

## Literature Briefs

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### Respiration

#### SCOLIOSIS AND PULMONARY FUNCTION

The most serious sequelae of scoliotic thoracic deformity is cardiorespiratory insufficiency, particularly in children and adolescents. In time, both restrictive and obstructive (secondary to recurring infections) pulmonary disease will intensify and cor pulmonale will develop, which signals the end state of the patients' fate. Surgical correction of the scoliosis is designed to prevent this chain of events. This study is to explore the effectiveness of instrumentation with the Harrington rod in stabilization of the spinal column in regard to improvement of pulmonary function. Thirty-three juvenile patients, aged 12-19 years, with various thoracic scoliotic deformities were studied shortly before and a year after operation. The tests included vital capacity, residual volume, total lung volume, and arterial blood gases, the latter before and after exercise. The angles of scoliosis ranged from 40 to 130 degrees, averaging 79.2 degrees. After surgical correction the angle amounted to 29 degrees. All pulmonary function values remained as before operation or changed only minimally with the exception of blood gases. There was a significant increase of  $P_{O_2}$  in patients who had had respiratory insufficiency preoperatively. This was particularly evident after exercise. Optimistic hopes that surgical correction of the scoliosis would improve limitations of static pulmonary volume were not fulfilled. On the other hand, surgical solidification of the spine by instrumentation and bone graft did not aggravate poor pulmonary function. A demand for early operation, preferably when pulmonary function is still normal or only slightly impaired, is justified; in growing children and adolescents the surgical procedure will definitely arrest further deformity of the

spine and prevent further deterioration of pulmonary function. (Meister, R., and Heine, J.: *Comparative Studies of Pulmonary Function in Juvenile Scoliosis Patients before and after Harrington Spinal Instrumentation*, *J Orthop* 111:749, 1973.)

#### PROGNOSTICATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Sixty-four patients with chronic obstructive pulmonary disease were followed for six years (1962-1968). Various pulmonary function tests were repeatedly done to evaluate their prognostic significance with regard to the final outcomes of the patients. Thirty-two patients died within six years. Twenty-two of these died of cardiorespiratory failure and the rest died from other causes. Following exercise, the initial mean  $P_{aCO_2}$  and mean  $S_{aO_2}$  were 55.8 torr and 81.7 per cent, respectively among the non-survivors, but the values were 48.2 torr and 89.4 per cent in the group that survived. Initial diffusing capacity after exercise was 18.4 ml CO/mm Hg/min in the non-surviving group and 21.5 ml CO/mm Hg/min in the group that survived. Those who had cardiorespiratory death had higher initial  $P_{aCO_2}$  and lower  $S_{aO_2}$  than those who died from other causes. Once chronic hypercapnia is established, the evolution of the disease is characterized in every patient by significant yearly deterioration of vital capacity, FEV<sub>1</sub>, and blood gases at rest. Only the yearly decreases of  $S_{aO_2}$  differed significantly between the survivors and non-survivors. (Vandenbergh, E., Clement, J., and van de Woestijne, K. P.: *Course and Prognosis of Patients with Advanced Chronic Obstructive Pulmonary Disease*, *Am J Med* 55:736, 1973.)

#### LUNG SCANNING AND PULMONARY EMBOLISM

The number and diameter of vessels of the pulmonary arterial system 100  $\mu$  in diameter or less were measured. For vessels less than 100  $\mu$  in diameter the data of von Hajek and Wagenwort *et al.* were