty provide guidance for research projects.

An outgrowth of the Rural Health course has been the Rural Health Series, a set of 16 autotutorial, self-instructional presentations on health problems of agricultural workers. The complete set of presentations constitutes a solid core of information for construction of rural health courses

at other medical schools. Presentation of salient information in a self-instructional format also makes it possible for students unable to attend scheduled class sessions to learn the course content. The presentations, which qualify for credit hours in Category I toward the Physician's Recognition Award of the American Medical Association, can be used by rural practitioners to brush up on health problems of their local area. (These materials are distributed at minimal cost through the National Library of Medicine, National Audiovisual Center, General Services Administration, Order Section/MM, Washington, DC 20409.) In addition to the audiovisual series, a text that describes factors involved in rural practice, designed for second-year medical students, is in preparation, with publication expected in 1983. Additional information on the series or text can be obtained from the authors.

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