

## Tools for Teaching Genetics in Primary Care

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NEGEA – Baltimore, Maryland

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## Learning Objectives

- ♦ Why is genetics an important topic for discussion now?
- ♦ Identify several reasons to teach Genetics in a systematic manner
- ♦ Demonstrate the USU Telegenetics website
  - How do we use this site to provide information for students and primary care providers
- ♦ Identify other Web based resources in Medical Genetics



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## Introduction

- ♦ Genetics is the study of biologic variation
- ♦ Medical genetics is the application of this study of biologic variability to human health and disease



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## Methods of Instruction

- ◆ Problem-based education
- ◆ Case discussion
- ◆ Self-Instruction using widely available resources
  - web-based
  - NIH/NCI
- ◆ Standard practice guidelines
  - ACOG
  - ACMG



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## USU Telegenetics Website - Introduction

- ◆ Why
- ◆ When?
- ◆ Where?
- ◆ For Whom?
- ◆ What?
- ◆ How?



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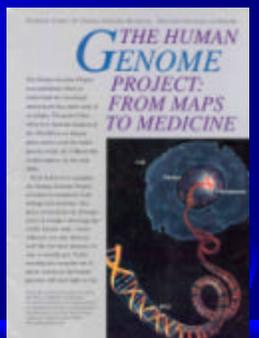
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## Why? Human Genome Project

- ◆ Mapping complete
- ◆ Disease gene ID
- ◆ Complex diseases
- ◆ Use of sequence info
- ◆ Protein structure
- ◆ Drug development
- ◆ Prevention



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## Implications of the Human Genome Project for Medical Science

- ◆ New diagnostic Tools
- Prevention strategies
- Treatment
- In-utero correction
- Somatic therapies
- Pharmacogenomics



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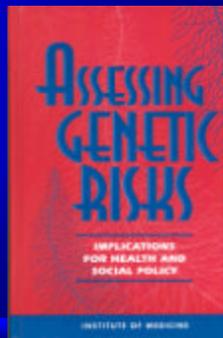
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## Why Is Teaching Genetics Important?

- ◆ Institute of medicine report about the future of medicine
- ◆ Assessing genetics risk
- ◆ Teaching genetics in Medical school



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## NCHPEG – Core Competencies in Genetics for all Health Professionals

- ◆ Because of Human Genome completion
- New paradigm in Medicine
- Diagnostic
- Therapeutics
- Prevention



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## Why? - Genes and Heart Disease

- ◆ Genetics of complex Diseases are being Identified
- Patients and families Will seek information
- Order the best test
- Save money



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## WHY Teach Genetics?

- ◆ Importance in medicine
- ◆ Future therapies
- ◆ Diagnostics
- ◆ Risk assessment
- ◆ Scientific literature



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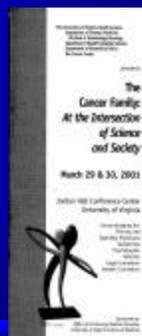
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## Cancer Genetics and Society

- ◆ Ethical issues in cancer Genetics
- Whom do we test?  
When to test?  
What tests are useful?  
Can we use this information  
To improve our health?



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## Human Genome Project and OBGYN

- ◆ ACOG meeting in May 2001
- Francis Collins to speak: Cystic fibrosis
- Other genetic info



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## How Do We Apply Genetics to Future Generations?

- ◆ Somatic manipulation?
- ◆ Gamete enhancement?
- ◆ Embryo selection?
- Sex selection
- Other factors?
- Height?
- IQ?



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## Genetics and Information Technology

- ◆ Vast amount of info
- ◆ High speed computers
- ◆ Gene structure
- ◆ Protein structure
- ◆ Interactions
- ◆ Drug development



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### Legal Concerns – A force for change?

- ◆ Will malpractice risk foster change?
- ◆ Refer any questions? To whom?
- ◆ At what point in care?
- ◆ At what cost?



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### USU Telegenetics Website - When?

- ◆ 1996 - 1997 - Navy established tele-radiology, tele-dermatology and tele-genetics
- ◆ Ships – digital radiography
  - Distance interpretation
- ◆ Overseas bases – isolated with limited specialty consultation available



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### USU Telegenetics Website - Where?

- ◆ Applied Physics Laboratory at JHU
- ◆ Contract with navy telemedicine office
  - Genetics information to deployed healthcare providers
  - Identification of laboratory services in remote locations
  - E-mail “Ask a Geneticist”
- ◆ Now hosted by the Uniformed Services University’s Department of Biomedical Informatics



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## USU Telegenetics – What?

- ◆ Pilot project as part of navy telemedicine
- ◆ Educational information
  - Case studies for medical students
  - Ethical, legal and social issues including ethics course from USU
  - Lecture presentations



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## USU Telegenetics – What?

- ◆ Distance learning – lectures
- ◆ Standardized bibliography of genetics references
- ◆ Web-based resources
  - OMIM
  - Medline
  - Databases
  - ELSI
  - Support groups



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## Support Groups for Patients With Genetic Conditions

- ◆ Alliance of support Groups
- Patient driven requests For information
- Physician requests for Genetic information



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## USU Telegenetics - Why?

- ◆ World-wide deployed forces and their families
- ◆ Time-differences make real-time consultations more challenging
  - 18 hour time difference with Japan
  - 6-8 hour time difference with Europe
- ◆ Universal access to www at DoD facilities



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## USU Telegenetics - Why?

- ◆ Information about genetics changes with new developments
  - On-line information can be updated more easily than books
- ◆ Move information rather than patients
  - Less expensive
  - Less time lost from work
  - Reassurance through information



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## Risks of Genetic Testing

- ◆ Informed consent
- ◆ Knowledge of patient
- ◆ Who controls “my” DNA?
- ◆ Life insurance company?
- ◆ HMO?
- ◆ Research lab?



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## How Shall We Teach Genetics?

- ◆ To whom?
- ◆ Primary care Providers?
- Medical students?
- Nurses?
- Patients/clients?
- Lawyers?



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## How do differences affect disease?

- ◆ Polymorphisms
- ◆ Gene-environment interactions
- Prevention
- Therapeutics



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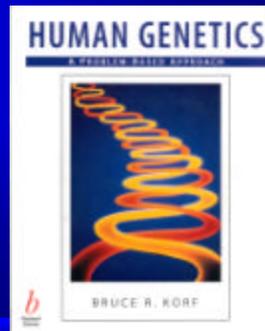
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## HOW Can We Teach Genetics?

- ◆ Problem-based Curriculum
- Use cases to guide Learning
- Web-based info
- Support groups
- Databases



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## USU Telegenetics

- [www.usuhs.mil/genetics](http://www.usuhs.mil/genetics)
- on-line resource



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