

# Two Unexpected Pregnancies Attributable to Cystic Fibrosis Gene-Specific Drug Therapy: A Case Study

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# Disclosures

I have no conflict of interest to disclose.



# Objectives

Discuss overview of cystic fibrosis (CF)

Describe experiences of a woman with CF who had two unexpected pregnancies while on new CF targeted therapeutics

Identify implications for education, practice, and research related to case presentation

# Overview

Cystic fibrosis (CF) –  
most common genetic  
disorder among  
Caucasians

Over 10M people (or  
1/31 Americans) carry  
defective gene

Affects 30,000 people in  
US; 70,000 worldwide

Half are age 18 or older;  
affects men and women  
equally

Advances in research,  
genetic testing, and clinical  
care = longer life and  
meeting developmental  
milestones

(CFF, 2017)

## Pathophysiology



Defective gene affects chloride transport channels



Tenacious mucus blocks lungs, pancreas, and other systems

## Transmission



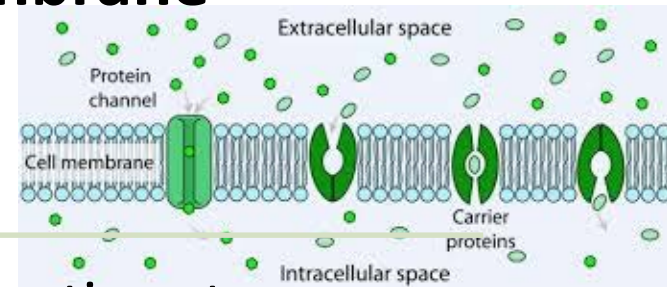
Genetic disorder on chromosome 7



Autosomal recessive

# CFTR

## Cystic Fibrosis Transmembrane Conductance Regulator



The CFTR gene contains instructions to make the CFTR protein.

Once at the cell surface, the CFTR protein functions as a chloride channel.

# Clinical Manifestations

Positive genetics and sweat chloride test

Frequent CF exacerbations & pneumonia

Productive cough with thick sputum

Frequent steatorrhea with malabsorption

Poor growth velocity

Wheezing, crackles with exacerbations, shortness of breath

Male infertility due to congenital bilateral absence of the vas deferens

Decreased fertility in women

(CFF, 2018)

# Complications

CF exacerbations

Malabsorption of nutrients

Distal intestinal obstructive syndrome

Pneumothorax

Hemoptysis

Musculoskeletal issues



# Therapies

Airway clearance (chest physiotherapy)

Inhaled medications (bronchodilators & mucolytics)

Pancreatic enzymes

CFTR modulators or potentiators

Anti-inflammatories

Antibiotics (inhaled, oral, intravenous)

Nutritional therapies

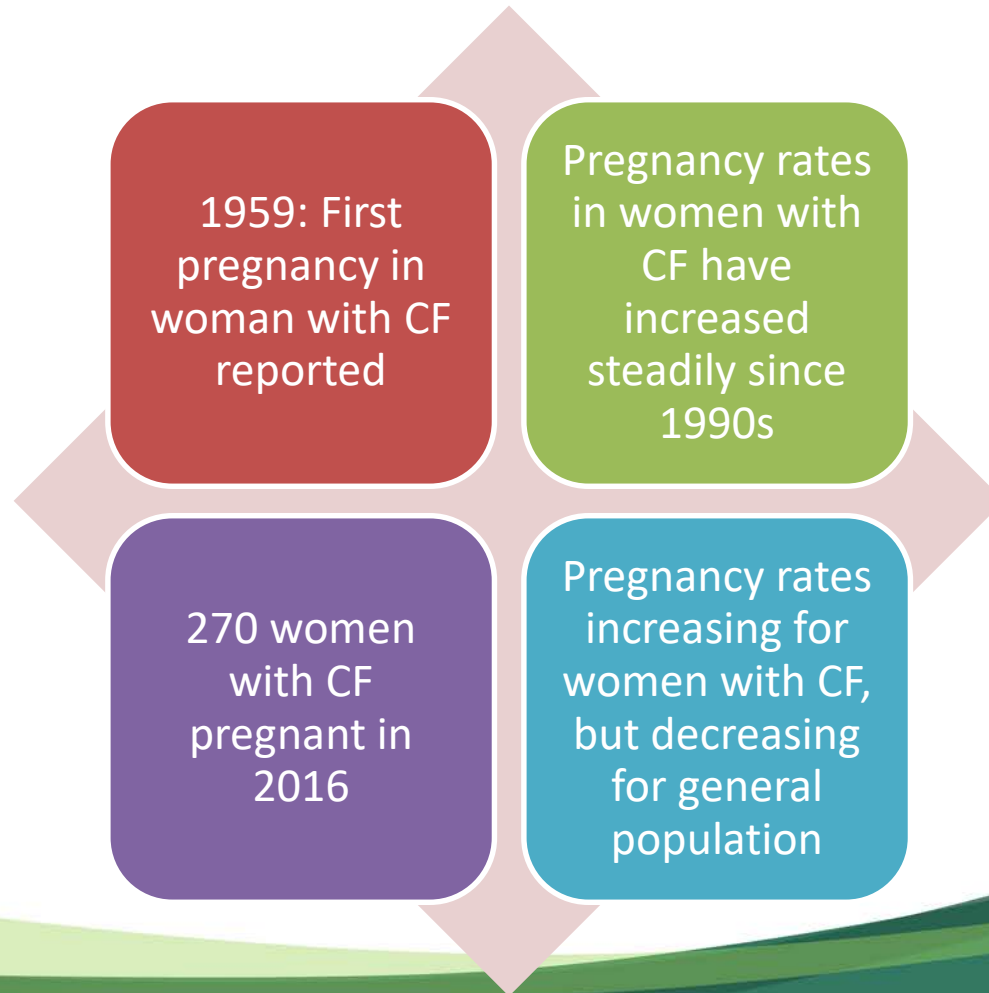
# Impact on Female Reproduction

Thick cervical  
mucus

Altered fluid  
micro-  
environment

Hormonal  
imbalance  
secondary to  
severe  
malnutrition

# Pregnancy & CF



**33% of women with CF reported they do not understand how CF affects fertility**

**84% of women with CF reported not using contraception while sexually active**

**22% of pregnancies were terminated due to deteriorating health or due to unplanned pregnancy**

(Korzeniewska et al., 2009)

# CFTR Modulators

Ivacaftor (Kalydeco)

2012

Ivacaftor-lumacaftor (Orkambi)

2015

Tezacaftor-ivacaftor + ivacaftor  
(Symdeko)

2018

# CFTR Modulators

Potentiators



Ivacaftor



Helps open the CFTR channel and helps increase the function of normal CFTR

Correctors



Lumacaftor &  
Tezacaftor



Helps defective CFTR fold correctly

# Methods



Interview,  
audio-  
recorded

Transcribed  
and  
reviewed

Narrative  
analysis to  
identify  
experiences  
& gaps

# Case Study

Ana (pseudonym)

- 29 years old
- Diagnosed at age 4 years
- Homozygous DF508del
- CF related co-morbidities



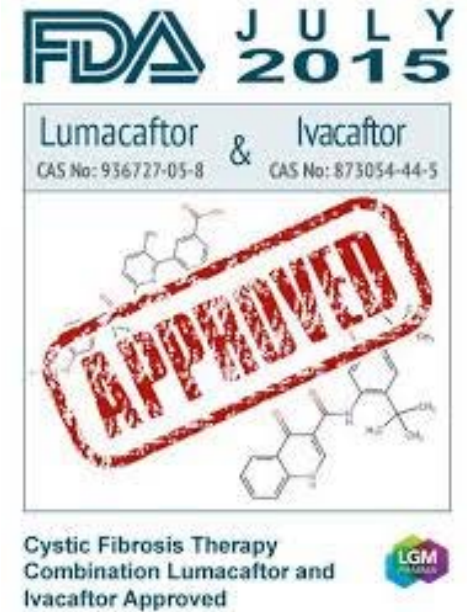
# Results

Unsuccessful attempts to conceive for 2 years

Started IVA/LUMA in August 2015

Became pregnant two weeks after starting IVA/LUMA

Only change in regimen was starting IVA/LUMA





# Effects of ivacaftor-lumacaftor (Orkambi):

- PFTs increased
- Energy increased
- Sinus congestion improved
- Became pregnant!

# Ana's Journey

Advocated to stay on ivacaftor-lumacaftor during pregnancy because of improved quality of life.

Her CF care team counseled against remaining on ivacaftor-lumacaftor.

Her child is now a healthy toddler.

She remained on ivacaftor-lumacaftor and became pregnant with a second unplanned pregnancy when her son was 7 months old

# Implications for Education



Women with CF need education about unplanned pregnancies that can occur with CFTR modulators.



Women with CF need education about how new therapies can adversely affect the efficacy of oral contraception, making a second barrier method necessary.



Women with CF need education about how unplanned pregnancies may adversely affect their health.

# Implications for Practice

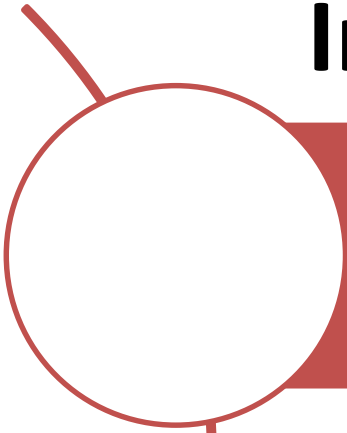


Pregnancy and motherhood are complex for women with CF.

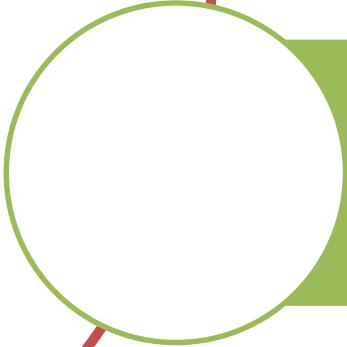
Unexpected pregnancies can have catastrophic outcomes for women with CF.

Pregnancy in women with CF requires careful surveillance by multidisciplinary team.

# Implications for Research



Research is needed to determine pregnancy rates and outcomes of women with CF while taking CFTR modulators.



Research is needed to establish protocols for the delivery of CF specific, current sexual and reproductive health education for women with CF.

# Conclusion



Anecdotal reports of pregnancy on IVA/LUMA



No official tracking by CF Foundation's Data Registry



Research is needed to develop safety profiles







Thank you!  
Email if you have questions  
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