c. Interpretation Algorithm

- ✓ To separate normal from abnormal test results, first examine the FEV_1/FVC to determine if obstructive impairment is present, and then evaluate the FVC to determine if restrictive impairment may exist. The FEV_1 is examined if the FEV_1/FVC indicates possible obstructive impairment, as shown in Figure 4.
- ✓ All three indices of pulmonary function are considered abnormal if they fall below their 5th percentile Lower limit of Normal (LLN). Fixed cutoff points for abnormality such as 80% of the predicted value or an observed FEV_1/FVC ratio <0. 70 should not be used in the occupational health setting.
- ✓ An FEV_1/FVC that is barely abnormal, in the presence of FEV_1 *and* FVC >100% of predicted, may indicate a normal physiologic variant pattern in healthy non-smokers. However, if such healthy workers are exposed to known respiratory hazards, clinical judgment is needed to evaluate the possibility of early airways obstruction.

4. EVALUATING RESULTS OVER TIME

a. Longitudinal Interpretation

- ✓ Evaluate technical quality of the spirometry tests and the adequacy of the follow-up period before interpreting change in pulmonary function over time.
- ✓ ACOEM recommends that FEV_1 losses exceeding 15% since baseline, after allowing for the expected loss due to aging, trigger further medical evaluation when spirometry is of high technical quality.
- ✓ ACOEM recommends that a confirmed FEV_1 decline of 10-15% since baseline, after allowing for the expected loss due to aging, would trigger further medical evaluation, when loss of FEV_1 is known to be related to an endpoint disease and test quality is adequate.

b. Pre- to Post-Bronchodilator Changes in Pulmonary Function

- ✓ A pre- to post-bronchodilator FEV_1 or FVC increase of 12% of the initial value and 0.2 L is suggestive of reversible obstructive airways disease.
- ✓ Determinations of permanent impairment need to be based on a worker's best values for FVC and FEV_1, whether recorded before or after a bronchodilator.

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