

Claude D. Arnaud, MD, FACE  
Professor Emeritus  
University of California at San Francisco

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12 August 2000

Dockets Management Branch (HFA-305)  
Food and Drug Administration  
5630 Fishers Lane  
Room 1061  
Rockville, MD 20852

**Re: Docket No 00D-1307, CDER 67. Guidance for Industry: "Development of Parathyroid Hormone for the Prevention and Treatment of Osteoporosis" published on June 14, 2000.**

Dear Sir/Madam,

I am Claude D. Arnaud, M.D., Professor Emeritus of Medicine and Physiology at the University of California at San Francisco (UCSF) and current Founder and Director of the newly formed independent Institute for the Cure of Osteoporosis (ICO), presently in application for non-profit status in California. I am internationally recognized for my research in bone and mineral metabolism, especially as it relates to parathyroid hormone (PTH) and parathyroid hormone related peptide (PTHrp).

Before I retired from UCSF in December 1999, my research was continuously funded by the National Institutes of Health for 30 years, the National Aeronautics and Space Administration for 15 years and the Veterans Administration for 10 years. I have authored more than 200 scientific papers and performed as an invited lecturer at many local, national and international meetings (see attached curriculum vitae and bibliography).

I am an active member of many prestigious clinical and scientific organizations and served on editorial boards of their journals. I was one of the six founders of the American Society for Bone and Mineral Research (ASBMR), served as one of its Councilors, its third President and chairperson of its new Professional Practice and Archives Committees. I received the highest research award conferred by the ASBMR, the William F. Neuman Award, in 1991. I am a Fellow of the American Association for the Advancement of Science and of the American Association of Clinical Endocrinologists. I have served on the NIH

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E-mail [carnaud@itsa.ucsf.edu](mailto:carnaud@itsa.ucsf.edu) or [carnaud@earthlink.net](mailto:carnaud@earthlink.net)

00D-1307

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Musculo-skeletal study section as well as many NIH special study sections and site visit teams.

I founded and was Chief of the Endocrine Units at both the Mayo Medical School and the San Francisco VA Medical Center as well as the UCSF Program in Bone Biology and Osteoporosis. I also founded and was Chief of a new Division of Gerontology and Geriatrics at UCSF. I developed and was Director of the NIH funded Mayo Medical School and the UCSF Diabetes, Endocrinology and Metabolism Training Programs and the UCSF Gerontology and Geriatric Medicine Training Program.

During the past 6 years, my team has processed a National Institutes of Health grant entitled "Building Bone with PTH and Estrogen." This study<sup>1</sup> assessed the BMD effects of 24 months of daily subcutaneous injections of hPTH1-34 plus oral estrogen (PTH+E) on spine, hip and forearm BMD in a randomized, placebo-controlled, double-blind study of 75 postmenopausal osteoporotic women. It showed increases in BMD far greater than those reported for currently available therapies. Eighty-nine percent of the PTH+E group achieved BMD values at the spine above the osteoporotic range, and 64 percent achieved BMD values above the osteopenic range, according to the definitions established by the World Health Organization (WHO).<sup>2</sup> A manuscript describing those results has been submitted to the *New England Journal of Medicine* for publication.

Based on my background, you can see that your recent request for comments on a draft Guidance document on "Development of Parathyroid Hormone for the Prevention and Treatment of Osteoporosis" is of considerable interest to me. As stated, the draft was produced because of the discovery that 2 strains of rats and one strain of mice developed osteosarcoma after being treated with relatively large doses of PTH 1- 34 since weanling. The draft did not state that at least one if not all strains of animals developing osteosarcoma were tumor prone but it did state that the clinical relevance of the animal findings are not currently known.

It is timely therefore, for the FDA to provide industry and non-industrial researchers with guidance as to the "Agency's current thinking regarding the impact of these pre-clinical findings on drug development programs for PTH for the treatment and/or prevention of osteoporosis."

Unfortunately the guidance document goes well beyond providing the "Agency's thinking" about the issue. Rather, it provides clear cut, arbitrary admonitions against performing investigations of the efficacy of PTH in the

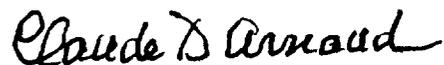
treatment of any but the most advanced forms of the disease. This can only lead to a dramatic decrease in research into the efficacy of PTH in the treatment and prevention of osteoporosis of lesser severity but still with a high risk of fracture. Moreover, if the arbitrary admonitions stand unchanged, they will certainly translate into a needlessly restrictive indication statement if PTH is ultimately approved for marketing. This would be a disaster because the available data<sup>1,3</sup> strongly suggest that PTH, with or without a concomitantly administered antiresorptive agent, represents the only currently available potential "cure" for this devastating disease.

One need only consider the alarming increase in the incidence of osteoporotic fracture to recognize that very little less than a "cure" will stem that tide and avert an enormous health care crisis which is projected to cost \$240 billion per year in the year 2040<sup>4</sup>.

I recommend a measured systematic approach to the future investigations of the efficacy PTH in the treatment of osteoporosis in which studies in patients with severe osteoporosis are permitted to proceed with due caution exerted by local Human Research Committees (HRC) and national Data and Safety Monitoring Boards (DSMB). Other PTH treatment studies in osteopenic or osteoporotic persons should be monitored by both HRC's and DSMB's with regular (6 month) reports of study progress and safety to the FDA.

I agree with the draft guideline concerning patient follow-up and patient informed consent. I would gladly provide you with any further information or comment upon request. Thank you for the opportunity to present my position on this very important issue.

Sincerely yours,



Claude D. Arnaud, MD

Enc: CV and bibliography

## REFERENCES

1. Roe EB, Sanchez SD, del Puerto GA, Bacchetti P, Cann CE, Arnaud CD. Parathyroid hormone 1-34 (hPTH1-34) and estrogen produce dramatic bone density increases in postmenopausal osteoporosis--results from a placebo controlled randomized trial. J Bone Miner Res 1999; 14(suppl 1):S137, Abst #1019.
2. Kanis JA and the WHO Study Group. Assessment of fracture risk and its application to screening for postmenopausal osteoporosis: synopsis of a WHO report. Osteoporosis Int 1994;4:368-381.
3. Neer RM, Arnaud C, Zanchetta JR et al. Recombinant human PTH [rhPTH(1-34)] reduces the risk of spine and non-spine fractures in postmenopausal osteoporosis. 82<sup>nd</sup> Annual Meeting, The Endocrine Society 2000, Abst#193:42.
4. Cummings SR, Rubin SM, Black D. The future of hip fractures in the United States: number, costs, and potential effects of postmenopausal estrogen. Clin Orthop 1990;252:164-6.

**CURRICULUM VITAE**  
**Claude D. Arnaud, MD**

Professor, Emeritus  
University of California, San Francisco

**Education:**

Columbia College, New York, NY	BA
New York Medical College, New York, NY	MD
St. Luke's Hospital, New York, NY	Internship
St. Luke's Hospital, New York, NY	Residency, Medicine
Milwaukee County Hospital, Milwaukee, WI	Residency, Medicine
Marquette University School of Medicine, Milwaukee, WI	NIH Trainee, Metabolism
University of Wisconsin, Madison, WI	NIH Trainee, Biochemistry

**Principal Positions Held:**

1965-1966	University of Pennsylvania Philadelphia, PA	Instructor, Biochemistry
1967-1970	Mayo Graduate School of Medicine Rochester, MN	Assistant Professor, Medicine
1970-1974	Mayo Graduate School of Medicine Rochester, MN	Associate Professor, Medicine
1974-1977	Mayo Medical School Rochester, MN	Professor, Medicine
1977-1998	University of California, San Francisco, CA	Professor VI, Medicine & Physiology
1998-pres	University of California, San Francisco, CA	Professor Emeritus on recall status.

**Ancillary Positions Held Concurrently:**

1967-77	Mayo Clinic, Rochester, MN	Consultant
1972-74	Mayo Clinic, Rochester, MN	Head, Mineral Research Unit
1974-77	Mayo Clinic, Rochester, MN	Head, Endocrine Research Unit & Mineral Research Laboratory
1977-88	Veterans Administration Medical Center, San Francisco, CA	Chief, Endocrine Unit
1981-89	University of California, San Francisco, CA	Program Director, NIH Diabetes, Endocrinology and Metabolism Training Program
1989- pres	University of California, San Francisco, CA	Assistant Director, NIH Diabetes, Endocrinology and Metabolism Training Program

**Ancillary Positions Held Concurrently** continued:

Claude D. Arnaud, MD

1989-92	University of California, San Francisco, CA	Chief, Division of Gerontology and Geriatric Medicine
1989-92	San Francisco Institute on Aging, San Francisco, CA	Director, Center for Research on Aging
1991-92	University of California, San Francisco, CA	Program Director, NIH Training Program in Gerontology and Geriatric Medicine
1992-pres	University of California, San Francisco, CA	Director, Program in Osteoporosis and Bone Biology
1992-pres	University of California, San Francisco, CA	Director, Center for Osteoporosis and Bone Health

**Honors and Awards:**

- 1998 Listed, Best Doctors in America
- 1996 Fellow, American American College of Endocrinologists (FACE)
- 1995 Fellow, American Association for the Advancement of Science (FAAAS)
- 1992 Jeffries Medical Research Award from the American Institute of Aeronautics and Astronautics--For outstanding contributions to space biology and medicine as a principal investigator on NASA Space Lab Life Sciences I mission.
- 1991 William F. Neuman Award from The American Society for Bone and Mineral Research--For a lifetime of distinguished achievement in the field of bone and mineral research.
- 1991 Listed, Who's Who in Science and Engineering
- 1981 Listed, 1000 most-cited scientist-authors for work published from 1965-78 by Current Contents 24:6, 1981 (Institute of Scientific Information)
- 1981 Author, Citation Classic, Institute of Scientific Information: Arnaud, C.D., Tsao, H.S., Littledike, T. Radioimmunoassay of human parathyroid hormone in serum. J Clin Invest 50:21-34, 1971
- 1981 Listed, Who's Who in the World, in America and in The West
- 1975 Chairman, Gordon Research Conference, Chemistry, Physiology and Structure of Bones and Teeth

**Memberships in Professional Organizations:**

- 1962-present American Federation for Clinical Research
- 1967-present American Association for the Advancement of Science
- 1969-present Endocrine Society
- 1969-present Central Society for Clinical Investigation
- 1969-present Sigma Xi
- 1970-present American Society for Clinical Investigation
- 1971-present Orthopaedic Research Society
- 1974-present American Society for Biological Chemists
- 1976-present Association of American Physicians
- 1977-present American Physiological Society
- 1977-present American Society for Bone and Mineral Research
- 1978-present Western Association of Physicians

**Memberships in Professional Organization** continued:

Claude D. Arnaud, MD

1978-present	Western Society for Clinical Investigation
1979-present	Society for Experimental Biology and Medicine
1980-present	Academy of Clinical Laboratory Physicians and Scientists
1986-present	California Academy of Medicine
1989-present	Gerontological Society of America
1990-present	American Society for Cell Biology
1993-present	Association of American Clinical Endocrinologists

**Service to Professional Organizations:**

1980-1983	Member, Council of the Endocrine Society
1981-pres	Co-Founder (1978), Council Member (1979-81), President (1981-82), and Chairman, Professional Practice Committee (1995-1998) of the American Society for Bone and Mineral Research
1986	Co-Founder, Advances in Mineral Metabolism

**Service to Professional Publications:**

1971-1976	Journal of Clinical Endocrinology and Metabolism	Editorial Board
1976-1981	Journal of Clinical Investigation	Editorial Board
1977-1990	Mineral and Electrolyte Metabolism	Editorial Board
1978-1990	Endocrine Research Communications	Editorial Board
1981-1984	Endocrinology	Editorial Board
1981-1994	Bone	Editorial Board
1982-1990	American Journal of Physiology	Editorial Board
1983-1994	Calcified Tissue International	Editorial Board
1985-1994	Journal of Bone and Mineral Research	Editorial Board
1990-pres	Osteoporosis International	Editorial Board

Currently manuscript reviewer for those listed and:

Journal of Biological Chemistry, American Journal of Physiology, Proceedings of the National Academy of Sciences, Kidney International, Western Journal of Medicine, New England Journal of Medicine, American Journal of Medicine, Annals of Internal Medicine, Clinical Chemistry

**Service to National Organizations:**

1992	NIH/NIDR Consensus Workshop on Osteoporosis and Oral Bone Loss	Chairman
1992	Site Visit, Program Project, NIAMS/NIH	Chairman
1985-1989	National Institutes of Health Orthopedics and Musculoskeletal Study Section	Member
1985-1989	National Academy of Sciences, Food and Nutrition Board, Committee on Diet and Health	Member
1981-1986	American Institute of Biological Science, NASA Space Biology Panel	Member
1980-1985	National Pituitary Agency Panel	Member
1980-1983	Veterans Administration Merit Review Board, Endocrinology Section	Member
1972-1976	National Cancer Institute, Tumor Immunology Study Section	Member

**Service to National Organizations** continued:

Claude D. Arnaud, MD

- 1970-pres                    *Ad Hoc* Grant Reviews:  
    National Institutes of Health, Veterans Administration,  
    National Science Foundation, NASA, Kroc Foundation,  
    and the Medical Research Councils of Canada, England,  
    and Australia
- 1970-pres                    Special Study Sections and Site Visit Teams:  
    National Institutes of Health, Member

**Service to Industrial Organizations:**

Numerous *Ad Hoc* consulting for the pharmaceutical and medical device industry :  
 Eli Lilly, Inc, Novartis Inc, Pharmacia- Upjohn Inc, Merck Inc, Chiron Inc, Genentech Inc,  
 Geomed Inc, Proctor and Gamble Inc, and Rhone Poulanc Rorer, Bristol Meyers Squibb, Pfizer,  
 Ipsen Int Ltd.. Regular consultant for Eli Lilly Inc. Co-founder, consultant, member of the Board  
 Directors and Chairman of the Scientific Advisory Board, Metra Biosystems Inc, Mountain View,  
 CA. (1990-1999)

**Doctoral and Postdoctoral Trainees Supervised:**

Edward Kaplan, MD  
 Professor of Surgery  
 University of Chicago School of Medicine  
 Chicago, Il

Susan Oldham, PhD  
 Professor of Medicine  
 University of Southern California School of Medicine  
 Los Angeles, CA

Jan Fischer, MD  
 Professor of Medicine and Orthopedics  
 Orthopädische Universitätsklinik Balgrist  
 University of Zurich  
 8008 Zurich, Switzerland

Albert Fournier, MD  
 Professor of Medicine  
 University of Amiens  
 Amiens, France

Glenn Sizemore, MD  
 Professor of Medicine  
 Chief, Section of Endocrinology  
 Loyola University  
 Chicago, Il

Nobuo Kugai, MD  
 Associate Professor of Medicine  
 University of Tokyo School of Medicine  
 Tokyo, Japan

James Flueck, MD  
 Professor of Medicine  
 University of Kentucky School of Medicine  
 Lexington, KY

**Doctoral and Postdoctoral Trainees Supervised** continued:

Claude D. Arnaud, M.D

Samuel Miller, MD  
Clinical Professor of Medicine  
University of Texas School of Medicine  
San Antonio, TX

Philip Lambert, MD  
Staff Endocrinologist  
Saginaw Cooperative Hospitals  
1000 Houghton  
Saginaw, MI

Philip Schaeffer, PhD  
Professor of Biochemistry  
University of Texas School of Medicine  
San Antonio, TX

Michael Labeuw, MD  
Associate Professor of Medicine  
University of Lyon School of Medicine  
Lyon, France

Herman von Lilienfeld-Toal, MD  
Private Practice of endocrinology  
Bonn, Germany

Ralph Benson, MD  
Professor of Urology  
Mayo Medical School  
Rochester, MN

Barbara Pickard, PhD  
Research Associate  
University of Leeds  
Leeds, England

Hunter Heath, MD  
Eli Lilly Pharmaceutical Co.  
Indianapolis, IN

Robert Nissenson, PhD  
Adjunct Professor of Medicine  
University of California School of Medicine  
San Francisco, CA

Luis Dorantes, MD  
Associate Professor of Medicine  
University of Mexico School of Medicine  
Mexico City, Mexico

Stephen Abbott, PhD  
Molecular Biologist  
Celltech, Ltd.  
Slough, Berkshire, England

**Doctoral and Postdoctoral Trainees Supervised** continued:

Claude D. Arnaud, MD

Nathan Pliam, MD, PhD  
Medical Director  
Pharmagenesis, Inc.  
Palo Alto, CA

Caroline Silve, MD  
Centre National de la Recherche Scientifique  
Paris, France

Anne P. Teitelbaum, PhD  
Research Consultant  
San Diego, CA

K. K. Pun, MD, PhD  
Clinical Associate Professor  
Department of Medicine  
University of California, San Francisco  
San Francisco, CA

David Karpf, MD  
Hoffman La Roche  
Palo Alto, CA

Thomas Mullen, MD  
Obstetrics and Gynecology  
Private Practice  
New York City, NY

Jon Fuller, MD  
Assistant Professor  
Division of Geriatric Medicine  
Stanford University  
VA Medical Center, Palo Alto  
Palo Alto, CA

Sheryl Denker, PhD  
Physiology Graduate Student  
University of California, San Diego  
San Diego, CA

Bruce Roe, MD  
Postdoctoral Fellow, Current  
University of California, San Francisco  
San Francisco, CA

Kit Chiu Mui, Ph.D.  
Park Davis Pharmaceuticals Inc.  
Ann Arbor, MI

**Military Service:**

Retired, U.S. Naval Reserve, Lieutenant Commander (M.C.)

## Grant Support for Research:

### Recently Inactive:

1 RO1 DK21614 from the National Institutes of Health, Principal Investigator, 1984-1993, "Parathyroid Hormone and Calcitonin," \$1,291,752.

Merit Review, Veterans Administration, Co-Principal Investigator with Robert Nissenson, Ph.D., 1986-1993, "Molecular Properties of the Parathyroid Hormone Receptor", \$742,280.

NASA 9-16227, National Aeronautical and Space Administration, Co-Principal Investigator with Christopher Cann Ph.D., 1981-1994, "Pathophysiology of Mineral Loss During Space Flight," \$1,477,439.

1 P50 DK39964 from the National Institutes of Health, Program Director, 1987-1992, "Programs of Excellence in Research on Osteoporosis: Prevention and Treatment," \$2,270,366.

National Aeronautics and Space Administration, 1994-1997, Co-principal investigator with Christopher Cann, Ph.D. "Direct Assessment of the Initial Bone Response to Space Flight in Humans," \$771,000.

1 RO1 AG05407 from the National Institutes of Health, Co-Investigator with Steven Cummings M.D. PI, 1998-2003, "Risk Factors for Hip and Colle's Fractures," \$5,800,000.

T32 AG00212 from the National Institutes of Health, Program Director at the time of award, now Associate Director 1991-1996. "UCSF Gerontology and Geriatric Medicine Training Program," Fellowships plus \$51,500.

T32 DK07418 from the National Institutes of Health, Program Director, 1986-1989, Associate Director, 1989-1996, "Diabetes, Endocrinology, and Metabolism Training Program." Fellowships plus \$150,000.

1 RO1 AG 10925 from the National Institutes of Health, Principal Investigator, 1993-2000, "Building Bone in Osteoporosis with PTH and Estrogen" \$1,122,971.

1 RO1 DK 46661 from the National Institutes of Health, Co-Investigator with Nancy Lane, M.D., PI, 1995-1999, "Can PTH Reverse Glucocorticoid Induced Osteoporosis," \$506,000.

Eli Lilly Pharmaceutical Corp., Principal Investigator, 1994-1999, "Effect of Raloxifene in the Prevention of Osteoporosis.

Eli Lilly Pharmaceutical Corp., Principal Investigator, 1994-1999, "Effect of Raloxifene on the Treatment of Osteoporosis.

Eli Lilly Pharmaceutical Corp., Principal Investigator, 1996-2001, "Effects LY333334 (human parathyroid hormone fragment 1-34) in the Treatment of postmenopausal Women with Osteoporosis.

### Scientific Meeting Participation (1983-1996):

#### International.

- 1999 International Conference on New actions of Parathyroid Hormone. July 1999, invited speaker
- 1998 25th European Congress on Calcified tissues, Harrogate, England, October 1998 invited speaker
- 1997 2nd International Conference on Osteoporosis, Osaka, November 13-15, 1997, invited speaker, Osaka, Japan
- 1997 25th European Symposium on Hard Tissue, invited speaker, April 1997, Harrogate, United Kingdom.
- 1996 World Congress on Osteoporosis, presented poster. May 18-23, 1996, Amsterdam The Netherlands.
- 1995 Osteoporoses '95 - First National Conference on the Diagnosis and Treatment of Osteoporosis, invited lectures, August 24 -26, 1995, Sao Paulo, Brazil.
- 1994 Argentine Congress of Osteoporosis, invited lectures; November 6-8, 1994 Buenos Aires, Argentina.
- 1993 4th International Congress on Osteoporosis, session chairperson, organizing committee, and invited lecture, March 27 - April 2, 1993, Hong Kong.
- 1992 International Congress of Obstetric and Gynecologic Sciences, invited lecture, June 7-14, 1992, Elba Island, Italy.
- 1992 XI th, International Conference on Calcium Regulating Hormones, presented poster, "Pathophysiology of mineral loss during space flight," April 24-29, 1992., Florence, Italy.
- 1991 International Conference on Osteoporosis, invited lecture, November 5-7, 1991, Kobe, Japan.
- 1990 2nd Asian Symposium on Osteoporosis, invited lectures, November 4-11, 1990 Kuala Lumpur, Malaysia and Taipei, Taiwan.
- 1990 3rd International Symposium on Osteoporosis, organizing committee member, session chairperson and invited lecture, October 14-19, 1990, Copenhagen, Denmark.
- 1990 UCSF Postgraduate Course, program committee, session chairman and invited lecture; January 6-7, 1990, Hong Kong.
- 1988 21st Nestle Nutrition Workshop on Rickets, invited lectures, December 5-8, 1988, Buenos Aires, Argentina.  
1988, Verona, Italy.
- 1987 International Symposium on Osteoporosis, program committee member, session chairperson and invited lecture; September 27-October 2, 1987, Aalborg, Denmark.
- 1985 Joint Board for Postgraduate Medical Education Symposium, Kuwait Ministry of Public Health; invited lecturers; April 13-17, 1985, Kuwait.
- 1984 Symposium on Disorders of Bone and Calcium Metabolism and Calcitonin, invited lecturers; August 29-September 1, 1984, Bogota, Colombia.
- 1984 University of Chile Department of Medicine Symposium, invited lectures, August 25-28, 1984, Santiago, Chile.
- 1984 International Congress of Endocrinology, co-chairperson; July 3, 1984, Québec, Canada.
- 1984 International Symposium on Osteoporosis, co-chairperson, session chairman and invited lecture, June 8, 1984, Copenhagen, Denmark.
- 1984 International Symposium of Bone Resorption, Metastasis, Diphosphonates, Istituto di Ricercho Farmacologiche "Mario Negi, invited lecture, May 31, 1984, Milan, Italy.
- 1983 International Conference on Calcium Regulating Hormones, invited lecture, October 16-4, 1983, Kobe, Japan.
- 1983 International Conference on Calcium Regulating Hormones, Satellite Symposium on PTH RIA, invited lecture, October 24, 1983, Tokyo, Japan.
- 1983 Post International Conference on Calcium Regulating Hormones, Satellite Symposium, invited lecturer, October 26-27, 1983, Taipei, Taiwan.
- 1983 European Symposium on Calcified Tissues, invited lecture; April 14, 1983, Davos, Switzerland.
- 1983 Measurement of Calcitropic Hormones, chairperson and invited lecture; April 15, 1983, Davos, Switzerland.

Local and National.

- 2000 San Ramon Medical Center, San Ramon, CA January 2000, presented Medical Grand Rounds
- 1999 Annual Meeting of the American Society for Bone and Mineral Research, St. Louis, October 1999, oral presentation of 2 papers.
- 1999 Annual Meeting of the Endocrine Society, San Diego, June 1999, invited speaker
- 1998 Chairman, 5th Program in Osteoporosis and Bone Biology Symposium, San Francisco, CA. January 22, 1988.
- 1998 Study of Osteoporotic Fractures Steering Committee Meeting, Palm Springs, CA, April, 17, 1998.
- 1998 Annual Meeting of the Association of American Physicians and the American Society for Clinical Investigation, Washington D.C. May 1-3, 1998, attendance.
- 1998 Osteoporosis Update 1998, Lecture: Markers of Bone Remodeling, San Francisco CA, May 27, 1998.
- 1998 Lecture: Detection, Prevention and Treatment of Osteoporosis, Eureka, CA, June 3, 1998.
- 1998 Lecture: Detection, Prevention and Treatment of Osteoporosis, Californi-Pacific Endocrinology Staff, San Francisco CA, June 17, 1998
- 1998 Annual Meeting of the Endocrine Society, New Orleans, June 24-27, 1998, present poster.
- 1998 Annual Meeting of the American Society for Bone and Mineral Research. December 1998, San Francisco, CA, Present Poster.
- 1997 Annual Meeting of the American Society for Bone and Mineral Research, Chairman, Professional Practice Committee, presented paper and posters, September 10-14, 1997, Cincinnati, Ohio
- 1996 Cambridge Healthtech Institute, Treatment of Osteoporosis Conference "Urinary deoxy pyridinoline: a highly specific bone resorption marker and its measurement in patients with osteoporosis," October 15-17, 1996, Philadelphia, PA.
- 1996 Annual Meeting of the American Society for Bone and Mineral Research, Chairman, Professional Practice Committee, presented posters, September 7-11, 1996, Seattle, WA.
- 1996 Pacific Medical Center, Medical Grand Rounds. "Biochemical markers of bone turnover," invited lecture, July 30, 1996, San Francisco, CA.
- 1996 UCSF, Mount Zion Research Seminar: "Anabolic Effects of Parathyroid Hormone," invited lecture, July 26, 1996, San Francisco, CA.
- 1996 National Osteoporosis Foundation (NOF), Interspecialty Medical Council, member, evaluate NOF guidelines for the diagnosis and treatment of osteoporosis July 24, 1996, Washington, DC.
- 1996 Eli Lilly Pharmaceutical Co., Raloxifene investigators conference, (CDA) Principal Investigator, July 17-18, 1996, Indianapolis, IN.
- 1996 10th International Congress of Endocrinology, participant June 12-15, 1996, San Francisco, CA.
- 1996 St. Joseph's Hospital, Medical Grand Rounds, "Biochemical Markers of Bone Turnover," invited lecture, June 10, 1996, Phoenix, AZ.
- 1996 Annual Meeting of the American Association of Clinical Endocrinologists, Seattle, WA. , May 1-5, 1996, participant. Inducted as a Fellow of the American College of Endocrinology, Seattle WA.
- 1996 University of Southern California, Woman's Hospital, Obstetrics and Gynecology Grand Rounds, invited lecture, "Biochemical markers for diagnosing and monitoring metabolic bone disease," March 15, 1996, Los Angeles, CA.
- 1996 Association for the Advancement of Science Annual (AAAS) Meeting February 7-10, 1996, participant, Inducted as a Fellow of the AAAS, Baltimore, MD
- 1996 Medical Grand Rounds, "Osteoporosis in Men" January 11, 1996, University of California, San Francisco, San Francisco, CA.
- 1995 Annual Meeting of the American Society for Bone and Mineral Research, Chairman , Professional Practice Committee, presented poster, September 9 -13, 1995, Baltimore, MD.

**Scientific Meeting Participation (1983-1996)**, (Local and National), continued  
 Claude D. Arnaud, M.D.

- 1995 Eli Lilly Pharmaceutical Co., Raloxifene investigators conference, WASHINGTON, D.C. June 13, 1996.
- 1995 Annual Meeting of the Endocrine Society, participant June 14-17, 1995, Washington, DC.
- 1995 Annual meetings of the American Federation for Clinical Research, the American Society for Clinical Investigation, and the Association of American Physicians, May 5-8, 1995, San Diego, CA.
- 1995 NIDDK Workshop on Anabolic Hormones; participant, May 1-2, 1995, Washington, DC.
- 1994 Annual Meeting of the American Society for Gravitational & Space Biology, invited lecture, "Pathophysiology of bone loss during spaceflight," October 19-22, 1994, San Francisco, CA.
- 1994 Mount Zion Hospital, Brown Bag Lecture, "Your Bones and Osteoporosis," invited peaker, September 20, 1994, San Francisco, CA.
- 1994 Annual Meeting of the American Society for Bone and Mineral Research, presented poster, "Pathophysiology of bone loss during spaceflight," September 9 - 13, 1994, Kansas City, MO.
- 1994 Buck Center for Research on Aging - Summer Training Course in Experimental Aging, June 12-16, 1994, invited instructor, Larkspur, CA.
- 1994 Mount Zion-UCSF, Medical Grand Rounds "Prevention and Treatment of Osteoporosis," invited lecture, May 6, 1994, San Francisco, CA.
- 1994 Annual Meetings of the American Federation for Clinical Research, the Society for Clinical Investigation, and the Association of American Physicians, April 29 - May 2, 1994, Baltimore, MD.
- 1994 UCSF Brown Bag Lunch Series, "Your Bones and Osteoporosis," invited lecture, March 23, 1994, San Francisco, CA.
- 1994 UCSF Endocrine Grand Rounds, "Calcium - What's New in Nutrition and Osteoporosis Treatment," invited lecture, March 9, 1994, San Francisco, CA.
- 1994 UC Berkeley, Department of Nutritional Sciences, invited lecturer, Calcium and Osteoporosis March 9, 1994, Berkeley, CA.
- 1994 Annual Meeting of the AAAS, "Musculoskeletal responses to space flight and inactivity," invited lecture, February 23, 1994, San Francisco, CA.
- 1993 Annual Meeting of the American Society for Bone and Mineral Research, participant; September 18-19, 1993, Tampa, FL.
- 1993 Gordon Research Conference, Biochemistry and Physiology of Bones and Teeth, July 7-13, 1993, Meriden, NH.
- 1993 Molecular Biology and Biotechnology Summer Workshop, Smith College May 30-June 12, 1993, North Hampton, NH.
- 1993 University of California Continuing Education, Advances in Internal Medicine; invited speaker, "Biochemical markers of bone turnover," May 26-23, 1993, San Francisco CA.
- 1993 Annual Meeting of FASEB invited lecture "Pathophysiology of bone loss during spaceflight," April 7-8 1993, Anaheim, CA.
- 1993 Annual Meetings of the Western Association of Physicians, Western Society for Clinic Research, present paper, February 18-19, 1993, Carmel, CA.
- 1992 International Biotechnology Expo & Scientific Conference, "Can Biotechnology Have a Positive Influence on Aging?" invited keynote address speaker, October 10-14, 1992, San Francisco, CA.
- 1992 Bone Morphometry 1992: The Sixth International Congress, Member, Organizing Committee, present paper October 4-9, 1992, Lexington, KY.
- 1992 Annual Meeting of the American Society for Bone and Mineral Research, participant, September 30-October 4, 1992, Minneapolis, MN.
- 1992 World Space Congress, "Pathophysiology of mineral loss during space flight," invited lecture, September 1992, Washington, DC.

**Scientific Meeting Participation (1983-1996), (Local and National) continued**  
 Claude D. Arnaud, M.D.

- 1992 Loyola University Medical Grand Rounds, invited lecture "The parathyroid hormone receptor," August 25, 1992 Chicago, IL.
- 1992 The Second North American Congress on Biomechanics, "Pathophysiology of mineral loss during space flight," invited speaker, August 25, 1992, Chicago, IL.
- 1992 National Institute of Dental Research Workshop on Osteoporosis and Oral Bone Loss, Chairman, August 26-28, 1992, Leesburg, VA.
- 1992 National Osteoporosis Foundation Conference: Clinical Management of the Patient with Osteoporosis, Conference co-chair, invited lecture, "Pathophysiology of Osteoporosis," May 15-16, 1992, San Francisco CA.
- 1992 Annual Meeting of the FASEB, - Symposium, Human physiology in microgravity: Spacelab SLS-1, "Pathogenesis of mineral loss during space flight," April 1992, Anaheim, CA .
- 1992 Doctor's Hospital, UCSF Extended Programs in Medical Education, invited lecture, "Hyperparathyroidism," December 18 1992, Pinole, CA.
- 1991 Institute on Aging (UCSF/MZH), invited lecture, "Osteoporosis Update for the Primary Care Physician," October 25, 1991, San Francisco, CA.
- 1991 Annual Meeting of the American Society for Bone and Mineral Research, participant, received William F. Neuman Research Award August 24-28, 1991, San Diego, CA.
- 1991 Advances in Mineral Metabolism Meeting, participant, April 3-7, 1991, Snowmass, CO.
- 1991 Providence Hospital, Medical Grand Rounds, invited speaker, "Pathophysiology of osteoporosis," January 8, 1991, Oakland, CA.
- 1990 Northern California Bone and Mineral Club, "Calcium Nutrition and Osteoporosis," invited speaker, December 5, 1990, San Francisco, CA. 1990 NIH Consensus Conference on Diagnosis and Management of Asymptomatic Primary Hyperparathyroidism, participant. October 29-31, 1990, Bethesda, MD.
- 1990 The Effects of Space Travel on the Musculoskeletal System: invited lecture, "Pathogenesis of mineral loss during space flight," October 3-4, 1990, Washington, DC.
- 1990 Annual Meeting of the American Society for Bone and Mineral Research, presented paper, August 28-31, 1990, Atlanta, GA.
- 1990 Montefiore Senior Center/San Francisco Jewish Community Center, invited lecturer, "Your bones and osteoporosis," April 20, 1990, San Francisco, CA.
- 1990 UCSF Brown Bag Lunch Series, "Calcium Nutrition," invited lecture, March 21, 1990, San Francisco, CA.
- 1989 Biological Restoration of Bone and Articular Cartilage: invited participant; October 29-November 1, 1989, Arlie, VA.
- 1989 Mount Zion Hospital and Medical Center, Geriatric Grand Rounds, invited lecturer, Calcium nutrition in the elderly," September 28, 1989, San Francisco, CA.
- 1989 Joint Meeting of the American Society for Bone and Mineral Research and International Conference on Calcium Regulating Hormones, participant; September 9-14, 1989, Montreal, Canada.
- 1989 Boy Frame Memorial Lecture, Department of Medicine, Henry Ford Hospital, "Malignancy Associated Hypercalcemia," September 7, 1989, Detroit, MI.
- 1989 University of Kentucky, Department of Medicine, Medicine Grand Rounds, invited lecturer, "Hypercalcemia," May 3, 1989, Lexington, KY; .
- 1989 Annual Meeting of the Western Association of Physicians, keynote lecture, "Malignancy associated hypercalcemia," February 7-8, 1989, Carmel, CA.
- 1989 University of California Berkeley, Department of Nutritional Sciences, "Calcium Nutrition," invited lecture, November 30, 1988 Berkeley, CA.
- 1988 Invited Symposium on Cellular Mechanisms of Bone Remodeling: invited lecture and participant, October 2-5, 1988, Jacksonville, FL.
- 1988 Visiting Professor, Mayo Clinic, Endocrine Grand Rounds and Endocrine Research Conference, August 30 - September 1, 1988 Rochester, MN.
- 1988 Mount Zion Hospital, Medical Grand Rounds, "Pathogenesis of osteoporosis," July, 1988, San Francisco, CA.

**Scientific Meeting Participation (1983-1996)** (Local and National) continued  
 Claude D. Arnaud, M.D.

- 1988 Annual Meeting of the American Society for Bone and Mineral Research, presented paper, June 4-7, 1988, New Orleans, Louisiana.
- 1988 Seventh Avenue Presbyterian Church Senior Center, "You and your bones", invited lecture, April 21, 1988, San Francisco, CA.
- 1988 The Second Annual Symposium on the Long-Term Effects of Estrogen Deprivation, participant, February 12-15, 1988, St. Johns, U.S. Virgin Islands.
- 1988 University of California San Francisco, Endocrine Postgraduate Assembly, invited lecture, "Mineral Nutrition" October 24-27, 1987, San Francisco, CA.
- 1987 Annual Meeting of the Endocrine Society, session chairperson, June 10-12, 1987, Indianapolis, IN.
- 1987 Annual Meeting of the American Society for Bone and Mineral Research, participant; June 6-9, 1987, Indianapolis, IN.
- 1987 University of California, San Francisco, Medical Grand Rounds, "Osteoporosis Update," invited lecture; May 4-6, 1987, San Francisco, CA.
- 1987 Annual Meeting of the American Federation for Clinical Research, the American Society for Clinical Investigation, and the Association of American Physicians, participant, May 1-4, 1987, San Diego, CA.
- 1987 Annual Meeting, Advances in Mineral Metabolism, participant, March 30- April 3, 1987, Snowmass, CO.
- 1987 Annual Meetings of the American Federation for Clinical Research, the Western Society for Clinical Investigation and the Western Association of Physicians, participant, February 3-6, 1987, Carmel, CA.
- 1986 Endocrine Society Postgraduate Assembly, invited lecturer, "Hypercalcemia." November 6-10, 1986, Los Angeles, California;
- 1986 University of California, San Francisco, Endocrinology Metabolism Postgraduate Course, invited lecturer, "Primary Hyperparathyroidism" October 15-19, 1986, San Francisco, CA.
- 1986 Gordon Research Conference on The Chemistry and Physiology of Bones and Teeth, participant, July 14-17, 1986, Kimball Union Academy, Meriden, NH.
- 1986 The Annual Meeting of the Endocrine Society, session chairperson, June 25-27, 1986, Anaheim, CA.
- 1986 Annual Meeting of the American Society for Bone and Mineral Research, present paper, June 21-24, 1986, Anaheim, CA.
- 1986 University of California San Francisco, Advances in Internal Medicine, invited lecturer, May 19-23, 1986, San Francisco, CA.
- 1986 Annual Meeting of the American Federation for Clinical Research, the Society for Clinical Investigation, and the Association of American Physicians, participant, May 2-5, 1986, Washington, DC.
- 1986 Annual Meeting of the American College of Physicians, panel moderator, April 10, 1986, San Francisco, CA.
- 1986 Annual Meeting of Advances in Mineral Metabolism, invited lecturer, March 30-April 4, 1986, Snowmass, Colorado.
- 1986 Visiting Professor Medical College of Wisconsin, February 26, 1986, Milwaukee, WI.
- 1985 Medical-Dental Study Guild of California, invited lecture, December 11, 1985, San Francisco, CA.
- 1985 Stanford University Department of Medicine, Medical Grand Rounds, "Malignancy Associated Hypercalcemia," invited lecture, August 15, 1985, Stanford, CA.
- 1985 Consumer Exchange Meeting, United States Food and Drug Administration, " Calcium Nutrition," invited lecture; June 26, 1985, San Francisco CA.
- 1985 Annual Meeting of the Endocrine Society, session co-chairperson; June 19-21, 1985, Baltimore, MD.
- 1985 Annual Meeting of the American Society for Bone and Mineral Research, participant, June 15-18, 1985, Washington, DC.

**Scientific Meeting Participation (1983-1996), (Local and National) continued**

Claude D. Arnaud

- 1985 University of California, San Francisco, Advances in Internal Medicine, invited lecture May 1-4, 1985, San Francisco, CA.
- 1985 Annual Meetings of Association of American Physicians, American Society for Clinical Investigation, and American Federation for Clinical Research, participant, May 3-6, 1985, Washington, DC.
- 1985 University of California San Francisco, Endocrinology Metabolism Postgraduate Course, invited lecture, 1985, San Francisco, CA .
- 1985 Western Meeting of the American Federation for Clinical Research, and Annual Meetings of the Western Society for Clinical Research and the Western Association of Physicians, participant, February 5-6, 1985, Carmel, CA.
- 1985 University of Arizona, Visiting Professor (The Flynn Foundation Professor of Medicine), January 30-31, 1985, Tucson, AZ.
- 1984 Visiting Professor University of Texas Health Science Center, Division of Endocrinology and Metabolism, clinical and research seminars, December 5-7, 1984, San Antonio, TX.
- 1984 American Institute of Biological Sciences, Annual Space Biology Symposium, session chair and panel participant, November 6-9, 1984,Charlestown, WV..
- 1984 University of California San Francisco, Medical Grand Rounds, October 31, 1984. San Francisco, CA.
- 1984 University of Washington School of Medicine, Visiting Professor, October 25-27,1984, Seattle, WA.
- 1984 American College of Physicians, Army Regional Meeting Postgraduate Course, invited lecture, October 1-5, 1984, San Francisco, CA.
- 1984 SHEP Meeting, invited lecture; September 30-October 1, 1984, Portland, OR.
- 1984 University of California San Francisco Community Health Education Program, invited lecturer, September 18, 1984, San Francisco, CA.
- 1984 Cedars-Sinai Medical Center Renal Grand Rounds, invited lecture, August 7, 1984, Los Angeles, CA.
- 1984 Annual Meeting of the American Society for Bone and Mineral Research, participant, June 27-28, 1984, Farmington and Hartford, CT.
- 1984 Rocky Mountain Clinical ChemistrySection meeting, invited lecture, May 11,1984, Scottsdale AZ.
- 1984 Annual Meetings of the American Society for Clinical Investiogation, the Association of American Physicians, and the American Federation for Clinical Research, participant, May 4-7, 1984,Washington, DC.
- 1984 University of California, San Francisco, Endocrinology Metabolism Post Graduate Course, Session Chairman, March 10, 1984, Tahoe City, CA.
- 1984 St. Luke's Hospital, New York City, Visiting Professor, March 1, 1984, NY, NY.
- 1983 University of California, San Francisco, Primary Care Grand Rounds, invited lecture, August 11, 1983, San Francisco, CA.
- 1983 Paralyzed Veterans of America, Annual Symposium on Health Care for Persons with Spinal Cord Injury, invited lecture, June 24,1983 Washington, DC.
- 1983 Annual Meeeting of the American Society for Bone and Mineral Research Meeting, participant, June 5, 1983, San Antonio, TX.
- 1983 Annual Meeting of the Endocrine Society, participant, June 6, 1983, San Antonio, TX.
- 1983 University of California, San Francisco, Advances in Internal Medicine, invited lecture, May 17, 1983 San Francisco, CA.
- 1983 Annual Meetings of the Association of American Physicians, the American Society for Clinical Investigation, and the American Federation for Clinical Research, participant, April 29-May 2, 1983, Washington, DC.
- 1983 American Association of Endocrine Surgeons, invited lecturer, April 19, 1983, San Francisco, CA.
- 1983 Annual Meetings of the Western Society for Clinical Investigation, the Western Association of Physicians, and the Western Section of the American Federation for Clinical Research, participant, February 8-11, 1983, Carmel, CA.

**Scientific Meeting Participation (1983-1996)** (Local and National) continued  
Claude D. Arnaud, M.D.

1983 The American College of Physicians Intensive Course in Geriatric  
Medicine, invited lectures, January 17, 1983, Santa Monica, CA.

## RESEARCH AND CREATIVE ACTIVITY:

### A. Original Journal Articles

1. **Arnaud, C.D.**, Walker, J.A., Ewer, R.W. Primary hyperparathyroidism associated with a cystic lesion in the neck: probable parathyroid cyst. *J Clin Endocrinol* 21:833-838, July 1961.
2. Rasmussen, H., DeLuca, H., **Arnaud, C.D.**, Hawker, C., Von Stedingk, M. The relationship between vitamin D and parathyroid hormone. *J Clin Invest* 42:1940-1946, December 1963.
3. Rasmussen, H., **Arnaud, C.D.**, Hawker, C. Actinomycin D and the response to parathyroid hormone. *Science* 144:1019-1021, May 22, 1964.
4. **Arnaud, C.D.**, Rasmussen, H. Effect of purified parathyroid hormone added in vitro on the respiration of oligomycin-inhibited rat renal tubules. *Endocrinology* 75:277-280, August 1964.
5. Rasmussen, H., Fischer, J., **Arnaud, C.D.** Parathyroid hormone, ion exchange and mitochondrial swelling. *Proc Natl Acad Sci USA* 52:1198-1203, November 15, 1964.
6. Tenenhouse, A., **Arnaud, C.D.**, Rasmussen, H. The isolation and characterization of thyrocalcitonin. *Proc Natl Acad Sci USA* 53:818-822, April 15, 1965.
7. Arnaud, C.D., Kneubuhler, H.A., Seiling, V.L., Wightman, B.K., Engbring, N.H. Responses of the normal man to infusions of plasma from patients with Graves' disease. *J Clin Invest* 44: 1287-1294, August 1965.
8. Hargis, G.K., Williams, G.A., Tenenhouse, A., **Arnaud, C.D.** Thyrocalcitonin: cytological localization by immunofluorescence. *Science* 152:73-75, April 1, 1966.
9. **Arnaud, C.D.**, Rasmussen, H., Anast, C. Further studies on the inter-relationship between parathyroid hormone and vitamin D. *J Clin Invest* 45:1955-1964, December 1966.
10. Anast, C., **Arnaud, C.D.**, Rasmussen, H., Tenenhouse, A. Thyrocalcitonin and the response to parathyroid hormone. *J Clin Invest* 46:57-64, January 1967.
11. Rasmussen, H., Anast, C., **Arnaud, C.D.** Thyrocalcitonin, EGTA, and urinary electrolyte excretion. *J Clin Invest* 46:746-752, May 1967.
12. Kaplan, E.L., Staroscik, R., Peskin, G.W., **Arnaud, C.D.** Calcitonin-like responses in man during thyroid surgery. *J Clin Endocrinol Metab* 28:740-744, 1968.
13. **Arnaud, C.D.**, Littledike, T., Tsao, H.S. Radioimmunoassay of calcitonin: a preliminary report. *Mayo Clin Proc* 43:496-502, July 1968.
14. Riggs, B.L., Jones, J.D., **Arnaud, C.D.** Effect of calcium, infusion on serum calcium levels in hypothyroidism. *Metabolism* 17:747-750, August 1968.
15. **Arnaud, C.D.**, Tsao, H.S. Porcine calcitonin: simple procedure for isolation in high yield. *Biochemistry* 8:449-456, January 1969.
16. Kaplan, E.L., Peskin, G.W., **Arnaud, C. D.** Nonsteroid, calcitonin-like factor from adrenal gland. *Surgery* 66:167-174, July 1969.
17. **Arnaud, C.D.**, Tsao, H.S., Littledike, T. Calcium homeostasis, parathyroid hormone and calcitonin: preliminary report. *Mayo Clin Proc* 45:125-131, February 1970.
18. Kaplan, E.L. Singh, M., **Arnaud, C.D.** Influence of sex hormones on calcitonin response in the rat. *Curr Topics Surg Res* 2:167-174, 1970.
19. Salassa, R.M., Jowsey, J., **Arnaud, C.D.** Hypophosphatemic osteomalacia associated with nonendocrine tumors. *N Engl J Med* 28:65-70, July 9, 1970.
20. Kaplan, E.L., **Arnaud, C.D.**, Hill, B.J., Peskin, G.W. Adrenal medullary calcitonin-like factor: a key to multiple endocrine neoplasia, type 2. *Surgery* 68:146-149, July 1970.
21. **Arnaud, C.D.**, Tsao, H.S., Oldham, S.B. Native human parathyroid hormone: an immunochemical investigation. *Proc Natl Acad Sci USA* 67:415-422, September 1970.
22. **Arnaud, C.D.**, Majer, R., Reade, T., Scriver, C.R., Whelan D.T. Vitamin D dependency: an inherited postnatal syndrome with secondary hyperparathyroidism. *Pediatrics* 46:871-880, December 1970.
23. **Arnaud, C.D.**, Tsao, H.S., Littledike, T. Radioimmunoassay of human parathyroid hormone in serum. *J Clin Invest* 50:21-34, January 1971.

**A. Original Journal Articles** continued:

Claude D. Arnaud, M.D

24. Littledike, E.T., **Arnaud, C.D.** The influence of plasma magnesium concentrations on calcitonin secretion in the pig. *Proc Soc Exp Biol Med* 136:1000-1006, March 1971.
25. Fournier, A.E., Jonson, W.J., Taves, D.R., Beabout, J.W., **Arnaud, C.D.**, Goldsmith, R.S. Etiology of hyperparathyroidism and bone disease during chronic hemodialysis, I. Association of bone disease with potentially etiologic factors. *J Clin Invest* 50:592-598, March 1971.
26. Fournier, A.E., **Arnaud, C.D.**, Johnson, W.J., Taylor, W.F., Goldsmith, R.S. Etiology of hyperparathyroidism and bone disease during chronic hemodialysis, II. Factors affecting serum immunoreactive parathyroid hormone. *J Clin Invest* 50:599-605, March 1971.
27. Fischer, J.A., Oldham, S.B., Sizemore, G.W., **Arnaud, C.D.** Calcitonin stimulation of parathyroid hormone secretion in vitro. *Horm Metab Res* 3:223-224, May 1971.
28. **Arnaud, C.D.**, Oldham, S.B., Tsao, H.S., Sizemore, G.W., Fischer, J.A., Littledike, E.T. Human parathyroid hormone: glandular and secreted molecular species. *Am J Med* 50:630-638, May 1971.
29. Purnell, D.C., Smith, L.H., Scholz, D.A., Elveback, L.R., **Arnaud, C.D.** Primary hyperparathyroidism: a prospective clinical study. *Am J Med* 50:670-678, May 1971.
30. Oldham, S.B., Fischer, J.A., Capen, C.C., Sizemore, G.W., **Arnaud, C.D.** Dynamics of parathyroid hormone secretion in vitro. *Am J Med* 50:650-657, May 1971.
31. Goldsmith, R.S., Furszyfer, J., Johnson, W.J., Fournier, A.E., **Arnaud, C.D.** Control of secondary hyperparathyroidism during long-term hemodialysis. *Am J Med* 50:692-699, May 1971.
32. Riggs, B.L., **Arnaud, C.D.**, Goldsmith, R.S., Taylor, W.F., McCall, J.T., Sessler, A.D. Plasma kinetics and acute effects of pharmacologic doses of porcine calcitonin in man. *J Clin Endocrinol Metab* 33:115-127, July 1971.
33. **Arnaud, C.D.**, Glorieux, F., Scriver, C. Serum parathyroid hormone in x-linked hypophosphatemia. *Science* 173:845-847, August 27, 1971.
34. Riggs, B.L., **Arnaud, C.D.**, Reynolds, J.C., Smith, L.H. Immunologic differentiation of primary hyperparathyroidism from hyperparathyroidism due to nonparathyroid cancer. *J Clin Invest* 50:2079-2083, October 1971.
35. Jowsey, J., Riggs, B.L., Goldsmith, R.S., Kelly, P.J., **Arnaud, C.D.** Effects of prolonged administration of porcine calcitonin in post-menopausal osteoporosis. *J Clin Endocrinol Metab* 33:752-758, November 1971.
36. Littledike, E.T., **Arnaud, C.D.**, Whipp, S.P. Calcitonin secretion in ovine, porcine and bovine fetuses. *Proc Soc Exp Biol Med* 139:428-433, February 1972.
37. Vosik, W.M., Anderson, C.F., Steffee, W.P., Johnson, W.J., **Arnaud, C.D.**, Goldsmith, R.S. Successful medical management of osteitis fibrosa due to tertiary hyperparathyroidism. *Mayo Clin Proc* 47:110-113, February 1972.
38. **Arnaud, C.D.**, Glorieux, F., Scriver, C.R. Serum parathyroid hormone levels in acquired vitamin D deficiency of infancy. *Pediatrics* 49:837-840, June 1972.
39. Riggs, B.L., Jowsey, J., Goldsmith, R.S., Kelly, P.J., Hoffman, D.L., **Arnaud, C.D.** Short-term and long-term effects of estrogen and synthetic anabolic hormone in post-menopausal osteoporosis. *J Clin Invest* 51:1659-1663, July 1972.
40. Fischer, J.A., Oldham, S.B., Sizemore, G.W., **Arnaud, C.D.** Calcium-regulated parathyroid hormone peptidase. *Proc Natl Acad Sci USA* 69:2341-2345, August 1972.
41. Stote, R.M., Smith, L.H., Wilson, D.M., Dube, W.J., Goldsmith, R.S., **Arnaud, C.D.** Hydrochlorothiazide effects on serum calcium and immunoreactive parathyroid hormone concentrations: studies in normal subjects. *Ann Intern Med* 77:587-591, October 1972.
42. Brewer, H.B., Jr., Fairwell, T., Ronan, R., Sizemore, G.W., **Arnaud, C.D.** Human parathyroid hormone: amino-acid sequence of the amino-terminal residues 1-34. *Proc Natl Acad Sci USA* 69:3585-3588, December 1972.
43. Foley, T.P., Jr., Harrison, H.C., **Arnaud, C.D.**, Harrison, H.E. Familial benign hypercalcemia. *J Pediatr* 81:1060-1067, December 1972.

**A. Original Journal Articles** continued:

Claude D. Arnaud, M.D.

44. Fischer, J.A., Oldham, S.B., Sizemore, G.W., **Arnaud, C.D.** A parathyroid hormone conversion enzyme: regulation by calcium. *Schweiz Med Wochenschr* 102:1286-1287, 1972.
45. Dube, W.J., Goldsmith, R.S., Arnaud, S.B., **Arnaud, C.D.** Development of antibodies to porcine calcitonin during treatment of Paget's disease of bone. *Mayo Clin Proc* 48:43-46, January 1973.
46. Riggs, B.L., Jr., **Arnaud, C.D.**, Jowsey, J., Goldsmith, R.S., Kelly, P.J. Parathyroid function in primary osteoporosis. *J Clin Invest* 52:181-184, January 1973.
47. Goldsmith, R.S., Furszyfer, J., Johnson, W.J., Fournier, A.E., Sizemore, G.W., **Arnaud, C.D.** Etiology of hyperparathyroidism and bone disease during chronic hemodialysis, III. Evaluation of parathyroid suppressibility. *J Clin Invest* 52:173- 180, January 1973
48. Scholz, C.A., Riggs, B.L., Jr., Purnell, D.C., Goldsmith, R.S., **Arnaud, C.D.** Ectopic hyperparathyroidism with renal calculi and subperiosteal bone February 1973.
49. Sizemore, G.W., Go, V.L.W., Kaplan, E.L., Sanzenbacher, L.J., Holtermuller, K.H., **Arnaud, C.D.** Relations of calcitonin and gastrin in the Zollinger-Ellison syndrome and medullary carcinoma of the thyroid. *N Engl J Med* 288:641-644, March 29, 1973.
50. Arnaud, S.B., Goldsmith, R.S., Stickler, G.B., McCall, J.T., **Arnaud, C.D.** Serum parathyroid hormone and blood minerals: inter-relationships in normal children. *Pediatr Res* 7:485-493, May 1973.
51. Black, H.E., Capen, C.C., **Arnaud, C.D.** Ultrastructure of parathyroid glands and plasma immunoreactive parathyroid hormone in pregnant cows fed normal and high calcium diets. *Lab Invest* 29:173-185, August 1973.
52. Knox, F., Willis, L.R., Ott, C.E., Goldsmith, R.S., Schneider, E.G., Strandhoy, J.W., Cuhe, J.L., **Arnaud, C.D.** Proximal tubule reabsorption after hyperoncotic albumin infusion: role of parathyroid hormone and dissociation from plasma volume. *J Clin Invest* 53:501-507, February 1974.
53. Markey, W.S., Ryan, W.G., Economou, S.G., Sizemore, G.W., **Arnaud C.D.** Familial medullary carcinoma and parathyroid adenoma without pheochromocytoma: report of two cases. *Ann Intern Med* 78: 898-901, 1973.
54. DiBella, F.P., Dousa, T.P., Miller, S.S., **Arnaud, C.D.** Parathyroid hormone receptors of renal cortex: specific binding of biologically active 1,25 I-labeled hormone and relationship to adenylate cyclase activation. *Proc Natl Acad Sci USA* 71:723-726, 1974.
55. Purnell, D., Smith, L.H., Black, B.M., **Arnaud, C.D.**, Scholz, D.A., Sizemore, G.W., Goldsmith, R.S. Treatment of primary hyperparathyroidism. *Am J Med* 56:800-809, June 1974.
56. **Arnaud C.D.**, Goldsmith, R.S., Bordier, P. J., Sizemore, G.W., Larsen, J.A., Gilkinson, J. Influence of immunoheterogeneity of circulating parathyroid hormone on results of radioimmunoassays of serum in man. *Am J Med* 56:785-793, June 1974.
57. Benson, R.C., Jr., Riggs, B.L., Jr., Pickard, B.M., **Arnaud, C.D.** Radioimmunoassay of parathyroid hormone in hypercalcemic patients with malignant disease. *Am J Med* 56:821-826, June 1974.
58. Brewer, H.B., Fairwell, T., Rittel, W., Littledike, T., **Arnaud, C.D.** Recent studies on the chemistry of human bovine and porcine parathyroid hormones. *Am J Med* 56:759-766, June 1974.
59. Johnson, W.J., Goldsmith, R.S., Beabout, J.W., Jowsey, J., Kelly, P.J., **Arnaud, C.D.** Prevention and reversal of progressive secondary hyperparathyroidism in patients maintained by hemodialysis. *Am J Med* 56:827-832, June 1974.
60. Benson, R.C., Jr., Riggs, B.L., Jr., Pickard, B.M., **Arnaud, C.D.** Immunoreactive forms of circulating parathyroid hormone in primary and ectopic hyperparathyroidism. *J Clin Invest* 54:175-181, July 1974.
61. Oldham, S.B., Fischer, J.A., Shen, L.H., **Arnaud, C.D.** Isolation and properties of a calcium-binding protein from porcine parathyroid glands. *Biochemistry* 13:4790-4796, November 1974.

**A. Original Journal Articles** continued:

Claude D. Arnaud, M.D.

62. Eastwood, J.B., Phillips, M.E., de Wardener, H.E., Bordier, J., Marie, P., **Arnaud, C.D.**, Norman, A.W. Biochemical and histological effects of 1,25 dihydroxycholecalciferol (1,25-DHCC) in the osteomalacia of chronic renal failure. *J Urol Nephrol (Paris)* 80:984-985, 1974.
63. Schneider, E.G., Goldsmith, R.S., **Arnaud, C.D.**, Knox, F.G. Role of parathyroid hormone in the phosphaturia of extracellular fluid volume expansion. *Kidney Internatl* 7:317-324, May 1975.
64. Riggs, B.L., Jr., Jowsey, J., Kelly, P.J., Hoffman, D.L., **Arnaud, C.D.** Effects of oral therapy with calcium and vitamin D in primary osteoporosis. *J Clin Endocrinol Metab* 42:1139-1144, June 1976.
65. Miller, S.S., Wolf, A., **Arnaud, C.D.** Bone cells in culture: morphologic transformation by hormones. *Science* 192:1340-1343, June 25, 1976.
66. DiBella, F.P., **Arnaud, C.D.**, Brewer, H.B., Jr. Relative biologic activities of human and bovine parathyroid hormones and their synthetic NH<sub>2</sub>-terminal (1-34) peptides, as evaluated in vitro with renal cortical adenylate cyclase obtained from three different species. *Endocrinology* 99:429-436, August 1976.
67. Goldsmith, R.S., Jowsey, J., Dube, W.J., Riggs, B.L., **Arnaud, C.D.**, Kelly, P.J. Effects of phosphorus supplementation on serum parathyroid hormone and bone morphology in osteoporosis. *J Clin Endocrinol Metab* 43:523-532, 1976.
68. Eastwood, J.B., Stamp, T.C.B., de Wardener, H.E., Bordier, P.J., **Arnaud, C.D.** The effect of 25-hydroxyvitamin D<sub>3</sub> in the osteomalacia of chronic renal failure. *Clin Sci Molec Med* 52:499-508, 1977.
69. Lambert, P.W., Syverson, B.J., **Arnaud, C.D.**, Spelsberg, T.C. Isolation and quantitation of endogenous vitamin D and its physiologically important metabolites in human plasma by high pressure liquid chromatography. *J Steroid Biochem* 8:929-937, February 1977.
70. 71. Miller, P.D., Dubovsky, S.L., McDonald, K.M., **Arnaud, C.D.**, Schrier, R.W. Hypocalciuric effect of lithium in man. *Mineral Electrolyte Metab* 1:3-11, 1978.
72. DiBella, F.P., Gilkinson, J.B., Flueck, J., **Arnaud, C.D.** Carboxyl-terminal fragments of human parathyroid hormone in parathyroid tumors: unique new source of immunogens for the production of antisera potentially useful in the radioimmunoassay of parathyroid hormone in human serum. *J Clin Endocrinol Metab* 46:604-612, April 1978.
73. Dorantes, L.M., Arnaud, S.B., **Arnaud, C.D.** Importance of the isolation of 25-hydroxyvitamin D before assay. *J Lab Clin Med* 91:791-796, May 1978.
74. Berl, T., Berns, A.S., Huffer, W.E., Hammill, K., Alfrey, A.C., **Arnaud, C.D.**, Shrier, R.W. 1,25 dihydroxycholecalciferol effects in chronic dialysis. *Ann Intern Med* 88(6):774-780, June 1978.
75. Riggs, B.L., Gallagher, J.D., DeLuca, H.F., Edis, A.J., Lambert, P.W., **Arnaud, C.D.** A syndrome of osteoporosis, increased serum immunoreactive parathyroid hormone, and inappropriately low serum 1,25 dihydroxyvitamin D. *Mayo Clin Proc* 53:701-706, 1978.
76. European PTH Study Group, **Arnaud, C.D.** (member). Inter-laboratory comparison of radioimmunological parathyroid hormone determination. *Eur J Clin Invest* 8:149-154, 1978.
77. Hepner, G.W., Jowsey, J., **Arnaud, C.**, Gordon, S., Black, J., Roginsky, M., Moo, H.F., Young, J.F. Osteomalacia and celiac disease: response to 25-hydroxyvitamin D. *Am J Med* 65:1015-1020, 1978.
78. Nissenson, R.A., **Arnaud, C.D.** Properties of the parathyroid hormone receptor-adenylate cyclase system in chicken renal plasma membranes. *J Biol Chem* 254:1469-1475, 1979.

**A. Original Journal Articles** continued:

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**B. Original Articles by Endocrine Unit Faculty Members**

The following original articles were published by the San Francisco VA Medical center Endocrine Unit faculty during the time Claude D. Arnaud, M.D. was its Chief. To be certain that faculty members developed a reputation of independence, it was Dr. Arnaud's policy to delete his name from the list of authors on these articles even though he contributed substantially to their conception, writing and critical review. They are listed here in Dr Arnaud's bibliography because they represent a considerable segment of his creative life during the years between 1981 and 1989. Names of the Endocrine Unit faculty and postdoctoral students are "bolded."

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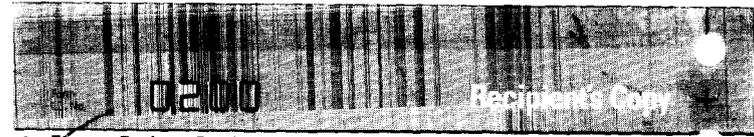
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