**Alpha₁ Antitrypsin—A Comprehensive Testing Algorithm**

Clinical suspicion of α₁-antitrypsin (A1AT) deficiency

**Order A1ALC / Alpha-1-Antitrypsin Proteotype S/Z by LC-MS/MS. Serum includes:**
- A1AT protein quantitation (serum)
- Proteotyping for Z and S alleles*
- Phenotyping by isoelectric focusing, if needed

A1AT serum level and proteotype

**Normal**—Not consistent with A1AT deficiency

- Report includes:
  - A1AT serum level
  - Proteotype
  - Interpretation

**Concordant**

- Report includes:
  - A1AT serum level
  - Proteotype
  - Interpretation

**Discordant**

- A1AT biochemical phenotype performed

Discordance explained?

**NO**

- Consider SERPZ / SERPIN1 Gene, Full Gene Analysis

**YES**

- Report includes:
  - A1AT serum level
  - Proteotype
  - Phenotype
  - Interpretation

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**For each of the possible A1AT proteotypes there is an expected range for the total serum level of A1AT. However, a number of factors can influence either the A1AT serum level or the A1AT proteotype results, including acute illness (A1AT is an acute phase reactant), protein replacement therapy, the presence of other rare variants and/or the presence of DNA polymorphisms. As noted above in the algorithm, when the serum level differs from what is expected for that proteotype (discordant), additional studies are performed in order to ensure the most appropriate interpretation of test results. Additional follow-up may include A1AT phenotyping by isoelectric focusing (IEF), obtaining additional clinical information, and/or DNA sequencing.**