Stakeholders

- Genetic Specialists
- Physicians
- Non-physician Health Care Providers
- Public Higher Education
- General Public
## Educational Programs

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of Program</th>
<th>Organization</th>
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</thead>
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<td>Gen’l education</td>
<td>Schools, pub programs</td>
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<tr>
<td>Undergraduate</td>
<td>Genetics courses</td>
<td>ASHG</td>
</tr>
<tr>
<td></td>
<td>Pre-med requirements</td>
<td>AAMC</td>
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<tr>
<td>Physicians</td>
<td>Med School curriculum</td>
<td>AAMC</td>
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<tr>
<td></td>
<td>Post-grad programs</td>
<td>ACGME, RRC, ABMS</td>
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<tr>
<td></td>
<td>CME</td>
<td>ABMS, ACMG</td>
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<tr>
<td>Geneticists</td>
<td>MD and PhD Counselors</td>
<td>ABMG</td>
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<tr>
<td>Health Professions</td>
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<td>ABGC</td>
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</tbody>
</table>
# Genetics Training for Physicians

<table>
<thead>
<tr>
<th>Level</th>
<th>Organization</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Med school curriculum</td>
<td>AAMC</td>
<td>Accreditation</td>
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<tr>
<td></td>
<td>APHMG</td>
<td>Curriculum contents</td>
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<tr>
<td>USMLE exams</td>
<td>NBME</td>
<td>Appoint exam writers</td>
</tr>
<tr>
<td></td>
<td>APHMG</td>
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<tr>
<td>Residencies</td>
<td>ACGME, RRC</td>
<td>Residency curriculum</td>
</tr>
<tr>
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<td></td>
<td>Accreditation</td>
</tr>
<tr>
<td>Continuing Medical Education</td>
<td>ABMS</td>
<td>MOC, Guidelines</td>
</tr>
<tr>
<td></td>
<td>ACMG</td>
<td>Programming</td>
</tr>
</tbody>
</table>
Genetics Specialists

- American Board of Medical Genetics
  Currently 2980 certificates to 2338 individuals
  93-96  down 21%
  96-99  down 32%
  99-03  down 16%
  Clinical Geneticists = 1075

  Residencies  of 175 slots, only 95 filled

- American Board of Genetic Counselors
Genetics in Residencies

- ACGME and RRC approval of curriculum
- ABMS specialty board programs
  - Pediatrics
  - Obstetrics & Gynecology
  - Internal Medicine
  - Neurology
  - Family Practice
- Formal combined residency programs
  - Approved
    - ABMG/ABPeds
    - ABMG/ABIM
    - ABMG/ABPath
  - Pending
    - ABMG/ABPN
    - ABMG/ABOG
    - ABMG/ABFP
Continuing Medical Education

- Maintenance of Certification
  - Time limited certificates
  - Demonstration of competence
- Board specific
- Utilize & integrate guidelines (ACMG)
  - Rather than use curricular materials
- COMMOC of ABMS
  - Committee on Management of MOC
Teaching Models

- Curriculum guidelines and elements
  APHMG, NCHPEG
- Professional guidelines
  ASHG, ACMG
- Programming for specialties
  ACMG
- Faculty development
  GPC model program
Undergraduate courses

- ASHG Information & Education Committee
  Survey of courses
    Biology courses inadequate
    Provided conceptual material
- Premed requirements
  Genetics rated 3rd most important subject
  Not a medical school requirement
Educating/Informing the Public

- Patient & consumer education

- General public
  - “genetics readiness”
Patients & Consumers

- Informational materials
  - At time of service
  - From organizations

- Websites
  - Organization websites such as Genetic Alliance
  - GeneTests
  - National Library of Medicine (GHR)
General Public

- Teacher training
  - NABT
  - NSTA

- Materials (examples)
  - NHGRI
  - NCHPEG
ASHG/NHGRI Mentor Network

- >700 volunteers
  - Classrooms
  - Museums
  - Projects and Individuals
- Materials development
- Plans for evaluation

www.ashg.org  www.genome.gov
Barriers

- Perceived lack of necessity or relevance
- Focus on rare disorders
- Overcrowded curricula
- Complex (probabalistic) material
Gaps

- Concepts in college
- Declining specialist pool
- Insufficient training faculty
- Genetics and common disorders
- Information gaps for non-specialists
Needs

- Change perception
  - Develop applications examples
  - Incorporate in practice during training
  - Facilitate interactions with consumer/advocacy groups
Needs

- Shift focus
  - Rare disorders
  - Emphasize common, complex disorders
- Incorporate pharmacogenetics
Needs, continued

- Overcrowded curricula
  - Develop and disseminate models
  - Incorporate into problem-based learning
  - Train standardized patients
  - Develop on-line modules
Needs, continued

- Complex material
  - Develop teaching materials
  - Encourage innovation and tools
  - Support professional guidelines
Needs, continued

- Enhance workforce
  - Increase # of genetic specialists
  - Support training programs
  - Fund residencies
  - Expand current teaching models
  - GPC and NCHPEG
Needs, continued

- Better informed workforce
  - On-line training
  - Conferences
  - Dissemination of information
Needs, continued

- Increase general awareness and knowledge
  - Support professional outreach programs
  - Support lay programs
  - Respond to media opportunities