

A Complicated Nail Puncture Wound

Marcia J. Chesebro, MD
Tuscaloosa, Alabama

In May 1983, a 10-year-old boy wearing sneakers stepped on a nail while playing in a rural part of Alabama. The following day he was seen in the outpatient clinic, and inspection revealed a small, nonpurulent, non-erythematous puncture wound on the lateral forefoot, with no swelling or foreign or necrotic material. An x-ray film showed no bony or soft tissue abnormality. He received a tetanus shot, instructions for local wound care, and a prescription for penicillin. The wound was not probed. Five days later he returned with redness, swelling, and pain in the forefoot. No purulent material was present at the puncture wound site, the white cell count was $11.4 \times 10^9/L$ ($11.4 \times 10^3/\mu L$), and his temperature was $37.8^\circ C$ ($100^\circ F$). He was admitted to the hospital, blood cultures and a subcutaneous culture of the wound were obtained, and intravenous nafcillin was started for a diagnosis of cellulitis.

All cultures from admission showed no growth, and findings on an x-ray film of the foot were normal. Over the next three days the boy showed gradual, though not complete, improvement. The findings on a foot x-ray examination were again normal. Sedimentation rate was 91 mm/h. An orthopedic consultant saw the patient and added tobramycin. On the 15th day after injury, results of an x-ray examination, a bone scan, and a computed tomographic scan of the foot were normal. Persistence of symptoms necessitated surgical exploration of the foot, revealing a loculated abscess with a small area of osteomyelitis of the fourth metatarsal. Cultures of the abscess and bone showed a light growth of *Pseudomonas aeruginosa*. In the succeeding six months the patient underwent two more hospitalizations and a right cuboidectomy. Five years after the injury he has no residual problems and is able to run, play baseball, and lift weights.

Submitted, revised, May 9, 1988.

From the Department of Family Medicine, College of Community Health Sciences, The University of Alabama, Tuscaloosa, Alabama. Requests for reprints should be addressed to Dr. Marcia J. Chesebro, Capstone Medical Center, 700 University Blvd East, Tuscaloosa, AL 35401.

DISCUSSION

Osteomyelitis following nail puncture wounds to the foot is difficult to diagnose because the clinical presentation is quite different from that seen with osteomyelitis of hematogenous origin, the usual osteomyelitis of childhood. A patient appears to recover from the injury and is asymptomatic for a variable period, usually 7 to 10 days, although it can be as long as eight years.¹ Subsequently, signs of local inflammation with minimal systemic toxicity develop. The leukocyte count may be normal or mildly elevated, and the sedimentation rate may or may not be abnormal.

In a retrospective study of 887 children presenting with puncture wounds of the foot,² 14.9 percent eventually developed cellulitis or abscess. Gram-positive organisms, especially penicillin-resistant *Staphylococcus aureus*, *S epidermidis*, and α -hemolytic streptococcus, were predominant. Most of these infections responded to soaking, elevation, rest, and antimicrobial therapy. Osteomyelitis developed in 1.8 percent of the 887 patients, with a mean interval between injury and diagnosis of 1.6 weeks. If the patients with osteomyelitis who were referrals from other hospitals are excluded, the incidence of osteomyelitis developing after a puncture wound of the foot is 0.6 percent.

Pseudomonas is a strictly aerobic, gram-negative bacillus found in moist areas, including soil, swimming pools, whirlpools, hot tubs, contact lens solution, disinfectants (eg, hexachlorophene), sinks, and distilled water. Because of its absolute requirement for oxygen, it is an organism of low virulence, rarely causing problems without a disruption of a person's normal defenses (eg, a break in the skin, burns, catheters) or a dysfunction of the immune system.³ Various sources for the origin of the infecting organism have been proposed, including the skin, the sneakers, the nail, the soaking solution, and distant sites by means of hematogenous seeding. Out of 370 moist cotton-swab cultures from various sites, including the feet and shoes of children and of metal nails collected from the ground, *P aeruginosa* was isolated only once, from the interdigital space of a child wearing sneakers.⁴ Cultures

Continued on page 641

Continued from page 640

from various parts of sneakers of children with documented *Pseudomonas* osteomyelitis found the organism in the spongy inner sole. No *Pseudomonas* was recovered from new sneakers.⁵ Thus, it is probable that the spongy inner soles of sneakers are the source of *Pseudomonas* in complicated puncture wound cases rather than the skin or the nail. Theoretically, hematogenous seeding to the injured area from colonized areas is possible. Rates of *Pseudomonas* colonization range from 2.6 to 24 percent in the stool, 0 to 6.6 percent in the throat, and 0 to 3.3 percent in the nose. These rates may exceed 50 percent in persons treated with antibiotics.⁶

Initial management of a puncture wound involves cleansing with iodophor, debriding dead skin, unroofing the site to prevent premature closure of the wound, and gentle, sterile probing of the wound for foreign bodies.² An x-ray film should be obtained to look for radiopaque foreign bodies.⁷ Tetanus prophylaxis is needed if more than five years have passed since the previous immunization. Rest, elevation, and daily soaking of the foot are also recommended.⁸

The administration of antibiotics at the initial presentation is controversial. If the wound appears heavily contaminated by dirt, a prophylactic broad-spectrum antibiotic should be considered.⁷ No single antibiotic is consistently active against all potential puncture wound contaminants. The combination of amoxicillin and clavulanate potassium has good activity against streptococcus, staphylococcus, and anaerobes, the most common organisms causing cellulitis associated with puncture wounds. Ciprofloxacin may show promise, being bactericidal and active *in vitro* against all aerobic microorganisms; however, clinical trials for its use in skin and soft tissue infections are needed.⁹

Cellulitis will usually respond to rest, elevation, and antibiotics.² Those cases that progress to osteomyelitis need surgical exploration to confirm the diagnosis and to treat infection adequately, even if adequate antibiotic

therapy was instituted earlier. *Pseudomonas* will survive in indolent form until all necrotic tissue is removed. Also, drug penetration into infected sites is often poor.

In summary, nail puncture wounds to the feet are common, and fewer than 15 percent develop complications, usually cellulitis. Most of these problems will resolve with conservative management. A very small percentage of patients, however, will develop bone or joint infection, usually caused by *P aeruginosa*, and will need surgical drainage. Prophylactic antibiotics, if used at the time of injury, should be broad-spectrum, especially covering staphylococcal and streptococcal species. If symptoms persist longer than four or five days, the possibility of a bone or joint infection should be considered and more aggressive management instituted.

References

1. Feigin RD, McAlister WH, San Joaquin VH, Middelkamp JN: Osteomyelitis of the calcaneus: Report of eight cases. *Am J Dis Child* 1970; 119:61-65
2. Fitzgerald RH Jr, Cowan JDE: Puncture wounds of the foot. *Orthop Clin North Am* 1975; 6:965-972
3. Pollack M: *Pseudomonas aeruginosa*. In Mandell GL, Douglas RG, Bennett JE (eds): *Principles and Practice of Infectious Diseases*. New York, John Wiley & Sons, 1985, pp 1236-1245
4. Fritz RH, Crosson FJ Jr: Concerning the source of *Pseudomonas* osteomyelitis of the foot, letter. *J Pediatr* 1977; 91:161-162
5. Fisher MC, Goldsmith JF, Gilligan PH: Sneakers as a source of *Pseudomonas aeruginosa* in children with osteomyelitis following puncture wounds. *J Pediatr* 1985; 106:607-609
6. Morrison AJ Jr, Wenzel RP: Epidemiology of infections due to *Pseudomonas aeruginosa*. *Rev Infect Dis* 1984; 6:S627-642
7. Rosen P, Baker F, Barkin RM, et al: *Emergency Medicine: Concepts and Clinical Practice*. St. Louis, CV Mosby, 1988, pp 923-925
8. Sanford CC: Puncture wounds of the foot. *Am Fam Physician* 1981; 24:119-122
9. Parry MF, Folta D, Nossek IT, et al: Comparative activity of ciprofloxacin and other new agents against 1454 clinical isolates at a community hospital. *Curr Ther Res* 1985; 38:755-761

Index to Volume 27

Pages	Number	Date
1-120	1	July 1988
121-232	2	August 1988
233-344	3	September 1988
345-448	4	October 1988
449-560	5	November 1988
561-656	6	December 1988

SUBJECT INDEX

A

ABSENTEEISM CERTIFICATION and the physician's role (Ash) (Letter) 464 (Fried) (Reply) 464
 ACANTHAMOEBA KERATITIS in contact lens wearers (White Jr et al) 104
 AGING infections and the immune system (Haddy) 409
 ALCOHOL and acute renal failure (Elsasser et al) 221
 ALCOHOL ABUSE in an adolescent (Forney et al) 65
 ALPHA-FETOPROTEINS screening for in maternal serum (Reed et al) (Letter) 20 (Campbell) (Reply) 26
 ALTITUDE and exercise in young adults (Perna et al) 279
 ANKYLOSING SPONDYLITIS abnormalities of the hand and wrist (Hogikyan et al) 533
 ASTHMA theophylline dosing and testing in (Moore III & Taylor) 57

B

BLOOD PRESSURE MONITOR automatic in primary care (Maines) (Letter) 357 (Ornstein) (Reply) 357
 BOOK REVIEWS
 Alcoholism: A Guide for the Primary Care Physician (Barnes et al) 334
 Clinical Method: A General Practice Approach (Fraser) 546
 Community-Oriented Primary Care: From Principle to Practice (Nutting) 546
 Comprehensive Gynecology (Droegemueller et al) 633
 Current Medical Diagnosis & Treatment (Schroeder et al) 633
 Cutaneous Side Effects of Drugs (Bork) 545
 Emergency Procedures and Techniques (Simon & Brenner) 224
 Family-Centered Medical Care: A Clinical Casebook (Doherty & Baird) 432

Handbook for the Academic Physician (McGaghie & Frey) 546
 Harrison's Principles of Internal Medicine Companion Handbook (Braunwald et al) 334
 Infections of the Hand (Mann) 545
 Interpretation of Arrhythmias: A Self-Study Program (Stein) 634
 Medicine: Preserving the Passion (Manning & De-Bakey) 432
 Neurology (Bernat & Vincent) 545
 Nutrition, Weight Control, and Exercise (Katch & McArdle) 634
 Office Gynecology (Glass) 634
 Oxford Textbook of Medicine (Weatherall) 633
 Pediatrics (Rudolph) 332
 The Physician as Teacher (Schwenk & Whitman) 435
 Primary Care Medicine: Office Evaluation and Management of the Adult Patient (Goroll et al) 434
 Procedures in Ambulatory Care (Gillette) 224
 Questions & Answers on AIDS (Frumkin & Leonard) 434
 Setting Limits: Medical Goals in an Aging Society (Callahan) 432
 Textbook of Diagnostic Medicine (Samii) 224
 Textbook of General Medicine and Primary Care (Noble) 332
 Year Book of Family Practice 1987 (Rakel) 332
 BULIMIA NERVOSA and diuretic abuse (Pomeroy et al) 493

C

CANCER endometrial screening for (Greenburg) (Letter) 258
 CAPITATED REIMBURSEMENT physician satisfaction with (Murray) 108
 CARDIOPULMONARY RESUSCITATION the slow code a hidden conflict (Neher) 429

CESAREAN SECTION

- fever and abnormal chest x-ray in (Miller et al) 259
- strategies to avoid (Glasser) 514

CHOLESTEROL elevated management in primary care (Vivier et al) 167

CHROMIUM and hypocholesterolemic effects (Urberg et al) 603

CLINICAL REVIEWS

- Aging infections and the immune system (Haddy) 409
- Bacterial vaginosis (Weaver & Mengel) 207
- Fever in children younger than three months of age: A pooled analysis (Gehlbach) 305
- Medical management of pressure sores (Knight) 95
- Preoperative evaluation of the elderly patient (Galazka) 622
- Strategies to avoid unnecessary cesarean sections (Glasser) 514

COMPARTMENT SYNDROME chronic in an elderly man (Lutz et al) 417

COMPUTER

- assisted exercise prescription (Brown & Cordes) 267
- assisted literature searches the comprehensiveness of (DeNeef) 404
- drug interactions screening and reduction of adverse reactions (Paulshock) (Letter) 330
- genogram development and evaluation of (Ebell & Heaton) 536

CONTACT LENSES acanthamoeba keratitis in wearers (White Jr et al) 104

CONTINUITY OF CARE and population mobility (McWhinney et al) 291 (commentary) (Dietrich) 294

CONTROVERSIES IN FAMILY PRACTICE

- Is screening mammography routinely indicated for women between 40 and 50 years of age? An affirmative view (Dodd) 313
- Is screening mammography routinely indicated for women between 40 and 50 years of age? An opposing view (Taplin) 316
- Is ultrasound of the prostate indicated for screening purposes? An affirmative view (Lee et al) 521
- Is ultrasound of the prostate indicated for screening purposes? An opposing view (Ansell) 525

COST EFFECTIVENESS principles for research (Ganiats & Schneiderman) 77

D

DECISION MAKING evaluation of two tools in acute cardiac ischemia (Corey) (Letter) 576 (Green) (Reply) 577

DECUBITUS ULCERS medical management (Knight) 95

DEPRESSION

- and physical illness (Reifler) 27

- in the elderly (Cadoret & Widmer) 71
- medical and psychosocial correlates (Duer et al) 609
- somatization and social factors (Katon) 579

DIAGNOSTIC TEST for theophylline and training of office personnel (Fischer et al) 497

DIURETIC ABUSE in patients with bulimia nervosa (Pomerooy et al) 493

DRUG INTERACTIONS and reduction of adverse reactions by computerized screening (Paulshock) (Letter) 330

DYSTOCIA diagnostic criteria and management (Byrd et al) 595

E

EDUCATION IN FAMILY PRACTICE

- The effect of a rural preceptorship during residency on practice site selection and interest in rural practice (Norris & Norris) 541

- Variations in content of care in a family medicine residency relating to types of insurance coverage (Johnson & Murata) 87

ENALAPRIL serum potassium and hypertension (Hume) 217

ENDOCARDITIS infective (Peterson) (Letter) 329

ENDOMETRIAL CANCER screening for (Greenberg) (Letter) 258

ENDOSCOPY cleaning endoscopes and prevention of HIV infection (Katner et al) 271

EPIGLOTTITIS acute and gastrointestinal bleeding (Kyrzcz & Indyk) 102

ERECTILE IMPOTENCE (Greico) (Letter) 357 (Heller & Gleich) (Reply) 357

EXERCISE at high altitude in young adults (Perna et al) 279

EXERCISE PRESCRIPTION microcomputer assisted (Brown & Cordes) 267

F

FAITH HEALING family practice patients' experiences (King et al) 505

FAMILY MEDICINE

- and religion (Brody & Foglio) 473
- residency training (Kerr) (Letter) 462

FAMILY PHYSICIANS

- and hospital privileges (Ferentz et al) 297
- use of sigmoidoscopy (Buckley et al) 197

FAMILY PRACTICE

- and obstetrics (Krall) (Letter) 329
- and obstetrics (Salyards) (Letter) 252
- and obstetrics (Toffler & Wall) (Letter) 16 (Eggertsen) (Letter) 16 (Meenan) (Letter) 17 (Weyrauch & Berman) (Letter) 17 (Rosenblatt) (Reply) 17
- and obstetrics in Ohio (Salyards) (Letter) 252

- FAMILY PRACTICE AND THE HEALTH CARE SYSTEM
 Physician satisfaction with capitation patients in an academic family medicine clinic (Murray) 108
 Specialty bias in obstetric care for high-risk socioeconomic groups in Maine (Onion & Mockapetris) 423
- FAMILY PRACTICE FORUM
 The "slow code": A hidden conflict (Neher) 429
- FAMILY PRACTICE GRAND ROUNDS
 Caring for the paraplegic patient and her family (Bluestein et al) 365
 Fever and abnormal chest x-ray findings after cesarean section (Miller et al) 259
 Headache and chronic pain in primary care (Greer et al) 477
 Male sexual impotence: A case study in evaluation and treatment (Halvorsen et al) 583
 A married man seropositive for human immunodeficiency virus (Prichard et al) 33
 Nutritional assessment of the hospitalized patient (Lipsky et al) 149
- FEBRILE INFANT management of (Shelov) 247
- FEVER IN INFANTS
 management of (Shelov) 247
 younger than three months of age (Gehlbach) 305

G

- GASTROINTESTINAL BLEEDING and acute epiglottitis (Kyrz & Indyk) 102
- GENOGRAM computer development and evaluation of (Ebell & Heaton) 536
- GERIATRICS
 compartment syndrome in an elderly man (Lutz et al) 417
 depression in the elderly (Cadoret & Widmer) 71
 infections and immune system (Haddy) 409
 preoperative evaluation of the elderly patient (Galazka) 622

H

- HEADACHE
 and chronic pain in primary care (Greer et al) 477
 in primary care (Becker et al) 41 (commentary) (Bass & McWhinney) 46
- HEALTH CARE AND POOR PATIENTS perceptions of residents (Price et al) 615 (commentary) (Roter) 620
- HIV seropositive in a married man (Prichard et al) 33
- HIV INFECTION prevention in cleaning endoscopes (Kattner et al) 271
- HMO procedure selection in (Norman) 327
- HOME VISITS follow-up study in an urban program (Gillette) (Letter) 360 (Balaban) (Reply) 436
- HOMOSEXUALITY attitudes toward (Prichard et al) 637

- HOSPITAL PRIVILEGES
 documentation of students' experiences in training (Franks) (Letter) 142 (Schneeweiss et al) (Reply) 142
 for family physicians (Ferentz et al) 297
- HYPERCHOLESTEROLEMIA
 management in primary care (Vivier et al) 167
 should cholesterol-lowering drugs be used (Crouch) (Letter) 574 (Zweig) (Reply) 575
 treatment with nicotinic acid and chromium (Urberg et al) 603
- HYPERTENSION serum potassium and enalapril (Hume) 217

I

- IBUPROFEN and acute renal failure (Elsasser et al) 221
- IMMUNE SYSTEM aging and infections (Haddy) 409
- IMPOTENCE male sexual (Halvorsen et al) 583
- IMPOTENCE ERECTILE evaluation and management (Greico) (Letter) 357 (Heller & Gleich) (Reply) 357
- INFANT LOW BIRTHWEIGHT and comparison of maternal factors of blacks with Mexican-Americans (Dowling & Fisher) (Letter) 551
- INFERTILITY a psychosocial description (Sahaj et al) 393
- INFLUENZA VACCINE routine indicated for people aged over 65 years an affirmative view—an opposing view (Glezen) (Letter) 253 (Frame) (Reply) 256
- INSULIN RESISTANCE (Keenan Jr & Abgott) 635
- INSURANCE STATUS relationship to content of care (Johnson & Murata) 87
- ISCHEMIC HEART DISEASE ACUTE applying a predictive instrument (Corey) (Letter) 576 (Green) (Reply) 577

L

- LOW BACK PAIN
 clinical predictors of outcome (Lanier & Stockton) 483
 (commentary) (Cherkin) 488
- LSD intoxication (Schwartz & Hopkovitz) (Letter) 550
- LYMPHADENOPATHY unexplained in family practice (Fijten & Blijham) 373

M

- MAILED REMINDERS FOR SIGMOIDOSCOPY patient response (Petrvavage & Swedberg) 387
- MAMMOGRAPHY
 screening (Bourguet et al) 49
 screening for women aged 40 to 50—an affirmative view (Dodd) 313
 screening for women aged 40 to 50—an opposing view (Taplin) 316
- MANAGED HEALTH CARE procedure selection in (Norman) 327

METRONIDAZOLE and atypical postpartum psychosis (McCahill & Braff) 323

N

NICOTINE CHEWING GUM

effectiveness and the influence of patient education (Blaise) (Letter) 146 (Shaughnessy et al) (Reply) 146
used in smoking cessation therapy (Oswald et al) 179

NICOTINIC ACID and hypocholesterolemic effects (Urberg et al) 603

NUTRITIONAL ASSESSMENT of the hospitalized patient (Lipsky et al) 149

O

OBESITY ADULT patient perceptions and weight loss (Levy & Williamson) 285

OBSTETRICAL CARE

access to a growing crisis (Robertson) 361
specialty bias in (Onion & Mockapetris) 423

OBSTETRICAL OUTCOMES in a rural practice (Kriebel & Pitts) 377 (commentary) (Smith) 381

OBSTETRICAL PRACTICE attrition from among family practice residency graduates (Krall) (Letter) 329

OBSTETRICAL RISK assessment of risk scoring systems (Wall) 153 (commentary) (Scherger) 162

OBSTETRICS

in family practice (Krall) (Letter) 329
in family practice (Manahan) (Letter) 330
in family practice (Salyards) (Letter) 252
in family practice (Toffler) (Letter) 16 (Eggertsen) (Letter) 16 (Meenan) (Letter) 17 (Weyrauch & Berman) (Letter) 17 (Rosenblatt) (Reply) 17
in Ohio (Krall) (Letter) 329
in Ohio (Salyards) (Letter) 252
strategy to avoid cesarean section (Glasser) 514
OSTEOMYELITIS due to pseudomonas (Gallo) 529

P

PAIN chronic and headache in primary care (Greer et al) 477

PAIN LOW BACK clinical predictors of outcome (Lanier & Stockton) 483 (commentary) (Cherkin) 488

PAPANICOLAOU SMEARS

improved endocervical cell yield with Cytobrush (Shadel) (Letter) 551 (Ruffin) (Letter) 577
techniques in a family practice setting (Ruffin) (Letter) 577

PARADIGMS disciplines specialties (Phillips) 139

PARADIGMS lost

a dilemma (Ruane) 133
disciplines and specialities (Phillips) 139

PARAPLEGIA caring for the patient with (Bluestein et al) 365

PATIENT EDUCATION effectiveness with nicotine chewing gum (Blaise) (Letter) 146 (Shaughnessy et al) (Reply) 146

PHARYNGITIS management of (Walker) (Letter) 436 (Wald) (Reply) 438

PHYSICAL ILLNESS and depression (Reifler) 27

PHYSICIAN-PATIENT RELATIONS how patients and physicians address each other (Bergman et al) 399

POSTPARTUM PSYCHOSIS atypical and metronidazole (McCahill & Braff) 323

POTASSIUM levels in enalapril-treated hypertension (Hume) 217

PRACTICE SELECTION effect of rural preceptorship (Norris & Norris) 541

PREGNANCY ectopic vs classic presentation (Bluestein et al) (Letter) 252

PRENATAL PATIENTS alpha-fetoprotein testing on in family practice (Ganiats) (Letter) 465 (Weiss) (Reply) 469 (Osborne) (Reply) 550

PREOPERATIVE EVALUATION of the elderly patient (Galazka) 622

PREVENTION screening patient perspective (Williamson et al) 187

PRIMARY CARE automatic blood pressure monitor in (Maines) (Letter) 357 (Ornstein) (Reply) 357

PROSTATE CANCER

screening with ultrasound—an affirmative view (Lee et al) 521
screening with ultrasound—an opposing view (Ansell) 525

PSEUDOMONAS OSTEO MYELITIS following puncture wound (Gallo) 529

PSYCHOSOCIAL CORRELATES of depressive symptoms (Duer et al) 609

PSYCHOSOCIAL DESCRIPTION OF INFERTILE COUPLES (Sahaj et al) 393

PSYCHOSOCIAL PROBLEMS screening for in primary care (Wagner) (Letter) 462

PUNCTURE WOUND complicated (Chesebro) 640

R

RELIGION

faith and family medicine (Brody & Foglio) 473
in family practice patients faith healing (King et al) 505
in The Journal of Family Practice (Craigie et al) 509

RENAL FAILURE acute associated with ibuprofen and alcohol (Elsasser et al) 221

RESEARCH principles of cost-effectiveness (Ganiats & Schneiderman) 77

RESIDENCY TRAINING in family medicine (Kerr) (Letter) 462

RESIDENT EDUCATION documentation of for hospital privileges (Franks) (Letter) 142 (Schneeweiss et al) (Reply) 142

RESIDENTS

attitudes toward homosexuality (Prichard et al) 637
perceptions regarding health care and poor patients (Price et al) 615 (commentary) (Roter) 620

RISK obstetrical assessment of scoring systems (Wall) 153 (commentary) (Scherger) 162

RURAL PRACTICE obstetrical outcomes in (Kriebel & Pitts) 377 (commentary) (Smith) 381

RURAL PRECEPTORSHIPS and practice selection (Norris & Norris) 541

S

SCREENING

examinations patient perspective (Williamson et al) 187
for endometrial cancer (Greenberg) (Letter) 258

for prostate cancer with ultrasound—an affirmative view (Lee et al) 521

for prostate cancer with ultrasound—an opposing view (Ansell) 525

for psychosocial problems in primary care (Wagner) (Letter) 462

mammography (Bourguet et al) 49

sigmoidoscopy and patient response to mailed reminders (Pettravage & Swedberg) 387

SIGMOIDOSCOPY

flexible is screening worthwhile (Long) (Letter) 144 (Frame) (Reply) 145 (Rodney) (Reply) 145

patient response to mailed reminders (Pettravage & Swedberg) 387

use of by family physicians (Buckley et al) 197 (erratum) 574

SMOKING CESSATION using nicotine gum (Oswald et al) 179

SOMATIZATION depression and social factors (Katon) 579

SPONDYLITIS ankylosing of the hand and wrist (Hogikyan et al) 533

T

TELEPHONE CALLS

documentation quality implications (Daugird & Spencer) 420

nature and content of to physicians (Spencer & Daugird) 201

THEOPHYLLINE

diagnostic test training of office personnel (Fischer et al) 497

dosing and testing (Moore III & Taylor) 57

TRAINING of office personnel with a diagnostic test for theophylline (Fischer et al) 497

V

VAGINITIS bacterial vaginosis (Weaver & Mengel) 207

AUTHOR INDEX

A

Abgott, Michael A 635
Anderson, Regina 253
Ansell, Julian 525
Ash, Wallace H 464

B

Balaban, Donald J 436
Bale, Ronald M 637
Barone, Eugene J 221
Bass, Martin J 46, 291
Becker, Lorne 41
Benyi, Judith 603
Bergman, James J 399
Berman, Henry S 17
Blaise, Judith C 146
Blijham, Geert H 373
Blustein, Daniel 253, 365

Bourguet, Claire C 49
Braff, David L 323
Braunstein, Ethan 533
Brody, Howard 473
Brown, William D 267
Buckley, Robert L 197, 271
Butler, Stephen 477
Byrd, Janis E 595

C

Cadoret, Remi J 71
Calonge, Ned 41
Campbell, Thomas L 26
Caplan-Tuke, Dee 477
Cherkin, Daniel C 399, 488
Chesebro, Marcia J 640
Chrisman, Noel 477
Colgan, Richard 297
Conway, Kathleen E 279

D

Danforth, Anne 393
Daugird, Allen J 201, 420
Davis, Denise 365
DeForge, Bruce R 505
DeNeef, Peter 404
Desmond, Sharon M 615
Dial, Lanyard K 637
Dietrich, Allen J 167, 294
Dodd, Gerald D 313
Donner, Allan 291

Dowling, Patrick 551
Driscoll, Charles E 187
Droesch, James 365
Duer, Susan 609
Dvorak, Laine D 187

E

Ebell, Mark H 536
Eby, Paul 149
Eggertsen, Sam C 161, 399
Ellsbury, Kathleen 142
Elsasser, Gary N 221
Eugley, Carol 253
Evans, Ellen 221
Everett, W Douglas 259

F

Ferentz, Kevin Scott 297
Fijten, Gerda H 373

Fischer, Paul M 497
 Fisher, Michael 551
 Foglio, John P 473
 Forney, Mary Ann 65
 Forney, Paul D 65
 Frame, Paul S 145, 256
 Franks, Peter 142
 Freeman, William L 41
 Fried, Robert A 464

G

Galazka, Sim S 622
 Gallo, Joseph J 529
 Ganiats, Theodore G 77, 465
 Garber, Keith A 187
 Gehlbach, Stephen H 305
 Gilchrist, Valerie J 49
 Gillette, Robert D 360
 Glasser, Morton 514
 Gleich, Paul 357
 Glezen, W Paul 253
 Goolishian, Harry 33
 Gordon, Katherine C 142
 Gore, Ed 142
 Green, Lee 577
 Greenberg, Maury J 258
 Greer, Thomas 477
 Greico, Alan 357

H

Haddy, Richard I 409
 Halvorsen, John G 583
 Hankin, Fred 533
 Heaton, Caryl J 536
 Heller, John E 357
 Henderson, Audrey M 271
 Hewes, Robert A 393
 Hoddinott, Susan 291
 Hogikyan, John 533
 Holler, Jacob W 142
 Holloway, Richard L 637
 Hopkovitz, Aviva M 550
 Houseknecht, Robert A 393
 Hume, Anne L 217
 Hunter, David 583

I

Indyk, Diane 102
 Iverson, Donald C 41

J

John, Reynold 603
 Johnson, Richard A 87

K

Kandula, Manju 49
 Kaplowitz, Haley Jo 637
 Katner, Harold P 197, 271
 Katon, Wayne 477, 579
 Keenan, William F Jr 635
 Kelly, Kim L 497
 Kerr, Colin P 462
 Kimmel, Kathryn L 393
 Kimmel, Sanford R 615
 King, Dana E. 505
 Knight, Aubrey L 95
 Krall, Michael A 329
 Kriebel, Stephen H 377
 Kyrzcz, Robert W 102

L

Lange, Paul 583
 Lanier, David C 483
 Larson, David B 509
 Leduc, Lawrence B 393
 Lee, Fred 521
 Levy, Barcey T 285
 Lipsky, Martin S 149
 Littrup, Peter J 521
 Liu Ingrid Y 509
 Long, Howard F 144
 Lopez, Lenora 221
 Lundergan, Maureen K 104
 Lutz, Lawrence J 417
 Lyons, John S 509
 Lytton, Diane E 595

M

Maines, John G 357
 Manahan, William D 330
 Mattingly, Linda 149
 McCahill, Margaret E 323
 McLeary, Richard D 521
 McWhinney, Ian R 46, 291
 Meenan, Anna L 17
 Mehr, Samuel B 259
 Mengel, Mark B 207
 Metz, Michael 583
 Meyer, Barbara E 393
 Miller, Rebecca S 41
 Miller, Thomas R 259
 Mitchell, James E 493
 Mockapetris, Anne M 423
 Mommsen, Craig 583
 Montano, Daniel 142
 Moore, L Doyle III 57
 Moore, Patricia 365
 Moriarty, James A 583

Morris, C Jay 33
 Mosley, Mark 637
 Murata, Paul J 87
 Murdock, Richard T 104
 Murray, James P 108

N

Naumberg, Betsy 142
 Neher, Jon O 429
 Norman, Lee A 327
 Norris, Sandy B 541
 Norris, Thomas E 541

O

Onion, Daniel K 423
 Ornstein, Steven 357
 Osborn, Lucy M 550
 Oswald, Jeffrey Sylvan 179

P

Paulshock, Bernadine Z 330
 Perna, John 279
 Peterson, Larry J 329
 Petravage, Jacqueline 387
 Phillips, Theodore J 139
 Phillips, William R 399
 Pitts, James D 377
 Pomeroy, Claire 493
 Price, James H 615
 Prichard, John G 33, 637

R

Raczek, James A 595
 Ratcliffe, Stephen 20
 Reed, Barbara D 20, 417
 Reed, Frank M 41
 Reeder, C Eugene 146
 Reifler, Burton V 27
 Ripley, William K 65
 Robertson, William O 361
 Rodney, Wm MacMillan 145
 Rosenblatt, Roger A 17
 Roter, Debra L 620
 Ruane, Thomas J 133
 Ruffin, Mack T 578

S

Sahaj, David A 393
 Salyards, Harry E 252
 Sayres, William 20
 Scherger, Joseph E 162
 Schneeweiss, Ronald 142
 Schneiderman, Lawrence J 77
 Schwartz, Joyce G 550

Schultz, Janet K 399
 Schwenk, Thomas L 609
 Seim, Harold C 493
 Seppala, Marvin 493
 Shadel, Robert F 551
 Shank, J Christopher 187
 Shaughnessy, Allen F 146
 Shelov, Steven P 247
 Shelp, Earl E 33
 Slate-Filice, Becki 497
 Smith, C Kent 393
 Smith, Mike U 197, 271
 Smith, Mindy A 381
 Snyder, Frank F 615
 Sobal, Jeffery 297, 505
 Spencer, Donald C 201, 420
 Starling, Elizabeth 365
 Steiner, Gerry A 149
 Stockton, Patricia 483
 Swedberg, Jay 387

T

Taplin, Stephen 316
 Taylor A Thomas 57
 Thiese, Steven M 104
 Toffler, William L 16
 Torp-Pedersen, Soren T 521

U

Urberg, Martin 603

V

Vivier, Patrick M 167
 Vogt, Susan C 595

W

Wade, Walter 365
 Wagner, Charles M 462
 Wald, Ellen R 438
 Walker, Phillip M 436
 Wall, Eric M 16, 153
 Weaver, Charles H 207
 Weiss, Barry 469
 Weyrauch, Karl F 17
 White, George L Jr 104
 Widmer, Reuben B 71
 Williamson, Paul S 187, 285
 Witters, Lee A 167
 Wolkten, Raymond van 253
 Worden, William Lamont 179

Z

Zeluff, Gary 417
 Zweig, Steven 575

CLASSIFIED

Classified correspondence should be addressed to: Classified Advertising Department, Appleton & Lange, 25 Van Zant Street, E. Norwalk, CT 06855. Phone: (203) 838-4400. Ad copy and material must be received by the 1st of the month prior to month of publication. (Example: by May 1st for June issue.) No cancellations will be accepted after this time. Classified rate is \$105.00 per column inch per issue. Minimum space is one inch. Each column inch measures ten typed lines deep with approximately 42 characters (including spaces) per line.

POSITIONS AVAILABLE

FAMILY PRACTITIONERS

The Geisinger Medical Group, Scranton/Wyoming County, a rapidly growing 15-physician multispecialty group with 6 offices serving a semi-rural area in northeastern Pennsylvania, has openings for 4 family practitioners. These positions will expand staffing at busy, well-established primary care practice site. Candidates must be BE/BC in family practice with a strong interest in providing a broad range of primary care services to a stable and growing community. Positions offer competitive salary including incentive program and comprehensive benefits package. Interested applicants should forward resume to: **Medical Director, Department R, Geisinger Medical Group, 125 Scranton-Pocono Highway, Scranton, PA 18505.** EOE-M/F/H.

ASSISTANT DIRECTOR, FAMILY PRACTICE RESIDENCY PROGRAM—Memorial Medical Center of Long Beach. This is a 6/6/6 program in a progressive 1000-bed private hospital affiliated with the University of California, Irvine. Applicant must be a Board Certified Family Physician with experience in Residency Programs and/or practice. Salary and benefits highly competitive. Send letter of interest and CV to Stephen Brunton, MD, Director, Family Practice Program, 2701 Atlantic Ave, Long Beach, CA 90806.

POSITIONS AVAILABLE

PGY-II POSITION—The Duke-Watts Family Medicine Program is offering a PGY-II position in its residency program beginning 1 July 1989. Highly competitive program based at Duke University with major affiliation with large community hospital. Requirements: Graduate of a LCME approved school, PGY-I family practice training or equivalent approved program. Send letter and CV to: Keith A. Frey, MD, Director, Duke-Watts Family Medicine Program, 407 Crutchfield St, Durham, NC 27704.

FAMILY PRACTICE Colorado

Opportunity for a family practitioner in a progressive regional commerce and medical community serving a population of 60,000. Facility is JCAHO accredited. Excellent housing, public and private schools, and a junior college. Located 2 hours from Denver and the Rocky Mountains. Guaranteed minimum gross income. Send CV to:
Brian C. Larson, CEO
Sterling Regional MedCenter
615 Fairhurst
Sterling, CO 80751
(303) 522-0122

POSITIONS AVAILABLE

CALIFORNIA-Fresno—FP/GP/Ped/IM physician for primary care group practice. Modern facilities, partnership position available, \$80,000-\$120,000 guaranteed annual income. Send CV to 4623 N. First St., Fresno, CA 93726.

ASSISTANT DIRECTOR SOUTHERN COLORADO FAMILY MEDICINE PROGRAM

An immediate opportunity exists to join our three full-time faculty in a strong community based regional residency program. Responsibilities include assisting in supervision of 18 residents in both an inpatient and outpatient clinical environment, active participation in curriculum design and implementation, plus modest direct patient care. Requires competency in obstetrics, residency trained, and board eligibility. Family medicine practice experience desirable. Excellent salary and benefits. Send letter of interest and curriculum vitae to: David Smith, MD, Director, Southern Colorado Family Medicine Program, 1008 Minnequa, Pueblo, Colorado 81004. EOE

DAYTONA BEACH, FLORIDA—Family Practice positions available, both inpatient and outpatient. Excellent salary, bonus system, comprehensive benefits. Write PO Box 9910, Daytona Beach, FL 32020.