

APR 27 1978

J. Occupational Medicine 25.7 Sept 1976
Dr. H. D. Belk

Development of a Medical Program for Small Plants

HAROLD D. BELK, M.D., Winston-Salem, N. C.

STRONG socioeconomic influences are operating today to encourage the establishment of in-plant medical services. Coverage under workmen's compensation is being broadened to encompass more and more entities. There is an increasing tendency toward liberalization in interpretation of the intent of these laws as they apply to the worker's relation with his employer. Benefits, too, are being revised upward as the cost of living rises.

The cost of providing health insurance as a fringe benefit has been increasing. Between 1950 and 1963 the average daily cost of hospital charges increased 138%, in comparison to an increase of 27% in the over-all cost-of-living index in the same period.¹

A third and potentially powerful influence is present in temporary disability insurance laws which had been enacted in 4 states by 1952 (Rhode Island, California, New York, and New Jersey). This legislation provides partial compensation for wage loss resulting from non-industrial illness. The tendency has been to require that the employer bear at least part of the cost of the program.²

Obstacles to Small-Plant Programs

In spite of these increasing economic pressures, small-plant operators have shown little interest in establishing in-plant medical programs to help deal with employee health problems. (A small plant is defined here as one which employs 500 or fewer workers.) Several problems peculiar to small plants were pointed out by

Robertson to the National Health Forum in 1959³ as contributing to the retardation in the development of medical facilities. First, the small business manager often has little time for long-range planning after groping for answers to immediate needs—sales, production, operating capital. Secondly, the small plant often cannot provide individuals specialized in production and staff functions to fill positions of responsibility; therefore, managers may be required to make decisions without benefit of specialized insight into the problems. Thirdly, records of small plants, because of a lack of systematic entries, often do not indicate that the plant has a problem regarding compensation costs, absenteeism, and labor turnover.

There are other obstacles to the acceptance of in-plant medical services that are not necessarily related to the size of the plant. An important one is a lack of understanding of the cost of such a program. Too often the short-term cost of initiating and operating an in-plant preventive medical service is considered prohibitive, particularly when management has little understanding of the increased long-term cost of loss of efficiency which is aggravated by chronic health problems and unsafe and unhealthy work environments.

A second general obstacle is a lack of understanding of the function of a program of prevention and health maintenance. This lack is not necessarily limited to management. All too often the private practitioner feels he has fulfilled his obligation to the patient after he has rendered reparative services. There is little appreciation of, and therefore little interest in, preventing recurrences of the problem or injury.

A third obstacle may be present in the general philosophy of management toward the employees. Often there is a feeling that the obligation to the health needs of the employees is

Dr. Belk is Director, Medical Department, Western Electric Co., Winston-Salem.

This presentation was the winning manuscript in the Central States Society of Industrial Medicine and Surgery Contest, at which time the author was a resident in occupational medicine at Ohio State University and AT&T Co.

satisfied when workmen's compensation benefits, as prescribed by law, are provided.⁴

A fourth obstacle is the general lack of information concerning the experience of others with employee health programs. Few papers have been published in recent years showing the cost and scope of such programs, the turnover rate, compensation costs, and absenteeism of industries with active employee health programs.⁵

A fifth obstacle is the lack of effective means of communicating information already available to industrial management. Results from a study of managerial attitudes⁶ show that managers are most likely to be influenced by industry sources (conversation with other businessmen in the same industry, conventions and meetings within the same industry, visits to other industries of the same type, and journals of the same industry). Yet, in the study, no relation was demonstrated between the importance attached to industry sources and willingness to institute health programs. This would indicate that potential industry sources have not been utilized effectively to encourage establishment of health services.

Types of Programs

No single type of arrangement for development of in-plant medical services has gained widespread acceptance either by medical personnel or by small industries. The most publicized types of in-plant programs have been sponsored by groups of small industries alone or in conjunction with local or state governmental agencies.^{5, 7, 8} These programs, however, seem not to have been widely popular because of either lack of appeal to the physician or severe restriction of quality or depth of services offered, for there have been no recent attempts to extend this type of service in other communities.

Because of the generally unsatisfactory state of in-plant programs in small plants and because almost no attention has been given programs developed by private physicians, it was deemed worth while to undertake a descriptive study of the program and services of 2 physicians who do provide central medical facilities for treatment of industrial injuries and illnesses and who have developed in-plant programs.

A Model Program

Several months were spent both observing and participating in the in-plant and office prac-

tice. The 2 physicians whose activities were studied freely offered their time and effort to provide records and answer questions regarding procedures and policies. After being assured that the plants would not be identified by name or location, the executives from each plant promptly gave permission to this observer to use data describing the setting in which the medical service functioned and the services provided by the medical program. (For protection of the privacy of the physicians and plants involved in this study the senior physician will be referred to as Dr. A; the junior, as Dr. B.)

Development of the Program

The industrial office developed in a city located in the northern half of a highly populated, industrialized midwestern state. Population growth of the city has been constant for every decade in this century except for the 10-year period of the thirties. During the 1950's there was a gain in population of 8.79%, to give an official census figure of 37,079 in 1960. County population in 1960 was officially 60,221.

Since 1950, 9 manufacturing industries have instituted operations in the local area. Three of these plants employ 500 or more workers; the remaining 6 employ less than 100. By 1964, the 9 employed approximately 2300 workers, more than one-third of the 6476 workers employed in manufacturing industry in June 1964 (local area chamber of commerce estimate). In-plant medical programs have been developed in 2 of the plants employing approximately 500 workers each.

The county is served by 56 physicians, and almost all medical specialties are represented. Two hospitals with bed capacities of 166 and 60 are located in the community.

The industrial medical practice developed from a practice of general medicine and surgery which also included treatment and care of patients who had sustained occupational illnesses and injuries. This practice was assumed by Dr. A in 1947 upon the retirement of his father from active practice. From the beginning of his practice, Dr. A was interested in the treatment of industrial illnesses and injuries. Under the influence of a physician from an industrial clinic in a nearby metropolitan area, he decided to confine his activity to treatment of these ill or injured workers. Over the next 2 years he gradually referred his private patients to other physi-

cians in the community to limit his interests to industrial cases.

During these formative years, Dr. A utilized 3 basic approaches to his practice: (1) He made himself readily available at all times to provide treatment in industrial injury cases. (2) He utilized every opportunity to visit the plants to analyze the mechanics of the accidental injuries which occurred and to examine methods of prevention with management; additionally, he visited the plant to examine prospective jobs for individuals returning to work following injuries. (3) He regularly attended safety meetings and frequently was asked to speak on medical problems regularly encountered in the workplace. As a result, safety councils in surrounding communities often requested his services for speaking engagements.

Gradually, over the years, the patient load increased, as established industry expanded and new industry moved into the area. An additional important aspect of the increased activity in the office was the expansion of services offered in pre-employment examinations, return-to-work examinations, and annual executive examinations. More and more industries made use of the facility as management of the plants slowly began to accept the usefulness of a few basic preventive services. Important, too, to industry was the utilization of a physician who had developed a more thorough understanding of workmen's compensation laws than was generally present in the medical community.

In 1958, Dr. A began visiting the in-plant medical facility of Plant D (see Table 1) for 1 hr. 5 times weekly. An in-plant medical dispensary already existed here; it had been served by a full-time staff physician who resigned to assume another position. The following year, Dr. A began to visit Plant G (see Table 1) for 3-4 hr. per week. Services to these plants were on a fee-for-service basis and consisted primarily of treatment of injuries, pre-employment examinations, and return-to-work examinations with placement of employees on jobs consistent with their ability to perform.

By 1960 Dr. A could not assume any further responsibilities although he had been approached by management of Plants A and B, located 18 and 22 miles from the office, requesting that he establish in-plant programs for them. Management of these plants had become interested in such a program by hearing Dr. A dis-

cuss this service at a safety meeting in their community.

About 2 years earlier, in 1958, Dr. A had felt that the demand for in-plant services had increased to the point that this demand would require the full-time attention of a partner. Dr. A believed that for maximal development of these in-plant services his prospective partner should be specifically trained to conduct in-plant medical programs. In June 1961, Dr. B, who had just completed a 3-year residency in occupational medicine, agreed to establish an in-plant program in Plants A, B, and C by visiting each plant 2-3 hr. once a week while he remained on the staff of the school where he received his training.

After 1 year Dr. B decided to devote full-time to the development of in-plant programs in the local area by joining in equal partnership with Dr. A. In 1964 Dr. B was certified in Occupational Medicine by the American Board of Preventive Medicine.

The Industrial Medical Office

The present office building, constructed in 1960, is located in an easily accessible location 4 blocks from the downtown area. The building is shared with other physicians, but approximately one-half the space is utilized by Dr. A.

Four persons are employed full-time in the office. A technician performs preliminary testing in the physical examination section. A full-time secretary and receptionist for Dr. A bills the industrial commission or specific industries for services or treatment of employees. Two graduate nurses work full time. The activities of one are confined to the physical therapy section, and the second assists Dr. A in the treatment area by offering technical assistance, cleaning and stocking supplies, and taking and processing X-ray films. A part-time secretary is available 4 hours daily for Dr. B.

Four types of physical examinations are performed in the office. The most frequently performed examination is the pre-employment, which is required by all major companies in the community. Those companies without in-plant programs also utilize the office for "special" examinations for employees returning to work following illness or injury. Six companies provided annual executive physical examinations for top management in 1963, while only 2 companies required periodic examinations for workers exposed to occupational hazards.

Occupationally injured or ill patients from all plants in the area are usually diagnosed and treated in the office. This service is also extended to the plants in which in-plant medical programs have been established, unless the injury is minor and can be effectively managed by the medical service in the plant. Most of the other small miscellaneous businesses in the area, from grocery markets to construction companies, encourage their employees to utilize the office for treatment.

Coverage for treatment of emergencies which arise during nonoffice hours is provided on a "call" basis by Drs. A and B. Coverage by each individual extends over the period of a week and is facilitated by an extension of the office phone in the homes of both.

At weekly intervals, the original copies of the examination forms (pre-employment, "special," and periodic occupational) are mailed to the medical departments of plants which have referred the individuals, to be incorporated into the employee's medical record. A copy is retained in the office of Drs. A and B in the individual's file. The original form of the executive examination is retained in the office, the first carbon is given to the examinee for his physician, and the second carbon is sent to the plant for inclusion in medical records there.

Liaison between the office and the plants with medical programs is maintained by periodic photocopies of the employee's office record of treatment for injury or illness. These copies are sent only to plants with medical departments for inclusion in the medical record.

Plants with Medical Programs

The location and type of operation for plants with in-plant medical programs are presented in Table 1.

Data showing employment; turnover, number of accidents, and workmen's compensation ratings for plants with medical programs are presented in Table 2. No attempt has been made in the presentation of the data to trace changes in employment and accident patterns which have occurred in recent years because records have undergone changes and the medical program in none of the plants could be expected to exert a maximal influence at this time.

Average monthly shop and salaried employment was obtained by calculating average employment for the month from weekly reports from the personnel offices. Monthly employment was then averaged for the year.

Percentage of additions (or separations) was obtained by the following formula:

$$\frac{I \times 100}{E}$$

where I is the number of individuals hired or returned to work (or dismissed or "laid off"), and E is the average monthly shop employment for the year. Many plants had very high turnover rates. Frequent temporary suspensions with subsequent return to work operated to produce these elevations in most instances.

Monthly total absenteeism percentages were obtained as follows:

$$\frac{Ab_M \times 100}{W_M \times Emp.}$$

TABLE 1. OPERATIONS IN PLANTS WITH MEDICAL PROGRAMS

Plant	Location	Shops	Products
A	22 miles from office	Foundry, machine shop, assembly area	Heavy road-building equipment
B	18 miles from office	Machine shop, assembly area	Heavy road-building equipment
C	In town with Plant A	Machine shop, assembly area, paint shop	Steel burial vaults, steel truck bodies—dump trucks, garbage trucks, etc.
D	In town with office	Machine shop, fabrication shop	Heavy earth-moving machinery
E	In town with office	Assembly and erector shops	Heavy earth-moving machinery
F	In town with office	Foundry	Castings for Plant D
G	In town with office	Forge shop, machine shop	Automotive parts—axles, brake units, clutches, etc.
H	In town with office	Machine shop, assembly shop	Air-conditioning compressors, refrigeration units
I	5 miles from office in rural area	Wire-braiding area, "curing" ovens	Reinforced tubing for hydraulic lines

Plants A and B are divisions of I company and Plants D, E, and F are divisions of another.

TABLE 2. DATA ON PERSONNEL, SAFETY, AND WORKMEN'S COMPENSATION
IN PLANTS WITH MEDICAL PROGRAMS

Plant	Employment, 1964 (monthly av.)		Turnover, shop, 1964		Absenteeism, shop, 1964 (monthly av. %)	Lost-time accidents, 1963		Workmen's comp. merit rating 1963 (%)
	Shop	Salaried	Addit. (%)	Separat. (%)		No.	Freq. rate	
A	335	187	1.8	1.8	3.2	23	23.76	+28
B	124	12	15.4	1.5	2.4	13	NA*†	+28†
C	322	164	42	39	5.6	25	28.8	+33
D	893	510	54.8	39.3	NA	22	6.88	+10‡
E	219	20	72.4	46.3	NA	8	24.97	+10‡
F	217	55	46.2	40.1	NA	8	15.15	+10‡
G	344	92	22.9	17.0	4.1	20§	22.61§	NA
H	664	78	30.1	17.3	3.7	42§	NA§	NA
I	375	85	2.0	2.0	2.9	4§	4.05§	NA

*Not available.

†A and B are divisions of the same company; workmen's compensation ratings and costs are combined.

‡D, E, and F are divisions of the same company; the rating is combined.

§Data presented are for 1964. Data from other years were not available.

||Plants G and I and self-insured.

¶Workmen's compensation rating and costs are combined with another division in the state.

Ab_m represents days of absence per month; W_m, number of working days per month; and Emp., the average number of employees. The monthly average for the year was then obtained by averaging these monthly percentages. Data were not available for Plants D, E, and F because these plants report only the number of different employees absent in a weekly period without an indication of the total days lost due to absence.

Data for numbers of lost-time accidents (accidents which did cause or would have caused the absence of the employee from work on the succeeding day), accident frequency rates, and workmen's compensation ratings are presented for 1963 because complete data for 1964 were not available when this information was obtained. The accident frequency rate was obtained by finding the number of lost time accidents per million man-hours of work the plant experienced.

In-Plant Medical Programs

All in-plant medical programs provide these services:

1. Pre-employment examinations
2. Work capacity evaluations for return to work from injury or illness
3. Rehabilitative efforts for victims of occupational and nonoccupational illnesses and injuries by careful job placement and follow-up
4. Individual counseling for health maintenance

5. Treatment of minor injuries

6. Advisement of management in areas of insurance and relations with the medical community

Usually pre-employment and return-to-work examinations are done in the industrial medical office for those plants which are located nearby (except Plants D, E, and F). Treatment of work-connected illnesses and injuries is also provided in the office for those plants in the local area. Almost all employees from Plants A, B, and C are referred to their personal physicians for treatment of industrial injuries.

As management has supported other programs, these have been instituted. Special activities and costs of the programs are presented in Table 3.

In the computation of the costs for the in-plant medical programs, the costs for space, utilities, or depreciation of equipment are not included. Also excluded are the costs to the companies for the treatment of illness or injury, since outside treatment for employees is provided by Plants A, B, and C. The charges for examinations performed in the office for these plants is included in this listing, and the cost for supplies is also included, except for Plants D, E, and F, where it could have been obtained only by examining all requisition orders of the company for the year.

Annual costs per employee of the medical programs for the plants in this study ranged from \$7.64 to \$44.57 (Table 3). The mean cost

per employee for all the plants was \$22.38. This mean cost was obtained by dividing the costs of the medical programs for all the plants (\$105,080.28) by the total average monthly employment of shop and salaried workers (4696).

The elevated cost of the program for Plant F occurred because there are 2 nurses for a small employee group and an annual occupational examination with chest X-ray, which is provided each employee. Full-time coverage by 2 nurses

also elevated the cost of the program for Plant G.

Most of the plants have provided space for a nurse's office, a treatment room, and a combination physician's office-examining room. Noise from the plant is a problem in Plants A and B. There are no facilities specifically reserved for the physician at Plant C. No nursing personnel are available here either. A secretary assists Dr. B on his visits, and she maintains records in a

TABLE 3. SPECIAL FEATURES AND COSTS OF IN-PLANT PROGRAMS FOR 1964

Plant	Special features	Physician's time (hr./wk.)	Nurse's time (hr./wk.)	Ann. cost per employee (\$)
A*	1. Biweekly surveys for safety hazards	11	30	21.20
and	2. Dust surveys of foundry by State Industrial Hygiene Laboratory	(3 visits A; 1 visit B)		
B	3. Survey each 6 mo. for lead intoxication in painters			
	4. Educational programs in proper handling techniques			
	5. Executive examinations			
C	Informal surveys for environmental hazards	4 (2 visits)	0	7.64
D	1. Informal surveys for welding fumes	10 (5 visits)	120 (3 full-time)	15.59†
	2. Frequent consultation with safety department for improving safety conditions in plant			
	3. Development of program for notifying medical department of new materials in plant			
E	1. Informal surveys for welding fumes	1	40	25.87†
	2. Consultation with management regarding safety hazards			
F	1. Periodic dust counts by State Industrial Hygiene Laboratory	1	80	44.57†
	2. Annual physical examination of employees, with chest X-ray			
	3. Periodic executive examinations			
G	1. Hearing conservation program with annual audiometric examinations	4 (2 visits)	80	41.40
	2. Scheduled programs in proper handling techniques for prevention of injuries			
	3. Surveying safety hazards with safety personnel			
H	1. Special emphasis upon health counseling because of low educational level of employees	4 (2 visits)	80	27.85
	2. Periodic executive examinations			
	3. Program for prevention of dermatitis			
I	1. Periodic executive examinations	1	40	18.53
	2. Hearing conservation program with periodic audiograms and ear protective programs			
	3. Survey of workers each 6 mo. for elevated levels of lead			

*Plants A and B and divisions of the same company.

†The cost presented does not include that for supplies, since the figures could be obtained only by examining all requisition orders for the plants for 1964.

locked file in the personnel department. Records at all other plants are maintained in the medical departments.

Supplies and equipment are limited in the dispensaries, being confined to those required for a well-stocked first aid unit—cleansing materials, antiseptics, and bandaging materials. Only in the dispensary of Plant D are supplies provided for repairing lacerations and other treatments. Plant D also has an X-ray machine. Equipment in other plants is confined to that necessary for physical examinations.

Summary

By 1964, after 2 years of full-time effort, Dr. B had initiated or expanded in-plant programs in 9 plants ranging in size from 140 to 1400 employees. These programs are widely varied in the scope of the preventive measures which they provide. Perhaps the most significant and critical progress has been made in improving the attitude of management toward a program of preventive medicine.

In the course of this study, several factors in the institution and perpetuation of a medical service for small plants seemed evident:

1. The physician seeking to establish such a service must be professionally interested in both the workplace and the employee. As an integral part of the medical program, the physician must go into the workplace to enhance his knowledge of job specifications and environmental hazards.
2. A physician who expects to establish in-plant medical programs in small plants must be willing and available to provide immediately and promptly services for treatment of occupational injuries and illnesses.
3. The physician must use every opportunity to show both management and the employee the potential which preventive medical programs offer.
4. The physician must balance the services

he proposes to provide to small industry against the specific needs of individual plants and the willingness or ability of management to provide for these services. In striving to arrive at a proper balance, the physician must be careful not to compromise his principles of providing adequate care and protection for the employee.

5. The physician must establish, in both the industrial and the medical community, his interest in occupational medicine. Ideally, this is accomplished by limiting his activity to treatment of occupationally induced injuries and illnesses, to providing in-plant services if in demand, and to offering consultative services to industry.

The activities of the 2 independent physicians presented in this study would indicate that initiation of in-plant medical programs in small plants is possible when interest, patience, and perseverance are applied to this perplexing problem. A need in the community is being met.

Western Electric Co.
3300 Lexington Rd.
Winston-Salem, N. C.

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DOCTOR'S BUSINESS

The higher a patient's income, the more often he is likely to pay a visit to his doctor. A new government survey shows 4.3 visits per person to the doctor each year among those from families with incomes of less than \$2,000. When family income jumps to \$10,000 or more, the number of visits increases to 5.1 a year. The same survey shows that 2.4 million people—roughly 1.3% of the population—have never turned to a doctor for care or advice.

Medical World News 6:169, 1965.