

Comparing Generalist and Specialty Care

Discrepancies, Deficiencies, and Excesses

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Policymakers, managed care organizations, medical educators, and the general public are showing an increasing interest in the amount and quality of care provided by generalists and subspecialists. This article reviews studies comparing the knowledge base of and quality of care provided by these 2 groups of physicians. English-language articles were identified through MEDLINE (1966-present) using the following keywords: generalist, generalism, (sub)specialist, (sub)specialty, (sub)specialization, consultation, referral, and quality of care, and through the bibliographies of these citations. All studies were evaluated. With respect to quality of care, only American studies were chosen. Data quality was assessed by me. Evidence is strongest that the knowledge base and quality of care provided by specialists exceeds those of generalists for certain conditions such as myocardial infarction, depression, and acquired immunodeficiency syndrome. Differences in many other areas are multifactorial, and often a function of study design or patient selection. The differences, however, are not as striking or important to the health of the public at large as those deficiencies in disease management, preventive care, and health maintenance that are common to all physicians. Furthermore, overuse of diagnostic and therapeutic modalities by certain specialists leads to increased costs with either no benefit or added risks to patients. The quality and coordination of care provided by generalists and specialists may be improved through changes in education and training, via quality improvement methods of providing patient care, and by increasing visit length and optimizing use of referrals and strategies for generalist-specialist comanagement. Further study of these areas is warranted and should concentrate on outcomes.

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This article evaluates the amount and quality of care provided by generalists and specialists, a subject of increasing interest to medical educators, managed care organizations, and the general public. Weaknesses in the knowledge base of practicing physicians are reviewed, and

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investigations attempting to compare generalist and specialty care for common conditions are described. While some of the differences in quality of care may be due

to generalists' knowledge deficits, many are secondary to system factors and most are remediable. Furthermore, disparities between generalist and specialty care likely have less impact on the population's health than the deficiencies all physicians share. After discussing the nature of these deficiencies, I explain how they might be corrected and how generalists and specialists can work together, building on their respective strengths, to improve the quality of health care in this country.

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Web site: www.ama-assn.org/internal.*

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DATA

English-language articles were identified through MEDLINE (1966-present) using the following keywords: generalist, generalism, (sub)specialist, (sub)specialty, (sub)specialization, consultation, referral, and quality of care, and through the bibliographies of these citations.

For the purposes of this review, generalists include general internists, family practitioners, general pediatricians, and general practitioners, although the focus is on problems pertaining to the care of adults. Specialist refers to those physicians practicing subspecialties of internal medicine (eg, cardiology or rheumatology) or, when noted, to other specialized fields (eg, psychiatry). Only those studies involving American physicians were evaluated, since generalists in other countries receive less postgraduate training.

COMPARING GENERALISTS AND SPECIALISTS

For most patients, generalists are the first point of contact with the health care system. They confront a greater variety of illnesses compared with specialists,¹ are more accessible,² see more patients per unit of time,³ charge less for primary care services,⁴ and are more likely to provide continuity and comprehensiveness of care.² Ideally, generalists treat a wide variety of medical problems; match patients' needs and preferences with the appropriate and judicious use of medical services^{5,6}; protect patients from the possible adverse effects of unnecessary care^{2,5,6}; decrease health care costs^{2,5,6}; and guard against the fragmentation of medical services that results from overspecialization.⁷ However, this ideal often does not match reality.

Generalists perform slightly better on standardized tests of general medical knowledge than specialists.^{8,9} While there is much room for improvement, they do a little better with respect to test ordering^{10,11}; some areas of health promotion and disease prevention^{12,13}; risk behavior counseling^{12,14}; and the recognition and management of, and willingness to explore and treat, psychosocial problems.¹⁵

Specialists, due to their advanced education and training, possess in-depth, expert understanding of a limited number of diseases within their respective domains and are qualified to perform many diagnostic and therapeutic procedures not in the repertoire of generalists. Evidence for superior knowledge and practices of specialists in selective diseases is strongest for the care of myocardial infarction and congestive heart failure by cardiologists, depression by psychiatrists, acquired immunodeficiency syndrome (AIDS) and its complications by infectious disease experts, and some rheumatic and musculoskeletal conditions by rheumatologists. Interestingly, myocardial infarction and depression are the diseases for which patients express the least confidence in their primary care providers.¹⁶

In other areas, however, generalists outperform specialists. For instance, under open-access esophagogastroduodenoscopy, general internists and family physicians did a better job of scheduling patients for appropriate indications than did internal medicine subspecialists.¹⁷ Also, in a prospective observational study,⁴ patients with back pain treated by primary care physicians, orthopedic surgeons, and chiropractors all achieved similar functional recovery, return to work, and complete recovery at 6 months; the mean number of radiographs taken and mean total outpatient charges were lowest for primary care physicians.

Specialists provide at least 20% of the primary care delivered in the United States.¹⁸ However, little is known about the quality of generalist care provided by specialists working outside of their particular areas of expertise. Furthermore, specialty care may lead to increased costs of care due to overuse of expensive diagnostic and therapeutic interventions in the absence of any additional health benefits.

CARDIAC DISEASES

For a prototypical patient with an acute myocardial infarction, Ayanian et al¹⁹ showed that cardiologists were more likely than generalists to use thrombolytic agents to treat acute myocardial infarction and

to prescribe β -blockers and aspirin in the postmyocardial infarction setting, all recommended interventions. The cardiologists were less likely to use prophylactic lidocaine, which has been shown to offer no therapeutic benefit,²⁰ and less likely to use calcium channel blockers, which are potentially harmful.²¹ In a retrospective chart review of Medicare patients treated for acute myocardial infarction in 1990, Ayanian et al²² confirmed that cardiologists were more likely than generalists to prescribe thrombolytic therapy and aspirin but not β -blockers. In a national sample of physicians, Chin et al²³ found that cardiologists were more likely than generalists to appropriately use an angiotensin-converting enzyme inhibitor for a hypothetical patient with congestive heart failure. However, on chart review of patients with congestive heart failure at one academic medical center, only three quarters of eligible patients were taking an angiotensin-converting enzyme inhibitor, and only 60% of these were at doses known to be efficacious.²⁴ Then, in a recent survey, Jancin²⁵ found that cardiologists reported greater adherence than generalists to the 1994 Agency for Health Care Policy and Research guidelines for the treatment of congestive heart failure.

Of patients with positive or very positive exercise stress test results who met additional clinical criteria for necessary coronary angiography, Borowsky et al²⁶ discovered that after adjustment for sociodemographics and clinical presentation, patients with a cardiologist as a regular source of care were more likely than all other patients to have undergone the procedure within 3 and 6 months. On the other hand, Stein et al²⁷ found that, according to published reports and established practice guidelines, noncardiologists ordered more radionuclide stress tests that were not indicated than did cardiologists. Both groups of physicians, however, overused this test.

In 1 community hospital, Schreiber et al²⁸ noted that internists were less likely than cardiologists to use aspirin, heparin, and β -blockers in their initial treatment of patients with chest pain. Internists used ex-

ercise tests more often for risk stratification and diagnosis; cardiologists performed coronary revascularization procedures 2 to 4 times as often. While patients of cardiologists had a substantially higher prevalence of established coronary artery disease, patients of internists presented more often with atypical chest pain. Even so, there were no significant differences in the incidence of myocardial infarction or in mortality between the 2 groups. It is hard to determine whether cardiologists were overly aggressive in their use of procedures or internists not aggressive enough, although the data on underuse of medications, particularly aspirin, shed a negative light on internists and cardiologists alike. Similarly, Brand et al,²⁹ analyzing insurance claims for filled prescriptions for the long-term use of β -blockers after acute myocardial infarction, noted that less than 50% of cardiologists' patients were taking β -blockers and that a third of these had contraindications for β -blocker use. Similarly, in the National Registry of Myocardial Infarction,³⁰ only 36% to 42% of 240 989 enrolled patients received β -blockers, while 30% to 40% were given calcium channel blockers.

The more favorable selection of interventions by cardiologists compared with generalists in treating acute myocardial infarction and congestive heart failure may be secondary to differences in frequency of treating myocardial infarctions; inadequate dissemination of guidelines; differences in continuing medical education programs and recertification procedures; generalists' confusion regarding relative vs absolute contraindications; inadequate feedback to generalists regarding clinical practices; and lack of generalists' participation in clinical trials, dissociating them from involvement in the generation of new therapies.³¹ Generalists may see more patients who refuse to take certain medications because of potential adverse effects, or more patients who actually experience adverse effects and reactions.³² This is not likely caused by patients' multiple comorbidities, since patients of cardiologists tend to be sicker and have more underlying medical problems.^{33,34} It may result from improper dosing by

generalists, although this has not been evaluated.

Since generalists provide more longitudinal care (including the majority of postmyocardial infarction care), they may be more averse to using agents that can cause strokes (thrombolytics) or impotence (β -blockers) because they continue to see the consequences of these adverse effects over the long-term in their patients. Support for this idea comes from an analysis of prescribing patterns, which showed that specialists give greater weighting to the beneficial aspects of antihypertensives, while generalists show greater concern over adverse effects.³⁵ Furthermore, the benefits of certain commonly used treatments in some circumstances remain controversial, such as the use of β -blockers after myocardial infarction in women, patients younger than 65 years, and those without mechanical or electrical complications.³⁶ However, others³⁷ have shown that many generalists have inflated perceptions of cardiovascular risk without treatment and of the benefits of risk-modifying medical treatment. Still, generalists may be slower to adopt new therapies or discard outdated ones secondary to excessive (or, at times, appropriate) caution.

Despite these differences in myocardial infarction and postmyocardial infarction care, McCrory et al³⁸ found no significant differences in the knowledge and attitudes of generalists and cardiologists regarding anticoagulation for nonvalvular atrial fibrillation in the elderly. In response to vignettes, however, both groups of physicians underused anticoagulation in this group at high risk of thromboembolic stroke. In the Medical Outcomes Study,³⁹ no specialty differences in 2- and 4-year outcomes of patients with hypertension were discernible. Smaller studies^{39,40} have shown that cardiologists and generalists provided similar quality of care for patients with transient ischemic attacks and stroke.

MENTAL HEALTH DISORDERS

Generalists are not as skillful as psychiatrists at recognizing and treating depression, and they frequently

miss clues to suicidal intent.^{12,41-44} Inpatients with depression received better management of the psychological aspects of their illnesses (although worse management of the medical aspects) when cared for in psychiatric wards.⁴⁵ In the Medical Outcomes Study,⁴² psychiatrists' patients had better functional outcomes, largely as a result of more frequent counseling, more appropriate dosing of antidepressants, and less use of potentially harmful minor tranquilizers. Callahan et al⁴⁶ found that even when primary care providers were given diagnostic scales and treatment algorithms, fewer than half of the patients they identified with depression actually received treatment. The authors attribute this to patient reluctance to take medicines and to physicians' pessimism regarding the effectiveness of treatments. Compared with psychiatrists, however, generalists see a higher percentage of mildly depressed and less-motivated patients in whom the use of antidepressants may not be as effective.⁴² Furthermore, adequately treating anxiety and depression is time and labor intensive,⁴¹ and reimbursement incentives encourage psychiatrists to offer more frequent and longer office visits for counseling.⁴²

HUMAN IMMUNODEFICIENCY VIRUS AND AIDS

In 2 studies, human immunodeficiency virus (HIV)-infected individuals cared for by generalists had higher odds of hospitalization after diagnosis of their seropositivity⁴⁷ and significantly shorter survival⁴⁸ than those cared for by an AIDS specialist. This may have been due to generalists inappropriately delaying initiation of anti-infective therapy, or to specialists' expertise in detecting AIDS-related complications at an earlier stage or in managing complications on an outpatient basis.^{47,49} In recent nationwide surveys, majorities of residents⁵⁰ and primary care physicians⁵¹ expressed concerns about the adequacy of their training in AIDS ambulatory care, and more than 80% of primary care physicians believed they lacked information needed to care for patients with those illnesses seen in advanced

HIV infection.⁵¹ Generalists failed to discern common HIV-associated lesions when confronted with standardized patients.⁵² Even those generalists with more experience managing HIV displayed multiple, significant knowledge gaps surrounding the treatment of *Pneumocystis carinii* pneumonia.⁵³

RHEUMATIC AND MUSCULOSKELETAL DISEASES

In a recent review, Solomon et al⁵⁴ concluded that rheumatologists performed arthrocentesis more appropriately than nonrheumatologists for acute monoarthritis and oligoarthritis and produced shorter durations of hospitalization, and that rheumatologists used colchicine during the introduction of urate-lowering therapy for patients with gout more appropriately than generalists. In a retrospective investigation⁵⁵ relying on patient recall, the average rate of progression of functional disability secondary to rheumatoid arthritis was substantially lower in those patients followed up regularly by rheumatologists, likely due to the specialists' more intensive use of second-line antirheumatic medications and more frequent joint surgeries. Other aspects of rheumatoid arthritis, such as pain control and psychosocial adjustment, were not evaluated. No consistent differences in outcomes between generalists and rheumatologists for patients with lower back pain have been found.⁵⁴

OTHER CONDITIONS AND PRACTICES

The strongest data demonstrating the equivalence of quality of care provided by generalists and specialists comes from the Medical Outcomes Study.³⁹ In this prospective, observational, 4-year investigation in 3 major US cities, no differences in quality of care or adjusted mortality were found for diabetes and hypertension care, other than that endocrinologists, compared with family physicians, achieved better outcomes for diabetic individuals with foot ulcers and infections. Smaller and less well-designed studies have also shown no differences

between generalists and specialists in the management of chronic obstructive lung disease⁵⁶ and perinatal outcomes.⁵⁷

However, many studies have found superior specialty care in other areas, which may result from greater knowledge and experience. For instance, Fendrick et al⁵⁸ surveyed practicing physicians 2 months after a National Institutes of Health Consensus Conference advocated antibiotic therapy for eradication of *Helicobacter pylori* in patients with peptic ulcer disease. Despite a low response rate, more gastroenterologists than generalists were aware of, and had adopted, this practice.

In 1 small retrospective analysis at 2 community hospitals,⁵⁹ pulmonologists disagreed with one third of general internists' spirometry interpretations. Much larger investigations have shown that, when compared with accepted management guidelines, pulmonologists and allergists use more appropriate pharmacotherapy for individuals with asthma than do generalists; generalists tended to underuse inhaled corticosteroids and overuse long-term oral corticosteroids, despite the many adverse effects associated with the prolonged use of these drugs, while underusing high-dose corticosteroids for acute exacerbations.⁶⁰⁻⁶²

In 1 study⁶³ using a convenience sample of physicians to evaluate patient photographs, dermatologists diagnosed the 10 most common skin conditions more accurately, ordered fewer laboratory tests, and prescribed more appropriate treatment than did family practitioners. In a similar investigation, Dolan et al⁶⁴ demonstrated differences in university-based primary care physicians' attitudes toward, behaviors in, and knowledge of skin cancer control, compared with dermatologists. White⁶⁵ observed that primary care physicians at 1 clinic underdiagnosed actinic keratoses, using 1 dermatologist's evaluation as a criterion standard.

Clement and Christenson⁶⁶ found that surveyed internists and family practitioners used the cytobrush less frequently than gynecologists in the collection of Papanicolaou smears. The authors express

concern that this might result in the collection of more false-negative Papanicolaou smears by generalists. Similarly, Starpoli et al⁶⁷ found that primary care internal medicine residents at 1 institution often failed to master routine gynecologic skills. In 2 survey studies, general internal medicine residents displayed knowledge⁶⁸ and practice⁶⁹ deficits surrounding the care of both pregnant and nonpregnant women with diabetes.

In other areas, findings of more appropriate specialty care may have resulted from patient selection. For instance, most generalists and specialists surveyed by Grisso et al⁷⁰ advocated exercise and calcium supplementation for postmenopausal women. However, despite the proven benefits of estrogen replacement therapy in this group, in an observational cohort study, Schwartz et al⁷¹ found that only 10% to 15% of general internists and 35% to 45% of gynecologists routinely prescribed estrogen. Those patients cared for by endocrinologists and gynecologists were 2 to 4 times as likely as those of general internists to receive estrogen.⁷¹ Specialists' opinions regarding estrogen replacement therapy may have reflected their heightened awareness of its benefits. Alternatively, patient selection of provider may have affected estrogen prescription rates. Both those patients self-referred to endocrinologists and gynecologists and those patients referred by their primary care physicians (for, say, a low bone density or severe osteoporosis) may have been more likely to choose estrogen replacement therapy for its benefits. The more typical postmenopausal woman seeing a generalist, on the other hand, may have been less willing to assume the possibly slightly increased risk of breast cancer or the inconvenience of vaginal bleeding that can result from taking estrogen.

More effective specialty care may also be the product of more time-, labor-, and financially intensive management by the specialist and his/her ancillary staff. For instance, intensive, multidisciplinary specialty interventions in individuals with severe asthma have been shown to lead to improved pharma-

cotherapy, fewer emergency department visits, and reduced admission rates, lengths of hospital stay, and overall costs.^{62,72-76} In addition to more rational use of antiasthmatic agents by specialists, these studies showed that spending more time to educate patients whose self-management skills were negligible, along with improving provider and ancillary staff availability by telephone and in clinic for minor exacerbations, resulted in better disease control. Similar reasoning may also apply to the improved blood glucose control seen in children attending one diabetes specialty clinic.⁷⁷ Even so, the large, prospective, observational Medical Outcomes Study³⁹ found no meaningful outcome differences between those patients with type 2 diabetes mellitus under the care of a general internist and those under the care of an endocrinologist. However, a claims-based profile of care provided to Medicare patients with diabetes elucidated that while large proportions of individuals with diabetes received few recommended services (eg, hemoglobin A_{1c} measurements, ophthalmologic evaluation, and cholesterol screening), differences between generalists and specialists were not uniformly large.⁷⁸

In a 31-year statistical overview of 10 randomized controlled trials, most of which were conducted outside the United States, Langhorne et al⁷⁹ found a trend toward decreased mortality in patients with stroke cared for in a stroke unit, compared with those hospitalized in a general medical ward. Horner et al⁸⁰ found a similar difference when comparing the outcomes of patients with stroke treated by neurologists and nonneurologists. These results may reflect neurologists' more appropriate management of cerebrovascular accidents and their complications, more intensive care and rehabilitation provided by nurses and physical and occupational therapists, and better education of patients and their families, but appear to be explained best by neurologists' selection of patients with better initial prognoses.⁷⁹⁻⁸¹

Finally, decreases in mortality in intensive care units with dedicated intensivists⁸²⁻⁸⁴ may result from the specialist's superior knowledge

and skills. Alternatively, the constant presence or at least immediate availability of a faculty physician to provide bedside care, the institution of patient care protocols and guidelines, increased teaching of house staff and nurses, the establishment of formal daily work rounds, and increased involvement of allied health workers (eg, physical therapists) may be responsible.

In other instances, within a given organization, superior management of patients by specialists may reflect in part the failure of those specialists to teach their generalist colleagues about properly managing common illnesses (or alternatively, the failure of the generalists to learn from specialists' feedback and education regarding management and consultation). Specialized clinics, such as anticoagulation clinics, can help both generalists and specialists better monitor certain aspects of patients' care.⁸⁵

Only some of the studies discussed were prospective, randomized comparisons,^{39,52,72-74} and most did not use adequate risk adjustment.^{45,56,81,86} Furthermore, the studies comparing generalists and specialists assessed their adherence to interventions recommended on the basis of expert consensus or, in a few cases, randomized clinical trials (eg, β -blockers following myocardial infarction). However, these process indicators have limitations inherent to the methods by which they were derived, and can change over time as new knowledge is accumulated. Thus, assessing patient outcomes^{4,42,47,48,55,72,73,75} may be more valuable than merely comparing the process of generalist vs specialty care. Due to a dearth of data on costs, future studies should include some form of economic analysis.

DEFICIENCIES AND OVERUTILIZATION COMMON TO ALL PHYSICIANS

While as a group specialists often outperform generalists in some areas of medical practice, this does not imply that any given specialist will provide better care than any particular generalist. Variations in quality of care among generalists and even among specialists are often

larger than variations between the 2 groups. Also, while as a group specialists' knowledge base and practice patterns are superior to those of generalists in certain instances, the magnitude of these differences and their overall effects on morbidity and mortality are likely small, compared with the sequelae of deficiencies in disease management and preventive medicine common to all physicians, generalists and specialists alike.

Deficiencies in Management of Disease

Deficiencies have been documented for the care of hypertension (recognition and treatment),^{87,88} atrial fibrillation (knowledge regarding anticoagulation guidelines),³⁸ congestive heart failure (use of angiotensin-converting enzyme inhibitors),²⁴ hyperlipidemia (recognition and treatment),⁸⁹⁻⁹¹ and myocardial infarction (use of aspirin, thrombolytics, and β -blockers).^{22,30,32,92-96} Deficiencies have also been noted in the use of endocarditis prophylaxis⁹⁷; in the monitoring of blood glucose control, renal function, and lipid levels in individuals with diabetes⁹⁸; in screening for and recognizing ophthalmic disease in individuals both with and without diabetes^{99,100}; for the management of ulcers (treatment of *H pylori*),¹⁰¹ asthma (use of inhaled corticosteroids),¹⁰² AIDS-associated *P carinii* pneumonia (inappropriate undertreatment),⁵³ and locoregional breast cancer (use of breast-conserving surgery)¹⁰³; in the care of the dying (attention to end-of-life concerns and remediable suffering),^{104,105} and in pain control (dosing of analgesics)^{106,107}; and in the recognition of depression,¹⁰⁸ functional disability,^{109,110} and other psychosocial stressors.^{43,111,112} Moreover, Wigton et al¹¹³ surveyed directors of internal medicine programs and found that current residency training does not ensure competency in all the procedures a general internist does in practice.

Deficiencies in Preventive Care

Equally important are the deficiencies common to all physicians in the provision of preventive care. These

include underimmunization; inadequate use of cancer and other screening tests; infrequent, poor health counseling; and inadequate identification and treatment of psychosocial problems. These deficiencies affect all patients and should be particularly distressing to generalists, since they lie in those areas in which generalists have traditionally claimed special expertise.

Vaccination

Current levels of child and adult vaccination in the United States are less than half the levels in other industrialized countries.¹¹⁴⁻¹¹⁶ While this is due in part to poor public awareness and to financial and systems barriers,^{117,118} physicians also contribute¹¹⁹ through missed opportunities,^{120,121} failure to administer multiple vaccines during the same visit,¹²² inappropriately broadening contraindications to vaccination,¹²³ and forgetting to assess the vaccination status of patients.¹²⁴ Weingarten et al¹²⁵ found that primary care physicians grossly overestimated their influenza and pneumococcal vaccination practices when self-report was compared with the medical record.

Cancer Screening

Physicians also significantly overestimate their performance of common cancer screening tests.^{126,127} Deficiencies in performing oral cavity inspections of smokers, rectal examinations, breast examinations, mammography, Papanicolaou smears, breast self-examination teaching, and skin examinations have been extensively documented.^{13,64,126,128} These may be due partly to lack of awareness of guidelines, forgetfulness, inconvenience, dislike of performing a procedure, and lack of time.^{114,126} In general, tests are used more often to evaluate new patients or those with risk factors for cancer.¹²⁷ The elderly, the uninsured, and those of lower socioeconomic status are less likely to receive screening tests, independent of number of physician visits, even in the presence of risk factors.¹²⁹⁻¹³¹

Substance Abuse

Physicians are frequently unsuccessful in identifying alcohol and drug

abuse, despite its high prevalence in both inpatient and outpatient settings.¹³² While brief, extensively validated screening tests with good sensitivity and specificity exist and are simple to use, most alcoholics go unrecognized, and, even when diagnosed, are untreated.¹³³⁻¹³⁵

While up to 80% of physicians may advise smokers to quit, less than half consistently counsel smokers about *how* to quit.^{128,136} Few former smokers state that their physician helped them to quit, even though quit attempts are twice as common among tobacco users encouraged by a physician.¹³⁷

Violence

Physicians frequently fail to identify victims of domestic violence, who represent 10% to 30% of females presenting to emergency departments.^{138,139} Even when they recognize abuse, they often provide no treatment, or inappropriate or harmful treatment.¹⁴⁰ Despite mandatory reporting laws, they underrecognize and underreport abuse of the elderly, which has been estimated to affect approximately 10% of Americans older than 65 years.¹⁴¹

Health Counseling

Physicians are frequently neglectful with respect to counseling patients in other areas, including diet,^{128,142} exercise,¹⁴³ stress reduction, sun exposure,⁶⁴ preconception health,⁶⁸ breast-feeding,¹⁴⁴ use of seat belts,¹⁴⁵ and helmets,¹⁴⁶ and firearm safety.¹⁴⁷

More than three quarters of parents want physicians to discuss substance abuse, sexuality, mental health issues, nutrition, and general medical issues with their teenagers.¹⁴⁸ Nevertheless, counseling regarding HIV transmission, breast self-examination, and proper diets is infrequently offered during adolescent clinic visits.¹⁴⁹ Many clinicians believe that issues related to sexuality, such as pregnancy, contraception, and premature sexual activity, are less relevant to their adolescent patients than to adolescents in general.¹⁵⁰ They frequently do not assess the sexual orientation nor the potentially risky practices of both

their adolescent and adult patients, and often fail to counsel those at high risk about AIDS prevention and safe sex.^{151,152} These deficiencies in risk behavior modification are particularly disheartening, given the high prevalence of deleterious health habits and incorrect understanding of sexually transmitted diseases in teenagers, and in view of evidence that advice given to adolescents in clinical settings is likely to be trusted and is often followed.^{153,154}

Psychosocial Factors

In the public's opinion, along with inadequate attention to costs of treatment, physicians' worst deficiencies lie in communication skills and in the recognition and management of psychosocial contributors to health and illness.^{16,155} Psychosocial difficulties may prompt up to 50% or more of outpatient generalist visits,¹⁵⁶ and cause as much or even more functional impairment than do strictly physical complaints.^{157,158} While most patients want their physicians to assess their functional performance and emotional well-being, a majority report that their physicians rarely or never inquire about these areas.¹⁰⁹ Many believe that physicians do not spend enough time with them, encourage questions, or solicit their opinions; others complain of rushed visits and state that their physicians do not seem to care about their emotional well-being.¹⁵⁹ While most patients prefer to be informed about aspects of their care, many report not getting adequate information about their treatments.¹⁶⁰

Often, physicians know little about their patients' social histories,¹⁶¹ and fail to recognize their psychosocial needs^{43,112,162} and functional disabilities.¹¹⁰ At least half, and possibly as many as 90%, of patients with depression in primary care practice remain undetected.^{108,163} Even when they are aware of problems, physicians may not intervene appropriately.¹⁶⁴ Some believe that managing psychosocial problems is not their responsibility.^{15,165,166}

Physicians often deal poorly with suffering and dying patients, neglecting to provide essential information about cardiopulmonary

resuscitation during discussions of code status, or failing to elicit patients' concerns regarding end-of-life issues.¹⁰⁵ They can neglect remediable factors contributing to dying patients' discomfort, such as poor oral hygiene, unquenched thirst, difficulty eating, and lack of personal contact.¹⁰⁴ Many tend to undertreat pain related to malignancies and chronic disease^{106,107} and underestimate the effects of nursing home residents' pain and depression on their health status.^{167,168}

Yet not all data show that physicians ignore counseling.¹⁶⁹ Those with more positive attitudes toward psychosocial aspects of care offer more empathy and reassurance and ask open-ended questions. In turn, their patients participate more actively in their own care by expressing opinions and asking questions.¹⁷⁰ Furthermore, some patients are unwilling to reveal psychosocial problems or believe that these problems are not something one shares with one's physician.^{171,172} Still, the public rates physicians' communication skills poorly; physicians in turn rate their training in counseling skills as inadequate.^{16,173,174} And, while they believe that health promotion is important, physicians tend to be pessimistic about their success in working with patients to modify behaviors that affect health.^{175,176} Many doubt their competency to deal with psychosocial aspects of care,¹⁷⁷ and up to one third believe that their training to foster wellness and encourage certain preventive behaviors was inadequate.¹⁷⁴ Almost all deans of medical schools have acknowledged that preventive medicine training is underemphasized at their institutions.¹⁷⁸

OVERUTILIZATION

On the other hand, overutilization can also negatively affect quality of care. Overtesting, without an appreciation for the test characteristics, can lead to further unwarranted interventions, including those that may harm the patient either physically or psychologically.¹⁷⁹ This may be true for the rapid, widespread adoption of prostate-specific antigen screening.¹⁸⁰ Overprescribing of potentially inappropriate medications has been docu-

mented. In a cross-sectional survey, Wilcox et al¹⁸¹ found that almost one quarter of community-dwelling elderly were receiving at least one contraindicated prescription drug, placing them at risk for adverse effects such as sedation and cognitive impairment.

On the other hand, high rates of inappropriate care and geographic variation in care patterns that do not affect clinical outcomes have also been extensively documented.¹⁸²⁻¹⁹² These may result from excessive test ordering and procedural use by specialists,^{6,183} or from differences in payer status,^{193,194} resource availability,¹⁹⁵ or local practice styles,^{6,190,191} but do not appear to be related to differences in severity of illness.

In cardiology, while certain drugs are clearly underused, coronary angiography and revascularization, expensive and invasive procedures, may be overused. Privately insured patients are more likely to receive angiography, angioplasty, and bypass grafting than Medicaid or uninsured patients.¹⁹³ Winslow et al^{188,189} found that a substantial proportion of bypass surgeries and endarterectomies were performed for inappropriate reasons. Using RAND criteria, Chassin et al¹⁹⁶ determined that 17% of coronary angiographies and 32% of carotid endarterectomies were inappropriate. Patients in high-use regions of the country were older, had less severe angina, and were treated less intensively medically than patients in low-use sites.¹⁹⁷ Hilborne et al¹⁹⁸ discerned that from one quarter to half of coronary angiograms were performed for uncertain indications.

Blustein¹⁹⁹ found that the availability of cardiac services in the hospital to which patients presented strongly influenced the likelihood of their use in the period following acute myocardial infarction; this was unlikely due to selection bias. Similarly, Every et al²⁰⁰ discovered that after adjustment for clinical factors, the availability of on-site catheterization facilities was associated with a higher likelihood that a patient would undergo angiography. While no short-term mortality benefit was associated with the greater use of angiography, their study lacked adequate statistical power to

detect either short- or long-term mortality benefits.

Thus, overuse of cardiac procedures appears likely. However, others^{201,202} have found low rates (approximately 5%) of inappropriate and uncertain coronary angiography and coronary artery bypass grafting in New York State, and Ayanian et al²² found that Medicare patients in Texas with acute myocardial infarction admitted to hospitals offering coronary angioplasty and bypass surgery had lower adjusted 1-year mortality than patients admitted to other hospitals.

While large US geographic variations in the use of angiography do not correlate with mortality or health-related quality of life,¹⁹¹ comparisons of the coronary procedure rates in Canada and the United States suggest that the greater rates in the United States may be associated with decreases in anginal symptoms.²⁰³ Even so, Tu et al²⁰⁴ showed that higher rates of cardiac procedures in the United States, compared with Canada, did not result in better long-term survival rates for elderly patients with acute myocardial infarction. Within the United States, greater physician and hospital experience with cardiovascular procedures leads to better outcomes.²⁰⁵

Other procedures may be overused because of broadening of indications, as has been suggested for radiography in lower back pain,²⁰⁶ for laparoscopic cholecystectomy,²⁰⁷ and for cesarean delivery and hysterectomies, 15% and 20% of which may be unnecessary, respectively.¹⁸⁴ Using RAND appropriateness criteria on a random sample of elderly patients, Kahn et al²⁰⁸ concluded that 11% of endoscopies of the upper gastrointestinal tract were performed for equivocal indications, and 17% for inappropriate indications. Interestingly, just as some specialists reach for different technologies first in treating patients, they tend to withdraw these same technologies first when withdrawing care from the terminally ill.²⁰⁹

Large geographic variations have also been noted in the use of grafts vs fistulae for patients undergoing hemodialysis.²¹⁰ Patients of lower socioeconomic status are more likely to receive a (less appropriate) graft than (the preferred) fistula.

Quality of Care for Various Specialties*

Specialty	Generalists and Specialists		Specialists Compared With Generalists	Comment	References
	Deficiencies	Overutilization			
Cardiology	Use of aspirin, β -blockers, heparin, and thrombolytics in MI	? Cardiac catheterization and revascularization procedures	More appropriate MI/post-MI knowledge and care	...	19, 22, 25, 27-30, 32, 38, 39,
	Anticoagulation for atrial fibrillation	Radionuclide stress tests	Similar care for hypertension, atrial fibrillation, and transient ischemic attacks and strokes	Multiple studies of knowledge base and practice patterns	87-97, 188, 189, 191, 193, 194,
	Endocarditis prophylaxis	Calcium channel blockers, prophylactic lidocaine	...	...	196-204
	Recognition and treatment of hypertension and hyperlipidemia	...	...	...
Mental health disorders	Recognition of depression and suicidality	Benzodiazepines	Psychiatric care more appropriate and more cost-effective	Multiple studies	12, 41-46
	Use antidepressants at appropriate doses	...	Worse handling of medical conditions associated with psychiatric illness	...	
	Psychotherapy	...	...	...
HIV/AIDS care	Inadequate education and training	...	Recognize AIDS-associated illnesses better	...	47-51, 53
	...	...	Patients have better outcomes	Therapies changing rapidly	
Rheumatology	...	...	More appropriate use of arthrocentesis, better care for gout, better functional outcomes in rheumatoid arthritis; no consistent differences for lower back pain outcomes	...	54, 55
Pulmonary	Underuse of long-term inhaled corticosteroids and high-dose oral corticosteroids for flares	Long-term oral corticosteroids	? Better disease control	Multidisciplinary intervention	56, 59-62, 72-76
	...	...	\pm More accurate spirometry interpretations	Small sample	
Neurology	...	Carotid endarterectomy	COPD management equivalent Improved outcome in healthier patients in stroke units	Small study Multidisciplinary intervention, patient selection	79-81, 188, 189, 196

(Continued)

Payment mechanisms may also affect utilization. Patients who receive care in health maintenance organizations are half to one fourth as likely to be operated on as patients in the fee-for-service sector, usually with no major outcome differences.¹⁸⁴ Finally, race may play a role in the differential use of procedures, with seriously ill African Americans less likely to receive major therapeutic interventions than similarly ill white patients.^{194,211}

Thus, a number of factors can contribute to overuse, including numbers of specialists, education, differences in local practice styles, uncertainty or skewed beliefs regarding the benefits of an intervention, eagerness to adopt new and un-

proved tests or procedures, patient race and socioeconomic status, patient choice, and, under fee-for-service, physician financial incentives. With increasing capitation under managed care, the influence of the latter incentive should diminish. Obviously, specialists should not be held responsible entirely for the high-documented rates of inappropriate interventions, since primary care physicians, through the referral process, play some role in determining who eventually receives these interventions. Furthermore, inadequate patient education by physicians and lack of patient involvement in the informed consent process may lead patients to accept more readily procedures they might have refused otherwise.

CONCLUSIONS

While certain differences point to correctable deficiencies of generalists, these differences are not as striking or clinically important as the deficiencies in disease management, preventive care, and health maintenance common to all physicians. These problems should be particularly distressing to generalists, who claim special interest and expertise in these areas. Furthermore, overuse of diagnostic and therapeutic modalities leads to inappropriate care that increases costs without providing benefit, or, worse, increases risks to patients. The **Table** summarizes findings from this review.

Generalists and specialists must work together to effect changes in

Quality of Care for Various Specialties (cont)

Specialty	Generalists and Specialists		Specialists Compared With Generalists	Comment	References
	Deficiencies	Overutilization			
Endocrinology	Hemoglobin A _{1c} , ophthalmologic, renal function, and cholesterol screening	...	Similar quality of diabetes care and mortality, except endocrinologists better for diabetic individuals with foot ulcers	...	39, 68, 69, 78, 99, 100
	Internal medicine residents' knowledge of care of pregnant women with diabetes	...	...	...
Obstetrics and gynecology	Hormone replacement therapy	Cesarean deliveries, hysterectomies	More patients receiving hormone replacement therapy	Patient selection	57, 71, 103, 184
	Breast-conserving cancer surgery	...	Better Papanicolaou smear technique	...	
Gastroenterology	...	...	Perinatal outcomes same	Small study	
	Awareness of the role of <i>Helicobacter pylori</i> in peptic ulcer disease	Upper endoscopies	More aware of <i>H pylori</i> role and treatment	Studies done soon after guidelines published, inadequate time for dissemination of knowledge to practicing physicians	17, 58, 207, 208
Dermatology	...	? Laparoscopic cholecystectomies	Generalists order more appropriate endoscopies than nongastroenterology specialists		
	Recognition of benign and malignant lesions	Diagnostic tests	Better recognition, more appropriate workup and treatment	...	63, 65, 66
Orthopedics	...	...	Better skin cancer control knowledge and practices	...	
	...	Radiography (by orthopedists and chiropractors)	Lower back pain outcomes same, generalists care less expensive	...	4, 206
Geriatrics	Care of the dying	Inappropriate, potentially dangerous overmedication	...	...	104, 105, 181
Pain control	Underappreciation of severity, undertreatment	...	...	...	104, 106, 107, 167, 168
Renal/urology	Fistulae for hemodialysis	Grafts for hemodialysis	Socioeconomic, racial differences	...	210
	...	? Prostate-specific antigen testing	...	...
Preventive medicine/public health	Immunizations	...	± More appropriate test ordering by generalists	Elderly, those of lower socioeconomic status fare worse	10, 11, 13, 15, 43, 64, 105, 108-112, 114, 115, 117-121, 123, 124, 126-154, 156-159, 161-166, 173-175
	Cancer screening	...	...	...
	Identification and treatment of substance abuse, violence, psychosocial difficulties, and functional impairment	...	Generalists more willing to treat psychosocial problems	...	
	Health counseling	...	...	...

*MI indicates myocardial infarction; HIV, human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome; ellipses, not applicable; and COPD, chronic obstructive pulmonary disease.

medical practice and to improve the quality, efficiency, and cost-effectiveness of medical care. To be effective these changes will require the support of payers, such as insurance companies and the government, as well as of managed care organizations.

Likely, the number of generalists will continue to increase and the

number of specialists will decrease.²¹² Even with today's distribution of physicians, there are not enough specialists (nor financial resources) for every individual with asthma to be cared for by a pulmonologist, or every patient with depression to be followed up by a psychiatrist. Thus, more attention should be paid to minimizing quality-of-care differ-

ences for the more common illnesses, eliminating those deficiencies in the provision of preventive care common to all physicians, decreasing unnecessary and inappropriate care, improving the referral process for patients with complicated conditions or those with less common diseases, and promoting comanagement and a teamwork

approach to the care of certain kinds of patients.²¹³ This could be achieved through education and training, feedback to providers, evidence-based disease management²¹⁴ research, and structural changes in the practice of medicine. Particularly, attention should be paid to improving counseling and screening practices, reversing the decrease in outpatient visit length,²¹⁵ defining provider roles, and improving referral utility.^{216,217}

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