PART 3

The Efficiency of Competition and Contracts in Health Care

Introduction

This year's Nobel Prize in economics was awarded to three economists for laying the foundations of mechanism design theory, a branch of economics that addresses the question of how to best design an economic system to attain the objectives, when information is not perfect and not symmetrically held among the parties involved. Most of the problems addressed in recent years by health economists and other health services researchers can be thought of as mechanism design questions. This is also true for the papers presented at the 3rd International Jerusalem Conference on Health Policy that appear in this volume.

Two important economic mechanisms are markets and contracts. Each of these mechanisms was the focus of one of our section's two keynote speakers at the conference, and summaries of their ideas appear in this volume. Tom McGuire, in his paper titled "Paying Doctors to Improve the Quality of Care", comments on pay for performance contracts in healthcare and their effects on quality and costs. Marty Gaynor, in "What Do We Know About Competition in Healthcare Markets?" addresses questions related to competition in healthcare and its effects on quality and costs. They both reach more or less the same conclusion, namely, that pay for performance and competition definitely affect providers' behavior but not always in the desired way. Much more research is needed before we can optimally apply these mechanisms.

The other papers also relate to one of these two mechanisms. Tor Iversen, in "Some Consequences of Incomplete Contracts for Primary Care Physicians", studies the performance of doctors when quality of care cannot be contracted upon and shows how the doctors' style of practice, in such cases, may be affected by the patients' preferences. Marcus Tamm, Harald Tauchmann, Jurgen Wasen and Stefan Gredi, in "The Dynamics of Price Responsiveness in the German Social Insurance Systems", study the effects of competition between health insurance companies on quality and prices. They show that if consumers can freely move between health insurers, competitive pressure will induce the companies to charge lower prices and provide higher quality. Esti Engelchin-Nissan, Moshe Leshno and Joseph S. Pliskin, in "Incorporating

a Geographical Variable within a Centralization Index", propose a modification of the well-known Herfindahl-Hirschman Index of market concentration, according to which the size of submarkets is also taken into account in the calculation of the index. They show that such a modification may lead to different results in terms of the degree of market centralization that these indexes are intended to measure. Julian Le Grand, in "Choice and Competition in Publicly Funded Health Care", discusses some of the tradeoffs that emerge in a competitive health care sector. The paper then draws some interesting conclusions about how a publicly funded health care sector should be designed, if one is to optimally address these tradeoffs.

These are all interesting papers and we wish you enjoyable reading.

Jacob Glazer and Thomas G. McGuire

Paying Doctors to Improve the Quality of Care*

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Professor Shani and Dr. Schroeder presented some dismal statistics about the quality of health care both in the US and in other countries. I'll remind you of one example: each year, in hospitals in America, between 50,000 and 100,000 people die due to preventable medical errors (Institute of Medicine, 2001). By the time you get to be my age it's not just a statistic – someone in your family or amongst friends is very likely to have been one of those statistics. Another issue is cost – $ 7000 dollars per person, $ 15,000 dollars per family per year.

If you put these things together, high cost and low quality, in economic terms we have an efficiency problem. What I'm going to be talking about today is a particular reform of paying doctors for their performance to address problems of quality and cost.

Before doing so, there are a couple of bases I want to touch. The first of these has to do with incentives – if this or any reform is to have a chance of working, financial incentives must affect doctors' behavior. In my experience in speaking to general audiences, I know not 100% of you believe that doctors are motivated by money. A number of people believe that doctors care only about their patients and what doctors do is what the patient needs. Money is not really a concern. If you are firmly in that camp I'm probably not going to change you but I might be able to soften you up a little bit by briefly mentioning a few of the studies that have examined how financial incentives affect doctors' behavior.

* Edited version of remarks made at the conference.

Arnie Epstein, a physician researcher at the Harvard School of Public Health, studied doctors in office practice who are paid by fee for service and by capitation. In the fee for service practice doctors receive more money if they recommend more tests for their patients. He found that if you compare doctors paid by these two methods, the highly profitable tests were done more frequently for the fee for service patients than for the capitated patients (Epstein, Begg, & Mc Neil, 1986).

Another study, a literal experiment, involved patients paid under fee for service and paid under capitation randomized to different pediatricians. Pediatricians whose patients were paid by fee for service attempted to provide more services to them; not only more services than the capitated doctors provided but more services than their own professional organization recommended should be provided to children (Hickson, Altemeier, & Perrin, 1987).

These are some of the studies that bear on the question of physicians responding to financial incentives. What these studies show, and what I believe, is that money (or incentives) matter. They do not show that only money matters. When a health economist claims that financial incentives affect doctors, it's not saying that only money matters; it's only saying that money matters.

The US healthcare system can be graded in two ways – achievement and effort. We do poorly on the payer-patient connection. America is a chaotic multiple payer system where insurers chase the good risks, where we have high administrative costs, where we have 46 million uninsured, where everybody is unhappy with the paperwork. Another part of the American system that does not do so badly is the payer-provider connection. There is quite a bit of interest in the rest of the world in American type institutions. DCGs (diagnostic cost groups) is a capitated payment system that was developed in the US for Medicare (Newhouse, 2002) and is evoking interest from the rest of the world. Germany, Netherlands, and other Western European countries employ a version of DRGs. (Wiley, 2004). DRGs are probably the most famous American export in healthcare. Diagnosis related groups are an empirical way to figure out how to pay hospitals. Physician payment methodologies developed in the US are also a basis for policy elsewhere.

What I will begin to talk about now is pay for performance (P4P), another American export concerning payment. Let me begin my

discussion of physician pay for performance with a new report from the Institute of Medicine (2006).

Pay for performance is a way to manipulate doctor behavior by aligning their incentives to good quality of care. What is the evidence as it exists in 2006 for physician pay for performance? From the report: "most studies have failed to demonstrate any significant effect." The evidence base for pay for performance is basically non existent. In spite of this absence, the Institute of Medicine recommended that Medicare begin to use pay for performance.

Why is this? The idea of pay for performance makes sense to people, in spite of the (lack of) evidence. I also think there is a kind of desperation, at least in America, in trying to deal with quality problems, and pay for performance, for better or for worse, is maybe the best idea around.

What I'd like to do now in talking about pay for performance is highlight a few of the things you should watch out for in the case studies that I will present in a few minutes. I'm going to talk about four issues or concerns, and then I'll turn to three case studies: The first case study will be the American Private Health Care system, the second will be the American Medicare; and the third case study will be the United Kingdom (Rosenthal, Landon, Sharon-Liss, Frank, & Epstein, 2006; Miller, 2005; Doran et al., 2006).

Is pay for performance cost effective? I don't think anybody doubts that if we pay doctors to do a certain thing and if we pay them enough they'll do more of that thing. If we say we want you to screen for cervical cancer in women over 50 and we pay you enough each time you do, we'll get doctors to do more cervical cancer screening.

A supply curve relates price, the "pay" for performance, to quantity of the desired service. As prices goes up, more patients are tested, but the price applies to all patients, even those who would have been tested without the pay for performance. This can make the cost per new patient tested very high, an effect that will be evident in one of the case studies I'll be presenting.

A common way to structure pay for performance systems is to set a price on hitting a target, which is what the private health insurance example in the US does and what the UK system does. This is bound to be inefficient. First of all, there are doctors already hitting the target. They could do more, but they're not given any incentive to do more by a target

that they already hit. In the same way there are doctors who are far away from the target either because of their own practice patterns or because of the patients they're taking care of. There's no way I'm going to get 75 percent of my patients tested, and so the target doesn't do anything for me. It's only the doctors who are a little bit less than the target in the first place who can reach the target at a reasonable cost that will increase their rate. So it also doesn't look like you're going to get very much, and what you get is inefficient. The distribution of new effort in response to a price for a target is not the distribution that minimizes the cost of the increase in testing for the entire population of doctors.

A second issue is multitasking. "Multi-tasking" means if you pay on one thing then you might get more of that but you're in danger of a doctor who only has ten minutes per patient, being less attentive to something else. Any partial system of reward has the danger of gaining something but at the same time losing something.

Third, we can ask, is pay for performance fair and acceptable to physicians? One of the points that Professor Le Grand made yesterday is: doctors like to be trusted; they like to be perceived as all being competent; as all performing at a high level. And once policy makers introduce a system that distinguishes the good from the bad, we may have to pay a price in some way. For one thing, any of these systems will have a bit of capriciousness in them. Trying to identify the high and low performers, we're not always going to get it right.

Imagine two distributions representing the good doctors and the not so good doctors in terms of their achievement of a particular target. Not everything influencing performance is under the doctors' control. Even though the good doctors may be more likely to achieve a good target, it may be because of where they practice, or the nature of the patients they take care of. A particular target is going to be easier or harder to reach depending on what your circumstances are. It's going to mean we're making errors in our rating system. Some of the doctors that are good doctors and doing the best they can are going to fail and, some of the bad doctors are going to be blessed and mistakenly rewarded as good doctors. This will create friction.

The fourth thing I want to mention in terms of the potential problems of pay for performance are data and operational issues. How to measure quality? What do we mean by quality? How to determine these targets?

How to do it in a timely way? What good are these data if they're two years old? If you use a system to reward or punish which is two years old, doctors may say my practice is completely different now. Another simple thing which we have a huge problem with in America is figuring out whose doctor this patient is? Patients see many doctors. Which doctor are we going to hold responsible for taking care of this patient?

Let me turn now to what's happening in the pay for performance in the US. Pay for performance is getting pretty popular, the evidence for its cost-effectiveness not withstanding. More than half of our HMOs are using some kind of pay for performance (Rosenthal & Frank, 2006).

It applies both to physicians and hospitals. I'm going to be talking only about physicians today. Only a few measures are used, not very much money is on the table at this point, and the typical pay for performance system uses a target rather than improvement based on some baseline.

Case study number one is about the private health insurance sector in the United States, specifically about PacifiCare, a large managed care plan in California. PacifiCare writes sub-contracts to physician groups - capitation contracts - and the physician group is then responsible for providing health care to the patients that chose that physician group. PacifiCare in California included a pay for performance system. PacifiCare operates the same insurance model in Oregon and Washington state (Rosenthal and Frank, 2006). Researchers were able to compare the improvement in quality in California during the time of the pay for performance system with what was happening with the medical groups in Oregon and Washington. Here are the results: The California network that was the experimental group demonstrated greater quality improvement after the pay for performance intervention only with respect to one of these interventions, and the intervention was pretty small. The conclusion from this article is that you get a little bit of improvement but it's not obvious that it's going to be cost-effective because you pay out a lot of money to doctors to get this small amount of improvement.

US Medicare is case study number two. Centers for Medicare & Medicaid Services (CMS) runs a demonstration selecting ten very large medical groups in the United States to participate in a pay for performance system for doctors (Miller, 2005). It has also selected other medical groups that are otherwise comparable but not part of the

demonstration. In year one, the demonstration applies to one illness, diabetes, and to only a few measures of performance. By year three, we'll have four illnesses that will be part of the pay for performance system. So this is a very modest, toe in the water, experiment with pay for performance.

How does it work? The basic idea is that if the physician group spends less than a comparable group then it is eligible to keep some of that money if it also meets quality targets. There are pages and pages of computer algorithms that are necessary in order to decide what patient is with what medical group in the US traditional Medicare system. That's a very non-trivial question and involves a lot of arbitrary decisions in how you're going to make those assignments. It's mostly about cost.

My last case study is the United Kingdom. This is a more extensive pay for performance system, a policy with a large number of quality indicators. There has been a very high rate of achievement of quality targets (Doran et al., 2006). The UK has some things that the US doesn't have, such as a single payer and a workable national electronic database system. They can link doctors and patients, something we have a hard time doing in America. Primary care doctors appear to be high achievers but I think something that's important to note about this system is that it's very expensive. It increased the total payment to primary care doctors in the UK by about thirty percent. Also, we do not know the impact. Data available describe only the post patterns of practice. No comparable data are available for the pre-period.

In the UK and other unified health care systems there is more potential for doing pay for performance than in the US. I think the down side is that focus on pay for performance will delay needed reform. Pay for performance seems to address quality problems but there is not good evidence yet that it really does.

To achieve good basic medical service, we need three things: First of all we need somebody to take responsibility for the patients, a "medical home" in the current jargon. I think we need patients who are better at deciding which doctors they want, and what they want done for them. I think we're getting there. People are learning more and I think they're exercising more choice. And finally, policy makers' obligation is to set up a payment system which makes patients attractive to doctors. Price controls that make doctors indifferent to taking care of patients

undermine everything else we are trying to do. We have to figure out a way to use the resources we have to pay doctors so that they seek patients and give them good care for both business and professional reasons.

Thank you.

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What Do We Know about Competition and Quality in Healthcare Markets?*,**

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INTRODUCTION

The percentage of GDP devoted to healthcare has more than doubled in the economies of the G7 since 1960. Since the healthcare systems in many of these countries feature universal coverage and no price rationing, reforms aimed at controlling the rapid increase in healthcare costs have emerged as a key issue. The quality of healthcare has also become an important area of concern.

A number of countries are currently adopting a more market-oriented approach to healthcare. Once such a system is in place, competition policy — or what is known in the United States as "antitrust enforcement" — becomes relevant. The presumption of competition policy is that

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unregulated monopoly is bad and, what is more, self-regulation (e.g., by professionals such as doctors) is not good for society: in the language of economics, self-regulation does not promote social welfare.

Competition policy is an important component of healthcare policy in the United States, which relies on markets for both healthcare delivery and financing. It is also becoming increasingly important in other countries, where most market-based reforms involve encouraging competition in the supply of healthcare while continuing central government financing. If supply is decentralized, then competition policy is relevant even with centralized financing. Even if prices are set centrally, nonprice aspects of service are determined by healthcare providers, which brings competition and competition policy into play.

In the United States, competition and antitrust enforcement are real issues, given the extensive consolidation of healthcare providers in recent years, notably through hospital mergers (Gaynor & Haas-Wilson, 1999; Gaynor & Vogt, 2000; Vogt & Town, 2006). Owing to the pervasive presence of insurance against healthcare expenditures, consumers are not exposed to the full expense associated with their healthcare decisions. Moreover, when price has a reduced role, quality looms larger in consumer choice and serves as an important rationing device.

WHAT QUALITY IN HEALTHCARE MEANS

Quality in healthcare involves better or worse health, including death. So is it possible to talk about quality being excessive in a healthcare setting, since that means that mortality rates might, in some circumstances, be too low? Suggesting that society would be better off—that social welfare would be improved—by increasing mortality rates is not a pleasant prospect.

However, the same economic concepts apply here as to any other problem of resource allocation. We want to devote resources to reducing patient mortality up to the point where the marginal benefit of reduced mortality is balanced by the marginal cost. This means that there will be a socially optimal mortality rate that will certainly be greater than zero.

While this may seem repugnant, it is important to realize that there are competing uses for resources, and if the value of a reduction in patient mortality is not that great, then it might be better to devote the

resources that are available to finding a cure for cancer, providing school lunches, or building battleships. It is also important to realize that trade-offs involving mortality risks are made every day. We devote resources to improving traffic and airline safety, but not to the point that the risks of death associated with these activities are zero.

ECONOMIC THEORY

Economists, antitrust scholars, and the courts intuitively think that competition is a good thing. Indeed, this is the presumption behind competition law and policy. But the view is not so clear in the economic theory of differentiated products, that is, products that consumers do not regard as identical and thus are not perfectly substitutable. The products may be differentiated either because some are better (a Honda compared with a Yugo) or because they are somewhat different, at least to some consumers (e.g., Coke versus Pepsi).

Although economic theory does not provide a clear answer to the question of whether competition is welfare enhancing in markets with product differentiation, it does provide guidance for thinking about the issues. Theory tells us that if prices are fixed through methods such as regulation, then competition leads to more quality, but this does not necessarily increase social welfare. In particular, social welfare can lessen if the result of quality competition is mainly that demand is divided up among more firms, rather than that there is greater total demand. If prices are determined in the market, then economic theory tells us anything can happen—there are no definitive predictions.

The Dorfman-Steiner (1954) condition offers a way of gaining some insight into the likely impact of competition. It tells us that the effects depend on the relative demand elasticities of price and of quality—how responsive consumer demand is to changes in price and quality. For example, if increased competition leads to demand becoming more responsive to price or less responsive to quality, then quality will decrease relative to price, and vice versa.

We can use this framework to help us think about the likely impacts of some changes in the healthcare market. For example, the advent of managed care in the United States in the 1990s is commonly thought to have increased the price elasticity of demand facing healthcare providers

(hospitals in particular); in other words, consumers became more responsive to price changes. This was also likely the result of the British NHS reforms in the 1990s that encouraged payer-driven competition. The increase in the price elasticity of demand should have led to lower prices, and indeed seems to have done so in the United States (Dranove & Satterthwaite, 2000; Gaynor & Vogt, 2000).

If there was no sufficiently countervailing increase in the quality elasticity, then quality should have fallen. It is important to bear in mind here that if the starting point was one where hospitals possessed market power, then the analysis predicts that quality should have been at above optimal levels. Thus a decrease in quality could be welfare-improving (assuming it did not fall below the optimal level).

Another recent change in healthcare markets is the emphasis on medical errors and quality improvement. If that leads to an increase in the quality elasticity of demand, then quality will improve. If the price elasticity remains unchanged, then quality will increase relative to prices (price may still increase in absolute terms).

EMPIRICAL EVIDENCE

Empirical research on competition and quality in healthcare markets is, for the most part, fairly recent and expanding rapidly. At present the research evidence comes from hospital markets, and the vast majority of studies are from the United States. Since the predictions of economic theory differ for markets with regulated prices and markets where prices are set by providers, I have divided the empirical evidence in this way.

Most of the studies of markets where prices are fixed (such as US Medicare) show a positive impact of competition on quality. The most prominent study is by Kessler and McClellan (2000), who examine the impact of hospital market concentration on mortality among US Medicare patients suffering heart attacks. They find that as of 1991 patients in the most concentrated markets had mortality probabilities 1.46 percentage points higher than those in the least concentrated markets (a 4.4% difference).This is an extremely large difference: it amounts to over 2,000 fewer (statistical) deaths in the least concentrated markets as compared with the most concentrated markets.

This result is not surprising since economic theory for markets with regulated prices predicts such a result. The empirical evidence for fixed prices clearly supports predictions from theory: it is clear that increased competition leads to increased quality. However, the current set of studies is not structured in a way that allows us to draw any inferences about the effects on social welfare.

The results from studies of markets where prices are set by providers are much more variable. Some show increased competition leading to increased quality, and some show the opposite. For example, Propper et al. (2003) find that competition led to substantial increases in mortality among heart attack patients in the United Kingdom following the NHS reforms of the 1990s that encouraged payer-driven competition. The estimated cumulative effect of competition led to increases in mortality that cancelled out the mortality reductions that would have occurred as a result of improved treatment methods.

On the other hand, Sari (2002) finds that quality (measured by a set of quality indicators, including mortality) is significantly higher in more competitive markets in the United States. While these contrasting results may appear surprising, they should not be. Economic theory predicts that quality may either increase or decrease with increased competition when firms are setting both quality and price. The presence of more competitors can increase quality elasticity, price elasticity, or both. If price elasticity increases more than quality elasticity, then quality will fall—and vice versa.

It is possible that the NHS reforms led to a larger increase in price than quality elasticity; hence the findings of Propper et al. Sari's finding could be the result of competition in the markets he examined leading to a greater increase in quality than price elasticity. This is possible since the NHS reforms introduced price competition where it had not previously existed, whereas in the U.S. setting, price competition was already in existence. Presumably the introduction of price competition has a bigger effect than variation in the number of competitors in a setting where price competition already exists.

The implications of these findings for society are unclear. A study that finds that competition increases quality does not tell us if this is socially optimal: competition could lead to excessive quality. Similarly, a result that indicates that competition decreases quality does not tell us if this

is, in fact, good, bad, or neutral with regard to social welfare. If quality was excessive previously, then a decline may be welfare-improving, as it may free up resources to be used where they are more highly valued.

CONCLUSIONS

The first generation of studies of competition and quality in healthcare markets has provided a very valuable base of knowledge for further research. But they do not allow us to draw inferences about whether their estimated results imply that competition increased or decreased social welfare. A major next step for research in this area is to sort out the factors that determine whether competition leads to increased or decreased quality, specifying more complete models of quality determination in healthcare markets so as to allow for normative analysis.

Market-oriented healthcare reforms are being considered in quite a few countries. US courts have to make decisions about antitrust issues involving healthcare providers. Evidence concerning the effects of competition on quality in healthcare is vital to the decisions these policymakers must make.

What are the take home lessons for policymakers? Markets with regulated prices get a "greenish" light for competition. The research evidence indicates that competition leads to increased quality in markets with regulated prices, although the impacts on social welfare are unclear. Competition gets a "yellow light" for markets with prices set by providers. The evidence is not clear as to whether competition increases or decreases quality, let alone if this is good or bad. There is considerable scope for future research to suggest and support policy on this issue.

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Some Consequences of Incomplete Contracts for Primary Care Physicians

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1. INTRODUCTION

Many aspects of the quality of health care are not contractible. Hence, for a purchaser of health care the design of contracts with health care providers is particularly challenging. Typically, actual contracts mirror trade-offs between several goals the purchaser attempts to fulfill. For instance, the mix between capitation payment and fee-for-service payment is likely to entail a certain degree of risk selection relative to inefficiency in the provision of health care. In this paper some trade-offs involved are illustrated with results from empirical studies of the Norwegian regular general practitioner scheme. In Norway all inhabitants are listed with a general practitioner (GP). The payment system for GPs is a mix of capitation payment without risk adjustment and fee-for-service. Although quality in general is non-contractible, we show that patients have preferences for particular types of GPs and these preferences have an impact on the practice style of GPs. In particular we show that GPs who would like to have longer lists of patients provide more services to their patients compared with physicians who are content with their number of patients. However, the extra number of services does not prevent patients from switching physicians. Hence, we suggest that patients' behavior reveals that the extra services are socially inefficient and discuss the challenge that this inefficiency entails for the content of the GP contract. The article is structured as follows. Section 2 contains a brief description of the Norwegian regular general practitioner scheme. In

Section 3 we describe why patient shortage may lead to excess service provision and in Section 4 we study whether or not the extra service provision discourages patients from switching physicians. Section 5 offers some concluding remarks.

2. THE NORWEGIAN REGULAR GENERAL PRACTITIONER SCHEME

Norway is a country of about 4.5 million inhabitants. The health care of Norwegians is covered by a national health service, which is mainly tax-financed. Hospitals are publicly owned, and in-patient care is free to users. Outpatient consultations with primary care physicians and specialists are offered with co-payments of about US $ 25 and US $ 40 respectively (2006 prices). Since the implementation of the Regular General Practitioner Scheme in 2001, each inhabitant of Norway has been listed with a GP. About 90% of GPs are self-employed, private physicians contracting with municipalities, with the remaining GPs employed by the municipalities. Each GP has a list of patients. In 2004 the average list-size was between 1250 and 1300 people. Besides providing primary care, GPs act as gatekeepers: a referral by a GP is required for consultations with health care specialists. The national insurance covers all expenditures if co-payments for physician services and medicines within a year exceed a deductible of about US $ 250.

The Regular General Practitioner Scheme of 2001 required each inhabitant to submit to the National Insurance Administration up to three preferred physicians. GPs submitted to the administration the maximum number of patients they were willing to include in the practice list. A matching process of patient and GP preferences formed the GP patient lists. If the preferred number of patients stated by a GP was smaller than the number of residents who wanted to be listed with him or her, priority was given to previous patients, according to the stated number of years with the physician. For many physicians the maximum number of patients they were willing to accept exceeded the number of people who showed interest in being listed with them. The administration then allocated inhabitants who did not submit any physician preference (30 percent of the adult population) to these GPs. After this second round of

assignments, about 30 percent of the GPs still ended up with at least 100 patients fewer than the number of patients they were willing to take. We say that these GPs experience a shortage or deficit of patients.

Private practice general practitioners have three sources of revenue. First, there is a fee-for-service payment; a GP provides various services to patients in return for a fee from the national insurance. Second, for each consultation, a GP receives a co-payment from the patient. Third, a GP receives a capitation fee from the municipality in which he serves. The capitation amount is based on the number of patients listed with the practice without any risk adjustment. Each of the three components constitutes about one third of the income of an average practice.

For econometric analysis the Norwegian patient list system has several advantages. There is close to 100 percent participation both among GPs and residents. Since each GP's list of patients is known, we know whether the total number of services provided is due to the number of patients or to the number of services provided per patient. Finally, fees (including the magnitude of co-payments) are fixed for the individual GP and negotiated between the state and the Norwegian Medical Association. Hence, fees can be considered as exogenously determined from the individual GP's perspective.

3. PATIENT SHORTAGE AND THE INTENSITY OF SERVICE PROVISION

In a related work (Iversen & Lurås, 2000) we have shown that a shortage of patients is likely to imply a more service-intensive practice style among general practitioners. The point of departure is the observed variation in medical practice and its implication for the variation in the provision of health services (Andersen & Mooney, 1990; Wennberg et al. 1998; Scott, 2000). For instance, views among physicians may differ with respect to how often a patient with diabetes or hypertension should be called in for check-ups. Views may also differ on whether a GP who prescribes antibiotics to a patient should call in the patient for a follow-up consultation in one week or ask the patient to contact him if he feels worse. The intensity of service provision will on average be higher in the first case than in the second.

We argue that for many treatment choices there is an interval of

health service provision where the marginal effect on health is not documented to be different from zero. For our purpose, an interesting consequence of the lack of medical standards is that several practice profiles are all regarded as equally satisfactory from a professional point of view. A physician's practice style is simply defined as the optimal value of his decision variables, i.e., the number of patients and the number of services provided to each patient. His personal interests may influence the style of medicine he believes in. But since all feasible practice styles are assumed to have zero marginal effects on health, our approach implies that a patient's health is never balanced against the GP's income or leisure. This assumption simplifies the formal reasoning considerably, but is not critical for the argument. A relaxation of the assumption would imply that the effect of economic incentives is strengthened. In Iversen and Lurås (2000), the maximization problem is analyzed by means of concave programming. The GP's objective function has income and leisure as arguments, and there are three constraints:

1. working time and leisure time add up to total time at disposal
2. the number of services per patient is within the range of professionally acceptable practice styles and
3. the number of patients is less or equal to the number wishing to be listed with the GP.

If constraint (3) is ineffective, the problem has a corner solution with the minimum amount of care provided to each patient. If constraint (3) is effective, the GP experiences patient shortage and is said to be rationed. An interior solution as well as corner solutions is then possible. Since our focus in the present article is not on formal issues, we present the main result without the formal argument and refer interested readers to Iversen and Lurås (2000). In a mixed capitation and fee-for-service system, we find that:

- A minimum volume of health services per patient is provided when patients are abundant.
- When a shortage of patients occurs, the volume of service provision per patient may exceed the minimum volume.

The intuition behind this result is straightforward: an increase in the level of service provision to existing patients has an opportunity cost because the time could have been used to provide services to additional

patients. Since providing services to additional patients would also result in a capitation fee, providing services to additional patients is always more rewarding than increasing the service provision to patients already listed. When a shortage of patients occurs, increasing the list of patients is no longer an option. The volume of service provision per patient will then exceed the minimum if the marginal income of service provision per unit of time exceeds the marginal valuation of leisure. The more the rationing hurts (measured by the magnitude of the Lagrange-parameter in the maximization problem), the more service-intensive the practice style is likely to be.

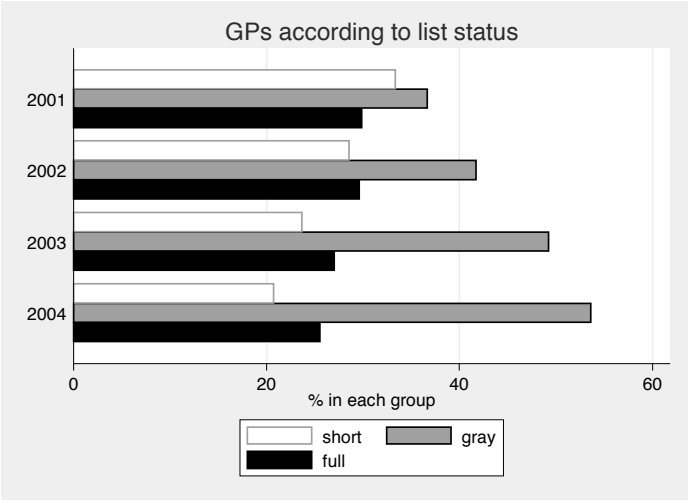
The reason for income-motivated behavior may coincide with less rationing of services by the physician or with physician-induced demand (PID). According to McGuire (2000), "Physician-induced demand (PID) exists when the physician influences a patient's demand for care against the physician's interpretation of the best interest of the patient." Hence, according to this definition a physician who helps the patient to move towards the consumer's optimal point is not practicing physician induced demand. McGuire (2000) distinguishes between PID and rationing. While under PID the physician influences the patient's preferences, under rationing he fixes the quantity of services such that a discrepancy between the patient's demand for services and his actual use of services occurs. Hence, under rationing the patient is dissatisfied with the services he received, while under PID he is satisfied because his preferences are manipulated. Since the problem to be addressed in this paper is confined to whether income-motivated behavior can be found among physicians who experience a shortage of patients, we do not need to give much attention to whether this happens because of PID or because of direct quantity setting[1].

Figure 1 shows the distribution of privately practicing GPs according to list status and year[2]. GPs are divided into three groups. Those with a discrepancy of at least 100 between preferred and actual list size are

1. But the question is of course of importance when social welfare is considered.
2. A total number of 3650 GPs contracted with the regular general practitioner scheme when the system was introduced. We exclude from the description those GPs who ended the contract since system was introduced and the approximately ten per cent of the GPs who are public employees. This leaves us with a panel of 2725 GPs.

said to experience a shortage of patients and are denominated as short. Those with a discrepancy between preferred and actual list between zero and 100 patients represent a gray area in the sense that we do not really know whether they consider the discrepancy to be costly to them. According to local authorities some GPs should have open lists to offer new residents a choice of GP and also to offer a choice for those residents who are dissatisfied with their present GPs. Some GPs may then have open lists because they feel obliged to contribute to an actual choice for the population. That means they are probably rather indifferent between having the current list and having some additional patients. This group of physicians is denominated as gray in Figure 1. The third group, denominated full, consists of those GPs with actual lists equal or greater than the preferred lists. Only 5–6 percent of the physicians have a list that is greater than their preferred. From Figure 1 we see that the percentage of GPs who experience a shortage of patients steadily declined from 33 percent in 2001 to 21 percent in 2004. Also, the proportion with full lists declined somewhat, from 30 percent in 2001 to 26 percent in 2004. These declines go together with an increase in the proportion of GPs in the gray area, whose proportion increased from 37 percent to 54 percent during the period.

Figure 1: GPs according to list status (No. GPs = 2725)



With annual data of 2725 GPs from 2000 to 2004 we have estimated the effect of patient shortage on provision of services. This is not quite straightforward since we cannot ignore a possible unobservable third factor that has a positive impact both on the probability of experiencing patient shortage and on the volume of health services provided. Then ordinary least squares regression is likely to give biased estimates. Since we have data from periods both before and after the reform, we are able to adjust for possible unobservable heterogeneity by means of difference-in-differences estimation (Blundell & Costa Dias, 2000). We find that a shortage of patients is expected to increase a GP's income per listed person from fees from national insurance by about 8%. A higher income from fee-for-service per person listed is of course not equivalent to a higher total practice income. We find that the increase in fee-for-service income per patient does not fully compensate for the decline in income that fewer patients and less income from capitation entail. At a more detailed level we find that shortage of patients both increases the number of consultations per listed person and, in particular, the number of consultations with a long duration per listed person. Both services entitle the GP to a fee from the National Insurance Scheme. We are not able to find any effect of patient shortage on the number of laboratory tests performed in the physician's office.

4. FACTORS THAT CONTRIBUTE TO PATIENTS SWITCHING PHYSICIANS

We study whether we can identify physician characteristics related to the number of patients who switch physicians. We are also interested in whether a physician with unfavorable characteristics can compensate by providing a higher quantity of services to his or her patients. If so, a trade-off exists between quality characteristics, as perceived by patients, and quantity of services in the physician services market.

The motivation comes from Lurås (2007), who surveyed a representative sample of Norwegians about whether they are satisfied with the general practitioners they are listed with. The responses to the survey were linked with some basic information about the physician a person is listed with. The survey showed that residents in general express a high level of satisfaction with their physicians' medical skills,

interpersonal skills, and referral practices. The satisfaction with consultation length and waiting time is more mixed. The survey also revealed that being listed with a GP who experiences a shortage (deficit) of patients relative to his preferred number adds to the probability of being dissatisfied along all dimensions except for waiting time. Hence, we wanted to find out whether expressed dissatisfaction carries over to decisions about actually switching physicians. This is not obvious since in Hirschman's (1970) terms; while dissatisfaction is "voice," switching is "exit" and requires an alternative provider considered to be better than the present one. We also wanted to find out to what extent physicians who experience a shortage of patients in fact manage to compensate for their less favorable characteristics by providing better accessibility and more of the services their patients appreciate.

The literature on switching costs suggests that dissatisfaction may not result in actual switching. Klemperer (1995) summarizes some of the reasons. Of particular importance for our issue are:

- "Transaction costs of switching suppliers." A person who considers switching must collect information about available physicians in his or her municipality and do the administrative work related to the actual switching. The last task is now made easier for people with Internet connections. They can simply log into their personal page at the National Insurance Administration's web page and make the switch online.
- "Cost of learning to use new brands." The present physician would have a lot of patient history information. A new physician would need to acquire much of this information from the patient. Also, a relationship of mutual trust between physician and patient requires investments from both sides.
- "Uncertainty of the quality of untested brands." Physician services are experience goods in the sense that the quality for the individual patient is not actually revealed before an episode of illness occurs. This means that, even with extensive market research before making a switch, there is always uncertainty about the quality of an untested physician (untested, at least, by the particular patient).
- "Psychological cost of switching, or non-economic 'brand-loyalty.'" Some patients would perhaps feel that they will disappoint their present physicians if they switch. This potential psychological cost is reduced in the present context in which the present physician is informed about the

decision to switch by the National Insurance Administration.

Hence, it is interesting to study empirically whether dissatisfaction, as expressed in surveys, in fact has consequences for actual switching. We predict that the probability of switching physicians

- increases with being assigned a GP that experiences a shortage of patients
- decreases with the patient's age since transaction costs are expected to increase with age
- increases with the number of physicians in the community who have open lists
- decreases with the number of services that the physician provides. We predict that a less popular GP may compensate for unfavorable characteristics by being more generous in the provision of services to his patients.

With annual data covering all GPs from 2001 to 2004 we can estimate the effect of the explanatory variables on the number of switches a GP is expected to experience. All the regressions show a positive and statistically significant effect of patient shortage on the number of switches. The likely explanation is related to the matching procedures when the system was implemented. While the list of a popular GP was filled with people having this particular GP as the first choice, the list of a GP with patient shortage consisted to a greater extent of people having the GP as a second or third choice, or who had not even submitted a preference. Hence, it is more likely that a patient admitted to a GP with a full list experiences a good match than it is for a patient who is listed with a GP with patient shortage.

We also find that the number of physicians in the municipality who accept new patients has a positive impact on the number of patients who switch. This is as predicted, since more options are likely to result in an increase in the number of switches. The magnitude of the effect is not very great. We also study the effect of service provision on switching. We find that neither the length of the consultation nor the number of consultations has any impact on the number of switches. There is a statistically significant negative effect of the total income from fees as an indicator of service provision on the number of switches. The magnitude of the effect is considered to be too small to be of any practical importance. We conclude that an increase in the intensity of service provision does not seem to have an impact on switching.

5. CONCLUDING REMARKS

We find that individual constraints that physicians are facing as patient shortage have an impact on the actual quantity of services provided. Hence, patient shortage is costly to the insurer because of income motivated behavior by physicians with unknown benefit to the patients. The income motivated behavior is driven by the fee-for-service component.

An alternative would be to drop the fee-for-service component and let the payment system be based on the capitation fee only. The GPs would then compete for patients without considering the income from services per se. Services delivered would be a means to attract patients to the list and hence, to generate capitation income. The problem is that under a flat capitation system not all patients are equally attractive because of variation in need for services. A risk adjustment component would then be required to prevent risk selection by the GPs. It is well known from the literature (Glazer & McGuire, 2006) that a risk adjusted capitation system is hard to construct in practice. The present study may therefore demonstrate the classical trade off between selection and inefficiency in health care.

We find that GPs with patient shortage in general provide more services to their patients compared with GPs who have enough patients. In the policy discussion in Norway it is claimed that GPs with enough patients allocate too short time to each consultation. Hence, one may think that the extra services provided by GPs with patient shortage would be appreciated by their patients. However, we do not find that the level of service provision has an impact on the number of patients who decide to switch physician. An example illustrates a mechanism likely to be involved: A patient may be dissatisfied with his GP because of mistrust in his professional knowledge and dissatisfaction with the communication skills. More time with the GP is then unlikely to compensate for the patient's perception of low professional quality. Hence, we conclude that extra service provision does not compensate for negative characteristics of less popular GPs.

A fundamental question is whether or not the present system provides the physicians with sufficient incentives for providing quality care. We know that a relatively high level of switching is concentrated to a minority

of GPs, and the extra quantity of services they provide is not capable of preventing patients from switching. An obvious reason seems to be that patients are demanding better quality care, and greater quantity is not considered to compensate for the perceived quality deficiency. Quality indicators and incentives for quality improvements, as described by other presenters at this conference, should therefore be considered both in future research and in future policy-making.

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The Dynamics of Price-Responsiveness in the German Social Health Insurance System

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1. INTRODUCTION

Some ten years ago, the Germany social health insurance systems underwent major reforms, which among other changes introduced elements of competition between health insurance companies. Competition was intended to increase the quality of health care provision, to put pressure on prices and to improve the overall efficiency of the system. Due to legal restrictions, competition is mainly limited to providing the benefits package at different prices. The coverage of the benefits package, however, is highly standardized

This paper tests whether consumers who are allowed to freely choose health insurers are sensitive to price differences, and are inclined to search for those with lower prices. Only if the answer is "yes" will price competition will put pressure on health insurers. The analysis is based on information on individual health insurers and relates market shares with prices. Our analysis focuses on market dynamics, i.e., on changes in market shares, not on absolute differences in market shares, were the focus has been in most previous research (e.g., Schut, Greß, & Wasem, 2003).

Analyzing dynamic processes seems to be more appropriate than modeling a static one, because, unlike in the case of consumer goods like

food or petrol, where goods are purchased on a regular basis and where consumers have to make (new) choices frequently, only a small number of consumers might be inclined to decide on their health insurer each period. Thus, on the health insurance market, consumer behavior might react much slower to changes in prices than on other markets, and the insurance market is therefore likely to display persistence. In addition, unlike in the case of petrol, for instance, where prices change frequently, insurance companies try to avoid or are not allowed to change prices very often. Thus, an increase or decrease in the price of an insurer will be in effect for a relatively long time and will not be redone frequently. Consumers will therefore be confronted with the new prices for more than one "period" and are likely to take some time to adjust to changes in contribution rates. For this reason, instantaneous adjustment of consumer behavior (i.e., after one period) is likely to differ from long term adjustment (i.e., after several periods). To fully account for the impact of price changes it is therefore important to analyze several periods using a dynamic model.

In this paper we summarize results, which have been published in more detail in Tamm, Tauchmann, Wasem, and Greß (2007). In addition, we present further information on the persistence of market shares of health insurance companies and provide conclusions as well as policy recommendations. Our findings support the notion that consumers display a distinct sensitivity to differences in prices. However, market shares are highly persistent and change slowly.

The rest of the paper is organized as follows. Section 2 describes those institutional features of social health insurance in Germany that are relevant for consumer choice. Section 3 describes the data set and the empirical model. Our estimation results are presented in section 4, which also provides conclusions.

2. BACKGROUND

In the German social health insurance market, risk-bearing health insurers compete for enrollees. In principle, it is mandatory for all employees to acquire social health insurance. Yet, when the salary exceeds a certain threshold, individuals can choose whether to remain in the social health insurance system or to opt out and buy private health

insurance; self-employed and civil servants also can opt out. Nevertheless, approximately 90% of the German population is covered by social health insurance. Consumers are allowed to switch between social health insurers on a regular basis. The only restriction is that they must have remained at their previous insurance company for at least 18 months. However, if their health insurer raises its premium, they can switch immediately.

German social health insurers do not calculate individual risk-dependent premiums. Instead, they set contribution rates. Individual premiums are then equal to salaries times the contribution rate, up to an income ceiling. By law, competition between health insurers is almost exclusively based on price, i.e., the contribution rate that varies across insurers. More than 95% of the benefits package is standardized. Thus, there are only a few services for which it is up to the insurance company to decide upon their inclusion in the benefits package. Moreover, health insurance companies are obliged by law to contract collectively with all licensed health care providers. Hence, the quality of insurance is basically identical among companies. For this reason, one would expect the majority of consumers to choose low premium insurers. In this paper we analyze whether this is the case and measure consumers' sensitivity to price differences.

Overall, the number of competing health insurers in Germany has dropped dramatically from 642 in 1996 to 242 in 2007. This reduction in the number of insurance companies is mainly the result of many mergers between companies. Although this consolidation of the market seems to be continuing and choice is somewhat less ample on the regional level, consumers can still choose between many health insurers, in most regions at least 50.

3. DATA AND ECONOMETRIC MODEL

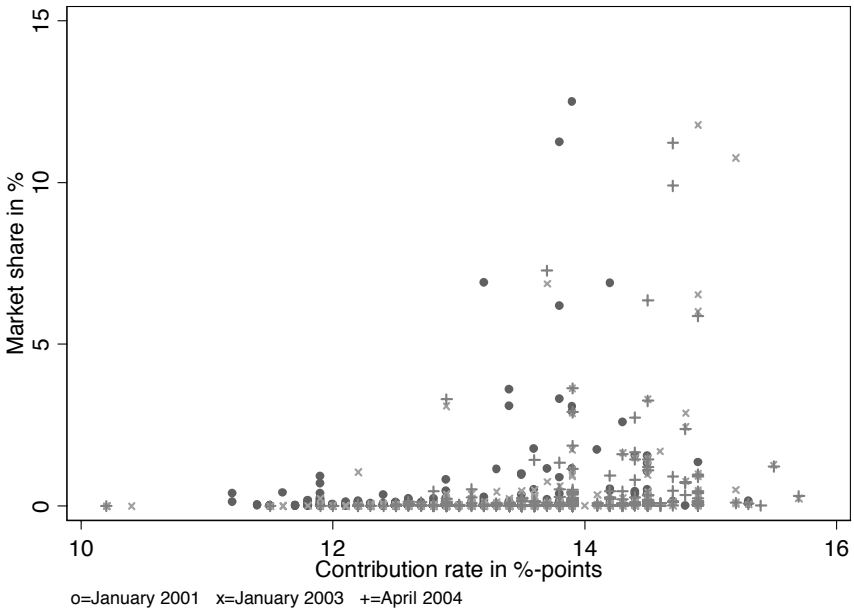
Our study is based on an almost complete panel of individual health insurers that were active in the German social health insurance market between January 2001 and April 2004. For each health insurer, the panel includes the contribution rate and the number of enrollees in each of seven points in time. Because health insurers are not obliged to publish information on the number of enrollees, data had to be collected by Dostal & Partner, a commercial market research company. The data have

been validated by comparing them to information provided by several branch organizations of health insurers and by the Federal Ministry of Health.

On average, individuals had to pay some 13% of their salary for social health insurance. This contribution rate generally increased during the period under observation. The range between the lowest and the highest contribution rate is quite large, being more than 3 percentage points during most of the time. In 2004, switching from the company with the highest contribution rate to the one with the lowest generated an annual saving of several hundred euros for an individual.

Figure 1 juxtaposes the market share and the contribution rate of all insurers at three points in time. Somewhat surprisingly, Figure 1 indicates that several insurers that charge rather high contribution rates are (still) among the largest companies in the market. However the figure also indicates that market shares are highly persistent and that competition might only work in the long-run. This becomes transparent when focusing on those six observations in the upper right angle of the figure, i.e., on those insurers with large market shares and high contribution rates. These six observations display information on two insurers at three points in time. Both insurers first increased their contribution rates between 2001 and 2003 and then reduced them somewhat in 2004. In the meanwhile their market shares dropped steadily by an overall of 1.3 to 1.4 percentage points each. This drop in market shares took place even when the insurers partly withdrew the preceding increase in premiums and might reflect that the level of their contribution rates is relatively high compared with competing insurers and that this fact had not fully been accounted for by consumers in 2001 and 2003. Overall the figure makes clear that the empirical analysis should account for potential dynamics in the effect of contribution rates on market shares.

Figure 1: Market shares and contribution rates



The empirical model is based on a conditional logit model (McFadden, 1973) estimated on the basis of company data (Berry, 1994). The model relates the (logged) current market share $\log(s_{it})$ of insurer *i* at time *t* with contribution rate x_{it}, and, in order to account for persistence, with the lagged market share $\log(s_{it-1})$. In addition, we control for time – and insurance-specific effects δ_t and γ_i:

$$\log(s_{it}) = \alpha\log(s_{it-1}) + \beta x_{it} + \delta_t + \gamma_i + \varepsilon_{it}.$$

In this model, β measures the impact of contribution rates on market shares and $0 \leq \alpha \leq 1$ captures the degree of persistence of market shares. If $\alpha = 0$, only current prices would have an impact on the level of market shares. However, because Figure 1 indicates that this is very unlikely, we focus on those cases where $\alpha > 0$.[1] In these cases, the market share

1. Tamm et al. (2007) show that models, which wrongly assume that $\alpha = 0$, are likely to result in biased estimates for β.

is influenced by current and previous prices, which is reflected by the persistence of market shares. As has been shown in Tamm et al. (2007), it is likely that $\alpha = 1$. Thus in the results section we will focus on this case. That is, we assume that market shares are highly persistent and that transitory changes in the contribution rate have permanent effects on market shares. This specification is equivalent to a model which explains changes in market shares.

4. EMPIRICAL FINDINGS AND CONCLUSIONS

This section provides the estimation results of our empirical analysis of market shares of health insurers in Germany. As indicated in the preceding section we use a model that explains changes of market shares. This implies that even temporary differences in contribution rates lead to permanent changes in the level of market shares. Once a consumer changes her insurance company, she will stay with the new company as long as no further differences in contribution rates prevail, nor any unsystematic effects occur.

Table 1 presents results for our preferred specification, which also takes into account insurance-specific effects. These insurance-specific effects are highly significant and represent drifts of market shares that might, for instance, be due to death rates that vary across insurance companies.[2] Results indicate that the contribution rate has a significant negative effect on changes in market shares. That is, consumers respond to price differences and insurers that charge relatively high contribution rates will continuously lose enrollees. This can also be seen in Figure 2, which shows that changes in market shares display a strong negative correlation with contribution rates.

2. In this specification we assume that the contribution rate is determined exogenously, which might not be the case at the level of company data, since price-setting insurers observe those insurance-specific effects that are unobservable to the researcher (e.g., differences in the quality of service). Tests for endogeneity, however, indicate that this assumption is not violated.

Table 1: Estimation results for dynamic model

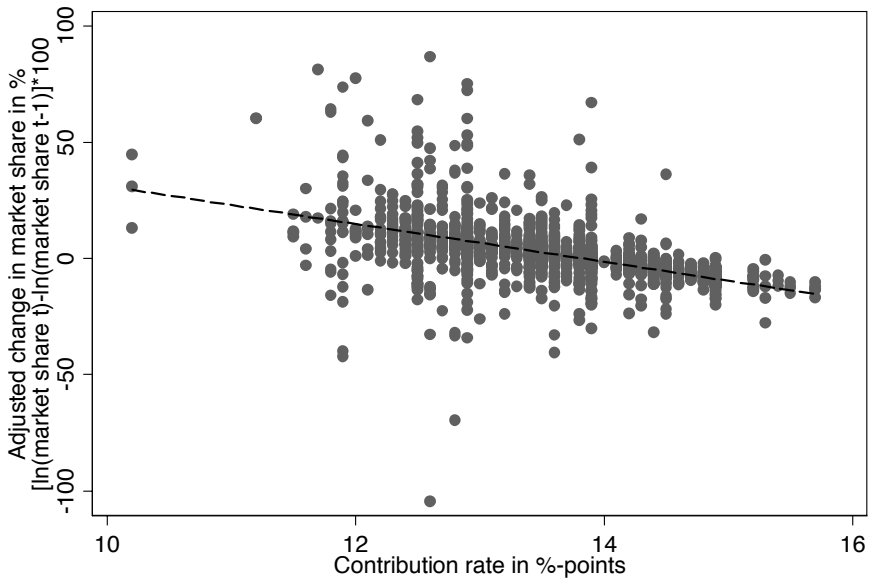
	Dynamic model (α = 1) with fixed-effects	
	Coef.	Std. error
Contribution rate	-0.0814***	0.0130
Observations	1589	
F-Test	10.59***	

Note: Regression includes time dummies for each wave. Dependent variable is first-difference of logged market share. Huber-White robust standard errors given. *** indicates significance at the 1% level.

The estimated coefficient implies a short term price elasticity of about minus one,[3] i.e., a price increase of 1% will induce 1% of the clients of the insurance to leave and to switch to another one. This short-run elasticity of minus one indicates that consumers' price sensitivity is only moderate. From the point of view of economic theory, the estimated short-run price sensitivity even appears to be rather small, because consumers can choose between products that are almost perfect substitutes.

3. The short-run elasticity, which we estimate at sample mean, is equal to $\eta_{it} \equiv \frac{\partial s_{it}}{\partial \chi_{it}} \frac{\chi_{it}}{s_{it}} = \beta (1-s_{it}) x_{it}$ and measures the impact of a transitory change in the contribution rate on the level of the market share. In our sample the average market share is around 0.0037 and the average contribution rate is 13.4 percentage points, i.e., . η = -.0814(1-0.0037)13.4 $\approx$ -1.09

Figure 2: Changes in market shares and contribution rates



Dashed line indicates predicted values for 'Fixed-effects' specification.
Change in market share is adjusted for insurance-specific trends and time effects.

There are several possible explanations for this. Firstly, most consumers might not perceive health insurers as perfect substitutes. This could be due to real or presumed differences in the quality of service. Secondly, several surveys showed that consumers consider the cost incurred by switching insurance companies to be high, that consumers think that (price) differences between insurers are negligible and that many consumers lack information on their right to switch insurance companies (e.g., Höppner et al., 2004; Braun et al., 2006). Finally, consumers might refrain from switching due to loyalty to the insurer or a general unwillingness to effect changes. Experimental findings show that the compensation (in terms of a reduction in the contribution rate) necessary for making a consumer consider switching from her current insurer to a new one are on average very high (Braun et al., 2007).

Furthermore, this short term elasticity only takes into account the impact of price changes on the market share after one period. In order to take into account the long-run impact of a permanently higher contribution rate we also present the long-run elasticity. This long-run

elasticity approaches infinity.[4] Thus, in addition to a small instantaneous effect, our findings indicate that permanent relative changes in contribution rates will have dramatic effects on the market shares of health insurers in the long-run. For example, an insurance company will loose around 10% of its clients within 5 years if it increases its price by 1% (prices and all other characteristics of competing insurers remaining unchanged). That is, insurers who permanently charge contribution rates that are higher than those of competitors and do not offset this by being attractive to consumers for other reasons than price will ultimately drop out of the market. At least in the long-run, this imposes substantial pressure on health insurers.

Intense competition is likely to improve service and efficiency of health insurers' provision of service. In order to increase the pressure of competition even in the short-run via increasing the short-run willingness of consumers to switch to low-priced, high-quality health insurers, we suggest enhancing the transparency of the system. One instrument might for instance be a standardized reporting system including information on contribution rate and other differences between insurers. In addition, the general level of knowledge that consumers have of their rights might be improved through information campaigns.

Furthermore, allowing insurance companies to differ on other aspects than price might also lead to greater competition and thus to more incentives to be efficient. We suggest making selective contracting with health care providers easier for the insurers. Yet, since this and other possible instruments improving on competition can also be used for risk selection strategies (van de Ven & Ellis, 2000), a better system of risk adjustment would therefore be necessary as well.

4. The impact of a permanent change is equal to $\frac{1}{1-\alpha}\eta_{it}$ and approaches infinity if $\alpha = 1$.

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Incorporating a Geographical Variable within a Concentration Index

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INTRODUCTION

Measurement of competition figures prominently in economic studies of sector organization. It is current practice to examine competition in an industry as a function of five basic forces: struggles for positioning among the existing competitors; threats from alternative products or services; the bargaining power of suppliers; threats from would-be new entrants; and the bargaining power of customers (Porter, 1979). The assumption that competition maximizes social welfare underlies most economic theories. Yet Vogt and Gaynor (2000) argue that while in most markets such a direct correlation in fact exists, this is not the case in the health care industry. The reason, they say, is that unique features characterize the health care industry, and competition in this market is therefore either inefficient or nonexistent. The most significant of these factors are a different service product, incomplete information that is exchanged among all the bodies in the system and broad government intervention. Consequently, the issue of social welfare in this industry should be discussed in the context of "second best". The level of competition in this industry determines the degree of efficiency in allocating resources, affects the performance

and stability of the bodies concerned, and establishes the distribution between manufacturer benefits and consumer benefits. Accordingly, economic studies dealing with industrial organization have dedicated close attention to measuring competition between markets and within the markets themselves.

HHI is the prevailing economic index (Herfindahl-Hirschman Index, as mentioned by Rhoades, 1993), which measures the concentration of any organizational system using two components: inequality between firms, and the number of firms in the industry. This index varies between Zero [0], representing a perfectly competitive market, and One [1] representing a complete monopoly. The larger the number of firms in a sector, the smaller will be the value of the index. When the number of firms in a sector is given, the minimum value of the index will be a numerical value, the inverse of which expresses the number of firms of equal size operating in the system. For example, in the health funds market in Israel, which consists of four health funds, the value is 1/4.

H (min) = 0.25. (equation number 1).

$$H = \sum_{i-1}^{n} S_i^2 = \frac{1}{n} + \sum_{i-1}^{n} (S_i - \overline{S})^2$$

S_i – The market share of firm i in the sector.

$\overline{S}$ – The arithmetical average of S_i.

n – The number of firms in the sector.

DEVELOPING A NEW CONCENTRATION INDEX

As pointed out above, the HHI is the generally accepted index for measuring concentration. However, this index does not account for the geographical distribution of market shares of the relevant firms. In the health funds market in Israel, for example, the physical location of the health services provider (physician, laboratory services, etc.) is of crucial importance. An examination of the geographical distribution of the insured among the four health funds in Israel indicates much asymmetry among the regions. In one region, a particular health fund controls about 70% of the market, whereas in another, that same health fund comprises

only 30% of the market share. Naturally, it would be possible to make use of the HHI index to measure the level of concentration at the regional level only. However, there is an importance as well, both academically and as a tool for understanding and determining policy, in a formulation that takes national levels into account. But since the market shares nationwide cancel out one other, yielding result that are lower than the "real" level, the need existed to develop the Herfindahl Geographic Index (HGI) as a new tool to be used in determining the precise level of concentration in markets where the geographical location of the customer/insured in relation to the location of the firm/health fund is of importance. This index draws on the HHI, while taking into consideration the geographical concentration of the firms in each region. In order to obtain the values of the HGI, the values of the HHI have to be computed for each region in the country and then multiplied by the percentage of the general population that lives in the region. The sum of all of the products will yield the HGI value. The values of the HGI range from the minimum value of the HHI itself when calculated on a national basis, where the share of each firm on a nationwide level is identical to its respective share in each and every region, to a maximum of 1 in the case of regional monopolies. The higher the gap between the HGI and the HHI, the larger the asymmetry between the market shares of the firms at the national level and their shares at the regional levels.

Table 1 presents the HHI in the health funds market in Israel in the various districts of the country. In 2003 the HHI value in the northern district was 0.529, as opposed to the national HHI value, which was 0.379 for that year. That is, the level of concentration in the northern district was much higher than the level in the country as a whole. Conversely, the HHI in the district of Jerusalem was 0.33. That is, the level of concentration in the district of Jerusalem was significantly lower than that prevailing in the country. The computation of the HHI value at the national level is calculated as a function of the shares of the four health funds in the country as a whole. This computation offsets the large differences existing among the respective market in the various districts.

Table 1: The HHI in the various districts of the country for 2003

Health Fund Market Share / District	Clalit	Leumit	Maccabi	Meuhedet	HHI Values
Jerusalem	0.461	0.14	0.102	0.296	0.330
North	0.706	0.117	0.113	0.064	0.529
Haifa	0.615	0.069	0.228	0.090	0.443
Central Region	0.539	0.074	0.276	0.111	0.384
Tel Aviv	0.423	0.081	0.427	0.069	0.373
South	0.599	0.100	0.228	0.073	0.426
Judea and Samaria	0.310	0.241	0.204	0.245	0.255
Total	**0.549**	**0.090**	**0.239**	**0.114**	**0.379**

The HHI ignores the asymmetry in the level of concentration in the various districts in the country. In markets such as the health funds market in Israel, in which geography is an important variable in the estimation of the level of competition, the HGI is a significant tool.

Table 2 presents the way in which the HGI is computed.

Table 2: The HHI and the HGI in the Various Districts of the Country for 2003

District	HHI	Number of Residents	Proportion of the Population	HGI
Jerusalem	0.3300	814,516	0.1196	0.0395
North	0.5290	1,161,599	0.1707	0.0903
Haifa	0.4430	844,525	0.1241	0.0550
Central Region	0.3840	1,563,641	0.2297	0.0883
Tel Aviv	0.3730	1,208,115	0.1775	0.0661
South	0.4260	991,296	0.1456	0.0621
Judea and Samaria	0.2550	221,280	0.0325	0.0083
Total	**0.3790**	**6,804,972**	**1.0000**	**0.4097***

* In order to obtain the values of the HGI, the values of the HHI have to be computed for each region in the country and then multiplied by the percentage of the general population that lives in the region. The sum of all of the products will yield the HGI value.

As is evident from Table 2, the HHI value for the health funds market in Israel for 2003 was 0.379, as opposed to the value obtained from the HGI, which was 0.4097. The latter reflects a higher level of concentration.

The Significance of the Relationship between the HHI and the HGI

After the mathematical relation between the HHI and HGI has been established, we will examine the significance of this relationship. Table 3 presents the values of the HHI and the HGI for the health funds market in Israel between 1996 and 2003.

Table 3: Values of the HHI and HGI for 1996-2003

	1996	1997	1998	1999	2000	2001	2002	2003
HHI	0.423	0.409	0.404	0.398	0.392	0.386	0.383	0.379
HGI	0.452	0.439	0.435	0.429	0.422	0.415	0.416	0.409
HGI/ HHI	1.069	1.073	1.077	1.078	1.077	1.075	1.086	1.079

The last line in Table 3 presents the ratio between the HGI and the HHI. Any value in excess of 1 expresses the concentration stemming from the lack of geographical uniformity in the respective shares of the health manifested by such concentration.

A consistent decline in both the HHI and HGI can be seen over the years and, as is evident from the data, the decline in the overall level of concentration in the market has taken place concurrently with a relative increase in the imbalance in the geographical concentration, with the ratio increasing from 6.86% in 1996 to 7.92% in 2003. This means that even though the HGI went down by about 4 percentage points over the years - which is significant in itself – the variation in concentration across regions increased and the problem of geographical concentration was not resolved, since the higher the ratio, the larger the asymmetry between the respective market shares of the firms nationwide and their shares in the various regions.

Nevertheless, a degree of improvement may be noted during this period, a conclusion to which the drop in both indices (the HHI and HGI) points.

With regard to the possible affect of the change in the indices on public policy, it could be useful to consider the HHI, the HGI and the ratio between them. The difference between the HGI and HHI is a function of the differences in the various market shares of the health funds in the different geographical regions of the country (multiplied by the coefficient – the proportion of the population in any given region, to the population as a whole). It appears that the difference between the two indices is an expression of the absolute contribution of the lack of geographical

uniformity in the market shares of each and every health fund. The ratio HGI / (HGI-HHI) expresses the lack of geographical uniformity with regard to the overall levels of concentration in the market.

Nevertheless, the fact that the ratio between the two indices is greater than 1 can be seen as a positive factor, since it is not certain that the degree of competition in every region needs to be similar. There appears to be no necessity for the government to institute a policy legislating equal levels of competition everywhere in the country and we might also say that people choosing to live in peripheral areas do so for many reasons, not taking into consideration the degree of competition among the funds as one of their main motivations. In any case, this is an issue that could deserve consideration at a later date.

SUMMARY

This paper proposes a new index, HGI (Herfindahl Geographic Index), which draws upon the HHI plus a variable for geography. The importance of the new index lies in its ability to measure a more precise level of concentration than the concentration level measured by the HHI in those markets where the geographical location of the customer in relation to the firm's location is of importance, such as the health funds market in Israel.

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Choice and Competition in Publicly Funded Health Care

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Many countries in which health care is funded from the public purse face severe problems with their systems of care delivery. Public funding is often accompanied by public delivery: that is, delivery of health care by hospitals and other medical facilities owned and operated by the state. Although on occasion such institutions work successfully, in many other cases they do not. In fact, typically they provide low quality care, are inefficient in their use of resources, and are unresponsive to the needs and wants of their patients. In addition, they are frequently effective monopolies with their patients having few alternative sources of treatment — especially if the patients are poor and cannot afford whatever private facilities may be available. They are often directly funded from government funds, with budgets that are determined historically and that bear little relationship to their performance or activities.

Critics of these forms of health service delivery have linked the fact that such institutions perform poorly to their monopoly status and budgetary system. They have argued that, if patients had more choice of where they could go for treatment, and if the money followed the choice so that medical facilities would only successfully obtain resources if they successfully attracted patients, then the resultant competition would provide a powerful incentive for these facilities to improve all aspects of the service they provide: their quality, their responsiveness and their efficiency. Such a 'quasi-market' system would also be more equitable, with choices that are currently reserved only for those who can afford private care being extended to the less well off, and with the resultant

rise in standards benefiting everyone.

However, many would not accept these arguments. They would point to the problems that quasi-market systems of this kind of face, including the lack of genuine competition in the real world, the difficulty of providing information to patients both of a good enough quality and comprehensible enough to enable them make sensible choices, and the danger of cream-skimming (the selection by providers of easier or cheaper patients to treat). All this, they would argue, would vitiate the alleged advantages of choice and competition and instead create a system encouraging exploitation and inequity.

This paper addresses some of these issues. It begins with a discussion of alternative models for health care delivery, arguing that all have their merits and their faults, but pointing out that, in many situations, there are good theoretical arguments for preferring systems with a strong element of choice and competition. It then discusses some of the empirical evidence to see whether theory is born out in practice. Finally, it draws together practice and theory to discuss how choice and competition policies in health care can be designed so as to benefit from their advantages without incurring too many of their disadvantages.

MODELS OF PUBLIC SERVICE DELIVERY

The basic reason that many publicly funded health care systems have experimented with quasi-markets in health care is because other models of public service delivery are perceived to have failed in this area. Essentially, there are three other such models, all of which have been tried in one form or another within most health care systems[1]. First, there is the *Trust Model*, where professionals and managers are trusted to know what is best for their users, and to deliver high quality services without interference from government or any other source. Then there is the *Command and Control Model*, where central management sets targets for providers, rewards them if they succeed in meeting those targets, and penalizes them if they fail. And third is the *Voice Model*, where users express their dissatisfaction (or satisfaction) directly to providers. This

1. For a longer version of much of the material in this paper and a fuller discussion of all these models, see Le Grand (2007).

can be through face-to-face conversations with the front line providers themselves, through complaints to higher managers, or even through elected representatives.

All of these models have their advantages and disadvantages. The advantages of the trust model are that it requires little by way of monitoring and regulation (after all, an absence of these is in the nature of trust) and that, unsurprisingly, professionals and others working in the system like it, which in turn contributes to higher morale, and perhaps therefore to higher productivity. The principal difficulty with the trust model concerns the assumption concerning provider motivation that is implicit within it: providers are solely motivated by the desire to provide exactly the services that patients want and need, and that they have no more self-interested concerns. In terms of a metaphor I have used elsewhere, they are assumed to be 'knights' not 'knaves' (Le Grand 2006): that is, they are public spirited altruists (knights), not self-centred egoists (knaves). Of course, like everyone else, professionals and managers who work in health systems are actually a mixture of knight and knave; and inevitably, at times the service provided is likely to be organised in a way that is more in the interests of the provider than of the user.

The chief merit of the command and control model is that it can work – at least in the short term. In the first years of this century, the English National Health service adopted a wide variety of targets coupled with heavy management from the top; and in consequence some key aspects of service delivery (notably patient waiting times) have sharply improved. For instance, in 2002 the target was set that 98% of accident and emergency attendees should be treated, discharged or admitted to hospital within four hours of their arrival (at that time it was true for less than 20%.) By 2005 this target had been reached – and this despite an increase of over a quarter in the number of people attending accident and emergency admissions in that period (Department of Health, 2005, Statistical Supplement). Another example concerns elective surgery. In 1999 more than a quarter of the relevant patients in England were waiting longer than six months for surgery, and over 4% for more than a year. Key targets were set and by 2005, there was no-one waiting longer than a year and only 5% waiting longer than six months (Bevan & Hood, 2006, p. 420, Table 1).

But, however well it might work in the short run, command and

control creates difficulties in the longer run. Perhaps the most significant of these is the demoralization and 'demotivation' of those on the front line of service delivery – especially if they are professionals who are not used to taking orders and have been trained to believe that they will have substantial autonomy and independence in their work. Other problems include a possible distortion of priorities, and the incentive for 'gaming' behavior of various kinds, ranging from straightforward fiddling of the figures to more subtle ways of meeting the target by changing other un-targeted behavior in undesirable ways.

The voice model has its advantages as a means of public service delivery. Obviously it takes direct account of users' needs and wants, at least as they themselves perceive them. Moreover, individual voice mechanisms, especially, can be rich in useful information. Telling providers what is wrong with the service they provide (and also what is right with it) can be very helpful to providers who desire to improve – indeed much more so than simply not turning up for appointments or, as with the choice model, just switching to another provider.

However, it too has its difficulties. In a no-choice world of publicly funded health care, patients who are dissatisfied with the quality of the treatment they are getting, or the responsiveness of the medical professionals or managers with whom they are dealing, have only a limited range of options open to them. If there is a private health care sector running in parallel to the public one, they can use that – or, at least, the wealthier among them can do so. Those who cannot afford this option can only complain, either directly to the professional or manager concerned or to their superiors. In each case, the individual has to depend for a response on the goodwill, or the knightliness of the person to whom he or she is complaining. As well as being demanding, this is a fragile mechanism for improving quality. It offers little or no direct incentives for improvement to the knavish or self-interested professional or manager; and even knightly, more altruistic, ones do not respond well to being challenged by pushy patients.

Moreover, in so far as complaining works at all, it favors the self-confident and articulate middle classes, thus tending to steer services in their direction at the expense of the less well off. The middle class patients thus have a double advantage over the less well off. They are better placed to persuade the key decision-makers in the public service

to meet their needs. And, if that fails, they can use the private sector. In neither case are equity and efficiency being served.

All of these models of service delivery clearly have significant problems associated with them. So what about the model that is our principal concern here: the choice and competition or quasi-market model? It has some clear advantages over the others. Unlike the trust model, it channels both self interest and altruism to serve the public good. If the money follows patient choices, then the hospital or practice that provides the better service will gain resources; that which provides the inferior service will lose. Whether the unsatisfactory providers are knights or knaves, they will wish to continue in business; the knaves because it is in their self-interest to do so, the knights because they want to continue to provide a good service to needy patients. But, in order to attract patients and thus continue in business, they will have to improve the quality and responsiveness of the service they provide, as well as the efficiency with which the service is delivered. Unlike the command and control model, it gives freedom and autonomy to professionals and managers, encouraging them to engage in innovation and creativity, with no outside authority continuously telling them what to do. Unlike voice, in a quasi-market world where patient choice and provider competition are the norm, patients dissatisfied with the general quality of the service they can get from one provider — a hospital or a GP practice - have the opportunity to go to another who can provide them with a better service. This gives considerable leverage to those who do want to voice their dissatisfaction: if the listeners to a complaint know that in the last resort the complainant can go elsewhere, they are much more likely to respond positively to the issues being raised. Choice gives power to voice. Moreover, now both poor and rich can exit if necessary, and the less well off are no longer dependent on their ability to persuade professionals to get the service they want; these realities can improve the equity of service delivery.

Of course, there are limitations to the applicability of these kinds of arguments to all forms of health care. Patients who have suffered an accident or are seriously ill are unlikely to be able to make any kind of choice of provider, and may have to rely upon others (attending doctors or ambulance crews) to make the choices for them. Some forms of medical treatment are one-off (your appendix can only be taken out once); in such cases information gained about the quality of treatment may be of little

use in deciding where to go for other forms of treatment. Some people – perhaps an elderly person or one suffering from a debilitating long-term condition - may prefer not to have to make the necessary decisions.

However, the number of conditions where choice is impossible or unwanted should not be exaggerated. The number of patients arriving at hospital accident and emergency departments who are actually unconscious or seriously ill is relatively small[2]. Although it is obviously difficult to get information for one-off emergencies prior to the emergency itself, for planned care like elective surgery or first time births there are often weeks (or months in the case of births) for prospective patients to garner comparative information from friends or published sources. Further, experiencing one form of treatment at a hospital can give insights into the quality of care provided for other treatments at the same facility. And the recent British Social Attitudes Survey showed that most people do want choice of medical facility – with, interestingly, larger majorities in favour of choice among the less well-off than among the middle classes (Appleby & Alvarez, 2005).

So, in theory at least, elements of quasi-markets, especially patient choice and provider competition, can be used to promote responsiveness, quality, efficiency and equity across wide areas of health care. But do things really work out that way in practice?

CHOICE AND COMPETITION IN PRACTICE

Martin Gaynor's contribution to this volume provides a useful survey of the US, as well as other international evidence concerning the effects of competition between providers, especially hospitals (see also Burgess, Propper, & Wilson, 2005). There is evidence that, as the model would predict, competition in the US both reduced costs and increased quality, so long as prices were fixed. But the US also provides examples of how problems can arise. Information provided to patients on quality was often too complex to be used effectively by them or indeed by institutional

2. In the UK it can be as low as 1% of all attendances (5% of ambulance attendances). See www.chrisgrayling.net/hospital/20040520_workingpaper6.htm. Accessed on 7th January 2007.

buyers of health care. It was in fact most widely used by the providers of that care itself, sometimes in ways that may have harmed patients. Providers concentrated on improving what was measured, which was not necessarily that which contributed to health. The fixed price system may have induced 'cream-skimming,' whereby hospitals try to attract patients whose treatment costs they expect to be below the fixed price they are being offered, and to 'dump' patients whose costs they expect to be above that price.

There are also useful lessons to be derived from the British experience with the Conservative Government's NHS internal market from 1991 to 1997. The principal feature of that market (and one that remains under the current system, at least in England) was the splitting up of the old state monolithic bureaucracy into 'purchasers' and 'providers.' The providers, mostly hospitals, became semi-independent 'trusts,' with freedom to price their services and to compete for custom from the purchasers. The purchasers were of two kinds. There were GP 'fund-holders': family practices which not only provided primary care for the patients registered with the practice, but also held a budget to purchase some forms of secondary care (mostly elective surgery) for them. And there were health authorities, geographically defined organizations which purchased all secondary care services for all those who lived in their area, except for those purchased by fund-holders.

In the ten years prior to 1991, NHS activity had been rising at a rate 1.6% faster than resources; for the five years after 1991, however, the difference in the rate of increase rose to 2%. This suggests that overall, despite some well-publicised increases in transaction costs, there was an increase in efficiency in the NHS that was attributable to those reforms (Le Grand, Mays, & Mulligan, 1998, p.24). Moreover, following the partial roll-back of the internal market that was carried out by the new government in 1997, efficiency fell (Le Grand 2002). Although many analysts predicted that cream-skimming would cause equity problems, no cream-skimming was observed in practice. The principal equity concern arose from the differences between the two types of purchasers, one of which, GP fund-holders (where general practitioners held the budget of the hospital care of their patients), was more successful in getting a better deal for their patients. In particular, GP fund-holders were effective in bringing down waiting times, reducing hospital referrals

and holding down prescription costs. They were also able to generate improvements in the responsiveness of providers (Goodwin, 1998).

Although much of the rhetoric surrounding the reforms involved extending the choices open to patients, the reforms in fact offered few opportunities for increased patient choice, as purchasing was confined to health authorities and GP fund-holders. However, there were improvements over the period in indicators of quality such as waiting lists and patient satisfaction, although it was difficult to attribute these directly to the reforms. One study, however, found an increase in mortality from heart attacks in hospitals that were under greater competitive pressure (Propper, Burgess, & Green, 2004).

Overall, despite some changes in culture, measurable changes were relatively small, not as great as was predicted by the reforms' advocates, or as was feared by their critics. This appears to have been due to the limited competition within the market, and this in turn may have transpired because some of the essential conditions for the market to operate were not fulfilled. More specifically, the incentives for the market players were too weak and the constraints imposed by central government were too strong. This interpretation is reinforced by the fact that the area in which the greatest changes occurred, GP fund-holding, was the one where the incentives were greatest and the constraints the weakest.

Finally, there is evidence from the choice experiments that were tried out in England under the Labour Government in the early years of this century (Coulter et al., 2005; Dawson et al., 2004). These offered a choice of hospital to patients who had been waiting more than six months for certain kinds of surgery (chiefly cataracts and heart surgery). Help was provided with transport costs, and patients were given a 'patient care adviser' to help them with the relevant choices, points to which I return below.

Take up of choice was high – perhaps not surprisingly given that the patients concerned had already been waiting six months. Significantly, there was no difference in take up between socioeconomic groups defined in terms of income, class or education, though the unemployed took up the offer of choice less frequently that the employed. The experiments also had a significant impact on waiting times in the areas in which they operated. For instance, in all of England except London where there was

a choice project in operation, in the six months ending in March 2003, there was a fall of 2% in ophthalmology referrals received and seen compared with the same period in the previous year, and a decline in the mean waiting time of 6%. However, in London there was an **increase** in referrals of 5–6%; but this was accompanied by a **decrease** in waiting times of 17%.

So what are the lessons that can be learned from all this about choice and competition policy design? The principal ones may be summarised under the headings of competition, information and cream skimming.

COMPETITION

For the quasi-market model to work – that is, for it to provide the necessary incentives for greater quality, efficiency and responsiveness - there have to be competitors, actual and/or potential. That is, there have to be alternative providers from which to choose; and there have to be ways of preventing these providers from engaging in anti-competitive behavior, such as colluding with one another against the interests of users, or trying to create local (or even national) monopolies. In short, the competition must be real.

A related condition concerns the ability to enter and exit the market. New providers face barriers to entry into any market. An obvious one in health care is the capital cost of setting up a new facility; this could be quite considerable, especially if high technology equipment is required. A less obvious barrier concerns the habits of users; if people are accustomed to being referred to their local hospital, it can be difficult to persuade them to use a new or a different provider. In such cases it may be necessary to offer some kind of assistance to new providers, for instance, guaranteeing them a higher price for their services, or guaranteeing a specific volume of business. However, such assistance should be strictly time limited.

Then there is the crucial question of 'exit' – or, more generally, how to deal with failing hospitals or other medical facilities. It is critical for the choice and competition model that there be some mechanism for dealing with failure that imposes costs on failing institutions, for if there is no cost to failure, then much of the incentive that is so important for generating the desired outcomes disappears.

Dealing with inefficient or ineffective providers presents perennial

difficulties for all systems for delivering public services. One advantage of quasi-markets in this respect is that failure under choice and competition is obvious. If a hospital or other medical facility is failing in terms of quality, and if it is recognized as such by potential users, then it will not be chosen. In consequence its revenues will fall, and its quality failure will be reflected in financial failure. The failure will be clear; moreover, since few people will be choosing the facility, it will affect a relatively small number of people directly. Hence it will not be necessary to have some additional mechanism for checking quality; and, if it becomes necessary to close the facility there will be relatively few patients affected.

However, the very clarity of the failure process in the choice and competition model creates – or rather exacerbates – a further problem. This is the danger of political intervention to prevent that failure. Such intervention is very hard for ministers and other politicians to resist in any public system for which they are perceived as responsible. But this type of intervention is particularly serious in the case of choice and competition models: by protecting hospitals and other medical facilities from the consequences of losing patients, they blunt the incentives to improve not only for the hospital in question, but, via osmosis, throughout the system.

So how can destructive political intervention be avoided? Part of the answer is to have procedures for dealing with failure that are rule-driven, and that allow little opportunity for discretion and hence for political intervention. But possibly even more important is that both the decision to intervene and the intervention itself must be undertaken by an agency independent of government. This could be an industry regulator, as in the privatized utilities in the UK, where regulators have statutory powers to act to protect consumers in the event that the utility should face financial distress or failure. In those cases the regulator does not have to wait until a firm becomes insolvent to act (difficult in the case of essential services such as hospital facilities), for its powers enable it to approve or reject a financial restructuring.

Also, there is a danger in any market that the actors in the market will behave in ways that damage competition. Examples include agreements to drive up prices, arrangements to divide up the market and not to poach on one another's territory, and attempts to try to take over competitors

so as to create a monopoly. In order to prevent unwarranted or unhelpful political interference, the answer here, too, would seem to be to have a rule-driven system implemented by an independent regulator. It would in fact be sensible for this to be the same regulator as that for deciding upon the entry and exit of providers; for all the relevant decisions are aspects of competition and indeed all are part of the business of making competition real.

INFORMATION

Information is crucial to the quasi-market model. More specifically, if patient choice is to act as an effective driver of quality, it is necessary to rely upon the user's judgement about the quality and responsiveness of the service and also for providers to react to choices made on the basis of those judgements.

In health care this is clearly a key issue, since much of the relevant information is of a technical nature that most patients will have difficulty dealing with. For instance, there is little evidence that when presented with information about the quality of outcomes by individual surgeons, patients actually use that information to make the appropriate judgements (Burgess, Propper, & Wilson, 2005; Marshall et al., 2000).

However, all is not lost. Even if not driven by patient choice, there is evidence that providers do use published information to improve their performance — even if, as noted earlier, they may on occasion game the system. This may be because of professional pride (the naming and shaming phenomenon discussed in a previous chapter), or because they believe that, although patients do not directly use the information, it will eventually affect patient choice through the impact on their reputation and other less direct factors.

Moreover, there are ways of making information more accessible to patients. One method that has proved very successful in helping overcome the patient information problem and encouraging user choice in the United Kingdom was the Patient Care Adviser (PCA) used in the choice pilot experiments mentioned above. Patient Care Advisers were trained staff, sometimes with a clinical background, who advised on choice of provider; they also gave advice on other matters, including clinical ones (when the PCA was clinically trained), and offered support

and reassurance. They were very popular with patients.

CREAM-SKIMMING

Any quasi-market system carries within it the danger of cream-skimming: that is, instead of users choosing providers, providers choose users on the basis of cost. Thus, in health care there is the possibility that popular hospitals, perhaps with waiting lists or queues for treatment, will choose to treat only those patients who are the easiest or the cheapest to treat.

One possible way to deal with this is to introduce a stop-loss insurance scheme whereby hospitals faced with a patient whose treatment costs lie well outside the normal range is allocated extra resources once the cost has exceeded a certain threshold. These would have to be justified as catastrophic costs (and not as the result of poor quality care). This has the advantage of removing the incentive to discriminate against high cost patients, but carries with it the problem that the hospitals concerned have no incentive to economize on treatment once the threshold has been passed.

A second possibility is to require hospitals to accept whoever was referred to them; they would have no discretion in admission decisions. There is a danger that hospitals would then develop more subtle ways of discouraging frail and possibly expensive patients, such as positioning the car park a long way from the hospital reception. Ways would need to be found to guard against this.

A third alternative is to risk-adjust the tariff system such that higher risk patients have higher tariffs associated with them. This will happen to some degree under the payment-by-results national tariff system. If fully risk adjusted, this could eliminate the incentive to cream-skim completely. However, risk adjustment is a complex and difficult business; perfectly accurate risk adjustment is arguably an impossible task. But so long as risk-adjustment is not perfect, there will remain an incentive to cream-skim. Risk adjusted payments also provide the incentive to up-code patients to more lucrative high price categories.

CONCLUSION

Publicly funded health care systems that incorporate quasi-market elements such as patient choice and provider competition can achieve the ends of health care policy. But they must be properly designed to meet the conditions for effectiveness. There must be mechanisms for ensuring: that the entrance for new providers is easy; that exit can take place and that the relevant decisions are immune from political interference; and that patients are given the relevant information and help in making choices, especially the less well off. And the opportunities and incentives for cream-skimming should be eliminated, either through not allowing providers to determine their own admissions, or through properly risk adjusting the fixed price system.

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PART 4

Will We See the Decline of Doctoring in the 21st Century?

Introduction

When considering possibilities for the future of doctoring our scope should integrate macro and micro parameters. These considerations range from global developments in technology and health care, socialization of medical professions and interprofessional interaction, national government policy, on the large scale, to the microcosmos of direct contact with the empowered patient and the physician's personal attitudes.

Evan Willis debates the question of "decline or stability", highlighting the dynamics of change over time encroaching on the once paternalistic autonomic status of the doctor. Broader perspectives of social, legal, economic and political change have molded a new image of the physician. These are all part of large-scale trends in global concepts, national insurance schemes, consumerism and complementary and alternative medicine.

Movement is apparent in the changing focus of medical care from hospitals to the community, as reviewed in the article by Nirel, Birkenfeld and Israeli. The authors reinforce the basic contention of this shift to preserve health through preventive techniques and health promotion. This involves appropriate residency training in ambulatory settings, taking into account relevant curricula, budgets, infrastructure and organizational aspects.

This community medical approach involves extended "flexible" medical teams, with legislation defining occupational realms. Cooperation through medical teamwork enables more timely access for patients to health care providers such as nurses in cases of chronic disease and health promotion. Revital Gross and colleagues highlight the possible implications of expanding the responsibility, commitment and authority of nurses in caring for the chronically ill. An example of such interaction was described by Chaim Doron in the doctor-nurse team in Israel. This project required appropriate training to alleviate the pressure on the physicians, booster health promotion and early detection, integrate health care and also focus attention on the individual patient's health needs and contributing

social and economic circumstances.

The subject of training is paramount in preparing for the future. Alon Seifan accentuated the challenge in training competent physicians. This requires education in numerous fields ranging from the fundamental science of pathophysiology, scientific development such as genetic innovations, evidence-based medicine and informatics to knowledge in behavioral and social sciences. Combining theory and practice at early stages of training can be advantageous in the learning process. Nurturing real-life experience with patients during their studies encourages creativity in medical students. These new mindlines of integrated knowledge and interactive, participative skills, as described by John Gabbay, can be coordinated into evidence-based medical practice. This will assist in their demanding future efforts to secure skillful, high quality, interdisciplinary, personalized, patient-centered health care.

Menahem Fainaru adds that providers and regulators should in turn enhance these special educational aspects through the appropriation of adequate resources and training required and alleviation of administrative impediments. This will strengthen patient trust so that the patient-physician interaction will be empowered and not only fueled through gatekeeping proposals. Medical associations, too, as described by Yoram Blachar, have a key role in defining emerging issues, resource allocation, training, preparing guidelines and influencing legal and ethical determinants.

New technological developments blossom rapidly. Effective innovations should be incorporated ethically, as noted by Rafael Beyar, receiving adequate attention in training programs paving the way to the patient encounter of the future. Optometry, in the article by Mort Soroka and David Krumholz, is an example of a profession transformed. Over time the curricula expanded, new technologies were adopted and legislation implemented, thereby revising patient care.

My article on the challenges of emerging health technology development briefly focuses on the future interaction between medical care, patient empowerment and responsibility, teamwork, clinical education and the overall social framework and values.

Will the doctor of the future be the compassionate learned hand that leads his patient through the myriad of options and consortiums to the best cure available?

Or will the future doctor be a dehumanized bureaucrat with a robotic computer dictating remedies from a detached labyrinth?

In my opinion, I do believe that the personal human touch of a caring physician will prevail.

Joshua Shemer

Doctoring in the Future: Evaluating the "Decline or Stability" Debate

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"A doctor is a doctor is a doctor."
(AMA Vice President, Choong Sew Yong[1])

INTRODUCTION

While doctoring has undergone significant changes and is now far removed from its peak of autonomy and power in the mid 20th century, the medical profession is not about to be written out of the health care scene just yet! There are instead a series of dualisms or contradictions in the nature of medical power that shape the position of doctors; the "decline or stability" debate is only one dimension of what is occurring in the reform of health systems. In particular, the role and position of the medical profession must be seen in the context of wider societal changes in the political economy of societies that is driving the reform of health systems.

THE HISTORICAL CONTEXT

In sociological parlance, the terms used to describe and analyze the social organization of health care is medical dominance (Willis, 1989). That is, within the division of labour in health care (who does what to whom under what circumstances), one occupation, the medical profession,

1. Responding to the Report of the Australian Productivity Commission (2006). Found at: http://www.ama.com.au/web.nsf/doc/WEEN-6L6TU2

dominates to an extent probably unparalleled in any other area of society. In most societies this position of dominance was established with the advent of scientific medicine in the last decade of the nineteenth and first three decades of the twentieth century. Once established, the golden age of medical dominance arguably lasted for about four decades of the twentieth century from the 1930s to the 1970s. It probably peaked during the 1960s and has been declining since. The basis for the dominance of the medical profession during that age was state patronage and support. To a large extent the state (or states in at least western countries) were largely willing to leave matters health to this small, relatively homogenous group of largely upper middle class white men. In Weber's terms, a sort of "elective affinity" existed between state interests (of legitimacy and so on) and the interests of this group.

Since that time a great deal has changed, especially in the larger political economy of western societies. Usually summed up by the term "economic rationalism" in the Australasian context, or neo-liberal/neo-conservative economics elsewhere, the major feature of this change in political economy terms has been the unfettering of the capitalist market to be the driver of economic and social change. An important feature of those changes has been labor market reform; initially as an anti-trade union strategy on the part of corporate elites to tip the balance away from labor market to capital market, but then logically applied to white collar and professional labor markets as well.

The state's underwriting of dominance in the health care field, as the original study argued, sustained a position of preeminence for the medical profession to an extent almost unparalleled in other areas of western societies. Dominance of doctors was supported at various levels: over the content of their own work (characterized as autonomy), over the work of other health care occupations (authority) and as institutionalized experts in all matters relating to health in the wider society (sovereignty).

The position of medicine was supported by its own collective organization, in the Australian context by the Australian Medical Association, arguably the most powerful professional organization in the country. According to its website, the AMA currently has more than 27,000 members and annual revenue of Aus $ 17m. In spite of internal differences among segments or factions of the profession that make

the organization more akin in some respects to a trade union congress than a single trade union, with traditional class links through "old school ties" and the like, its leaders were and continue to be able to move easily among political elites (Lewis, 2006).

Perhaps the most visible expression of this power has been in the design of the principal legislative framework for ensuring quality of care among health workers generally. Statutory registration legislation defines the occupational territory or task domain of a particular health care occupation. A struggle to secure statutory registration has long been (and still is) the major professionalization strategy for emerging health occupations, as their leaders seek to have legislative backing relating to the issues of who can "hang out a shingle" in that field. As the original medical dominance study showed historically, the medical profession was able to enshrine its own dominance by means of political influence. It did so by restricting the occupational territory of other occupations in legislation and by having the registration boards, established to administer the acts, be vigilant in enforcing the restrictions. An example is the Optometrist Registration Act passed in Victoria in 1935.[2] This act was the outcome of active political intervention by organized medicine to restrict the task domain of optometrists to measuring sight defects only and not to diagnosing or treating ill health associated with the eye, that being the task domain of medicine. As Bucher and Strauss (1961:327) have argued in their classic 1961 article, "statutory registration legislation [is] … the historical deposits of the exercise of power and authority."

THE EVIDENCE FOR THE DECLINE OF MEDICAL DOMINANCE

But "the state giveth and the state taketh away." In the last three decades, into the early part of the twenty first century, dominance has been under challenge at all those levels and the activities of the AMA have increasingly taken on the character of a rearguard action to preserve influence and authority.

2. See Medical Dominance chapter on Optometry.

The challenges have come at all three levels. At the level of autonomy, doctors have previously enjoyed almost unfettered autonomy in the performance of their work. What has changed is the result of two related processes: both internal and external constraints on this autonomy. Internally, data collection practices have been instigated that have made at least some of the internal workings of the medical profession more transparent. What this has revealed have been varying degrees of what are called practice variations. These involve, for instance, variations in the rate of certain medical procedures that could not possibly be accounted for by varying incidence of the medical condition across the country. Logically, they have to be the result of doctor preferences in treatment. In one example, the incidence of obstetrical episiotomy varied by as much as 100% from one part of the country to others (Graham, Carroli, Davies, & Medves, 2005).

Concern about, and efforts to regularize, these practice variations were advanced by another factor – medical legal concerns of litigation. Given that the standard medical defense was that treatments were in line with accepted medical procedures of the day, clinical practice guidelines have been rapidly transformed into evidence based medicine, the effects of which are still flowing through medicine (White & Willis, 2002). No longer can medical practitioners draw only on their own diagnostic and treatment preferences. Doctors now have to be able to defend their actions as consistent with accepted medical practice.[3]

Additionally, the consumer movement has had a significant impact in shaping how medical practice is governed with consumer representatives now on many governance bodies. This change is reflective of a decline in the willingness of many patients to leave their treatment decision in the hands of the doctor, but wishing instead to be an active participant in the health care process (Allsop, Jones, & Baggott, 2004).

3. This is to recall an interview done as part of a Masters degree in New Zealand; a study of what would now be called the family-life work balance of General Medical Practitioners; especially those practicing solo in more isolated rural areas. In one memorable interview the (elderly) GP opined that digital rectal examination was a seriously underused diagnostic tool in practice generally! See Willis (1976).

Related to the growing consumer role in health care has been the public outcry over the activities of a small number of high profile individual doctors where professional autonomy and lack of collegial scrutiny has lead to patient deaths. In such cases, there has been a clear failure of the system of self regulation or peer review that supports the autonomy of individual doctors. The notorious cases of Dr. Shipman in the United Kingdom and Dr. Patel in Queensland have forced governments to respond in a way that results in the decline of this self regulation and autonomy. The effect, Allsop (2004) argues in the U.K. context, is that there has been a decline in the extent to which consumers are willing to trust doctors to act in their best interests, and growing pressure on governments to act in ways that calls the medical profession to greater account.

At the external level, medical practice has become more corporatized as doctors increasingly work for third party companies (Collyer & White, 2001). As management systems of data collection are instituted (such as electronic patient records instead of cards), there is a much greater degree of transparency in medical practice, as doctors have less ability to practice unrestrained by these wider considerations.

The level of authority refers to the ability of the medical profession to control and direct the work of other heath occupations. Again, there has been a general decline as a number of writers in this volume have shown. For instance, since 1999 optometrists in Victoria have been able to perform some diagnosis and use therapeutic substances to treat some eye diseases of a more straight forward nature; this is now spreading to other states as well (Optometrists Association Australia, 2006). Members of the medical profession are less and less involved in governance procedures of other health care occupations/professions. The Optometrists Registration Board of Victoria, for instance, no longer has a medically qualified member.

Outside the conventional health care system the situation has changed even more. As I have argued elsewhere (Coulter & Willis, 2004), there is an apparent huge increase in the demand for complementary and alternative (CAM) treatments; this increase is not necessarily reflective of a significant body of evidence in support of the effectiveness of CAM treatments. This also, in spite of scandals, e.g., PAN pharmaceuticals, concerning the manufacture of products used in CAM treatments that might have been expected to undermine public confidence in them.

At the level of sovereignty, changes are also evident. In the past the state has underwritten medical dominance because of a compatibility of interests. One of the most important of those has been medicine's role as a gatekeeper to the health system to restrain costs. Additionally, the profession has exercised a social control role in gate-keeping access to sick leave and exemption from role responsibility in a Parsonian sense. However, this role in regulating access to the sick role is granted by the state, and if circumstances change, the state may be willing to look elsewhere to secure its aims. An example is the recent controversy over who can write "medical" certificates to legitimate absence from the productive process.

As part of its legislative program to rewrite industrial relations policy to heavily favor capitalist interests as against labor, the incumbent conservative Australian government has provided a legislative framework (Workplace Relations Amendment Bill 2005) to allow employers to severely restrict access to the sick role and to sickness payment. This is in an attempt to reduce the supposed improper taking of sick leave otherwise euphemistically known as "sickies." So the period of time that can elapse before individuals must have their illness legitimated by a medical practitioner in order to get paid sick leave has been reduced in many industries from three days to one. Rather than securing a sickness certificate with a start and end date, it is necessary to have one for each day taken off work; requiring a daily visit to the doctor's surgery. Indeed, in one publicized incident, one employer demanded 24 hours notice be given of the intention to even take sick leave!

An outcry to this proposal emanated from the AMA to the effect that such a burdensome requirement would clog up doctor's waiting rooms and that the three day grace before certification must be sought was, in fact, highly sensible given the self limiting nature of many minor medical conditions. In an extraordinary response that would have been unthinkable a decade ago, the Federal Minister for Health responded to the complaint by the AMA with the suggestion that health occupations other than medicine could be licensed to perform this certification role. Pharmacists, nurses, acupuncturists and physiotherapists, among others, would be allowed to write sick certificates. However, from the point of view of the medical profession, attending a practitioner other than a doctor would encourage seepage to paraprofessionals or, worse still, CAM practitioners.

In competitive terms, it could further undermine the role of the medical practitioner as gatekeeper to the health system (enshrined in Medicare as well) as well as encourage consumers to attend other practitioners for other more general health matters.

The AMA objected strenuously to this threat. Their President, Mukesh Haikerwal, was quoted as saying:

> Work Choices gives employees too many choices on sick leave, and many of them are poor choices for their health…. And worse, it will encourage employees to go to people other than their family doctor for health assessment. . . . A medical certificate issued by a doctor is based on many years of experience and training a holistic assessment of the patient condition. It is a document an employer can have confidence in. No other health professional or registered health practitioner is subject to the same legal requirements when it comes to assessing an individual's health and issuing a medical certificate recommending time off work (Sydney Morning Herald, March 28, 2006).

So it is this increasing preparedness by the state to recognize the apparent inadequacies of medical dominance as the principal feature of the social organization of health care that now constitutes a major threat to medical dominance. Crucial also in the state's wavering support of medical dominance is the report of the Australian Productivity Commission (2006) with its emphasis on workforce flexibility.

Arguably in the vanguard of current neo-liberal workplace policies, the report was released early in 2006 and the resultant legislative outcome is still under consideration. This report considered the question of whether labor market rigidities in the health workforce (mostly the effects of medical dominance) were preventing optimum organization of health service delivery. The Commission considered a range of issues including: workforce supply issues (are there enough health workers? are they where we need them? are they mobile enough?); jurisdictional issues, especially federal/state inconsistencies; and regulatory issues such as, does peer review protect the public and does it support a flexible and responsive workforce? Their general conclusion is that much needs to be done to free up the health labor workforce to make it more responsive – a head-on challenge, in other words, to medical dominance.

The AMA was critical of the report. Its Vice President, Choong Sew Yong, was reported as saying:

> The language of the Productivity Commission report is all about health care workers, not medical workers, and this is a sure sign that shifting roles and tasks away from doctors to other health workers is at the heart of the report (AMA 2006).

How are we to understand the Productivity Commission report? In the initial stages of neo-liberal/economic rationalist type labor market policies, the focus of attention was limited to the blue collar workforce, often with the not-too-subtle aim of reducing the power and influence of trade unions. But in more recent times the same ideology has been applied to white collar professional labor markets, and comes up against entrenched guild style protection of labor market regulation in which the supply of practitioners was carefully controlled in the economic interests of its members. The problems with that approach are well documented, not the least of which is ensuring a supply of practitioners in rural, regional, and working class areas of the nation where health professionals may be less keen to practice.

Furthermore, the recommendation of the report that a more flexible workforce is needed with the attendant loosening of professional domains is likely to be supported by health service managers and policy-makers. The professions, on the other hand, become anxious for their professional autonomy (and ultimately professional status) whenever it is suggested that their registration boards might undergo reform. If as the report recommends there is to be one overarching accreditation body for all health professions, then this is likely to be interpreted as an attack on professional status and autonomy.

The Australian Medical Association correctly identifies the trend to shed some of the tasks that doctors have traditionally performed to other health care workers who are cheaper and may be in more plentiful supply. Given the demand for health services and the rigidities of supply inherent in a restricted professional labor market, the response has been to advocate widening the roles that other health care workers can perform (otherwise known as pass-the-task). The most common of these are variously called Nurse Practitioners or physicians' assistants. Traditional objections, based upon the ideology of professionalism that only doctors

can perform many of these tasks, are being undermined as the methodology of evidence based medicine evaluates the outcomes of what happens in actual practice. Using the research technique of systematic reviews through the Cochrane Collaboration, for instance, has shown that there was the same or better outcomes for services performed by nurse practitioners and that they were well accepted by patients (Laurent et al. 2005).

Attempts by segments of the medical profession to restrict supply are under scrutiny on other fronts as well. Surgeons, the apex of the status hierarchy of the medical profession, have been able to resist these neo-liberal economic imperatives enshrined in competition policy more than most professional groups and have retained longer than most a form of professional organization close to the traditional guild system. Yet, the restriction of supply inherent in that approach has been opposed by the Australian Competition and Consumer Commission (2003:1), labelling it a "closed shop" arrangement. They argue:

> The supply of such an important professional service as surgery is too important a community issue for the selection, training and assessment of surgeons to be left solely in the hands of the profession through the College and its Fellows. There is a serious risk of conflict of interest.

Their reform proposals involve taking control of training, and therefore supply, out of the hands of the surgeons themselves, making the process much more transparent and open to public accountability. Yet out of this process the ACCC was forced eventually to give permission for "anticompetitive practices" in surgeon training to occur because it was deemed in the public's best interest. The issue remains vigorously contested.

At the heart of the state patronage for the medical profession in the Australian context has been Medicare, the national health insurance scheme in existence since the 1970s. Funded by a levy on taxable income, the scheme provides for all or part of the fees for certain health services. The provision of almost all of these services is the domain of the medical profession. Only a small amount of maxillofacial surgery, and curiously, optometry are provided under the scheme.[4] An inquiry into extending this

4. For an explanation of this historical curiosity see *Medical Dominance* (1989).

scheme to other health modalities was held in the 1980s (known as the Layton Inquiry) and I was seconded for over a year as a consultant (see Willis, 1990). No less than 22 health modalities made submissions to this enquiry to be allowed access to the Medicare scheme and to have their services reimbursed either partially or wholly by Medicare, as happens with doctors. In this way of course, the very substantial competitive advantage that the medical profession holds vis-a-vis the services of other health care professions would be undermined.

With the passing of more than 20 years, it can now be said of the Inquiry that there was considerable political pressure from the government of the day to pay careful attention to the cost implications of any recommended expansion to the Medicare scheme (because the levy on taxable income already did not meet the cost and needed "topping up" from consolidated revenue). In addition to AMA resistance to any expansion was opposition from the Australian Dental Association, the modality most likely to be electorally popular. This combined professional opposition to any expansion was because of the clearly expressed expectation of the government of the day that any entry into Medicare would not be open ended and would require a participating agreement to restrict costs, something that was ideologically an anathema to dentists. As a result the report found little case for expansion of the scheme (Willis, 1990).

But the passage of time has seen the issue being revisited on several occasions. The extension of Medicare has arisen in relation to mental health services being provided by clinical psychologists. The general context is deinstitutionalization of mental health services and an emergent perception that services are not adequate to manage this growing problem. If it eventuates, psychologists will have achieved what they set out to do in the Medicare Inquiry of 20 years ago. A prime ministerial press release of April 5th under the banner "Better Mental Health Services for Australia" announced:

> From 1 November 2006, the MBS [Medicare Benefits Schedule] will be restructured to better support the work of psychiatrists. GPs and psychiatrists will be able to refer patients with a mental illness to psychologists, and these services will now be eligible for a Medicare rebate. This means that appropriately trained psychologists will be able to play a much greater role in Australia's mental health system.

The final item of evidence of the possible decline of medical dominance concerns the struggle for statutory registration legislation that has traditionally been a major plank of the professionalization strategy of health occupations. Until occupations can restrict the use of occupational title, it is difficult to introduce systems of regulation internal to the profession that are the springboard for many other political gains, including potential entry to state subsidized services through Medicare.

Yet, in neo-liberal times, the current has been flowing against further statutory registration on the grounds that labor market rigidities were introduced that had the not-too-subtle aim of driving up the price of the service. Governments on these grounds have generally been opposed to passing any more statutory protection of this nature. In spite of that neo-liberal current, the issue has arisen several times in Australia. The actual passing of statutory registration legislation in the state of Victoria to register traditional Chinese medical practitioners was remarkable in the light of this trend[5]. Other Australian states have followed Victoria's lead. The legislation was passed for reasons of legitimacy: the treatments used by TCM practitioners were found not to be the harmless substances assumed by many but clearly dangerous if improperly administered. The case in point was death of a patient (an 11 year old girl) from improper administration of Royal Jelly (The Melbourne Age 1/4/94). In addition there was a need to have greater control of raw material used in the preparation of Chinese medicines after some supplies imported into Australia were found to be contaminated by pesticides (Bensoussan & Myers, 1996).

On other occasions the issue of further registration has arisen as a political compromise. For instance, in 1998 when the Liberal/National Government of the day sought to ensure the passing of the legislation to introduce a Goods and Services Tax, starting in 2000, it required the support of the Australian Democrats, a minor party in the Senate. In return, the government promised to give active consideration to implementing

5. In 1996-7, I was a consultant to the study that reviewed the context of TCM practice in Australia and then a member of the (Victorian) Ministerial Review Committee on the Future of Traditional Chinese Medicine in Victoria that recommended the legislation. See Bensoussan, A. & Myers, S. (1996).

some aspects of the Democrats' political platform which included support of naturopathy. Since then, however, nothing appears to have come of this in relation to legislated statutory registration. Instead, five professional associations were given $ 100,000 each to establish their own national professional registration systems for practitioners they themselves deemed to be qualified. Such a move enabled these practitioners to enjoy an exemption from the GST for three years, a benefit negotiated as part of the political compromise.

AND YET... EVIDENCE AGAINST THE DECLINE

The evidence for and against the decline in medical dominance is hard to access. There is also the problem of interpreting what evidence is available in terms of whether "the glass is half full or half empty." Certainly there is also evidence that the medical profession retains very significant power and authority. Boundaries between health occupations have become more fluid and less entrenched but that does not mean they do not exist.

Attempts by governments and their agencies to change the basis on which health care is provided – in the direction of more competition and ending entrenched monopolies – has not always resulted in opposition to such neo-liberal policies. For instance, take the example of surgeon training. Despite the attempts by the ACCC to end the closed shop training arrangements, more than three years after it was raised, the ACCC is still trying to make surgeon training more transparent and accountable. As the NSW Health Minister John Hatzistergos argued recently in an interview with the Australian Broadcasting Corporation, "this is the stupidity of the current situation that we're in where we won't train a sufficient number of trainees, but we're increasingly forced to go overseas in order to be able to meet the workforce requirements that we have."[6]

Nurse practitioners are another case in point. Despite more than a

6. Australian Broadcasting Corporation (2006) 'ACCC asked to investigate Royal Australasian College of Surgeons' The World Today – Wednesday, 22 February, 2006 12:22:00 (Reporter: Andre Geoghegan) http://www.abc.net.au/worldtoday/content/2006/s1575778.htm

decade of discussing such possibilities and their existence in other countries for more than 40 years, and despite nurses acting as de facto nurse practitioners in isolated remote communities, little progress has been made in the Australian context. Discussions have been held on their introduction into the state of Victoria for more than a decade now (Keating & Transancos, 2003). AMA opposition appears to have been important in this although actual evidence of behind-the-scenes influence is difficult to locate.

In a recent article, Melbourne political scientist Jenny Lewis studied networks of influence in health policy in the Australian context. She concludes:

> While many claim that the medical profession has lost power in health policy and politics, this analysis yields few signs that the power of medicine to shape the health policy process has been greatly diminished in Victoria. Medical expertise is a potent embedded resource connecting actors through ties of association, making it difficult for actors with other resources and different knowledge to be considered influential. (2006: 2125).

So it is apparent that the medical profession retains much of its dominance. The extent to which that occurs varies in different countries, although there is inevitably slippage between policies that seem to undermine the power of medicine, but do not, in the end, have much actual control or influence. Organized medicine remains politically skilful in steering and modifying governmental policies as they are applied and implemented.

Important in understanding the manner in which medical power can be conserved are a series of dualisms or contradictions that enhance and can be exploited to reinforce the position of the medical profession. One of these is a central conceptual dualism used in the field of medical sociology between technicality and indetermination. Since it was developed in the 1960s by French medical sociologists Jamous and Peloille (1970), the conceptual distinction between elements of technicality and in determination in the work performed by an occupation has been a useful tool with which to analyze such developments. The technical aspects (the "science") are those which are susceptible to codification by rules, procedures and techniques and could be made available to others in the

form of a manual (e.g., how to bandage a sprained ankle). The indeterminate aspects (the "art") by contrast are those which are not codifiable into precise prescriptions of tasks. All occupations contain a mixture of technicality and indeterminacy, of explicit and implicit expertise and it is possible to compare occupations in terms of the ratio of indeterminate to technical elements (I/T ratio). In the health labor process the medical profession has a high ratio of indeterminate elements to technical elements sometimes called "medical mystique." It is this claim to uncodifiable indeterminacy in medical expertise which has provided a powerful means of resisting technological deskilling. The more codifiable aspects of clinical practice have been incorporated into the training of subordinate occupations by a process of specialization of the division of labor, and it is their susceptibility to deskilling which provides a buffer for the medical profession

CONCLUSION

The paper argues that doctoring has undergone significant changes and is now far removed from its peak of autonomy and power in the mid 20th century that can be summed up by the term "medical dominance." Yet the medical profession is not about to be written out of the health care scene just yet! Instead the "decline or stability" debate must be understood in the context of wider societal changes in the political economy of societies that is driving the reform of health systems.

Though the paper has focussed mainly on the Australian context, it raises the question of the longer-term trends in professionalization, particularly in countries with similar health care systems (UK, Canada, NZ, and Australia). Specifically, to what extent is the state exerting greater control of the professions, and to what extent is this the result of greater public financing of health care as opposed to the growth of the consumer movement?

From a situation where medicine largely set the agenda for health policy and debate in an active way, doctors are now spending considerable political effort in reacting to reform proposals. In that sense, as Coburn (2006) argues, if current debates reflect another battle between the state and health professionals, then a research agenda in this field might focus on two questions: What are the key factors/influences that are likely to

shape the outcomes (based on longer-term trends/developments, and international lessons)? Secondly, what are the longer-term trends in professionalization in countries with similar systems?

Overall, though, there needs to be more comparative research between countries that share a broadly similar background. At present there is a dearth of studies that attempt to bridge the gap between the institutional level of analysis, at which most analyses of the professions take place, and the level of political economy and the nation-state, or, indeed, globally.

The sick will always be with us, and the central role of the medical profession will continue, albeit in different ways, as the health system evolves to place greater importance on the needs of the consumer, and to balance those needs against those of the healthcare professional.

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The Decline of Doctoring – Or the Adaptation of the Doctor's Role to a New Reality?*

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BACKGROUND

Technological development and social changes have altered the nature of doctoring in the twenty-first century. One dimension of this change is the transfer of a substantial share of medical practice from hospitals to the community, where patient mix and types and severity of morbidity vary. Additionally, the role of the physician includes health promotion, preventive care, and patient education and there is a physician-patient dynamic that is not possible in a hospital setting (Yu, 1998).

In light of these changes, it has been proposed that other professionals take responsibility for the provision of some areas of healthcare. We look at a different solution – adapting the medical profession to the changing reality in which most of the care is provided in the community. One way to achieve this is by placing a stronger emphasis on training residents in the community. In this way, residents would have the opportunity to acquire practical training in medical procedures that are practiced mainly in the ambulatory setting, to familiarize themselves with illnesses that are treated outside of the hospital, to conduct diagnostic and care interventions in the community, and to be introduced to multi-disciplinary teamwork.

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* The opinions expressed in this article are those of the authors only and do not necessarily represent those of the above organizations.

Based on an extensive review of the literature, which summarizes other countries' cumulative experience of transferring residency training to ambulatory settings, in this article we discuss the following related issues:

1. Ambulatory settings for residency
2. Accreditation of residency training in the community
3. The substance of residency in the community
4. Organizational obstacles
5. Implications for the workload in hospital wards

1. Ambulatory Settings for Residency

We reviewed the professional literature and, with the help of the Google search engine (Google Scholar, 2007), examined medical-school websites, the majority of them in the United States. The reviews revealed that most of the ambulatory residency programs are for internal medicine, pediatrics, and family practice. These programs are requisite for the accreditation of these medical specialties. On a smaller scale, there are ambulatory residency programs for dermatology and ophthalmology (Stanford School of Medicine, 2007; NYU Medical Center, 2007; Accreditation Council for Graduate Medical Education, 2007; Palmetto Health Residency Programs, 2007) and for cardiology, surgery, emergency medicine, obstetrics and gynecology, psychiatry, and neurology (Irby, 1995). In Israel, there are periods of residency in the community for several specialties. Some are compulsory, as in the case of primary medicine, psychiatry, and child and adolescent psychiatry, and some are elective, for example pediatrics, obstetrics and gynecology, and gastroenterology.

There are two settings for ambulatory residency programs: (1) residency continuity clinics and (2) block rotation. In the first case, the time allocated depends on the medical specialty and the year of study that the residents have reached – they spend half-a day per week working in the clinic during the first year of residency and three-and-a-half days per week in subsequent years. The residency continuity clinics can be at a hospital or a hospital campus or in the community (HMO or private clinic). The only difference between these and "regular" clinics is that they are staffed by faculty members who instruct and supervise the residents and are, accordingly, equipped to meet the residency requirements. During block rotation, residents are released from their hospital duties and devote

all their time to the clinic. The duration of the rotation varies from one medical specialty to another and from one residency program to another. Thus, for example, internal medicine and pediatrics residents have to spend a month working at the clinic during their first two years (Columbus Children's Hospital, Residency Programs, 2007; University of Maryland Medical Center , 2007) and more than that in the third year (Yale School of Medicine and Yale New Haven Hospital, 2007). Dermatology may include a twelve-month rotation at a hospital outpatient clinic in the first year and six months in the second (Iowa Dermatology Residency Program, 2007).

2. Accreditation of Residency Training in the Community

In the United States, accreditation is usually given to a residency program rather than to the institution where it is implemented (a hospital or ambulatory clinic, associated in most – but not all – cases with a medical school). The accreditation is granted by the Accreditation Council for Graduate Medical Education Residency Review Committee (ACGME). In practical terms, the residency review committee for each specialty conducts the examination and gives the accreditation (Accreditation Council for Graduate Medical Education, 2007). The requirements for accreditation include: the program must be administered and supervised by a medical institution that is known to meet the requirements of the residency committees for the various medical specialties through the ACGME; there must be an institutional residency committee responsible for the conduction of the residency along with the appropriate management and supervision mechanisms; the place where the residency takes place (hospital, medical school, school of public health, HMO, or the clinic of a private doctor) must be accredited by the Joint Commission on Accreditation for Health Care Organizations (JCAHO) or by national organizations that have similar standards. A request for JCAHO accreditation is tantamount to consenting to be measured by national standards and JCAHO accreditation means that the institution meets the organization's standards for various aspects of its work, such as medical procedures and medical technology, and the quality of the nursing and medical staff. It is a lengthy process and includes visits by a JCAHO professional committee for the initial accreditation and additional visits every few years to renew it (JCAHO, 2007). Other requirements for residency accreditation are:

the institutions have to assure an ongoing quality assurance process; all residents must meet the residency requirements and the institution must bear responsibility for them as stipulated by ACGME; an internal institutional audit must be conducted in accordance with the ACGME protocol; there have to be laboratory, pathology, and radiology services, medical records, support services to patients, and catering facilities for the residents and a quiet place to rest; an internal audit of the program must be conducted and a report submitted to the specific residency committee for each medical specialty at ACGME. The residency program will be accredited after the institution itself and the paperwork it has submitted have been examined successfully. The requirements for the residency program also include the ability to provide the knowledge and technology required and an examination of the skills of members of the faculty and the head of the residency program (Accreditation Council for Graduate Medical Education, 2007).

In Canada, accreditation has been given to medical schools and their residency programs since 1970. The examination and accreditation process largely resembles that of the United States. However, it is concentrated entirely in the hands of the interdisciplinary committee of the Royal College of Physicians and Surgeons of Canada, which is supported by the work of the residency committees of various residencies and post-residences (accreditation of residency programs in family medicine at medical schools is subject to a similar process conducted by the College of Family Physicians). Accreditation of the residency program is based on a process of periodic inspection, examination, and audit of the program, including interviews with members of the faculty and the residents conducted by representatives of the accrediting organization, with the goal of providing the accrediting body a first-hand appraisal as to whether the accredited program meets the required standards (Cassie, Armbruste, Bowmer, & Leach, 1999).

With the opening of national borders and the broader employment possibilities for physicians in the European Union, efforts have been made by the European Union of Medical Specialists (UEMS) to standardize the residency requirements for the various medical specialties. The Union has drawn up a charter on the training of residents in the EU. Chapter 6 of the charter sets out the requirements for various medical specialties, some of which include residency community clinics. Accreditation of a residency

institution is awarded by the appropriate institution in the respective member state; additionally, for accreditation to be granted, the requirements of the European Union have to be met (European Union of Medical Specialists, 2007 and 2005).

Note that in Israel accreditation is not given to residency programs but to the respective hospital wards. The Accreditation Committee of the Scientific Council examines whether the hospitals meet the institutional criteria and whether the ward meets the criteria for the specialty, which are stipulated in writing. The Council submits its recommendations to the Ministry of Health, which awards the status of "residency-accredited ward."

3. Substance of Residency in the Community

The advantages of residency in ambulatory settings are that it offers care to a mix of patients, particularly those with chronic conditions, continuity of treatment, development of communication skills with patients, and a glimpse at social, financial, and ethical aspects of medical care (Irby, 1995). Another relative advantage of learning in ambulatory settings that should be stressed is that it offers residents the possibility of preparing to deal with issues they will encounter in their professional working lives, such as health promotion, preventive care, patient support, patient education, continuity of care, and the dynamics of the doctor-patient relationship, which is not possible in hospital settings (Yu, 1998). Contact with patients coping with the "final stage" of their illnesses should therefore be minimized, while residents should be given the maximum opportunity to attend initial meetings with the patients (Kenneth & Palepu, 2003).

However, in his 1980–1994 review of the literature (250 articles), Irby (1995) concludes that medical education in ambulatory settings is deficient due to its heterogeneity, unpredictability, immediacy, and lack of continuity. In many cases, being at one clinic only, residents see an incomplete range of patient problems and gain limited experience of continuing patient care. Only in a few, rare cases do they discuss things with their instructors and in still fewer cases are they examined by them. Case discussions are brief, include little teaching, and provide very little feedback. Indeed, observations of medical education in ambulatory settings show that the interaction between instructors and residents is short (3–5 minutes), that there is insufficient time for direct teaching, consultation, and feedback, and that

the orientation is insufficiently adapted to clinical procedures (Bowen & Irby, 2002). In view of these deficiencies, the question is: Do residents learn what they need to in ambulatory settings?

Another question is: What characterizes this learning environment and are the residents and the instructors satisfied with their educational experience in this setting? Bowen and Irby (2002) reviewed 140 articles that attempt to answer this question. They concluded that clinics that facilitate effective learning give residents the chance to assess patients and to acquire clinical skills, have an adequate number of teachers, a sufficient volume of patients, and a heterogeneous mix of patients and morbidity, and allow enough time for teaching. Qualities that turn instructors into role models include being enthusiastic, being actively involved in the work with residents and showing them respect, having the ability to communicate and teach effectively, and giving support to the residents.

Another aspect of residency in the community programs that is tested is their learning resources:

1. The patients. It was found that the patient and morbidity mix and the socio-demographic background of the patients vary according to the type of clinic and where it is located. There is also variance in the extent that residents are exposed to different types of patient; the number of patients seen by residents; the extent that they can make independent assessments of patients' conditions; and the extent of continuity of care for patients in the different ambulatory settings according to the type of practice and its location.

2. The curricula. It has been argued that the duration of residency in the clinics is insufficient due to the heterogeneity of the patients and the complexity of the knowledge to be acquired. Studies examining this issue have found that curricula in ambulatory settings have to be based on practical experience and to include diagnostic, communication, and even management skills and to develop the ability to draw conclusions. The studies present a long list of subjects that are included in ambulatory setting training programs, but since most of the reports concern local programs, it is very hard to reach general conclusions from them.

3. Teaching methods. There are differences in the methods of instruction in the clinic, the learning methods, and the methods of enhancing the effectiveness of what is studied. Some employ conventional methods such as lectures with support material and studies based on

problems and extend to chart audit with feedback and role play. In the same context, teaching aids that have been used in these frameworks, such as computers, databases, and Internet-based study, are also discussed.

With regard to **results**, the studies have produced contradictory findings. Some show that students learn equally well in ambulatory settings as in hospitals (Bowen & Irby, 2002). However, one study reported that an OSCE examination (two stations) showed no improvement in residents' performance after a year, as opposed to another study that found a significant improvement in the level with each year of residency, based on the OCSE exam (ten stations). Other studies have shown that there are medical students and residents in ambulatory settings whose patient-interview and psychical examination skills are weaker and who are less able to discuss psychological problems and family matters effectively (Irby, 1995; Bowen & Irby, 2002). Irby (1995) concludes that the results of residency in ambulatory settings are inconclusive because of the variance in the findings of different researchers and the use of different types of examinations.

Studies that have examined how residents view their residency in ambulatory settings indicate satisfaction with their exposure to diagnostic work and general administration and the ability to present skills. It is important for the residents to be given authority to treat patients (their own patient lists), proper supervision, prompt feedback, and guidance from the instructor. In addition, internal medicine residents highly valued the possibility of comprehensive treatment and continuity from the first contact with the patient and having the instructing physician on hand. Most studies revealed a clear preference for continuity of care over block rotation because it gives practical experience of continuity of care with the patient and instructors (Bowen and Irby, 2002). Despite the criticism, Bowen and Irby conclude that the studies they reviewed revealed that medical students and residents do learn in ambulatory settings and the type of patients they encounter there prepares them for practice in the future. Swing & Vasilias (1997) obtained similar findings. However, Bowen & Irby (2002) indicate large gaps in what is known about effective clinical study methods and the ambulatory study environment. This is due, in part, to the fact that most of the studies examined programs in individual organizations, which greatly limited the ability to generalize.

4. Organizational Obstacles

The goal of the residency program is to produce a work environment that meets the residency requirements and achieves its objectives. In contrast, the goal of the clinic is to care for the patients without exceeding the budget. These two opposing perspectives are liable to lead to conflicts on four levels: (1) providing treatment at the clinic vs. instruction to residents; (2) achieving the desirable level of productivity at the clinic vs. the residents' need for medical education; (3) fulfilling the administrative needs of the clinic vs. the administrative needs of the residency; and (4) maintaining the financial stability of the clinic vs. the financial stability of the residency program. These conflicts could lead to a series of obstacles to the existence or expansion of the residency program (Prislin, Morohashe, Dinh, Sandoval, & Shimazu, 1996)]. The main difficulties associated with residency in an ambulatory setting are: finding accredited clinics with a suitable volume and mix of patients; the costs of teaching and training the residents; and finding teachers of a suitable quality (Levinsky, 1998). Added to the foregoing is the requirement for suitable infrastructure and equipment (Yu, 1998).

Costs and Funding of Residency

There is relatively little data about the costs of residency programs in clinics. Most studies have been based on a single organization and the methods for assessing costs vary from one study to another. Some costs are measured in dollars and some in units of relative value, time, and/or the number of patients seen by the doctor. Furthermore, no distinction is made between the costs of the service and the medical tuition, and the connection among the variables affecting the costs is not examined. The costs included direct and indirect teaching time; overheads; the time of the clinic staff; use of resources; and the residents' contribution to patient care (Bowen & Irby, 2002). There are conflicting data on the cost of residency programs. On the one hand, it has been found that residents increase productivity in the clinics and some studies have shown that the cost-effectiveness of doctors' work during the residency period at the clinic is high er than that of members of the teaching faculty (Bowen & Irby, 2002). On the other hand, a cost analysis of the residency program in primary-

care clinics has revealed that residency in the community raises the cost of the clinics 24–36% over the cost of clinics that do not have residency programs (Prislin, Morohashe, Dinh, Sandoval & Shimazu, 1996; Jones, Culpepper, & Shea, 1995; Boex, Bol, Franzini, Hogan, Irby, Meservey & Boex, 2000). In the United States, there is generally an arrangement between the academic institution (medical school or the respective department) and the community clinic. However, the problem of funding and fundraising is one of the main obstacles to expanding medical education in the community.

Teaching Faculty

Ambulatory residency requires teaching staff, the allocation of teaching hours, and remuneration for members of the clinic staff. The absence of financial remuneration and academic credit for the instructors is the main obstacle to establishing residency clinics (Rieselbach & Jackson, 1986). It is hard to motivate doctors to devote their own time to teaching without compensation. Making a distinction between an academic track and a clinical-teacher track and rewarding outstanding teaching are among the solutions that have been suggested (Yonke & Foley, 1991). Several studies have indicated a shortage of quality teachers in ambulatory settings and noted that staff members at clinics have more confidence in their clinical ability than their teaching ability. The authors repeatedly emphasize the importance of training the teaching staff as part of the establishment of ambulatory residency programs (Swing & Vasilias, 1997; Bowen & Irby, 2002).

Infrastructure and Equipment

Infrastructure and equipment include an adequate work space for the residents and members of staff (treatment and lecture rooms). The work space must also contain a state-of-the-art computer system with access to databases and learning programs (e-learning), and the latest treatment equipment. In addition, the clinic must have support staff – management, secretaries, and nurses – and an interdisciplinary staff to treat patients, including professionals such as pharmacists, dieticians, social workers, and psychiatrists or psychologists. Not all ambulatory clinics, even those with

a suitable volume of patients and staff, can serve as residency clinics (Yu, 1998).

5. Implications for the Workload in Hospital Wards

The decision to transfer some of the residencies to the community has implications for the workload in the hospital wards, where much of the work is done by the residents. The reduction in shift hours achieved by the residents has already increased the burden on the doctors in the wards. The solutions found to replace residents leaving the hospitals to work in the community include: employing moonlighting residents as substitute personnel; having more external duty physicians; and having parallel, non-accredited wards that are less reliant on residents (Kenneth & Palepu, 2003). Another solution practiced mainly in the United States is for hospital wards to employ nurse practitioners and physician assistants to perform some of the tasks usually performed by residents (Crawford, 2003). Studies that have examined their performance in general intensive care, pediatric and neonatal intensive care, nephrology, and dialysis have found this to be an effective method of patient care in those wards (Anderson, Torres, Bitter, Anderson & Briefel, 1999; Ellis and Brandt, 1997; Snyder, Sirio, Angus, Hravnak, Kobert & Sinz, 1994; DeNicola, Kleid, Brink, van Stralen, Scott & Gerbert, 1994).

DISCUSSION

Including work in the community as part of the residency program pertains to a discussion being held in Israel as to whether specialist (secondary) medicine in the health system should be practiced in hospitals or in the community. A committee discussing the subject has reached the consensus that in order to have the right combination of service provision, it is necessary to establish guidelines for the division of work between the community and hospitals in all fields of specialization (Israel Institute for Health Policy and Health Services, 2001). The indicators for dividing medical practice between hospital and the communities are as follows: safety of the medical procedures and ensuring strict adherence to the medical requirements for equipment and technology, skills and level of training of the medical staff, maintenance of continuity of care, and a critical mass

of patients and professional staff. These are the elements on which the licensing requirements for performing medical procedures in the community will be based. A solid division of procedures between the community and hospitals should also lead to an acceptable, orderly change in the residency programs for specialties for which a significant proportion of the treatment is given in the community. However, the process of transferring residency from hospital to the community is liable to run into obstacles, the first being the sound operation of the hospitals. The standard number of beds in each accredited ward in Israel has to meet the requirements of the Scientific Council of the Israeli Medical Association, which stipulates the minimum number of beds required for a ward to be accredited for training residents – an incentive to keep residency in the hospitals for the entire duration. Removing the obligation on the place of residency to have a minimum number of beds would de facto mean no further connection between the number of beds and accreditation of the ward. There is therefore a need for a new model for the accreditation of a ward that would, inter alia, take into account the patient mix, type of treatments given, professional and academic standards, results of treatments, and the volume of activity required in the various frameworks of the ward's activity in order to acquire and prove skills as recommended by the Amorai Commission (Public Commission, 2002).

Another barrier is that the hospitals will have to cope without the residents when they go on block rotation, which is liable to seriously increase the workload for the doctors in the ward. We cannot be sure whether solutions found abroad, such as additional professional members of staff who are not physicians (nurse practitioners or physician assistants), are suitable for Israel. There is apparently a need for creative solutions such as transferring some of the responsibility to senior doctors in the ward, transferring non-medical duties from residents to other members of staff, or changing the shift arrangements and altering the division of work in the hospital wards.

Mention has been made of the hospitals' fear that they will loose the monopoly and control over the residency process and the residents' work. Evidently the positive experience of the combined residency track in Israel shows that all sides benefit. It is good for hospitals because patients are referred for continuing treatment, relations with the community are strengthened, and there are a greater number of positions for residents.

The health plans benefit from the academic status given to the doctors and from the prevention of stagnation and duplication. The patients and the health system benefit from continuity of treatment, better treatment, and financial savings.

Residency in the community requires additional paid positions for residents and teaching staff in accredited units in the community. The question is, where can we find enough teachers with good clinical and teaching skills and what will attract them to do the job without any additional recompense? Moreover, it is unclear who will finance the positions for the residents and whether the hospitals and health plans will agree to sharing the cost of a resident's position proportionately to the time he or she spends in each place.

Another unknown factor is what incentive there is for the health plans to bear the cost of instructing the residents, especially since it is quite possible that patients at their specialist clinics will become less satisfied because they will have to wait longer at the clinic since the treatment of patients will be lengthier while instruction takes place. Furthermore, transferring the residents to the community entails appropriate adaptation of the physical features at the community clinics (e.g., rooms, information systems, and technology), which is also likely to raise costs for the clinic. As we saw in the review of the literature, the problem of funding sources has not been solved in the Western world either and implementation of a period of residency in the community depends on an arrangement between the hospitals and the clinics in the community. If we want to implement this reform, it will evidently be up to the Ministry of Finance, the Ministry of Health, and the Scientific Council to establish sources of funding for it.

Other areas to be considered concern the maintenance of the standard of clinical teaching. It has to be decided who will be responsible for the period of residency in the community – vis-à-vis both the professional program and the administrative responsibility. It is also necessary to decide which specialties will have a period of residency in the community and whether they will be compulsory or optional for all residents. This is particularly important in specialties where the resident cannot get to know the entire range of the specialization without being in the community. We have to think about ways to check that the Scientific Council requirements are being met and how to maintain an appropriate

level of instruction in the community so that residents trained in both settings (community/hospitals) attain the same standard.

In our study, we brought up issues relating to the implementation of a process of transferring periods of residency from the hospital to the community. Our goal was to place these issues on the public agenda. We hope that our review will draw attention to these and other related issues and pave the way toward public discussion of them, and that the medical community as a whole and decision-makers in the health system in particular will respond to the issues we have raised in this article.

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The Desired and Actual Division of Labor between Nurses and Physicians in the Care of Chronic Illness: Implications for the Role of Physicians in the 21st Century

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Physicians and nurses have been working alongside one another for decades – in hospitals and community settings. The relationship between these professions has evolved significantly over the last two decades. In the past, physicians had dominance in hospitals and clinics with nurses assisting them and subordinate to them. Today, nurses are independent professionals, the profession has academic recognition and nurses have patient care responsibilities and make independent decisions in hospital wards and as care coordinators in community settings (Le Tourneau, 2004). Nurses have stopped playing the traditional role of "willing subordinate" and are striving for more autonomy and recognition of their clinical competence (Fagin, 1992). Still, physicians in most settings maintain the right to control the division of labor, and direct much of the medical care patients receive (Marrone, 2003).

The division of labor between the professions is of particular importance today, when chronic conditions account for about 46% of morbidity in developed countries (WHO, 2002). Optimal care for chronic patients in community settings is seen as a product of collaboration between physician

and nurse – each providing part of the required care in coordination with the other. Evidence is accumulating that failure to coordinate care has a significant impact on patient outcome in hospitals and in community settings (Larson, 1999; Fagin, 1992; Garman, Leach, & Spector, 2006; Shojania et al., 2006).

The importance of sharing patient care between physicians and nurses has been long recognized by Israeli health plans. Indeed, about 80% of physicians affiliated with Israel's two largest health plans work alongside nurses. Moreover, clinical guidelines for treatment of the most prevalent chronic conditions – hypertension and diabetes – are addressed to the "medical team"; physicians and nurses participate together in training sessions related to these guidelines and they use the same medical monitoring record. However, the guidelines do not spell out the exact division of labor among doctors and nurses and that is left to the discretion of each clinic (Gross et al. 2005). Consequently, we do not know how the teamwork is in fact implemented, or in other words, who is in charge and what is the actual division of labor between physicians and nurses in managing the care of chronic patients.

The literature suggests that often working together arouses inter-professional conflicts about the model to be adopted for teamwork. Explanations of the source of conflict are varied: mismatch in the fundamental beliefs about the value of collaboration and its meaning; incompetence in interpersonal skills and lack of role model of collaboration (Larson, 1999). Furthermore, as nurses' roles have expanded and as nurse practitioners and physician assistants undertake tasks that formerly were done by physicians, with encouragement of insurers and providers seeking creative and less costly alternatives that do not reduce quality, conflicts between the two professions have intensified (Jamison, 1998; Fagin, 1992). Similar to responses of US physician associations who feel threatened by competition from these practitioners (Fagin, 1992), the Israeli Medical Association (IMA) has recently also voiced concerns of paraprofessionals trespassing on their professional domain. The Director of IMA expressed concern that "financial constraints are an incentive to save money by transferring medical tasks to other professionals. The Israeli Medical Association has a serious problem with this trend" (Wafner, Zman Harefoa, April 2006).

Given the ambiguous attitude towards the model of working together

in Israel, the objective of this paper is to: a) Examine the existing role of physicians and nurses in treating patients with hypertension and diabetes in Israel (as perceived by physicians and patients); and b) Compare it to physicians' perceptions of preferred nurse involvement in care.

Based on the findings we will then discuss implications for redesigning the roles of physicians in the 21st century to improve the division of labor with nurses.

RESEARCH DESIGN AND METHODS

Setting

This study was conducted in Israel, where universal coverage for all residents is provided through four competing health plans.

In Israel, the prevalence of diagnosed diabetes is estimated to be 6% of the population in Israel (Porath, Rabinowitz, & Raskin-Segal, 2006) and hypertension about 29% internationally (Hajjar & Kotchen, 2003). Primary care physicians play a crucial role in managing diabetic care (Goldfracht & Porath, 2000) and hypertension (Heymann et al. 2005). Israel's two largest health plans, Clalit Health Services and Maccabi Healthcare Services, which together cover over 80% of the population, have developed clinical guidelines on the treatment of diabetes and hypertension. Both health plans regularly monitor indicators of diabetes and hypertension care.

This paper is based on a secondary-data analysis of a study funded by the Israel Institute for Health Policy and Health Services Research to assess primary care physicians' adherence to hypertension and diabetes guidelines (Gross et al. 2005). The study was approved by the Ethics Committee of the Emek Medical Center in Afula, Israel.

Subjects

The study population of physicians included all community-based primary care physicians who were affiliated with Clalit Health Services and Maccabi Healthcare Services. A representative sample of 997 physicians was then drawn from the lists of physicians employed by each of these health plans, after stratifying for specialty (general practitioners versus specialists in family medicine, internal medicine or another specialty) and terms of

employment (salaried versus independent physicians who are remunerated based on number of patients on their list). A total of 52 physicians did not meet the inclusion criteria (i.e. did not practice primary care, had retired or died, had been fired, or were not currently working due to a medical condition). A total of 743 physicians were interviewed, yielding a response rate of 78%. Each physician was assigned a weight based on the probability of being sampled.

The study population of patients included 1,775 patients with hypertension and/or diabetes registered with these primary care physicians[1]. A total of 1,369 participants completed the patient questionnaire (77% response rate). Each participant was assigned a weight based on the probability of being sampled, adjusted to reflect the numbers of patients with hypertension, diabetes, or both diseases registered with the health plans. The number of weighted cases in the separate analysis of each disease was 1125 for hypertension and 400 for diabetes.

Data collection

Structured, pre-tested questionnaires were sent by mail to physicians between October 2002 and March 2003, with telephone reminders by trained interviewers.

Between December 2002 and June 2003, telephone interviews were conducted with hypertensive and diabetic patients using structured questionnaires. The interviews lasted an average of 20 minutes and were conducted by trained interviewers. The questionnaires were translated into Russian and Arabic to include significant segments of Israel's population that do not speak Hebrew.

1. From half of the physicians, we sampled patients with diabetes and from half patients with hypertension. Each patient sampled was interviewed on the condition for which he/she was sampled. For example, a patient with hypertension and diabetes that was sampled from the diabetes register was interviewed only on his/her diabetes condition.

Measures

The dependent variables were:

1. Actual nurse involvement as perceived by physicians: physicians rated nurse performance of tasks indicated in the guidelines. For each of the tasks listed in Figure 1 the physician rated whether the nurse performs it for "almost all patients", "most/more than half"; "some/less than half"; "almost none" . For each physician we counted the reported number of tasks the nurse performs for "almost all patients". We defined physicians that the nurse performs at least one of the tasks for almost all patients as practicing with "high nurse involvement". The others were defined as practicing with some nurse involvement.

2. Actual nurse involvement as perceived by patients: patients reported who provided the care for each aspect of the care indicated in the guidelines: the primary care physician, the nurse or both[2]. We asked about explanations, counseling, check up examinations and referrals (see tables 4 and 5).

3. Preferred involvement of the nurse in providing care for chronic patients as perceived by physicians: For each of the tasks listed in Figure 1 the physicians rated to what degree they wanted the nurse to perform it for all patients: to a "very high" degree, "high", "medium", "low", "not at all". For each physician we counted the number of tasks he/she rated as desirable "to a very high degree" that a nurse perform for all patients. Those rating all tasks as "very high" were defined as preferring "high nurse involvement". Others were defined as preferring "some nurse involvement".

The independent variables in the multivariate analysis were:

1. Physicians' background variables: demographic characteristics (e.g., gender, age);
2. Physicians' professional characteristics (specialty, country where medical studies were completed), organizational setting (e.g., health plan affiliation, employment terms, staff, work load).

2. Percent answering "both" was added to each profession.

Statistical Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS, SPSS Inc., Chicago, IL). Bivariate analysis was performed using overall chi square tests. Multivariate analysis was performed to determine the independent effect of physicians' demographic and professional characteristics on their report and preferences regarding nurse involvement.

We used the model of logistic regression to identify non-linear associations. The dependent and independent variables were dichotomized in order to differentiate between physicians with high and low scores, given the skewed distributions. Variables that were found to be significantly related to the dependent variable in the bivariate analysis ($p<0.05$) were included in the multivariate analysis, as were control variables (to negate the effect of differences between the health plans, and possible spurious or latent effects).

FINDINGS

Physicians' reports on working with a nurse

Overall, 80% of physicians work with a nurse. However, there are significant differences in the practice patterns of physicians in Clalit (75% of the sample) and Maccabi (25%) health plans. 50% of Maccabi physicians work with a nurse compared to 90% of Clalit physicians.

There is also diversity within Clalit: In rural areas, higher rates of physicians report working with a nurse who provides care only for their patients (48% vs. 17% in urban areas).

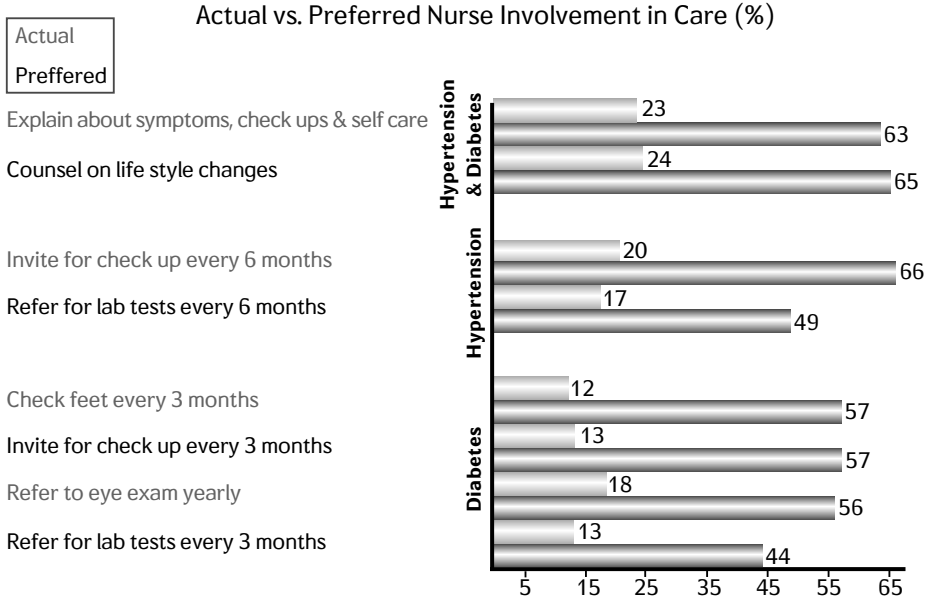
In urban areas, higher rates report that the nurse provides care for patients of several physicians (74% vs. 46% in rural areas).

Physicians' Perceptions: Actual and Preferred Nurse Involvement in Care[3]

Reported rates of actual nurse involvement were much lower than preferred rates of involvement. Less than 25% of physicians report that a nurse performs each of the tasks for "almost all patients" (upper bars). Much higher rates (between 45% and 65%) report they would very much like the nurse to perform these tasks for all patients (lower bars, Figure 1).

The actual involvement rates range from 12% reporting that the nurse checks almost all diabetes patients' feet every 3 months to about a quarter reporting that the nurse counsels all patients on life style changes and provides explanations. The preferred involvement rate was highest for counseling on life style changes and providing explanations. The least preferred involvement was in referral to lab tests.

Figure 1: Physicians Perceptions:
Actual vs. Preferred Nurse Involvement in Care (%)



3. We present rates of actual nurse involvement for all physicians, including those who don't work with a nurse. This presentation enables us to compare between actual and preferred involvement as well as between physician and patient reports. A separate analysis conducted only for physicians who work with a nurse (80% of physicians) shows only slightly higher rates of involvement

About 35% of physicians practice with "high nurse involvement" in the measure defined above (methods). Higher rates of nurse involvement were found among: men, GPs and family physicians, salaried, employed in Clalit, serving a rural population and seeing over 50 patients per day (see Table 1).

Table 1: Reported Actual and Preferred Nurse Involvement by Physician Characteristics (%)

	Actual "high nurse involvement"	Preferred "high nurse involvement"
Gender		
Women	31*	32
Men	37	28
Age		
56 +	32	22**
Under 56	36	32
Specialty		
Spec. internal med	24**	25*
Family and general	38	32
Employment		
Independent	28**	28
Salaried	39	32
Health Plan		
Maccabi	18**	19**
Clalit	40	34
Population		
Urban population	31**	32**
Rural population	49	23
Number of patients		
< 50 patients per day	32**	28
> 50 patients per day	42	34

Logistic regression analysis indicates that employment in Clalit, practice in rural areas and male gender have a positive independent effect on reported high nurse involvement, while specialty in internal medicine has a negative effect (see Table 2).

Table 2: Logistic Regression: Characteristics of Physicians Reporting Actual and Preferred Nurse Involvement (n=743)

	Actual "high nurse involvement" Odds Ratio (CI)	Preferred "high nurse involvement" Odds Ratio (CI)
Gender (men)	1.58* (1.11-2.25)	1.03 (0.72-1.47)
Age > 56	0.89(0.59-1.34)	0.56** (0.36-0.86)
Specialty in internal medicine	0.56* (0.34-0.92)	0.87 (0.53-1.44)
Specialty in family medicine	1.00 (0.68-1.47)	1.24 (0.83-1.84)
Clalit	2.68** (1.68-4.26)	2.35** (1.46-3.76)
Rural Practice	1.70** (1.14-2.53)	0.47** (0.30-0.73)
Independent physician	1.35 (0.93-1.97)	0.97 (0.66-1.43)
> 14 minutes per chronic patient visit	1.20 (0.86-1.68)	1.18 (0.84-1.66)
< 50 patients per day	0.99 (0.99-1.00)	0.99 (0.99-1.00)

*p<0.05 ** p<0.01

30% of physicians were found to prefer "high nurse involvement" in the measure defined above (methods). Higher rates of preferred nurse involvement were found among: family physicians, employed in Clalit, serving an urban population and under the age of 56 (See Table 1)

Logistic regression analysis reveals that employment in Clalit has a positive independent effect while age over 56 and rural practice have a negative effect on reported preference for high nurse involvement (Table 2).

Hypertensive and Diabetic Patients' Perspective on Nurse Involvement in their Care

From the perspective of the hypertension patients, care is provided predominantly by physicians. Except for measuring BP, less than 10% reported that the various aspects of care were provided by the nurse (Table 3).

Table 3: Hypertension Patients' Reports:
Role of Physician and Nurse in Care (%)

	physician	nurse
Measured blood pressure last visit	70	21
Regular check up	90	9
Counseled on diet	57	5
Explained about importance of taking medications regularly	69	5
Explained about dangers of disease	47	4
Counseled on physical activity	34	4
Explained about target weight	53	4
Explained about self measurement of BP	25	3

The same picture emerges from the reports of diabetes patients, although nurse involvement here is slightly higher. Less than 20% of patients report nurse involvement in each aspect of care (Table 4).

30% of hypertension and 55% of diabetes patients reported that a nurse was involved in at least one aspect of their care.

Table 4: Diabetes Patients' Reports:
Role of Physician and Nurse in Care (%)

	physician	nurse
Full body examination (height, weight, mouth, pulse)	31	17
Checked feet in past year	23	13
Regular check up	78	12
Explained about dangers of disease	49	12
Counseled on diet	59	10
Counseled on checking feet	21	9
Explained about checking eyes	53	6
Referred to eye exam in past year	65	1

SUMMARY AND DISCUSSION

The findings of this study show that in the Israeli model, in spite of the stated intention of the guidelines, it is mostly the physicians who provide the care indicated in the guidelines for hypertension and diabetes, and nurses have only a limited role (as reported by both patients and physicians). We have also found that physicians are not satisfied with this model and that most physicians prefer higher rates of nurse involvement in the care of the chronically ill.

There may be several explanations for these intriguing findings:

- Patients may prefer receiving care from the physician and do not cooperate with nurses.
- Physicians after all may prefer to provide care by themselves instead of delegating tasks and sharing responsibility with the nurse, but they feel uncomfortable saying this in surveys.
- Nurses may prefer low involvement for reasons such as lack of time, heavy workload or preference to perform more interesting/

professional nursing tasks.

- Organizational constraints may also explain this – not enough positions for nurses and over supply of physicians; lack of managerial support for teamwork, and the professional hierarchy in the nursing sector that independently defines nursing care policy and practices.
- Lastly, perhaps both professions are unable to create a better model of care, when working together?

We assume that all of these contribute to the limited role that nurses currently undertake in the care of patients with hypertension or diabetes, but further research is needed to assess the role each of these has in creating the current situation. In particular, there is a need for a survey of nurses in order to understand their perspective regarding the preferred model of care, reasons for the current situation and barriers for change.

In the following sections we will elaborate on the last explanation – that both professions are unable to create a better model of care when working together – because it has major implications for designing a new role for physicians in the 21st century. Even though changing the model of care may not be the only change that is needed for increasing nurse involvement in care of chronic patients, the evidence from the literature suggests that it has high potential for creating significant improvements in this area. The rationale behind this argument is that in light of the developments in the nursing profession in the last decades, creating a model of working together in which nurses are equal partners, with autonomy in performing their tasks, will increase their job satisfaction (Zangaro & Soeken, 2007). Based on job performance theories (Petty, McGee, & Cavender, 1984), this is expected to consequently increase their motivation to take on more responsibility in the care of chronic patients.

In the next section we will present three basic models for constructing the relationship of doctors and nurses (Davies, 2000), summarize the advantages of the collaborative model that emerges from the literature, and then discuss barriers and facilitators to implementation of this model.

Previous research has identified three basic models for constructing the relationship of doctors and nurses, which differ in two dimensions: the principles underlying the division of labor between the two professions and the extent of physician dominance in the relationship.

- The *Traditional model* is characterized by physician dominance,

controlling division of labor, directing medical care; nurses are subordinate. Due to developments in the nursing profession in the last decades, this model is losing ground (Fagin, 1992, Davies, 2000).

- In the *Partner model*, physicians and nurses work side by side, allocating tasks by principles of specialization and delegation; it is replacing the traditional model in many places. Still, physicians in most settings maintain the right to control the division of labor, and direct much of the medical care patients receive. These power differences translate into greater physician responsibility for patients (Marrone, 2003) which is reflected in a passive role of nurses, who are of less power and thus do not assume a proactive role in patient care (Davies, 2000).
- The *Collaborative mode* is a relatively new model characterized by joint decision making; interdependent equal parties working with mutual respect and trust, acknowledging their equally valid knowledge and expertise; and collective responsibility for outcomes (Davies, 2000; Baggs, 2005; Storch & Kenny, 2007).

Evidence is gathering in the literature about advantages of the collaborative model which is implemented in several sites, mainly in the US (Liedtka & Whitten, 1997; Fagin, 1992; Baggs, 2005; Gardner, 2005; Larson, 1999; Garman et al. 2006; Shojania, et al., 2006; Jamison, 1998; Lindke & Sieckert, 2005). The main advantages include:

- Better outcomes of patient care: each provides part of the required care in coordination with the other
- Reduced costs – related to more effective and coordinated care
- Improved quality of provider's work life and personal growth

Evaluation of efforts to implement a collaborative model of care has indicated that it is not an easy process. There are many deep-rooted barriers to implementation (Davies, 2000). These include:

- Traditional values underlying training
- Disparate beliefs about value and meaning of collaboration
- Incompetence in interpersonal skills
- Lack of a collaborative role-model
- Gender-related issues
- Competition over domains

However, several strategies for facilitating collaboration have been identified (Fagin, 1992; Lindeke & Sieckert, 2005; Leidtka & Whitten, 1997; Boswell & Cannon, 2005; Walker & Elberson, 2005):

- Reform of education curricula
- Committed organizational leadership
- Programs to develop interpersonal skills
- Team development: building trust, shared vision and goals
- Structuring collaboration: setting aside time for collaborative meetings and providing facilities for them
- Using IT for facilitating coordination and communication

Weighing advantages and risks of adopting a new model of work raises the question – is it worthwhile for physicians to give up the traditional physician-dominated model of care and make a serious effort to implement a collaborative model? Is it worthwhile to try and overcome the various barriers that prevent true collaboration? There is no clear cut answer.

On one hand, this model of care carries within it an opportunity to reduce physicians' workload and improve care by better using nurses' skills. On the other hand, it also carries a threat for physicians of losing their dominant position (and related power) and sole responsibility for patients which they perceive as a cherished value. In Israel, the value of this was clearly declared by the Director of IMA: "The physicians are the only profession that takes an oath at the end of their training and thus join an historic tradition of ethical behavior and responsibility as is not the case in any other profession" (Zman Harefoa, April 2006). Losing sole responsibility can therefore be perceived by Israeli physicians as a threat.

This new collaborative model can either be a threat or an opportunity (depending on how the change is managed) for the status of physicians in the system; for the physician-nurse relationship; and for the demand for physicians in the workforce. This last point is a serious issue for physicians based on the US experience. In the US, in many workplaces, change in the physician-nurse model of collaboration has taken the form of the employer's demand for skilled low cost manpower (physicians' assistants and nurse practitioners) who can perform many tasks including provision of preventive and supportive care for patients with chronic conditions. They have, to a large extent, the ability to replace primary-care physicians and thus reduce the demand and undermine the profession (Iliffe, 2000;

Anonymous, 2004). Nevertheless, this is not inevitable. If the synergetic potential of collaboration is realized, the role of the physician can be secure even if some of the tasks are performed by others.

CONCLUSION

To conclude, when looking towards the challenges facing physicians in the 21st century, it is apparent that morbidity trends will probably lead to changes in patterns of care of chronic patients – with growing prevalence of "case management", "disease management" and other chronic care models. The literature shows that physicians and nurses have complementary skills to provide optimal care as a team when implementing such models (Bodenheimer & Fernandez, 2005; Bodenheimer, MacGregor, & Stothart, 2005; Jamison, 1998; Edlin, 2004; Sund & Sveningson, 1998; Sandy, 1991). However, our study has shown that in the Israeli case, nurses have a limited involvement in the care of chronic patients, and physicians perform most of the tasks. We argue that one of the reasons for this may be the current model of teamwork in Israel. Since there is yet no empirical data on this, our study thus highlights the importance of future research on the prevalence of different models of teamwork in Israel as well as the impact of the different models on the role nurses assume in care of chronic patients.

Based on a review of the literature we suggest that if physicians really want to attain nurses' cooperation in caring for chronic patients, they need to actively restructure the relationship with nurses – and create a better model of care. The literature shows that a collaborative model – shared responsibility with joint decision making of equal partners, mutual respect and trust - can reduce costs and improve quality of work life for both physicians and nurses. Therefore, we believe that although achieving a collaborative model may be a difficult process, it is probably well worth the effort. The potential benefits to be reaped are not only for the patients, but also for the physicians and nurses themselves.

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Back to Teamwork in Primary Care?

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The possible decline of doctoring in the 21st century is closely linked to the rise of allied professionals and inter-professional competition. This topic is very much influenced by the study of John B. Mckinlay and Lisa D. Marceau: "The End of the Golden Age of Doctoring", published in the International Journal of Health Services in 2002 (Mckinlay & Marceau, 2002).

Among the major extrinsic factors for this decline the authors include "the emerging competitive threats from other healthcare workers". Within the non-physician practicing clinicians, the authors mention the traditional disciplines: nurse practitioners, certified nurse midwives and the physician's assistants. In addition, they mentioned the alternative or complementary providers and some specialty disciplines.

The authors added that "late 20th century changes enhanced the labor market position of non-physician clinicians". The aggregate number of them graduating annually in all the disciplines is growing impressively especially in the U.S and competition is likely to be more and more intensive.

In contrast to the competitive approach, the objective of this presentation is to describe a model of physician-nurse teamwork which we tried in Clalit Health Services between the end of the 1960s till the 1990s, a model of close cooperation instead of competition between nurses and primary care physicians in Israel. This close cooperation improved doctoring and contributed significantly to satisfying the health needs of the current era, in which non-communicable diseases are the main challenge facing health systems. We saw the model of physician-nurse teamwork as an integral part of the process of renaissance in primary care, which is so vital today.

The present era of prevalence of chronic diseases implies, from our point of view, the concept of an integrated health service, and not merely a sickness-oriented health care system. The main locus for the crystallization of this change should be the primary care system. This process implies the transformation from solo practice to physician-nurse teamwork. Obviously, we are referring to cooperation instead of competition.

We consider the time available for physician-patient contact in primary care to be a major medical and economic issue. The more effective use of other health professions contributes to the solution of this problem.

The teamwork model in Clalit was based on the access to the physician after nurse-patient contact and related to three additional main functions:

1. Promotion of health including early detection of community diseases (such as hypertension, diabetes and cancer).
2. The follow-up of the chronic ill.
3. Information on the social environment.

After approving the residency program in family medicine, the IMA Scientific Council appointed a committee under the chairmanship of the late Dr. Max Pollack in order to specify the conditions of practice within the residency program. The Pollack Committee's report on primary care specified:

1. A registered nurse will be recognized as a **"registered family nurse"** or a "registered pediatric nurse" after special training.
2. During the regular visit hours every patient will be referred first to the team nurse who will consider with him if it's necessary and urgent to be examined by the physician.
   The team nurse will prepare the patient for a visit to the physician and will carry out the regular nursing functions of health education and others, according to the physician's instructions.
3. The team nurse will actively participate in the follow up program on chronic disease patients.

One of the first clinics where the doctor-nurse teamwork was introduced in the year 1967 was the "Shimshon Clinic" in Beit Shemesh, a development town in the Jerusalem area. The town was populated with many new immigrants, mostly from North Africa, with a very low socio-economic status. Four family doctors worked in the clinic, each of them in charge of

one of the four neighborhoods of the town. Before the introduction of the physician-nurse team system, three nurses worked in the clinic, two of them dealt with dressing and intravenous injections and the third dealt with all the other injections. During the routine day work there wasn't any contact between physicians and nurses. With the introduction of the new system, a fourth nurse was added to the team and every one of the nurses was connected to one of the physicians. The head of the clinic and the initiator of the change was Prof. Yair Yodfat, professor of family medicine at the Hebrew University Medical School in Jerusalem (Doron& Shwartz, 2004).

One of the major findings of the doctor-nurse teamwork system was **the decrease in the number of visits to the family physician** per person which enabled the physician an improved framework of the available time for the doctor patient relationship. Table 1 shows the decrease in the annual average number of visits to physician per person during the years 1966 - 1968. This decrease appears to have been achieved largely through a shift in visits from doctors to nurses. But it is important to note that total visits (to doctors and nurses combined) also decreased.

Table 1: Visits per person to physician-nurse teams in the Beit Shemesh Primary Care Clinic (Yodfat, 1972)

Year	Visits to Physician	Visits to the Team Nurse	Total Visits
1966	7.6	-----	7.6
1967	3.8	3.9	7.7
1968	3.1	3.5	6.6

Table 2 shows this decrease, in comparison to three other development towns where the doctor-nurse teamwork had not yet been introduced during those years, as well as with the national average. The major decreases in visits found in Beit Shemesh were not found elsewhere. Clearly, the introduction of teamwork was associated with a dramatic reduction in the number of visits to primary care physicians.

Table 2: The Annual Average Number of Visits to Primary Care Physicians in selected Development Areas (Yodfat, 1972)

Year	Or Akiva	Nazeret Eillit	Shlomi	Beit Shemesh	National average
1966	7.1	6.8	6.9	7.6	6.6
1967	6.5	6.8	6.9	3.8	6.4
1968	6.8	6.9	6.7	3.1	7.0

Several studies conducted at the time, suggested that the teamwork approach reduced various categories of health plan expenditures. Ziv and Bialik (1978) found that visits per person per year to clinicians averaged five in the teamwork clinics, compared with seven in other clinics. Yodfat (1972) reported similar findings. Pollack and Shavit (1977) reported that hospitalization days were 40% lower in teamwork clinics, while Yodfat (1972) as well as Purisman and Shneider (1970) reported that teamwork clinics were associated with markedly lower use of bandage and injections. We cannot prove definitively that these lower expenses were completely the direct result of the teamwork approach, as the associations reported may be due to other differences in patient and physician characteristics. Still, the consistent pattern of findings is highly suggestive.

Table 3 gives us a picture on the development of the doctor-nurse teamwork in the urban clinics of the Clalit Sick Fund between the years 1970-1979. Note that the number of team clinics, teams and registered patients all doubled during this period.

Table 3: The Development of the Doctor-Nurse Teamwork in the Urban Clinics, the Clalit Sick Fund 1970-1979

	1970	1977	1979
Number of team clinics	61	109	128
Number of teams	155	299	368
Number of members registered with teams	313,515	561,954	662,127

Source: Clalit Sick Fund, Haifa Region: The Clinic as a Socio-Medical Center in the Teamwork. The research Department, Clalit Central Management, No. 39

The teamwork approach was in operation for approximately 25 years, from 1966 until the early 1990s. The formal reason for its discontinuation was the pressure to reduce expenses. The teamwork approach had entailed the addition of a half-time nurse position in each clinic, which typically employed four physicians. In my opinion, this measure was short sighted even from the economic perspective, as it did not take into account the savings on pharmaceuticals, lab tests, and hospitalizations which resulted from the teamwork approach.

Table 4 is based on information from OECD countries in comparison to Israel on the average number of visits per person per year to physicians. We can see that while most of the countries had an increase in the average number of visits between the years 1981 and 1986, only Israel, Germany and Poland experienced a decrease in these visits. I believe that the change in Israel was due largely to the implementation of the teamwork approach, which by the end of the 1970s covered almost 20% of the population.

Table 4: The Utilization of Primary Care Services:
International Comparisons – OECD Countries and Israel

Average number of visits per person per year

Country	1981	1996
Australia	4.5	6.6
England	4.7	5.9
France	4.2	6.5
Israel	**8.5**	**6.7**
Japan	14.6	16
Finland	3.3	4.3
Germany	**11.6**	**6.5**
Italy	8.3	8.3
Mexico	1.3	2.2
The Netherlands	5.3	5.4
Poland	**6.5**	**5.4**
Sweden	2.6	2.9
USA	4.6	6.0

Source: OECD Health Data, OECD, Paris, 1998

Obviously, the physician-nurse team required intensive **programs of nurse education.**

In 1983, WHO appointed an expert committee in Geneva on "Education and Training of Nurse, Teachers and Managers with Special Regard to Primary Health Care" (WHO Expert Committee Report, 1983). A year later, in 1984, WHO held a consultation on post-graduate education and inter-disciplinary training (Holger, 1986). Primary care teamwork and multi-disciplinary education were considered very closely linked. Posterior discussions took place in the WHO regional office for Europe in Copenhagen.

The Kupat Holim teamwork in primary care was accompanied by a wide range of multi-disciplinary education. The team work was extended through

the development of medical social workers in the community.

Chart 1 presents the main findings of one of the early detection programs of community disease (hypertension) carried out within the teamwork system clinics and reported in 1983. Clearly, such a program, with its heavy reliance on outreach and patient education, would not have been possible outside the teamwork setting.

Chart 1: Early Detection of Community Disease in the Team Work System

Hypertension Intervention Study, 1983:

Report on 100,000 patients, follow up through the physician-nurse team:

1. In 5% of the examined patients: DRR: 95+
2. Decrease in waiting time for physician and nurse
3. Decrease of 20% in the total number of visits to the doctor
4. A decrease in the number of patients who were not examined over six months and continued living in the same area.
5. From 30% unexamined at the beginning of the program, to 1% at the end within the 100,000 patients.
6. Between the pre-team work time and that of the team system, the number of hypertension patients under medical control was 4 times higher.

In summary, the introduction of physician-nurse teamwork in primary care appears to have contributed greatly to population health and health system efficiency. It was associated with a decrease of 30% in the number of visits to the doctor and a significant increase in the available time for the doctor-patient relationship. It promoted the integration of health promotion and early detection in primary care. Teamwork also facilitated the organized follow up of chronic patients by physicians and nurses, and greater attention to personal, familial and social problems. Teamwork replaced competition between doctors and nurses with cooperation between them, and there are also indications that in doing so it increased patient as well as staff satisfaction.

At the beginning of this article, I emphasized that the current era, in which

community-based chronic care constitutes the main challenge facing health care systems, requires that primary care take an integrated approach, and not restrict itself to the treatment of illness. The implementation of integrated primary care would be facilitated by a return to the teamwork approach described in this paper.

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Teaching Pathophysiology in the Clinical Setting – A Solution to 21st Century Undergraduate Medical Education Challenges

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INTRODUCTION

To improve quality in U.S. healthcare, several recent education reform initiatives have identified content areas and competencies in need of better attention in the modern medical curriculum. As a result, undergraduate medical educators nationwide are struggling to fit an increasing number of important topics into the limited medical school curriculum. For example, behavioral and social sciences now comprise up to 1/5 of preclinical teaching hours at some schools (Institute of Medicine, 2004).

Meanwhile, medical science continues to expand. In the modern, team-oriented environment, with increasingly sophisticated diagnoses and therapies, the importance of the fundamental science of pathophysiology cannot be understated.

Creating competent physicians, therefore, is becoming increasingly challenging. Without true innovation, such an educational onus may simply be too great. A system of pathophysiology-based clinical experiences, such as cardiology rotations during the second-year cardiology course, is proposed as a powerful solution. By bringing the first two years of the traditional medical school curriculum alive, this system ensures competency

in the fundamental sciences of medicine. It also enables the incorporation of contemporary curricular content which is inherently difficult to teach in the classroom. Possibly most importantly, such a system invigorates our nation's bright medical students, encouraging the creativity necessary for U.S. healthcare to achieve its great potential.

THE FUTURE DOCTOR'S WORK ENVIRONMENT

The Institute of Medicine, in its seminal 2001 report, "Crossing the Quality Chasm: A New Health System for the 21st Century" (Institute of Medicine, 2003), demonstrated that the quality of care has suffered in the U.S. The report stated that the current system has simply not kept pace with rapid advancement in science and technology, the increase in chronic conditions and growing patient empowerment. It described necessary changes to the health care system, making apparent the fact that the role and required competencies of the physician of the 21st century will be quite different.

The current fragmented healthcare system, with its high costs and heavy administrative burdens, is forcing health care providers across the country to consolidate into larger, more centrally managed systems (Smith & Walshe, 2004). Already, the proportion of patient-care physicians in the U.S., especially young ones, entering salaried employee positions with larger health care organizations is increasing (McKinlay & Marceau, 2002). Consolidated provider corporations of the future will likely implement information technology to create and enforce clinical guidelines and they will employ an increasing number of non-physician clinicians. Thus, rather than practicing privately, on a fee-for-service basis, with high levels of individual autonomy and limited scrutiny of performance, most doctors of the near future will practice in a highly technological and cost-regulated environment in which the delivery of services will be community-based, interdisciplinary and patient-centered.

CALLS FOR MEDICAL EDUCATION REFORM

In response to the Quality Chasm report, over 150 leaders and experts from U.S. health professions convened in 2002 to develop strategies for restructuring clinical education to be consistent with the principles of the

health system of the 21st century. The result of their meeting was a report entitled "The Health Professions Education: A Bridge to Quality" (Institute of Medicine, 2003). This report defined the following five core areas of proficiency:

- providing patient-centered care
- working in interdisciplinary teams
- employing evidence-based practice
- applying quality improvement and
- utilizing informatics

A recent review article summarized nine other major medical education reform reports (Halpern, Lee, Boulter, & Phillips, 2001). This synthesis revealed that similar categories of competencies were called for by multiple prominent panels:

- health care system overview
- population-based care
- quality measurement and improvement
- medical management
- preventive care
- physician-patient communication
- ethics
- teamwork and collaboration
- information management and technology
- practice management

In 2004, the Institute of Medicine published a report entitled "Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula." The report, stating that skills in the behavioral and social sciences are essential for the prevention and management of many chronic diseases, recommends that schools provide an integrated 4-year curriculum that will create competency in the following high priority content areas:

- mind-body interactions in health and disease
- patient behavior
- physician role and behavior
- physician-patient interaction
- social and cultural issues in healthcare

- health policy and economics

A recent author affiliated with the National Institute of Health, citing the growing predominance of the humanistic, legal and management aspects of modern medicine, makes a sound argument for changing the premedical admissions requirements to include more relevant courses such as statistics, ethics and psychology. The author also argues for updating the premedical curriculum by replacing traditional requirements such as organic chemistry and physics with courses such as genetics and molecular biology (Emanuel, 2006).

ARE WE ASKING TOO MUCH OF MEDICAL SCHOOLS?

Medical schools must find room in the curriculum for these and other "hot topics," while also keeping up with the explosion in the amount of scientific knowledge relevant to current practice. To consider teaching medical pharmacology alone, the average number of new drugs approved has doubled each year since the 1980s (Institute of Medicine, 2003). One of my own basic science professors stated that "a lot of time, which is severely limited, is spent getting everyone up to speed [with material that could be taught at the undergraduate level]. This leaves no time in the curriculum for in-depth analysis of cutting edge diagnostic tools and current thinking on molecular bases of disease."

THE STATE OF THE UNION

Since the above-mentioned reports, and others of their kind, approximately 50% of U.S. medical schools were in the process of revising their medical curricula (Smith & Walshe, 2004). However, the feasibility of teaching such a wide number of topics and the effectiveness of such educational interventions are questionable. Concerning medical ethics education, there exist significant shortcomings in curricular content, pedagogic methods, and methods for outcomes analysis (Lehmann, Kasoff, Koch, & Federman, 2004; Eckles, Meslin, Gaffney, & Helft, 2005). There is little evidence that the current models of cultural competence education lend themselves to positive outcomes and implementation in clinical practice (Kripalani, Bussey-Jones, Katz & Genao, 2006); some even claim

that the complex topic of culture has been misused in cultural competence training (Gregg & Saha, 2006). With regard to preventive medicine, 30% of respondents to a survey of U.S. medical schools expressed a need for assistance in designing curricula and evaluation methods (Garr, Lackland & Wilson, 2000). And although interdisciplinary work teams are expected to be the model of the future, fewer than 15% of U.S. medical schools offered interdisciplinary teaching programs of any kind (Miller, 2004).

Thus, it is not surprising that, despite the consistent calls for reform, a number of surveys of new physicians continue to demonstrate gaps in physicians' perceived capabilities. Students and residents have reported ill-preparedness in practicing evidence-based medicine (Institute of Medicine, 2003), counseling patients about preventive and psychosocial issues (Park, Wolfe, Gokhale, Winickoff, & Rigotti 2005), delivering cross-cultural care (Weissman et al., 2005) and providing good care for the dying (Sullivan, Lakoma & Block, 2003). Worse, the majority of physicians in a 2004 study perceived their medical training for chronic illness care to be inadequate (Darer, Hwang, Pham, Bass, & Anderson, 2004).

FOCUSING ON THE ROLE OF THE PHYSICIAN

It is becoming obvious that no single health care worker is capable of possessing all the skills and resources necessary to provide good care in the modern era. Multiple studies have shown that non-physician clinicians are capable of providing certain services, especially those involving basic primary and chronic care, of equal or better quality than those of physicians, and sometimes at considerably less cost (Laurant et al., 2005). Studies have also shown that these services are being provided in conjunction with, rather than in substitution of, physician services (Cooper, 2001). Schools, rather than attempting to create jacks-of-all-trades, should focus on graduating physicians with true competency in the key skills that will distinguish the professional role of the physician in the 21st century healthcare team.

What exactly is the role of the physician on the modern healthcare team? The practice of medicine is characterized by the need for sound judgment in the context of uncertainty. It is the explicit scientific knowledge and accumulated clinical experience that enables the physician to take responsibility for these judgments and their consequences. Therefore, an understanding of pathophysiology and the scientific / technological basis

of therapies is possibly the most important value that the physician adds to the team. As common diseases such as asthma and hypertension continue to be further sub-divided into distinct, molecularly-based entities, and the number of therapeutic options continues to grow, a well educated physician will be of increasing value to the team. Therefore, schools, first and foremost, must ensure that they graduate physicians with a mastery of the science of medicine.

The physician's second unique contribution will be the ability to interpret an increasing number of clinical trials. Thus, the medical school should ensure true competency in analyzing and interpreting clinical trials.

Physicians must not only be able to interpret the scientific evidence, but also understand how to apply the evidence on a case-by-case basis to genetically and culturally unique individuals. Because the skills required to practice scientifically sophisticated, evidence-based, culturally sensitive medicine in a team setting are much less attainable through classroom instruction, there must be a new paradigm of interdisciplinary, real-world, patient-centered learning throughout the curriculum.

ONE SOLUTION: PATHOPHYSIOLOGY-BASED CLINICAL ROTATIONS

Early clinical exposure is a medical education trend that rose in prominence over the 1990s. It has been shown to foster empathic attitudes towards ill people, to boost students' confidence, to motivate and satisfy them, to help them develop a professional identity, and to improve interpersonal skills (Dornan et al., 2006). Clinical experiences during the first two years also make biomedical, behavioral and social sciences more relevant and easier to learn. Today, many schools offer early clinical exposure. However, this exposure often exists in the form of a basic doctoring course that meets once a week, during which the physical exam and history taking skills are learned. Alternatively, early clinical exposure has been provided in the form of a shadowing experience in the community setting, aimed at providing exposure to primary care practice. However, according to the Association of American Medical College's (AAMC) Medical School Profiling System, there are very few, if any, U.S. medical schools that specifically correlate experience in clinical departments with pathophysiology content during the first two years (one exception known

to the author is the Mayo Medical School's second-year musculoskeletal course).

A better system of early clinical exposure would involve students spending part of the day in didactics and part in a clinical setting throughout the pathophysiology curriculum. Many afternoons at my school were spent in small group sessions discussing cases; I propose that these hours could be spent studying cases as they are occurring in real life. In the clinical setting, students would be free to accompany their patients to procedures, analyze their radiographic findings and examine the pathology under the microscope. Instead of only learning about the multiple different types of pneumonia on paper, students would meet patients with the distinct clinical manifestations, and begin to understand how different people get different infections in different environments, all the while interacting with the worried families at the bedside.

A system of real-world education such as this may not only augment students' understanding of pathophysiology as it manifests itself in the community, but also enable the implementation of longitudinal curricular objectives involving the behavioral and social sciences, the humanities and professionalism. Examples are medical error tracking, communication skills workshops and evidence-based medicine discussions. Moreover, patients picked up during pathophysiology courses could be followed longitudinally through diagnosis, treatment, recovery and chronic management. This type of continuity in education is poised to become paramount in the design of modern medical curricula (Hirsh, Ogur, Thibault, & Cox, 2007).

Because medicine is increasingly specialized and interdisciplinary, it is imperative that students gain an in-depth understanding of the various organ systems as they are approached in their respective specialty departments, and how patients must often navigate many of these departments in the course of an illness. The truth remains that, each year, physicians are graduated who have never witnessed many of the treatments, procedures and patient care decisions that are undertaken in each specialty every day, yet they will refer to these specialties throughout their residency and career.

Although the prevalence of musculoskeletal conditions is increasing, exerting a profound impact on society, patients who are afflicted with these conditions often receive inadequate treatment (AAMC, 2005). The AAMC, as part of its Medical School Objectives Project special report on

musculoskeletal medicine education, urges schools to "develop...clinical experiences in musculoskeletal medicine by using clinical sites where musculoskeletal medicine is practiced." Musculoskeletal medicine is a required clinical rotation at very few medical schools; teaching this organ system while providing patient encounters is a compelling solution.

Finally, clinically-based education in the first two years is also well-suited to interdisciplinary education. Recognizing that interdisciplinary education builds communication, conflict resolution and leadership skills, the Institute of Medicine urges that more effort be made in interdisciplinary education, whereby a group of health professions students from different educational backgrounds learn together as part of collaborative teams. Several recent studies have concluded that, for physicians, exposure to interdisciplinary teamwork and team decision making needs to occur earlier than residency training, preferably in the first two years (Hall & Weaver, 2001).

SHORTCOMINGS OF THE TRADITIONAL CLERKSHIPS

There are a number of reasons why the traditional clinical rotations do not provide the necessary clinical context that such a proposed system could offer. First, students' learning during the third and fourth year clinical rotations is often inhibited by responsibilities as part of the health care team. There is often an awkward conflict between the objectives of the student and those of the health care team. Students may forego learning opportunities in order to engage in other activities that might garner positive evaluations from superiors. Second, the timing of the clinical rotations does not coincide with the time at which the student is being exposed to most of the knowledge base. Lastly, and possibly most importantly, time constraints in the high volume environment often inhibit teaching and learning during the formal clinical rotations. Results of the AAMC Graduation Questionnaire in recent years suggest that medical students are not receiving the kind of one-to-one teaching that was once the hallmark of excellence in American medical schools (Xu, Hojat, Veloski & Gonnella, 1999).

If these issues are indeed real, as much of the literature suggests, then this is a gross underachievement on the part of the medical education community. Medical students must have the necessary time and independence to function freely as learners in the clinical setting. They

need to be able to separate themselves from the team as needed to tackle concepts they don't understand and discuss the underlying behavioral or humanistic aspects of their cases. The great English physician Thomas Sydenham would agree, as he taught that clinical medicine could only be learned at the bedside (Weatherall, 2006).

LOGISTICS

A legitimate argument against this system is that there are simply too many students to accommodate in a clinical setting at any given time. This issue has probably hindered previous efforts at better correlating clinical experiences with didactics. This barrier is especially important considering recommendations by the AAMC and the Council on Graduate Medical Education to increase medical school class sizes (Hobbs & Manyon, 2007). Without question, our proposed solution would require division of medical school classes into smaller groups, as is done throughout the third and fourth years, and teaching of the pathophysiology courses repeatedly throughout the year on a rotating basis, as the clinical rotations are also taught.

It is beyond the scope of this article to provide a detailed logistical analysis, especially considering that each school operates within its own framework. However, there are a number of cost-effective ways to convey the static portion of these courses. These include using self-directed computer-based tutorials, videotaping lectures and recruiting senior medical students, residents or hospitalists as teachers. Moreover, most schools already have electives in place in each subspecialty for visiting or senior students. It is possible that these same teaching resources could be leveraged for smaller groups of second-year students. In fact, there are a number of examples of feasibility with respect to accommodating large class sizes in clinical settings. These include innovative clinical teaching occurring at Manchester University, the University of Washington, the Mayo Medical School and the Cleveland Clinic (Foster & Dornan, 2003; Goldstein et al., 2005; Laskowski, Moutvic, Smith, Newcomer-Aney, & Showalter 2000; Drake, 2007).

Frankly, if logistics is the only real argument against such a system, then there is really no argument at all. It is often those leaders who have the vision to look past such hindrances who are able to guide their organizations,

companies or communities into the forefront. This type of leadership is called for and deserved, not only by tomorrow's physicians, but more importantly by their patients.

FOSTERING CREATIVITY

Recently, the National Center on Education and the Economy released a report titled "Tough Choices or Tough Times." Citing the fact that routine work can be increasingly computerized, automated or outsourced, the report urges an overhaul of the U.S. educational system, with the goal of producing more workers who can think creatively. Marc Tucker, the head of the National Center on Education and the Economy, states that creativity occurs when people who have mastered two or more fields apply knowledge from one framework to think in a novel way about the other (Friedman, 2006). Applying this concept to the medical field, in which much routine work previously done by physicians is being delegated to other clinicians or to machines, creativity can be fostered by ensuring that students experience medicine it in its very different environments, each with its own technologies, culture and treatment patterns. Exposed in this way, America's bright students will have the opportunity to encounter difficult ethical and quality problems and apply their knowledge, experience and imagination. They may also realize early on in their careers where the boundaries of science are impassable and the art of humanism indispensable. Indeed, if we are truly to move forward into an age of patient-centered care, it is time for patient-centered education.

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Evidence-Based Medicine and the Future of the Health Professions: Will We Ever Make Knowledge Fit for Practice?

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INTRODUCTION: POST WHAT?

In a collection of papers about the "post reform era," it may be useful to ask what is meant by "post-reform," as it is not a term in general use. I doubt if the conference organizers were thinking in terms of postmodernism, or the "post-industrial" era (Hage & Powers, 1992), but I shall argue later that both of these, which denote a complex and disordered world far removed from the utopia of Evidence-Based Medicine (EBM), may in fact reflect the realities of knowledge-based clinical practice more than we would ideally wish. Indeed, they may be an inextricable part of the transformation that clinical professions are undergoing.

Certainly in the UK there currently can be no such thing as a post-reform era: with constant restructuring, health service reform has become a permanent state of being! Few could deny that the changes in health professions have been profound. Some have even referred to the "proletarianization" of medicine, to emphasize the shift of doctors' status from autonomous professional to regulated employee (Exworthy et al. 2003). Gone are the old hierarchies: the omniscient senior consultant, the dependably avuncular general practitioner, the handmaiden nurse, the acquiescent patient. We see instead new relationships between professionals - including an increasing emphasis on multidisciplinary teams and on the reformulation of professional roles (e.g., nurse practitioners), and between professionals and their clients. We see, moreover, the authority of old clinical relationships giving way to managerialism; the unquestionable

competence of individual autonomy has been replaced by the systematic review, the guideline, the organizational target. The long traditions of clinical teaching and lifetime qualification have been transformed into problem-based learning, objective structured clinical examination, continuous professional development, audit and revalidation. The lifelong job is being replaced by mobile career paths, portfolio careers, and complex private/public partnerships that undermine the traditional job security of the health professional. Behind all that has been a democratization of the clinical knowledge base, which means less "eminence based medicine" with its attendant unacceptable variations in practice, dependent on the opinions of powerful doctors. And underpinning that shift has been the growth of evidence-based medicine.

THE PLACE OF EBM IN THE REFORMS

When David Sackett and his colleagues defined EBM as: "...the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients..." (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996), they were being more sophisticated than many who followed them on the reforming bandwagon of EBM (Trinder & Reynolds, 2000). Sackett and colleagues' definition recognises the importance of clinical judgement when applying the most appropriate care in any given set of circumstances, based on rigorous review of what is known to be effective. In contrast, however, much of the EBM movement seems to have been about slavishly applying the results of clinical trials to populations of patients; or worse, unquestioningly following guidelines that are not always as explicit as they should be about the sources and the limitations of the evidence on which they are based.

EBM has brought with it a host of reforms. They include the flood of guidelines now available to clinicians, the Cochrane Collaboration (which, excellent as it is, still relies heavily on the RCT and still largely ignores economic studies of cost-effectiveness), a renewed emphasis on applied health sciences (as characterised, e.g., by the rise of pragmatic and complex trials and of health services research), and the growing industry of research on the implementation of research (little of which, ironically, is widely implemented) (Haines & Donald, 1998). Thus, for example, we see the growing influence of the National Institute for Health and Clinical

Excellence (NICE) not only in its native UK, but also beyond, as countries the world over experience pressures to deliver more cost-effective care. Although rooted in detailed and rigorous reviews of the evidence on cost-effectiveness, such programmes are also characterised by unprecedented levels of bureaucratization and organizational accountability in health care, designed to encourage if not enforce conformity to "best practice."

Such changes have given reformers the opportunity to try to alter clinicians' behavior by using change management techniques to introduce more evidence into practice. In the UK, for example, the government has encouraged the "modernization" of health services not only by injecting more cash into the NHS, but also by relentlessly changing the contractual relationship with health service providers in ways that are designed to encourage evidence-based practice and hence reduce variation in practice. Whether or not that has succeeded in improving health outcomes – or even standards of care, which it probably has done but patchily - is not the point here. The fact is that the structures and processes of health care in the UK have been completely transformed, and indeed continue to be subject to further changes at a rate that many find distressing and dysfunctional, if not destructive. As in other countries, these measures include a plethora of new health policies leading to reorganized services. There has been considerable organizational support, e.g., the NHS established a "Modernisation Agency" (now the "Institute for Innovation and Improvement"!) to facilitate changes in the organization of practice. At the level of the individual practitioner, there has also been a new emphasis on training, continuing education, appraisal and even revalidation as the means to corral clinicians and ensure conformity to current best evidence. Such activity is complemented by measures designed to improve the available knowledge base; these include new resources for applied research and new tools (e.g., the development of care pathways) to foster compliance.

The result of all this has been an undoubted sea change: there is now no one who would dispute the principle that clinical practice should be based on the best available evidence, nor that the methodology of EBM (e.g., systematically and explicitly reviewing and using all the available evidence) is potentially beneficial to practice and hence to patient outcomes. Neither is there doubt that practitioners are nowadays more likely to be aware of the best evidence either directly or – more usually – through the widely

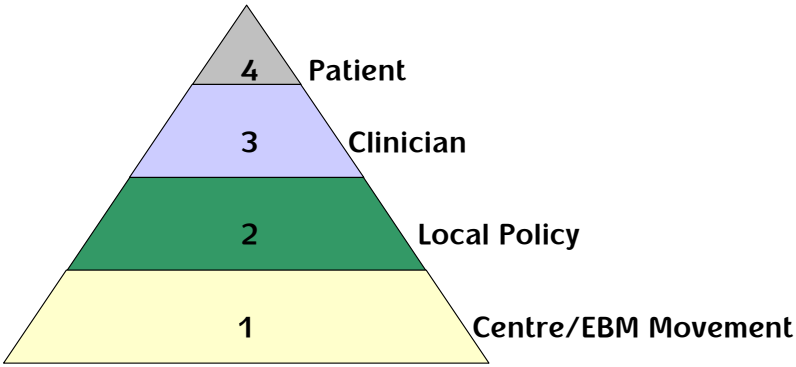
promulgated guidance purporting to be based on best evidence. But there have been many barriers to overcome, not least the defiance of clinicians, and especially doctors (Dopson, Locock, Gabbay, Ferlie, & Fitzgerald, 2003). Knowledge, attitudes and beliefs have all played their part in that resistance: the knowledge base both of individual doctors and of medical science in general has often been inadequate to sustain EBM; the attitude of clinicians has often been one of wariness of the motives and competence of those advocating change or producing guidance; and strongly held beliefs have undermined the use of evidence. In one study of the implementation of EBM, for example (Dawson, Sutherland, Dopson, Miller, with Law,1998), the senior hospital doctors believed that the guidelines on asthmas and glue ear did not apply to their specialized and complicated patients, while the general practitioners (GPs) believed that the guidelines did not apply to their mostly atypical patients, and the junior doctors said they really didn't have time to practice EBM and anyway had to do as their bosses told them. So all parties believed that the guidelines applied to someone else but not to them.

Even where there has been a willingness to adopt evidence and try to change practice, organizational barriers such as inadequate resources or inappropriate systems have provided further obstacles (e.g., one might accept that one should scan all patients who have had strokes, but what if the scanners are not available?). Perhaps above all, practitioners have found that the science base is often not there when they need it; that there are still large swathes of gray area in which the evidence is too insubstantial to justify a change in practice. That, indeed, is why there has been such an increase in needs-led, service-oriented research whose aim is to produce answers to the *practical* questions facing clinicians.

USING THE EVIDENCE-BASE IN PRACTICE?

The post-reform picture is therefore a mixed one. Certainly there has been a reform in the way evidence is applied to practice, but equally certainly, the change is not nearly as radical or fundamental as the proponents of EBM might wish. Trying to unravel this mixed picture, Andrée le May and I have suggested a hierarchy of levels to try and clarify the experience of EBM (Figure 1).

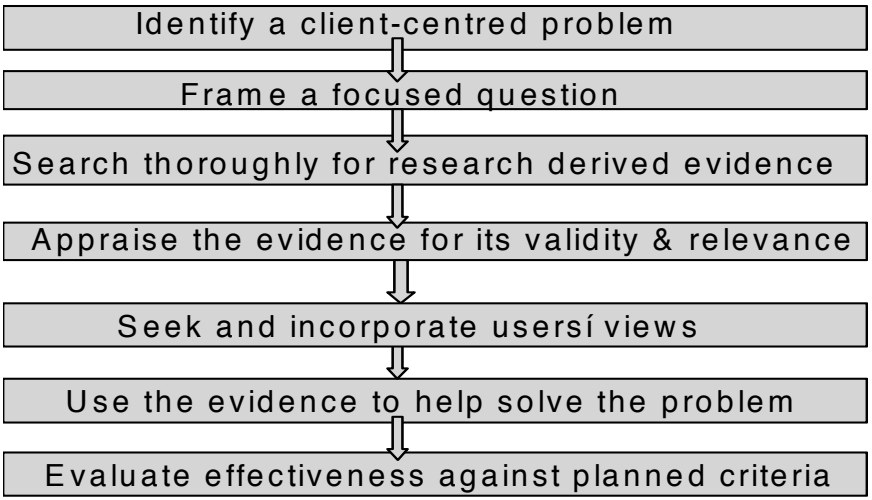
Figure 1: Levels of EBM in practice



Level 1 is theoretical EBM, espoused by the EBM movement and by central authorities such as professional organizations, health ministries, healthcare funders, and much of the medical press. It is epitomized by the very logical and linear reasoning set out in Figure 2, which will be familiar to any clinician since some version probably appears in every manual or article designed to train them in EBM. But any honest clinician — even those claiming to be EBM practitioners — would admit that they rarely actually perform the steps as set out in the figure.

The second level of EBM is the way in which evidence is used in organizational policy-making. How, for example, might a group of clinical managers or healthcare commissioners approach the use of evidence when planning appropriate health services, patient care pathways or clinical protocols? In an ethnographic study of decision making by multisectoral groups advising on the provision of services for the elderly, Gabbay et al. (2003) studied how two such groups, who were asked to design improvements in health and social services for older people, processed and applied evidence in formulating their views.

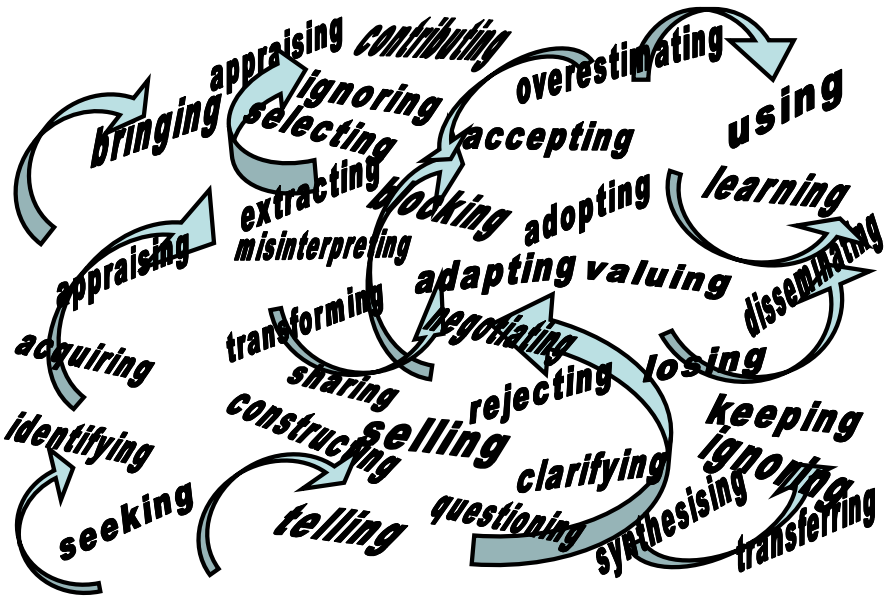
Figure 2: The ideal process for practising EBM.



The groups' uptake of best evidence was specifically encouraged, including not only explicit facilitation of EBM, but also the services of a librarian to provide them with relevant publications to assist in their deliberations. Data collection for the study included observing and tape-recording the groups, interviewing participants and reviewing documents they generated and used. During the analysis of all these sources, which was intended to identify knowledge-related behaviors, four main themes emerged. Firstly, certain kinds of knowledge (such as personal experience or the views of locally respected authorities, often relayed as stories and anecdotes) were more likely than others to be accepted by the participants; this had much less to do with scientific validity than with perceived immediate credibility and relevance. Secondly, we found that the participants transformed and internalised new knowledge through a wide range of activities within the meetings (e.g., making sense of a new piece of information by relating it to their personal experience and interests). Thirdly, the processing of the available knowledge was haphazard and contingent upon features of the groups ranging from who happened to be at the meeting to who commanded the greatest respect in a particular debate. Fourthly, the changing agendas, roles and power-relations of the group members had differential effects on the way they collectively made

sense of the information available to them. (In other words, the way in which the group reacted to available knowledge depended on the way its members exercised more or less power and influence as the group evolved). Far from the orderly, linear, rational processes envisaged in Figure 2, our observations of how the group members handled new evidence as a basis for their policy recommendations resembled more the apparent chaos of Figure 3.

Figure 3: What the multi-sectoral, multidisciplinary groups were doing with new evidence



Yet despite their apparently chaotic knowledge management, the multisectoral groups' conclusions presaged two major national initiatives in care of the elderly. So perhaps they weren't too far off the mark (unless of course the national decision makers were experiencing a similar process: we couldn't possibly comment…!!). Certainly anyone who has worked in policy- making groups will recognise the picture and an established literature on group decision making also confirms this model. (e.g., Lindbloom, 1959; Cohen, March, & Olsen, 1976).

USING EVIDENCE FOR CLINICAL DECISIONS

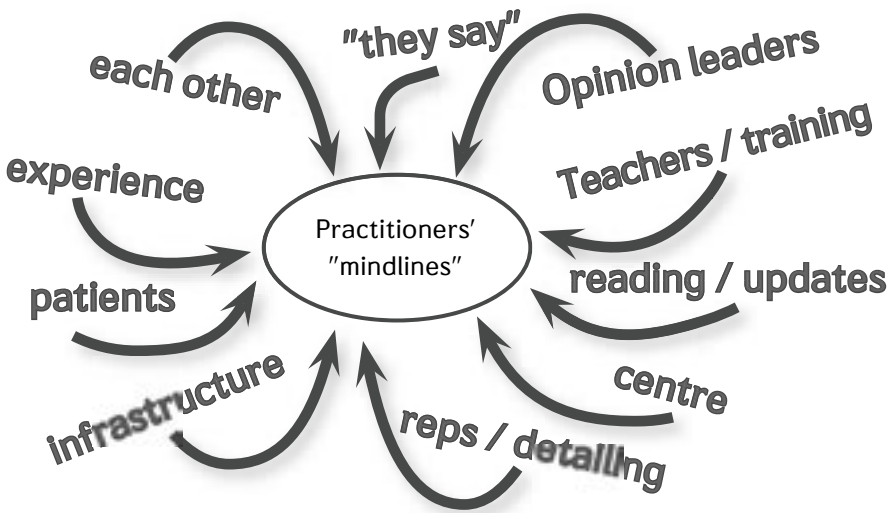
What then of Level 3, clinicians using evidence in their dealings with patients? To investigate this third level of EBM, Gabbay and le May (2004) explored in depth how a group of GPs and practice nurses derived their health care decisions. We used ethnography as the best way to understand the way they use evidence in day-to-day practice. Ethnography is the research method favoured by anthropologists as a means of understanding what really goes on in people's day-to-day lives, and how their culture actually works. It is perhaps best described simply as "hanging around," followed up with intensive analysis of what one has observed (Eriksen, 2001; Agar, 1996; Spradley, 1979) We gained access to a successful and very highly regarded primary care practice with seven partner GPs - two women and five men, aged from about 35 to 60 - plus three sessional GPs, one trainee GP, three practice nurses and a phlebotomist. Fully computerised, their practice is superbly well organized in its recently purpose-built premises in a semi-rural blue-collar area with a large elderly population. Success has been reflected in a number of awards from the RCGP, and maximum performance data in the monitoring of the NHS new GP contract. Our reasoning was that by choosing a practice that is widely thought to provide top quality care we could see how the best of clinicians incorporate evidence into their practice. This included not only how they use their knowledge base in dealing with individual patients, but also how they collectively discuss their clinical practice.

The early part of our ethnography entailed participant and non participant observation of around seven days-worth of GP surgeries, home visits and nursing clinics, attending some 30 practice meetings and holding innumerable unstructured informal interviews and chats, along with three formal semi-structured interviews, as well as reviewing any relevant documentation. All of this took place intermittently over a period of two years, during which we came to know the practice very well, becoming almost "part of the furniture." We spent a short time in a contrasting inner-city practice that also had a very high reputation; we did this as a way of ensuring that our main findings were not exceptional. As a further check we tested the credibility and face validity of our findings with the participants at our main study site – a technique often used in such research.

We found that clinicians rarely accessed and used explicit evidence from

research or other sources (such as guidelines) directly. Instead they relied on what we have called "mindlines" - collectively reinforced, internalized, tacit guidelines. These mindlines were informed to a small extent by browsing a range of easily accessible written sources, both printed and electronic, but mainly by their own experience and that of colleagues, and by their interactions with their colleagues and their networks. One could describe mindlines as the knowledge "in my head," as one GP put it, something that once lodged there could be very difficult to lose. Mindlines come from many sources (Figure 4) including not only the knowledge and routines deeply embedded over years of education and training, but also the experiential knowledge gained over years of practice, and the aural, written and other sources of knowledge and opinion that form such an important part of doctors' day to day interactions with colleagues, pharmaceutical representatives, patients, specialists, etc. Many of these were sources of tacit knowledge, that is, knowledge that is built into day-to-day practice and is difficult to codify or make explicit Many sources were only vaguely identified if at all – just something that the clinicians knew they had heard from many sources that had mutually reinforced each other until they became accepted as the norm. (The phrase "they say" – as in, "They say that the best drug in these circumstances is…" was often used and meant, as far as we could work out, something like: "experts whom I can't specify but whom I trust to know best practice, and whose views I have received from lots of sources that I can't recall right now"). Alongside such tacit norms of good practice came the much more explicit and codified central guidance/pressure from professional bodies as well as those running the health service. All of these sources fed into mindlines that had originally been laid down during years of training.

Figure 4: The sources of mindlines



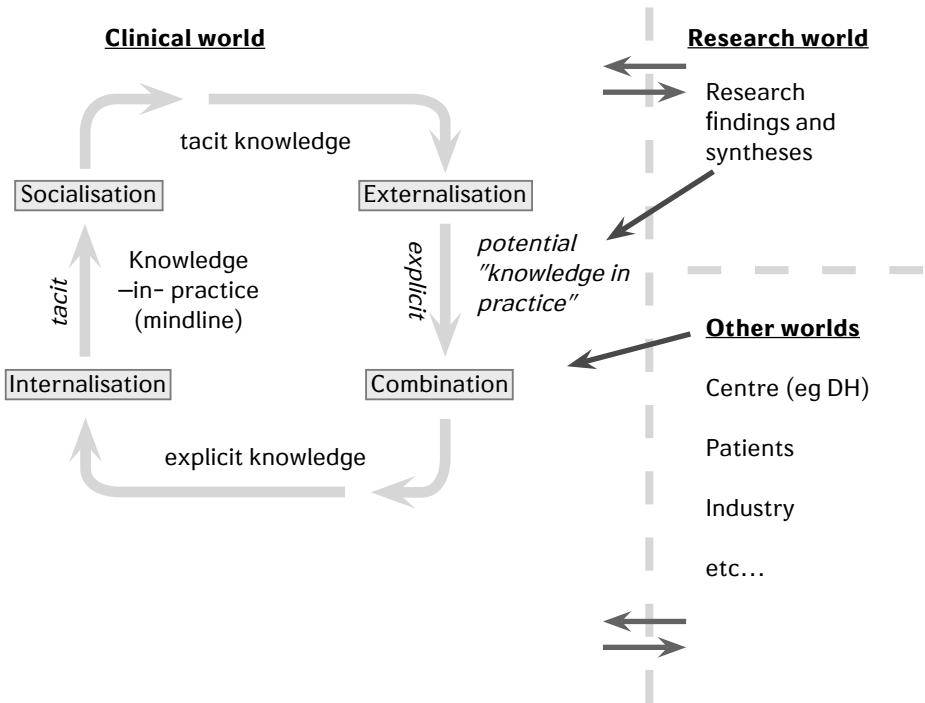
Mindlines provided our GPs with bounded areas of accepted practice within which they could adapt the management of individual patients, but how were those boundaries set? The clue seemed to lie in their interactions with each other; when clinicians were discussing patients or practice policy, for example, or when they were reviewing the care given by hospital colleagues, one could see them checking out and comparing each other's ways of managing patients. The same applied when they received a new set of guidelines or saw a review article that suggested a different way to manage a condition. They would tend to scan through to see (a) if it seemed plausible and credible and (b) if it differed greatly from what they already did. If the answer to both of these implicit questions was "yes" they would discuss it with trusted colleagues – often briefly, elliptically, almost offhand or humorously – to test out whether their usual practice was worth changing. (Suggestions from pharmaceutical representatives would usually be rapidly dismissed in such conversations.) A mindline was amenable to change but tended to revert to the "default setting" unless there was a very good reason to alter practice. Whether it was modified or reinforced depended on their exchanges of ideas and information with trusted colleagues. It also, of course, depended on whether their infrastructure

supported, or perhaps demanded, the change. There was no point, for example, deciding to refer all patients with a certain kind of depression to a counsellor if counselling services were in short supply, nor in deciding not to set up a diabetic register if the NHS contract with GPs stipulated one.

It was no surprise to find that as in many other walks of life, medical knowledge-in-practice (Lave, 1986) — the largely tacit knowledge that is used day-to-day with one's patients - was different from the largely theoretical knowledge found in textbooks, guidelines and exam papers. Clinicians have always known that "textbook patients" are the exception; indeed that's why so much clinical training is really an apprenticeship, albeit garlanded with science-based exams. But in addition, our observations showed that knowledge-in-practice was being developed via a largely social process between colleagues struggling with similar problems. This has also been described in the growing literature on knowledge management (e.g., Brown & Duguid, 2000). Many of these accounts, which, like ours, stress the importance of social interaction and the exchange of tacit knowledge, have built on the now classic model set out by two Japanese academics, Nonaka and Takeuchi (1995), exploring the way knowledge is used in the industrial sector. They suggest a four stage "knowledge spiral" (or "cycle") by which people in organizations develop and use knowledge. The first stage is socialization, when tacit knowledge is transferred from one person to another, while still remaining tacit (e.g., when a new doctor arrives on a ward and finds out how things are done there, which may be different both from the guide in her pocket and from her previous job). Next comes "externalization" or "articulation," when the tacit knowledge is made more explicit as people become better at expressing it in words, often stories, and images. This stage of the cycle may involve external experts, benchmarking, or customers' views, and again comes about by the social processes of dialogue and collective sensemaking (Weick, 1995). The result may be, for example, an explicit local practice guide. Thirdly comes the stage of "combination," when explicit formulations of the originally tacit knowledge, combined with other sources (such as new research) are made available for others to access. In industry, this is often via an intranet or expert system. Typically in the clinical world, this further transformation might take the form of lectures, textbooks or editorial reviews (but increasingly also online expert systems) in which clinicians codify their collective wisdom in a form accessible to all. Finally, and back once again at the level of the

individual, there comes the stage of internalization, where practitioners transform that explicit knowledge into something that makes sense to them in the light of their own existing knowledge and experience, incorporate it into their daily practice and pass this modified tacit knowledge on to colleagues as the cycle/spiral continues.

Figure 5: The "knowledge cycle" in clinical practice



From our study of GPs, it is this last stage that we have been describing in terms of the development of individual, internalized mindlines. It is important to realize that the day-to-day knowledge-in-practice is the result of individuals internalizing a combination of explicit and tacit knowledge from many sources. One such source – and only one – is the research evidence championed by the EBM movement. For the researchers, epidemiologists, Cochrane collaborators and meta-analysts that source, being easily the most sound, should be pre-eminent (e.g., Muir Gray, 2001). But for the practitioner, the results of clinical trials and systematic reviews

are not useable/useful "knowledge" in their own right. They are merely another source of information that might potentially become part of knowledge-in-practice but first must be weighed up and combined with other potential knowledge-in-practice that come not from the world of researchers, but from other worlds such as the Department of Health, the pharmaceutical industry, one's patients, the local specialists, and so on. Perhaps above all it needs to be combined with one's own experience and that of one's colleagues, i.e., with the tacit knowledge that has proven successful day-to-day.

Ironically, the bulk of the efforts in the multi-million dollar growth industry of knowledge management in big business has been precisely to find ways of eliciting the tacit knowledge of successful practitioners, which is deemed to be the great hidden asset of successful organizations (Davenport & Prusak, 1998). In contrast, the aim of the EBM movement is to eliminate such unreliable and unproven clinical knowledge and replace it with the best (i.e., scientifically validated) research evidence. But what the researchers and the practitioners call "best evidence" is not necessarily the same thing.

One reason why research evidence, and central guidance based on it, did not gain the acceptance among our GPs that the EBM movement would wish for was perhaps the fact that it centred almost entirely on the doctors' *medical* role. But GPs had many other roles too. We found that their daily activities slipped frequently, effortlessly and unconsciously between many implicit roles. Even in the course of a few minutes, they could switch from a patient-focussed *medical* role (which might include diagnosing, prescribing, investigating, advising, We found that their daily activities slipped frequently, effortlessly and unconsciously between many implicit roles. Even in the course of a few minutes, they could switch from a patient-focussed medical role (which might include diagnosing, prescribing, investigating, advising, explaining, referring, etc.) to any number of *managerial* roles (e.g., managing resources, personnel and logistics, improving quality, complying with contractual or legal requirements, developing and maintaining the IT system, handling the higher echelons of the NHS, training practice staff), to *public health* roles (such as disease prevention, health promotion and education, screening, disease surveillance or knowing the health risks within the local district), not forgetting all the activities necessary to develop their *professional*

standing (e.g., keeping up to date, auditing practice, nurturing networks, sustaining their credibility in colleagues' and patients' eyes, defending the cause of primary care in a sometimes undermining environment, teaching students or training new GPs). Now this range of multiple roles and associated activities might of course exert contradictory pulls on the GPs. For instance, the decision to routinely order an ECG for a patient with minor chest pain looks very different through the eyes of diagnostician, resource manager, contract monitor, staff trainer, patient advocate, health promoter and so on. Perhaps a key reason why the GPs tended to downplay the evidential status of guidance from the worlds of research and NHS policy-makers was the need to take account of this plethora of roles and activities, which such guidance mostly ignored.

COLLECTIVELY SHAPING CLINICAL POLICY

The findings from our original ethnography, summarized above, led us to dig deeper into two other aspects of the way evidence gets into practice. Firstly, how did the incorporation of new evidence in practitioners' individual mindlines relate to their collective discussions about practice, and secondly, how were those discussions shaped by the organizational environment? The ideal opportunity to explore those questions came while we were in the middle of our ethnography. We were attending monthly practice meetings aimed at securing a quality award from the RCGP and these had become a very effective forum at which doctors, nurses, phlebotomist, receptionists and others, chaired usually by the practice manager, could all actively engage in discussions about the practice. When the government (Department of Health, 2003) introduced a new contract with primary care practices that entailed highly structured financial incentives coupled with detailed and rigorously monitored standards, the practice meetings were refocused on attaining the new targets, and we had our chance to observe detailed discussions about changes to clinical policy. One example, introduced in the second year of the contract, was a set of targets for improving the management of chronic kidney disease (CKD). There was a good deal of concern nationally among GPs about the wisdom of this particular target (e.g., Spence 2006) and our GPs were certainly dubious about it. As the discussions developed it became clear

that the key problem was deciding when to label someone as having a level of CKD requiring further action. Most of the national guidelines (e.g., Department of Health 2005) and the new primary care contract were clear that anyone with Stage 3 CKD – an estimated Glomerular Filtration Rate (eGFR) of 60 or less – should be investigated and followed up. But for the GPs, the questionable validity and consequences of pursuing that line led to a tussle over what the actual threshold should be. As the meetings progressed, we saw the clinicians continually clarifying, comparing, balancing, and reformulating who and what would count as a case of renal failure. They were negotiating their own individual and collective norms of practice with those advocated by central guidance in order to arrive at a consensus on how to alter the way they manage the condition, while leaving sufficient flexibility to allow for individual judgement within agreed bounds. The statements in Figure 6 offer a précis of some of the arguments advanced for raising or lowering the threshold for Stage 3 CKD. Each statement can be seen as rooted mainly in one of the four groups of roles mentioned above: their (sometimes conflicting) medical, managerial, public-health and professional-standing roles.

The conclusion mattered: depending on the balance of forces in that discussion, hundreds of local patients would or would not be identified, labelled and managed as having Stage 3 CKD. In that sense, the organizational contingencies of practice were shaping the very existence of this disease. Interestingly, the resultant practice prevalence (2.98%) was much lower than the 5% predicted in the contract documentation because many patients with eGFRs below the official figure of 60 were being excluded (Figure 6). Yet the national prevalence figure of 2.24% was actually even lower by one-third – suggesting that on clinical or other grounds practices throughout the country were excluding possible CKD patients even more frequently than ours was.

Figure 6: A précis of some of the arguments, as used in the observed primary care meetings, for raising or lowering the threshold for defining Stage 3 CKD

Arguments for excluding most patients whose eGFR technically indicates Stage 3CKD			
Medical	**Managerial**	**Public health**	**Professional**
We are already giving the right care to most CKD patients because of the good follow up on their related illnesses	It won't be practicable to carry out all the required new tests	"We have only had one death from CKD in the last 10 years!" so this isn't a priority	The guidance takes little note of the realities of primary care practice (e.g. no GP consultation over local guidelines)
Results of routine screening will unnecessarily alarm patients	We need to avoid unnecessary workload – both within practice and elsewhere (e.g. the laboratory service and hospital nephrologists)	It's generally agreed that US basis of eGFR makes it unhelpful for elderly UK populations. And low scores in Stage 3 are especially dubious. So why comply?	
	Results of routine screening will overburden resources with little or no resulting health improvement		
Arguments for including most patients whose eGFR technically indicates Stage 3CKD			
We fail patients with high creatinines in ways that aren't even mentioned in the QOF and in other guidelines (e.g. medicines management). So let's focus on those, not just QOF items (Also an argument for refashioning the QOF criteria).	With training we can find ways within the rules to recode patients with eGFRs of 30-60	Our prevalence seems comparatively low – we may be missing too many renal patients	We will become better at managing patients with renal disease if we take this seriously
Maybe we currently fail to identify renal patients who therefore miss out on important follow-up care	Ensuring that we identify and register all renal patients will secure QOF points and payments		

In summary, the new GP contract added to the many forces that already mould what clinicians do and the knowledge they need to do it. The process by which it led to a change in practice for CKD relied largely on the knowledge they carry in their heads – their mindlines – which they subtly and continually refined and amended as a result of their collective

discussions. These discussions enabled them to examine their views on the strengths and weaknesses of differing information from a range of sources, mainly during the course of exchanging practical information as well as other – frequently anecdotal – ways of disclosing tacit knowledge-in-practice. This in turn entailed detailed moment-to-moment implicit "negotiations" (Strauss, 1978) to try and resolve the tensions, including internal role conflicts, which were shaping their decisions. It is this largely social process that led to a shift in clinical practice and, in this example, to a redefinition of the functional meaning of Stage 3 CKD.

One could therefore argue that this development in local clinical policy was a form of collective sensemaking (Weick, 1995) in which scientifically derived facts, organizational demands and constraints, and professional and personal incentives and interests (Latour, 1988) were all influential in fashioning what was meant by Stage 3 CKD. Through the dialogues we observed, clinicians appeared to be contributing to a virtual "collective mindline" against which all of the professionals involved could check their own individual view. As long as they then kept within the evolving consensual boundaries of that collective view, practitioners could vary in the way they interpreted their own mindlines and could implement them flexibly in different patients. In other words, the group of colleagues were functioning as a close-knit "community of practice" (a network informally sharing practical learning), which played a key part in how they developed their individual knowledge-in-practice (Wenger, 1998). To answer the two questions posed at the beginning of this section, (a) the incorporation of new evidence into practitioners' individual mindlines seemed to be channelled through the social processes of their collective discussions; and (b) the impact of the organizational environment on that process seemed to be mediated via the plethora of roles that the environment demanded of them.

A MEETING OF MINDLINES?

Having so far talked about how clinicians develop and use their mindlines, I would now like to explore briefly what happens when clinicians bring this knowledge to bear on specific patients (level 4 in Figure1). Clinicians can apply their mindlines flexibly to suit the needs of a particular patient, but the patient will also have a view. Despite the potential impact of the patient's

own ideas and expectations on the execution of a mindline, it was relatively rare for the clinician to elicit those ideas explicitly. Rather, these would usually be inferred from what little the patient might say on the subject, set against the clinician's prior assumptions about the patient's likely views and/or the clinician's knowledge of the patient's previous behavior. We found, in short, that when the patient's view seemed to differ from the actions indicated by the mindline, clinicians were adopting a number of strategies. These included: ignoring the possibility that the patients might think differently; trying to engage the patients by "selling" the treatment plan to them; explaining the biomedical reasoning behind it; justifying it in some other way that would appeal to the patients; or "negotiating" a modification of the actions suggested by the mindline in order to satisfy both parties. Thus, for example, if the mindline suggested that an upper respiratory tract infection needed no treatment, but the patient clearly expected an antibiotic, the GP could simply not prescribe it; could point out the benefits to the patient of not taking antibiotics ("selling"); could explain why antibiotics were a bad idea (e.g., the dangers of developing resistance); could justify not prescribing it by reminding the patient that in the past he or she (or perhaps others with the same condition) got better without; or they could (in usually a very short exchange) arrive at some negotiated compromise ranging from justifying to themselves that this was indeed an exception that merited antibiotics, or maybe prescribing, say, a cough mixture, which while pharmacologically useless, would at least allow the unspoken negotiation to be resolved to mutual satisfaction.

To explore how the patients' own prior views affected the way evidence is used in practice, it would have been helpful for us to interview them as part of our ethnography, but we did not have ethical approval to do that. Fortuitously, however, I was also part of a research team that was using semi-structured interviews to elicit the views of patients, doctors and others on depression (Kendrick et al. 2007). Using a grounded theory approach with iterative data collection and analysis among a maximum variety sample until data saturation was perceived, the team interviewed individually 32 GPs, 28 depressed patients, 18 patients who had been depressed in the past, 15 who had never been depressed, and 18 people who were supporting someone with depression at home (111 interviews in all). I will focus on just one aspect of the findings relevant to my argument here, namely the way in which interviewees' concepts of

depression varied hugely across many dimensions. For example, respondents varied in the degree to which they thought depression was a biological vs. a social phenomenon. There were many such sets of dimensions, such as depression being genetic vs. environmental; it being due to early life vs. current problems; due to current problems vs. endogenous tendencies; explicable vs. inscrutable; stigmatised vs. an acceptable part of the human condition; a key task for doctors vs. best dealt with outside healthcare; best treated by antidepressants vs. pills being the last resort; best treated by counselling vs. scepticism about "talking cures"; the goal being to cure the depression vs. simply to cope with it…. and so on. In other words, from the messy reality of painful human experience, people were constructing differing views of what it means to be depressed. Interestingly we found opposing examples along all these axes among both GPs and patients. Thus it might be quite possible to have a GP with a biomedical model and a patient with a social model of depression, or vice versa. We weren't able as part of that study to observe what happens when two such people—doctor and patient — meet to deal with the problem, but one might reasonably conclude that there may be only a limited overlap in their understanding of what is going on, and that this would have a very large impact on the outcome of that consultation. (Patients talked, for example, of their unspoken dissatisfaction with the whole approach taken by their GPs, which influenced their decision not to comply with treatment.) Going back to the findings in our ethnography, one might also expect that such a conceptual dissonance would also impact on the way the clinician's mindline could have an ultimate effect on the patient's health outcome. There may therefore be a great deal of merit in the clinician doing more to explore explicitly the patient's views, so that appropriate strategies can be more effectively used to ensure that the evidence base of the mindline is translated into action by the patient.

SUMMARY OF EMPIRICAL FINDINGS

The empirical qualitative studies reported here lead us to conclude that clinicians do not use theoretical knowledge or explicit guidelines but rather "knowledge-in-practice," mediated through what we have called mindlines. These mindlines are continually amended with new knowledge from a very wide range of sources, of which research is but one component. Research

evidence almost never enters clinicians' mindlines directly but (a) tends to come from multiple sources and (b) is assessed and processed as part of being internalised into mindlines. That internalization is a deeply social process, relying on networks of trusted colleagues and "communities of practice" with whom are constructed implicit "collective mindlines" that act as a benchmark for the flexible use of individual mindlines. During that process the mindlines are also shaped by the demands, opportunities and constraints of the organizational context of practice. An example is the way in which the clinicians' multiple roles and activities can affect knowledge-in-practice, as we saw in the example of the redefinition of renal failure. Finally, and based on strong evidence of the great dissimilarities in the ways that people conceive of depression, we surmised that the way in which clinicians' mindlines become translated into the patient's actual care depends on the final stage of negotiation between two possibly very divergent views of an illness and how to manage it. If the evidence underpinning practice must run through such a complex and deeply social obstacle course, it is not surprising that getting clinicians to make better use of evidence in their practice has proven to be anything but simple.

CONCLUSIONS

With these findings in mind, we can now see why the properties of post-modernism and the post-industrial era, as hinted in my introduction, might be relevant in the "post-reform" era of EBM. A brief review of websites on postmodernism (besides giving one the queasy feeling that one is entering a world very far removed from that of the health service researcher!) reveals some common and relevant themes. (Box 1)

Box 1: An amateur's synopsis of postmodernism

- rejecting boundaries between "high" and "low" culture
- rejecting rigid genre distinctions
- emphasizing bricolage
- fragmentation, discontinuity, ambiguity
- an emphasis on the de-centered subject
- favouring reflexivity and self-consciousness

(Source: a vertiginous Google session!)

We have seen how clinicians (and these were first rate clinicians) reject the reformists' rigid boundaries between "high" and "low" forms of knowledge, melding in their mindlines many different genres of, e.g., scientific, experiential or organization-based knowledge. They do indeed use "bricolage" (the ad-hoc use of whatever materials are to hand) when constructing their day-to day knowledge-in-practice, turning to whatever trusted sources of knowledge they can most easily and reliably access. We find fragmentation, discontinuity and ambiguity in the way that policy making groups use evidence in their decision making, for instance, and this was particularly true in the multisectoral, multi-disciplinary groups. And we find that increased reflexivity (as, e.g., in the externalization of tacit knowledge or the use of reflective practice as part of continuing professional development) and self-consciousness (as in the need, e.g., to be more aware of the differences between the clinician's mindline and the patient's concept of what is wrong) have an important bearing on the way evidence is used in practice. Finally, even "the decentred self" (insofar as I can interpret what the term means) is perhaps an aspect of postmodernism affecting EBM, since the incorporation of evidence into practice is so heavily reliant on interactions with other people who include not only one's community of practice but specialists, scientists, bureaucrats and – not least – patients, who all have differing worldviews.

What of Hage and Powers (2002) "post-industrial" era? The explosion of information technology, new knowledge, R&D, new technologies and the educational revolution in Western society, have led to what they call the "complexification" of our daily lives, leading in turn to a reduction in routine work and a consequent redefinition of our working (and domestic) roles. Professionals in particular find that the boundaries of their work are changing; they are increasingly called on to play a multiplicity of fragmented, often conflicting roles with no ready-made "role scripts". So doctors, ever more reliant on extended teams and organizational systems, are no longer able to use just their knowledge and skill to diagnose and treat a difficult case. Now they must be interactive and participative with diagnostic protocols, clinical guidelines, computerised expert systems, nurse practitioners, audit trails, and the patient's own internet printouts. Moreover many of their routine decisions, say Hage and Powers, have been usurped by protocols, by other people, or by machines, leaving them only the more

exceptional problems to solve – which may require skills (emotional and social as well as intellectual) for which they were not originally trained. This analysis certainly has relevance for the implementation of EBM, and it is not difficult to see how mindlines, shaped by the clinician's multiple, complex and fragmented roles and dependent upon the sharing of knowledge with others, are well suited to meet the need for local creative flexible and complex problem solving.

We are led back, then, to the question in my title: in a post-reform era, will we ever make knowledge fit for practice? In one sense, that's exactly what we have seen clinicians doing daily – through their mindlines they take many sources of knowledge and make them fit for practice! But in the context of EBM, we may want to be sure that the knowledge is really improving the evidence base of practice. And my argument is that we will only achieve that if we move away from exhorting clinicians to use research knowledge in ideal ways and instead accept our need to understand better the sources of evidence that are actually used in real life, and how that knowledge is socially processed, internalized and practised. This might result in a better chance of designing and trialling interventions such as:

- knowledge management systems with an explicit social component based on the use of, e.g. multiple cues for change;
- the development of existing knowledge networks and communities of practice (or the establishment of new ones) to ensure that they are steeped in knowledge assurance methods;
- imaginative ways to ensure that key components of the transmission of knowledge – e.g., widely read ("low culture") publications, local opinion leaders, and patients - are targeted with best evidence.[1]

By refocusing the reformist efforts of EBM in such directions, we might be much better able to ensure that knowledge for the future of the post-reform profession will indeed be both evidence-based and fit for practice.

1. In fact, isn't that what the pharmaceutical industry have been doing successfully for years?!

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The Future of "Doctoring" – Dancing between Patients, Providers and Resources Perspective of a Former Clinician, Educator and Provider

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INTRODUCTION

Healthcare and medical practice have developed and undergone profound changes during the last century, and together with the improvement in nutrition and standard of living, have brought about the doubling of life expectancy and improved quality of life. Albeit, the reciprocal satisfaction of the population and of the practicing clinicians is in decline (Thiedke, 2007; Zuger, 2004). The doctor – patient relationship deteriorated during the last decades in spite of the advancement in medical practices (Table 1). Hence, two major questions may be raised: Why are so many patients dissatisfied when medicine is more successful than ever in combating disease and extending life? And why are so many physicians frustrated when medical science and technologies have been progressing at an accelerated pace?

Table 1: Evolution of the Doctor Patient Relationship during the 20th century

	Early	Late
Patients' Perception		
Doctors image	caring, devoted always right, reliable, trustworthy	"double agent" prone to errors, detached, greedy
Trust	"blind trust"	low
Communication	doctor listening	brief, interrupted
Patients' knowledge	none	well informed
Satisfaction	**high**	**low**
Doctors' Perception		
Knowledge and skills	low and harmful	high
Societal stature	supreme	"flesh and blood"
Externalities	complete autonomy, internal ethics the only driving force	patients bill of rights, managed care, media, litigation
Attitude to patient	paternalistic, secretive, keep away bad news	partnership, informed consent, transparency
Emphasis	comforting patients	prolonging life
Satisfaction	**high**	**frustrated**

As the future of effective healthcare relies on the restoration of the good relationship of the past, and in order to mend the current severed relationship, we have first to unravel the causes for this crisis – i.e., ***diagnosis,*** and tackle its main culprits in an effective manner – i.e., ***treatment.***

Before grappling with this analysis, we need to define the terms of "doctoring" and "professionalism". The Merriam-Webster Dictionary - online defines "doctoring" as "giving medical treatment… to restore to good condition…" (accessed 11.11.2006). It is easier to define its necessary attributes:

- Skills in medical interviewing, physical examination and clinical medicine.
- Skills in behavioral science (including sexuality, life cycle, anthropology and healthcare economics).
- Proficient communication skills.
- Knowledge and skills needed for evidence-based medical practice, clinical -reasoning, disease prevention and health promotion.
- Medical ethics and **professionalism**.

The most appropriate and comprehensive definition of "professionalism," in my opinion, has been proposed by Cohen (Cohen, 2006): "***…means by which individual doctors fulfill the medical profession's contract with society***…," where **"contract"** stands for "*a promise to the public that care received from doctors will be competent, rational and free of self interest in exchange for autonomy, ,financial security and social standing*". The specific attributes of "professionalism" are altruism, honesty, integrity, dutifulness, honor, excellence and accountability.

A. ETIOLOGY AND PATHOGENESIS (or, *what caused this crisis?*)

Four major issues are involved and responsible for this evolving paradoxical crisis in doctor-patient relationship:

1. Changes in healthcare practice;
2. The growing prevalence of managed care ;
3. Patients' expectations;
4. Physicians' reactions.

I shall now discuss these issues in detail; later I shall address recommended "remedies" to overcome those problems which can be eliminated and to adapt to those that cannot.

1. Changes in Healthcare Practice

The focus of medical practice in modern society has shifted from merely prolonging life to improving its quality, from curing disease to its prevention, and, when facing an incurable condition, concentrates on rehabilitation, comfort and well-being. Among the main features of this change we may find:

1.1. Aging population – During the 20th century, the life expectancy at birth in the United States almost doubled from 47 and 49 in 1900, to 73 and 80 in 2001, men and women, respectively (National Center of Statistics, U.S.A). A similar increase in longevity occurred all over the world.

1.2. Practice shift from treating patients with acute infections to caring for those suffering from chronic and degenerative diseases – During the 20th century, the prevalent highly contagious infectious diseases almost disappeared from the developed world, as a result of better living conditions and nutrition, water safety and sanitation, and effective immunization against the agents causing these infections. On the other hand, the increase in life expectancy gave rise to an elderly population with chronic degenerative diseases and special needs almost nonexistent in the past. Even in the developing world, coronary heart disease, diabetes mellitus and obesity became prevalent ailments (accounting for more than 60% of the global burden of coronary heart disease in 2002, WHO report).

1.3. Focus shift from treatment to prevention – The increased progress in medical science and improved diagnostic and treatment technologies during the last decades resulted in the medical profession's capability to identify traits, risk factors and subtle signs of many diseases. Thereby, it is frequently possible to prevent diseases from occurring by early treatment of their risk factors (e.g., lowering blood pressure or cholesterol before a stroke or heart disease has developed), or from

developing into life threatening conditions (e.g., early angioplasty for coronary heart disease).

1.4. Emphasis on well being – Already in 1948, health was redefined by the WHO: *"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."*

1.5. Improved diagnostic and therapeutic technologies – These improvements continue to affect medical practice as we knew it a few decades ago (e.g., adding an inexpensive proton pump inhibitor pill obviates the need for stomach surgery).

1.6. Shift from hospital centered to community healthcare services – This change is a direct consequence of the availability of sophisticated diagnostic and therapeutic modalities to outpatients, and as a result of the increasing cost of hospital services.

1.7. Adoption ("medicalization") of new aspects of life - e.g., sexuality, aging, dying and psycho-social well-being.

1.8. Severe economic constraints

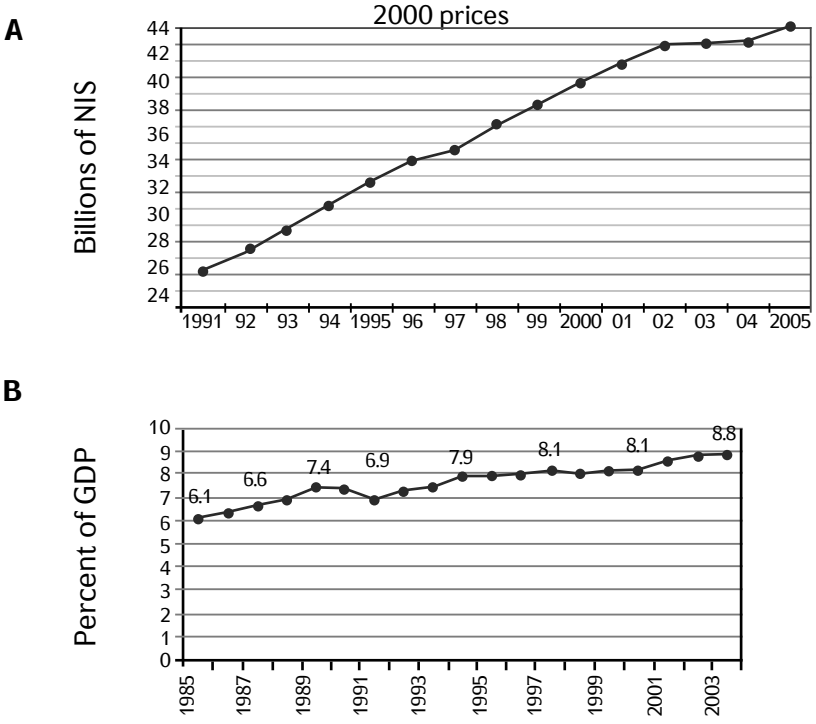
2. The Growing Prevalence of Managed Care

Two predominant reasons lie behind the growing prevalence of "managed care": the increase in healthcare expenditure, and limited resources (the so called "Scissors Diagram of Needs and Budget" [Ronen, 2006]).

2.1. Increase in healthcare expenditure - Throughout recent decades, healthcare systems (providers) all over the world have had to face the challenge of dealing with massive increases in heath care costs, both in real terms and as a percentage of their gross domestic product (GDP). Data for the Israeli market, derived from the Central Bureau of Statistics, are depicted in Fig. 1A and 1B, respectively. The main reasons for the soaring costs are a repetitive "vicious cycle": an aging population with an increased need for treatment of chronic and degenerative diseases, coupled with

research and development leading to innovative drugs and technologies (both diagnostic and therapeutic), many of them extending life without curing disease (e.g., kidney dialysis). This in turn leads to a further increase in life expectancy with its additional expenditure on drugs, devices and rehabilitation; and so on. Similar increases in healthcare expenditure have been occurring all over the world, and are continuing.

Figure 1: Israel National Expenditure on Health

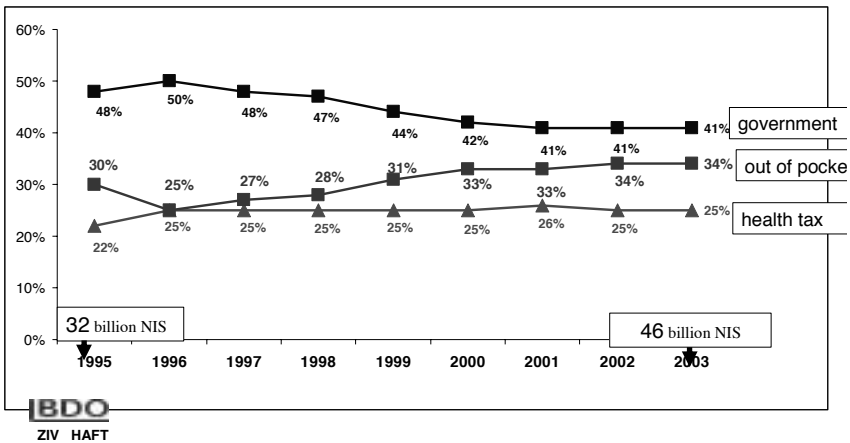


Israel Central Bureau of Statistics

2.2. Limited and Shrinking Resources – Since the introduction of the National Health Insurance Law in Israel in 1995, the total healthcare expenditure increased by almost 50%, from NIS 32 billion in 1995 to NIS 46 billion in 2003 (in adjusted NIS for 2000 prices). During this period, the government contribution dropped from 50% to 41%, the healthcare

premium share remained stable at 25%, but the "out-of-pocket" expenditure soared from 25% to **34%!** The latter increased the burden on the family budget, leading to greater inequities in healthcare consumption and health itself.

Figure 2: Source of Healthcare Expenditure in Israel



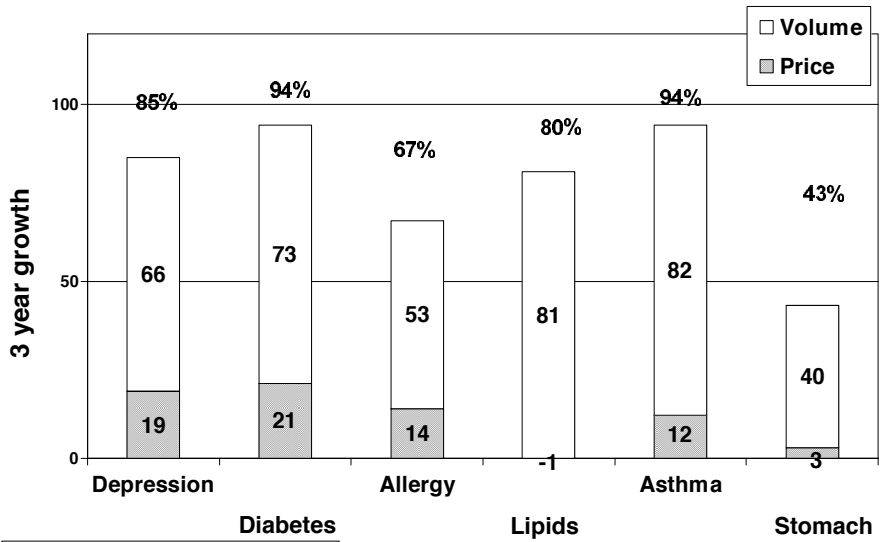
This economic crisis in funding healthcare needs was the result of limited resources combined with the increasing cost of drugs and novel medical technologies. In countries devoid of national health insurance (e.g., the USA), private healthcare organizations then increased premiums to almost unaffordable rates, leading to "uncoverage" of an increasingly larger portion of the populace. In other parts of the world, including Israel, the healthcare systems including health maintenance organizations (HMOs), funded by government appropriation and under obligation to balance their budgets, had no choice but to adopt **managed care** practices. This policy, which is aimed at better management of existing resources, i.e., doing more with the same resources in terms of output, response time and quality of healthcare (Ronen, 2006), has an additional social responsibility. As the availability of good medical care tends to vary inversely with the need for it in the population served *(Hart, 1971; Watt, 2002)*, managed care policy should also assure an equitable distribution of available resources to cover effectively the needs of the whole population, including the underprivileged, and hence

help in bridging the gaps in society.

Optimal managed care uses tools of both **utilization** and **quality management**. Appropriate utilization management is based on the fact that *the promotion of proactive and equitable utilization of established, effective and evidence-based preventive diagnostic and therapeutic means, is made possible by limiting unnecessary expenditure (=luxury expenditure, i.e., unaccompanied by health outcomes, quantifiable by survival and quality of life).* This policy has been advocated by the WHO at its conference in 1985 in Nairobi, Kenya, stating that: "*the rational use of drugs requires that the patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, but also at the* ***lowest cost to them and their community***".

Appropriate utilization management is best demonstrated with prescription drugs. Retail spending on drugs in the US doubled within four years (1997-2001), from US $ 78.9 billion to US $ 154.5 billion, i.e., a constant yearly increment of more than 18% (www.nihcm.org)!! Many have blamed the drug industry for the skyrocketing increase in expenditure, maintaining that most of this rise was caused by the rapid evolvement of more expensive drugs and technologies on one hand, and the proliferation of "me-too" drugs (innovative patented drugs belonging to an existing pharmacological class with only marginal advantage over the "generic," and thereby cheaper, prototypes). A more thorough analysis demonstrated that the main cause for the increased cost was that more patients were being treated appropriately, with drugs aimed at proper disease prevention and management, as depicted in Fig.3 (Dubois, Chawla, Neslusan, Smith, & Wade, 2000). Similar findings were observed at a large Israeli HMO (personal observation), namely, "volume" rather than "unit price" is the major contributor to the increase in drug expenditure.

Figure 3: Growth in Medication Costs in the US (1994–1997)



Adapted from Dubois RW et al. (2000)

In order to tackle this increase of drug costs, managed care organizations have developed and used several approaches:

1. Incentive based formularies (the notorious "three tier" for cost sharing that hurts the underprivileged and adversely affects compliance [Huskamp et al., 2003]);
2. Restricted drug formularies and coinsurance ("drug basket," that limits the physician's autonomy and hurts mainly the underprivileged);
3. Preauthorization for high-cost or overused drugs and technologies (introducing bureaucratic measures, angering both patients and physicians);
4. Incentives to pharmacists (unethical, in my view, as it introduces a stakeholder);
5. Influencing the prescribing behavior of practicing physicians (the best measure to my opinion, although it also impinges on physicians'

autonomy).

The latter policy has been introduced in a large HMO in Israel. Its effect may be appreciated from the utilization management of drugs (statins) used to lower blood cholesterol. The HMO's objectives were both to increase the use of statins (aiming at prevention of cardiovascular disease), and to contain the cost. Two main statins were popular at that time, the generic Simvastatin and the still patented Atorvastatin. The annual cost for lowering LDL cholesterol from 160 to 100mg/dl (the target value in early 2000s) was more than fivefold for Atorvastatin compared to the generic Simvastatin (i.e., substitution of Simvastatin for Atorvastatin in one patient frees resources to treat effectively four additional patients). During a four year period (2001–2004), the number of patients treated with statins almost quadrupled, and the number of patients reaching the target value for blood cholesterol tripled, whereas the total HMO expenditure on statins remained stable during those years (personal observation)!

This experience exemplifies what characterizes an appropriate and effective utilization management: "doing more with what you have" (Ronen, 2006). This achievement is offset, however, by the encroachment of physicians' autonomy and patients' freedom of choice.

3. Patients' expectations – *consumerism*

Patients' expectations from modern medicine and healthcare have changed during the last century. The patients, under the strong influence of both direct-to-consumer advertising and popular television shows, expect "miracles," and when faced with the not so ideal reality get frustrated and angry, and are prepared to sue. These changes in patients' attitudes may be summarized in modern terminology as "*consumerism*"; namely, the patients are knowledgeable and enterprising, expect personal attention, dialogue and partnership in decision making; have an increased demand for well-being in addition to healthcare (associated with willingness for out of pocket expenditure, e.g., "complementary medicine"); expect convenient and accessible care; and dislike the need for co-payments, preauthorization or other bureaucratic impediments associated with the intensification of "managed care". Discontinuity and "fragmentation" of modern healthcare adds to this dissatisfaction. They are required to visit experts and

specialized diagnostic laboratories associated with long waiting, instead of the "one-stop shops" in their homes or at their doctors' offices as in the past. In addition, patients complain about their overworked doctors who are too busy to attend to their psychological needs or answer their questions, and whose loyalty may be divided ("double agent," see below). The patients' free monologue detailing their complaint is usually interrupted (within less than 30 seconds) by their primary care practitioner (PCP), in both the USA (Marvel, Epstein, Flowers, & Beckman, 1999), and Israel (Rabinowitz, Luzzati, Tamir, & Reis, 2004).

Surveys conducted all over the world reveal these factors and others as causing dissatisfaction (Thiedke, 2007). The most important expectations of Israeli in - and outpatients from their doctors, observed during a survey conducted in an Israeli hospital, are detailed in Table 2 (n=445).

Table 2: How would you like your Doctor?
(Schattner, Rudin, & Jellin, 2004)

To be experienced – *"professional," knowledgeable*	50%
To be patient with me	38%
To explain what is wrong with me – *"transparency"*	36%
To listen to me carefully – *"attentiveness"*	30%
To represent my interests vs. HMO – *"advocate"*	29%
To tell me the truth about my ailment - *"transparency"*	28%
To be "up-to-date" - "*professional," knowledgeable*	28%

4. Physicians - "like hamsters on a treadmill"

During the last several decades, physicians have been taken on a wild ride. Many of them have found it difficult to adapt to the continuing and accelerating pace of changes in medical and healthcare practices, for which they were not prepared; to clinical guidelines; and to changing patients' expectations. This is understandable, as in the past they were surrounded by admiring assistants; loyal, satisfied and thankful patients;

and respectful colleagues. They had full autonomy in their work and a luxurious income. Today, their profession is in retreat, plagued by bureaucracy, loss of autonomy, diminished prestige and deep personal dissatisfaction (Bovier & Perneger, 2003; Zuger, 2004) .

The principal causes for this transformation may be summarized in six points:

4.1 Changing medicine –"fragmentation of medicine". Practicing physicians turned from "omnipotent" primary care practitioners (family physicians, internists or pediatricians) to practitioners needing to refer patients to specialists and trained experts for consultations and tests. Moreover, they became dependent on sophisticated technologies not in their possession for both diagnosis and treatment.

4.2 Managed Care Policies (section 2) are perceived and characterized by physicians as loss of autonomy, caused by practice guidelines, need for preauthorization and other bureaucratic measures, and requiring divided loyalty (role of "double agent"). In addition, the evolving practices of evidence based Medicine and the need to achieve national healthcare indices have been translated into clinical guidelines to assure quality management (an educational tool designed to aid clinicians in providing optimal care). Hence, practitioners are left with very little freedom of action. Moreover, practitioners also have to demonstrate financial accountability, leading to further encroachment on their autonomy.

4.3 Lack of time – There just is not enough time to fulfill the obligations to patients (shortening the consultation session to less than 10 minutes [Rabinowitz et al., 2004]), due to the patient load induced by economical constraints of the provider. Therefore, the physicians have to work longer hours to maintain their income, leaving almost no time for updating knowledge (CME) or for family life. This time pressure is associated with adverse effects on both patient care and professional satisfaction and morale. This frustration, prevalent among practitioners all over the world has been coined "hamster healthcare" (Morrison & Smith, 2000): "Across the globe doctors are miserable because they feel like hamsters on a treadmill. They must run faster just to stand still."

4.4 Disparate expectations – Patients (section 3), backed by the Patients' Bill of Rights, expect 24/7 personal care in all aspects of life, including aging and sexuality, psychological counseling and sometimes also societal well-being. Doctors view their patients as having exaggerated expectations, non compliant with advice, distrustful, disloyal, abusive and domineering. The recent education and training conditions of doctors have been protected from the "Real World," leading to frustration once meeting Reality.

4.5. Defensive Medicine – Due to the need to prevent malpractice claims, litigation and being singled out by the media, doctors' practice has expanded to include unnecessary tests and treatments, against their better clinical judgment. This adds further to their dissatisfaction.

4.6 Erosion of Patients' Trust – Ethical demands and the need for "professional" behavior, for which the current practitioners have not been properly prepared, further strain their life. But what is even more disturbing is the loss of patients' trust, which is essential for effective medical practice. This decline in trust results mainly from: patients perceiving conflicting interests on the part of their physicians ("double agents"); doctors' behavior not meeting patients' expectations; scandalous reports in the media on doctors' misconduct, errors, negligence and malpractice; and, overly close relationships of doctors with pharmaceutical companies. Among the main symptoms for this disruption in trust we may find: doctors turning into **providers**, patients into **clients**, and their relationship viewed as **encounters**.

B. TREATMENT – RECOMMENDATIONS
(or, what should be done?)

Two of the four major contributing factors to the evolving crisis in the doctor – patient relationship are unchangeable. For the benefit of humankind, healthcare and medical practice will continue to develop and result in the introduction of even more sophisticated and expensive technologies, resulting in a further increase in cost. The second unchangeable factor is the patient whose expectations and demands will

continue to grow, thus enhancing his "*consumerism*". Hence, we are left with two factors that may be influenced to save the future of the medical profession, namely, providers and physicians. I will devote the remainder of this article to elaborating on the measures that are necessary in order to save the future of healthcare delivery.

1. Providers (HMOs)

Providers must organize their services to fit the needs of patients and physicians alike. They need to allocate their limited resources in a rational, appropriate, equitable and cost effective manner. They will have to involve both doctors and the patients (patients' advocates) in setting transparent policies for healthcare provision. In addition, they will have to harness medical Informatics technology (i.e., electronic medical records, decision support systems and telemedicine) to assure high quality healthcare, and introduce Information technology (IT) in order to reduce paper work, and lessen the administrative and bureaucratic burden on their doctors and patients (preauthorization, prescriptions, referrals, etc.)(Weiner & Biondich, 2006). Finally, it is their obligation to assure effective quality, utilization and risk management, in consensus with the practitioners' representation and the respective medical professional societies. The providers have to empower physicians and patients to form a true partnership; the doctor turning into a ***"personal physician"*** rather than serving as a ***"gatekeeper"***. HMOs in Israel have already adopted some of the above listed recommendations.

2. Physicians

Physicians must first appreciate and internalize that patients' expectations differ from their own, and that healthcare practice is under constant change for reasons detailed above (Zandbelt, Smets, Oort, Godfried, & de Haes, 2004). They have to familiarize themselves with, understand, and adapt themselves to these changing expectations as detailed in previous sections (Kravitz, 2001;Thiedke, 2007). For example, they must consider their patients desires to get involved in clinical decision-making (Carlsen & Aakvik, 2006). Finally, they have to undertake the role of leaders in society ("Doctoring as Leadership – *the power to heal*" [Schei,

2006]). It would be very difficult to do all this by themselves, hence they have to be assisted by the academia, the regulators (Ministry of Health and the HMOs) and the professional societies.

2.1 Academia – The mission of medical schools has to change, as it did in leading medical schools all over the world over the last decade (Deveugele et al., 2005; Haq, Steele, Marchand, Seibert, & Brody, 2004; Peters et al., 2001; Wilkes, Usatine, Slavin, & Hoffman, 1998). They have to equip future doctors with the necessary scientific and "professional" skills for practicing in a constantly and rapidly changing medical profession and healthcare system, while maintaining their integrity and ethical behavior, aimed at answering the needs for "well-being" of both their patients and society. The medical schools also are obligated to equip PCPs and specialists alike with the skills necessary to answer the comprehensive needs of patients. Finally, it is their duty to provide an effective continuing medical education (CME) to established practitioners who find it difficult to adapt to modern medical practice, including communication skills, in specialized laboratories using simulated patients (such a facility is operating at Sheba Medical Center in Israel). The specific role of medical schools in training for "professionalism" has been outlined recently by Stern and Papadakis (Stern & Papadakis, 2006), Hafferty (Hafferty, 2006), and others (Deveugele et al., 2005; Haq et al., 2004; Peters et al., 2001): a. ***adjustment of admission criteria to the medical schools,*** to improve the selection of future doctors by including noncognitive attributes in addition to the ability to acquire new knowledge (e.g., motivation, altruism, commitment to service, interpersonal communication); b. ***comprehensive instruction of "professionalism,"*** through faculty development, and longitudinal small group learning teams aimed at the absorption of core values and virtues of medicine (***being a professional rather than acting as one*** [Hafferty, 2006]); and to provide experiences relevant to "real life".; c. ***purge the learning environment of "unprofessionalism,"*** and dismiss the few students who are incapable of practicing professional medicine.

2.2 Regulator – Ministry of Health – The Ministry has to assure a transparent and rational appropriation of resources based on equitable, cost effective measures (supported by evidence based medical practice), in consensus with the doctors' professional societies and the doctors' associations. It has the responsibility to balance the appropriation of

resources between individual and public needs, between preventative and curative appropriation, and between community and hospital expenditure. The MOH has the duty to assure patients safety by licensing and monitoring physicians' performance, and last but not least, to provide funding and to promote healthcare-associated research.

2.3 Medical Professional Societies – Medical professional societies have to design evidence based clinical and practice guidelines compatible with providers' policies, and thereby reduce patients' distrust and defensive medical practices; set health outcome associated goals and indicators (appropriate performance measurements[Hayward, 2007]); help their membership understand the need for cost control, regulation, and consideration of the health of the population, sometimes even at the expense of "doing the maximum" for individual patients; provide the population with the necessary information to understand the equitable cost-effective rationale of providers' policies, and thereby promote the trust in their physicians; balance the physician workforce between primary care practitioners and specialists and thereby limit discontinuity and "fragmentation" of healthcare; design innovative ways of practice to answer the modern needs of the profession and the society (Larson et al., 2004); and finally, help counteract both the media quest for sensationalism and politicians' rhetoric.

4.4. Doctors themselves – The physicians themselves have an obligation to adapt to modern healthcare and balance between biomedical and psychosocial needs (showing empathy - "care" in addition to "cure"); to adapt to rapidly changing medical practice (new technologies) and healthcare delivery system (Larson et al., 2004; Lord, 2003); to become lifelong "professionals"; assimilate resource management accountability into practice; to remember that patients, irrespective of their changing behavior, were the reason they studied medicine; and last but most important, to win back their patients' trust. In order to regain the lost trust, doctors have first to acknowledge its absence. Then they must each change by assuring technical and interpersonal competency, putting patients' welfare first, and practicing "care" in addition to "cure". Finally, the whole medical community has to change the system it created, and revert back to doctors, patients and

relationships instead of "providers," clients, and encounters. We all have to remember that trust is earned!

A prescription for the preferred mode of practice has been provided by the WHO (http://www.who.int/hrh/en/HRDJ_1_1_02.pdf, accessed March 2007) in its definition of a *"five stars doctor": a doctor who assesses and improves quality of care; makes optimal use of new technologies, promotes healthy lifestyle, reconciles individual and community healthcare requirements, and is able to work efficiently in teams.*

C. PROGNOSIS AND CONCLUSIONS

The asymmetry in knowledge between physicians and patients will persist. The tendency for consumerism, pursuit of well-being and quality of life, and the quest for autonomy will continue to evolve in our patients, as will their distrust. The rapid development of diagnostic and curative technologies will continue, leading to further increase in cost and "fragmentation" of healthcare; the need for utilization management and equitable appropriation of resources will increase. Consultation time will remain short and the income of doctors will remain low; and the media and lawyers will continue to plague our profession.

Therefore, in order to preserve the crucial role of the primary care practitioners (PCPs) in health maintenance of the populace, disease prevention and care for the sick, as well as coordinators of the provision of comprehensive care, and in view of the continuing process of "fragmentation of healthcare," it is the common obligation of academia, providers (managed care systems, Ministry of Health) and physicians' professional societies to join forces to educate, train, assist and ensure appropriate working conditions for the doctors to fulfill their critical mission in the society they serve.

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Physician Communities in the Future

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INTRODUCTION

The practice of medicine, the roles of the physician, and the patient-physician relationship have all changed greatly over the years and will continue to change in the future. Physicians and patients are faced with issues and decisions that they never had to face in the past. The individual physician is often ill equipped to deal with these issues on his own, as they involve legal, ethical, moral and philosophical issues in addition to medical ones. S/he has neither the time nor the resources to research the issues, nor the network with which to consult other physicians. It is in this capacity that medical associations have an important function and will play an increasingly large role in the future.

National medical associations (NMAs) around the world, and the international organizations to which they belong, have been responsible for defining emerging issues, influencing legal and ethical processes, and ensuring the best possible health care system for both physician and patient. These roles will only become more prominent as changes continue to occur.

The reasons for the changes in medical practice are manifold, and relate to changes in medicine itself, as well as changes in the context in which it is practiced. Basically, changes can be loosely classified into four categories: medical, economic, societal and technological.

MEDICAL CHANGES

The medical changes that have occurred in the last twenty years, let alone the last one hundred, are seismic, and portend to even greater

changes in the future as medicine becomes increasingly specialized and complex and our base of knowledge continues to grow. The multitude of treatments available present difficult decisions, and raise the expectations of patients (Wanless, 2002). Physicians, in turn, are faced with ethical decisions they did not have in the past. Are all lives worth saving or extending and at all costs? Does the fact that a certain treatment is available mean that it should be used in every situation? What treatments should be afforded a seriously ill newborn? What treatment should a doctor recommend, or a patient choose, when faced with a wide variety of options for cancer treatment? Physicians often feel at a loss to advise their patients when they themselves have not had the luxury of sorting through the ramifications of each decision. NMAs can and do play a pivotal role, by discussing ethical issues and formulating guidelines to assist physicians. This role will only increase in the future as new ethical situations arise.

Physicians must also be the ones to draft the clinical guidelines that will form the basis for proper care in each of the medical fields. This can best be accomplished through medical associations, and the scientific associations to which their member doctors belong. As part of their responsibility in setting professional norms and ensuring the maintenance of high standards of medicine, NMAs can ensure the integration of new techniques and new information into the training and residency of physicians, so that their use becomes normative.

ECONOMIC CHANGES

Economic issues are also directly and indirectly partially responsible for the changing face of medicine. Economics and medicine will become even more intertwined in the future, due to more options, more expensive treatments, an aging society and shrinking resources. Physicians and their medical associations will have to stand fast in the face of these and other external threats, in order to see to the best interests of their patients. The medical profession rightfully feels its job is to strengthen the bond between doctor and patient and serve as the patient's champion by ensuring the best treatment possible for the patient. Yet this may at times bring the doctor in conflict with the government, employers or insurance companies. Already we are witness to instances where the physician is constrained by his employer to provide a certain treatment or prescribe a

specific drug based on economic, as opposed to medical factors. This form of indirect interference in the physician's decisions and autonomy is extremely hard to detect and harder to oppose because on the surface, these outside parties such as the government or sick funds appear to be interested in what is best for the patient. They couch their guidelines in terms of better health and lower costs, which appeal to the public. NMAs must play a central role in continuing to ensure that medical care is first and foremost a professional, and only then, an economic issue.

Economic factors also play a large part in the attempt to shift certain physicians' responsibilities to para-health professionals. This global trend of downgrading physicians' roles is not only a threat to physicians' professional right of self-governance, but also to patient safety. Physicians undergo extensive training and acquire skills and knowledge that distinguish the physician-patient relationship from the patient's relationship with other health care professionals. In addition, the nature of the physician–patient relationship is more comprehensive, since physicians are more familiar with a patient's history and are therefore in a better position to decide upon and administer treatment. Diminishing physicians' roles, in particular when such policy is predicated on economic considerations, is risky, and places external considerations before patient safety. Dr. Otmar Kloiber, Secretary General of the World Medical Association, has voiced his concern over the argument that training doctors is too expensive (World Medical Association, 2006). Physician communities and their representatives, such as national and international medical associations, are involved in highlighting the risks inherent in this issue and exerting influence to reverse this trend and replace it with a model of teamwork between various health care professionals. The individual doctor, overworked, may see only the benefit to himself in transferring responsibilities. The medical association is able to see and highlight the larger picture, while taking into account the needs of the individual doctor. There is also a need for dialogue among physicians in different specialties, and among physicians and other groups of healthcare professionals, in order to arrive at a model that will best serve patients; this dialogue can only be accomplished on an organizational, rather than an individual scale.

The allocation of resources is another economic issue that has taken center stage. More complex decisions must be made as the increase in the treatment options leads to the decrease of already limited resources.

Should resources that can be used for a large number of patients be exclusively channeled towards one? The individual physician must be concerned first and foremost for the individual patient before him/her. However, there is no question that societal considerations are also relevant. NMAs can engage in a dialogue with society and provide their professional expertise to help decide upon the proper allocation of resources.

SOCIETAL CHANGES

Changing social roles play a large part in the evolution of medicine. As aforementioned, the roles of the physician and the physician-patient relationship have undergone enormous changes. The physician-patient relationship has become more of a partnership and less paternalistic. Instead of simply acting in the patient's best interests, physicians now must strive to respect patient's autonomy and engage the patient to actively participate in his/her treatment (Emanuel & Emanuel, 1992). The role of the physician, too, is no longer clear. In previous years, the physician was the authority who made the diagnosis, decided upon the treatment (of which his choices were limited) and supported the patient when nothing else could be done. Today, physicians are in uncharted territory as they attempt to define the new meaning of professionalism. Such a process requires extensive discussion amongst physicians, research, and dialogue with patients' groups that can be facilitated by a national medical association.

TECHNOLOGICAL CHANGES

Technological advances represent another component that will affect and change physician communities in the future. New technologies require more specialized training. Information and communication technologies present enormous opportunities to the health care industry, but also pitfalls. The use of new technology must gradually be integrated into current workflow, providing healthcare professionals the time to become proficient in its use and to deal with new ethical and legal situations as they present themselves. National medical associations can help identify, facilitate and stimulate debate and discussion on these emerging issues.

One technological issue that confronts healthcare in the future is the use of electronic medical records. Computerizing patients' medical records

has a number of benefits, such as standardizing procedures, reducing duplicity, and facilitating continuity of care. However, privacy, confidentiality and security are issues that need to be dealt with prior to and during the implementation and use of electronic medical records. It is crucial that the promotion and development of health information technology not precede the institution of privacy protections. As Joy L. Pritts, a health policy analyst at Georgetown University told the New York Times, "If you don't have the trust of patients, they will withhold information and won't take advantage of the new system" (Freudenheim & Pear, 2006). Similarly, physicians must trust the new system and feel it is to their benefit and not simply an additional administrative burden. If doctors feel uncomfortable using new technology, whether for practical or ethical reasons, it will be difficult to implement. NMAs are uniquely suited to gauge the effect of such innovations on doctors in the field, and thereby assist in the implementation of new measures by ensuring that such measures are suited to the needs of the populations that will be using them. They can help sort through and refine the issues, and gain the cooperation of physicians, necessary to implement any such system by ensuring it is to their benefit as well.

The internet is another innovation that is changing and will continue to change the face of both patient and physician communities in the future. This medium allows both communities access to great quantities of information. This can greatly enhance the work of physicians and empower patients, but can also introduce an element of distrust and even antagonism into the patient-physician relationship.

Additionally, with the ever-increasing access to all types of information via the internet, patients are all too often confused as to which websites to trust when it comes to health related material. Even worse, they may unknowingly rely on information that is lacking or even false. Physicians are in a unique position to help their patients make sense of the information found on the web and to apply it to their individual circumstances. Dr. David Blumenthal of Massachusetts General Hospital predicts that in the future, physicians will need to "demonstrate that they are expert at marshaling all the available new information technologies for their patients' benefit" (Health Behavior News Service, 2002). NMAs might consider endorsing particular websites or providing some sort of a "stamp of approval" to help the public discern which sites are reliable with regards to health information and services, or alternatively opening up sections of their own

websites to the public, as many medical specialty societies have done.

NMAs embrace the incorporation of information and communication technology within the practice of medicine. These new technologies cannot and should not replace the crucial interpersonal contacts that form the cornerstone of clinical medicine, but instead should be used to enhance such contacts. It is critical for NMAs to specifically advocate on behalf of physicians that these new technologies adapt to the needs of the physician and not the other way around.

CONCLUSION

In conclusion, the future for physician communities holds the promise of new developments in medicine, changing patient-physician relationships and increasing use of advanced technology. NMAs in the future will have more prominent roles, working on behalf of the physicians that they represent. NMAs will continue to mediate the discourse between society's needs and desires and those of physicians. Communication is one of the fundamental building blocks of the patient-physician relationship and sometimes this communication can benefit from the mediation of a third party, such as a national medical association. NMAs will also continue to play a pivotal role in helping to facilitate dialogue between physicians and employers and regulators. They will continue to provide a forum for their member physicians to formulate policies on a national or regional level, to receive ethical guidance, to understand legal ramifications and where necessary, to influence the legal process. Where an individual physician might feel lost when faced with the great changes of medicine, the medical association provides him with the support, resources and backing to navigate these changes.

This is no easy task and it will not get any easier in the future with all the changes yet to come. However, national medical associations are up for the challenge.

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How New Technologies Will Change Patient-Doctor Relationships

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I. INTRODUCTION

Changes in technology in health care have shaped medical practice in the last five decades. In current times, the pace of technological development in all disciplines is increasing exponentially, and the effect of these changes on the practice of medicine and on our relationships with our patients is increasing at a very fast rate. It is clear that, beyond the effect on individual and population health, new technologies will impact the way we interact with our patients. This is true for our relationships and interactions with our patients in out-patient clinics, in hospitals, and in cyberspace. New medical technology is everywhere and affects diagnostic, therapeutic, data management and information technology, as well as the organization of the practice of medicine in terms of financial and administrative management of health care systems. Medical education is also changing, and teaching methods are constantly being altered, with a need for regular modification and rethinking of the way we educate our students and residents. In general, new developments in medicine can be classified according to the mechanism of initiation to the following categories:

University-based developments usually rely on basic or applied research that leads to a discovery. This generally evolves from a research project that is not intended for application, such as the development of drugs based on an incidental discovery of a molecule, or from a more focused

project for the development of a new diagnostic or therapeutic tool.

Hospital-based inventions are usually tied to patient care. Here the physician is the driver to the development, and the physician defines the requirement from the proposed solution based on his clinical practice. Examples are devices for surgery, endoscopic procedures, and interventional cardiology, or new methods of treatment that come from the need for an improved way of conducting a specific diagnostic or therapeutic procedure.

Industry-based developments are driven by the vision of the industry and use the ability of the specific industry to lead the development and then introduce it into the market. This is often dictated by technological advantages that are developed within the company and, together with advisory medical teams (whether within or outside the company), define the challenge and structure the solution. This is how large companies work, directly interacting with a team of medical advisors, in advancing drugs, imaging methods, and leading devices for the market. Industry's contribution to medical development can come from large, established companies or start-up companies alike; the idea can come from an engineer, a physician, or an innovator, and the funding mechanism allows these individual to "risk" some initial investment in order to test the feasibility of an idea.

There are combined mechanisms for developments in medicine, involving national or international consortia and incubators. These are usually financial and organizational tools that enhance interactions between university-based research and industry, with some aid from the government or international funding mechanisms. Such a mechanism, by enhancing collaboration between the less practical but highly innovative academic staff and the more technology rich and financially strong industry, generates novel ideas that would otherwise not materialize, leading to breakthrough medical technologies.

II. PERSPECTIVES

The pathways and time it takes for recognition of major developments in medicine can be learned through some examples from the world of cardiology. How major breakthrough discoveries change medical practice can be seen through some of the innovations in this field. The first Nobel Prize in Cardiology, awarded in 1924 to Einthoven (Raju, 1998) for

proposing and developing the mechanism of the electrocardiograph (ECG) have opened the door to diagnosing and treating many cardiac abnormalities. This is clearly a diagnostic method that became a powerful tool in daily life in cardiology and has maintained its central role since then. In 1956, Cournaud, Forsmann and Richards were awarded the Nobel for their development of a procedure linked to physiology: "heart catheterization and pathologic changes in the circulatory system." This is also an example of a practical and powerful diagnostic application that became therapeutic when the use of catheterization was expanded beyond catheterization to transcatheter therapeutics. Interventional cardiology developed as an entire field from these major inventions and has completely reshaped the way we treat our cardiovascular patients today.

In our institution, Hershko, Ciechanover and Rose were awarded the Nobel in Chemistry in 2004 for the Ubiquitin Protein Degradation System, based on an initial observation of the biochemical phenomena of an energy-demanding proteolytic cellular process in 1978 (Ciechanover, Hod, & Hershko,1978). While this is an example of a discovery of basic knowledge that spans all life sciences and sheds light on almost all biological processes, worldwide recognition of the importance of this discovery and practical applications of the development were delayed for close to 30 years before the first anticancer drug compound, based on the Ubiquitin system and proteazome inhibition (Velcade), reached the clinical market (Milano, Iaffaioli & Caponigro, 2007).

III. COMPUTERS AND COMMUNICATIONS

Since the middle of the last century, when computer technology was introduced to the world and entirely revolutionized our lives, data management and information technology have been undergoing major revolutionary changes. Electronic medical records (EMR) are becoming the standard of care in most medical services (Shortliffe,1999; Bates, Ebell, Gotlieb, Zapp, & Mullins, 2003; Lejbkowicz, Denekamp, Reis, & Goldenberg, 2003; Saia, 2005; Kuperman et al., 2007). The shift from paper charts to complete electronic management of our patient files in clinics and in hospitals is rapidly evolving. At Rambam Health Care Campus, for example, the Prometheus EMR system has radically improved our clinical data management in the last five years. The system features full connectivity

within the hospital and uses on-line data information. The system is constantly evolving, with implementation in other hospitals. In addition to completion of the development and implementation of the system and timely adjustments, current and future directions involve decision support systems, alerts and safety features that will further enhance the robustness of the system for general medical care.

The introduction of such systems to hospitals and clinics raises many questions regarding the ability to access medical files within and between hospitals and the transfer of medical information from one institution to another, (Lejbkowicz et al., 2003). While, theoretically, this feature can be a major asset of utilizing advanced information technology, administrative and bureaucratic barriers often prevent this from happening on a larger scale that spans hospitals and clinics. While EMR is expected to lower the barriers to information, technical complexity, ethical concerns, competition between health care providers and other factors may generate new barriers and thus hinder, rather than help. Out-patient information management systems are now common practice in our world and, with the intense development in this field, it is evident that reducing administrative barriers will lead to better connectivity and on-line sharing of information between institutes. We use such an approach to a limited extent in our institute in a system which brings current medical information about a specific patient to the hospital's "point of care" (Saia, 2005). Obviously, the safety of the data, confidentiality, and maintaining the rights of our patients are legal aspects that must be strictly adhered to in these plans (Kuperman et al., 2007).

The information revolution of the internet has also changed the knowledge of our patients. The immediate accessibility by everyone to the most updated information worldwide has resulted in patients who are more informed about their disease. However, despite this availability of information, patients do not know how to discriminate between correct and biased data that exists on the internet, increasing the challenge to the physician. Electronic communications with our patients supplement the direct physical examination by follow-up sharing of information, passing on results of laboratory tests, etc. The ability of patients to communicate with their physicians through email or other electronic media is becoming standard. While practice changes as tools become more widely available, the safety and confidentiality of email messages needs careful consideration.

IV. ENHANCED DIAGNOSTIC ABILITY – LOSING THE MEDICAL TOUCH?

Our diagnostic ability is constantly evolving, due to new imaging modalities and novel laboratory tests. The x-ray systems, revolutionary in the first part of the last century, are fortified today by fast multi-detector CT, ultrasound, MRI, nuclear imaging modalities, and other novel imaging systems employing new physical principles. The multi-detector CT scanners have modified the way we approach trauma, of which we had extensive experience at Rambam during the last war in Lebanon. A novel hybrid imaging system with a 64 CT scanner and SPECT-CT was applied to cardiac patients and greatly enhanced our ability to diagnose cardiac diseases (Rispler et al., 2007). It is clear that innovations in imaging abilities are changing medical practice. The introduction of SPECT-CT for cancer (Keidar et al., 2004; Bar-Shalom, 2005) has modified the approach to the treatment of cancer patients. Imaging has been and will continue to be a major force, driving changes in medical practice. We rely less on our senses, auscultatory and palpatory skills. The speed with which we send the patient to imaging before we try our own senses and medical skills is interfering with our practice to a large extent.

Indeed, we will lose the "medical touch" if we do not act properly. Our cyber eyes reduce the skill levels of physical examinations. We see that trend today among our students, residents and senior physicians. This may lead to distance between patients and doctors and may interfere with the "medical touch," a fundamental element of individual medicine. This is a sacred part of medicine that we should praise, educate towards, and use as a role model to our students and staff. The patient is always in front of us, whether he is behind the office desk with a thin computer screen separating us, or in the operating room.

V. DRUG DEVELOPMENT

Developments in the field of drugs and biotechnology products are different than in the field of imaging or devices. New drugs are constantly being developed, yet the pace of drug development is limited by the extended length of time it takes to prove that a drug is efficient and safe. We, as physicians, are constantly charged with supplying the information

regarding the effects of these drugs and the indications for their use. Direct marketing of drugs to patients (Mackenzie, Jordens, Ankeny, McPhee & Kerridge, 2007) that we witness today may bias the patients toward a certain treatment, without having the tools to judge the appropriateness of that treatment. Therefore, careful sharing of information between the doctor and the patient regarding proper drug selection continues to be the elementary foundation of medical care. An example of the length of time it takes to approve a drug can be taken from the experience in our institute with Rasagiline (Azilect) for Parkinson's that was developed by Youdim and Finberg (Finberg, Tenne, & Youdim, 1981) over 25 years ago and reached the market only in 2006 (Schapira, 2006).

VI. MEDICAL THERAPEUTICS AND DEVICES

Devices have been a major driving force in modifying medicine. Balloon angioplasty and stents (Roguin, Beyar, 1999) are examples of devices that revolutionized the way we treat our cardiac patients after we diagnose them with the appropriate imaging tools. New devices are emerging at an ever-increasing rate. In contrast to drugs, the development process of devices often demands a physician's technical skill factor, in order to ensure the safest and most appropriate introduction and testing of the new technology. Many times these new devices are conceived and developed in full or in part by the physician who then becomes the first to test the device. This introduces a new challenge to medical ethics in conducting proper clinical research.

It is clear that the mechanisms for the introduction and approval of a new device can interfere with the patient-physician relationship. With new devices, the trust of the patient in his physician is of critical importance. Full disclosure of financial interests is a mandatory part of medical ethics in this respect. Disclosure of all potential effects of a device on the patient's health should be complete and objective, and explained to the patient in lay terms. Leading institutions, such as Stanford University and others in the USA and throughout the world, typically allow for the initial clinical study for device evaluation to be conducted by the developing physicians, recognizing that s/he is the one that often has the best skills in that technology, and that it is for the benefit of the patients that s/he conduct the actual procedure. However, it is clear that later on, the pivotal clinical

study for approval of such a device should take place with a different and wider team of investigators, where any individual conflict of interest is disclosed to the scientific and regulatory bodies.

Device technology is becoming more complex. Use of complex biomaterials in various applications becomes more frequent. Examples from our institutions on developments in that area are the use of Gelrin Hydrogels (Dikovsky, Bianco-Peled, & Seliktar, 2006) for cardiovascular applications such as stents (Livnat, Beyar, & Seliktar, 2005), and matrices for the growth of various cardiac cell types that may be used to replace damaged heart muscle (Shapira-Schweitzer,& Seliktar, 2007), or, with or without bone-generating cells, can be used for bone healing in orthopedics (Peled, Boss, Bejar, Zinman, & Seliktar, 2007).

Stem cells are currently under intense research worldwide. We have pioneered in this area in Israel, and the first publication by Thompson et al (1998) of the first human embryonic stem cell lines demonstrated the collaboration between our Prof. Joseph Itzkovich and Prof. Thompson. Since then, intense research in that area has lead to several innovative directions, including the first cardiovascular stem cell lines by Kehat et al. (2001) in Prof. Lior Gepstein's laboratory, and the first biological stem cells-based pacemaker in an animal model (Kehat et al., 2004).

VII. GENETICS

Genetics is a field where the enormous incidence that we are witnessing today will reach the clinical market in a major way in ten years. Today, genetics is revolutionized by our knowledge based on the genome and mutations, and the novel methods to deal with the huge amount of data that exists on genetic codes. We are learning more and more how genetics affects diagnostics, prediction ability and therapeutics. We are beginning to implement the use of genetic information in the prognosis of therapeutic interventions in certain genetic diseases. We are applying these facts to the management of certain types of cancer and blood disorders, but we have not as yet developed the know-how to utilize genetic information for all our patients who need drugs. Pharmacogenomics will become a major tool in predicting the response to therapy based on genetic information (Giacomini, et al., 2007). This field is in its infancy and I predict that it will have a major impact on our practice in the near future.

Genetics is a field of high public sensitivity that should be properly addressed. The patient must have a high level of confidence in his doctor and in the entire medical system, and we should secure that principle. Genetics will be the key component of personalized medicine, where each patient will be treated individually, based on his genetic code, with the most appropriate therapy. It is clear that proper bioethical principles should be tightly linked to the local culture and often to religious principles, which vary markedly between religions.

Conflict of interest is a major issue with the advance of medicine and science, and should be properly dealt with at all levels. The scientist who conducts his experiments must disclose all financial interests that may influence his findings. Physicians who are experimenting with new devices should fully disclose any conflict of interest than they may have to the proper authorities in the hospital and the regulatory bodies, as well as to the patient. This should be stated clearly at meetings and in publications. There has been more than one example in the last years of improper disclosures of conflict of interest resulting in a judgment of unethical conduct and legal action taken against physicians or health providers. Nabel (2006) raised an issue of a conflict of interest that was not disclosed by members of an institutional review board. It is mandatory that any conflict of interest within the IRB should be dealt with and closely monitored in a transparent process. Trust in a clinical research enterprise is a fragile commodity that, once lost, will not be easily restored. The trust of our patients in the scientific and ethical levels of medical practice is crucial to the continuing advancement of clinical science through clinical research. We must all work to enhance and preserve the public trust that is granted to us, the medical community.

VIII. EDUCATION

Education is also undergoing major changes with new needs and rapid advancements in science. Electronic methods of spreading knowledge and new electronic tools for frontal and individual learning are being developed throughout the world, as are various simulation tools. Simulation has become a part of training for surgeons and cardiologists who do complex interventions (Alderliesten, Konings, & Niessen, 2006). Changes in this respect will affect our interaction with our patients and we will be more

prepared for the encounter, whether in the office or in the operating suite.

IX. SUMMARY

New technology modifies the doctor-patient relationship in all aspects of medical care. This development is an evolution that has to be taken into account in medical schools and in our practice, so that the future generations will have the right technological skills and, more importantly, the ethical tools to deal with these changes.

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Optometry in the 21st Century: An Expanded Role in the Treatment of Ocular Disease

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INTRODUCTION

Optometry has its roots as a refractive profession whose scope of practice has expanded over the past several decades. Optometry today is a broad multifaceted primary health care profession. During the past twenty years, changes in the scope of licensure, major reforms in health care delivery (e.g., managed care), advances in pharmacology, and the restructuring of optometric education have redefined the very essence of the optometric practitioner in the United States. The scope of optometric practice has expanded to the treatment and management of ocular disease. Comanagement with ophthalmology, including minor surgical and laser techniques, are part of the regimen of the contemporary optometric practitioner. Optometrists practice in many different modes and practice settings, delivering care to many diverse populations, and the range and scope of services vary. A study commissioned by the National Board of Examiners in Optometry with the Center for Vision Care Policy (CVCP) of the State College of Optometry State University of New York (SUNY) was

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designed to obtain information about patients seen in general optometric practices in the United States. This study was designed to facilitate restructure of the licensure examinations and the updating of their content to reflect current optometric practice.

A profile of demographic and clinical characteristics (including diagnostic procedures and treatments performed, medications prescribed, and referrals for additional care) was captured from patient records by a representative sample of optometrists practicing in different clinical settings and modes of practice. The methodology and overall findings are reported elsewhere (Soroka, Krumholz, & Bennett, 2006). This paper addresses similarities and variations in practice patterns and profiles among optometrists in different settings in the United States and their implications for the future of optometric practice both in this country and elsewhere.

METHODOLOGY

Names of optometrists were retrieved from available optometric workforce sources: the American Optometric Association (AOA), the Centers for Medicare & Medicaid Services (CMS), a national listing of practitioners compiled by a marketing firm, the Blue Book of Optometrists, and www.yellowpages.com , state boards of optometry and ARBO (the Association of Regulatory Boards in Optometry). These directories were combined and edited extensively to eliminate duplicative, repetitive or incomplete entries resulting in a database of 57,000 active optometrists. Active practitioners with multiple state licenses are included once in the database for each state in which they practice. Providers were randomly selected using the Statistical Program for Social Sciences (SPSS). A total of 2,719 offices received invitational letters; 480 agreed to participate, for a response rate of 17.7%. Participating doctors received a $ 100 honorarium for completing encounter forms for patients examined during a typical two-day period in 2004. Patient demographics, examination types, diagnoses, and diagnostic and treatment procedures were tabulated from the survey forms returned by the practitioner. Patient data was collected between January 2004 and October 2004.

Provider demographic information and practice setting classification (solo/group practitioners, employed by other optometrists, ophthalmologists,

opticians, commercial establishments, schools, governmental agencies or HMOs) were based on self designation. Optometrists working in an optical franchise, optical chain, or optical establishment were classified as commercial, regardless of whether they considered themselves self-employed or employed by the company.

RESULTS

More than 60% of all providers surveyed were in solo practice, 17% in commercial settings, 11% employed by or affiliated with an ophthalmologist (Ophth-OD) and 9% in a VA (Veterans Affairs) facility, HMO, school, or the Public Health Service or Indian Health Service. Optometrists in commercial settings were found to be younger than their colleagues in other settings, while more than one quarter of practitioners in solo/group settings were over the age of 50 years. Two thirds of participating practitioners were male (318) while one third was female (162).

Two-thirds (7,154) of the 11,012 patients were seen by solo/group practitioners, commercial practitioners saw 15% of patients (1,647), and 9% of patients (1,005) were seen by practitioners working in a VA facility, the Public Health System (PHS), the Indian Health Service (IHS), a college of optometry, an HMO, or a hospital. Eleven percent of the study patients were cared for by optometrists employed by or affiliated with an ophthalmologist (Ophth-OD).

A majority of all optometric patients were over the age of 40 years. More patients were in the 40-49 and 65+ age categories than any other age group. Almost one-fourth of all patients participating in the study were older than sixty years of age, and fewer than 5% were younger than ten years of age. The mean age of all patients was forty-three years, the oldest patient seen was ninety-eight years and the youngest was seven months. Fifty percent of all patients at commercial settings and slightly fewer than half of patients at solo/group optometrists were under forty years of age. Although solo/group and commercial optometrists see more patients under 20 years of age, this still represents only 20% of all their patients. Solo practitioners saw more patients in the 0-9 year old age group than did practitioners in the other practice settings (although this represented only 6% of all their patients). Commercial practices saw more patients in their teens, 20s and 30s, and fewer patients older than 60 years. Patients in their

40s were seen slightly more frequently in solo and group practices than in the other practice settings. Half of all patients receiving care at a VA/HMO or ophthalmology-based setting were over 50 years of age, considerably older than patients at solo or commercial practices.

Approximately 60% of all the patients were females, who were represented in greater numbers in all age categories. Three quarters (77%) of all patients were Caucasian, 8% were African American, approximately 6% were Hispanic, and 3% were Asian. The ethnicity of 4% of patients was not reported and therefore was unknown.

Type of Examination

Most eye examinations conducted by optometrists in the study were patient–initiated and for "primary care" (table 1). Disease-related examinations, contact lens care, low vision services, vision training/therapy, or pre/post op examinations accounted for less than one-third of all encounters. Three-quarters of all exams conducted by solo/group practitioners (72%) and commercial practitioners (77%) were for a comprehensive eye and vision examination. Contact lens examinations were the most frequently reported secondary reason by solo/group and commercial practitioners. Vision training and low vision services were rarely performed either as a primary or secondary reason. Disease related care was the most frequently cited secondary reason among offices where optometrists practiced in a VA/HMO setting and within offices where an optometrist was employed by or affiliated with an ophthalmologist (Ophth-OD offices), with one fourth of all examinations at Ophth-OD locations and more than 20% of all exams at VA/HMO settings being for disease-related reasons. One sixth of all examinations performed at commercial practitioners' offices were for contact lenses, twice the rate found at VA/HMO and Ophth-OD practice settings. Pre and post-operative visits were performed in 8% of exams within Ophth-OD offices, significantly greater than all other settings.

Table 1: Type of eye examination by practice setting

Primary Reason	Solo/Group		Commercial		VA, HMO,PHS.		OPH – Opt		All Patients	
	N	%	N	%	N	%	N	%	N	%
Comprehensive Eye Exam	5,166	72.2%	1,274	77.4%	681	67.8%	701	58.1%	7,822	71.0%
Disease	816	11.4%	72	4.4%	200	19.9%	289	24.0%	1,377	12.5%
Contact Lens	762	10.7%	282	17.1%	76	7.5%	104	8.6%	1,224	11.1%
Low Vision	11	0.1%	2	0.1%	2	0.2%	4	0.3%	19	0.2%
VT/Binocular vision	83	1.2%	1	0.0%	0	0.0%	8	0.7%	92	0.8%
Pre/Post Op	229	3.2%	10	0.6%	33	3.3%	92	7.6%	364	3.3%
Other	87	1.2%	6	0.4%	13	1.3%	8	0.7%	114	1.1%
Total:	**7,154**	**100%**	**1,647**	**100%**	**1,005**	**100%**	**1,206**	**100%**	**11,012**	**100%**
Secondary Reason	Solo/Group		Commercial		VA, HMO, PHS		OPH – Opt		All Patients	
	N	%	N	%	N	%	N	%	N	%
Comprehensive Eye Exam	381	20.2%	109	24.2%	57	24.3%	65	20.8%	612	21.2%
Disease	498	26.4%	95	21.1%	107	45.5%	106	34.0%	806	28.0%
Contact Lens	801	42.5%	216	48.0%	57	24.3%	66	21.1%	1,140	39.6%
Low Vision	6	0.3%	1	0 .2%	1	0.4%	1	0.3%	9	0.3%
VT/Binocular vision	75	4.0%	3	0.7%	2	0.8%	9	2.9%	89	3.1%
Pre/Post Op	67	3.6%	6	1.3%	3	1.3%	33	10.6%	109	3.8%
Other	56	3.0%	20	4.5%	8	3.4%	32	10.3%	116	4.0%
Total:	**1,884**	**100%**	**450**	**100%**	**235**	**100%**	**312**	**100%**	**2,881**	**100%**

Diagnostic Procedures

A total of 21,386 diagnostic procedures were performed, averaging almost two procedures for every patient. A summary of all diagnostic procedures by practice setting is presented in Table 2. Dilated fundus examinations (using eye drops to dilate the pupil for a view of the entire inside of the eye) were performed for 40% of all patients regardless of practice setting. Almost half (48%) of all patients receiving a comprehensive eye examination received a dilated fundus exam. Thirty-three percent of patients whose primary reason for the exam was disease-oriented and 14% of patients who sought contact lens care were dilated at that visit. Dilations performed prior to these clinical encounters or subsequently are unknown since the encounter forms collected information on procedures performed on the study date only. Established patients may have received a dilated exam on prior visits to the same practitioner but this information was not captured. The following diagnostic procedures were rarely performed: anterior segment photos (taking pictures of the front of the eye), contrast sensitivity testing, cultures for ophthalmic pathogens, specialized imaging procedures such as GDX™, HRT™, low vision work-up, ultrasounds (ultrasonography of the eye), and ophthalmic fluorescein angiography. It should be noted that fluorescein angiography is an invasive procedure that is outside the scope of licensure of most optometric practitioners as currently legislated.

Table 2: Diagnostic procedures by practice setting

Diagnostic Procedures	Solo/Group (7,154 Patients)		Commercial (1,647 Patients)		VA, HMO, PHS (1,005 Patients)		OPH –Opt (1,206 Patients)		All PATIENTS (11,012 Patients)	
	N	%	N	%	N	%	N	%	N	%
Anterior Segment Photos	34	0.24%	1	0.03%	8	0.44%	3	0.16%	46	0.22%
BV/sens-Motor Evaluation	641	4.48%	58	1.71%	11	0.61%	82	4.38%	792	3.70%
Contrast Sensitivity	17	0.12%	0	0.00%	28	1.54%	2	0.11%	47	0.22%
Corneal Topography	262	1.83%	2	0.06%	19	1.05%	21	1.12%	304	1.42%
Culture	2	0.01%	0	0.00%	1	0.06%	0	0.00%	3	0.01%
Fluorescein Angiography	0	0.00%	0	0.00%	6	0.33%	7	0.37%	13	0.06%
Fundus Exam-Dilated	2727	19.05%	616	18.19%	422	23.25%	525	28.04%	4290	20.06%
Fundus Exam-Non-Dilated	2245	15.69%	736	21.73%	274	15.10%	160	8.55%	3415	15.97%
Fundus Photo	427	2.98%	44	1.30%	30	1.65%	29	1.55%	530	2.48%
GDX	48	0.34%	0	0.00%	0	0.00%	19	1.01%	67	0.31%
Gonioscopy	73	0.51%	4	0.12%	21	1.16%	38	2.03%	136	0.64%
HRT	37	0.26%	1	0.03%	4	0.22%	18	0.96%	60	0.28%
Low Vision Workup	14	0.10%	1	0.03%	2	0.11%	3	0.16%	20	0.09%
Pachymetry	109	0.76%	5	0.15%	31	1.71%	40	2.14%	185	0.87%
Refraction	5364	37.48%	1384	40.86%	725	39.94%	647	34.56%	8120	37.97%
Refractive Surgery Workup	74	0.52%	6	0.18%	9	0.50%	6	0.32%	95	0.44%
Scleral Depression	36	0.25%	10	0.30%	5	0.28%	5	0.27%	56	0.26%
Ultrasound Scans (A & B)	2	0.01%	0	0.00%	4	0.22%	3	0.16%	9	0.04%
Visual Fields	1215	8.49%	378	11.16%	108	5.95%	148	7.91%	1849	8.65%
unlisted	985	6.88%	141	4.16%	107	5.90%	116	6.20%	1349	6.31%
Total Number of Procedures	**14,312**	**100%**	**3,387**	**100%**	**1,815**	**100%**	**1,872**	**100%**	**21,386**	**100%**

Diagnoses

A refractive diagnosis (indicating a need for a prescription for eyeglasses or contact lenses) was far and away the single most common diagnosis for all practice settings; over 50% of all diagnoses were refractive in nature (Table 3). Two-thirds of all commercial patients had a refractive diagnosis compared to over 50% of solo practitioners, 45% of patients treated in a VA/HMO, and less than 40% of patients within an Ophth-OD setting. The distribution of refractive conditions (type of prescription) was similar across practice settings with astigmatism (a diffusely blurred image) and myopia (nearsightedness) accounting for 29% each, presbyopia (the normal loss of focusing ability due to aging) 24%, and hyperopia (farsightedness) 16%. A frequency tabulation of the diagnosis categories by practice setting is presented in Table 3.

Systemic diagnoses (such as diabetes and high blood pressure) were second for all practice settings, except for Ophth-OD practices, comprising approximately 12% of all diagnoses. Even among patients at commercial settings, 10% reported a systemic diagnosis. In Ophth-OD practices, cataracts (a disorder of the lens in the eye) were just slightly more commonly diagnosed than systemic conditions. Cataracts were the third most common diagnostic category in the three other practice settings, found in one-quarter of VA/HMO and OPH/OD patients, and in 15% of patients in solo/group and commercial offices.

More than 5.6% of Ophth/OD patients were diagnosed with macular degeneration (an age-related condition affecting central sight) – twice the rate in all other settings and five times the rate as reported in commercial sites. Four percent of VA/HMO patients and 3% of Ophth/OD patients had retinopathy from diabetes (either background diabetic retinopathy or proliferative diabetic retinopathy) as compared to only 1% at solo/group and commercial settings. Three percent of all patients were treated for glaucoma (which is pressure in the eye high enough to cause damage if left untreated).

Table 3: Diagnoses categories by practice setting

Diagnoses	Solo/Group (7,154)		Commercial (1,647)		VA/HMO, PHS (1,005)		Oph – Opt (1,206)		All Patients (11,012)	
	N	%	N	%	N	%	N	%	N	%
Refractive	11,790	52.94%	3,198	63.71%	1,613	44.92%	1,329	38.71%	17,930	52.25%
Conjunctiva/ Sclera	848	3.81%	150	2.99%	138	3.84%	108	3.15%	1,244	3.63%
Eyelids	629	2.82%	112	2.23%	150	4.18%	128	3.73%	1,019	2.97%
Vitreous	478	2.15%	71	1.41%	60	1.67%	72	2.10%	681	1.98%
Optic Nerve	113	0.51%	16	0.32%	18	0.50%	16	0.47%	163	0.48%
Systemic	2,825	12.69%	540	10.76%	517	14.40%	439	12.79%	4,321	12.59%
Functional	1,235	5.54%	198	3.94%	119	3.31%	120	3.50%	1,672	4.87%
Cornea	1,317	5.91%	240	4.78%	207	5.76%	261	7.60%	2,025	5.90%
Retina	772	3.47%	122	2.43%	203	5.65%	226	6.58%	1,323	3.86%
Lens	1,577	7.08%	293	5.84%	382	10.64%	478	13.92%	2,730	7.96%
Anterior Chamber	72	0.32%	19	0.38%	21	0.59%	29	0.84%	141	0.41%
Glaucoma	614	2.76%	61	1.22%	163	4.54%	227	6.61%	1,065	3.10%
Total:	**22,270**	**100%**	**5,020**	**100%**	**3,591**	**100%**	**3,433**	**100%**	**34,314**	**100%**

Treatment Procedures

Treatment procedures on the 11,012 patients are presented in Tables 4. One fourth of all patients obtained contact lenses, 30% received a prescription for eyeglasses, and 20% were given a prescription for a topical ocular medication. Vision training (eye exercises) was seldom provided in general practices. Few patients received punctal plugs (a procedure to treat dry eyes), epilation (removal of an eyelash), or had a foreign body removed from the surface of the eye.

Table 4: Treatment procedures by practice setting

Treatment Procedures	Solo/Group (7,154 Patients)		Commercial (1,647 Patients)		VA, HMO, PHS 1,005 Patients)		OPH OPT (1,206 Patients)		All Patients (11,012) Total Percent	
	N	%	N	%	N	%	N	%	N	%
Any surgical Post-Op Procedure	225	3.10	13	0.76	27	3.42	98	7.65	363	3.30
Contact Lens fitting/ dispensing	1870	25.73	565	33.26	137	17.34	192	14.99	2,764	25.04
Epilation	38	0.52	6	0.35	8	1.01	8	0.62	60	0.54
Excise chalazion	5	0.07	1	0.06	0	0.00	0	0.00	6	0.05
Eye glass dispensing	2140	29.45	702	41.32	203	25.70	212	16.55	3,257	29.51
FB Removal	43	0.59	6	0.35	5	0.63	15	1.17	69	0.62
Low vision dispensing	14	0.19	1	0.06	1	0.13	4	0.31	20	0.18
Ocular injections	2	0.03	0	0.00	0	0.00	0	0.00	2	0.02
Punctal plugs	39	0.54	2	0.12	2	0.25	6	0.47	49	0.44
Vision training	132	1.82	2	0.12	1	0.13	8	0.62	143	1.30
Prescribed Medications	1,372	18.88	154	9.06	227	28.73	463	36.15	2,216	20.08
Over The Counter Medications	1,173	16.14	219	12.89	165	20.89	256	19.99	1,813	16.42
Other	214	2.94	28	1.65	14	1.77	19	1.48	275	2.50
Total Number of Procedures	**7,267**	**100%**	**1,699**	**100%**	**790**	**100%**	**1,281**	**100%**	**11,037**	**100%**

Prescribed Medications

Approximately 60 different ocular medications were prescribed. These were divided into seven categories including glaucoma, anti-allergy, and anti-inflammatory (Table 5). Practitioners in Ophth-OD settings prescribed medications to approximately 36% of their patients (463). In contrast, 9% of patients (154) seen by commercial practitioners were prescribed an ocular medication. These differences were statistically significant, and are most probably a result of differences in patient care mix; patients seen within ophthalmology-based practice settings are likely to be referred or self-referred for a medical ocular condition in addition to their general eye care. Patients who receive care at a commercial establishment are generally younger, seeking eyeglasses or contact lenses rather than medical eye care. For all practice settings as a group, Patanol™ (an anti-allergy drop) was the most frequently prescribed medication. The next most frequent drop prescribed contained prednisolone, a topical steroid. Xalatan™, an anti-glaucoma medication, was the next most frequently prescribed drug. Among glaucoma medications, Alphagan-P™, timolol (a beta blocker), and Lumigan™ were prescribed most often after Xalatan™.

Over-the-Counter Prescriptions

Overall, 16% of all patients were given over-the-counter topical ophthalmic medications, lubricants, or nutritional supplements. Topical ocular lubricant drops were the most commonly prescribed OTC medication in all practice settings, with VA and Ophth-OD optometrists more likely to prescribe them (14-18% of their patients), and solo practitioners least likely (11%). Refresh™, a re-wetting drop (artificial tears) was, by far, the most popular lubricant recommended. Nutritional supplements were most frequently prescribed by the solo practitioners, but only accounts for 5% of all patients. Of the 439 nutritional supplements prescribed, multivitamins were given to 156 patients, anti-oxidants to 113, lutein to 77, glucosamine to 26 and ginko biloba to11 patients.

Table 5: Type of prescribed medication by practice setting

Type of Medication	Solo/Group (7154)		Commercial (1647)		VA/HMO, PHS, IHS (1005)		Oph Opt (1206)		All Patients (11012)	
	N	%	N	%	N	%	N	%	N	%
Glaucoma	324	23.62%	19	12.34%	94	41.41%	166	35.85%	603	27.21%
Antibiotic	268	19.53%	33	21.43%	32	14.10%	75	16.20%	408	18.41%
Anti-Inflammatory	209	15.23%	26	16.88%	36	15.86%	124	26.78%	395	17.83%
Anti-Allergy	251	18.30%	34	22.08%	22	9.69%	29	6.27%	336	15.16%
Anti-Viral	9	0.66%	1	0.65%	0	0.00%	4	0.86%	14	0.63%
Combination Antibiotic/ Anti-Inflammatory	88	6.41%	11	7.14%	14	6.17%	30	6.48%	143	6.45%
Combination Antibiotics	15	1.09%	1	0.65%	2	0.88%	3	0.65%	21	0.95%
Other Medications	208	15.16%	29	18.83%	27	11.89%	32	6.91%	296	13.36%
Total	**1,372**	**100%**	**154**	**100%**	**227**	**100%**	**463**	**100%**	**2,216**	**100%**

Referrals

Among the 11,012 patients seen, there were approximately 1,300 referrals, or 12%. Although referrals for refractive surgery represent less than 1% of all patients seen, these referrals accounted for 8% of all referrals, and the majority of these were made by solo/group practitioners. One out of every five patients seen in a VA/HMO setting was referred to an ophthalmologist. Fewer than 2% of all patients were told to consult with a primary care physician.

DISCUSSION

Optometrists in the United States practice in many different settings which may influence the scope of practice and the population they serve. Newly licensed practitioners are likely to practice in numerous locations, and in multiple practice settings. Similarly, patients seeking eye care may be selective in choosing a particular eye doctor based on their perceived needs, their insurance programs, or what they believe to be the most suitable site. The largest single group of patients was comprised of those over 65. These patients would be expected to have the highest incidence of ocular disease based on age alone. Coupled with their newly obtained Medicare coverage, they would therefore be more likely to seek care. The study reflected these differences in practice patterns.

Younger patients were under-represented in this study and may be a potentially untapped source for eye care practitioners. Several programs have begun in the United States to address children's need for eye care, such as the infantsSEE program, and several state laws require children to have an eye examination prior to starting school (Ciner et al., 1999). A national disease prevention initiative, Healthy People 2010, sponsored by the U.S. Department of Health, specifically includes two objectives that would increase vision screenings to children under 5 years of age and reduce visual impairments in children and adolescents aged 17 years and younger (see http://www.healthyvision2010.nei.nih.gov/exams/index.asp). The vision problems of preschool children are detectable with a comprehensive eye examination. However, it is estimated that fewer than 15% of all preschool children undergo an eye examination (Ciner et al., 1998). Amblyopia, strabismus, and significant refractive error are the most prevalent vision disorders of childhood (Gerali, Flom, & Raab, 2004). A survey of children entering the public school system for the first time showed that 14% of the children were prescribed corrective lenses, 3.4% were diagnosed with amblyopia and 2.3% were diagnosed with strabismus (Zaba, Johnson, & Reynolds).

Patients older than 60 years were most likely to be seen in either VA/HMO or Ophth-OD settings and practitioners in a VA/HMO or an ophthalmological setting tended to see significantly more patients who were older than 65. This may have to do with available health benefits offered to veterans, eligible recipients of the Public Health Service, and a

self- selection process among elderly patients.

More often than not, eye care tends to be driven by patients seeking care for what they perceive to be a need for vision correction (eyeglasses or contact lens). Since most patients who do not normally wear glasses don't perceive such a need until the onset of presbyopia in their 40s or 50s, this would explain the peak of patients seen in this age group. A departure from this trend seems to be the large number of patients in their 20s seen by commercial practitioners. Much commercial marketing is aimed at this age group, as these are the patients who, for the first time in their lives, have the disposable income to spend on themselves. Since the incidence of eye disease is lower in this age group as opposed to older patients, this probably represents patient initiated visits for either fashion oriented eyewear or contact lenses; commercial practices are aimed at both.

There were differences in the reported reasons for the patient encounters between the diverse practice settings. Providers had been asked to designate both a primary and secondary reason for each eye examination. Overwhelmingly the most common primary reason reported for the patient seeking eye care for all practice settings was for a comprehensive eye examination. This is consistent with optometry's status as a primary care profession, and with the fact that most vision care plans provide for such an examination at regular intervals. Historically, this has served as the point of entry into the eye care delivery system for a majority of patients. The next most common primary reason given for patient encounters was disease related, except for commercial settings where the desire for contact lenses prompted a patient visit. For commercial practices, the fact that contact lens examinations represented the second most frequent reason may very well be attributed to their specific marketing strategy and location within shopping centers and malls. Contact lens related visits were the most common secondary reason for patient encounters in both solo and commercial practices, while disease-related was the most common secondary reason in both VA/HMO and ophthalmological practice settings. Again, this fits in with the primary care nature of optometry. Patients are typically seen first for a "routine" eye exam, then brought back later to address issues identified during the first examination, be they disease related workups or treatments, or fittings with contact lenses.

Less than 1% of all eye examinations were for low vision or vision therapy irrespective of practice setting; however, specialty practices were excluded from this study. Although pre - and post-operative examinations are absent within commercial settings, a small minority of patients received such care at solo/group and VA/HMO practices.

Not surprisingly, refraction (determining an eyeglass prescription) was the most common diagnostic procedure performed in all practice settings. Nonetheless, the refraction rate may be under-reported, as some practitioners considered it as part of the comprehensive eye exam and did not report it separately. Fundus examination (looking inside the eye) was the next most common diagnostic procedure. Practitioners in ophthalmological settings performed more dilated (using drops to dilate the pupil) fundus exams (28%) and fewer non-dilated (without using drops) fundus exams than their counterparts in the other practice settings. More non-dilated exams were performed in commercial settings; this may have something to do with patient self-selection, as many patients presenting to commercial practitioners go there precisely because they want prompt service and may defer having drops put in their eyes. Also, since commercial practitioners tend to see a younger, healthier population, one might expect a lower rate of dilated fundus examinations. Interestingly, although binocular vision evaluations (to test eye-teaming skills) were performed quite infrequently in all settings, when done, they were performed mostly in solo/group or ophthalmological settings, and then only on fewer than 5% of all patients. Also of note is that visual fields (an examination of peripheral vision) were performed more frequently in commercial settings (Table 2), where perhaps it is often used as a screening tool. Fundus photography (taking pictures of the inside of the eye) and corneal topography (mapping the surface of the cornea for irregularities) were performed more frequently in settings of solo practitioners. Pachymetry (measuring corneal thickness) and gonioscopy (looking at the anterior chamber angle) were seldom performed, but when done, they were more prevalent in VA/HMO and Ophth/OD practices and virtually absent in commercial settings.

Several techniques and diagnostic tests such as GDX™, HRT™, and ultrasonography require specialized equipment not normally found in private practices and are usually limited to institutional settings. As such, they would not be expected to be reported in large numbers in this

study.

There were a surprising number of diagnoses reported that were systemic in nature. Upon reflection, this seems to be consistent with the primary care nature of the optometric profession. While many patients seek care due to some type of visual complaint, commonly due to uncorrected refractive error, there are significant numbers of patients presenting with systemic diseases for whom the optometrist provides evaluation and treatment for eye disease that may be present from their systemic disease.

Cornea, retina, lens, and glaucoma problems were more prevalent at VA/HMO and Ophth-OD office settings. More than 6% of patients at Ophth-OD offices were treated for glaucoma; five times the rate reported at commercial settings and two and half times that found at solo/group practices. This pattern appears again to be consistent with the nature of the practice setting. Patients seem to self-select and present themselves to certain settings mainly due to a perceived need for eyeglasses, and refractive diagnoses are made. While patients at other practice settings also have refractive diagnoses made, they have a higher incidence of ocular disease, and this is reflected in the types of diagnoses. Interestingly, although more than 6.5% of patients were reported to have dry eye syndrome, treatment for this condition with punctual plugs was rarely employed.

Prescribing medications and prescribing or dispensing eyewear (glasses and contact lenses) were the most common type of treatment procedures, accounting for approximately three quarters of all procedures for all practice settings as a group. Eyeglass prescriptions may be under-reported since the collection form listing treatment procedures was phrased as "eyeglass dispensing". As would be expected, prescribing eyeglasses and contact lenses was the most common treatment choice in solo (55%) and commercial (74%) practices. Slightly more than half of the patients in solo/group practices received a prescription for eyeglasses or contact lenses. Corrective eyeglasses are prescribed and dispensed more frequently among patients of commercial practitioners than patients of VA/HMO and Ophth-OD practitioners. More than 40% of patients at commercial settings received an eyeglass prescription as compared to 17% receiving care at an Ophth-OD office. This trend was also found regarding the fitting and dispensing of contact lenses. One-third of all commercial patients were fitted for contact lenses, considerable more than patients

in all other settings. Part of this differential may be attributed to self selection of these patients to this setting, and restricted or limited contact lens benefits available to patients in VA/HMO settings. Prescribing and dispensing corrective eyewear (eyeglasses and contact lenses) appears to be emphasized in commercial practice settings, accounting for three quarters of all patients.

Patients seen by an Ophth-OD practitioner or a VA/HMO practitioner received a prescribed topical ocular medication significantly more frequently than patients seen by practitioners in the other practice settings. Patients receiving care at VA/HMO and ophthalmological sites may be selectively drawn precisely because of their medical/ocular conditions. Even so, solo practitioners prescribed some sort of topical (prescribed and over-the-counter) ocular medication 35% of the time. More legend drugs than OTC drugs were prescribed in all practice settings except for commercial, where the reverse was true, as might be expected with the population seen in a commercial setting. Overall, commercial practitioners prescribe fewer drugs than their counterparts in all the other settings, again, possibly for the same reason.

Glaucoma medications were the most prescribed class of medication in all settings except for commercial practice, representing more than 27% of all prescribed medications. Proportionately, more glaucoma patients were treated within VA/HMO and Ophth-OD practices. This would support the patient self-selection process since glaucoma would be expected to be more prevalent in these offices. Topical antibiotics and anti-allergy drops were most frequently prescribed in commercial and solo settings. Most topical anti-inflammatory medication was prescribed in ophthalmological settings, probably due to the surgical volume, as these drugs are a mainstay of virtually all post-operative ocular care. Anti-viral and combination antibiotic medications were rarely prescribed.

Twelve percent of all patients in the study were referred out to another provider for one reason or another. Solo/group and commercial optometrists had the lowest referral rate among all practice settings. Unquestionably, most referrals from optometric offices (58%) were to an ophthalmologist; this represents an overall referral rate for ophthalmological care of 6%. There were a very small number of referrals to other optometrists (fewer than 1%). Practitioners in ophthalmological settings were more likely to refer to other optometrists, perhaps because

of the nature of that setting. Institutional based providers (VA, PHS and HMO) were more likely to refer to primary care physicians and for imaging studies than their counterparts in other practice settings. This may have to do with the ready availability of these services within a hospital or multidisciplinary setting. Most of the referrals for refractive surgery came from solo or commercial practitioners. This seems consistent with the nature of the different types of practice settings reported here. Yet, refractive referrals only accounted for fewer than 1% of all patients seen. One would expect few refractive surgery patients in a VA setting, and ophthalmologists would be likely to do their own surgery.

There are some limitations to this study. First, while our findings may be taken as a "typical" profile for each practice setting, one should not draw the conclusion that these practice settings are limited to these profiles. While the emphasis may be different depending on the setting, the optometrist must be able to recognize and manage a broad range of conditions, even if the management consists solely of identification of the condition and referral to another practitioner, even another optometrist. Secondly, many optometrists spend their professional time split between multiple offices and practice settings. As such, the mixture of patient types, diagnoses found, prescribing and treatment patterns will be affected. Thirdly, a selection bias may be present since the study included only optometrists who agreed to participate. Although the primary reason for declining was due to time constraints and the need to complete encounter forms for all study patients during a two day period, a selection bias may have occurred nonetheless. Lastly, as the scope of optometry continues to expand and new graduates enter the field, the demographic characteristics of providers, the professional services provided, and the type of care rendered in all settings will change. This will undoubtedly influence the profile of patients, the reasons for their encounters, the diagnoses found and the treatments offered. Therefore, this study is limited by the time at which it was conducted. Periodic surveys must be conducted in order to gauge and assess fluctuations and changes in the practice of primary care optometry.

CONCLUSION

This study presents a snapshot of the optometric profession in the United States in the year 2004 relating to two days in the life of 480 optometrists. Optometrists of yesterday were predominately solo practitioners who did not engage in other modes of practice. Today, even though solo practice remains the principal form of practice, its predominance has been significantly reduced and we see a definite shift to other practice settings and modes. As a profession, optometry has also matured due to changes in legislative authority. Optometrists are no longer solely providing routine eye examinations. With the passage of topical therapeutics legislation in all 50 states, optometrists are indeed utilizing their prescribing privileges in managing and treating ocular disease on a primary care level. Optometrists in all settings have integrated prescribed medications as a treatment modality in their management of general eye care. Ocular disease treatment has become a fundamental component of the optometrist's regimen and patients seeking medical treatment for ocular disease are coming to optometric practices. Projected to the population at large, millions of patients with systemic conditions and associated ocular sequela are managed by optometrists.

Advances in the treatment of ocular disease are continuous as new technology and new medications are constantly introduced. Notable transformations, new testing and treatment techniques are revolutionizing the scope and practice of optometry. As these trends merge, institutions that educate and produce these practitioners, as well as the testing organizations that certify competency, must become more responsive to the rapid changes reflected in our heath care system.

The demographic characteristics of the patient population seen in general practices can be viewed as a road map for future outreach efforts by the profession. Our study found that children under ten years of age comprised the smallest group of optometric patients. At a time when infants' vision care is being promoted, the potential for reaching out to this population seems essential. The under-representation of Hispanic - and African-Americans in the optometric practices sampled in this study also presents the profession with a challenge.

Because the study sample was restricted to providers who classified themselves as general optometric practitioners, and optometrists who

specialized (e.g., in vision training or low vision) were excluded, it was not surprising that diagnostic or treatment services reported in this study such as low vision evaluations and vision training were rarely performed. While referrals to other optometrists who do specialize in these areas would be expected, these intra-professional referrals were extremely few in number. As a primary care profession, one would expect more evaluations in the area of low vision and vision training even if the practitioner does not provide the full service. An assessment of the visual needs of patients for specialized services is warranted and the profession should inquire why general practitioners are not providing this care.

Differences found among optometric settings may be attributed to several reasons. The extent that patient self-selectivity accounted for these differences was not studied. Nonetheless, the profession should give attention to this and determine whether more referrals and intensive testing is warranted for specific patients.

Although this study was designed to assist the NBEO in restructuring the examination for entry level providers, it should be emphasized that the boards must address the rapid changes in the profession. This study merely describes the current trends. From the time the encounter form was designed, new drugs (e.g., Restastis™, Elestat™) were introduced to the market and new diagnostic tests (GDX™, HRT™, pachymetry) were beginning find their way into optometric practices. The profession is most definitely a dynamic one that is maturing as new therapies become established. Licensing examinations must necessarily take this into consideration and anticipate that these trends will continue to occur. At the same time countries such as Israel, which is attracting health professionals from the United States, should take advantage of the skills and training of these professionals and begin discussions on how to best integrate them into society and update their own licensing laws to reflect the current scope of optometric practice.

Optometry as a profession is a study of the transformation of a profession. Optometry has evolved from a drugless profession to one that has successfully incorporated prescribed medications into its treatment regimen. This transformation has been accomplished with an expanded educational curriculum, coupled with the enactment of legislation over a twenty year period. These changes revolutionized patient eye care and the clinical practice of optometry. Optometry can be viewed as a case study

for other health professions as they consider broadening their scope of licensure and responsibilities.

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Telescoping the Future in Health Practice – Physician Attitudes in the 21st Century

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Skepticism exists in relation to our ability to forecast or foresee, but maybe the hand of experience can guide us as we look to the future. This article presents highlights from the challenging world of health technology development, focusing mainly on technologies in relation to the future development of medical care, patient empowerment and responsibility, teamwork, clinical education and the overall social framework and values.

The potential for the future is an enigma. Are we on the edge of a new world? Will it be a smooth path into the unknown? Our deliberations on the future require flexibility and freedom to change, blending biologic understanding, scientific knowledge, clinical reasoning, practical skills and interdisciplinary approaches. This is an age of socialization and implicit learning in the development of professional attitudes and behaviors such as compassion and integrity (Cooke, Irby, Sullivan, & Ludmerer, 2006).

The seeds for technological development are sewn throughout history. New technologies rise and fall, hopefully to lead the way to better health outcomes. Roy Porter, a popular and well-regarded medical historian, records the force of thoughts and proceedings, showing how society is becoming less healthy and more hazardous. He draws from prehistoric Greece, where the major endeavor centered on substituting the unnatural with naturalistic clarification of health complaints. Porter's writings accentuate the fact that the tasks facing medicine in the 21st century will be to redefine its limits, even as it extends its capacities. Porter refers to the leading impact of Western medical traditions on worldwide medicine (Porter, 1998).

Table 1 below highlights the major topics presented in this article.

Table 1: Major Issues in Physician Attitudes in the Future

* Technology (genetics, biological innovations, robots…)
* Teamwork – Non-Physician Clinicians – management and organization
* Patient empowerment
* Clinical Education
* Framework of social values, trust and empathy ensuring quality care

Technology

Technological developments seek new roads in screening, prevention, imaging, new drugs, therapy and rehabilitation. Current trends focus on combining techniques (such as incorporating MRI during operations) and advocating less invasive examinations and therapy (laparoscopic or "virtual" procedures).

As the 21st century opens two new technologies raise the promise of benefits for humankind — biotechnology and nanotechnology.

However, experience has shown, for instance as in the cases of stents, hormone therapy and Vioxx, that long term monitoring is essential to ensure safety and improvement. Society must remain alert to the real and potential risks posed by new technologies.

This article presents some of the major trends in future advances. Recent news items illustrate medical advances in a number of key fields:

A. Patient-focused attention

1. personalized medicine
2. genetic profiles
3. patient empowerment and patient responsibility
4. lifestyle choices

B. Physician-oriented trends

1. computer-assisted technologies – telemedicine, information technology
2. nanotechnology

3. economic forces
4. teamwork

A. PATIENT-FOCUSED ATTENTION

Gravitating towards a future of personalized medicine, the NY Times article, "Saving Lives with Tailor-Made Medication" published on August 29, 2006 presents pharmacogenetics, a clinical discipline in which doctors use high-tech genetic testing to custom-make drugs to patients' individual needs (Dreifus, 2006). Seeking out our roots, we dig into the most basic components that combine to create our being. Analyzing the structures that can create risks for the future, we struggle to gather data to understand the key to genomics. Developments are heading for a more personalized form of treatment, where ideally, patients will have custom-made therapeutic solutions suited to their individual needs.

The genetic profile of disease and well-being is a beacon illuminating future paths to identify and treat morbidity. Large studies are being conducted throughout the world to collect and process extensive genetic data on large populations. The UK Biobank, the Icelandic genetic bank, the Framingham study and the recently announced Kaiser Permanente study (Reinberg, 2007), are examples of large-scale research striving to understand the complex interplay of genetics, environmental factors and lifestyle that cause many common diseases and furnish the knowledge "to make a real difference to the health of future generations". On a personal level, by identifying genome-based information about his/her own health risks, an individual can develop preventive strategies to safeguard his/her health thereby improving health and reducing costs. Furthermore, some drugs have been recently developed on the basis of a detailed molecular understanding of the disease's genetic cause, for instance, imatinib mesylate (Gleevec), an inhibitor of the BCR-ABL tyrosine kinase, used for the treatment of chronic myelogenous leukaemia (CML).

The largest study into the genetic and environmental causes of disease – Biobank – is to be carried out across the UK. Dr. Mark Walport, director of the Wellcome Trust research charity is confident that this study has the opportunity to make a real difference to the health of future generations (Walport, 2006).

In an article in September 2006 in the NY Times, genes were highlighted

as a link between life span and cancers (Wade, 2006).

Patient Empowerment and Responsibility

Information technology has endowed the patient and others with access to endless information. However, individuals may drown in this ocean of limitless data. Analyzing and deciphering relevant applicable knowledge becomes a challenge to both patients and doctors. We have to guide our patients on how to evaluate and assess the huge amount of information from the media which is expanding at an astronomical pace. During the 100 years from 1800 to 1900 the world's body of knowledge doubled (Holbrook, 2003). In the recent decade Anthony J. D'Angelo estimated that "knowledge doubles every fourteen months."(http://www.worldofquotes.com/author/Anthony-J.-D'angelo/1/index.html). It is predicted that by the year 2020 the collective body of knowledge will double every 35-72 days (Holbrook, 2003; Daily News, 2007).

The once paternal doctor now involves today's more knowledgeable patient in the decision-making process. Active patient participation can result in improved patient outcomes. Strengthening patient/doctor cooperation is the way of the future, working together to attain optimal health.

However, knowledge is not only an asset, to some it may become a liability. Access to extensive online patient details should be clearly defined as it also carries responsibility. It is imperative that confidentiality be ensured without unwarranted "leakage" of personal details. Commercial bodies may utilize personal details to raise levies on insurance coverage and other purchases.

Personal Responsibility

Responsibility is also required on the part of the patient to maintain his/her own well-being. Two articles published in 2006 in the British Medical Journal ("Germany Will Penalize Cancer Patients Who Have Not Undergone Regular Screening"[Tuffs, 2006]) and the New England Journal of Medicine ("Personal Responsibility and Physician Responsibility — West Virginia's Medicaid Plan" [Bishop & Brodkey, 2006]) emphasize this responsibility, and the consequences of not acting responsibly - bearing

the cost of their actions (or lack of action). Tuffs' article in BJM presents the proposed legislation in Germany that forces people to take part in screening procedures under threat of financial penalties for non-compliance. Higher co-payments are proposed for citizens who do not undergo screening and then develop the associated cancer: For instance, in the case of:

1. women who do not have annual cervical smears from the age of 20
2. men who do not have annual digital rectal examination of the prostate from the age of 45"(Tuffs, 2006)

The NEJM article by Bishop and Brodkey describes personal and physician responsibility in West Virginia. This state is planning to ask residents who are eligible for Medicaid because of low income to sign documents outlining "member responsibilities and rights", thereby agreeing to take their medications, keep their appointments, and avoid unnecessary emergency room visits (Bishop& Brodkey, 2006).

Genetic endowment is not the only determinant of well-being; behaviors and lifestyle choice are patient responsibilities. These parameters have a great influence on how we age, our well-being and quality of life. Maintaining well-being optimally focuses on lifestyles, encouraging physical activities, reducing weight, ceasing smoking and promoting optimal nutrition.

B. PHYSICIAN-ORIENTED TRENDS

Telemedicine, enabling online contact while not requiring actual presence on-the-spot, is gaining momentum. Technological developments and innovations in communication facilitate telemedicine. The NY Times article by Barnaby J. Feder, "Remote Control for Health Care", shows a patient with a communications system at her bedside at home. This apparatus enables access to both the physician and information systems with remote control to identify health problems, maintain surveillance and call for consultation. This may not be a cure but it helps keep the patient alive (Feder, 2006).

In September 2006, The Daily Mail pictured a gastric band that could be adjusted by computer. This new stomach band that can be tightened electronically could revolutionize obesity surgery (Hagan, 2006).

Our ever-present friend, the computer, has also extended its possibilities into fields of rehabilitation, mechanically replacing injured human

functions when possible. In August 2006 Newswise presented, "Computer Assisted Neuro-Rehabilitation Devices Way of the Future", describing new computer-assisted devices that "offer patients an alternative to traditional physical rehabilitation and medical treatment for stroke, brain injuries and spinal cord injuries" (Newswise, 2006).

Nanotechnology has been adopted for medical use. For example, a tiny scanning robot that can swim through the body beaming images back to a TV monitor is only one example of evolving trends.

Looking forward in time, preventive medicine may ideally take the forefront. Hence new medications also exhibiting preventive characteristics, safeguarding and preserving well-being, will have a natural advantage.

New procedures are being developed, some anticipating future environmental conditions and needs. In September 2006 surgeons participated in the first operation of its kind on a human being in zero-gravity conditions, removing a cyst from the arm of a man as the aircraft which carried them soared and dived to create weightlessness. This was vividly described in the Washington Post: "Surgeons Do 1st Near-Weightless Surgery", by Jamey Keaten (Keaten, 2006).

Engineering spare body parts has become a pragmatic necessity, especially with extended life expectancy creating additional functional "wear and tear". A bionic eye and an artificial pancreas for diabetics are only a few examples of new technological lines of development, as well as continual efforts to create new organs through stem cell developments.

Economic considerations provide the fuel for technological development. Investments in innovative ideas are essential for future progress. Physician reimbursement can stimulate new initiatives.

Teamwork

Comprehensive teamwork is required to orchestrate these multiple missions to safeguard and promote well-being. The WHO's 2002 policy statement (Ferrinho & Dal Poz, 2003) raised the need for: new approaches to organizing teams of staff with some nursing roles to be taken over by health care assistants. For example, in the chronic disease model, collaboration is required with non-physician clinicians including nurses, case managers, social workers and specialists. In November 2005 at the Chief Nursing Officer's conference in London, the Health Secretary, Pat

Hewlett announced that patients will be able to receive "quicker and more efficient access to medicines thanks to extensions to nurse and pharmacist prescribing" (Department of Health, UK, 2005).

"When the doctor is out, nurses next line of defense for heart patients", states the article in the Annals of Internal Medicine (Sisk et al., 2006). Researchers at Mount Sinai School of Medicine reported that: "heart failure patients who received routine follow-up by a nurse in addition to visits to a physician had fewer hospitalizations and functioned better than patients who received only usual care".

Nursing staff will be more and more actively involved in chronic care, which I believe will be the burden of medicine in the 21st century.

This teamwork will enable physicians to spend more time providing acute care and handling complex multisystem cases.

Teamwork is the pathway of the future emphasizing:

* Public health/disease prevention
* Management of long term conditions
* Support for self-care

But initially, comprehensive health care is the mandate of the primary care physician. Terming primary care the "backbone of the nation's health care system," Bodenheimer's article in the NEJM on its survival raises the question of the precarious status of primary care (Bodenheimer, 2006).

On the one hand, the great majority of patients turn to their primary care physician for initial care. However, both patients and doctors express frustration for many reasons, such as long waiting times and inadequate quality of care. Some departments such as emergency departments are overflowing with patients who do not have access to primary care while patients with chronic illness (such as diabetes) do not receive adequate clinical care (Bodenheimer, 2006).

In a recent personal account in NEJM by Dr Beverly Woo (2006), a Boston primary care physician, she raises the ultimate question:

> With all the changes in our health care system, one thing remains constant: the needs of patients. Patients want a continuing relationship with a doctor whom they can trust, and they increasingly need the doctor to act as an advocate to help them get the best care within a fragmented health care system.

A strong primary care infrastructure is associated with better health outcomes, lower costs and a more equitable health care system, since primary care is key to providing services to vulnerable populations.

On the horizon are continuous cultural shifts in medical education. Alon Seifan addressed this subject in detail in this publication.

Social Values

The basic human right to live a healthy life faces conflicts when the cost of preserving and maintaining good health is beyond individual affordability.

Social, legal and ethical values are raised in the decision-making process and all have an integral role in determining the future for doctoring.

Physician-Citizens — Public Roles and Professional Obligations

In recent years, health care leaders have urged physicians to become more involved in the public arena in order to cultivate public trust and address community-based causes of ill health. Gruen, Pearson, and Brennan presented these responsibilities in the societal context as shown by the model that appeared in JAMA in 2004 (Gruen, Pearson & Brennan, 2004), stretching between the realms of individual patient care and access to care to direct, broad and global socioeconomic influences.

There is a real conflict of interest for the physician who is asked to be both an advocate of the individual patient and a representative of the larger health system.

Due to inefficient use of resources and poor quality care, health systems throughout the world are undergoing organizational reform. This is characterized by a shift towards privatization, increasing "clinical governance" or external supervision of physician decision-making.

Sometimes doctoring is controlled by centralized bureaucracy emphasizing the cost consequences of clinical decision-making.

Current trends are promoting quality care.

Meeting the Challenge – The Human Touch

Doctors will continue to strive to promote and protect the health of people during their entire life, to reduce the incidence of disease and accidents and to alleviate the resulting pain and suffering.

Health is a basic human right and equity in access to health services and collective responsibility with regard to health activities are ambitious goals.

The modern physician combines more concrete diagnostic information with epidemiological evidence and personal clinical experience in making medical decisions, integrating personal knowledge of the patient, economics, law, ethics, social values and policy. This is both a science and an art, requiring knowledge, an open rational mind and a caring heart. Furthermore, the physician will be responsible for recognizing the patient's individuality.

But, to sum up, we have to remember George Bernard Shaw's words on the doctor's credentials: "remember that I, too, am mortal" (Sobol, 2004).

My vision is of a profession that needs to blend wisdom, creativity, experience, knowledge and the sensitivity of the human touch in the paths of future doctoring.

The essential nature of human needs will remain unchanged.

Compassionate, expert, trusted professionals should be in even greater demand in the rapidly evolving and increasingly complex medical world.

I do believe that in the 21st century doctoring will be on the rise.

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