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Thank you very much Mr. Chairman for your invitation to speak before this committee on the topic of technology, innovation, and their effects on cost growth in health care.

I would like to speak today about how we can better understand the value or cost-effectiveness of medical technology.

Broadly speaking, medical technology contributes to growth in health care expenditures.

But this research says nothing by itself about the benefit side of the equation. As we consider medical technology, it is important to address not just how much medical technology contributes to health costs, but whether the investments in medical technology are worth the health benefits produced.

We all would like to get good value for our money when we pay for new drugs, devices, and procedures. How do we get there? What tools do we have to use, and what policy options are available? Formal economic evaluation can help us answer these questions.

The field of economic evaluation of health and medical interventions has been an active area of research in recent years. It includes cost-effectiveness analysis, which shows the relationship between the total resources used (costs) and the health benefits achieved (effects) for an intervention compared to an alternative strategy. Often a standard metric such as life-expectancy or quality adjusted life-expectancy is used as the measure of health benefits.

In part with funding from the Agency for Health Care Research and Quality, my colleagues and I have compiled a list of over 1500 cost-effectiveness ratios, covering a wide variety of medical technologies and public health strategies in many disease areas. More information is available on our website www.hsph.harvard.edu/cearegistry.

These data underscore several important points about the cost-effectiveness of medical technology. First, a great deal of information on the topic has become available to policymakers in recent years. Unlike many unsupported assertions made about the "cost-effectiveness" of drugs and other medical technology, these studies quantify costs and health effects using data and a standard, well-accepted methodological technique.

Second, according to peer-reviewed articles, many technologies are indeed cost-effective. Examples include warfarin therapy to prevent stroke in those with atrial fibrillation, immunosuppressive drugs for those with kidney transplants, and treatment with mood-altering drugs for those suffering from depression. These interventions provide good value in the sense that they produce health benefits for relatively little cost, or may actually save money for the health care system.

Third, cost-effectiveness does not mean cost-savings. Over the years, people have sometimes confused these terms. But restricting the term cost-effective to cost-saving interventions (where equal or better health outcomes is implied) would exclude many widely accepted interventions, which do not save money but are "cost-effective" in the sense that their additional benefit are worth their additional cost.

A related point is that a critical aspect of any medical technology's cost-effectiveness involves the manner in which the question is framed. A technology is not intrinsically cost-effective or cost-ineffective. It is only meaningful to say that a technology is cost-effective

compared to something else. A drug prescribed to lower an individual's blood pressure may in fact be cost-effective compared to the option of no treatment, but not necessarily when compared to an alternative intervention, such as an intensive program of diet and exercise, or another medication. Similarly, claims of cost-effectiveness often depend on the population under investigation. For example, statin drugs used to lower an individual's cholesterol have been found to be relatively cost-effective as secondary prevention in persons with existing heart disease, but considerably less cost-effective as primary prevention.

Does anyone actually use CEA? Logically, cost effectiveness analysis should be used by private insurers and state and federal policy makers. However, many payers, including Medicare, have shied away from using CEA in coverage and reimbursement decisions.

But why? Cost-effectiveness analysis promises to inform decisions and enhance population health in an explicit, quantitative and systematic manner. Medical journals, including the most prestigious ones, routinely publish CEAs. Furthermore, many other countries have incorporated CEA into their policy decisions.

How do we explain this paradox? Studies point to a couple of explanations. Some of them fault the methodology itself. But in fact, most experts agree on the basic tenets. Instead, the opposition more likely relates to the hardened American distaste for explicit rationing. This is understandable, perhaps. But still, how do we get good value in face of this opposition?

I would offer five observations as we look ahead.

CEA should not be used rigidly. Leaders in the field have always warned against using CEA mechanically, but experiences teaches that rigid use of CEA will be resisted. Expectations for CEA should be modest. CEA should inform decisions not dictate them.

CEA will not save money. CEA should not be conceptualized or promoted as a cost containment tool, but rather as a technique for obtaining better value. Paradoxically, using CEA may actually increase health spending, because it often reveals under- than over treatment.

How you say it matters. Research shows that physicians understand that resources are limited but they are not willing to admit to rationing. Similarly, health plan managers deny that they ration care but admit that their budgets are constrained. These responses are instructive. It suggests that the term "cost-effectiveness" may be part of the problem. We might instead use terms such as "value analysis" and comparability, rather than cost-effectiveness analysis and rationing.

Incentives first. Debates about the use of cost-effectiveness cannot be separated from debates about the underlying health system and the incentives they embody. The technique is sometimes opposed if used centrally. But reconfiguring the incentives facing providers and patients is challenging and critical.

Think broadly across sectors. A final message involves the importance of thinking expansively about applications of CE information. CEAs should not simply focus on medical interventions but more broadly on interventions to improve health by reducing environmental exposures, injuries at home and in the workplace, and motor vehicle accidents.

In closing let me emphasize that whether medical technology offers good value is a question that can only be informed by careful analysis. I would encourage the judicious use of cost-effectiveness analysis in the years ahead.

Thank you very much.

Table 1: Selected cost-effectiveness ratios

Interventions	Cost per QALY ratio (US$2002)
Onetime colonoscopic screening for colorectal cancer at 60-64 yrs old vs. no screening in women over 40 years old	Cost-saving
Chemoprevention with tamoxifen vs. surveillance in 40 year-old women with high-risk breast cancer 1/2 mutations	$1,800
Drug treatment vs. no treatment in stage I hypertensive patients: men, age 80	$4,800
High-dose palliative radiotherapy vs. best supportive care in patients with advanced non-small-cell lung cancer	$13,000
Combined outreach for the pneumococcal and influenza vaccines vs. no new outreach program in persons aged 65 years old and older never vaccinated with pneumococcal vaccine and/or not vaccinated for influenza in the last year	$13,000
Screening for diabetes mellitus vs. no systematic diabetes mellitus screening in all individuals age 35-44	$22,000
Driver side air bag vs. no air bags in driving population (and passengers)	$30,000
Bypass surgery vs. medical management + aspirin over 5 years in ischaemic heart disease patients	$35,000
Automated external defibrillators on large-capacity aircraft, selective training vs. no automated external defibrillators, attendants with basic life support training in patients experiencing cardiac arrest onboard US commercial aircraft during a 12-month period	$36,000
Coronary artery bypass graft surgery vs. percutaneous transluminal coronary angioplasty (PTCA) in 55-yo men with 3-vessel coronary artery disease and type A lesions with severe angina and normal ventricular function	$99,000
Intensive school-based tobacco prevention program vs. status quo (Current average national tobacco educational practices) in every 7th and 8th grade in the U.S.	$5,300-650,000
MRI + dynamic susceptibility contrast-enhanced (DSC) magnetic resonance imaging (MRI) vs. head computed tomography (CT) scan only in patients presenting for the first time to an Alzheimer's Disease center/clinic.	$530,000
Triple therapy with zidovudine, lamivudine, and indinavir for all exposures vs. The current United States Public Health Services (USPHS) post-exposure prophylaxis guidelines in health care workers exposed to known HIV+ blood	$850,000
Surgical strategy vs. Medical strategy in 45 year old men with severe esophagitis	$1,900,000

Source: Harvard School of Public Health Cost-Effectiveness Registry, 2003. www.hsph.harvard.edu.cearegistry.

Cost-Effectiveness of Underutilized Interventions in the Medicare population

Health intervention	Cost-Effectiveness ($/QALY)	% Implementation in Medicare population	
Influenza vaccine	Cost saving	40-70%	
Pneumococcal vaccine	Under $10K/QALY	55-60%	
Beta blocker treatment after myocardial infarction	Under $10K/QALY	85%	
Mammogram	Under $20K/QALY	75% (depending on age)	
Colon cancer screening	Under $20K/QALY	20-40% (depending on age)	
Osteoporosis screening	Under $20K/QALY	35%	
Antidepressant medication management	Under $25K/QALY	40-55%	
Hypertension control	Under $50K/QALY	35%	

Source: Harvard School of Public Health, 2003
QALY=quality-adjusted life year
Note: The estimates in this table are intended to provide a rough guide to cost-effectiveness and % implementation. However, study methodology for estimated cost-effectiveness often varies across analyses. Moreover, cost-effectiveness may depend on factors such as the age and gender of the population, and the particularly screening and technologies used.