

Medical Intervention Evaluation and Research

PEIMS Code: N1302125

Abbreviation: MEDINEV

Grade Level(s): 10-11

Award of Credit: 1.0

State Approved Innovative Course

- Districts must have local board approval to implement innovative courses.
- In accordance with Texas Administrative Code (TAC) §74.27, school districts must provide instruction in all essential knowledge and skills identified in this innovative course.
- Innovative courses may only satisfy elective credit toward graduation requirements.
- Please refer to [TAC §74.13](#) for guidance on endorsements.

Course Description:

Medical Intervention, Evaluation, and Research further develops basic knowledge of health informatics, data management, and biotechnological advances and their connections in the various healthcare settings. Topics include informatics in medical intervention and evaluation, electronic patient management systems, applications in medical diagnostics, best practices in billing and coding medical diagnosis and procedures, appropriate International Classification of Diseases (ICD) 10 codes, fraud prevention, and databases culminating in an extended learning experience. The demand and growth in the field precipitates a needed integration of multiple medical technologies and their impact in healthcare delivery.

Essential Knowledge and Skills:

- (a) General Requirements. This course is recommended for students in grades 10 and 11. Recommended prerequisite: Principles of Health Informatics or Principles of Health Science. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
 - (1) Career and technical education instruction provide content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services and biotechnology research and development.
 - (3) Medical Intervention, Evaluation, and Research further develops basic knowledge of health informatics, data management, and biotechnological advances and their connections in the various healthcare settings. Topics include informatics in medical intervention and evaluation, electronic patient management systems, applications in

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medical diagnostics, best practices in billing and coding medical diagnosis and procedures, appropriate International Classification of Diseases (ICD) 10 codes, fraud prevention, and databases culminating in an extended learning experience.

- (4) To pursue a career in the medical intervention, evaluation, and research industry, students should learn to think critically, make decisions, solve problems, and communicate effectively.
 - (5) The health science industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students should identify the employment opportunities, technology, and safety requirements of each system. Students are expected to learn the knowledge and skills necessary to pursue a health science career through further education and employment.
 - (6) Students are encouraged to identify career opportunities and participate in extended learning experiences such as career and technical student organizations as well as other leadership or extracurricular organizations.
 - (7) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and Skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) communicate ideas in a clear, concise, and effective manner;
 - (B) practice responding quickly to the needs of the customer to meet expectations and achieve customer satisfaction;
 - (C) communicate written and oral instructions accurately;
 - (D) exhibit soft skills such as interpersonal skills, problem solving, and working well with a diverse group of people inside and outside the organization across different levels and cultures;
 - (E) demonstrate professional behaviors; and
 - (F) assess interpersonal situations and apply conflict-resolution skills to resolve or remediate workplace conflict.
 - (2) The student demonstrates knowledge of various medical terminology used in the processes of medical intervention, research, and evaluation. The student is expected to:
 - (A) differentiate among abbreviations and symbols related to the health science industry;
 - (B) employ medical terminology appropriately when collaborating with health care professionals and apply ICD-10 codes and bills related to treatment, procedures, and diagnosis in the patient medical records;
 - (C) use accurate terminology when creating medical bills and codes;
 - (D) identify directional terms and opposite directional terms and correlate anatomical planes related to the area of the body of symptoms and disease; and

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- (E) use specific occupational terms, including terms related to body systems, surgical and diagnostic procedures, disease, and treatment.
- (3) The student investigates medical intervention, evaluation, and research careers. The student is expected to:
- (A) analyze the intersections of health informatics with various medical occupations;
 - (B) research and present on various careers in health informatics and medical intervention, evaluation, and research;
 - (C) practice interview skills for a position related to a medical intervention, evaluation, and research career of interest;
 - (D) explain preparation for a career in health informatics, including education requirements and industry certifications; and
 - (E) describe and role play effective collaboration with the healthcare team.
- (4) The student examines of the use of health informatics and technology. The student is expected to:
- (A) employ computer skills such as data entry, information security, and database management required to maintain patient health records;
 - (B) analyze the monitoring processes used to safeguard patient information;
 - (C) evaluate the quality of information such as appropriate diagnostic test and therapeutic treatment according to content and purpose;
 - (D) list and describe the steps necessary to develop a records management system;
 - (E) analyze best practices to prevent loss of information;
 - (F) describe and execute the process to verify patient information; and
 - (G) explain database design and management as it is used in health informatics.
- (5) The student examines the relationship between therapeutics and the use of informatics and technology. The student is expected to:
- (A) review diagnostic tests to verify disease state;
 - (B) explain the data modeling process, including the attributes and relationships of the data and the reconciliation of data discrepancies;
 - (C) describe the process to request diagnostic or medical reports and records;
 - (D) analyze different demographics such as race, ethnicity, socioeconomical status, or education level in data, medical reports, and records.
 - (E) use code data and patient information to evaluate therapeutic treatment provided for specific disease states;
 - (F) identify and explain the codes for medical procedures and how to process the information for administrative purposes such as insurance records and facility documentation; and

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- (G) demonstrate the process to compile patient data with relevant medical documentation such as matching disease state with diagnostic procedure (e.g., lung cancer and chest radiograph).
- (6) The student explores therapeutic applications associated with medical intervention and evaluation. The student is expected to:
 - (A) define therapeutic interventions, including preventative care, early intervention, community interventions, and chronic and acute care;
 - (B) explain the process of evaluating a therapeutic intervention for measurable outcomes, including using evidence-based medical practices;
 - (C) identify measurable goals of therapeutic intervention such as increased life expectancy and health-related quality of life;
 - (D) define quality-adjusted life year (QALY) and identify how QALY addresses mortality and morbidity;
 - (E) evaluate a therapeutic intervention using QALY as a basis for allocating medical resources in a healthcare system;
 - (F) differentiate between using QALY as cost-effective measure and providing each patient with adequate care; and
 - (G) analyze the benefits of a therapeutic intervention, including efficacy, effectiveness, assigning value, and patient changes in health behaviors.
- (7) The student uses informatics and databases to accurately process medical information. The student is expected to:
 - (A) describe the Health Insurance Portability and Accountability Act (HIPPA) and Protected Health Information (PHI) guidelines for confidentiality, privacy, and security of patient medical information when sharing with an entity such as the guideline clearing house;
 - (B) complete forms related to coding and billing such as superbills and Center for Medicaid and Medicare Service (CMS)-1500 claim forms;
 - (C) describe the differences between insurance fraud and insurance abuse;
 - (D) verify and use the correct diagnosis codes such as the ICD-9 or ICD-10 codes in patient documentation;
 - (E) describe the two types of codes in the Healthcare Common Procedure Coding System (HCPCS);
 - (F) use technology necessary to document charges billed and reimbursement for disease state and diagnostic procedures; and
 - (G) discuss how medical coding affects the payment process.
- (8) The student demonstrates knowledge of medical research standards associated with interventions and evaluations. The student is expected to:
 - (A) differentiate between single-blind and double-blind studies;
 - (B) identify the types of clinical trials, including randomized clinical trials (RCT), controlled trial without randomization, case control analytic study, multiple

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time series, uncontrolled experiment, case study, and expert opinion and classify by using the hierarchy of evidence;

- (C) define community-based participatory research and evaluation;
- (D) explain the four major foci of evaluation, including context, process, impact, and outcome; and
- (E) compare an impact evaluation to an outcome evaluation of a therapeutic intervention.

Recommended Resources and Materials:

Souraya, Sidani. Health Intervention Research. Understanding research design & methods. Thousand Oaks, California Sage Publications, 2014.

Agency for Healthcare Research and Quality (AHRQ): Tools and Resources For Research and Evaluation | Agency for Healthcare Research and Quality (ahrq.gov). www.ahrq.gov/ncepcr//tools/research-eval/index.html

Center for Disease Control and Prevent (CDC). Data & Statistics. www.cdc.gov/datastatistics/

US Bureau of Labor Statistics: Occupational Outlook Handbook.
<https://www.bls.gov/ooh/healthcare/home.htm>

World Health Organization (WHO): Global Health Observatory (who.int). www.who.int/data/gho.

Recommended Course Activities:

- Explore the CDC and WHO databases.
- Incorporate patient scenarios associated with medical care to determine if appropriate ICD-10 codes were used to diagnose the patient disease process.
- Use patient scenarios associated with medical care to determine if appropriate diagnostic procedures were performed.
- Use case studies with the outcomes of inappropriate use to compare and contrast disease states and necessary diagnostic procedures.
- Incorporate data to examine if the ICD 9 or ICD 10 code is appropriate for the disease state and diagnostic procedures.

Suggested methods for evaluating student outcomes:

- Projects
- Tests
- Quizzes
- Oral presentations
- Build a patient portfolio
- Proofread medical claims

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Teacher qualifications:

An assignment for Medical Intervention, Evaluation, and Research, is allowed with one of the following certificates:

- Health Science: Grades 6-12.
- Health Science Technology Education: Grades 8-12.
- Vocational Health Occupations.
- Vocational Health Science Technology.

Required related work experience to include two years of work-related experience corresponding medical intervention, evaluation, or research fields (i.e., business administration, database informatics, medical coding).

Additional information: