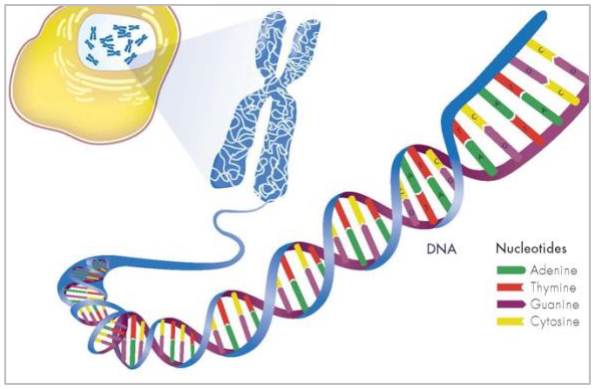
NP-EDGE Learning Resources 2025

1. Genomics 101



This module comprises four Units which introduce/review key concepts in human genetics and lay the groundwork for understanding how genetic variation can lead to health effects, and how those changes may impact other family members. Genomics 101 has four sections, chromosomes, genes and DNA, family history and inheritance patterns, applying genetic testing, and applying family history risk assessment.

Estimated time: 1 hour 28 minutes

a) Chromosomes, Genes, and DNA

Reviews the structure and function of DNA, to lay the groundwork for understanding how genetic variation can lead to health effects.

Learning Objectives

- Define genetics vs. genomics
- Recognize normal chromosome structure
- Explain the relationship between chromosomes, DNA, genes, and proteins
- Contrast categories of genetic variation at the chromosome level and the DNA level
- Contrast the inheritance patterns of somatic and germline genetic variation

b) Family History and Inheritance Patterns

Discusses how documenting the family history of your patients can improve the ability to quickly identify patterns that could indicate hereditary risk and aid in a quicker path to diagnostics or prevention.

Learning Objectives

- Draw a simple family history using standard symbols
- Identify modes of genetic inheritance presenting in a family

c) Applying Genetic Testing

Identifies real-world applications of genomics in NP practice. Reviews genetic testing scenarios and provide an explanation of the key concepts of genotype, phenotype, monogenic and polygenic sources of genetic risk for disease.

Learning Objectives

- Identify applications of genomics in NP practice
- List genetic testing scenarios
- Define the role of monogenic and polygenic sources of genetic risk
- Connect genotype to phenotype

d) Applying Family History Risk Assessment

Uses concepts from the first three units to illustrate a framework for a precision health approach caring for a patient and their family. Reviews key questions to ask during a family history assessment and identifies red flags that indicate when genetic testing or a referral to genetics may be beneficial.

Learning Objectives

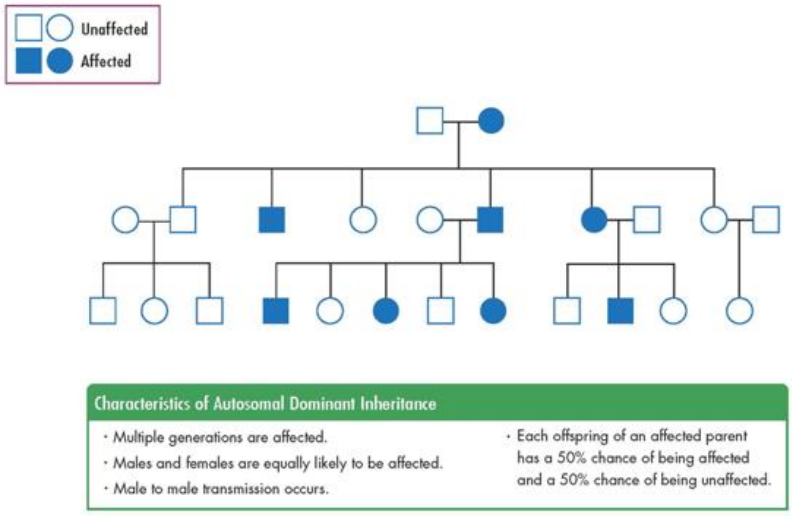
- Define sporadic, multifactorial and hereditary susceptibility to disease using cancer as an example
- List key questions to ask during family history assessment
- Identify red flags to suggest when a genetic test or genetics referral may be indicated
- Examine the mainstream testing approach and subsequent cascade testing in a family

2. Family History Case Studies

The family history case studies included in this module demonstrate the practical use of genetic testing for a genomics informed precision healthcare approach.

The *Genomics 101* module provides helpful background for the family history cases.

Estimated time: 40 minutes



a) Case 1: Cardiogenomics

Demonstrates the practical use of genetic testing for a genomics informed precision healthcare approach. Offers practice in assessing a family history for a hereditary cardiovascular condition.

b) Case 2: Hereditary GI cancer (Lynch syndrome)

Demonstrates the practical use of genetic testing for a genomics informed precision healthcare approach. Offers practice in assessing a family history for a hereditary colorectal cancer condition.

Learning objectives

- Identify patients whose family history suggests an increased risk of a genetic condition
- Review the genetic basis of the condition and applicability of genetic testing
- Modify screening and management to improve patient outcomes
- Find high quality genomics educational resources appropriate for primary care

3. Indigenous Health Care: Genetic and Genomic Considerations

This module exposes learners to issues in genetics and genomics that are of particular relevance to Indigenous peoples and discusses topics through an Indigenous lens.

Indigenous health care has six sections: 1) indigenous peoples and genomics, 2) genetics, Genomics and Indigenous Communities, 3) the CPT1 variant, child health and risk mitigation, 4) long QT syndrome and 5) tntroduction to epigenetics.

Estimated time: 3 hours 26 minutes

Learning objectives

- Understand some of the meanings and implications of genetics and genomics testing and research from an Indigenous lens
- Learn about several genetic variants that are more common in Indigenous peoples of Canada and different perspectives on treating and screening for them
- Summarize what is known and not known about epigenetic inheritance and Indigenous trauma
- Discuss issues of family history taking in Indigenous individuals with awareness of cultural safety.

4. Ethical Issues in Genetics

This module has three sections, direction to consumer genetic testing, what is genetic discrimination, and population-based screening for hereditary cancer.

Estimated time: 3 hours and 34 minutes

a) Direct to Consumer Genetic Testing

Introduces the phenomenon of direct-to-consumer testing (DTC) and discusses issues and challenges. Makes use of a DTC case study to illustrate these.

Learning objectives

- Understand the nature and scope of direct-to-consumer (DTC) genetic tests
- Compare the risk and benefits of direct-to-consumer tests compared to physician or NP-ordered genetic testing
- Formulate a plan on how you might respond when patients ask you about DTC testing

b) What is Genetic Discrimination?

Introduces and defines the phenomenon of genetic discrimination. Reviews Canadian legislation around genetic discrimination.

Learning objectives

- Describe genetic discrimination
- Understand the Genetic Non-Discrimination Act (GNDA)
- Review the Genetic Discrimination Observatory

c) Population Based Screening for Hereditary Cancer

Introduce the topic of population-based genetic screening in adult populations using the example of BRCA1/BRCA2 genetic testing.

Learning objectives

- To define population genetic screening.
- To relate the Wilson and Jungner principles of screening to genetic screening.
- To evaluate advantages and challenges of population genetic screening for adult-onset conditions using BRCA1/BRCA2 gene testing as an example.

5. Prenatal Screening in British Columbia: A Case Study Approach

Offers nurse practitioners the knowledge and skills needed to navigate the complexities of prenatal screening and identify BC-centric resources. Uses a case-based approach and offers practical insights into the application of screening protocols, the interpretation of results, and the provision of compassionate, evidence-based care.

Estimated Time: 10 minutes

Learning Objectives

- Identify common genetics questions that arise during pregnancy
- Determine what prenatal screening options are appropriate based on patient preference, age, gestational age, and history
- Provide patient-centered information related to testing options and outcomes
- Identify resources to support your practice in the area of prenatal genetic screening.

6. Newborn Screening

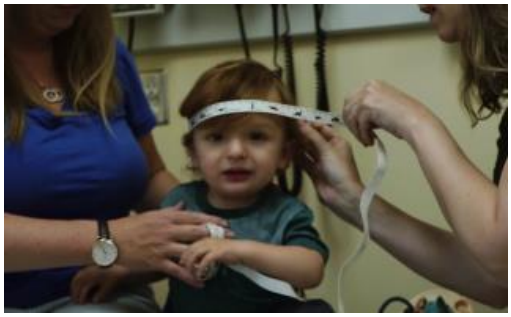
Introduces the newborn screening program in BC, with case examples.

Estimated time: 35 minutes

Learning Objectives

- Review newborn screening principles
- Identify BC-specific resources for conditions screened in the newborn period
- Learn the process for reporting out results from newborn screening
- Apply NBS principles to two conditions: hemoglobinopathy and spinal muscular atrophy

7. Physical Exam Screening for Genetic Conditions



Introduces dysmorphology as the study of disordered development that results in recognizable features that fall outside of the range of normal human variation. Outlines the role of NPs in recognizing patterns of differences that may help understand if a young child has a specific medical issue caused by an underlying DNA change.

Estimated time: 50 minutes

Learning objectives

- Learn how to undertake physical exam screening for genetic conditions and how to look for physical difference.
- Recognize different types of features and the language used to describe them.
- Know how to identify patterns of physical differences running together in one individual.
- Be able to create a care plan for a patient suspected to have a genetic condition.

8. Pharmacogenomics & Pharmacogenetics

Introduces, defines and differentiates pharmacogenetics and pharmacogenomics as important areas of clinical practice and prescribing.

Sections in this module include:

- Definitions and drug metabolism
- CYP * nomenclature
- Drug transporters and targets
- Implementation of testing and professional responsibilities
- Thinking critically about PGx testing panels evidence for action in prescribing

Clinical cases are used to illustrate key concepts.

Estimated time: 2 hours and 30 minutes

Learning Objectives

- Compare and contrast the disciplines of pharmacogenetics and pharmacogenomics
- Describe how pharmacology and pharmacogenetics are related
- List types of genetic variation and pharmacological impact.
- Discuss the four main sources of reliable pharmacogenetic information.
- Describe the pharmgkb.org resources, including levels of evidence.
- Find prescribing information, drug label and clinical annotations within the pharmgkb.org resource.
- Discuss how pharmacogenetic information regarding drug metabolism, drug transporter, and drug targets can help with appropriate drug selection.
- Describe scenarios in which a pharmacist or patient should order a pharmacogenetic test.

9. Cardiogenomics

Provides a summary of cardiogenomics as it relates to NP practice. Topics include arrhythmias, cardiomyopathies, heart failure, lipid disorders, and aortic diseases.

Discussed are the many forms of cardiovascular disease that have a genetic component. "Red flags" are highlighted for possible genetic conditions.

Information and resources include how to use Pathways BC for specialist referral and clinic information.

A case study is used as an example of how to approach someone with possible cardiac problems.

Estimated time: 45 minutes

Learning Objectives

- Appreciate the mechanisms underlying various cardiovascular disorders
- Be aware of the implications of genetic testing results for patients and families
- Determine when to offer specialist assessment
- Identify where to find resources for cardiovascular genomics relevant to the nursing practice

10. Mental Health Genomics

This short module touches on our current understanding of the genetics of mental health, with practical information to help NPs understand genetic vulnerabilities that influence these conditions and help to interpret recurrence risk estimates

The module is based on commons questions faced by NPs in their day-to-day practice.

A psychiatric genetic counsellor discusses some of the issues surrounding the genetic and environmental factors and how they may interact to determine whether or not a patient becomes symptomatic. She uses the "jar model" as analogy that may be useful in your practice.

Estimated time: 45 minutes

Learning Objectives

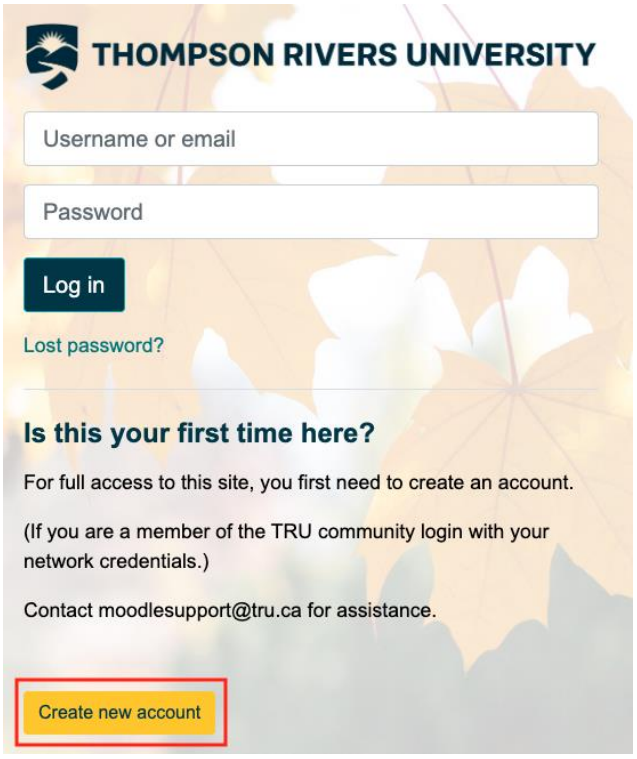
- Understand the genetic and environmental contributions to common mental illnesses
- Appreciate the importance of including mental illness in a family history
- Use the family history to assess vulnerabilities for specific types of mental illness for patients and family members
- Gather some tools to help to share this information with patients to aid their understanding of the causes of mental illness as well as strategies to promote mental health.

How to access NP-EDGE resources

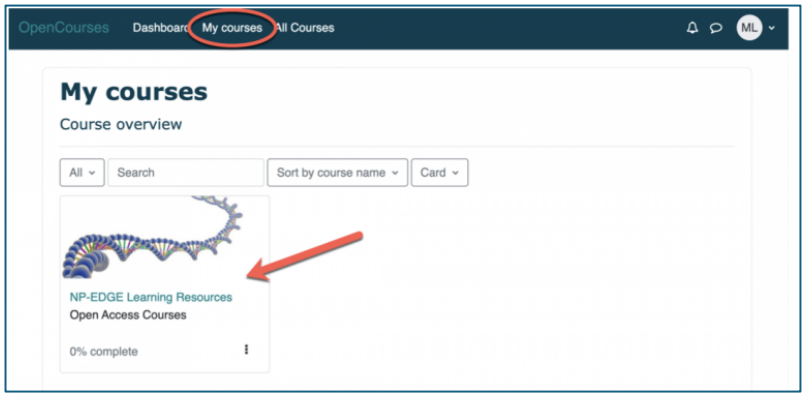
a) Non-Thompson River University Affiliates

If possible, please use an institutional or organizational email address to self-enroll. However, other external emails (such as gmail) will work for account creation.

1. Go to https://opencourses.tru.ca
2. Under the **'Self enrolment (Student)'** header, click the **'Continue'** button
3. Click the 'Create New Account' button, and follow instructions to create an account



4. Return to https://opencourses.tru.ca/course/view.php?id=7 to log in
5. Use the self-enrolment key: **NP-EDGE**
6. When returning, click **My Courses** and select the learning resource



b) Thompson River University Affiliates

1. Go to https://opencourses.tru.ca/
2. Under the **'Self enrolment (Student)'** header, click the '**Continue**' button
3. Enter your TRU Moodle login details.
4. Enter the enrolment key: **NP-EDGE** and click the Enrol Me button.
5. You should now have access to the course content.
6. Return to https://opencourses.tru.ca/course/view.php?id=7 to log in with your TRU credentials
7. Then, navigate to the My courses link where you will find the NP-EDGE Learning Resources course.