Cystic Fibrosis: \textit{CFTR} Common Mutation Panel

\textbf{Test Code:} CF  
\textbf{Turnaround time:} 2 weeks  
\textbf{CPT Codes:} 81220 x1

\section*{Condition Description}

Cystic fibrosis (CF) is a chronic genetic condition involving multiple organ systems. Classical CF primarily involves the respiratory and digestive systems, and may have a range of clinical severity. Pulmonary symptoms often include lower airway inflammation, chronic cough, chronic sinusitis, and recurrent infections. Digestive symptoms often include meconium ileus, pancreatic insufficiency resulting in malabsorption and/or failure to thrive, diabetes mellitus, and hepatobiliary disease. Congenital bilateral absence of the vas deferens (CBAVD) is seen in men without pulmonary or digestive symptoms of CF, and results in azoospermia \[1\]. CBAVD is a significant cause of male infertility.

CF is caused by mutations in the cystic fibrosis transmembrane conductance regulator (\textit{CFTR}) gene. Individuals with mutations in the \textit{CFTR} gene may also present with milder or atypical symptoms such as pancreatitis or chronic sinusitis.

The incidence of CF is approximately 1 in 2500 live births among Caucasians and is inherited in an autosomal recessive pattern. The carrier frequency is estimated to be approximately 1 in 25 in the Caucasian population, 1 in 24 in the Ashkenazi Jewish population, 1 in 61 in the African American population, 1 in 94 in the Asian population \[2\].

The current recommendation from the American College of Obstetrics and Gynecologists \[2,3\] and the American College of Medical Genetics Subcommittee on Cystic Fibrosis \[4\] is that screening for cystic fibrosis should be offered to all patients, regardless of ethnicity.

This panel tests for the 39 most common \textit{CFTR} mutations (listed below), including the core panel of 23 mutations for cystic fibrosis as recommended by the American College of Medical Genetics in 2004 \[4\].

\begin{itemize}
\item DeltaF508
\item DeltaI507
\item R117H
\item W1282X
\item 3120+1G>A
\item G85E
\item Y122X
\item R334W
\item R347P
\item R347H
\item A455E
\item V520F
\item G542X
\item S549R
\item S549N
\item A559T
\item G551D
\item R553X
\item R560T
\item Y1092X
\item M1101K
\item R1162X
\item S1255X
\item N1303K
\item 394delTT
\item 621+1G>T
\item 711+1G>T
\item 1078delT
\item 1717-1G>A
\item 3876delA
\item 1898+1G>A
\item 1898+5G>T
\item 2183AA>G
\item 2184delA
\item 3905insT
\item 2307insA
\item 2789+5G>A
\item 3659delC
\item 3849+10kbC>T
\end{itemize}

Reported results describe the presence or absence of mutations tested and, if appropriate, provides calculated residual carrier risk, and risks to future pregnancies.

Click here for the GeneReviews summary on this condition.

Visit \url{www.ThinkGenetic.com} for patient-friendly information on cystic fibrosis.

References:


\section*{Genes}

\textbf{CFTR}

\section*{Indications}

Testing is indicated for:

\begin{itemize}
\item Individuals with a diagnosis of CF, or atypical presentations of CF (chronic pancreatitis, sinusitis).
\item Males with congenital bilateral absence of the vas deferens (CBAVD).
\item Carrier screening for individuals of Caucasian or Ashkenazi Jewish background
\item Family members of an affected individual at risk to be carriers of CF.
\end{itemize}

\section*{Methodology}

This panel of 39 mutations in the \textit{CFTR} gene is tested for by an allele-specific primer extension assay and includes the recommended ACMG panel of 23 common mutations.

\section*{Specimen Requirements}

Disclaimer: This information is confidential and subject to change without notice. It may not be reproduced in whole or part unless authorized in writing by an authorized EGL representative.
Submit only 1 of the following specimen types

* Preferred specimen type: Whole Blood

**Type: Whole Blood**

Specimen Requirements:

In EDTA (purple top) tube:
- Infants (2 years): 3-5 ml
- Older Children & Adults: 5-10 ml

Specimen Collection and Shipping: Refrigerate until time of shipment. Ship sample within 5 days of collection at room temperature with overnight delivery.

**Type: Dried Blood Spot**

Specimen Requirements:

Peripheral blood from finger prick or heel stick spotted on filter paper, completely saturating the circle. Air dry the sample.

Specimen Collection and Shipping: Ship sample at room temperature for receipt at EGL within 24 hours of collection. Do not refrigerate or freeze.

**Related Tests**

- Sequencing and deletion/duplication analysis of the *CFTR* gene is available for individuals who test negative with the common mutation panel, when other mutations are suspected.
- *CFTR* poly T analysis is performed as a reflex test when an R117H mutation is detected or when evaluating males with CBAVD.
- Ashkenazi Jewish Carrier Panel is available to screen for the panel of 9 autosomal recessive conditions common in individuals of Ashkenazi Jewish background.
- Prenatal testing is available to couples who are confirmed carriers of gene mutations. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.