Osteopathic postdoctoral education in transition

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Because of alternative options for postdoctoral training made available by the AOA Board of Trustees and House of Delegates recently, this report summarizes the status of these important changes. The report also discusses the administration of postdoctoral education by the AOA and presents current statistics regarding internships, residencies, and certification.

Administration of postdoctoral education in the AOA

The Committee on Postdoctoral Training (COPT) was established by action of the AOA Board of Trustees in January, 1968, to assure the Bureau of Professional Education, the AOA Board of Trustees, the osteopathic medical profession, and the general public that postdoctoral programs were operating within approved standards, rules and regulations, and providing educational training satisfactory to the public interest. The COPT has 32 members from affiliate organizations representing the major branches of osteopathic medicine, hospital administration, the uniformed services, and directors of medical education. (See Appendix I, page 1403.)

The COPT works through the Division of Postdoctoral Training of the AOA Department of Education to regulate and monitor postdoctoral training in osteopathic institutions and evaluate postdoctoral training taken in the military and approved allopathic locations. This is done through inspections of training programs which are then reviewed by the Committee at its meetings in April and November each year.

The COPT is divided into two subcommittees. The intern subcommittee reviews all intern policies and procedures: new and existing intern programs; requests for increases in the number of positions at training sites; requests for approval of military internships; and any other matter pertinent to intern training. The residency subcommittee, working through the osteopathic specialty colleges, reviews all residency policies and procedures: all new and existing residency programs; requests for increase in the number of positions in training

programs; requests for approval or recognition of allopathic and military specialty and subspecialty programs and training; and, any other issue pertinent to residency training.

Recommendations from the COPT on basic training documents and policy are defined by the Bureau of Professional Education and the AOA Board of Trustees for approval, while routine program and training approval recommendations go directly to the Board of Trustees. Items which are recommended for denial by the COPT may be appealed to the Bureau of Professional Education prior to presentation to the Board of Trustees. The approval and appeal processes and other policies regarding postdoctoral training are published in the AOA's annual *Yearbook and Directory of Osteopathic Physicians*.

Certification

Specialty certification is awarded by the AOA Board of Trustees through the appropriate specialty boards and on recommendation from the Advisory Board for Osteopathic Specialists. The Advisory Board was established in 1939 by action of the AOA Board of Trustees to meet the needs resulting from the growth of specialization in the osteopathic medical profession. The Advisory Board is composed of one representative from each of the 18 specialty boards, two representatives from the Bureau of Professional Education, and a chairman and vice chairman appointed by the president of the AOA. In addition to making recommendations to the Board of Trustees concerning certification of physicians, the Advisory Board makes recommendations concerning the rules, regulations, and procedures established by the specialty boards. The Advisory Board is also charged with providing recommendations concerning the establishment of new certifying boards and the assignment or transfer of specialty and/or subspecialty jurisdiction.

Osteopathic postdoctoral education

Postdoctoral education in the osteopathic medical profession maintains that a well-trained physician must have a broad-based clinical education as a

TABLE 1. INTERNSHIP - APPLICANTS AND POSITIONS, AS OF JULY 1 OF EACH YEAR.

<i>Intern class</i>	1986	1987	1988
Number new graduates	1,553	1,579	1,571
Registrants who graduated in previous years	11	12	30
Total available for internships	1,564	1,591	1,601
New graduates in funded osteopathic positions	1,349	1,330	1,332
New graduates in unfunded positions	6	3	0
New graduates in military programs	43	53	50
Subtotal for new graduates	1,398	1,386	1,382
Graduates from previous years in intern positions	8	5	18
DOs in allopathic programs, applied for "pilot program"	Not appl.	47	31
Total in AOA-approved internships	1,406	1,438	1,431
Applicants still seeking AOA positions as of July 1	9	21	22
<i>Hospital positions</i>			
Approved positions	1,643	1,660	1,774
Funded positions	1,378	1,387	1,490
Filled, funded positions	1,357	1,330	1,350
Filled, unfunded positions	6	3	0
Subtotal, filled positions	1,363	1,333	1,350
Vacant, funded positions	21	37	140

TABLE 2. INTERN CONTRACTS: RELEASES AND VIOLATIONS, AS OF JULY 1, 1988.

	Number	%
Total commitments made between hospitals and potential interns	1,352	
Agreements terminated by mutual consent:	105	7.8%
Of these 105, 26 interns (25%) went to allopathic programs, and 79 (75%) went to other osteopathic programs		
Breaching of contracts to go to allopathic programs, release not obtained	17	1.3%
Commitments broken by hospitals which closed	15	1.1%
Of these 15, 14 (93%) went to other AOA-approved programs		
Total releases in 1988-89	137	10.2%

foundation for further postdoctoral education. As a result, the AOA internship is a required prerequisite for entrance into osteopathic residency programs. Participants in osteopathic internships must be graduates of AOA accredited colleges of osteopathic medicine.

The osteopathic internship has a core curriculum, including 12 weeks of internal medicine, 12 weeks of surgery, four weeks of general practice, four weeks of pediatrics, and four weeks of obstetrics and gynecology. Osteopathic principles and practices are integrated throughout the internship. This core curriculum is mandated regardless of future educational or practice choices, and is described in more detail in the AOA's annual *Yearbook and Di-*

rectory of Osteopathic Physicians. Students interested in taking a military intern training program may apply for approval on an individual basis if the program rotations are equivalent to the rotating internship.

Following the internship, the AOA offers specialty and subspecialty residency programs which build on the internship year and give osteopathic physicians the opportunity to acquire advanced skills in specific specialty areas. Residency programs vary in length depending on the basic standards established by the specialty affiliate and approval by the AOA Board of Trustees. Currently there are 46 specialties with approved osteopathic residency programs which are designed to prepare the physician for examination for certification.

If an osteopathic physician who has completed an internship approved by the AOA is unable to obtain specialty or subspecialty training within the osteopathic profession, the resident may seek approval of the specialty training from the AOA. These policies and procedures are described in detail in the AOA's annual *Yearbook and Directory of Osteopathic Physicians*.

Postdoctoral education in transitions

During the past two decades, there have been tremendous increases in the number of graduates from osteopathic colleges. In 1970, there were only 470 graduates from osteopathic colleges; by 1988 this number had more than tripled, to 1,570. Conse-

TABLE 3. HOSPITAL CLOSINGS, AS OF JULY 1986-AUGUST 1988.

Institution	Approximate date	Intern positions	Residency programs	Residency positions
Saginaw Osteopathic Hospital, MI	March 1987	14	2	5
Baptist Medical Center, NY	November 1987	20	5	26
New Berlin Memorial Hospital, WI	April 1988	4	0	0
PCOM/St. Mary's Hospital/PA	June 1988	6	0	0
University Hospital/UHS, MO	July 1988	14	7	23
Total lost through closing		58	14	53

quently, the profession was faced with unprecedented demand for postdoctoral positions. To meet this need, members of the profession and the AOA staff undertook the expansion of training opportunities in osteopathic hospitals, both by further development of existing programs and creation of new programs in osteopathic hospitals. Furthermore, in 1986, the Board of Trustees adopted a policy to encourage expansion of postdoctoral programs in colleges of osteopathic medicine's, intern and residency programs. These efforts toward expansion have led to substantial gains: there were 1,775 approved intern positions in 1988, compared to only 1,218 approved positions in 1982 (a 46% increase). There are 114 more approved intern positions in 1988 than one year before, and 149 additional residency positions.

The Board of Trustees also adopted a resolution which created a "pilot program" as a temporary option for students who were unable to obtain osteopathic positions. This program is available only to 1987, 1988, and 1989 graduates who actively participated in the Intern Registration Program but failed to find an osteopathic internship. If these graduates participate in an allopathic program which meets the rotation requirements of an AOA-approved internship, they may apply through a subcommittee of the COPT for individual approval of their internships. Subsequent Board action determined that this "pilot program" will terminate June 30, 1990, as adequate intern positions will be available within the profession by that time.

During the July 1988 meeting of the AOA House of Delegates and Board of Trustees, a resolution was adopted to support, in principle, the report of its Task Force on Alternate Approval Mechanisms for Postdoctoral Training. This resolution may have a major impact on postdoctoral education (see the September 1988 issue of THE DO). One proposal of the report is creation of alternate paths for approval of postdoctoral training for DOs who have completed an AOA-approved internship and have completed or will complete residency training not approved under existing AOA policies and procedures. Details of the procedures and implementation of

TABLE 4. AOA-APPROVED INTERN POSITIONS BY STATE, AS OF JULY 1, 1988.

	Approved	Funded	Filled	Vacant
Arizona	40	34	32	2
California	56	40	36	4
Colorado	19	15	14	1
Delaware	6	6	2	4
Florida	116	103	88	15
Georgia	10	7	7	0
Illinois	86	71	71	0
Indiana	17	16	15	1
Iowa	28	25	22	3
Kansas	12	9	9	0
Maine	19	19	19	0
Massachusetts	4	2	2	0
Michigan	308	268	253	15
Missouri	86	66	62	4
New Jersey	123	96	88	8
New Mexico	6	6	4	2
New York	180	138	110	28
Ohio	189	166	146	20
Oklahoma	76	60	58	2
Oregon	7	5	5	0
Pennsylvania	250	229	218	11
Rhode Island	7	6	6	0
Texas	81	64	55	9
Washington	6	4	4	0
West Virginia	27	27	19	8
Wisconsin	15	8	5	3
Subtotal	1,774	1,490	1,350	140
Military	—	—	50	—
Total			1,400	

this proposal are under consideration by the appropriate AOA committees. We anticipate that the new mechanisms will begin to be approved in 1988-89, with many of the alternatives in place by July 1989.

A second recommendation of the report is possible restructuring of the internship. Institutions which choose to do so may continue their current rotating internship with little appreciable change. However, the proposed model would allow more flexibility in meeting the goal of preparing well-rounded general physicians while maintaining flexibility in meeting the needs of modern medical practice.

The proposed internship model decreases the number of required rotations; recommends additional emphasis on ambulatory, rather than hospital-based, care; places additional emphasis on conti-

Fig 1. Intern positions and total DOs.

nuity of care; and adds flexibility for the director of medical education or program director to work with an intern to tailor the program to meet the intern's future needs. Specifically, the proposal recommends four months of general/internal medicine, one month of ambulatory gynecology, one month of general ambulatory pediatrics, one month of inpatient general surgery, two months of ambulatory surgical specialties, and three months of electives. It further recommends addition of a primary care component and a biopsychosocial component throughout the 12-month period. This model would allow reevaluation of the first year of residency training by appropriate specialty colleges, to more closely integrate the internship and residency programs. This proposal is now before the appropriate AOA committees and subcommittees for further input and development of implementation mechanisms.

The third recommendation of the task force report is even further expansion of postdoctoral training opportunities in osteopathic institutions. While substantial gains have been made in this area, further development is needed to improve both quality and quantity of postdoctoral education opportunities.

In yet another change, the intern registration program will, for the first time in 1988, use a com-

puterized matching program. As before, interns and institutions are bound by the policies and procedures of the AOA, and may not make arrangements other than through this process. The deadline for receipt of materials from students and institutions is Jan 6, 1989, with results being reported on or about Feb 1.

Another major change approved by the Board in July 1988 was an increase in the general practice residency requirement, making it a two-year residency program. With inclusion of the intern year, this increase makes the general practice residency training sequence a three-year program.

Osteopathic internships

Table 1 summarizes results of the Intern Registration Program for the past three years. Note that the number of approved and funded intern positions increased from 1,387 in 1987 to 1,490 this year, an increase of 103 for the year. A total of 140 funded positions remained unfilled as of July 1, 1988.

Other than the increase in positions, the 1988 intern registration program results were similar to those from previous years. A total of 1,431 DOs are in AOA-approvable internships; this represents 89.4% of the potential pool of applicants. This compares to 90.4% in 1987 and 89.4% in 1986.

TABLE 5. OSTEOPATHIC RESIDENCY STATISTICS.

Specialty	1986-87			1987-88			1988-89		
	Pgms*	Pos†	Res‡	Pgms	Pos	Res	Pgms	Pos	Res
Anesthesiology	37	118	74	34	121	68	33	124	90
Dermatology	1	2	0	2	4	0	2	4	5
Emergency Medicine	17	70	50	17	83	76	16	123	85
General Practice	60	326	200	69	388	243	72	452	318
Internal Medicine	51	346	270	52	363	255	49	358	261
Allergy/Immunology	0	0	0	0	0	0	0	0	0
Cardiology	10	23	9	11	27	9	10	27	10
Endocrinology	1	1	0	1	1	0	1	1	0
Gastroenterology	6	16	8	6	16	7	6	16	9
Hematology	2	6	0	2	6	1	2	6	2
Hematology/Oncology	2	4	1	2	4	0	2	4	0
Infectious Diseases	1	2	0	3	6	0	3	6	1
Medical Diseases of the Chest	8	18	7	8	18	10	8	18	11
Nephrology	4	10	0	4	10	2	4	10	0
Oncology	0	0	0	0	0	0	0	0	0
Rheumatology	1	1	0	1	1	0	1	1	0
Neurology	5	13	9	5	13	6	5	13	12
Child Neurology	n/a	n/a	0	0	0	0	0	0	0
Nuclear Medicine	2	3	0	2	3	0	2	3	0
Obstetrics and Gynecological Surgery	31	124	105	32	126	109	37	127	110
Ophthalmology	15	40	27	16	42	29	15	41	30
Orthopedic Surgery	34	125	112	33	130	116	34	138	120
Osteopathic Principles and Practices	6	18	3	8	28	6	8	28	5
Otorhinolaryngology	3	6	5	3	6	4	4	8	5
Oro-Facial Plastic Surgery	16	49	33	16	50	31	16	51	36
Anatomic Pathology	20	45	10	20	45	6	18	43	12
Pediatrics	20	73	21	18	68	25	15	71	27
Neonatal Medicine	1	2	0	2	6	0	2	6	0
Public Health/Preventive Medicine	1	2	0	1	3	0	1	2	0
Proctology	5	8	4	5	8	3	4	6	1
Psychiatry	5	36	20	5	36	19	5	36	29
Child Psychiatry	2	4	0	2	4	0	2	4	0
Radiology	13	51	35	13	51	48	12	52	59
Angiography	1	1	0	1	2	0	1	2	0
Neuroradiology	1	1	1	1	1	0	1	1	0
Nuclear Radiology	1	1	1	1	2	1	1	2	0
Radiation Oncology	1	1	0	1	2	0	2	4	1
Diagnostic Ultrasound	1	1	0	1	1	1	1	1	0
Diagnostic Radiology	15	52	49	14	50	19	15	72	15
Rehabilitation Medicine	2	5	3	2	6	3	2	6	3
Surgery									
General	51	215	188	54	223	168	53	223	196
General Vascular	4	8	1	4	8	0	3	6	1
Neurological	6	13	5	7	16	9	6	14	10
Plastic and Reconstructive	0	0	0	0	0	0	0	0	0
Thoracic/Cardiovascular	3	7	0	3	7	0	2	5	0
Urological	16	35	17	15	33	16	14	31	16
Total	482	1,882	1,268	497	2,018	1,290	490	2,146	1,480

* Pgms = AOA approved residency programs.

† Pos = approved positions.

‡ Res = residents in AOA approved osteopathic training programs.

In 1988, 22 new graduates (1.4%) remain unmatched in any program. This number is consistent with previous years. Approximately 103 registrants took allopathic programs and 44 did not register with the AOA, bringing the total believed

to be in allopathic programs to 147, or 9.2%.

Table 2 addresses concern for intern agreements which were not filled. As shown in the table, most of these were mutual releases, to allow an intern to take a position in another osteopathic program.

Table 3 shows the loss of positions occurring because of hospital closings. These closings remain a source of great distress, in spite of the fact that the total number of available positions has been steadily increasing (Table 1). When a closing hospital has had interns or residents in training at the time of the closing, the Directors of Medical Education and the AOA have been able to assist with relocation of the trainees, and in every case where AOA assistance was sought, an AOA-approved position was identified for the resident or intern.

Table 4 lists intern positions and their geographic location. Ninety-two percent of the funded intern positions are found in the states with osteopathic colleges. Fig 1 shows, by state, a graph of intern positions and proportion of D.O.s. Six states account for 67% of the interns positions. Initiatives are under way to focus expansion of intern programs on "small states" and states for which there is unmet demand for intern positions.

Positions available—residencies

Table 5 reports data on residency training programs and residents in training. These data include programs approved at the July 1988 AOA Board of Trustees meeting. In 1988, there are 128 more positions than in 1987, and 264 more positions than 1986. The number of residents in training in osteopathic programs in 1988 shows a 7% increase over 1987 and a 15% increase since 1986.

Certification

Table 6 shows certification granted in 1986 through 1988. In 1980, a total of 276 physicians received certification; by 1988, this number had more than doubled, to 714.

Table 7 shows resident in nonosteopathic program who have received AOA approval of their training program.

Summary

Postdoctoral osteopathic education is in transition.

TABLE 6. PHYSICIANS RECEIVING CERTIFICATION, 1986-1988, AS OF AUGUST 31, 1988.

	86	87	88
Allergy and Immunology	0	0	0
Preventive Medicine/ Aerospace Medicine	4	1	2
Anesthesiology	3	19	14
Anatomic Pathology	0	3	2
Anatomic Pathology and Laboratory Medicine	1	0	0
Cardiology	22	13	8
Child Neurology	0	1	0
Child Psychiatry	0	1	1
Dermatology	7	3	7
Diagnostic Radiology	21	16	25
Emergency Medicine	37	38	30
Endocrinology	2	1	2
Fellow of the AAO	2	0	3
Gastroenterology	4	7	5
Gynecologic Oncology	0	0	1
General Practice	247	285	384
General Vascular Surgery	0	0	9
Hematology	0	2	0
Hematology and Oncology	0	0	0
Infectious Disease	1	1	2
Internal Medicine	59	78	80
Laboratory Medicine	1	2	1
Medical Diseases of the Chest	6	7	7
Maternal and Fetal Medicine	0	0	1
Neurology	0	3	6
Neonatology	4	1	1
Nephrology	3	4	4
Nuclear Medicine	3	0	1
Neurological Surgery	3	0	0
Obstetrics and Gynecology	0	11	13

Preventive Medicine/ Occupational Medicine/ Environmental Medicine	13	5	6
Obstetric/Gynecological Surgery	16	0	0
Preventive Medicine/ Occupational Medicine	0	0	0
Oncology	4	4	2
Otorhinolaryngology and Oro-Facial Plastic Surgery	2	7	7
Ophthalmology	5	12	8
Oro-Facial Plastic Surgery	1	0	2
Orthopedic Surgery	15	20	21
Otolaryngology	0	0	0
Otorhinolaryngology	1	0	2
Psychiatry	0	8	8
Pediatrics	11	20	16
Preventive Medicine and Public Health	0	4	0
Plastic and Reconstructive Surgery	0	0	0
Proctology	0	2	1
Radiology	3	2	2
Reproductive Endocrinology	0	0	2
Rheumatology	0	0	1
Rehabilitation Medicine	5	4	6
Radiation Oncology	0	1	1
Diagnostic Roentgenology	0	0	0
Surgery (General)	15	17	9
Thoracic/Cardiovascular Surgery	4	4	5
Radiation Therapy	2	0	0
Thoracic Surgery	0	0	0
Urological Surgery	7	6	6
Total Number of Physicians Per Year	534	613	714

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LDL + VLDL cholesterol	↓	↔	↔	↑	↔
HDL cholesterol	↔	↔	↔	↔	↓
Triglycerides	↔	↔	↔	↑	↑

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Brief Summary

CLINICAL PHARMACOLOGY: Pharmacodynamics: Clinical studies of terazosin used in once-a-day (majority) and b.i.d. regimens with total doses usually in the range of 5-20mg/day, in patients with mild or moderate hypertension. Because terazosin, like all alpha₁ antagonists, can cause large falls in blood pressure after the first dose or first few doses, the initial dose was 1mg in virtually all studies, with subsequent titration to a specified fixed dose or titration to a specified blood pressure end point.

Blood pressure responses were measured at the end of the dosing interval (usually 24 hrs.) and effects were shown to persist throughout the interval, with usual supine responses 5-10mmHg systolic and 3-5mmHg diastolic greater than placebo. The responses in the standing position tended to be somewhat larger, although this was not true in all studies. The magnitude of blood pressure responses was similar to prazosin and less than hydrochlorothiazide (in a single study). In measurements 24 hrs. after dosing, heart rate was unchanged.

Limited measurements of peak response (2-3 hrs. after dosing) during chronic terazosin administration indicate that it is more than twice the trough (24 hr.) response, suggesting some attenuation of response at 24 hrs. presumably due to a fall in blood terazosin concentrations at the end of the dose interval. This explanation is not established with certainty and is not consistent with the similarity of blood pressure response to once-a-day and b.i.d. dosing. With the absence of an observed dose-response relationship over a range of 5-20mg, i.e., if blood concentrations fall to the point of providing less than full effect at 24 hrs., a shorter dosing interval or larger dose should lead to increased response. Measure blood pressure (BP) at the end of the dose interval; if response is not satisfactory, patients may be tried on a larger dose or b.i.d. regimen. The latter should be considered if side effects, such as dizziness, palpitations, or orthostatic complaints, are seen within a few hours after dosing.

The greater BP effect associated with peak plasma concentrations (first few hours after dosing) appears somewhat more position-dependent (greater in the erect position) than the effect of terazosin at 24 hrs. In the erect position there is a 6-10 bpm increase in heart rate in the first few hours after dosing. During the first 3 hrs. after dosing 12.5% of patients had a systolic pressure fall of 30mmHg or more from supine to standing, or standing systolic pressure below 50mmHg with a fall of at least 20mmHg, compared to 4% of a placebo group.

INDICATIONS AND USAGE: Indicated for the treatment of hypertension.

CONTRAINDICATIONS: None known.

WARNINGS: Syncope and "First-dose" Effect: Terazosin, like other alpha₁-adrenergic blocking agents, can cause marked hypotension, especially postural hypotension, and syncope in association with the first dose or first few doses. A similar effect may occur if therapy is interrupted for more than a few days. Syncope has been reported with other alpha₁-adrenergic blocking agents in association with rapid dose increases or introduction of another antihypertensive drug. Syncope may be due to an excessive postural hypotensive effect, although occasionally the syncope episode has been preceded by severe supraventricular tachycardia with heart rates of 120-160 bpm.

To decrease the likelihood of syncope or excessive hypotension, always initiate treatment with a 1mg dose at bedtime. The 2mg, 5mg and 10mg tablets are not indicated as initial therapy. Increase dosage slowly, and add additional antihypertensive agents with caution. Caution patients to avoid situations where injury could result if syncope occurs during initiation of therapy.

In early studies, where increasing single doses up to 7.5mg were given at 3 day intervals, tolerance to the first dose phenomenon did not necessarily develop and the "first dose" effect was observed at all doses. Syncope episodes occurred in 3 of 14 subjects given doses of 2.5, 5, and 7.5mg, which are higher than the recommended initial dose. Severe orthostatic hypotension (BP 50/0mmHg) was seen in two others and dizziness, tachycardia, and lightheadedness occurred in most subjects. These adverse effects all occurred within 90 min. of dosing.

In multiple dose clinical trials involving nearly 2000 patients, syncope was reported in about 1% of patients, in no case severe or prolonged, and was not necessarily associated with early doses.

If syncope occurs, place patient in recumbent position and treat supportively. There is evidence that the orthostatic effect of terazosin is greater, even in chronic use, shortly after dosing.

PRECAUTIONS: General: **Orthostatic Hypotension:** While syncope is the most severe orthostatic effect of terazosin, other symptoms of lowered BP, such as dizziness, lightheadedness and palpitations, are more common, occurring in 28% of patients in clinical trials. Patients with occupations in which such events represent potential problems should be treated with particular caution.

Information for Patients: Make aware of possibility of syncope and orthostatic symptoms, especially at initiation of therapy, and to avoid driving or hazardous tasks for 12 hrs. after the first dose, after a dosage increase, and after interruption of therapy when treatment is resumed. Caution to avoid situations where injury could result should syncope occur during initial therapy. Advise to sit or lie down when symptoms of lowered BP occur and to rise carefully from a sitting or lying position. Bothersome dizziness, lightheadedness, or palpitations should be reported to physician.

Tell patients that drowsiness or somnolence can occur, requiring caution in people who must drive or operate heavy machinery.

Laboratory Tests: Small but statistically significant decreases in hematocrit, hemoglobin, WBC, total protein and albumin were observed in clinical trials. The magnitude of decreases did not worsen with time. These findings suggest the possibility of hemodilution.

Drug Interactions: In controlled trials, terazosin was added to diuretics, and several beta-adrenergic blockers; no unexpected interactions were observed. Terazosin has also been used concomitantly without interaction in at least 50 patients on the following: 1) analgesic/anti-inflammatory (acetaminophen, aspirin, codeine, ibuprofen, indomethacin); 2) antibiotics (erythromycin, trimethoprim and sulfamethoxazole); 3) anticholinergic/sympathomimetics (phenylephrine HCl, phenylpropanolamine HCl, pseudoephedrine HCl); 4) antitumor (allopurinol); 5) antihistamines (chlorpheniramine); 6) cardiovascular agents (atenolol, hydrochlorothiazide, methyldopa, nifedipine, propranolol); 7) corticosteroids; 8) gastrointestinal agents (antacids); 9) hypoglycemics; 10) sedatives and tranquilizers (diazepam).

Carcinogenesis, Mutagenesis, Impairment of Fertility: HYTRIN was devoid of mutagenic potential when evaluated *in vivo* and *in vitro*.

HYTRIN, administered in feed to rats at doses of 8, 40, and 250mg/kg/day for 2 yrs., was associated with a

statistically significant increase in benign adrenal medullary tumors of male rats exposed to the 250mg/kg dose. This dose is 655 X max. recommended human dose (20mg/55kg). Female rats were unaffected. HYTRIN was not oncogenic in mice when administered in feed for 2 yrs. at a maximum tolerated dose of 32mg/kg/day.

The absence of tumorigenicity in a battery of tests, of tumorigenicity in any cell type in the mouse carcinogenicity assay, of increased total tumor incidence in either species, and of proliferative adrenal lesions in female rats, suggests a male rat species-specific event. Numerous other diverse pharmaceutical and chemical compounds have been associated with these tumors in male rats without supporting evidence for carcinogenicity in man.

Effects on fertility were assessed in a standard fertility/reproductive performance study in which male and female rats were administered oral doses of 8, 30 and 120mg/kg/day. Four of 20 male rats given 30mg/kg and 5 of 19 female rats given 120mg/kg failed to sire a litter. Testicular weights and morphology were unaffected. Vaginal smears at 30 and 120mg/kg/day appeared to contain less sperm than smears from control matings and good correlation was reported between sperm count and subsequent pregnancy.

(Oral use for 1 or 2 yrs. elicited a statistically significant increase in testicular atrophy in rats exposed to 40 and 250mg/kg/day, but not in rats exposed to 8mg/kg/day (> 20 X max. recommended human dose). Testicular atrophy was observed in dogs dosed with 300mg/kg/day (> 800 X max. recommended human dose) for 3 months but not after 1 yr., when dosed with 20mg/kg/day. This lesion has also been seen with Minoxipress[®].

Pregnancy: Teratogenic effects: Pregnancy Category C. There are no adequate and well-controlled studies in pregnant women and the safety of terazosin in pregnancy has not been established. HYTRIN is not recommended during pregnancy unless potential benefit justifies potential risk to mother and fetus.

Nonteratogenic effects: In a peri- and post-natal development study in rats, significantly more pups died in the group dosed with 120mg/kg/day (> 300 X max. recommended human dose) than in the control group during the 3-week post-partum period.

Nursing Mothers: It is not known whether terazosin is excreted in breast milk; therefore, exercise caution when administering terazosin to a nursing woman.

Pediatric Use: Safety and effectiveness have not been determined.

ADVERSE REACTIONS: The prevalence of adverse reactions has been ascertained from 14 placebo-controlled studies conducted primarily in the U.S. The studies involved once-a-day administration of terazosin as monotherapy or in combination with other antihypertensive agents, at doses ranging from 1 to 40mg. All adverse events reported during these studies were recorded as adverse reactions. Adverse events where the prevalence rate in the terazosin group was at least 5%, where the prevalence rate for the terazosin group was at least 2% and was greater than the prevalence rate for the placebo group, or where the reaction is of particular interest are summarized below. Only asthenia, blurred vision, dizziness, nasal congestion, nausea, peripheral edema, palpitations and somnolence were significantly ($p < 0.05$) more common in patients receiving terazosin than in patients receiving placebo.

Other events include (%TERAZOSIN-%PLACEBO): asthenia (1.3%-4.3%), back pain (2.4%-1.2%), blurred vision (1.6%-0.9%), depression (0.3%-0.2%), dizziness (19.3%-7.5%), dyspnea (3.1%-2.4%), edema (0.9%-0.6%), headache (16.2%-15.8%), impotence (1.2%-1.4%), libido decreased (0.6%-0.2%), nasal congestion (5.9%-3.4%), nausea (4.4%-1.8%), nervousness (2.3%-1.8%), pain extremities (2.5%-3%), palpitations (4.3%-1.2%), paresthesia (2.9%-1.4%), peripheral edema (5.5%-2.4%), postural hypotension (1.3%-0.4%), sinusitis (2.6%-1.4%), somnolence (5.4%-2.6%), tachycardia (1.9%-1.2%), weight gain (0.5%-0.2%).

Adverse reactions were usually mild or moderate in intensity but sometimes were serious enough to interrupt therapy. Adverse reactions that were most bothersome as judged by being reported as reasons for discontinuation of therapy by at least 0.5% of the terazosin group and being reported more often than in the placebo group (%TERAZOSIN-%PLACEBO) are: asthenia (1.6%-0.9%), blurred vision (0.6%-0.9%), dizziness (3.1%-0.4%), dyspnea (0.9%-0.6%), headache (1.3%-1%), nasal congestion (0.6%-0.4%), nausea (0.8%-0.4%), palpitations (1.4%-0.2%), paresthesia (0.8%-0.2%), peripheral edema (0.6%-0.4%), postural hypotension (0.5%-0.4%), somnolence (0.6%-0.2%), syncope (0.5%-0.2%), tachycardia (0.6%-0.4%).

Additional adverse reactions have been reported, but these are not distinguishable from symptoms that might have occurred in the absence of exposure to terazosin. The following additional adverse reactions were reported by at least 1% of 1987 patients who received terazosin in clinical studies or during marketing experience: abdominal pain, abnormal vision, anxiety, arthralgia, arthritic, arthritis, bronchitis, chest pain, cold symptoms, conjunctivitis, constipation, diarrhea, dry mouth, dyspepsia, epistaxis, facial edema, fever, flatulence, flu symptoms, gait, increased cough, insomnia, joint disorder, myalgia, neck pain, pharyngitis, pruritus, rash, rhinitis, shoulder pain, sweating, tinnitus, urinary frequency, urinary tract infection, vasodilation, vomiting.

DOSE AND ADMINISTRATION: Dose and dose interval (12 or 24 hrs.) should be adjusted according to BP response.

Initial Dose: 1mg at bedtime. Observe the initial dosing regimen strictly to minimize potential for severe hypotensive effects.

Subsequent Doses: Slowly increase dose to achieve desired BP response. Usual dose range is 1mg to 5mg once a day. Some patients may benefit from doses up to 20mg/day. Doses over 20mg do not appear to provide further BP effect. Doses over 40mg have not been studied. Monitor BP at the end of dosing interval to assure control is maintained. It may be helpful to measure BP 2-3 hrs. after dosing to see if maximum and minimum responses are similar, and to evaluate symptoms which can result from excessive hypotensive response. If response is substantially diminished at 24 hrs, consider an increased dose or b.i.d. regimen. If administration is discontinued for several days or longer, reinstitute therapy using initial dosing regimen. In clinical trials, except for the initial dose, the dose was given in the morning.

Use With Other Drugs: Caution should be observed when terazosin is administered concomitantly with other antihypertensive agents (e.g., calcium antagonists) to avoid the possibility of significant hypotension. When adding a diuretic or other antihypertensive agent, dosage reduction and retitration may be necessary.

Revised: Sept., 1988 Abbott Health Care Products, Inc. North Chicago, IL 60064

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References: 1. HYTRIN Product Information, Abbott Laboratories. 2. Deger G: Effect of terazosin on serum lipids. *Am J Med* 1986;80(suppl 5B):82-85. 3. Dza VJ: Evolution of the clinical management of hypertension: Emerging role of "specific" vasodilators as initial therapy. *Am J Med* 1987;82(suppl 1A):36-43. 4. Weinberger MH: The effects of antihypertensive therapy on lipids. *Cardiovasc Med* 1986;11:10-11. 5. Ames RP: The effects of antihypertensive drugs on serum lipids and lipoproteins. II. Non-diuretic drugs. *Drugs* 1986;32:335-357.

TABLE 7. RESIDENTS IN AOA-APPROVED NONOSTEOPATHIC PROGRAMS 1986-87 THROUGH 1988-89.

	1986-87			1987-88			1988-89		
	N/O*	M†	P‡	N/O	M	P	N/O	M	P
Aerospace Medicine	1	2	0	2	2	0	3	11	0
Anesthesiology	3	8	0	3	7	0	2	10	0
Cardiology	4	0	0	11	0	0	12	0	0
Dermatology	3	2	10	4	3	18	1	2	24
Emergency Medicine	4	2	0	7	3	0	12	2	0
Endocrinology	3	0	0	1	0	0	3	0	0
Gastroenterology	1	1	0	3	0	0	3	0	0
General Practice	0	4	0	2	16	0	2	8	0
Hematology	0	0	0	1	0	0	6	0	0
Hematology/Oncology	5	0	0	4	0	0	4	0	0
Infectious Disease	4	0	0	1	0	0	3	0	0
Internal Medicine	0	6	0	0	4	0	0	3	0
Maternal/Fetal Medicine	2	0	0	1	0	0	0	0	0
Medical Diseases of the Chest	3	0	0	5	0	0	6	1	0
Neonatal Medicine	0	0	0	2	0	0	3	0	0
Nephrology	3	0	0	5	0	0	3	0	0
Neurological Surgery	2	0	0	2	0	0	1	0	0
Neurology	15	2	0	24	2	0	26	1	0
Neuroradiology	1	0	0	0	0	0	5	0	0
Nuclear Medicine	0	0	0	0	0	0	0	0	0
Obstetrics and Gynecological Surgery	2	10	0	2	5	0	2	3	0
Occupational and Environmental Medicine	1	0	0	1	0	0	8	0	0
Oncology	4	0	0	2	0	0	3	0	0
Ophthalmology	2	3	1	3	2	1	2	0	1
Orthopedic Surgery	1	3	0	0	3	0	0	3	0
Otolaryngology	1	1	0	0	1	0	1	2	0
Otorhinolaryngology	0	0	0	0	0	0	0	1	0
Otorhinolaryngology and Oro-Facial Plastic Surgery	0	1	0	0	0	0	0	0	0
Pathology	0	1	0	0	2	0	1	3	0
Pediatrics	0	5	0	0	2	0	0	4	0
Plastic and Reconstructive Surgery	2	1	0	1	0	0	8	0	3
Proctology	0	0	1	0	0	1	0	0	1
Psychiatry	21	2	0	21	3	0	33	5	0
Psychiatry, Child	0	0	0	0	0	0	2	0	0
Public Health	3	0	0	3	1	0	4	0	0
Radiation Oncology	2	0	0	3	0	0	2	0	0
Radiology	0	2	0	0	2	0	0	1	0
Radiology, Diagnostic	0	5	0	0	6	0	0	4	0
Rehabilitation Medicine	13	0	0	23	0	0	33	1	0
Rheumatology	3	0	0	4	0	0	4	0	0
Surgery, General	0	2	0	0	2	0	0	3	0
Surgery, Thoracic and Cardiovascular	6	0	0	3	0	0	6	0	0
Surgery, Urologic	1	1	0	0	1	0	1	1	0
Surgery, General Vascular	1	0	0	1	0	0	2	0	0
Totals	117	64	12	145	67	20	207	69	29

*N/O = nonosteopathic residents in training.

†M = military residents in training.

‡P = physicians enrolled as preceptees.

Increases in the number of osteopathic graduates has led to dramatic changes in the need for postdoctoral positions. This in turn has led to changes in expansion of AOA internships and residencies and to changes in AOA policies and procedures.

Details regarding program approval, internship and residency requirements, names of active programs, and information on certification are available on request from the AOA Department of Edu-

cation, Division of Postdoctoral Training, 142 E. Ontario Street, Chicago, Illinois 60611.

Dr Ward and Dr Baker are director and associate director, respectively, of the AOA Department of Education.

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