# Caring of Leukemia Patients with Li-Fraumeni Syndrome with TP53 Mutation

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## Abstract

Background: Plan to illustrate how to care for patients with Acute Leukemia, with a history of Li-Fraumeni Syndrome from the TP53 mutation. There will be discussion about a newly diagnosed patient with Leukemia and his journey dealing with Li Fraumeni Syndrome.

Objective: The goal is to provide the audience with education about Li-Fraumeni Syndrome. Plan to focus on ordering the appropriate diagnostic testing and promote strategies that will aid in the care of Li-Fraumeni patients.

Methods: The case study was conducted on a 25-year-old male diagnosed with Li-Fraumeni Syndrome and the TP53 Mutation was found upon performance of diagnostic testing. The plan is to further demonstrate how the patient was diagnosed with Leukemia and what measures that are being taken to care for him and eventually put the patient into remission.

Results: Li-Fraumeni Syndrome affects 1 in 5000 live births worldwide. These patients have a high probability of developing a wide spectrum of childhood and adult malignancies. This can result in 50% risk of cancer by age 30 and 80% risk of cancer by age 70.

Conclusion: The outcome is to help readers understand how patients diagnosed with Li-Fraumeni Syndrome with TP53 mutation are at higher risk of developing cancers such as: Sarcoma, Adrenocortical, Breast, and Brain cancer. Patients with Li Fraumeni Syndrome should undergo physical examination every 6-12 months including whole body and brain MRI, dermatology and neurological evaluations. These patient should be monitored closely..


## What is Li-Fraumeni?

Autosomal dominant disorder linked the germline mutation in the tumor suppressor gene TP53.
TP53 germline mutation loss of heterozygosity in cancer cells, resulting in no expressional functional TP53 and is the presumed mechanism of transformation from normal to malignant cells.

High lifetime probability of developing a wide spectrum of childhood and adult-onset malignancies

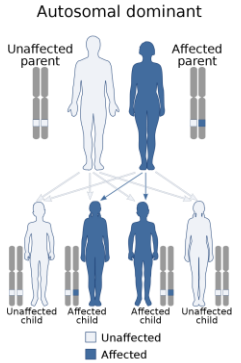
- 50% risk of cancer by age 30
- 80% risk of cancer by age 70

Estimated that LFS accounts for 1% of hereditary Breast cancer.
Incidence estimated to be 1in 5000 live births worldwide.
Historical perspective: It was named after two American physicians, Frederick Pei Li and joseph F. Fraumeni, Jr, who first recognized the syndrome after reviewing the medical records and death of 648 childhood Rhabdomysarcoma patients. The syndrome is linked to germline mutations of the TP 53 tumor suppressor gene.
If a patient has this gene mutation they are at a higher risk of developing Sarcoma, Breast Cancer, Leukemia and Adrenal Gland Syndrome.
The risk of developing cancer in individual with TP53 mutation estimated to 50% by age 30 years and 90% by ager 60 years. Lifetime risk of cancer is up to 90%Leukemia, lung cancer, colon cancer and melanoma are frequently seen in Li-Fraumeni Syndrome.


Core cancer types (SABB)
Sarcoma,
Adrenal
Breast Brain
Autosomal Dominate transmission
Mutations in TP53 gene located ton chromosome 71
60%-80% of families with classis LFS have a detectable
mutation. Stongly condsider TP53 gene testing in women with Breast cancer.
Screening guidelines for patients
Consider Ultrasound of abdomen & Pelvis in children quarterly
Blood test quarterly; CBC, LDH, SED
Annual MRI/ whole body MRI
Leukemia or Lymphoma, consider blood test every 4-6 months, CBC, ESR, LDH
Colonoscopy and Endoscopy Every 2 years
Annual Dermatology examinations
Breast examinations/mammograms 6mts/yearly

## Clinical Information

The classical LFS malignancies - sarcoma, cancers of the breast, brain, and adrenal glands - comprise about 80% of all cancers that occur in this syndrome.
The risk of developing any invasive cancer (excluding skin cancer) is about 50% by age 30 (1% in the general population) and is 90% by age 70.
Early-onset breast cancer accounts for 25% of all the cancers in this syndrome. This is followed by soft-tissue sarcomas (20%), bone sarcoma (15%), and brain tumors - especially glioblastoma- (13%).
Other tumors seen in this syndrome include leukemia, lymphoma and adrenocortical carcinoma




## Case Study

Patient P.F.25-year-old male with history of Li Fraumeni Syndrome/ acuteTP53 mutated leukemia. Treatment frontline CLIA+ Mylotarg on protocol Allogenic SCT at MDACC, 4 months post transplant MRD is undectable and on maintenance therapy.
ROS; negative
Allergies; Allopurinol
PMH; Anxiety & Depression
Family History: patient adopted
Physical Examination; stable, AAo x3, Lungs; CTA, Heart: RRR,
ABD; soft nontender
Skin, no rashes, Neuro: grossly intact
Pathology; 1/28/22 BMBx Hypocellular (5-10%)
Male with TP53, Mutated Biphentoypic, in the setting of Li-Fraumeni Syndrome. . Patient is at an increased lifetime risk to develop several .Skin biopsy confirmed TP53 pathogenic splice variant,

## What is Autosomal Dominant?

Autosomal dominant inheritance is a way a genetic trait or condition can be passed down from parent to child. One copy of a mutated (changed) gene from one parent can cause the genetic condition. A child who has a parent with the mutated gene has a 50% chance of inheriting that mutated gene.
Management of Li Fraumeni

## Recommendations and Management

Management of Li Fraumeni
Genetic counseling and genetic testing are used to confirm that this person has this gene mutation. Once identified with Li-Fraumeni, early and regular screening for cancer are recommended. The patient with
Li-Fraumeni are likely to develop another primary malignancy in the future 57% within 30 years of diagnosis.
Plan: Lead Clinic referral for surveillance which includes biannual clinic visits with Whole body MRI and Brian MRI, GI Evaluation- EGD and Colonoscopy every 2-5 years, neurology exam and annual dermatology appointment. Plan to continue to follow up with the patient in clinic ever 6-12 months.