MEDICAL MANAGEMENT OF CHEMICAL EXPOSURES IN THE PETROLEUM INDUSTRY

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Foreword

The American Petroleum Institute has a long history of providing the best possible health information to member companies and to others who are interested in such data.

This is one of their many publications and has been developed primarily to provide pertinent information and guidance to physicians who are employed on a part-time basis, and to other health professionals who are retained or employed by the petroleum or petrochemical industry. This publication should help familiarize the reader with the products, activities, personnel, and potential hazards of the industry.

While the role of the physician in the petroleum industry has not changed drastically over the years, there are now mandated legal requirements as to the health evaluation procedures the physician is to administer, their frequency, and method of reporting results.

The material presented herein is intended to familiarize the physician and other health professionals with the industry by providing brief, nontechnical descriptions of the petroleum and petrochemical industry, defining job titles, and indicating in a general manner the broad scope and multitude of chemicals utilized and handled.

This publication is not intended to be a technical or medical treatise, but rather a source of basic general information which may assist the health specialist in considering and recognizing the possible role of various environmental stresses and hazards in the causation of worker complaints and health problems. To our knowledge, the information, treatment and procedures discussed in this volume are current to the date indicated for each item. However, any user of the data contained herein should consult appropriate reference sources to determine whether there have been any changes since that time.

This manual is a companion to the "Industrial Hygiene Monitoring Manual" also available from the American Petroleum Institute (API).

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INTRODUCTION

Historical Development of Occupational Health

Prior to 1900 very little concern was expressed for protecting the health of the worker, although literature records *recognition* of hazards to health. As early as the 4th century B.C. lead toxicity in the mining industry is discussed by the "Father of Medicine"—Hippocrates —and in the 1st century A.D., Pliny, a Roman scholar, referred to dangers inherent in dealing with zinc and sulfur. In the next century, Galen, a Greek physician famous for his theories on anatomy and pathology, recognized the dangers of acid mists to copper miners. Although many *observations* of these conditions were made, their alleviation, elimination or prevention appeared to be of little concern, and the study of occupational diseases was ignored. In the 18th century Bernardo Ramazzini is credited with writing the first inclusive treatise on occupational diseases. Charles Thackrah, in the latter part of the same century, wrote a 200-page treatise dealing with occupational medicine. Said he: "... let benevolence by directed to the prevention, rather than the relief of the evils."

The first evidence of government interest in developing safeguards for health of workers was the passage of the English *Factory Acts* of 1833. These are considered to be the first effective legislative acts in the field of industry which required that some concern be given to the working population. Various European nations followed England's lead and developed "Workmen's Compensation Acts" which stimulated adoption of increased factory safety precautions and inauguration of medical service in the industrial plants.

In the United States early in the 20th century the work of Alice Hamilton, a physician, substantiated evidence of a relationship between illness and exposure to toxins; further, she proposed specific solutions to the problems. This was the start of an "Occupational Medical Renaissance." With public awareness now aroused, legislation was enacted for workmen's compensation, in 1908 by the federal government and in 1911 by the first state. The Workmen's Compensation Laws were important factors in the development of occupational health.

The petroleum industry took an early lead in developing modern day occupational health programs to protect the health of their workers in the period preceding World War I, extending their influence to many foreign oil explorations. At approximately this same time, within the federal government the Office of Industrial Hygiene and Sanitation was organized (1914) to provide industrial hygiene and medical support to the U.S. Bureau of Mines.

At the time when most American industries were employing part-time physicians, primarily for the purpose of treating traumatic injuries, the petroleum industry began to apply the principles of preventive medicine despite the fact that many considered it unnecessary, wasteful, and costly to industry. One of the first full-time industrial physicians was Dr. Allen Schoenleber. He pioneered occupational health in the petroleum industry, and subsequently published a book "Doctors in Oil",[1] which is essentially a diary of events in which he participated that brought about changes in industrial and social facets as well as in health.

According to Dr. Schoenleber, early industrial physicians had little standing within the industry or even in the medical community. The "industrial" physician was looked down upon by other physicians because he was "not making an honest living in private practice," perhaps because he was "not good enough." This prejudice was displayed by plant management as well in various ways, such as being assigned inadequate space. Added to the prejudices encountered by the early industrial physicians in the petroleum industry were the problems of sanitation, which obviously had to be improved in order to make health measures effective, and the attitude of the workers themselves, who had to be "sold" on these changes. The early industrial physician therefore had to be a good "salesman" as well as a good practitioner of the healing arts. Through the dedicated efforts of pioneer physicians such as Dr. Schoenleber and others, the fruits of their labors began to take form during the 1920s, and today the occupational health physician is a recognized specialist with the same standing as other specialists.

Industry used part-time medical assistance in the early days prior to World War I. Selection and appointment of these physicians was often made without regard to ability, and by men not in a position to make an intelligent choice. Directives issued by management to appoint company physicians were passed on down the line to local foremen, who called upon family physicians or someone they happened to know and like. These physicians who took on such assignments had few instructions, knew little of company policies, and since they were not under the supervision of a corporate phy-