Mgmt 444

Inefficiencies and Regulatory Solutions

We have discussed inefficiencies that result when patients face the "wrong" financial incentives and make the "wrong" decisions

Motivated by Arrow's work, researchers wondered whether it might be more appropriate to examine physician incentives and decision making

- Any inefficiencies resulting from physician behavior could not be directly alleviated by copayments, and might instead require new solutions

- Researchers have identified two classes of problems with physician decision making: *medical practice variations* and *demand inducement*. Together with *moral hazard,* they represent the *three* inefficiencies of Marcus Welby Medicine

Medical Practice Variations

In the 1960s, a young physician working in the Vermont Department of Health named Jack Wennberg observed that *where you live* affects the type of medical care you receive

- Wennberg produced startling evidence of regional variation in the rate of various surgical interventions and called them *small area variations*

- Some of the variations were simply due to differences in demographics, economic circumstances, and insurance coverage

- But even after using regression to control for these differences, variations in medical practice persisted. There was no easy explanation for them. They were not due to any readily measurable factors

- Wennberg took an academic position at Dartmouth and is still active

Wennberg used a statistic called the *coefficient of variation* (CoV) to measure variations.

- CoV = Mean/Std Deviation

- E.g., consider the following data

Community	C-section Rate
Northville	.25
Southville	.3
Eastville	.35
Westville	.40

- In this data the std. dev. Is .065 and the CoV is .065/.325 = .20

- Statisticians will "risk adjust" the data to control for the possibility that the medical need for caesarians differs by community

. This involves running a regression where each data point represents a patient
. Your regression predicts whether the patient gets a caesarian (the dependent variable =1) or a vaginal delivery (dependent variable =0).
. You include predictors such as the age of mother, health status of mother, and fetal position)
. You also include "dummy variables" for each region
. The coefficients on the region dummy variables give the relative rate of the intervention in each region. The Std. Dev of these dummy variables is used to compute the CoV

Wennberg asserts that a high CoV is symptomatic of inappropriate medical decision making.

Phelps's textbook chapter provides estimates from many studies

Facts like these demand attention, and many analysts have attempted to explain:

- Where do CoV's come from?

- Do high CoV's really imply problems with medical decision making?

- What is the cost (DWT loss) of CoV?

We will have a general discussion about the first two questions, informed by a bit of empirical research. The last question can be answered using a detailed economic model

1) Where do CoV's come from?

2) Do they imply problems with medical decision making?

3) What is the cost?

Charles Phelps uses the concept of DWT loss to estimate the cost of practice variations

- He assumes that the use of any service (e.g. caesarians) in any market reflects supply and demand conditions in that market

- Markets with very high rates of use have the highest levels of demand; markets with low use have low demand

- He also assumes that there is some level of demand that is appropriate (though he does not assert where that appropriate level might be; that is up to medical experts to decide)

- These assumptions are enough to show the DWT loss from practice variations in a simple supply/demand graph

Let's view the loss graphically (in-class analysis)

Now consider how to estimate the loss. Remember, we have to decide what we think is the "appropriate" level of demand. Let's suppose it is the mean level.

- Let the utilization rate at the mean level of demand be X. Now consider the loss in a market where the demand is overly optimistic, leading to utilization 1.5X

- The dwt loss is the area under the cost line and above the demand curve, from X to 1.5X. This is a triangle.

- To compute the area, we need to know the slope of the demand curve. If the slope is -B, then the area is $.5(.5X)(B \cdot .5X) = .125BX^2$

- Given a CoV and a slope, one can use calculus to integrate the DWT loss over the range of demand curves to compute the aggregate DWT loss (technique beyond the scope of the course)

- E.g. Phelps estimates the annual loss from variation in CABG at $1 billion

Combining Practice Variations with Moral Hazard

The following model shows how decision making can go awry as a result of these two problems

Suppose that an individual seeks medical attention. That individual has a set of symptoms that allows the MD to form a diagnosis

Suppose the true value of an intervention is V_t and the cost if C. Then if we take the societal view:

Treatment should be given if $V_t > C$

Practice variation researchers believe that MDs and their patients do not accurately assess V_t.

- Instead, they assess the value of care to equal $V_t + V_e$, where V_e is an error in judging the value of the treatment

- Also note that patients do not pay C, but instead pay λP where λ is a cost sharing parameter and P is the price. If we suppose that $P \approx C$, then

Treatment is actually given when $V_t + V_e > \lambda C$

This leads to several possibilities:

	$\mathbf{V_t > C}$	$\mathbf{V_t < C}$
$\mathbf{V_t + V_e > \lambda C}$	Treatment correctly given	Treatment incorrectly given (λ small and V_e big)
$\mathbf{V_t + V_e < \lambda C}$	Treatment incorrectly denied V_e very small and λ not too small	Treatment correctly denied

We will return to this table in a later lecture when we discuss managed care controls on physician decision making

Demand Inducement

Another potential problem with Marcus Welby Medicine surfaced in an early 1960s article in the magazine *Hospitals*

- Milton Roemer reported on an interesting "natural experiment"

    - After a hospital in upstate New York added about 50 beds, the daily census increased by about 25 patients
    - This led to the famous saying, "a bed built is a bed filled", or, more accurately, "a bed built is a bed half filled

- Of course, hospital managers today would love to be able to fill their empty beds so easily

- But the idea took hold with a research and policy community convinced that health care markets were "different" and defied conventional analysis

One follow-up paper was written by prominent Harvard economist Martin Feldstein

- Though the results turned out to be invalid, the paper has historical significance and raises important statistical issues

- We will use it as an excuse to see the footprints of omitted variable bias in health services research

Feldstein estimated demand curves for physician services

- He used empirical methods commonly used study markets that are in equilibrium and consistently found a positive coefficient on price

- This permitted three conclusions, only two of which Feldstein acknowledged

    . Demand sloped up
    . Medical markets are not in equilibrium
    . His empirical methods were flawed

Feldstein embraced the second conclusion.

- He even posited an alternative to traditional equilibrium models of supply and demand – the theory of "permanent excess demand"

  . MDs deliberately set low prices so as to have an excess of patients.
  . They then choose the "most interesting" cases
  . Feldstein does not directly test this conjecture. It is an inference based on the failure to get the expected slope for demand

As it turns out, Feldstein's methods were flawed

- Feldstein had 19 years of annual data on utilization of physician data, an MD services price index, and a few control variables

- He regressed

  MD services per capita = $B_0 + B_pP + B_x\underline{X}$

  where $\underline{X}$ represents control variables

- He generally found $B_p > 0$

- Should we accept the regression results are correctly describing the effect of price in the real world?

As you know, regression coefficients imply correlation, not causation

- There are of course three possible sources of correlation between A and B:

  . A → B
  . B → A (reverse causality)
  . There is some other factor C, where C → A and C → B (OVB)

Both alternative explanations are plausible

- If demand is growing over time, then MDs may incur higher costs by working longer, hiring more staff, etc. This would lead to higher fees.

- A third factor, quality, increased during the period of the study.

OVB rears its head quite often in older health services research, and is worth reviewing OVB to make you savvier consumers of the research

You must consider two things to assess the direction of omitted variable bias,

- What would be the effect of the omitted Z on the dependent variable Y?

- What is the correlation between Z and the included variable X?

- The following table reports the direction of the bias

. Biased "positive" implies that the regression coefficient is more positive than the actual real world effect
. Biased "negative" implies that the regression coefficient is more negative than the actual real world effect

	Effect of Z on Y	
Correlation between X and Z	Positive	Negative
Positive	Biased positive	Biased negative
Negative	Biased negative	Biased positive

In Feldstein's study, Quality (Z) has a positive effect on quantity (Y) and is correlated positively with price (X). Thus it causes the coefficient on price to be biased positive.

- I.e., The coefficient on price picks up the effect of price *and* the effect of quality changes on demand

Here are other examples of OVB in health services research

- E.g., Studies of the effect of treatment costs on mortality

  . Lower treatment costs are associated in the data with superior outcomes
  . Q: What is the potential OVB?

- E.g., Studies of the effect of hospital management style on hospital profits

  . Hospitals with "prospector" managers (e.g., first to adopt new technologies) earn higher profits
  . Q: What is the potential OVB?

By the mid-1970s, Arrow's ideas about the prominent role of the physician, combined with Roemer's study of hospital beds, led to one of the most important theories in health economics, the theory of *supplier-induced demand*

The theory starts with a consideration of the role of physician as agent

- The MD is both a diagnostician and clinician

- There is a clinical gray area in which several treatments are of roughly equal effectiveness

- As long as patient well-being is not markedly affected, MDs will act selfishly, recommending more remunerative treatment options

- Patients are relatively uninformed and are likely to consent unless the recommendation is totally unreasonable

The theory then assesses the impact of adding fee-for-service payments

- Physicians get paid more to do more

- The conclusion: Physicians can and will recommend high cost services of questionable value

- Inducement is constrained only by patient credulity and the physician's conscience

There is little controversy about the claim that incentives matter.

The strong version of inducement theory goes one step further, arguing that incentives matter most when physicians are faring least well financially

- This generates the *target income hypothesis*: MDs are more likely to induce demand when their income is lower, such as might happen if the supply of MDs increased or fees were cut.

Early research on FFS incentives focused on the target income hypothesis

- In a seminal paper, Victor Fuchs offered some of the most widely cited empirical estimates

- He was perhaps the first to suggest that we could think about inducement as simply a *shifting of the demand curve* (see figure)

- Suppose supply of MDs increases. If MDs do not induce demand, then what would happen to their income?

- The target income hypothesis holds that MDs will induce more demand when the supply of MDs is higher

Equation (1) expresses the target income/inducement hypothesis:

(1) $Q_d = g(X_d, \#MDs)$

- Equation (1) can be estimated using regression techniques

Fuchs set about to estimate equation (1)

- He collected data on the quantity of MD services provided in different markets (Q_d), predictors of demand (X_d), and the supply of MDs in those markets (Q_s)

- He did not immediately estimate equation (1), however, due to concerns about causality

To understand his concerns, consider the following example:

- E.g., Suppose a regression reveals a positive relationship between construction workers and the number of office buildings under construction.

- What is the assumed direction of causality?

A similar causality question emerges in the case of supplier-induced demand:

- You may observe a positive relationship between the number of MDs and the utilization of MD services. Do more MDs cause high demand, or does high demand cause more MDs?

- Fuchs understood that he needed to do more than simple regression analysis if he was to disentangle causality

- He employed what was, at the time, a new analytic technique known as Two Stage Least Squares (TSLS)

The following thought experiment may clarify the intuition behind TSLS:

- Suppose we could randomly allocate MDs to different places, making sure to allocated more MDs to some places than others.

- We are now sure that Q_s is not caused by Q_d. Nor is there some third factor affecting both of them.

- If Q_s is correlated with Q_d , we can be certain that Q_s caused Q_d. We would have proven that inducement occurs

We need some factor *I* with the following characteristics (*I* stands for “instrument” or “identifier”):

- *I* affects the location of MDs

- The demand for MDs does not affect *I*

- There is no third factor Z that affects *I* and the demand for MDs, aside from factors that can be controlled for in the regression

Finding valid instruments is not easy

- Perhaps we could examine the number and quality of golf courses.

. It seems plausible that MDs prefer to live near golf courses.
. It seems doubtful that golf courses affect Q_d.
. Q: Could some factor affect both golf and Q_d?

- If we observed that Q_s is higher in areas with more golf courses, and that Q_d is also higher in the areas with lots of golf courses, then we would reason as follows:

. “These golf courses are here for a reason that has nothing to do with demand for medical care. But the golf courses also attract a lot of MDs. The fact that the use of medical care is higher among nearby residents, is therefore evidence that the local MDs are inducing demand.”

You implement TSLS as follows

- You start with the initial set of variables Q_d, X_d, and Q_s

- You add identifiers *I*

- Stage one: regress $Q_s = f(I, X_d)$

  . Recover the *predicted* values of Q_s. Call them $\widehat{Q_s}$

- Stage two: estimate equation (2), which is a slight variation of equation (1)

(2) $Q_d = g(X_d, \widehat{Q_s})$[1]

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- The regressor $\widehat{Q_s}$ contains information that is correlated with Q_s but, by design, is otherwise unrelated to Q_d.

- If the coefficient on $\widehat{Q_s}$ is significant, then Q_s really does cause Q_d

Fuchs implements TSLS in a famous 1978 paper

- He gets a coefficient on predicted supply that indicates an inducement elasticity of .28

  . For every 10 percent increase in MD supply, the number of surgeries per capita would increase by 2.8 percent

- Later studies using a more complete set of identifiers and more detailed data obtain elasticities of about .10

  . For every 10 percent increase in MD supply, the number of surgeries per capita would increase by 1 percent
  . Findings like these prompted calls to limit MD supply and specialist training

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[1] As a technical aside, it is necessary to perform a statistical adjustment to the standard errors in equation (2). Modern statistical software makes this easy. Fuchs had to employ a team of graduate students to do the work by hand!

- Many researchers were not satisfied with these studies.

    . TSLS lives or dies by the quality of the identifiers
    . Key identifiers in the inducement literature are dollars spent on hotels per capita (Fuchs) and weather conditions (later authors)
    . These are valid instruments only if they predict MD supply but are not otherwise related to the demand for MD services

I published a paper that criticized these identifiers

- I studied a procedure for which the ability of MDs to influence quantity was minimal – there should be no evidence of inducement

- I used the hotel and weather identifiers and got similar evidence of inducement.

- The method appears to find inducement even when there isn't any

- This does not reject the theory, but does challenge whether there exists any statistical support for it

The academic community continues to debate the target income hypothesis.

However, policy makers are convinced that MDs will do what they can to maintain their incomes. Here are some examples of what they have done in response

- German physicians are capped on the aggregate number of tests and procedures they may perform (based on their total number of patients)

- Canada limits the availability of costly diagnostic services, creating queues and relying on triage to best serve the neediest patients

- Medicare tried to cap the total payments for surgeries after implementing rules that would reduce the fee per surgery

- Planning laws (i.e. Certificate of Need) in Illinois and elsewhere continue to be based on the theory that supply creates its own demand

Our concerns about empirical methods also apply to other studies of incentives

- A classic set of studies pertains to the relationship between ownership of testing equipment and ordering of tests (This is weak form because financial incentives to order tests are greater when the doctor owns the equipment)

- Several famous studies appear to show that MDs who own testing equipment order about 2-3 times as many tests as those who do not

- This led several states to ban MD ownership of testing equipment and MD dispensing of Rx (though a few nations, such as Japan, allow this practice)

We must again remember that correlation does not imply causality

- Q: Can anyone offer another explanation for the correlation?

- Hemenway's 1992 before-and-after study in NEJM suggests that ownership effect is much smaller

- We will see next week that other researchers have used "before and after" studies to assess how incentives affect provider behavior

In-class discussion question:

Imagine that you are a lobbyist for the German College of Obstetrics and Gynecology (DGGG). A consortium of Sickness Funds (quasi private insurers) has presented data to the Federal Government on the extent of variations in caesarian section rates across cities in Germany. They want to profile all German doctors and withhold funding from those doctors whose risk-adjusted c-section rates depart from acceptable norms. (Such profiling already takes place in Germany for drug prescription and selected other practices.) How would you respond to this profiling recommendation? Can you offer a proposal that serves both the members of DGGG and the German public?

Regulatory Responses

By the early 1970s, health care costs were escalating world wide.

- European nations and Canada introduced nationalized systems for financing care

- U.S. continued to rely on a private/public mix

- In all cases, governments sought to rein in spending

Regardless of where they are implemented, spending controls come in a limited number of flavors

- Limit Q

  . You could forbid certain services but that is a bit extreme; it is more effective to limit availability of the inputs into the services
  . For example, suppose the production of surgery requires both equipment and labor.
  . If you limit the availability of capital, then there is little labor can do
  . In fact, this forces labor (i.e., doctors) to figure out how to ration the available equipment
  . Thus, if you believe there is too much surgery (perhaps due to inducement or moral hazard), then you simply limit availability of equipment

- This is the main way that Canada and England limit total spending

- Rationing has been well documented

  . Canada: http://www.fraserinstitute.ca/admin/books/chapterfiles/WYT2005pt2.pdf#
  . England: http://www.performance.doh.gov.uk/waitingtimes/index.htm
  . There are also waiting lists in Scandinavian countries. For example: http://www.fraserinstitute.ca/admin/books/files/swedish-health-2.pdf

- Limit P

    . Favorable direct effect on total spending
    . Indirect on total spending by affecting Q.
    . Q: What direction is this effect?

- Price caps on MDs are particularly important in Germany (where MDs also face global utilization caps)

- In UK, MDs are salaried (with substantial bonus structure), reducing incentives for inducement

- All regulated nations place caps on prices they pay for technology

    . There is a variety of other approaches for regulating drug pricing, such as “most favored nation” pricing and “reference pricing.
    . We will talk more about these regulatory options in our pricing lecture

We will focus the remainder of our time on U.S. regulations, for two reasons

- U.S. regulations have spilled over to private sector, profoundly affecting providers as well as technology suppliers

- Reams of available research evidence provide the most compelling understanding of how regulation works

Begin with US regulation of Q

One form of quantity regulation is direct oversight of medical decision making

- "Utilization review" (UR) is an offshoot of third party "peer review"

    . Q: How is this related to practice variations?

- Third party peer review formalized in U.S. in 1972 with creation of Professional Standards Review Organizations (PSROs)

    . Local physician panels charged with establishing guidelines and assuring that MDs follow them
    . CBO found minimal impact on overall costs
    . No apparent impact on practice variations

- Q: Why do you suppose PSROs failed? Would your reasons apply today?

- PSROs would be replaced in 1983 by Professional Review Organizations, which themselves became the impetus for private sector utilization review

    . We will say more about private UR when we discuss managed care
    . But note the lineage of private UR; it is not unique

Another form of quantity oversight is facilities *planning*

- Healthcare planning is an old and respected field

    . Planners use epidemiological data to forecast medical utilization
    . They use productivity data to establish resource needs for any utilization level
    . Combine forecasts and productivity to compute resource needs
    . Compare with current resource availability. Difference is the resource deficit or surplus

- Example: Planning for heart surgery facilities

. Based on forecasts made in 1976, Chicagoans would undergo 1500 CABG surgeries in 1984
. Estimated that the optimal CABG surgery unit should perform 300 procedures annually
. Chicago had 2 surgery units at that time
. Thus, planners would allow for establishment of 3 more facilities

- Q: Comments?

- This planning methodology began in several states in the 1960s and was enshrined in the National Health Planning and Resource Development Act of 1974

. Created Health Systems Agencies charged with setting planning goals
. Hospitals had to obtain "Certificates of Need" to add beds, surgical units, or make large capital investments in things like new diagnostic technology
. CON applications included planning studies documenting utilization projections and deficits in available resources
. Local boards held community hearings in which merits of CON proposals were debated, and then voted CON applications up or down

- Evidence fairly conclusive that CON failed

. Q: What factors weighed against the success of CON?

- National CON was repealed in early 1980s but survives in many states including Illinois

. Illinois' program is in jeopardy

Let’s turn our attention to US regulation of price

- As with CON, price regulation began with the states

- “Marcus Welby” healthcare markets can create a pricing nightmare

  . Providers control decision making
  . Patients are loyal
  . Patients are insensitive to price

- Famous economist Dennis Carlton once asked me: “Why aren’t prices infinity?”

- Insurers worried about this too, and large ones negotiated special pricing arrangements based on principles of utility regulation

  . Cost-based reimbursement guaranteed hospitals a set rate of return on total expenses/assets (depending on the model used)
  . Q: What are the potential problems with cost-based reimbursement?

- States began using cost-based reimbursement for Medicaid hospital payments, but this wasn’t working

- NY in 1970 had the nation’s largest Medicaid program. It proposed to set hospital rates prospectively

  . Announce a flat *per diem* rate
  . Hospitals had to keep their costs under that rate
  . Provided patient days did not increase, NY could keep a tight hold on its Medicaid hospital budget
  . Medicare agreed to go along
  . Private insurers, fearing “cost-shifting”, asked to be under the umbrella

- Within a few years, several other states had followed suit

- Research suggests that these states would have experienced “mean regression” in costs, but even so, prospective rate setting was having a small but meaningful effect on costs

Medicare took notice

- Prospective payment had desirable incentives

- But *per diem* payments made little sense

  . The "good" being sold was not a hospital *day*
  . The "good" was a *treatment*

- Medicare set a fixed a prospective price per *admission*; this is known as the Prospective Payment System (PPS)

  . Adjust price based on treatment/condition
  . Adopted diagnosis related group (DRG) system being developed by Yale researchers
  . Originally 470 DRGs, now 590
  . The price is adjusted further to account for regional cost differences, teaching and rural status

- The PPS created "yardstick competition"

  . Illustration: Suppose the average cost of treating a patient is given by $AC = \alpha - \beta E + \gamma E^2$, where E is management effort
  . In this formulation, E is part of the cost, and there are diminishing returns to effort, so that average costs can go up if management works too hard (due to rising management costs that are not offset by falling treatment costs)
  . We could generalize this; E could represent nursing effort, or even hospital size
  . The important point is that there is a U-shaped cost curve:

- Note the implications of yardstick competition

  . For any regulated price, what is the profit maximizing level of E?
  . Under PPS, what is the resulting regulated price in the long run?
  . In this way, “yardstick competition” emulates market competition
  . (Note: the graphical example in the assigned reading is correct but overly complex)

- Medicare understood that PPS might lead to perverse responses by hospitals

  . It created PROs to oversee the program, limit rapid readmission and “unbundling” of admissions
  . Q: How might hospitals respond to this system?

Upcoding and for-profit hospitals

- Providers have considerable discretion when recording diagnostic codes

- (As we will see, this is a big issue for report cards)

- The DRG system invites “upcoding”

  . Many DRGs are in “couplets”; e.g., DRG 16 (CVD w/ complications) and DRG 17 (CVD w/o complications).
  . Medical records coders receive considerable training as to what to include as complications
  . There is a gray area that can affect remuneration; the payment for DRG 16 is nearly double that for DRG 17 (about $7000 versus $4000).

- Leemore Dafny has documented that for-profit hospitals are more likely to place patients in the more remunerative DRG in the couplet

  . This could simply reflect patient mix
  . But, in late 1980s, a change in Medicare rules widened the payment gap between the DRGs in each couplet
  . The result? There was a pronounced shift into the more remunerative DRG in for-profits; much less so in non-profits!

The query “why aren’t prices infinity?” applies almost as well to doctors

- Historically, patients were less well insured for MDs

- Patients did show some price sensitivity

- Insurers established “UCR” payment rules

  . Pay the maximum of the usual, customary, or reasonable fee
  . “Usual” is what the doctor charges other patients (thus the insurer price reflects the price charged by the doctor to uninsured patients)
  . “Customary” is the median fee in the community
  . “Reasonable” was to allow exceptions in special cases

- This fee schedule endured into the 1990s, by which time almost all Americans had MD insurance and the UCR payment was effectively an inflation adjustment above the prior year’s payment

- There were alarming discrepancies between prices paid for “cognitive” versus “procedural” services

  . Both on an annual and hourly basis, surgeons made 2-3 times the earnings of primary care providers
  . Q: What kinds of distortions would this create?
  . Q: Why do you suppose these pricing discrepancies arose to begin with?

- In 1992, Medicare replaced its UCR system with the “Resource Based Relative Value Scale” This remains the foundation for MD payments in both public and private insurance programs

- RBRVS is a “comparable worth” system

  . A legacy of the movement to equilibrate men’s and women’s wages
  . Formulae were developed to estimate the “cost” of performing work, and set pay according to the cost

- Here is the 2008 formula from Medicare:

Work RVU x Budget Neutrality Work Adjustor x Work Geographic Practice Cost Index (GPCI)
+ Practice Expense (PE) RVU x PE GPCI
+ Malpractice (PLI) RVU x PLI GPCI
= Total RVU
x $38.087
= Medicare Payment

- The cost of providing each service is divided into three components:

. Physician work RVU (includes time spent performing the activity, technical skill and physical effort, mental effort, and stress)
. Practice expense RVU (training, office space, staff expenses)
. Professional liability insurance (based on treatment specific exposure to liability but lagged 3-4 years)

- Each procedure is coded and given a work and malpractice RVU

- The "Budget Neutrality Work Adjustor" is based in science but determined by politics. It is currently 0.8806 (i.e., payments are adjusted down.)

- Each specialty has a practice expense RVU

- The payment for service with RVU = 1 is $38.087

- For more, visit http://www.ama-assn.org/ama/pub/category/16397.html

Q: Why might market wages for MDs differ from the RBRVS wage?
Is the RBRVS a step in the right direction?

It turns out that RBRVS has only partly closed the gap between wages for cognitive services and procedures.

- E.g., in 1991, the payment for 72 mid-level office visits to an internist equaled to payment for 1 CABG procedure by a heart surgeon. Today, it requires about 40 office visits to equal 1 CABG surgery.

- Yet heart surgeon incomes still exceed general internal medicine salaries by at least 100%