

Figure 4 illustrates some of these conditions:

A is normal.

B is destruction of the wall plus reduced capillary bed.

C is obstructed air flow.

D is obstructed blood flow.

E and F illustrates condition where carbon monoxide uptake might be increased, i. e., increased number of capillaries and increased size of capillaries.

G illustrates a variety of interferences due to change in the condition of the membrane: thickening, tissue separation, beginning pulmonary edema, non-ventilated alveoli filled with exudate or fluid.

This brief discussion indicates that by using a combination of tests of pulmonary functions, such as:

1. Spirogram: forced expiratory volume, one, two, or three seconds; forced mid-expiratory flow; maximum flow rate; total vital capacity.
2. Diffusion capacity,* resting and with exercise: measured by the steady state carbon monoxide uptake method (based on recommendations of Dr. George Wright, St. Luke's Hospital, Cleveland, Ohio; Advisory Fellow of IHF).
3. Calculation of:

Total lung capacity; functional residual capacity; residual volume, and by comparing meaningful deviations from "normal" of these parameters in these two populations, i. e., the older, highly exposed groups versus the older, lower exposed groups, these objective measurements would quantify any significant effects of fibrous glass dusts exposure on the function of the lungs, provided no other explanation can be found for these differences.

Obviously, failure to demonstrate such differences would help document the null hypothesis.

Either event would be useful in furthering our efforts to measure and obtain information about the effects of industrial processes, products, and wastes on health.

* The December 1968 issue of the Industrial Hygiene Digest of the Industrial Hygiene Foundation contains a discussion, in a book review, of the relative merits of the various carbon monoxide uptake methods.