



Virtual Learning

# Medical Interventions Pharmacogenetics

April 28, 2020



# Medical Interventions

## Lesson: April 28, 2020

### **Objective/Learning Target:**

Explain how single nucleotide polymorphism (SNP) profiles may factor into the decision to prescribe a specific medication. (3.4.1)



## Let's Get Started:

1. Watch [this video](#) to learn about pharmacogenetics.
2. What is pharmacogenetics and what is used to study this field?



## Let's Get Started: **Answer**

1. Watch [this video](#) to learn about pharmacogenetics.
2. What is pharmacogenetics and what is used to study this field?
  - a. science dedicated to investigating how an individual's genetic makeup can impact how well the person responds to a particular medication and to what degree this person experiences harmful side effects
  - b. Genetic testing



## Lesson Activity

Read the information on SNPs from the [Utah Genetics website](#) and answer the following questions:

1. What Is a SNP?
2. What Is a Haplotype?
3. Explain how SNP profiles can factor into the decision to prescribe a specific medication.
4. How can pharmacogenetics tests be helpful to doctors?



## Lesson Activity - **Answers**

1. What Is a SNP?
  - a. single-nucleotide polymorphism is a substitution of a single nucleotide that occurs at a specific position in the genome
2. What Is a Haplotype?
  - a. group of alleles in an organism that are inherited together from a single parent
3. Explain how SNP profiles can factor into the decision to prescribe a specific medication.
  - a. SNPs can show whether a patient reacts well, fairly, or poorly to a specific medication. Testing SNPs beforehand can remove the possibility of the patient reacting badly to a medication.
4. How can pharmacogenetics tests be helpful to doctors?
  - a. Minimize adverse reactions to medications and improve patient outcomes



## Practice

1. Complete [this](#) exercise over pharmacogenetics.
2. A patient comes into a doctor's office complaining of shortness of breath when she exercises for long periods of time. The doctor diagnoses the patient with exercise-induced asthma. Before prescribing medication, however, the doctor analyzes a sample of the patient's DNA and determines that the patient has Haplotype group 'd'. Based on your research, would you recommend albuterol for this patient?
3. Why or why not?

## Practice - Answers

1. View table
2. No
3. Albuterol has no effect on this haplotype

Haplotypes Table

Haplotype #	Highlighted SNPs	Patient #'s	Results of the Study
a	TAT	4,7	○
b	TAG	1,10	✓
c	TGT	8,14	✓
d	CAG	9,3	○
e	CGG	12,2	✓
f	TGG	5	✓
g	CGT	13,6	∅
h	CAT	11	✓



## Additional Practice/Resources

1. Check your understanding by completing a concept map of the terms found [here](#) over pharmacogenetics.
2. Learn about some controversial and ethical issues currently facing pharmacogenetics [here](#). Read about how their current use with [depression](#) medication isn't as effective as it could be.