We must all hang together, or assuredly we shall all hang separately. Benjamin Franklin

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Colorado Associates in Medical Physics
President Elect, AAPM

Thanks to PNHP for the healthcare financing data
Donald Frey. Ph.D.
Bruce Thomadsen, Ph.D.
AAPM Staff


OPUS ONE

Structure of a Hospital Based Private Practice in Medical Physics

- Hospital based staff
- Professional Services Contract for Staff Physics services rather than employee or consulting physicist arrangement
- Radiation Oncology facilities staffed at 1.0 to 2.2 FTE.
- Consulting activities at smaller institutions (Diagnostic, Nuclear Medicine, Radiation Safety) ~25% of effort.


Reserved
Physicist
Parking
Only

Group Profile

- 14 members of the group (3 principals).
- 10 full time, 3 part time , one PRN
- Board Certificate Status:
  - 2 Tx, Dx, MNP
  - 2 Dx, Tx
  - 1 Dx, MNP
  - 4 Tx
  - 3 Dx
  - 2 in the Examination Process

Organization

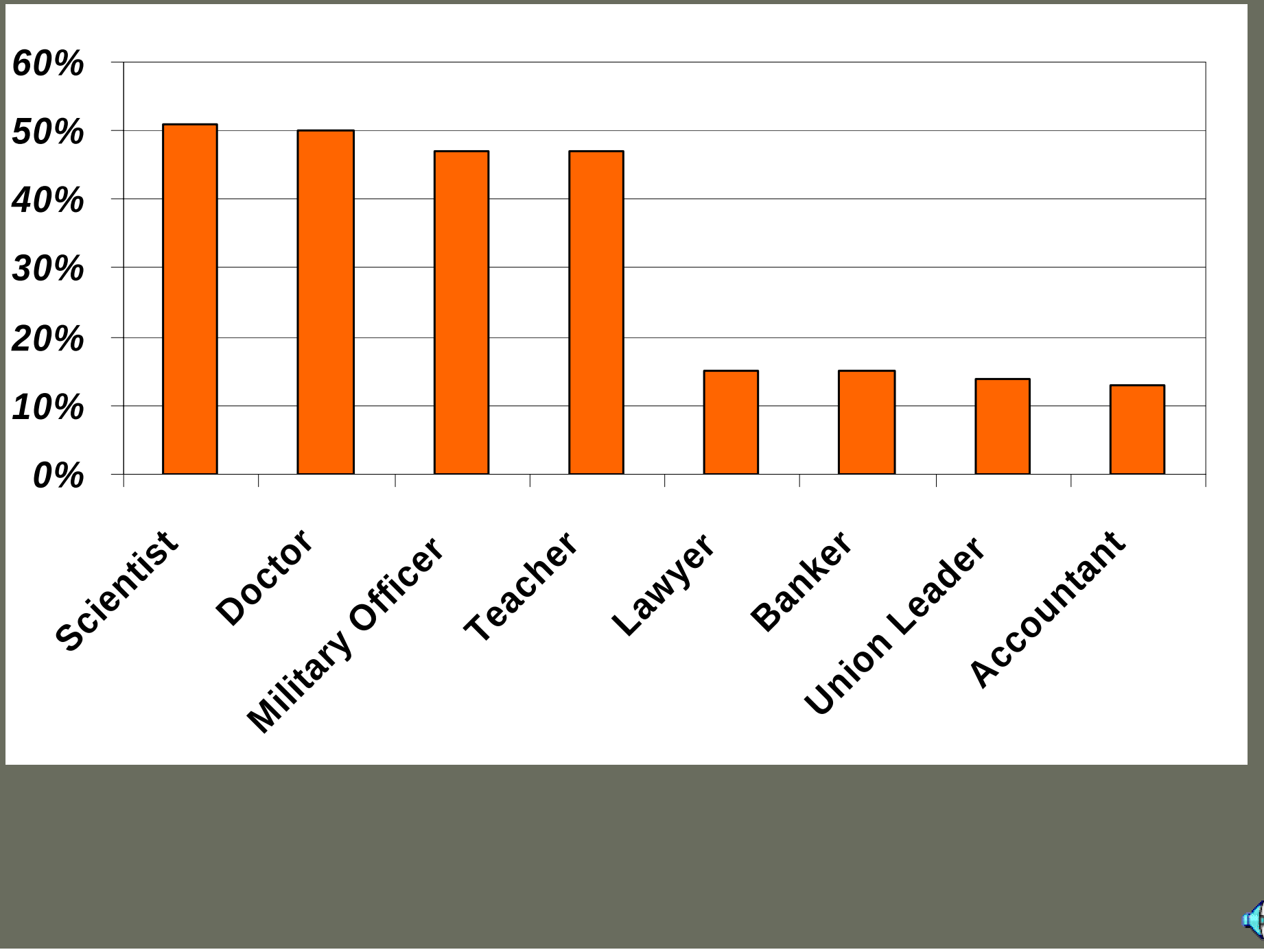
- IRS C- Corporation
- 3 Principals are the sole stockholders
- Group purchases Physics Equipment for measurement and image analysis
- Facilities purchase equipment dedicated to a single site.
- Benefit Package:
  - Medical Insurance
  - Disability
  - Professional liability insurance
  - Sick leave
  - Vacation
  - Professional Education leave
  - Professional Education allowance
  - SAR/SEP IRA
- Salary guided by the AAPM Professional Survey.

Advantages

- Provide non-integral FTE increments to facilities.
- Scale up for special projects (commissioning, etc.)
- Coverage during absences is by a physicist familiar with the clinic.
- Supervision of physicists done by peers.
- Sensible equipment purchase process, sharing of low utilization equipment.
- Control over benefits – optimized for a professional staff.
- Increased autonomy for physics staff.

Distinguishing Features of a Profession

- Occult Knowledge
- Recognized Range of Expertise
- Defined educational pathway
- Controlled entry into the profession
- Peer review mechanism
- Responsibility to those served and society at large


60%
50%
40%
30%
20%
10%
0%
Scientist
Doctor
Military Officer
Teacher
Lawyer
Banker
Union Leader
Accountant

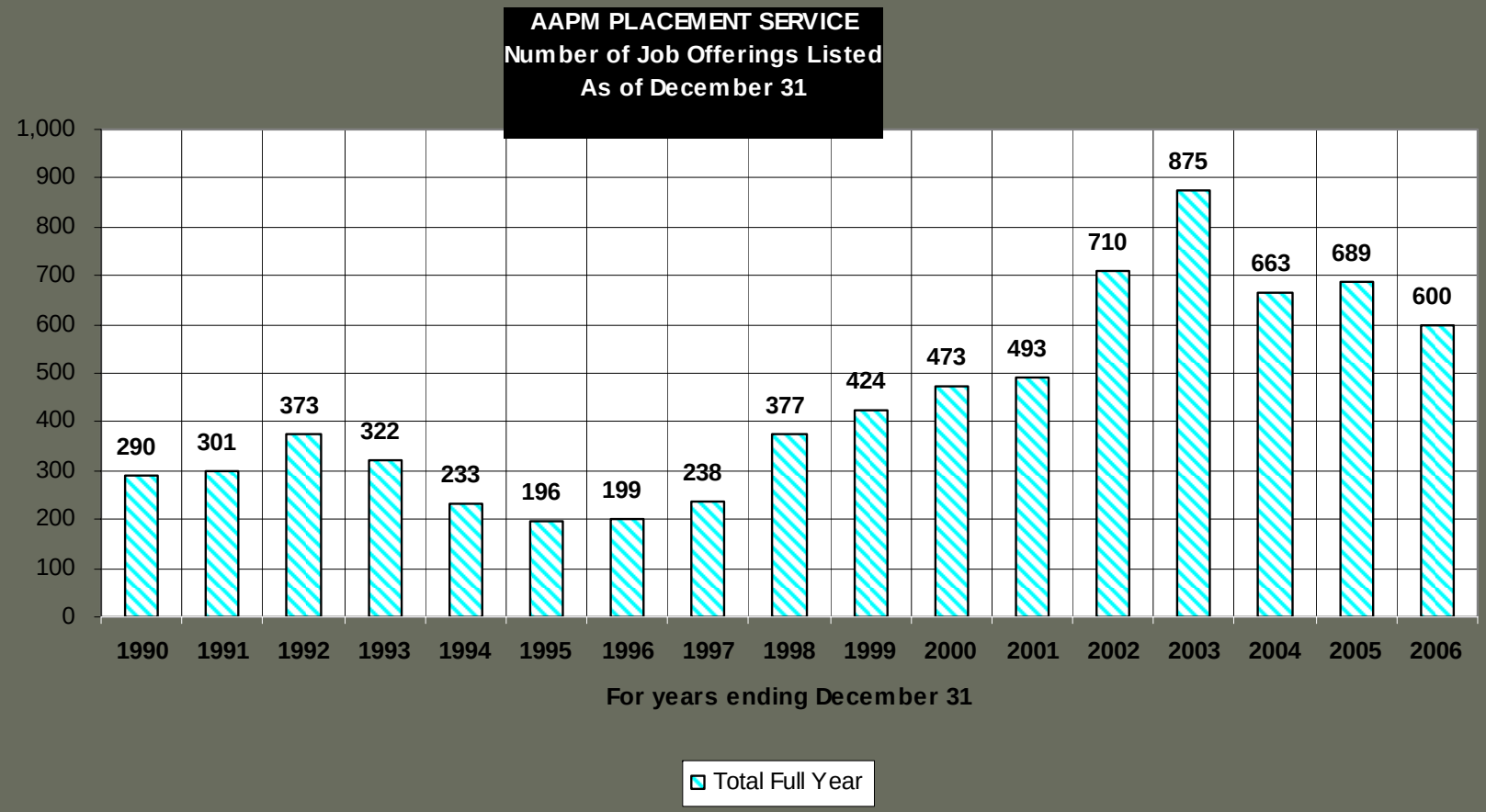
Factors That Will Lead to Opportunities

- Research Funding and Allocation
- Scientific and Technical Developments
- Increasing Complexity of our “routine” work
- Diversification of our Medical Partner base
- Consolidation in the Hospital Industry
- Education Reform
- Healthcare Financing Changes

Educational Pathways

- B.S. in Physics or other Physical Science or Engineering and
- M.S. (Medical Physics, Physics, Physical Science, Engineering- Research or Professional) or
- Ph.D. research degree (Medical Physics, Physics, Physical Science, Engineering-)

Workforce Projections?



Education Reform

- More rigorous Board Examination requirements and passing thresholds
- Board Certification and Licensing requirements to assure inappropriately qualified individuals are not responsible for patient care.
- Increasing numbers of fellowship trained Physicians will require more highly trained entry level MP's
- Perception that entry level MP's lack sufficient clinical training and experience
- MOC
- Education and training for those desiring a career in Medical Physics research and/or teaching?

Educational Pathways

- No clinical experience is required for the qualifying degree.
- Clinical Experience during the degree program
- On the Job Training (Mythic History)
- Formal Residency (1-2 years)
- Structured Distributed Residency

Educational Pathways

- Formal Residency
  - Loss of residents to staff positions in good times
  - Difficulty recruiting in bad times
  - Limited availability of institutional resources
  - Limited number of actual or potential residency programs.
- Distributed Residency
  - Opportunity to have a pseudo staff position while in residency
  - Multiple facilities participating, with internal motivation
  - Efficient use of “mothership” resources
  - Partial funding by satellite programs

Professional Doctorate Degree

- Prepare for a career in Clinical Medical physics directly
  - Similar to the Psychology pathways of a Ph.D and Psy.D.
- Gain the necessary clinical experience as part of a degree program
  - Clear expectations of clinical competency (faculty focus)
  - Avoids possibility of leaving a residency prior to completion

Proposal: Establishment of a new Degree:
Doctor of Medical Physics (MedPhys.D.)

For Medical Physics Graduate Students at the University of Wisconsin

Proposed by Bruce Thomadsen, Bhudatt Paliwal, Larry DeWerd, Paul DeLuca, Robert Jeraj, Rock Mackie, Jenni Smilowitz, Rupak Das, Wolfgang Tomé

Rationale: Most jobs in medical physics are in the discipline of radiotherapy. Clinical medical physicists assume responsibilities for patient wellbeing beyond what should be expected of a practitioner with a Masters' degree. The propose program would provide the graduates with the necessary understanding, skills and experience.

AAPM Opportunities: Education Reform

- Short term: support for non-traditional Residency Programs
- Long Term: support for clinical degree programs for those students who intend to pursue a career in clinical Medical Physics.
- Creation of high quality, accessible MOC opportunities.

Licensure

- Texas, Florida, New York, Hawaii have formal licensure programs.
- CARE Bill will enhance a national solution, not necessarily licensure
- States with pseudo-licensure

110TH CONGRESS
1ST SESSION

H. R. 583

To amend the Public Health Service Act to make the provision of technical services for medical imaging examinations and radiation therapy treatments safer, more accurate, and less costly.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 19, 2007

Mr. DOYLE (for himself, Mr. PICKERING, Mrs. CAPPS, Mr. DUNCAN, Mrs. BLACKBURN, Mr. ROGERS of Michigan, and Mrs. WILSON of New Mexico) introduced the following bill; which was referred to the Committee on Energy and Commerce

---

A BILL

To amend the Public Health Service Act to make the provision of technical services for medical imaging examinations and radiation therapy treatments safer, more accurate, and less costly.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Consistency, Accuracy, Responsibility, and Excellence in Medical Imaging and Radiation Therapy Act of 2007''.

20.3.2 Training for Radiation Therapy Physicist. The registrant for any therapeutic radiation machine subject to RH 20.7 or 20.8 shall require the Radiation Therapy Physicist to:

20.3.2.1 Be registered with the Department, under the provisions of Part 2 of these Regulations, as a provider of radiation services in the area of calibration and compliance surveys of external beam radiation therapy units; and
20.3.2.2 Be certified by the American Board of Radiology in:
20.3.2.2.1 Therapeutic radiological physics; or
20.3.2.2.2 Roentgen-ray and gamma-ray physics; or
20.3.2.2.3 X-ray and radium physics; or
20.3.2.2.4 Radiological physics; or
20.3.2.3 Be certified by the American Board of Medical Physics in Radiation Oncology Physics;

RH 20.6 Radiation Therapy Physicist Support.

20.6.1 The services of a Radiation Therapy Physicist shall be required in facilities having therapeutic radiation machines. The Radiation Therapy Physicist shall be responsible for:

20.6.1.1 Full calibration(s) required by RH 20.7.16 and 20.8.19 and protection surveys required by RH 20.4.1;.20-11
20.6.1.1.1 Supervision and review of dosimetry;

20.6.1.1.2 Beam data acquisition and transfer for computerized dosimetry, and supervision of its use;

20.6.1.1.3 Quality assurance, including quality assurance check review required by RH 20.7.17 and 20.8.20.

20.6.1.1.4 Consultation with the authorized user in treatment planning, as needed; and

20.6.1.1.5 Perform calculations/assessments regarding misadministrations.

Board Certification

- American Board of Radiology
  - Therapeutic Radiological Physics
  - Diagnostic Radiological Physics
  - Medical Nuclear Physics
- American Board of Medical Physics
  - MRI Physics
  - Medical Health Physics

Challenges and Opportunities

- MOC process for ABR

- Year 2012 ABR requirement for Clinical Residency training
- CARE Bill requiring state by state qualification standards

- NRC Part 35 T&R fails to properly recognize Board certifications prior to 2007

- AAPM expands and tailors educational offerings to match MOC process
- Formalize distributed Residency programs
- Create an AAPM facility to assist state Medical Physics Communities in implementation
- Introduction of a Petition for Rulemaking to the NRC to recognize earlier Board Certifications.

Research Funding and Allocation

- Politicization of Federal Science Policy
- Competition for Science Funding Between Health Related and Other (Physical, Biological, Security) Entities.
- Guns, Butter and Tax Cuts.
- Join with the wider scientific community on issues of mutual interest
- Participate with ASTRO and ACR in research efforts AND develop AAPM as a recipient and disburser of grant funds.
- Open discussion of the effect of diverting Billions of dollars to military and homeland security spending.

AAPM Opportunities: Research and Funding Allocations

- Speak the Scientific Truth
- Enter The Mud Bowl
  - Seek professionally appropriate alliances
  - Raise relevant issues with members
  - Develop legislative and agency contacts
- Provide professional services for members who are primarily engaged in research
- Rebuild structures that recover Medical Physics researchers who have migrated to other societies.

Scientific and Technical Developments

- Deployment of Expansions to Existing Technologies (Hendee, Radiology, Feb 06)
  - MR imaging, MR spectroscopy, functional MR imaging
  - MultiDetector Computed Tomography
  - PET and PET CT
  - Duplex Doppler Ultrasonography
  - Computed and Digital Radiography
  - Digital Fluoroscopy
  - Digital mammography
  - 3-D and 4- D imaging and segmentation
  - Fusion modalities
  - Image Guided Radiotherapy
  - Respiratory Compensated Radiotherapy
  - High Precision Hypo-fractionated Radiotherapy

Scientific and Technical Developments

- Development and Deployment of Novel Technologies (Hendee, Radiology, Feb 06)
  - Optical Coherent Tomography
  - Bioluminescence in Molecular Imaging
  - Magnetoencephalographic imaging
  - Microwave Tomography
  - Laser Tomography
  - Elastography
  - Phase Contrast Imaging

AAPM
Opportunities: Scientific and Technical Developments

- Create timely standards / guidelines for the use and quality metrics for new technologies
- Provide the infrastructure to assure that MP's have sufficient knowledge to be the "masters" of this new technology.
- Create relationships with other Physician societies as these technologies roll out to non-Radiologist specialties.
- Actively participate in the cost evaluation (RUC/PEAC) for new technologies and provide clear evidence on the work effort of the MP in the provision of patient specific services associated with the new devices.
- Develop, in conjunction with appropriate government entities, the regulatory structure that will provide safe and efficient use of these new technologies and properly describe the necessary MP involvement.


A CARTOON WRITTEN BY A DOCTOR:

AAPM Opportunities: Scientific and Technical Developments

- Control of the Knowledge:
  - Scientific, Technical Standards
  - Teaching Standards for MP's and Practitioners (of all specialties)
  - Focused Topic Educational Offerings
  - Technology Evaluations

Diversification of Traditional Physician Partner Base

- Nuclear Medicine: Radiology to Cardiology
- Complex Imaging Procedures: Radiology to Orthopedics, Cardiology, Urology and Medical Oncology
- Interventional Radiology to Cardiology and Vascular Surgery
- Radiation Oncology to Medical Oncology, Urology, Neurosurgery

IAC
INTERSOCIETAL ACCREDITATION COMMISSION

Member Organizations

INTERSOCIETAL COMMISSION FOR THE ACCREDITATION OF VASCULAR LABORATORIES

INTERSOCIETAL COMMISSION FOR THE ACCREDITATION OF ECHOCARDIOGRAPHY LABORATORIES

INTERSOCIETAL COMMISSION FOR THE ACCREDITATION OF NUCLEAR MEDICINE LABORATORIES

INTERSOCIETAL COMMISSION FOR THE ACCREDITATION OF MAGNETIC RESONANCE LABORATORIES

INTERSOCIETAL COMMISSION FOR THE ACCREDITATION OF COMPUTED TOMOGRAPHY LABORATORIES

IAC Sponsoring Organizations

- Academy of Molecular Imaging
- American Academy of Neurology
- American Academy of Orthopedic Surgeons
- American College of Cardiology
- American College of Nuclear Physicians
- American Institute of Ultrasound in Medicine
- American Society of Echocardiography
- American Society of Neuroimaging
- American Society of Nuclear Cardiology
- Society for Cardiovascular Angiography and Intervention
- Society for Cardiovascular Magnetic Resonance
- Society of Vascular Medicine and Biology
- Society for Vascular Surgery
- Society for Cardiovascular computed Tomography
- Society of Diagnostic Medical Sonography
- Society of Interventional radiology
- Society of Nuclear Medicine
- Society of Pediatric Echocardiography
- Society of Radiologists in Ultrasound
- Society of Vascular Ultrasound

Consolidation in the Hospital Industry

- Hospitals are joining large consortia with centralized equipment evaluation, acquiring and maintenance.
- Physicists are becoming more distant from those who make significant decisions

AAPM Opportunities: Consolidation in the Hospital Industry

- Facilitate shared knowledge among Physicists regarding purchase contracts, negotiating tools, equipment evaluation, Bio-Med interfaces. (e.g. Impact)
- Increase our societal and personal visibility with hospital administrators (AHA, SROA, RBMA).
- Develop relationships at the society level with vendors who specify operating procedures for their equipment.

Health Care Financing Changes

- Nipping at the edges: Deficit Reduction Act, SGR adjustments
- Self-Referral – Quality filters – Physician specialty conflicts
- Realignment of the RUC and PEAC away from procedure based providers. Competition between TC and PC funding.
- The BIG CHANGE

Update Adjustment Factor 2006

$$UAF_{06} = \frac{Target_{05} - Actual_{05}}{Actual_{05}} \times .75 + \frac{Target_{4/96-12/05} - Actual_{4/96-12/05}}{Actual_{05} \times SGR_{06}} \times .33$$

UAF_{06} = Update Adjustment Factor for 2006

$Target_{05}$ = Allowed Expenditures for CY 2005 = \$79.9 billion

$Actual_{05}$ = Estimated Actual Expenditures for CY 2005 = \$92.9 billion

$Target_{4/96-12/05}$=Allowed Expenditures from 4/1/1996 - 12/31/2005 =\$611.2 billion

$Actual_{4/96-12/05}$=Estimated Actual Expenditures from 4/1/1996 - 12/31/2005= \$641.7 billion

SGR_{06} = 2.5 percent

$$\frac{\$79.9 - \$92.9}{\$92.9} \times .75 + \frac{\$611.2 - \$641.7}{\$92.9 \times 1.025} \times .33 = -21.1\%$$

Saved by SSA Section 1848(d)(4)(D)!
And
Economic Growth

- UAF 2006 = -21.1%
- Statute mandates the UAF may not be less than -7%
- Medicare Economic Index (MEI 2006 =2.9%)
- CF adjustment = 0.93*1.029=0.957 (-4.3%)

Imaging Cost Growth – a CMS “Area of Interest”

	2000-2001	2001-2002	2002-2003	2003-2004
Standard Imaging	6.5%	7.1%	3.9%	**18.9%**
Advanced Imaging	17.5%	16.1%	12.6%	**25.8%**
Echocardiography	11.3%	12.8%	5.5%	**19.3%**
Imaging/Procedure	10.5%	19.4%	13.6%	**23.2%**

Imaging Cost Growth – a CMS “Area of Interest”

- Deficit Reduction Act of 2005
  - Diagnostic medical imaging technical component cap
    - Effective January 1, 2007, the DRA caps the Physician Fee Schedule payment for the technical component (TC) of certain imaging services at the hospital outpatient payment amount for the same service.
    - Does not apply to the majority of radiation oncology codes
    - TC cap applies to CPT codes 76000, 76001, 76370, 76376, 76377, 76380, 76873, 76950, 76965, 77417 and 77421

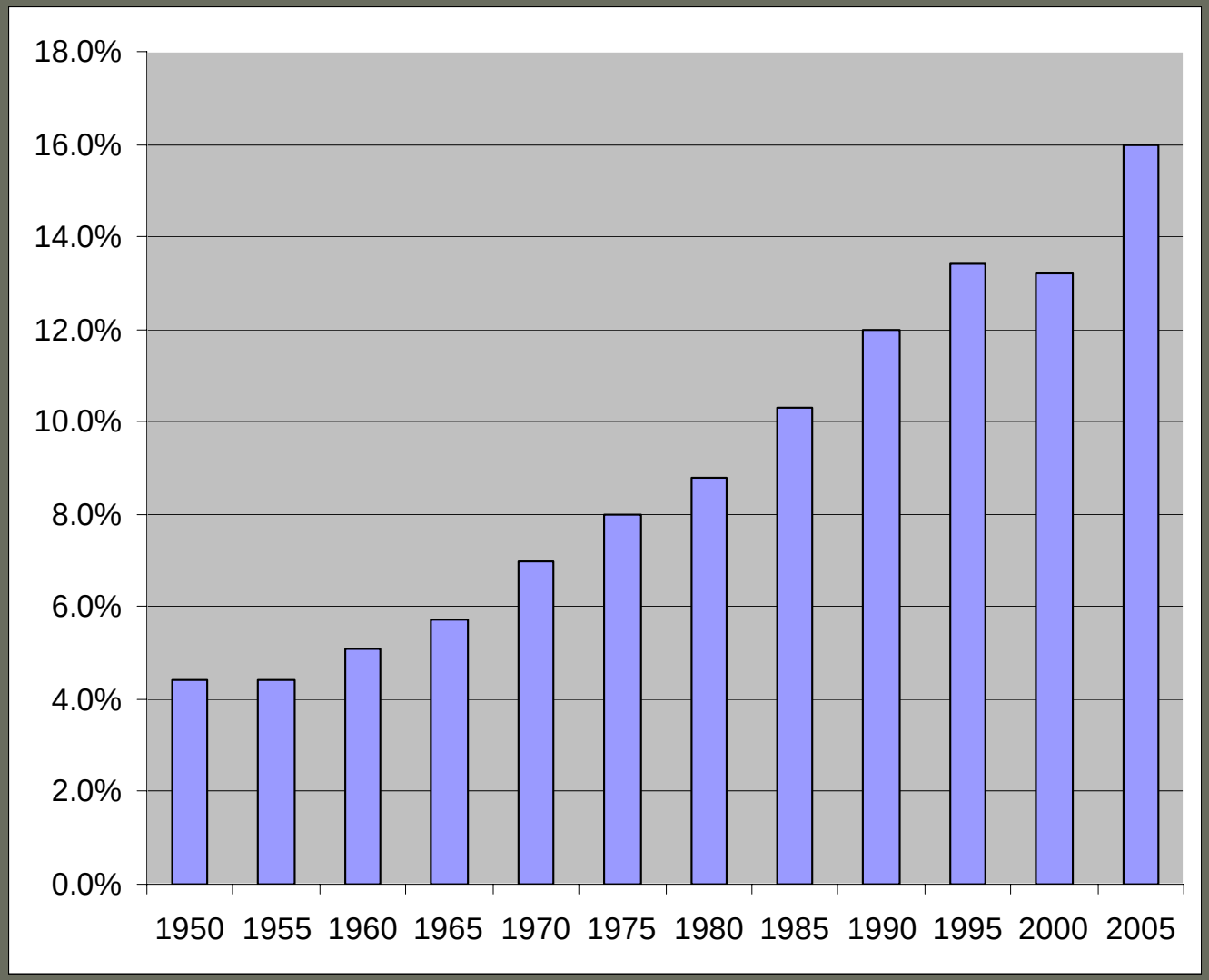
Radiation Oncology

- Migration to high precision (high cost) hypofractionated modalities (HDR, SRS, SBRT)
- Growth in Cancer incidence due to aging population (48% 2005 to 2020)
- Increasing survival rate for Cancer patients

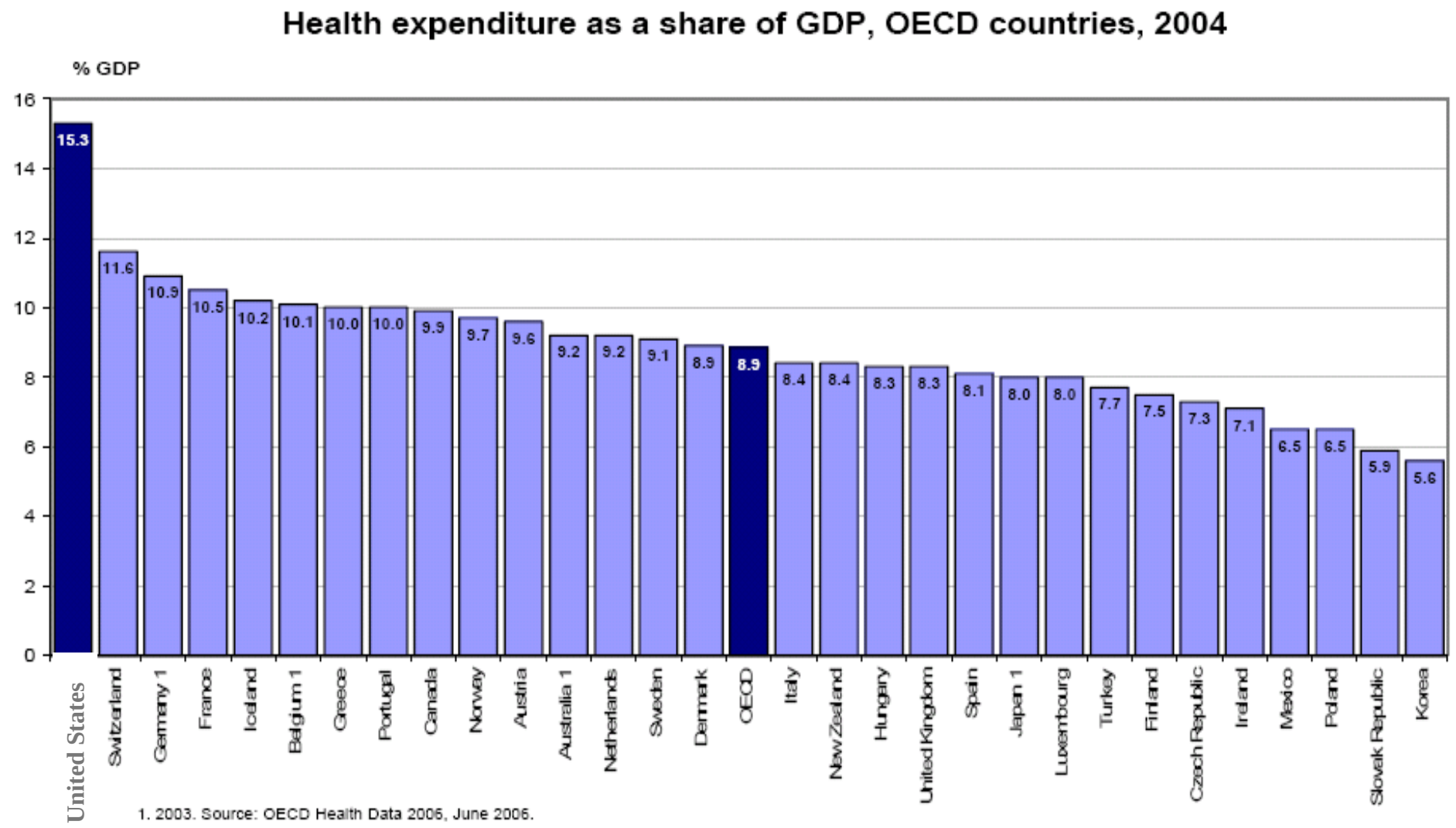
AAPM Opportunities: Health Care Financing Changes

- Add our separate voices in lobbying for legislative relief to the Deficit Reduction Act and a fix to the SGR methodology.
- Develop a strategy within the Medical Physics community to deal with the inevitable conflicts between Radiologists and other specialties that use imaging and between Radiation Oncologists and other specialties that provide therapeutic services.
- Position our members to be key players in the Quality Based Service filters that are on the way. (Appointments to key committees)
- Develop staff and volunteer expertise within the AAPM on functional reimbursement issues. Place MP's on appropriate economic and technical committees within the Physician societies (ASTRO, ACR, ACC, SNM) to leverage this expertise
- The BIG CHANGE

U.S. National Health Spending as a % of GDP

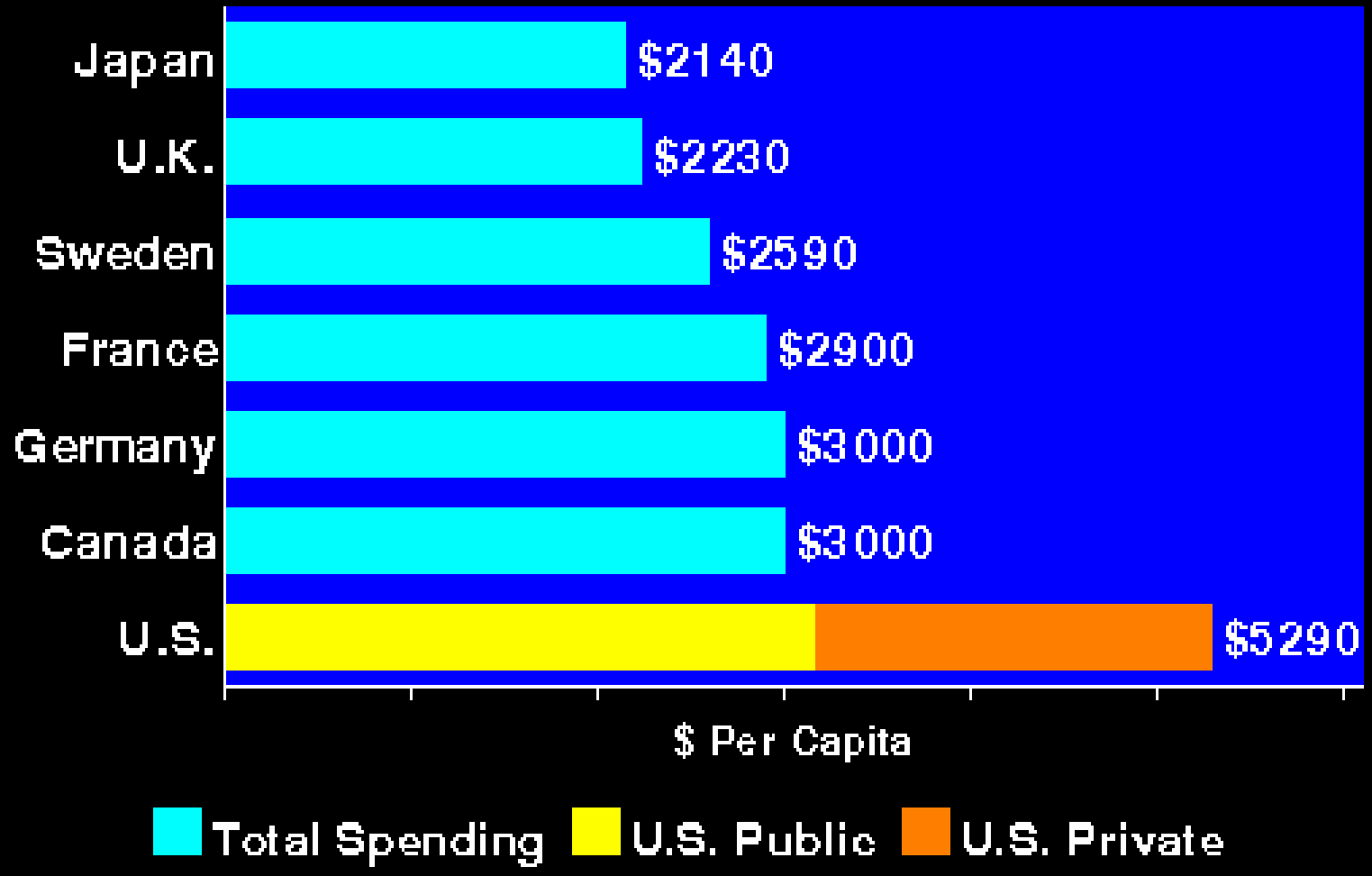


U.S. Health Costs are 70% Greater than the Median of Other Countries



"We're borrowing the best features of the Canadian system."

U.S. PUBLIC Spending Per Capita for Health is Greater than TOTAL Spending in Other Nations



Note: Public includes benefit costs for govt. employees & tax subsidy for private insurance

Source: OECD 2005; Health Aff 2002; 21(4):88 - Data are for 2002

Infant Mortality Ranking

- Singapore
- Sweden
- Hong Kong
- Japan
- Iceland
- Finland
- Norway
- Malta
- Czech Republic
- Andorra
- Germany
- France
- Switzerland
- Macau
- Spain
- Slovenia
- Denmark
- Austria
- Belgium
- Australia
- Liechtenstein
- Guernsey
- Canada
- Luxembourg
- Netherlands
- Portugal
- Gibraltar
- United Kingdom
- Jersey
- Ireland
- Monaco
- Greece
- San Marino
- New Zealand
- Aruba
- Isle of Man
- Italy
- Faroe Islands
- Cuba
- Taiwan
- United States
- Croatia
- Lithuania

CIA Factbook 2005

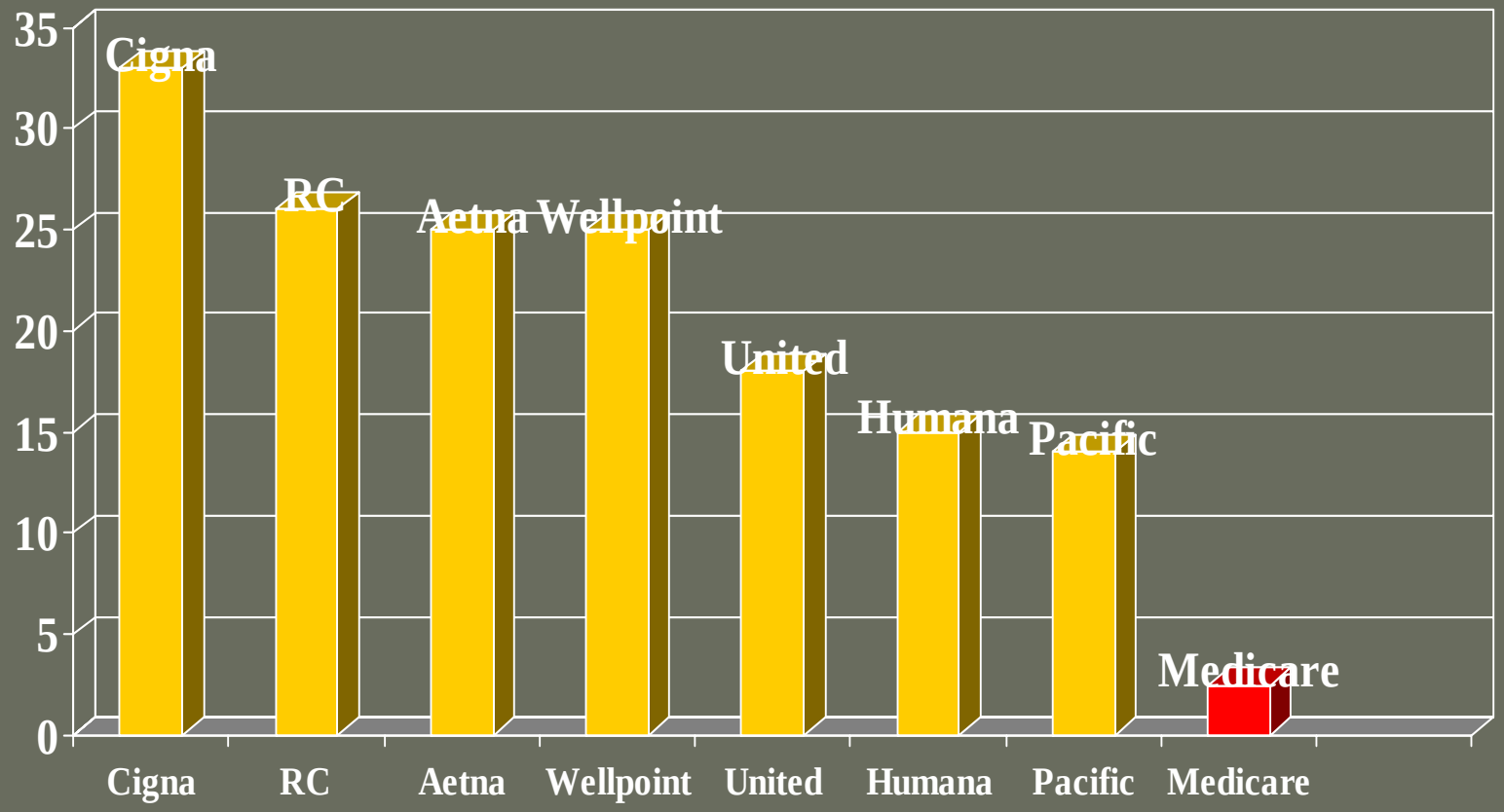
General Motors' Health Care Costs

"A Social Insurance System that Sells Cars to Finance Itself"

- $5 billion in 2003 (profits = $1.7 billion)
- $1,200 per car
- $9,000/year for employee
  (average firm = $5,758)
- $15,000/year for retiree < 65
- $4,000/year for retiree on Medicare

Source: New York Time 7/15/03: C1

Overhead & Profit
As Percent of Premium



Professional Work Effort-- Keep our eye on the goals

- Healing the Sick
- Advancing Knowledge
- Personal Satisfaction
- $$$$

  - The poor have little,
    Beggars none;
    The rich too much
    Enough not one. B. Franklin