and the determination of an employee's fitness to wear and use a respirator" (Tr. 7/3).

Respondents disagreed about how frequently medical tests and chest X rays should be required. All of those who commented on pre-placement exams agreed with OSHA that employees engaged in asbestos work should receive a pre-placement medical examination (Exs. 84-424, 84-457, 123.A, 312.A, Trs. 6/21, 6/26, and 6/29). ORC indicated that "a pre-placement medical evaluation should be designed to determine the suitability of the individual for the job and vice-versa . . . it is important to establish baseline data for longitudinal prospective follow-up" (Ex. 123.A). The American Association of Occupational Health Nurses (AAOHN) concurred with ORC: "[d]elaying gathering of this essential baseline information could be detrimental to both the employee and the employer, because knowledge of a pre-existing condition could influence initial job placement" (Tr. 6/26).

However, opinions differed on the frequency of both medical examinations and chest X rays given after the initial exam. AGC stated that "[c]ontractors should not . . . have to provide more than one medical examination to an employee in any one calendar year" (Ex. 84-457). The BCTD suggested that triennial medical exams be given to workers under forty years of age or with less than 20,000 hours of work experience in the building trades and annual exams thereafter, except for chest X rays, which they recommended should be performed every three years without regard to duration of workplace exposure. However, the BCTD suggested that an examination to determine an employee's fitness to wear and use a respirator be given annually. The International Brotherhood of Boilermakers (IBB) generally concurred with BCTD's recommended medical examination protocol and recommended that "for those post-40 or with 20,000 hours or more of employment, the medical examination should be provided annually. . . ." (Tr. 7/3). However, the IBB felt that a chest X-ray should be included in this annual examination. The Asbestos Victims of America (AVA) also agreed with the BCTD that employees at least 40 years of age should be provided with medical examinations on an annual basis (Tr. 6/26). Scott Schneider, of the Carpenters Union, recommended one exam every three years after the initial exam, for those employees just beginning to work with asbestos (Ex. 84-424); William Ewing Jr., of the Georgia Institute of Technology, also suggested that medical tests be given every three years to reduce the frequency of X rays (Tr. 6/25); and Dr. Hans Weill, of Tulane University, questioning the usefulness of annual examinations, agreed that this frequency was appropriate (Tr. 6/19).

The National Institute for Occupational Safety and Health (NIOSH) recommended that a comprehensive medical examination be given every five years for the first fifteen years of occupational exposure to asbestos and "thereafter every two years using the standardized guidelines for instrumentation training and interpretation of the recognized expert authorities" (Tr. 6/21). The American Iron and Steel Institute (AISI) recommended a reduction in the frequency of chest X rays (Ex. 263). OSHA agrees that annual X rays may not always be necessary and believes that the interval between X rays is best determined by the physician, who can base his or her decision on the general health status of the employee and specific workplace conditions. In the final rule, OSHA has retained the requirement for a preplacement examination and at least an annual exam thereafter, but grants to the physician the right to determine what interval is appropriate.

Respondents disagreed on the content of medical examinations to determine respirator fitness (Exs. 90-254, Trs. 6/29, 7/3, 7/12). For example, the National Constructors Association (NCA) stated that, ". . . a pulmonary function test . . . must be performed because the employee could be at risk in using respirators" (Tr. 7/12). David Kirby, an Industrial Hygiene Chemist with the University of Alabama, felt that medical surveillance should be used to determine if the employee is capable of wearing a respirator and is physically able to do the work, but that chest X rays and pulmonary function tests are inappropriate for the asbestos abatement industry (Tr 6/20). OSHA has determined that pulmonary function tests serve a dual purpose in this Final Rule. In addition to establishing respirator fitness, spirometric measurements can detect lung fibrosis due to asbestosis. Therefore, pulmonary function tests are required in this standard.

The issue of whether to include mandatory or recommendatory medical tests in the revised standard was controversial. Some commenters argued that certain tests should be required (Exs. 277, 330, Trs. 6/26, and 7/3), while others maintained that the tests should be chosen by the examining physician rather than by OSHA (Exs. 312.A, Trs. 6/21, 7/12, 7/10). The following commenters suggested specific tests: BCTD stated that OSHA should require ". . . a rectal exam and stool guaic test for occult blood [for asbestos-exposed workers] after the age of 40" (Exs. 277, 330); the Oil, Chemical and Atomic Workers Union (OCAWU) recommended a stool test to screen for gastrointestinal malignancies and sputum cytology tests to screen for lung cancer (Tr. 6/26); and the International Brotherhood of Boilermakers advocated annual tests for digestive tract cancer for employees over the age of 40 or with 20,000 hours or more of employment (Tr. 7/3).

However, many respondents supported permitting greater discretion on the part of the physician in determining what tests to conduct. For example, NIOSH recommended that "[the use of] routine periodic stool, sputum cytology and lavage tests . . . should be left to the discretion of the examining physician" (Tr. 6/21), and Dr. Hilton C. Lewinsohn, Assistant Corporate Medical Director of Union Carbide, stated that, as a physician, he doesn't want to be ". . . confined to doing certain things in a medical examination or a physical examination" (Tr. 7/12).

In the final rule, OSHA has struck a balance between mandatory and non-mandatory medical surveillance requirements: the requirements for medical and work history, physical examination, and pulmonary function tests are mandatory, while the selection of other specific tests to be conducted has been left to the discretion of the examining physician. Choosing this cut-off point on the continuum between performance standards on the one hand and specification standards on the other reflects, in OSHA's view, the record evidence in the case of asbestos. In addition, mandating certain basic elements of the medical surveillance program and stating others in non-mandatory terms follows the precedent established in OSHA's final rule for ethylene oxide (29 CFR 1910.1047).

Some commenters supported the administration of a questionnaire during the medical examination (Exs. 84-424, 90-138 and 90-162). Monsanto felt that a respiratory disease questionnaire should be issued in conjunction with the pulmonary function tests (Ex. 90-138). James Packenham, of OSHA's Advisory Committee for Construction Safety and Health, suggested that ". . . because of the nature of construction . . . there has to be a rather thorough questionnaire in the appendices . . . which will facilitate