Tools for Teaching Genetics in Primary Care
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NEGEA – Baltimore, Maryland
3 March 2001

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

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

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

USU Telegenetics Website - Introduction

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

Why? Human Genome Project

- Mapping complete
- Disease gene ID
- Complex diseases
- Use of sequence info
- Protein structure
- Drug development
- Prevention
Implications of the Human Genome Project for Medical Science

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

Why Is Teaching Genetics Important?

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

NCHPEG – Core Competencies in Genetics for all Health Professionals

- Because of Human Genome completion
- New paradigm in Medicine
- Diagnostic
- Therapeutics
- Prevention
Why? - Genes and Heart Disease

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

WHY Teach Genetics?
- Importance in medicine
- Future therapies
- Diagnostics
- Risk assessment
- Scientific literature

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?
Human Genome Project and OBGYN
- ACOG meeting in May 2001
- Francis Collins to speak:
  - Cystic fibrosis
  - Other genetic info

How Do We Apply Genetics to Future Generations?
- Somatic manipulation?
- Gamete enhancement?
- Embryo selection?
- Sex selection
- Other factors?
- Height?
- IQ?

Genetics and Information Technology
- Vast amount of info
- High speed computers
- Gene structure
- Protein structure
- Interactions
- Drug development
Legal Concerns – A force for change?

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

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

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
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

USU Telegenetics – What?

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

Support Groups for Patients With Genetic Conditions

- Alliance of support Groups
- Patient driven requests for information
- Physician requests for Genetic information
Information About Genetic Tests

- www.genetests.org
- Clinical information
- Referral lab services
- Follow-up recommendations
- Counseling issues

Genetics and Primary Care?

- What is the value?
- What about cost?
- Who will pay for this?
- How much time?
- Privacy?
- Discrimination?
- Informed consent?

USU Telegenetics - Why?

- Limited number of geneticists and genetic counselors available
- Many primary care health providers - trained before genetics information and genomics was so pervasive
  - General medical officers
  - Family physicians, internists, pediatricians, OBGYN
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

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

Risks of Genetic Testing

- Informed consent
- Knowledge of patient
- Who controls “my” DNA?
- Life insurance company?
- HMO?
- Research lab?
How Shall We Teach Genetics?

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

How do differences affect disease?

- Polymorphisms
- Gene-environment interactions
- Prevention
- Therapeutics

HOW Can We Teach Genetics?

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

- www.usuhs.mil/genetics
- on-line resource