

SPRING 2024 | VOLUME 11

# INNOVATORS IN EDUCATION

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# Pediatric Iron Deficiency Anemia

[View the modules](#)

Iron deficiency anemia (IDA) is the most common nutritional deficiency in children and can have long-term consequences on growth and development.

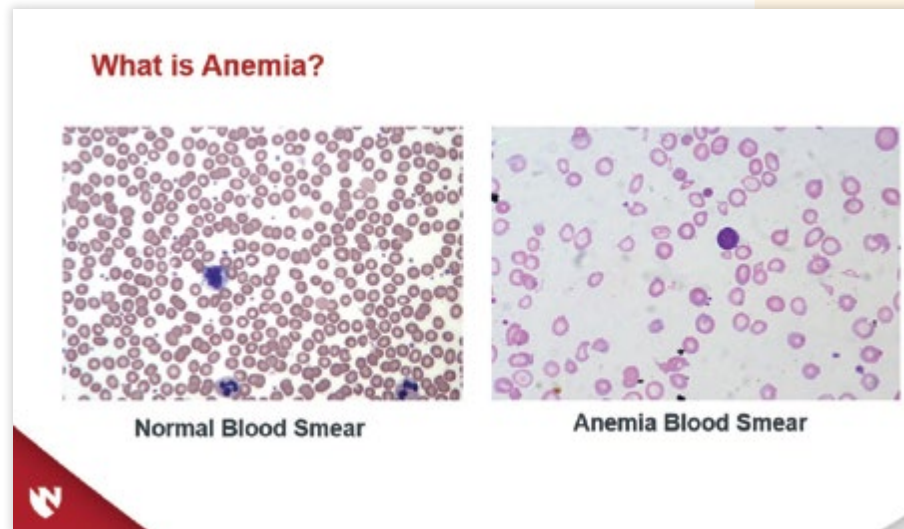
Patients with IDA are seen frequently in the pediatric hematology clinic. IDA is evaluated and treated by several different specialists, including general pediatricians, gastroenterologists and hematologists.

We chose this project because we felt it was a topic that was applicable to learners with various specialty interests who are rotating through the pediatric hematology clinic, and it would be helpful in providing a solid foundation of knowledge on a common pediatric condition.

**The goal of this module is to teach medical students during their pediatric hematology and oncology rotation about IDA, so they are more confident in identifying IDA and determining the appropriate treatment when they become practicing physicians.**

The module will serve as a supplemental learning activity. After completing the module, learners will have the opportunity to apply the knowledge they gained by seeing actual patients in the clinic for evaluation and treatment of IDA.

This module includes interactive elements throughout for students to stay engaged and actively participate. Learners will be assessed with both formative and summative assessments within and at the end of the module. Learners will be able to take the knowledge they gain from this module and apply it to their practice in various specialties when they start practicing independently.



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# Dental Injections: Retractions and Fulcrums

[View the modules](#)

All senior dental hygiene students complete a local anesthesia course in their fall semester. This course includes laboratory sessions where students are introduced to different types of injections. The students are required to master a specific retraction and fulcrum associated with each injection.

Since retractions and fulcrums are specific to injection, we chose this topic to help learners become familiar with the designated retraction and fulcrum before attending their laboratory sessions.

**Currently, students are given a laboratory booklet with written descriptions of each retraction and fulcrum. We wanted to provide another educational resource that uses visuals and interactions to help with comprehension of the material.**


Learners will use the module prior to laboratory sessions and evaluations to increase retention of the material. It will serve as an educational resource that is accessible and convenient for current and post-graduate students.

The e-module includes interactive practice questions that help the students use their critical thinking skills while applying the content. Additionally, a summative assessment will assess the learner's understanding of the information.

We believe that this e-module will increase the learner's confidence in their ability to administer dental injections. Being comfortable with dental injections will allow our students to become competent and prepared health care professionals.

**Review Question**

Which photo below is an example of the correct fulcrum and retraction for the left Mental Block?



The image displays four photographs of dental procedures. Each photo shows a dental professional in blue gloves performing an injection on a patient's face. The photos illustrate different techniques for retraction and fulcrum placement during a Mental Block injection. The top-left photo shows a retractor being used to pull the lip back. The top-right photo shows a different retractor design. The bottom-left photo shows a hand holding the patient's head to stabilize the procedure. The bottom-right photo shows a different hand position for stabilization. To the right of the photos are several question mark icons, indicating an interactive quiz.

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# Standardized Telehealth Workflow Design for the Primary Care Setting

[View the modules](#)

Access to quality care remains a problem in rural and underserved communities.

**This project addresses the use of virtual care delivery and telehealth for the problem of accessibility and provider shortage in primary care rural and underserved areas.**

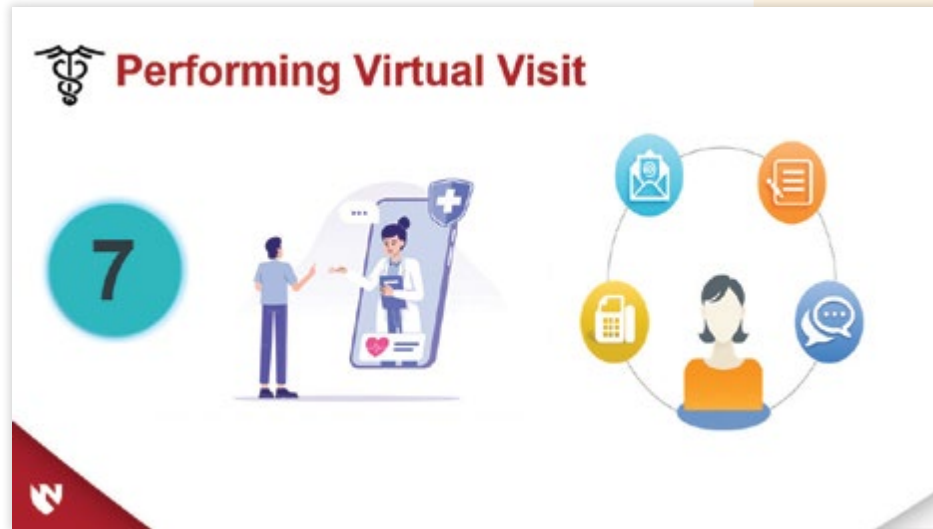
This module is foundational and identifies roles and performance parameters of different professionals. It uses a workflow design tool and synchronous video telehealth care delivery. The workflow design tool emphasizes patient, office staff/nurse/telehealth coordinator and provider roles. The tool can be used by different professionals, including the advanced practice registered nurse and undergraduate baccalaureate nursing student to learn their role and scope of practice.

Workflow design can improve quality care quadruple aims, namely through impact on clinical outcomes through attention to scope of practice and identification of best practices and standards of care for their role.

The module uses interactive videos, formative learning evaluations and virtual media methods to enhance learner's knowledge, skills and attitudes for successful implementation of virtual care delivery and telehealth using the workflow design tool.

The module assists students and helps them identify national standards and best practices for their role and scope of practice. The tool can be used along with supplemental experiences, such as simulation, standardized patients, case studies, telehealth carts, peripheral tools, remote patient monitoring, home care kits, and clinical experiences with certified telehealth providers and educators.

This module is unique by emphasizing a workflow design tool and helps learners identify national standards of care for their role and scope of practice in virtual care delivery and telehealth.



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# Here, There and Everywhere: Germ Layers and Their Derivatives

[View the modules](#)

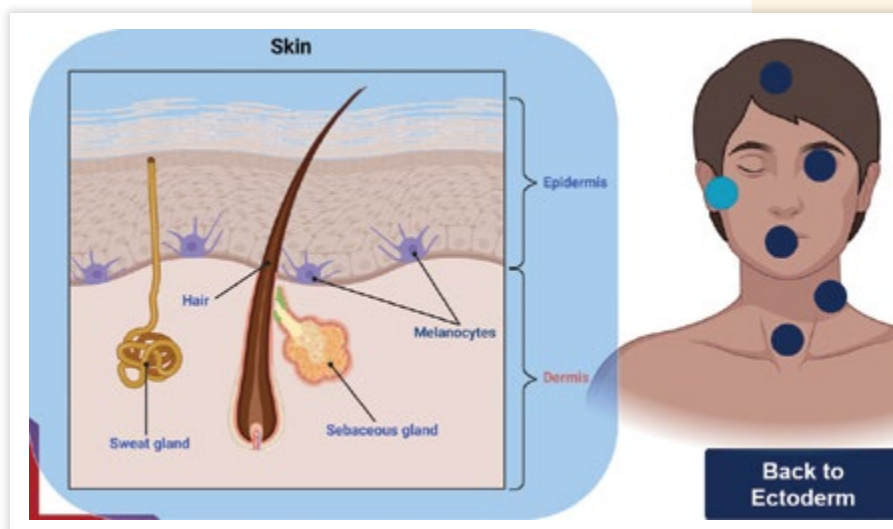
A germ layer is a group of cells in an embryo that interact with each other as the body continues to develop all organs and tissues. Gastrulation is the process of forming the three germ layers, which occurs in the third week of human gestation.

**This topic was chosen because understanding germ layers is a foundational component essential for comprehending human development and is also extremely complex and a frequent source of frustration and/or confusion for students.**

In this module, learners will study the steps of gastrulation and the formation of the three germ layers, as well as the parts of the human body that derive from specific divisions of the germ layers. Learners will also be coached on how to identify patterns in the germ layer derivatives and developmental lineages, which will improve their diagnostic skills as clinicians.

This module is designed as a self-directed and self-paced supplemental learning tool in which learners can explore the content in two different ways, depending on their individual stage in education: by germ layer subdivision or by anatomical region. Thus, learners from any educational program that includes human development in the curriculum can use this module.

The module includes a combination of didactic content delivery, interactive hotspot maps of the human body, and knowledge checks to ensure consistent learning and strengthen long-term retention. Both formative and summative assessments are used to evaluate learner outcomes. Learners will apply the knowledge they gathered to answer these assessments and synthesize their learning, which culminates in a final assessment.



[Back to Ectoderm](#)

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# Introduction to Biomedical Research Modalities

[View the modules](#)

The advancement of biomedical science relies heavily on research conducted by health care professionals. Considering the vital role of research in medicine and the importance of research literacy for future physicians, it is imperative for medical colleges to foster a culture that emphasizes research engagement from the early stages of training.

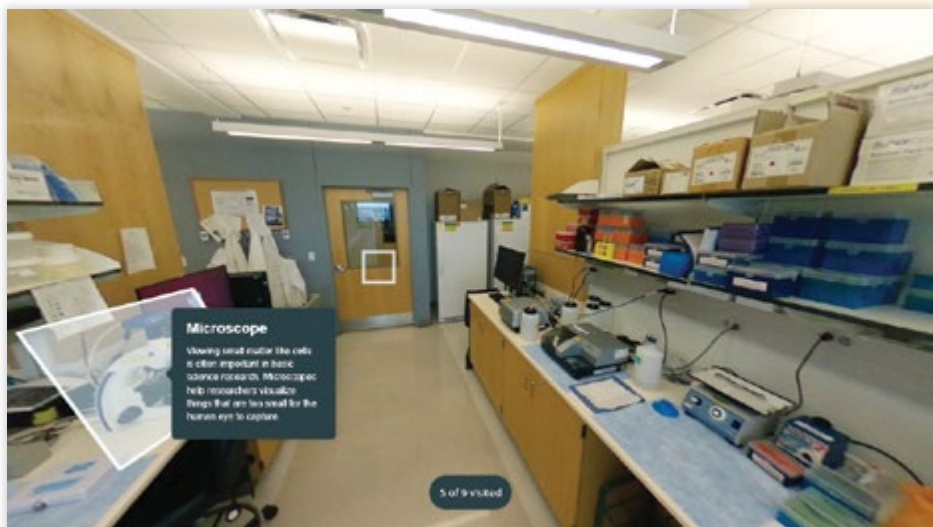
The e-module was crafted to fulfill this goal by offering students guidance in selecting research experiences that best suit their interests. We built it around three central objectives:

- Define the concepts of basic, translational and clinical research
- Highlight the advantages of engaging in research
- Provide guidance to students seeking research opportunities

The module uses faculty interviews and virtual lab tours to showcase various research possibilities and encourage students to explore their passions and goals. This brief introduction to basic, translational and clinical research is insightful to students who are newcomers to research.

**It is our sincere hope that the curriculum presented helps students connect with research mentors and experiences that shape their trajectories through medicine and scientific investigation.**

Our module will be incorporated into the Fundamentals Block during the first year of medical student training. This timeline is intended to support medical students endeavoring to participate in summer research experiences the following year. Student survey data stemming from the module will inform future projects aiming to support student involvement in biomedical research with the overarching goal of preparing a health care workforce invested in evidence-based medicine.



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# Let's Talk About Sex (And Gender)!

[View the modules](#)

Sexual and gender diverse (SGD) people may experience inadequate, negative or discriminatory care due to health care practitioners' lack of experience and educational preparation.

**Spectrums of gender and sexuality are important parts of an individual's holistic health, and as such, it is important for practitioners to have the basic knowledge to be able to interact with and provide culturally appropriate care for these individuals.**

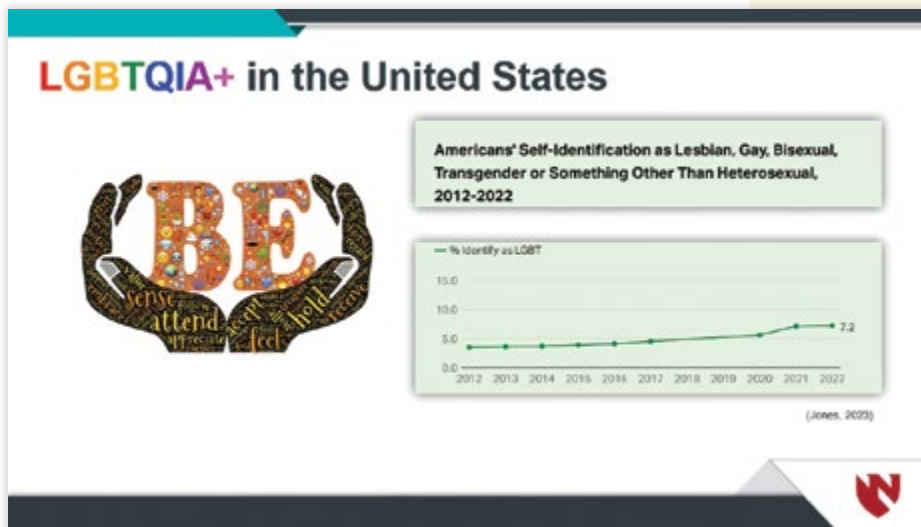
Sex and gender development are more complex than what was previously understood, necessitating updating information in health curricula. Health professionals will encounter and provide care for this marginalized population at some point in their career if they have not already.

This module will be integrated into an undergraduate nursing course; however, it could be used to promote learning for all health professions students and practicing providers.

This module will provide an interactive experience, as well as the opportunity for the learner to reflect on personal knowledge and potential bias. To assist in providing culturally sensitive care for SGD individuals, topics include basic terminologies related to gender and sexuality and current evidence of health inequities. Learners will be encouraged to adopt strategies to improve care for members of the SGD community.

This module is intended as a self-directed supplement to reproductive health topics in nursing classes, as a pre-class activity to supplement course material or as an active learning experience to replace lecture. Students' knowledge and confidence in using SGD terminologies and developing strategies to care for this population are assessed through quizzes and interactive elements.

By completing this module, learners will begin to develop the knowledge and skills to serve an increasingly diverse population.



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# Sodium and Water Balance of IV Fluids

[View the modules](#)

The “Fluid and Electrolytes” section taught in the Pharmacotherapy I course is notoriously one of the more challenging sections.

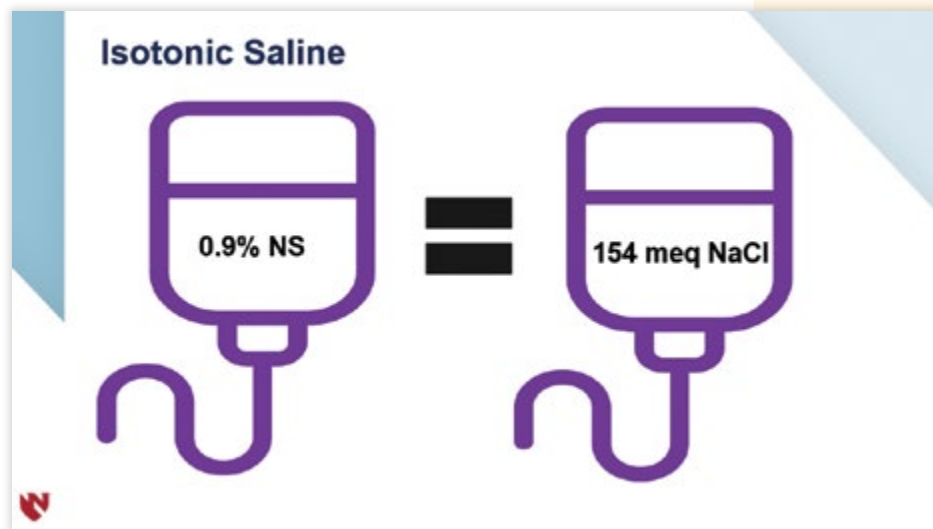
This e-module provides an additional learning resource for students to obtain a better understanding of the course lectures. Our goal is to provide a more visual, interactive experience for students to grow their confidence in the material on which they will be tested.

**This training paves the way for future health care workers to have a better understanding of how to regulate volume status, electrolyte changes and the timing of treatments to correct imbalances.**

The topic of sodium and water balance is significant for many different health care professions, not just pharmacy.

This module will help establish the basics of body fluids and fluid replenishment by providing visuals and examples that simplify the material. Content covered includes fluid compartments within the body, total body water calculations, abnormal fluid status and different IV fluid products. This will be used to help strengthen students’ understanding of concepts learned in class by allowing them to apply what they have learned to realistic examples.

The module includes several assessment questions spread throughout the material for learners to check that they understand the content.



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# Strategies to Build Therapeutic Rapport with Children with Autism and Complex Communication Needs

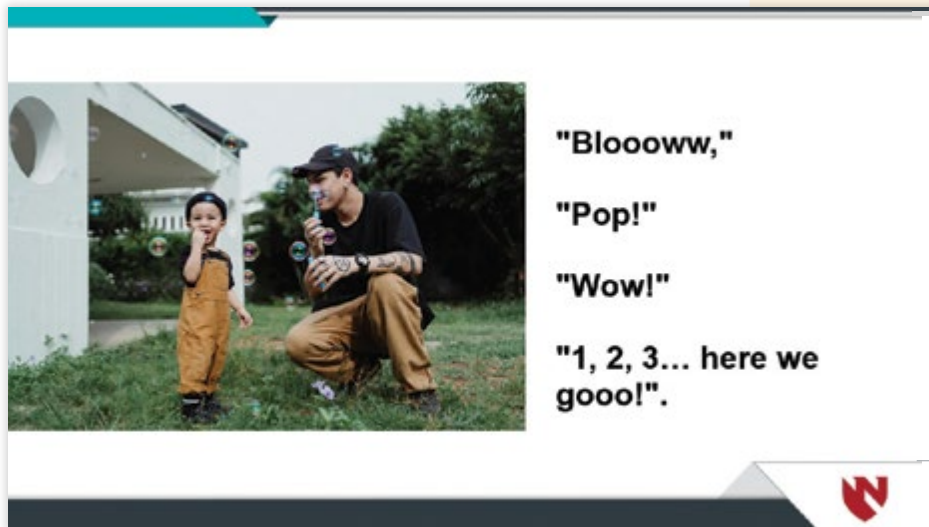
[View the modules](#)

Building rapport with children with Autism Spectrum Disorder (ASD) is essential for effective communication, trust and comfort. It helps reduce anxiety in social situations and creates a supportive environment for learning. Building rapport facilitates the development of social skills and allows for individualized support tailored to a child's unique needs.

**Ultimately, building rapport contributes to positive relationships, promoting independence and a more fulfilling experience for children with ASD. The module aims to teach caregivers, educators and health care professionals practical strategies to improve interactions, support social skill development and provide individualized care.**

By using this module, students, especially health care professionals, learn important skills for connecting with children on the autism spectrum. It focuses on effective communication, building trust and creating a comfortable environment for these children.

The module includes practical examples and immediate feedback to enhance the overall impact on learning and retention. The interactive and multimedia elements also enhance engagement, making it a practical and preferred method for ongoing professional development in the health care field.



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# Sexually Transmitted Infection Testing Guide: The Right Test for The Right Patient at the Right Time

[View the modules](#)

This topic was selected because there was a noted lack of preparedness for laboratory test ordering in student volunteers at the RESPECT clinic. Test forms were often filled with crossed out orders and students often had questions about which tests were appropriate. Sometimes, patients would have to return to the clinic for additional testing missed at their initial visit.

This module's case study approach for STI testing provides realistic examples of what student providers can expect at an STI clinic. This allows students an opportunity to learn in a risk-free environment, and also provides important feedback and information to help students understand why each test is appropriate or inappropriate. When students are more adequately prepared, fewer tests will be missed and fewer inappropriate tests will be ordered.

**This module will help physician assistant and medical students practice critical thinking when faced with patient scenarios and help prepare student provider volunteers for UNMC's RESPECT clinic. Students learn a basic understanding of the timing and interpretation of serological, molecular and microscopic screening for patients who have contracted, currently or in the past, an STI.**

Students are assessed throughout the module by being asked to select appropriate tests for different clinical scenarios. The module is followed by a 10-question summative assessment, which is multiple choice. Data collected from the assessment can assess student provider preparedness. When paired with a pre-test, the final assessment can be used to assess the success of the module in teaching key concepts.

Contemporary learners will appreciate the interactive nature and simplicity of this e-learning module and will feel more prepared to face different patient scenarios in STI clinics.



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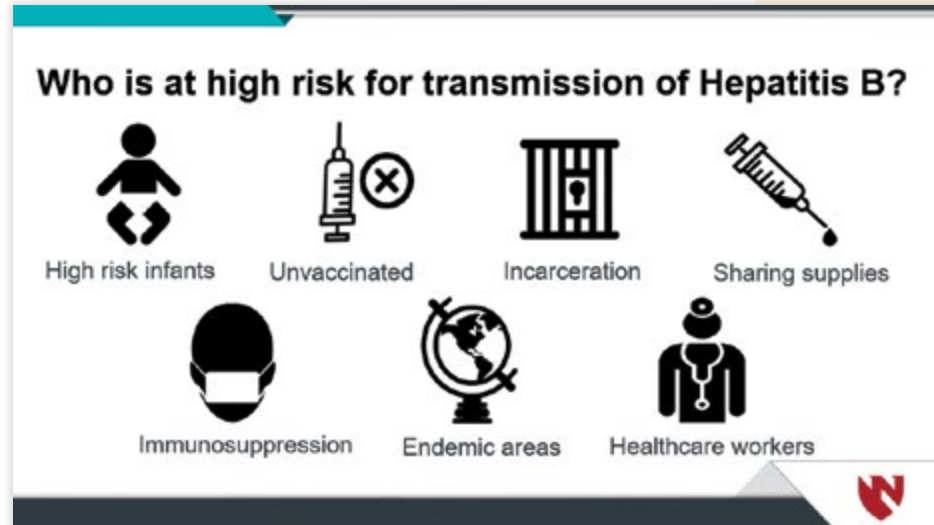
College of Allied Health Professions

# Hepatitis B Virus and Interpretation of Serology in Clinical Course

[View the modules](#)

Hepatitis B is a viral infection that, when left untreated, can progress to a chronic disease state, which increases the risk for cirrhosis and hepatocellular cancer. Interpreting Hepatitis B viral serology and correlating results to the progression of the disease can be challenging as a student, given the complexity and dynamic nature of the serological markers used in diagnosis.

This module seeks to help students identify epidemiological risk factors for transmission, recognize signs and symptoms, and lastly, distinguish serological patterns that arise during the disease course.



**Understanding the concept of interpretation of Hepatitis B serology results will help future health care professionals in the management and diagnosis of Hepatitis B, and the approach to learning featured in this module can be applied to other difficult concepts students will encounter in their education and career.**

Students will be allowed to progress through the module at their own pace, giving them the opportunity to interact both visually and kinetically with the information to supplement current classroom learning by expanding on traditional learning methods. Students will be able to test their knowledge throughout the module using content review checkpoints, as well as complete a summative assessment at the end of the module.

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# Ergonomics in Dental Practice: A Path to Healthier Careers

[View the modules](#)

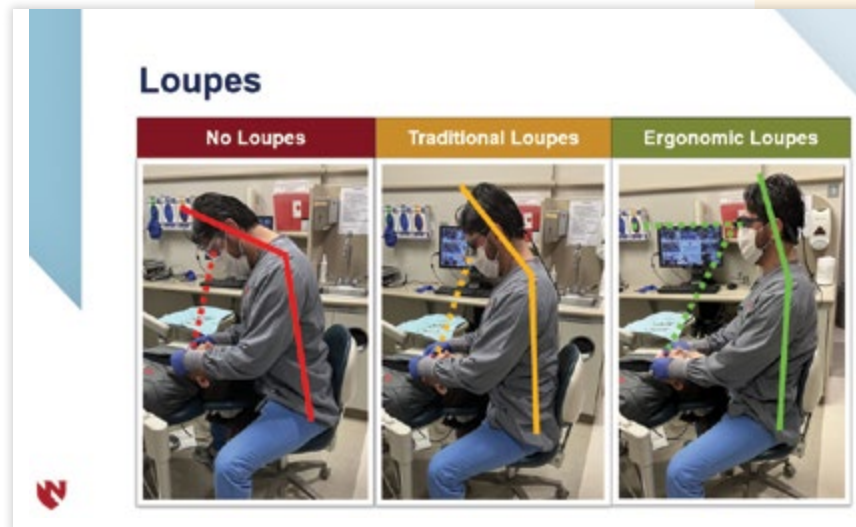
Ergonomics holds paramount importance for dental students as they embark on their educational journey and future careers in dentistry. These students experience a unique phase of professional growth, which encompasses rigorous training, hands-on clinical experience and the acquisition of essential skills, involving prolonged periods of precise and repetitive tasks. The combination of those factors places dental students at high risk of developing musculoskeletal disorders (MSDs).

Embracing ergonomic principles not only ensures the well-being and comfort of these future professionals but also significantly influences the quality of patient care.

**By mastering ergonomic techniques, dental students can reduce the physical strain on their bodies, minimize the risk of debilitating MSDs and enhance their overall job satisfaction. Moreover, incorporating ergonomics into their daily routines equips them with essential skills that will serve as the foundation for a long, healthy and successful career in dentistry.**

This e-module is a collaboration between dentistry and occupational therapy. It educates dental students and professionals on the importance of ergonomics in dentistry by illustrating common posture and ergonomic mistakes in dental practice that may lead to musculoskeletal discomfort and disorders. The e-module reviews common sites of discomfort resulting from awkward or static postures or repetitive motions and provides practical guidance on applying ergonomic principles in dental practice.

It features clinical scenarios brought to life through videos, animations and images, highlighting situations where maintaining optimal ergonomics can be challenging, and offers the dental student strategies for reducing risk and increasing comfort while learning dentistry skills.



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# Understanding Hypothesis Testing, Significance Level, Power and Sample Size Calculation

[View the modules](#)

Hypothesis testing, significance level, power and sample size calculation are essential topics in statistics, namely in the realm of research spanning diverse fields, including medicine, psychology, economics and social sciences. They play a crucial role in empirical research by serving as the foundation for decision-making and assuring the accuracy of study findings.

**These statistical principles are essential for distinguishing genuine impacts from random occurrences, assessing the dependability of findings and adequately distributing research resources. This project will serve as a significant educational resource to help students become skilled and ethical researchers capable of conducting and evaluating investigations proficiently.**

In this module, students will learn about the power, sample size, types of error and how they are related. The module explores the connection between hypothesis testing or parameter estimation with power and sample size. The importance of performing a sample size calculation prior to conducting research is emphasized.

Learners will develop a comprehensive understanding of designing, interpreting, and evaluating research findings through interactive content and real-world case studies. This will enable them to make well-informed decisions based on statistical best practices.

The module's framework allows a thorough learning experience, starting from fundamental definitions and progressing to the hands-on implementation of statistical ideas. This ensures that learners acquire the essential abilities to conduct ethically appropriate and scientifically valid research.

## Type I and Type II Errors

Justice System - Trial		
	Innocent	Guilty
Guilty Verdict	Type I Error	Correct
Not Guilty Verdict	Correct	Type II Error

Statistics - Hypothesis Test		
	Null True	Null False
Reject Null	Type I Error (False positive)	Correct (Power)
Fail to Reject	Correct	Type II Error (False negative)

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# Beyond the Waves: A Guide to Therapeutic Ultrasound

[View the modules](#)

**This e-learning module takes the learner into the depths of therapeutic ultrasound to uncover the theory, review procedural components and explore clinical reasoning.**

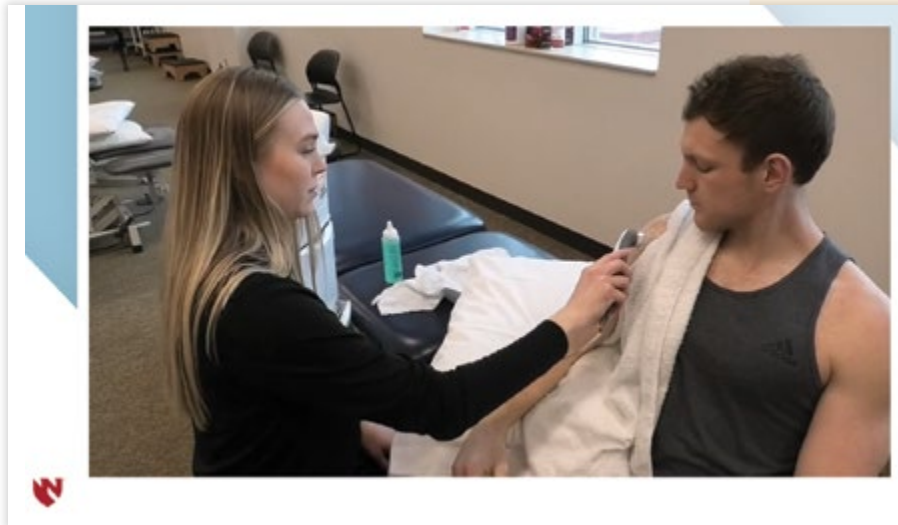
Therapeutic ultrasound is commonly used in physical and occupational therapy practice, and other health professions clinics as it may help reduce pain, heal tissues and decrease inflammation. Learners will advance from this e-learning module to hands-on, faculty-directed learning experiences in the lab.

The module is full of multimedia and interactive elements to promote engagement while learning the key concepts, emphasizing patient/client safety and case studies.

For example, one feature is the use of analogies to make logical connections about “how it works” from the abstract nature of therapeutic ultrasound.

Another feature is a video demonstrating therapeutic ultrasound procedures from start to finish to allow the learner to see a role model expert to facilitate learning the procedural steps for safe application. The video is tailored for learners who are new to the technique providing a comprehensive guide. It also serves as an excellent refresher for those seeking to revisit the fundamentals of therapeutic ultrasound application.

This self-paced, repeatable e-learning module will be an essential educational resource for learners to be equipped for hands-on application of therapeutic ultrasound.



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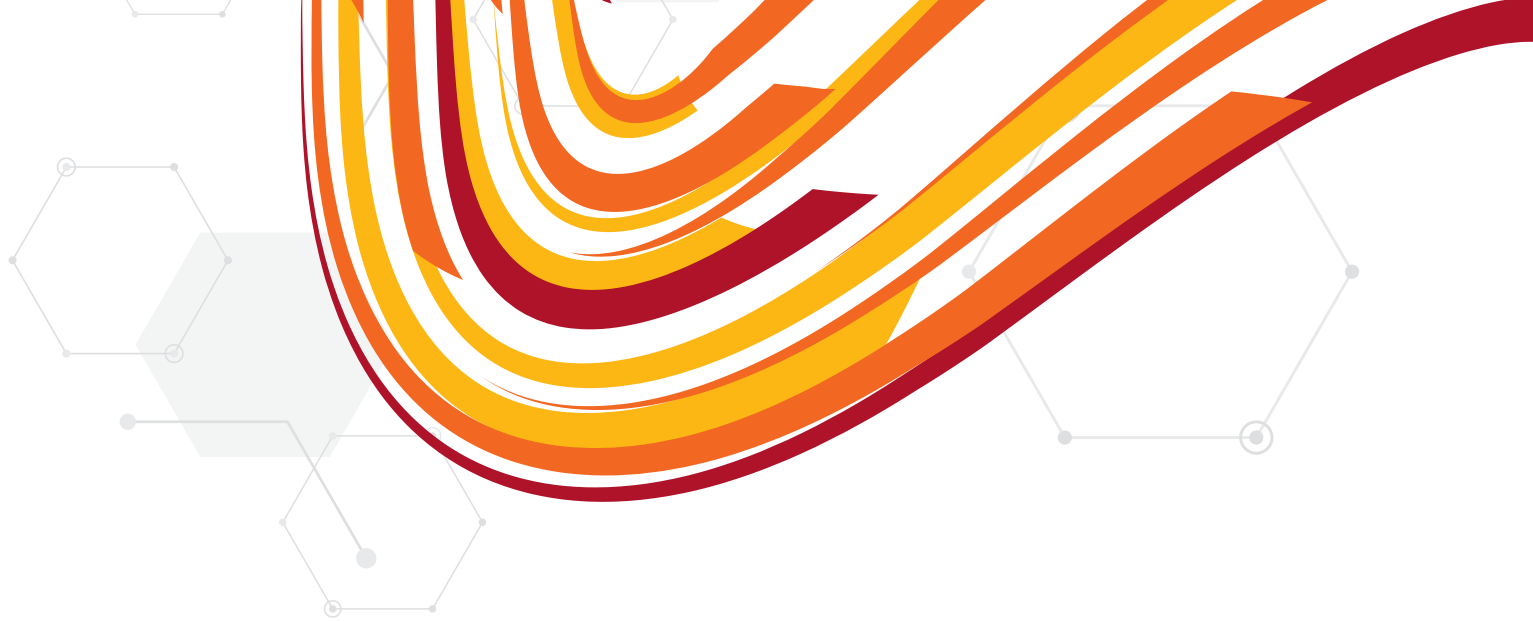
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