Physician Extenders: Divergent Views and Implications for the Future

Michael Zubkoff, PhD, Jeff Reynolds, PhD, Sandra Zubkoff, FNP, RN
Nashville, Tennessee

This paper analyzes the rationale supporting the emergence of the physician extender role, indicates some of the characteristics of physician extenders, and reviews evidence from previous studies and from research in progress on the utilization and productivity of the physician extender. Based on this review, it can be predicted that physician extenders will become "perpetual interns" providing rather routine physician services in institutional settings largely independent of direct physician supervision. Even before the potential for physician extenders to extend primary care was expressed, countervailing trends were developing. These trends are likely to have these consequences: (1) increasing specialization will preclude the effective use of physician extenders in private practices, increase the likelihood of their employment in institutional settings, and preclude any amelioration of existing maldistribution of physician services; (2) increasing institutional employment will increase salaries; and (3) increased salaries will attract better educated and qualified physician extender prospects desiring specialty training and institutional employment.

The past decade has seen a proliferation of programs developed for the training of a "new" type of health personnel – physician extenders.[1-3] The physician extender's (hereafter PE) role is emerging along a number of distinctively different lines. Each of the variants, however, is related either directly or indirectly to the provision of "physician services." The purpose of this paper is to describe the rationale supporting the emergence of the PE role, indicate some of the characteristics (and variations) of that role, and provide both a review of previous studies and an overview of evidence from research in progress on the utilization and productivity of the PE. We will then project our views of the likely future of those who fill this role.

From the Department of Family and Community Health, Meharry Medical College; The School of Nursing, and the Departments of Economics and Sociology, Vanderbilt University; Nashville, Tennessee. Reprinted from THE JOURNAL OF FAMILY PRACTICE, Volume 1, Number 2, 1974. Requests for reprints should be addressed to Dr. Michael Zubkoff, Department of Family and Community Health, Meharry Medical College, 1005 18th Avenue North, Nashville, Tenn 37208.

Rationale for Physician Extenders

There appear to be at least four major justifications for the emergence of the PE.

Response to a "Physician Shortage"

Based on economic criteria, a physician shortage implies that physician services demanded by individuals are not available.[4] It should be immediately apparent that the translation of the demand for physician services to a demand for physicians is far from perfect. It would be naive to conclude that the only way to increase the supply of physician services is to increase the number of physicians.[5] There are alternative possibilities to achieve an increase in physician services: changing technology, new organizational forms, and utilization of auxiliary personnel such as the PE.[4] Pondy feels that the third alternative can be effective in relieving a shortage of physician services, and that the training of PEs can expand services more rapidly and less expensively than by training additional physicians.[7] If it can be shown that there is a shortage of physician services and that the utilization of the PE can increase the supply of such services, the PE would appear justified.

That there is a shortage of physician services is easily asserted but difficult to document. The majority of studies asserting either a current or anticipated physician shortage (some implying physician services) rely on some aspect of the physician-population ratio.[4,8] Such a measure is grossly inadequate in representing both the level of physician services and the medical care demands of a population. To be appropriate, the numerator of the ratio should represent the productivity (in services offered) of full-time equivalent, clinically active physicians. The denominator should represent the effective medical demand of the population, considering demographic and socioeconomic characteristics of the population and the substitutability of other medical care inputs for physician services.[8] The

"diagnosis" by Fein seems to approximate this ideal by consideration of demand factors such as the changing age-sex distribution of the population, increasing urbanization, changing racial composition, general income increases, rising educational levels, and the utilization impact of Medicare. He estimates an increase in demand for physician services of 22 to 26 percent during 1965-1975 in contrast to a projected increase in the number of physicians by 19 percent.[4] If the level of physician services was adequate at the beginning of this period, a substantial increase in productivity would be necessary to keep pace with the rising demand projected. Even greater productivity increases would be necessary if, in 1965, there was "unsatisfied demand," or if during the interim, consumer "tastes" for medical care changed, or if new financing programs were implemented which increased the availability of medical care to the population.[4]

Response to Maldistribution of Physicians

If physicians and physician services are inequitably distributed, implying a shortage of services in some areas, and if PEs can be distributed so as to reduce the inequity in services, then PEs would seem justified. The inequitable distribution of physicians is hardly debatable. Somers and Fein have each documented and described physician maldistribution.[4,9] Further, there appears to be a trend toward further maldistribution.[10] Again, the physician-population ratio does not adequately represent either the level of physician services or the effective consumer demand. It ignores both differences in physician productivity and in effective demand.

Specialization within the Medical Profession

There has been a continuing trend toward increasing specialization within the medical profession resulting in a decreasing proportion of physicians in general or family practice. According to Somers, only 21 percent of the physicians in the US were in general/family practice in 1969. Further, the ratio of primary care physicians (including general/family physicians, internists, and pediatricians) to population decreased from 76 to 50 per 100,000 from 1950 to 1965. In 1969, only two percent of medical students were considering entering general practice.[9] Although we have seen an increasing interest in family practice among medical students in the last several years, it seems evident that there is and will continue to be a shortage of family physician services.

Potential for Delegation of Selected Physician Tasks

The contention here is that the physician performs many expendable tasks which could often be performed satisfactorily by others with less training. Caye and Hansen indicate that the rationale underlying the physician extender's role "has its roots in the belief that education to the level of the MD degree is not necessary for all who render, or participate in, 'basic' or 'routine' medical care."[11] According to Levy, "It has been demonstrated that certain kinds of health services can be performed by professional and subprofessional groups other than physicians and performed more skillfully."[12] This view is echoed by McClure.[13] The very existence of nurses and various medical technicians attests to the fact that the physician has given up some of his/her former activities. Kramer points out the decrease in the proportion of health workers who were physicians from one third in 1900 to one tenth in 1970, which certainly indicates the impact of changing medical technology and the changing role of the physician in primary medical care.[14] Nonetheless, physicians still routinely take patient histories, perform routine tests, and make routine physiological observations prior to diagnosis and treatment – activities which are necessary but in the majority of cases capable of being performed by others. If PEs can perform pre-diagnosis procedures, or even routine diagnosis, and if physicians are willing to delegate these (and other) tasks, then the physician would be able to spend more time and energy in "critical tasks.[7]

The four possible justifications for the PE which have been posed raise four critical questions:

1. Can physician extenders raise physician productivity (increase level of physician services)?
2. Can physician extenders be so distributed to ameliorate current inequities of physician services?
3. Can physician extenders be trained as generalists (ie, to perform the kind of service most needed)?
4. Can and will physicians delegate routine tasks not requiring their expertise?

In order to answer the above questions one must understand the emerging roles of physician extenders and their impact on the provision of medical care services.

Description of Physician Extender Roles

The potential impact and future of the PE appears to depend considerably on the kinds of roles which are developed for PEs. Is the PE to be an independent, though limited, practitioner? Is he/she to be an aide rather than a surrogate for the physician? Is he/she to be a specialist, limited to specified, rather demanding tasks oriented to specialty services within a health-care team? Each possible role would have rather unique implications for the critical questions raised previously.

Citing a 1970 report of the Board of Medicine of the National Academy of Sciences, Cannon provides a most cogent description of three emerging PE roles.[15]

The Type A Assistant (Extender)

The Type A assistant is capable of approaching the patient, collecting historical and physical data, organizing these data, and presenting them in such a way that the physician can visualize the medical problem and determine appropriate diagnostic and therapeutic steps. He/she is also capable of assisting the physician by performing diagnostic and therapeutic procedures and coordinating the roles

of other, more technical, assistants. While he/she functions under the general supervision and responsibility of the physician, he/she might, under special circumstances and under defined rules, perform without the immediate surveillance of the physician. He/she is thus distinguished by his/her ability to integrate and interpret findings on the basis of general medical knowledge and to exercise a degree of independent judgment.

Examples of the Type A assistants would be the physician's assistant, physician's associate, medex, primex, or family nurse practitioner.

The Type B Assistant (Extender)

The Type B assistant, while not equipped with general knowledge and skills relative to the whole range of medical care, possesses exceptional skill in one clinical specialty, or more commonly, in certain procedures within such a specialty. In his/her area of specialty, he/she has a degree of skill beyond that normally possessed by physicians not engaged in the specialty. Because his/her knowledge and skill are limited to a particular specialty, he/she is less qualified for independent action.

This is the category for the specialty-oriented assistant such as the orthopedic assistant, urologic assitant, pediatric nurse practitioner, or child health associate.

The Type C Assistant (Extender)

The Type C assistant is capable of performing a variety of tasks over the whole range of medical care under the supervision of a physician, although he/she does not possess the level of medical knowledge necessary to integrate and interpret findings.

The best example of this category is the "medical assistant" who assists a doctor of medicine in a number of settings, from physician's office to a hospital, in business-administrative and clinical duties.

The Type C assistant, as described above, falls outside the PE realm as we have defined it. As a "medical assistant," his/her relationship to the provision of physician services is tenuous. Cannon has indicated that the medical assistant frequently assumes routine administrative/clinical tasks such as completing insurance reports. The activity is necessary to the physician's practice, but hardly "physician services."

Three distinctive PE roles are identifiable from the descriptions of Type A and B assistants. Type A assistants are those engaged in the provision of "primary care." Two of the PE roles can be classified as Type A, differing primarily in the degree of dependence upon direct physician supervision. The first, the Independent Generalist, provides routine primary care without direct physician supervision. The second, the Dependent Generalist, also provides routine primary care, but is directly supervised by a physician, usually in the same office.

A third role, the super-Specialist's Assistant, can be classified as a Type B assistant. Because of the specialized nature of his/her role, the Specialist's Assistant can not perform independently from a supervising physician/specialist.

Training programs for PEs vary, though not systematically, by role type. The roles of PEs can perhaps be better described by what they are doing in the "field" rather than by what comprises the training. Each role type will be considered separately.

The Independent Generalist role is well illustrated by the activities of the Family Nurse Clinician (FNC). One such FNC is currently in the seventh month of providing direct patient care in Red Boiling Springs, Tennessee.* In providing first contact care, she determines and facilitates preventative and promotive health measures, diagnoses and treats common deviations from health, and maintains the care of stabilized chronic diseases across all age groups. In a very real sense, the FNC is acting as a primary provider of health care, with activities largely independent of direct physician supervision. She examines, diagnoses, prescribes, and treats patients, performing activities traditionally reserved for physicians.

Perhaps the most frequent utilization of the PE has been as a dependent, supervised aide to a physician, performing a wide range of tasks (Dependent Generalist). This PE performs essentially as an "extra pair of hands" of the physician, taking patient histories, performing routine physical examinations, and assisting with a variety of routine medical procedures.

*Family Nurse Clinician Program, Vanderbilt University School of Nursing

Some of the recent graduates of the Duke physician's assistant program are performing essentially Type B assistant activities, the Specialist's Assistant. Two examples can be briefly illustrated.[7] The surgical assistant performs a limited range of tasks related to a specific activity. He/she coordinates and performs many of the preoperative procedures at the direction of, but not necessarily under the direct supervision of the surgeon. Other Duke graduates are involved in clinical research. Generally these PEs act as lower-level research administrators, directing (and performing) necessary technical tasks. They may act without direct supervision of the physician, but are not independent.

Impact of Physician Extenders on Health-Care Services

Assessing the impact of any health-care component is difficult; assessment of the impact of a new component in its early stages of development and deployment is even more so. Available evidence is sketchy and occasionally contradictory. We have identified three PE roles and will report available evidence on each.

Independent Generalist

Perhaps the most accurate evidence on the impact of the Independent Generalist is that which is accumulating on the FNC activities at Red Boiling Springs.[6] Given that a "typical" physician practice has 91.6 office visits per week,[7] the FNC clinic seems to be approximating a typical practice. As indicated in Table 1, the number of patient visits increased steadily from the second month through the fifth month.

The fifth month's experience (104 patients/week) probably represents the effects of the "cold-flu" season and while rigorous comparison is not possible, the overall experience is probably typical of rural general/family practice.

The nature of care rendered by the FNC is indicated by the distribution of primary complaints as given in Table 2. The eight most frequent complaints indicate that the FNC is providing the kinds of care associated with general/family practice.

Table 1. Patient Visits by Month to FNC

Month	Number of Patient Visits	Percent of Total	Approximate No. of Visits per Week
First (2 weeks)	104	6.4	52
Second	198	12.3	49
Third	270	16.7	67
Fourth	300	18.6	75
Fifth	416	25.7	104
Sixth	256	15.8	64
Seventh (1 week)	72	4.5	72
Totals	1,617	100.0	70

Table 2. Patient Complaints: FNC

Complaint (care)	Number	Percent of Total
Ear-nose-throat	732	45.3
Preventive	200	12.4
Wounds	98	6.1
Respiratory	80	4.9
Gynecological-breasts	59	3.6
Skin	59	3.6
Abdomen-gastrointestinal	58	3.6
Musculoskeletal	58	3.6
Other**	273	16.9
Totals	1,617	100.0

**Includes: dental (.4%), cardiac (1.5%), vascular (1.9%), liver-kidney-biliary (.1%), gastrourinary (2.5%), nervous system (.2%), psychological (2.4%), obstetric (1%), blood-lymphatic (.3%), endocrine-metabolic (1.2%), unclassified (5.5%).

Table 3. Summary of Treatment Time and Waiting Time

	Mean	Median	Range	Standard Deviation	Percent Below 30 Minutes
Treatment Time (min)	15.3	14.9	0-90	14.7	91.0
Waiting Time (min)	13.7	5.42	0-95	17.4	87.3

Accurate assessment of the effect of the FNC on the level of services provided would require some measure of services provided before the FNC. However, even if all the patients being served by the FNC were seeing private physicians prior to her coming (which is unlikely), her presence is now allowing physicians to expand their care. It appears irrefutable that the FNC is increasing the level of physician services.

Quality of care is always difficult to assess. The only assessment data available at present for the FNC experience is indirect, perhaps even spurious. If we can assume that patients continue using FNC services only if they are satisfactory in quality, the number of return patients is some indication of patient satisfaction (perhaps quality of care). During the six-month period, over half (50.9 percent) of the patient visits to the FNC were return visits. The time spent treating patients and the time patients spend awaiting treatment also provide some very indirect evidence of the quality of FNC care. As is evident from the data summarized in Table 3, the treatment time probably approximates that of general physician practice, while the waiting time may be less in the FNC practice. Such conclusions are, of course, somewhat speculative.

We would conclude that, even though the findings are probably more relevant to consumer satisfaction than to quality care, there is no a priori reason to assume that the care provided by the FNC is anything less than satisfactory.

We can easily summarize the cost of FNC care, but cannot provide valid comparisons with the cost of physician care under similar conditions. Patients of the FNC were charged an average of $5.28 with a modal amount of $6.00. Charges ranged from $0.00 to $24 including routine laboratory tests and medications and/or home visits, with 96 percent of the patients being charged $10 or less, and 83 percent being charged $6 or less. The FNC is providing services at a consistently lower price than do physicians in the area. It would seem reasonable to conclude that (in rural areas at least) the Independent Generalist (as exemplified by the FNC) can increase the supply of services at lower cost; with the impact on quality yet to be meaningfully evaluated.

Dependent Generalist

Pondy's study of eleven graduates of the Duke program[7] and numerous other reports provide some evidence on the productivity of PEs acting as Dependent Generalists. Andrus reported the findings of a California Rural Health Project, concluding that paramedical personnel can be trained from a local population and increase productivity, save physician time, shorten hospitalization, and prevent unnecessary hospital admissions.[16] Sarver reported an increase in patient contacts from 522 to 651 per month (and an increase in income of $4,000) after training a nurse as a PE.[17] Cihlar reported seeing 75 percent more patients (with no fee increase) after employing a PE in a private practice.[18] These accounts would seem to indicate that the addition of a PE in private practice increases productivity with no reduction in quality, nor any increase in cost to consumers.

Pondy's study presents somewhat contradictory findings.[7] In one Vermont site, adding a second physician (to the original one physician) and two PEs increased the size of the practice only 79 percent. In another Vermont site, the addition of a PE to a solo practice was followed by a 21 percent drop in patient load. At a North Carolina site with two physicians, the size of the practice increased by only nine percent in the two years following the addition of a PE. Pondy concludes that "the aggregate results are disappointing and fall short of the rosy predictions of 30 to 50 percent increases in productivity." Pondy indicated three possible reasons for the failure of PE to effect productivity increases:

1. Physicians "trade-off" possible increased productivity for leisure time or professional development.
2. Physicians do not understand how to use the PE or how to effectively delegate tasks.
3. Total demand for medical care was inadequate to support additional personnel.

The judgment is uncertain, but the Dependent Generalist *may* effect productivity increases with no necessary consumer cost increase, nor any decline in quality. As before, the assessment of quality is largely speculative.

Specialist's Assistant

Only Pondy's study provides evidence on the productivity of Specialist's Assistants. Only those Duke PEs in institutional settings (generally performing specialized tasks) effected productivity increases. No assessment of cost impact is possible but there was no indication of a reduction in the quality of services rendered.

While the evidence is far from conclusive, it does appear that the PE utilized in any one of the above ways can potentially effect productivity increases with no assumable decline in quality. If we could assume that the PE would be widely accepted and utilized in these roles, the questions raised earlier regarding whether the physician extenders can influence availability and accessibility could be answered on the positive side.

Barriers to Utilization of Physician Extenders

It is not at all certain, however, that the PE will be effectively utilized. Resistance to PEs can come from two sources: physicians who must necessarily supervise them and patients who must utilize their services. Levy has identified four factors which may impede transfer of medical functions to the PE:[12] (1) conservatism, economic self-interest, and specialization; (2) the issue of final medical responsibility; (3) delegation vs surrender of function; and (4) comprehensiveness of function.

Levy describes the general conservatism of those in the medical profession, implying a resistance to innovation in medical care. He locates the sources of this conservatism in the socioeconomic backgrounds of physicians (upper middle class) and in the historical nature of the medical profession. Perhaps a greater barrier is economic self-interest; for example, a perceived low economic return for the self-employed physician may impede his acceptance of the PE.

Levy also cites legal, traditional, and psychological barriers to utilization of the PE. He indicates that the traditionally exclusive medical care role of the physician provides certain psychological rewards. Substituting the PE might then involve a psychological "cost." The legal implications of physician extenders remain somewhat uncertain, but appear not to present insurmountable barriers.[19] Morris and Moritz, for example, indicate the potential applicability of the legal principle of *respondent superior.* The principle implies a master-servant relationship with the physician responsible for any tort (including negligence) incurred by the PE.[20] Whether physicians will hesitate to assume this added responsibility is uncertain.

Levy further indicates that some physicians regard delegation of functions as surrender. The physicians' concern is with maintaining control, consistent with the principle of final medical responsibility. Physicians will surrender functions when they are defined either as non-medical or as uneconomical.

In Levy's view, many physicians may fear that they will be "taken over" by physician extenders with comprehensive functions. He contends that the more comprehensive the function which physicians are asked to release, the greater is their resistance.

Evidence on physicians' willingness to employ PEs is sketchy. Caye and Hansen's study of Wisconsin physicians indicates that the physicians believe in the need for PEs (61 percent so indicated), but only 41 percent indicated they would use them. Further, if used, the physicians indicated they would delegate little responsibility to PEs (for example, not wishing them to perform physical examinations).[11] An interesting, perhaps significant, finding of the Caye-Hansen study was that the closer the proposed duties of the PE to the specialty skill of the responding group, the more negative was their reaction. Psychiatrists were very willing for the PE to perform a wide range of tasks. Caye and Hansen conclude that physicians do not want the PE to do anything they could do themselves.[11]

A study of rural Iowa and Minnesota residents conducted by Litman provides some evidence of patients' acceptance of the PE. In general, there

was general acceptance of the concept of the PE – 65.6 percent of the population studied indicated a willingness to be served by the PE. Some 71 percent were unwilling for the PE to perform routine deliveries and 33 percent were unwilling for the PE to "screen" patients. Litman concludes that "any notion that paramedical personnel are likely to be unequivocally accepted by the rural public seriously underestimates the latent resistance to be overcome."[21]

Other factors, while not related to possible acceptance of the PE, may contribute to utilization patterns which would fail to meet the problems related to physician services which were originally posed. Pondy, for example, indicated the possibility of high turnover rates among PEs in private practice. He indicated that the lesser responsibility and independence accorded the PE in the Dependent Generalist role would contribute to the PE increasingly accepting institutional positions which might provide increased opportunities for vertical mobility and considerably greater financial remuneration.[7]

The licensure and/or certification of the PE may also decrease the likelihood that assistants will work in private practice or in rural areas.[22] Certification and/or licensure would surely increase the income which the PE could demand. Pondy cites an average PE whose starting salary increased from $8,000 to $14,000 from 1967 to 1971.[7] As White contends, "It may become prohibitively expensive to hire someone with certifiable training (for private practice)."[23] If the PE remains uncertified and/or licensed or certified in such a way as to tie him/her to a practitioner, there seems to be greater hope for increasing physician services in rural areas. If PEs become essentially independent practitioners, there is little reason to expect that their distribution would be markedly different from the distribution of other professionals. Carlson and Athelstan pose the question well – "How will overlaying this distorted pattern of distribution with a parallel distribution of physician's assistants produce meaningful advantages for medically deprived persons and areas?"[1] They also indicate another unpromising trend – the increasing specialization of the PE – "Much current activity is concentrated on creating assistants who are 'custom designed' to serve a single specialty." They indicate that 66 programs are currently training pediatric nurse practitioners, with others training assistants to perform specific technical procedures.[1] Pondy indicates a similar trend toward specialization among Duke PEs.[7] Carlson and Athelstan conclude that neither of these classes of extenders can be expected to expand the availability of primary care, the paramount need which PEs are purported to help fulfill.[1]

Discussion

Earlier we raised four "critical" questions regarding the justifications for the PE. These questions relate to whether PEs can: (1) increase physician productivity, (2) ameliorate distributional inequities, (3) perform general services, and (4) be accepted by physicians.

The evidence presented earlier would seem to indicate an affirmative answer to each. The PE roles possess the potential for accomplishment of the goals mentioned above. But, given the barriers identified by Pondy, White, and Carlson and Athelstan, will they?

Our predictions for the future status of the PE are rather pessimistic. Practically before the potential of the PE to extend primary care was expressed, countervailing trends were developing. The trends and their likely consequences are:

1. Increasing specialization will preclude the effective use of PEs in private practices, increase the likelihood of their employment in institutional settings, and preclude any amelioration of existing maldistribution of physician services.
2. Increasing institutional employment will increase salaries.
3. Increased salaries will attract better educated and qualified PE prospects desiring specialty training and institutional employment.

We think it reasonable to predict that PEs will come to be "perpetual interns," providing rather routine physician services in institutional settings largely independent of direct physician supervision. We hope that our pessimistic prediction does not prove to have been optimistic.

References

1. Carlson CL, Athelstan GT: The physician's assistant: Versions and diversions of a promising concept. JAMA 214:1855-1861, 1970
2. Cannon RO: The use of physician's assistants in primary health care. World Med J 2:31, 1972
3. Kempmeier RH: Physician's assistants. J Tenn Med Assoc 64:56-58, 1971
4. Fein R: The Doctor Shortage: An Economic Diagnosis. Washington, DC, Brookings Institution, 1967
5. Zubkoff M, Dell E, Shrago J: Tennessee's physician shortage: The answer is not more medical students. J Tenn Med Assoc 67:392-398, 1974
6. Miller M, Whitaker C, Dennis C, et al: Utilization of a family nurse service clinic. Paper presented at APHA Annual Meeting, November, 1973
7. Pondy LR: Utilization and productivity of the Duke physician's associate. Duke University, Graduate School of Business Administration, GSBA paper no. 61, pp 2-42
8. Butter I: Health manpower research: A survey. Inquiry 4: 1967
9. Somers AR: Health Care in Transition: Directions for the Future. Chicago, Hospital Research and Educational Trust, 1971
10. American Medical Association: Distribution of Physicians in the United States, 1970. Chicago, AMA, 1971, p 5
11. Coye RD, Hansen MF: The "doctor's assistant." JAMA 209:529-531, 1969
12. Levy L: Factors which facilitate or impede transfer of medical functions from physician to paramedical personnel. J Health Hum Behav 7:50-250, 1966
13. McClure WW: A "medic" in general practice. Medical Economics 44:72-77, 1967
14. Kramer J: Health care: Fund shortage impedes training of medical aides. Science 169:956-960, 1970
15. New Members of the Physician's Health Team: Physician's Assistants. Report of the Board of Medicine of the National Academy of Sciences, 1970, pp 31-32
16. Andrus LH: Paramedical personnel and private practitioners. Hosp Pract 3(12):64-72, 1968
17. Sarver RG: Don't be a do-it-yourself doctor. Medical Economics 48:162-175, 1971
18. Cihlar C, Steven L, Joyner PA: Hospitals 45(11)52-57, 1971
19. Blumstein J, Zubkoff M: Perspectives on government policy in the health sector. Milbank Mem Fund Q 51:395-431, 1973
20. Morris RC, Moritz AR: Doctor and Patient and the Law. St. Louis, Missouri, CV Mosby, 1971
21. Litman TJ: Public perceptions of the physician's assistant – a survey of attitudes and opinions of rural Iowa and Minnesota residents. Am J Public Health 62:343-346, 1972
22. Zubkoff M, Blumstein J: Framework for Government Intervention in Health. Boston, Lexington Books, in press
23. White FP: You bet we can end the doctor shortage. Medical Economics 48: 138-147, 1971