CURRICULUM VITAE

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PERSONAL INFORMATION:

Date of Birth:	August 9, 1949
Place of Birth:	Brunnen, Switzerland
Citizenship:	USA

EDUCATION:

1970	Matriculation, Stiftsschule Einsiedeln, Switzerland
1975	Dipl. Phys. ETH, Swiss Federal Institute of Technology, Zürich
1975	Teaching Certificate (Secondary Education), Swiss Federal Institute of Technology, Zürich
1978	Dr. sc. nat., Swiss Federal Institute of Technology, Zürich

PROFESSIONAL EXPERIENCE:

1. Positions Held

Dec 1978 - Mar 1979:	Research Associate Institute of Biomedical Engineering University of Zürich, Zürich, Switzerland
Apr 1979 - Dec 1980:	Research Associate Division of Biomedical Engineering & Applied Sciences Faculty of Medicine University of Alberta, Edmonton, Canada
Jan 1981 - Jun 1982:	Assistant Professor Division of Biomedical Engineering & Applied Sciences Faculty of Medicine University of Alberta, Edmonton, Canada
Jul 1982 - Dec 1985:	Associate Professor, with tenure Department of Applied Sciences in Medicine University of Alberta, Edmonton, Canada

Feb 1983 - Dec 1985:	Adjunct Associate Professor Department of Physics University of Alberta, Edmonton, Canada
Jan 1986 - Aug 1994:	Associate Professor Department of Biomedical and Human Factors Engineering Wright State University, Dayton, Ohio, U.S.A.
Jan 1986 - Present:	Director of Biomedical Imaging Laboratory Wright State University and Miami Valley Hospital Dayton, Ohio, U.S.A.
Feb 1990 - Aug 1994:	Associate Professor Department of Medicine Wright State University, Dayton, Ohio, U.S.A.
May 1994 - Aug 1994:	Associate Professor Department of Physics Wright State University, Dayton, Ohio, U.S.A.
Sep 1994 - Aug 1999:	Professor Department of Biomedical and Human Factors Engineering, Department of Medicine and Department of Physics Wright State University, Dayton, Ohio, U.S.A.
Sep 1999 - Present:	Professor Department of Biomedical, Industrial and Human Factors Engineering, Department of Medicine and Department of Physics Wright State University, Dayton, Ohio, U.S.A.
Jun 2010 - May 2011	Interim Chair Department of Biomedical, Industrial and Human Factors Engineering Wright State University, Dayton, Ohio, U.S.A.
Jun 2011 - Present	Chair Department of Biomedical, Industrial and Human Factors Engineering Wright State University, Dayton, Ohio, U.S.A.

2. Teaching

Courses:

University of Alberta, Edmonton, Canada

ASM 579:	Special Topics in Biomedical Engineering: Computed Tomography
ASM 700:	Supervision of graduate students (M.Sc.) and summer students

Wright State University, Dayton, Ohio

BME 420/620:	Biomedical Engineering Systems II; Generation and Effects of Radiation
BME 463/663:	Biomedical Computers I; software applications, digital electronics
BME 455/655:	Photon Radiation
BME 465/665:	Medical Imaging
BME 490	Honor's Project
BME 493/4/5:	Biomedical Engineering Design (project supervisor)
BME 494:	Biomedical Engineering Design (course director)
BME 499:	Special Problems in Engineering
BME 732:	Computed Tomography
BME 734:	Medical Image Processing
BME/HFE 790:	Seminar in Biomedical and Human Factors Engineering (coordinator)
BME 890:	Thesis (supervision of graduate students, M.Sc. degree)
BMS 999:	Dissertation (supervision of graduate students, Ph.D. degree)
SMD 608:	Bone and Mineral Metabolism
PHY 690:	Introduction to Medical Physics (team taught)
SMD 563	Musculoskeletal Course, year 2 medical students (team taught)

Ph.D. Dissertation Supervision:

Name	Title	Year
Julie A. Skipper	Feasibility of radiographic absorptiometry of the mandible as an osteoporosis screening method	2003
Bino Varghese	Quantitative computed-tomography based bon-strength indicators for the identification of low bone-strength individuals in a clinical environment	2011

M.S. Thesis Supervision:

Name	Title	Year
Keith Whitmore	Microprocessor controlled gamma-ray CT scanner for measurement of bone density	1980
Derek Wells	Calibration of a new rotate-rotate computed tomography scanner	1986
David D'Amico	Two new algorithms for detecting bone edges in quantitative computed tomography	1986
Stephen Veronneau	Effects upon feature detection and recognition viewing digitized radiographic images on a video display terminal	1990
Klaus Lohn	Disuse Osteoporosis: Changes in biochemical parameters during and following simulated microgravity	1991
Edward Powers	Measurement of bone density changes in simulated microgravity using an enhanced gamma computed tomography device	1991
Steven Farmer	Development of a method for determining the characteristics of an x-ray image intensifier system for use in three dimensional computed tomography	1992
Amjad Zaim	Prediction of mechanical strength of bone using finite element analysis and computed tomography	1995
Anita Narashiman	Automated measurement of minimum joint-space width in knee radiographs	2001
Sangeetha Alladi	Comparison of photon spectra generated by I-125 and x-ray tube for quantitative computed tomography	2003
Richard Villata	The effect of positive g_z and the resultant biomechanical force on bone mineral density in males and females	2003
Dhaval Shah	Modeling of blurring due to finite slice width in computed tomography	2003
Akhila Rajgopal	Segmentation of coronary vessels from spiral CT images of the heart	2003
Navin Kausthubh	Phantom to evaluate imaging of atherosclerotic coronary	2004

	arteries in motion by spiral computed tomography	
Dhruman Goradia	Repositioning of the region of interest in the radius of the growing child in follow-up measurements by pQCT	2005
Bino Varghese	Evaluation of bone strength in infants using finite element analysis based on radiographs of the radius	2005
Richa Jayakar	Characterization of CZT detectors for use in a computed tomography scanner	2006
Remya Nair	Simulation of imaging errors due to mechanical inaccuracies and detector geometry in a second-generation computed-tomography scanner	2006
Shruti Gupta	Performance analysis of quantitative bone measurements with spiral, multi-detector CT scanners	2008
Tarpit Patel	Motion-control system of bench-top CT scanner	2008
Shital Abhange	Graphical user interface (GUI) to study different reconstruction algorithms in computed tomography	2009
Binu Enchakalody	Timing-pulse measurement and detector calibration for the OsteoQuant®	2009
Zhihong Ni	Computer-based skeletal age assessment using hand/wrist radiographs in children 8-18 years old	2010
Jimish Joshi	Characterization and improvement of a cone-beam CT scanner for quantitative imaging	2010
Aijing Wang	Selective automatic image feature detection	2011

3. Honors and Awards

AHFMR (Alberta Heritage Foundation for Medical Research) Scholarship, 1 January 1981 to 31 December 1982

AHFMR Scholarship, 1 January 1983 to 30 June 1986

AHFMR Scholarship, 1 July 1986 to 30 June 1991

Certificate of Merit for Scientific Exhibit, The Radiological Society of North America, 1989

Invited entry in first edition of Marquis WHO'S WHO in Science and Engineering, 1991

National Research Competition for Associates, American College of Physicians, Top Ten Finalists, 1992

Outstanding Faculty Member Award (Teaching, Research and Service), College of Engineering and Computer Science, Wright State University, 1992/93

Outstanding Engineer and Scientist Award, Engineering and Science Foundation of Dayton, 1995.

Excellence in Research Award, College of Engineering and Computer Science, Wright State University, 1994/95

Presidential Award for Faculty Excellence in Research, Wright State University, 1995

Best Poster Award, The Ohio Academy of Family Physicians, 1998.

Tau Beta Pi, Eminent Engineer, 1998

Fellow of the American Association of Physicists in Medicine, 2001

Brage Golding Distinguished Professor of Research, Wright State University, 2001-2004

Consultant to the Chinese Osteoporosis Foundation, 2002

Professional Development Award, Wright State University, 2003/04

Honorary Chair, Imaging Science and Biomedical Engineering, The University of Manchester, 2003/04

Distinguished Professor of Biomedical Engineering Research, Wright State University, 2004-2010

Best Abstract, Annual Meeting of the International Society for Clinical Densitometry, 2006

Best Abstract, Annual LSD Symposium, Vienna, Austria, 2007

University Professor, Wright State University, 2009-2014

4. Patents

Method and apparatus for the evaluation of cortical bone by computer tomography, 14 claims; U.S. Patent No. 5,594,775, issued 14 January 1997.

Method and apparatus for the evaluation of structural width and density by computer tomography, 16 claims; U.S. Patent No. 5,673,303, issued 30 September 1997.

Osteoporosis screening using radiographic absorptiometry of the mandible, 35 claims; U.S. Patent No. 7,488,109, issued 10 February 2009.

5. Memberships

American Association of Physicists in Medicine (AAPM)
American Institute of Physics (AIP)
American Society for Bone and Mineral Research (ASBMR)
Institute of Physics (U.K.) (Affiliate Member) (IP)
International Bone and Mineral Society (IBMS)
International Society for Clinical Densitometry (ISCD)
National Osteoporosis Foundation (U.S.) (NOF)
National Osteoporosis Society (U.K.) (NOS)
New York Academy of Sciences (NYAS)
Tau Beta Pi, Engineering Honor Society

6. Professional Committees

National and International

AAPM (American Association of Physicists in Medicine) Standing Committee on Diagnostic X-Ray Imaging, member, 1988-91

NOF (National Osteoporosis Foundation) Task Force on Reimbursement, member, 1988-90

AAPM Task Force on Acceptance Testing for CT Scanners, consultant, 1988-90

International Committee for Standards in Bone Measurement, member, 1990 - 2000

ISCD (International Society for Clinical Densitometry) Committee on Standards of Bone Measurement, chair of Subcommittee on Axial Densitometry, 2005 - present

Radiation Equipment Committee (REC), Ohio Department of Health, 2007 - present

Local

Miami Valley Osteoporosis Society, Founding Chair, 1988 - present

Affiliate Societies Council Awards Committee, member, 2001 - 2003, chair 2004/05

7. Invited Reviews

Associate Editorship

Medical Physics

Manuscript Reviews for Journals

Academic Radiology
Bone
Bone and Mineral
Calcified Tissue International
Computer Methods and Programs in Biomedicine
IEEE Engineering in Medicine and Biology
IEEE Transactions on Evolutionary Computing
IEEE Transactions on Medical Imaging
International Journal of Modeling and Simulation
Investigative Radiology
Journal of Bone and Mineral Research
Journal of Clinical Densitometry
Journal of Computer Assisted Tomography
Journal of Orthopaedic Research
Medical Physics
Medical Engineering and Physics
Measurement Science and Technology
New England Journal of Medicine
New Journal of Physics
Osteoporosis International
Physics in Medicine and Biology
Physiological Measurement
The American Journal of Clinical Nutrition

Grant Reviews (by mail)

Alberta Workers' Health, Safety and Compensation, Canada
Alberta Heritage Foundation for Medical Researach, Canada
Medical Research Council (MRC), United Kingdom
National Aeronautics and Space Administration (NASA)
National Institutes of Health (NIH)
Swiss National Science Foundation
The American Institute of Biological Sciences (AIBS)
National Science and Engineering Research Council (NSERC), Canada

Grant Reviews (review panels)

AIBS (American Institute of Biological Sciences), April 1983
NIH, Institute of Arthritis, Musculo-Skeletal and Skin Diseases, July 1987
NIH, Small Business Innovation Research (SBIR), March 1988
NIH, Institute of Aging, Site Visit, University of California at San Diego, April 1991
NASA, Human Health in Space, Bone Biology, November 2004
NIH, SBIR/STTR: Medical Imaging Study Section, October 2008 - present

On-Site Research Review and Support

Specialized Center of Research (SCOR), Univ. of Pennsylvania, Philadelphia, 1988-92, yearly site visits, mandated by NIH

Univ. of Indiana, Bone Measurement Laboratory, Indianapolis, IN, 1988 - present

National Center for Health Statistics, Bone Measurements, March 1988

Ohio State University, Bone and Mineral Metabolism Laboratory, Columbus, OH, 1990 - present

University of Cincinnati, Children's Medical Center, Bone Measurements, 1996-97

National Center for Health Statistics, Bone Measurements, February 1997

University of Cincinnati, Bone Health & Osteoporosis Center, 2001 - present

8. University Committee Service

University Committees	Position	Dates
Research Council	Member	1987/88, 88/89, 89/90, 90/91
Graduate Studies Membership	Member	1987/88, 89/90, 90/91, 91/92, 92/93
Graduate Studies Membership	Chair	1988/89, 93/94, 94/95,95/96, 96/97, 97/98
Due Process Hearing Board	Member	1994/95, 98/99
Faculty Senate	Senator	1998/99, 1999/2000
Executive Committee of Senate	Member	1998/99
AAUP Bargaining Council	Member	1998/99, 1999/2000, 02/03, 04/05, 07/08
Promotion & Tenure	Member	2000/01
Graduate Council	Member	2000/01
Promotion & Tenure Appeals	Chair	2002, 2003
Tenure Removal Committee	Member	2005/06, 06/07, 07/08
Academic Integrity Hearing Board	Member	2005/06, 06/07, 07/08, 08/09, 09/10, 10/11
AAUP-Engineering Incentives Committee	Member	2006/07
Graduate Studies Reading Committee for Ph.D. in Sustainability	Member	2007/08
ECS Dean Search Committee	Member	2010

College Committees	Position	Dates
Review of Research Challenge Proposals	Chair	1988
Teaching Awards	Member	1988
Graduate Studies	Member	1987/88, 88/89, 90/91, 91/92, 93/94, 94/95, 95/96, 96/97, 97/98
Graduate Studies	Chair	1989/90, 92/93, 2004/05, 05/06
3-Year Admin. Review of Dept. Chair	Chair	1986/87, 93/94
5-Year Admin. Review of Dept. Chair	Member	1988/89, 95/96, 99/2000
Freshman Curriculum Sequence	Chair	1988/89
SOM Research Council	Member	1991/92, 92/93
Academic Dishonesty	Member	1991/92
Teaching	Member	1991/92, 92/93, 93/94
Teaching	Chair	1995/96, 96/97, 97/98
Peer Teaching Evaluation	Chair	1996/97, 97/98
Undergraduate Education	Member	1992/93
Faculty Development	Member	1996/97, 97/98, 2000/01, 01/02, 05/06, 06/07, 07/08 08/09
Due Process	Chair	1998/99, 1999/2000
BMS Ph.D. Program Admissions	Member	1996/97
BMS Ph.D. Academic Policies Committee	Member	2004/05, 05/06, 06/07, 10/11
BMS Ph.D. Nominating Committee	Member	2007/08
Egr. Ph.D. Program Coordinating Committee for *Sensor Signals and Image Processing*	Member	1996/97, 97/98, 98/99, 1999/2000, 00/01, 01/02
Egr. Ph.D. Focus Area *Sensor Signal and Image Processing*	Chair	2004/05, 05/06
Egr. Ph.D. Academic Affaires Committee	Member	2004/05, 05/06
Egr. Ph.D. Program *Structures and Responsibilities* document development	Chair	2004
Egr. Ph.D. *Candidacy Exam* document development	Chair	2005
Egr. Ph.D. *Milestone* document development	Chair	2006
SOM Curriculum Committee on *Musculoskeletal System*	Member	1996/97, 97/98, 98/99
Undergraduate Curriculum	Member	2001/02
Undergraduate Curriculum	Chair	2002/03
Scholarship	Member	2002/03
Ad hoc Committee on Computational Science	Member	2005
Ad hoc Strategic Planning Advisory Committee	Member	2006/07, 07/08, 08/09, 09/10
Steering Committee	Member	2008/09
Dean Search	Member	2010
Academic Computing Committee	Member	2009/10

Department Committee	Position	Dates
Faculty Development	Member	1988-present
Faculty Development	Chair	1996/97, 97/98
Teaching Evaluation	Chair	1988-2003
BME Program Committee	Member	2000-present
Medical Physics Curriculum	Member	1994-98
Bylaws Development	Chair	2000-03, 2006-09
Faculty Development for ME	Member	2001-03
Steering Committee Bone Club (DOM)	Member	2002/03
Preparation of CME course on bone	Member	2003/04
Chair Search (Math & Stats)	Member	2007/08
Chair 5-year Evaluation (BIE)	Member	2007/08
Research Com., Orthop., Sprots Med. & Rehab.	Member	2009-present
Ohio Research Scholar Search	Chair	2009-11
Junior Faculty in Medical Imaging Search	Chair	2010/11

9. Research Grants

"Bone mineral content measurements, using gamma-ray computed tomography"
Special Services and Research Committee, University of Alberta Hospitals.
$18,000; 1 September 1979 - 31 August 1980; co-principal investigator.

"Treatment of osteoporosis by manipulation of bone-cell populations: evaluation using gamma-ray computed tomography"
Special Services and Research Committee, University of Alberta Hospitals.
$10,600; 6 November 1980 - 5 November 1981; co-principal investigator.

"Dual-rotation computed-tomography system development for bone and soft-tissue density measurements"
Alberta Heritage Foundation for Medical Research (AHFMR).
$184,730; 1 January 1981 - 31 December 1982; principal investigator.

Secretarial support.
AHFMR.
$63,000; 1 January 1981 - 31 December 1986; principal investigator.

Grinnell image-processing and -display system.
AHFMR.
$39,690; 7 January 1981; capital request; co-principal investigator.

Additions to multi-user laboratory data-acquisition and -processing computer facility.
AHFMR.
$145,000; 26 February 1982; capital request; co-principal investigator.

Maintenance of computer and image-processing facilities.
AHFMR.

$40,500; 1 July 1982 - 30 June 1983; co-principal investigator.

"Characterization and monitoring of the adult skeleton in chronic renal failure by computed tomography"
Special Services and Research Committee, University of Alberta Hospitals.
$7,000; 1 September 1983 - 28 February 1985; co-principal investigator.

"Quantitative assessment of skeletal status by computed tomography in patients with multiple myeloma receiving conventional chemotherapy and either a diphosphonate or a placebo"
Alberta Heritage Savings Trust Fund: Applied Research - Cancer.
$56,100; 1 October 1983 - 31 March 1985; co-principal investigator.

"A clinical trial of skeletal activation in healthy post-menopausal women"
Medical Research Council of Canada.
$142,000; 1 July 1984 - 31 December 1986; co-principal investigator.

"A pilot study to improve the tolerance and effectiveness of phosphate/Didronel ADFR treatment in patients with post-menopausal osteoporosis"
The Proctor & Gamble Company, U.S.A.
$209,000; 1 October 1984 - 30 September 1986; co-principal investigator.

Expansion of disc storage and memory on a multi-user computer system.
AHFMR.
$29,000; 27 February 1985; capital request; co-principal investigator.

"Quantitative assessment of skeletal status by computed tomography in patients with multiple myeloma receiving conventional chemotherapy and either a diphosphonate or a placebo"
Alberta Heritage Savings Trust Fund: Applied Research - Cancer.
$50,100; 1 October 1985 - 31 March 1987; co-principal investigator.

Establishment of Biomedical Imaging Laboratory.
Wright State University and Miami Valley Hospital, Dayton, Ohio.
$674,000; 1 January 1986 - 30 June 1988; principal investigator.

Towards the development of the Bone Research Laboratory.
The Proctor & Gamble Company, U.S.A
$5,000; 5 March 1986; principal investigator.

"Analysis and interpretation of medical images - an approach using artificial intelligence"
Ohio Board of Regents.
$16,000; 1 January 1987 - 31 December 1987; principal investigator.

"Analysis and interpretation of medical images - an approach using artificial intelligence"
Image Digitizing System.
Wright State University, College of Engineering and Computer Science.
$6,500; 1 January 1987; capital request; principal investigator.

"Computer-based analysis system of spinal radiographs"

Wright State University, Research Incentive Grant.
$3,500; 1 February 1988 - 15 March 1988; principal investigator.

"Where are we with osteoporosis?" Continuing medical education program.
Ayerst Pharmaceuticals Inc.
$800; 20 April 1988; principal recipient.

Foundation of an osteoporosis information and support group.
Dayton-area health-care institutions.
$1,800; 1 August 1988 - 31 December 1988; principal recipient.

"Disuse osteoporosis - a new procedure for in-vivo assessment"
Ohio Board of Regents.
$60,000; 1 January 1990 - 30 June 1991; principal investigator.

"L-Thyroxine impact on bone mineral density in primary hypothyroidism"
US Air Force - Wright Patterson Air Force Base.
$4,200; 15 September 1990 - 31 August 1991; co-principal investigator.

"Influence of calcium on bone mass formation during puberty"
NIH - Nat. Inst. of Arthritis and Musculoskeletal and Skin Diseases.
$1,630,000; 5 August 1991 - 31 July 1996; co-investigator.

"Influence of calcium on bone mass formation during puberty"
NIH; Subcontract from The Ohio State University.
$91,154; 5 August 1991 - 31 July 1996; principal investigator.

"Bone density changes in spinal-cord injured patients"
NIH - Nat. Inst. of Arthritis and Musculoskeletal and Skin Diseases.
$898,727; 1 October 1991 - 30 September 1996; principal investigator.

"Bone density changes in stroke patients"
Pruett Seed Grant, WSU Office of Geriatric Medicine and Gerontology.
$5,000; 1 November 1992 - 31 October 1993; co-investigator.

"A phase III study of intermittent cyclical Tiludronate in the treatment of established post-menopausal osteoporosis"
Sterling Winthrop Inc.
$1,277,902; 1 December 1992 - 31 December 1997; principal investigator.

"A randomized, double-blind, placebo-controlled, multicenter, parallel group study to determine the efficacy and safety of Risedronate (NE-58095) in the treatment of postmenopausal women with established osteoporosis-related vertebral deformities"
Procter & Gamble Pharmaceuticals.
$850,489; 1 August 1994 - 28 February 1999; principal investigator.

"Analysis of Spinal Deformities"
Ohio Board of Regents.
$18,000; 1 August 1994 - 31 July 1995; capital request; principal investigator.

"A randomized, double-blind, placebo-controlled, multi-center, parallel group study to determine the efficacy and safety of Risedronate (NE-58095) in the prevention of corticosteroid-induced osteoporosis (CIOP)"
Procter & Gamble Pharmaceuticals.
$44,677; 1 March 1995 - 30 June 1997; principal investigator.

"A four-year (three-year core and one-year partial crossover), double-blind, multicenter, placebo-controlled study of the effects of three different doses of Calcimar (synthetic salmon calcitonin, injectable) on bone mineral density, stature, and biochemical markers of bone turnover in women with established postmenopausal osteoporosis (protocol RG-83853-402)"
Rhône-Poulenc Rorer Pharmaceuticals.
$217,531; 1 October 1995 - 30 June 1997; principal investigator.

"Change of bone density during pregnancy and lactation"
WSU Department of Obstetrics and Gynecology.
$1,850; 1 January 1995 - 31 December 1996; principal investigator.

"The use of computed tomography for measurement of bone density to distinguish fractures of osteogenesis imperfecta from child abuse."
The Children's Medical Center Foundation, Dayton, Ohio.
$12,500; 1 July 1995 - 30 June 1997; co-investigator.

"A randomized, comparative multicenter clinical trial evaluating Norian SRS and conventional treatment in unstable metaphyseal fractures of the distal radius"
Norian.
$5,000; 1 September 1995 - 31 December 1996; co-investigator.

"Osteoporosis: Diagnosis and Treatment", CME program in Dayton, OH.
Merck Pharmaceuticals.
$7,000; 12 October 1995; principal recipient.

"Ohio rapid prototype process development consortium"
Ohio Board of Regents.
$2,144,000; 1 September 1996; capital request; co-investigator.

"Ohio rapid prototype process development consortium"
Ohio Board of Regents.
$45,000; 1 July 1997; local share of capital request; principal investigator.

"The effect of exercise on CT bone density in 7 year old girls"
WSU School of Medicine, Dayton, OH
$9,560; 1 July 1999 - 30 June 2000; co-investigator.

"Qualification of radiologic technologists in North America for the test-retest reliability of measurements of the tibiofemoral joint space width in subjects with osteoarthritis of the knee"
Procter & Gamble Pharmaceuticals.
$180,000; 1 August 1999 - 31 December 2003; principal investigator.

"Bone and mineral metabolism research laboratory: a mobile unit"
Ohio State University, Columbus, OH
$265,000; 5 August 1999; co-investigator.

"Bone and mineral metabolism research laboratory: a mobile unit"
Ohio Board of Regents and Wright State University, Dayton, OH
$30,000; 5 August 1999; principal investigator.

"Radiographic knee procedures for clinical study in knee osteoarthritis"
Procter & Gamble Pharmaceuticals.
$300,000; 1 January 2000 - 31 December 2003; principal investigator.

"A randomized, double-blind, parallel, multicenter, placebo-controlled, two year study to determine the efficacy and safety of orally administered 5 and 15 mg/day, and 50 mg/week risedronate in patients with medial compartment knee osteoarthritis in North America"
Procter & Gamble Pharmaceuticals.
$600,000; 1 January 2000 - 31 December 2003; principal investigator.

"The effect of exercise, vitamin D receptor genotype and calcium-sensing receptor genotype on CT bone density in adolescent females"
Children's Medical Center, Dayton, OH
$44,442; 1 January 2000 - 31 December 2001; co-investigator.

"Analysis of coronary arteries by helical computed tomography"
Kettering Medical Center Foundation, Dayton, OH
$60,000; 1 September 2000 - 31 August 2003; principal investigator.

"Postmenopausal evaluation and risk reduction with lasofoxifene (PEARL)"
Pfizer Global Research & Development.
$220,000; 1 November 2001 - 31 December 2007; principal investigator.

Central analysis for pQCT substudy of PEARL trial.
Pfizer Global Research & Development.
$100,000; 1 March 2002 - 31 March 2006; principal investigator.

"A Randomized, Parallel, Double-Blind, Multicenter, Placebo-Controlled Study to Evaluate the Tolerability and Effectiveness of Etoricoxib 90 mg Q.D. vs. Diclofenac Sodium 75 mg B.I.D. in Patients with Rheumatoid Arthritis"
Merck Research Laboratories.
$25,000; 1 March 2003 - 31 December 2005; co-investigator

Central analysis for "A phase II, randomized, double blind, placebo-controlled, multicenter study of the safety and efficacy of zoledronic acid for improvement of bone mineral density in patients with Gaucher disease who are beginning with enzyme replacement therapy with Cerezyme®.
Genzyme Corporation.
$52,000; 1 September 2003 - 31 December 2004; principal investigator.

"A randomized, double-blind, placebo-controlled, multicenter, parallel group study of one year duration followed by 2 years of open-label treatment to determine the safety and efficacy of orally administered 2.5 mg or 5.0 mg daily risedronate, in children ≥4 to <16 years old with osteogenesis imperfecta"
Procter & Gamble Pharmaceuticals.
$80,000; 1 June 2004 - 31 December 2009; principal investigator.

Central analysis of vQCT for "A randomized, double-blind, placebo-controlled, multicenter, parallel group study of one year duration followed by 2 years of open-label treatment to determine the safety and efficacy of orally administered 2.5 mg or 5.0 mg daily risedronate, in children ≥4 to <16 years old with osteogenesis imperfecta"
Procter & Gamble Pharmaceuticals.
$135,000; 1 November 2004 - 30 September 2010; principal investigator.

Evaluation of vertebral deformity and aortic calcification.
Hologic Inc.
$25,000; 1 August 2005 - 30 April 2006; principal investigator.

Central analysis of DXA for "Pharmacogenetics research network and knowledge base."
NIH/IUPUI (subcontract).
$77,000; 1 July 2005 - 30 June 2010; principal investigator.

Central analysis and quality control of DXA and pQCT for "Bone mineral density in childhood study (BMDCS)"
NIH - National Institute for Child Health & Human Development (NICHD) / Clinical Trials and Surveys Corp. (C-TASC).
$252,000; 1 December 2006 - 31 March 2011; principal investigator.

DXA central analysis and quality control for "Longitudinal Study of Genetic Causes of Intrahepatic Cholestasis"
NIH - National Institute of Diabetes and Digestive and Kidney Diseases NIDDK / Children's Hospital of Denver
$430,000; 1 August 2007 - 31 May 2014; principal investigator.

"Development of a computer-based analysis method for skeletal maturity"
WSU Research Challenge
$18,000; 1 January - 31 December 2008; co-investigator.

"Characterization of the FlashCT"
Proctor & Gamble
$55,000; 1 September 2008 - 31 December 2009; principal investigator.

Ohio Research Scholar: "Ohio Imaging and Innovation Network"
State of Ohio
$25,000,000 total award; $3,000,000 WSU share plus $3,000,000 matching funds;
1 January 2009 - 31 December 2014; principal investigator for WSU share.

PREP Scholar Program
National Institute of General Medical Sciences (NIGMS)
$1,486,553; 1 June 2010 - 30 September 2014; co-investigator.

Central analysis of bone density in Gaucher disease
Shire Pharmaceuticals
$152,000; 1 August 2011 - 31 July 2012; principal investigator.

10. Participation in International Symposia

Fachtagung Medex '76, Basle, 15-18 June 1976.

First International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, San Francisco, CA, 7-9 June 1979.

Workshop on CT Technology for Bone-Density Measurements, Edmonton, Canada, 16-17 January 1981; co-organizer.

Second International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Zuoz, Switzerland, 13-16 April 1981; moderator.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 9-14 August 1981.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 25-30 July 1982.

Third International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Banff, Canada, 24-28 October 1982; co-organizer.

International Symposium on Clinical Disorders of Bone and Mineral Metabolism, Detroit, MI, 8-13 May 1983; invited speaker.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 7-12 August 1983.

Workshop on the Coherence Therapy for Osteoporosis, London, Ontario, 10-11 February 1984; invited speaker.

Fourth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Fontevraud, France, 29 May - 1 June 1984; moderator.

Copenhagen International Symposium on Osteoporosis, Copenhagen, Denmark, 3-8 June 1984.

Twelfth Annual Applied Basic Science Course: "Bone Fragility in Orthopedics and Medicine", Ottawa, Canada, 16-18 May 1985; invited speaker.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 4-9 August 1985.

Fifth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Bretton Woods, NH, 14-18 October 1985; moderator.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 10-15 August 1986.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 9-14 August 1987.

Sixth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Buxton, Derbyshire, England, 21-25 September 1987; moderator.

International Symposium on Osteoporosis, Aalborg, Denmark, 27 September - 2 October 1987.

World Congress on Medical Physics & Biomedical Engineering, San Antonio, TX, 6-12 August 1988.

Seventh International Workshop on Bone Densitometry, Palm Springs, CA, 17-21 September 1989; moderator.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 6-10 August 1990.

Eighth International Workshop on Bone Densitometry, Bad Reichenhall, Germany, 28 April - 2 May 1991; moderator.

Ninth International Workshop on Bone Densitometry, Traverse City, MI, 26-30 September 1992; moderator.

International Meeting on Clinical Impact of Bone Density, Ferrara, Italy, 6-8 May 1993; invited speaker.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 1-6 August 1993.

Tenth International Workshop on Bone Densitometry, Venice, Italy, 24-28 April 1994; moderator.

World Congress on Medical Physics & Biomedical Engineering, Rio de Janeiro, Brazil, 21-26 August 1994.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID,5-12 August 1995.

Eleventh International Workshop on Bone Densitometry, Gleneden Beach, OR, 24-28 September 1995; moderator.

Fifth Bath Conference on Osteoporosis and Bone Mineral Measurements, Bath, United Kingdom, 24-26 June 1996.

Twelfth International Bone Densitometry Workshop, Crieff, Scotland, 18-22 May 1997; keynote address, moderator.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 10-15 August 1997.

Sixth Bath Conference on Osteoporosis and Bone Mineral Measurements, Bath, United Kingdom, 22-26 June 1998.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 3-7 August 1998.

Thirteenth International Bone Densitometry Workshop, Delavan, WI, 4-8 October1998; moderator.

The Third International Congress on Osteoporosis, Xi'an, China, 31 March - 3 April 1999.

World Congress on Medical Physics & Biomedical Engineering, Chicago, IL, 23-28 July 2000.

Fourteenth International Bone Densitometry Workshop, Warnemünde, Germany, 3-7 September 2000; invited speaker, moderator.

1st Joint Meeting of the International Bone and Mineral Society and the European Calcified Tissue Society, Madrid, Spain, 5-10 June 2001.

Fifteenth International Bone Densitometry Workshop, Monterey, CA, 22-27 July 2002; moderator.

Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 4-8 August 2002.

2002 International Bone Research Instructional Course & Hands-On Workshop, Hong Kong, China, 17-19 October 2002.

2002 International Osteoporosis Conference, Shang Hai, China, 20-22 October 2002.

The Second DXA Quality Assurance Workshop, Shang Hai, China, 22-23 October 2002; invited speaker, moderator.

2nd European Medical & Biological Engineering Conference, Vienna, Austria, 4-8 December 2002.

WC2003 World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, 24-29 August 2003.

2003 International Osteoporosis Conference, Beijing, China, 20-22 October 2003; invited keynote speaker, moderator.

2003 DXA and Bone Measurement Quality Assurance Workshop, Beijing, China, 22-23 October 2003; invited speaker, moderator.

2003 International Symposium on Osteoporosis and Geriatrics, Zhangjiajie, China, 24-28 October 2003; invited speaker and moderator.

Sixteenth International Bone Densitometry Workshop, Annecy, France, 20-24 June 2004; invited speaker and moderator.

International Society for Clinical Densitometry, Annual Meeting, New Orleans, 16-19 February 2005.

2005 International Symposium on Quality of Bone and Scaffold Biomaterials, Hong Kong, China, 17-18 October 2005; invited speaker and moderator.

The 2nd International Conference on Osteoporosis and Bone Research, Chengdu, China, 19-23 October 2005; invited speaker and moderator.

International Society for Clinical Densitometry, Annual Meeting, San Diego, 1-4 February 2006.

World Congress of Medical Physics and Biomedical Engineering, Seoul, Korea, 27 August - 1 September 2006; moderator.

Seventeenth International Bone Densitometry Workshop, Kyoto, Japan, 5-9 November 2006; invited speaker and moderator.

Fourth International Conference on Children's Bone Health, Montreal, Canada, 21-24 June 2007.

17th Scientific Meeting, International Bone & Mineral Society, Montreal, Canada, 24-29 June 2007.

18th International Bone Densitometry Workshop, Pugnochiuso, Italy, 16-19 June 2008; invited speaker and moderator.

6th International Conference on Bone and Mineral Research & 8th International Osteoporosis Symposium, Hohhot, China, 19-23 September 2008; invited speaker.

5th International Conference on Child Bone Health, Cambridge, England, 23-26 June 2009.

World Congress of Medical Physics and Biomedical Engineering, 7-12 September 2009, Munich, Germany.

International Osteoporosis Foundation 1st Asia-Pacific Meeting, Singapore, 10-13 December 2011

CURRICULUM VITAE
Thomas N. Hangartner, PhD, FAAPM

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1. Theses

Hangartner TN (1974): Der Einfluss radialer und azimutaler Dichtevariationen bei Röhrenknochen auf die Bestimmung der mittleren Kompaktadichte mittels Gammastrahlen-Densitometrie. Diplomarbeit, Institut f Biomed Tech, ETH Zürich.

Hangartner, TN (1978): Quantifizierung der Osteoporose in Radius und Femur mittels Gamma- und Röntgen-Computertomographie. Dissertation, ETH 6291.

2. Books and Proceedings

Hangartner TN, Overton TR (Eds.) (1983): Proceedings of the Third International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography. Banff, 1982. *J Comput Assist Tomogr* 7: 548-567.

Hangartner TN, Genant HK (Eds.) (1985): Proceedings of the 4th International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography. Fontevraud, 1984. *J Comput Assist Tomogr* 9: 602-641.

3. Journal Articles

Rüegsegger P, Hangartner T, Keller HU, Hinderling T (1978): Standardization of computed tomography images by means of a material-selective beam hardening correction. *J Comput Assist Tomogr* 2: 184-188.

Hangartner TN, Overton TR (1982): Quantitative measurement of bone density using gamma-ray computed tomography. *J Comput Assist Tomogr* 6: 1156-1162.

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McClean BA, Overton TR, Hangartner TN, Rathee S (1990): A special purpose X-ray fan-beam CT scanner for trabecular bone density measurement in the appendicular skeleton. *Phys Med Biol* 35: 11-19.

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Trulzsch D, Hangartner T, Grandhi N (1993): Hepatische Osteodystrophie bei alkoholischer Leberzirrhose. *Der Kassenarzt* 9: 40-41.

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Evans BL, Martin JB, Burggraf LW, Roggemann MC, Hangartner TN (2002): Demonstration of energy-coded Compton scatter tomography with fan beams for one-sided inspection. *Nucl Instr and Meth A* 480:797-806

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Varghese B, Short DF, Penmetsa R, Goswami T, Hangartner TN (2011): Computed-tomography-based finite-element models of long bones can accurately capture strain response to bending and torsion. *J Biomech* 44:1374-1379.

Cole JA, Taylor JS, Hangartner TN, Weinreb NJ, Mistry PK, Khan A (2011): Reducing selection bias in case-control studies from rare disease registries. *Orphanet Journal of Rare Diseases* 6:61

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Varghese B, Short DF, Hangartner TN (2012): Development of quantitative computed-tomography-based strength indicators for the identification of low bone-strength individuals in a clinical environment. *Bone* 50:357-363.

4. Chapters in Books

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Hangartner TN (1995): Osteoporosis due to disuse. In: Matkovic V (Ed.), *Physical Medicine and Rehabilitation Clinics of North America*, W. B. Saunders, Philadelphia; 6:579-594.

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Hangartner TN, Goradia D and Short DF (2007): Repositioning of the region of interest in the radius of the growing child in follow-up measurements by pQCT. In: Ling Q, Genant HK, Griffith J and Leung KS (Eds.), *Advanced Bioimaging Technologies in Assessment of the Quality of Bone and Scaffold Materials*. Springer-Verlag Berlin- Heidelberg: 85-102.

5. Conference Proceedings

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Hangartner TN, Short DF (2001): Quantification by computed tomography of width and density of narrow bone structures suffering from partial volume effect. *Med Phys 28*: 1818.

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Hangartner TN, Shah D (2003): Modeling of blurring due to finite slice width in computed tomography. Proceedings of the *WC2003 World Congress of Medical Physics and Biomedical Engineering*, Sydney, Australia: 1652.

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Ward K, Hangartner T, Harrison E, Adams J (2004): A comparison of manufacturer and user-defined thresholds for analysis of bone geometry and density by peripheral quantitative computed tomography (pQCT). Proceedings of the *16th International Bone Densitometry Workshop*, Annecy, France: 153.

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Hangartner TN (2005): Comparison of short- and long-term precision of Lunar Prodigy and Hologic Delphi scanners. *J Clinical Densitometry 8:* 238.

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Hangartner TN (2005): Short- and long-term precision of Lunar Prodigy and Hologic Delphi scanners. *JBMR 20* (Suppl. 1): S328.

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Hangartner TN, Ward KA (2005): Thresholding technique for accurate analysis of density and geometry in QCT, pQCT and μCT. Proceedings of *The 2nd International Conference on Osteoporosis and Bone Research*, Chengdu, China: 11 & 267-272.

Hangartner TN (2006): Impact of long-term precision on least significant change. *J Clinical Densitometry 9:* 238.

Hangartner TN, Varghese B and Miller ME (2006): Analysis of pediatric radiographs of forearms - morphologic differences that separate children suffering from fractures due to unintentional injury or intentional injury. Proceedings of *The Fourth Clare Valley Bone Meeting*, Clare Valley, South Australia: O16.

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Wenstrup R, Kacena K, Kaplan P, Pastores G, Prakash-Cheng A, Zimran A and Hangartner T (2006): Bone mineral density in type I Gaucher disease: prevalence of fractures and effect of treatment with imiglucerase. *J Inherit Metab Dis 29*: Suppl 1:64

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DiMeglio LA, Short D and Hangartner TN (2006): pQCT precision: the importance of accurate repositioning. *JBMR 21* (Suppl. 1): S222.

Hangartner TN (2006): Image-based strength assessment of bone. Proceedings of *The 17th International Bone densitometry Workshop*, Kyoto, Japan: 38.

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Schousboe JT, Wilson KE, Hangartner TN (2007): Accurate detection of abdominal aortic calcification on VFA images. 7th International Symposium on Osteoporosis: Translating Research into clinical Practice, Washington, DC, 18-22 April 2007.

Schousboe JT, Wilson KE, Hangartner TN (2007): Accurate detection of abdominal aortic calcification on lateral spine DXA (VFA) images. *Calcif Tissue Int 80* (Suppl. 1): S147.

Carlino W Hangartner TN, Blades, HZ, Vickers Y, Bishop NJ (2007): Bone mass and architecture with and without fractures. *Bone 40* (Suppl. 1): S32-33.

Hangartner TN, Varghese BA, Miller ME (2007): Assessment of bone strength through finite element analysis based on radiographs of the forearm. *Bone 40* (Suppl. 1): S48.

Schousboe JT, Wilson KE, Hangartner TN (2007): Accurate detection of abdominal aortic calcification on lateral spine DXA (VFA) images. *Bone 40* (Suppl 2): S182.

Hangartner TN (2007): Assumptions and limitations in image-based strength assessment of bone. *JBMR 22* (Suppl. 1): S226.

McCracken PJ, Jayakar RY, Duong LT, Hargreaves R, Hangartner TN, Williams DS (2007): Model effects in the ovariectomized rhesus monkey as measured with pQCT. *JBMR 22* (Suppl. 1): S302.

McHugh K, Grabowski GA, Hangartner T, Kaplan P, Maas M, Mariani G, Moore S, Vellodi A, Yee J, Steinbach L (2007): Guidelines for the assessment and monitoring of bone disease in children with Gaucher disease. Society for the Study of Inborn Errors of Metabolism 2007 Annual Meeting, Hamburg, Germany, 4-7 September 2007.

Maas M, Grabowski G, Hangartner T, Kaplan P, Mariani G, McHugh K, Moore S, Vellodi A, Yee J, Steinbach L (2007): Guidelines for assessing and monitoring bone disease in children with Gaucher disease. European Study Group for Lysosomal Storage Disorders, Perugia, Italy, 27-30 September 2007.

Mariani G, Grabowski G, Hangartner T, Kaplan P, Maas M, McHugh K, Moore S, Vellodi A, Yee J, Steinbach L (2007): Guidelines for the assessment and monitoring of bone disease in children with Gaucher disease. Radiological Society of North America, Chicago, IL, 25-30 November 2007.

Grabowski GA, Hangartner T, Kaplan P, Maas M, Mariani G, McHugh K, Moore S, Vellodi A, Yee J, Steinbach L (2008): Guidelines for the assessment and monitoring of bone disease in children with Gaucher disease. Lysosomal Disease Network World Symposium 2008, Las Vegas, NV, 13-15 February 2008.

Alladi S, Abhange SK, Hangartner TN (2008): Peripheral computed-tomography scanner for high-resolution in-vivo imaging of trabecular-bone microarchitecture. Proceedings of The 18th International Bone Densitometry Workshop, Pugnochiuso, Italy, 15-19 June 2008: 30.

Hangartner TN, Short DF (2008): Fitting of BMD with consideration of confounding parameters. Proceedings of The 18th International Bone Densitometry Workshop, Pugnochiuso, Italy, 15-19 June 2008: 61.

McCracken PJ, Jayakar RY, Duong LT, Hangartner TN, Williams DS (2008): Efficacy of odanacatib in the ovariectomized rhesus monkey as measured with pQCT. *JBMR 23* (Suppl. 1): S459.

Hangartner TN (2008): Diagnosis of osteoporosis in China: a cost-effective approach. Proceedings of The 6th International Conference on Bone and Mineral Research & The 8th International Osteoporosis Symposium, Hohhot, China, 19-22 September 2008:18.

Hangartner TN, Varghese BA, Miller ME (2008): Bone-strength analysis from plain radiographs of the forearm. Proceedings of The 6th International Conference on Bone and Mineral Research & The 8th International Osteoporosis Symposium, Hohhot, China, 19-22 September 2008:18:24.

Hangartner TN, Short DF, Zemel BS, Gilsanz V, Kalkwarf HJ, Lappe JM, Oberfield S, Shepherd JA, Winer K (2009): Fitting of BMD with consideration of confounding parameters. *Bone 45* (Suppl. 2): S87.

Khan A, Hangartner TN, Weinreb NJ, Cole JA, Taylor JS, Gwosdow AR, Mistry PK (2009): Characterizing extra-skeletal phenotype and biomarkers of type-1 Gaucher disease patients with avascular necrosis (AVN) or fractures: a study from the ICGG Gaucher Registry. *Molecular Genetics and Metabolism 98:*81.

Mistry PK, Weinreb NJ, Kaplan P, Cole JA, Gwosdow AR, Hangartner TN (2010): Osteopenia in Gaucher disease develops early in life: response to imiglucerase enzyme therapy in children, adolescents and adults. SSIEM Annual Symposium, Istanbul, 31 August - 3 September 2010.

Mistry PK, Weinreb NJ, Kaplan P, Cole JA, Gwosdow AR, Hangartner TN (2010): Osteopenia in Gaucher disease develops early in life: response to imiglucerase enzyme therapy in children, adolescents and adults. American Academy of Pediatrics National Conference, San Francisco, 2-5 October 2010.

Gilsanz V, Chalfant J, Kalkwarf H, Zemel B, Lappe J, Oberfield S, Shepherd J, Hangartner T, Frederick M, Huang X, Mahboubi S, Sesmangles J, Wren T, Winer K (2010): Age at onset of puberty predicts bone mass in young adulthood. ASBMR 2010 Annual Meeting, Toronto, Canada, 15-19 October 2010, Abstract 1179.

McCracken P, Jayakar R, Purcell M, Mathers P, Savitz A, Szumiloski J, Cook J, Dardzinski B, Hangartner T, Motzel S, Hargreaves R, Evelhoch J, Duong L, Williams D(2010): A multi-modality imaging comparison of odanacatib to alendronate in the ovariectomized rhesus monkey. ASBMR 2010 Annual Meeting, Toronto, Canada, 15-19 October 2010, Abstract SA0435.

Hangartner T, Weinreb N, Kaplan P, Cole A, Gwosdow A, Mistry P (2010): Osteopenia in Gaucher disease develops early in life: response to imiglucerase enzyme therapy in children, adolescents and adults. ASBMR 2010 Annual Meeting, Toronto, Canada, 15-19 October 2010, Abstract SA0444.

Hangartner TN, Short DF, Zemel BS, Gilsanz V, Kalkwarf HJ, Lappe JM, Mahboubi S, Oberfield SE, Shepherd JA, Winer KK (2010): Modeling of pediatric spine BMD with consideration of anthropometric parameters. *Osteoporos Int 21* (Suppl. 5): S682-S683.

Khan A, Hangartner TN, Weinreb NJ, Taylor JS, Mistry PK (2011): Risk Factors for Developing Fractures or Avascular Osteonecrosis (AVN) in Patients with Type 1 Gaucher disease: Analysis

from the ICGG Gaucher Registry. ASHG?ICHG 2011 Meeting, Montreal, Canada, 11-15 October 2011, Abstract 1318T.

7. Invited Seminars and Workshops

Hangartner TN: CT-Projekt an der University of Alberta. Swiss Federal Institute of Technology, Zürich, Switzerland, 13 August 1980.

Hangartner TN: CT-system specifications. Workshop on CT-Technology for Bone Density Measurements, Edmonton, Canada, 16-17 January 1981.

Hangartner TN: Mechanical properties of human bone. University of Calgary, Calgary, Canada, 17 November 1983.

Hangartner TN: Development of a new CT scanner. University of California at San Francisco, CA, 5 December 1983.

Hangartner TN: ADFR theory of bone. University of California at San Francisco, CA, 5 December 1983.

Hangartner TN: Multicenter quality control in the radiological assessment of bone. Workshop on Coherence Therapy for Osteoporosis, London, Ontario, Canada, 10-11 February 1984.

Overton TR, Hangartner TN, Harley CH: The Edmonton ADFR experience. Workshop on Coherence Therapy for Osteoporosis, London, Ontario, Canada, 10-11 February 1984.

Hangartner TN: The measurement of trabecular bone density in vertebral bodies. Calgary General Hospital, Calgary, Canada, 18 January 1985.

Hangartner TN: Knochenmessungen mit Absorptiometrie und Computertomographie. Albert Ludwigs Universität, Freiburg i. Br., Germany, 20 February 1986.

Hangartner TN: Technische Aspekte des CT-Scanners 'Rotoscan'. Siemens, Erlangen, Germany, 28 February 1986.

Hangartner TN: Comparison of radiologic measurements of bone. Fifth Annual Symposium of the Biomedical Sciences Ph.D. Program: Recent Advances in Bone Research, Wright State University, Dayton, OH, 8 May 1987.

Hangartner TN: The radiologic measurement of bone. Indiana University, Indianapolis, IN, 13 May 1987.

Hangartner TN: The precise measurement of bone: methods. Johnson Space Center, Houston, TX, 23 June 1989.

Hangartner TN: Practical considerations of medical imaging instrumentation. University of Cincinnati, Cincinnati, OH, 28 June 1989.

Hangartner TN: Comparison of definitions of vertebral fractures. Workshop on Defining Vertebral Fractures, Washington, DC, 25 February 1990.

Hangartner TN: Bone mineral measurements. The Ohio State University, Columbus, OH, 11 October 1990.

Hangartner TN: Quantitative bone measurements by radiologic methods. Visiting Professorship Program, University of California at Los Angeles, CA, 18 January 1991.

Hangartner TN: Diagnosis and follow-up of osteoporosis by radiologic methods. University of Western Ontario, London, Ontario, Canada, 12 April 1991.

Hangartner TN: Quantitative assessment of bone by radiologic methods. London Regional Cancer Center, London, Ontario, Canada, 12 April 1991.

Hangartner TN: Knochenmessung zur Diagnose und Behandlungsbeurteilung der Osteoporose. Kantonales Spital Altstätten, Switzerland, 13 May 1991.

Hangartner TN: Bone density loss in spinal-cord injured patients. 1991 Spinal Cord Injury Research Symposium, Edmonton, Canada, 31 October - 1 November 1991.

Hangartner TN: Bone measurements and possible applications to research animals. Eli-Lilly, Indianapolis, IN, 16 April 1992.

Hangartner TN: Aufbau des OsteoQuant und Evaluation des trabekulären und kortikalen Knochens. Swiss Federal Institute of Technology, Zürich, Switzerland, 15 June 1992.

Hangartner TN: Knochemmineralverlust in der Tibia in der Folge von Querschnittslähmungen, Freie Universität, Berlin, Germany, 18 June 1992.

Hangartner, TN: Bone mineral analysis in peripheral sites. International Meeting on Clinical Impact of Bone Density, Ferrara, Italy, 6-8 May 1993.

Hangartner TN: Measurement of small bones by computed tomography: technical considerations. Eli-Lilly, Indianapolis, IN, 22 July 1993.

Hangartner TN: Bone densitometry and its link to osteogenesis imperfecta. Osteogenesis Imperfecta 1995 Patient Forum, Dayton, OH, 29 July 1995.

Hangartner TN: Quantitative radiological methods to assess bone. University of Dayton, 12 April 1996.

Hangartner TN: Materialdichtebestimmung des Knochens mittels Computertomographie. University of Stuttgart, Stuttgart, Germany, 18 July 1997.

Hangartner TN: In-vivo quantitative imaging of bone. University of Dayton, Dayton, OH, 10 March 1998.

Hangartner TN: In-vivo quantitative measurement of bone by roentgenologic methods. Union Medical University of China, Beijing, 27 March 1999.

Hangartner TN: Peripheral quantitative computed tomography. Tutorial at the 14th International Bone Density Workshop, Warnemünde, Germany, 3-7 September 2000.

Hangartner TN: Refresher course for x-ray technologists involved in osteoarthritis study of the knee. San Antonio, TX, 4-6 May 2001.

Hangartner TN: Distinction between osteoporosis and osteomalacia based on computed tomography images of bone in vivo. University of Utah, Salt Lake City, UT, 26 July 2001.

Hangartner TN: Refresher course for x-ray technologists involved in osteoarthritis study of the knee. Miami, FL, 25-28 April 2002.

Hangartner TN: Accurate measurement of width and density of cortical bone from computed tomography images. Mayo Clinic, Rochester, MN, 17 May 2002.

Hangartner TN: Calibration of image values in computed tomography. pQCT Users Meeting, Sun Valley, ID, 1-2 August 2002.

Hangartner TN: Radiologic methods for the in-vivo quantitative assessment of bone. Tsinghua University, Beijing, China, 14 October 2002.

Hangartner TN: Radiologic methods for the in-vivo quantitative assessment of bone. *The Second DXA Quality Assurance Workshop*, Shang Hai, China, China, 23 October 2002.

Hangartner TN: From the assessment of bone mass to the assessment of bone density: the experience of a student of Peter Rüegsegger. *Bone Architecture: History and Measurement*, Swiss Federal Institute of Technology Zürich, Switzerland, 30 January 2003.

Hangartner TN: Comparison of data between DXA scanners. *2003 International Symposium on Osteoporosis and Geriatrics*, Zhangjiajie, China:24-28 October 2003.

Hangartner TN: Quality assurance and control in DXA: Are the traditional phantoms adequate? University of Sheffield, Sheffield, UK, 19 January 2004.

Hangartner TN: Techniques to evaluate bone: imaging overview. Bone Expert Panel, Genzyme Corporation, Boston, MA, 5 February 2004.

Hangartner TN: Imaging techniques used in evaluating Gaucher bone disease. Bone Expert Panel, Genzyme Corporation, Boston, MA, 5 February 2004.

Hangartner TN, Short DF: The evaluation of bone cortex by computed tomography (CT): a method allowing accurate extraction of geometry as well as density, even under conditions of partial volume effect. University of Cambridge, Cambridge, UK, 2 April 2004.

Hangartner TN, Short DF: Measurement of cortical bone by CT: overcoming the partial-volume effect. University of Aberdeen, Aberdeen, UK, 30 April 2004.

Hangartner TN, Short DF: Overcoming the partial-volume effect of CT in the assessment of geometry and density of fine structures. Kings College, London, UK, 12 May 2004.

Hangartner TN: Bone Disease in Gaucher: DXA. 8th Annual LSD Registries Meeting, Washington DC, 22 May 2004.

Hangartner TN: State of standardization in central densitometry. ISCD-NIST Workshop on Standardization of Bone Densitometry, San Diego, 4 February 2006.

Hangartner TN: Latest findings: bone mineral density in patients with Gaucher disease. Gaucher Expert Meeting, Montreal, Canada, 24 March 2007.

Hangartner TN: Effect of enzyme replacement therapy with imiglucerase on bone mineral density in type I Gaucher disease. Latin American Symposium on Lysosomal Storage Disaeses, Montevideo, Uruguay, 15 September 2007.

Hangartner TN: Quantitative radiologic assessment of bone in Gaucher disease. University of Calgary, Calgary, Alberta, Canada, 3 December 2007.

Hangartner TN: Quantitative radiologic assessment of bone in Gaucher disease. British Columbia Children's Hospital, Vancouver, BC, Canada, 4 December 2007.

Hangartner TN: Gaucher Disease and bone-density assessment. Annual Canadian Healthcare Advocate Meeting, Toronto, Canada, 1 March 2008.

Hangartner TN: Quantitative assessment of bone by radiologic methods. Visiting Professorship, University of Pennsylvania, Philadelphia, PA, 9 December 2008.

Hangartner TN, Liu Y, Parikh P: Data mining: modeling bone-density response in Gaucher patients without a medical hypothesis. ICGG Gaucher Registry North American Board of Advisors Meeting, Charleston, SC, 13-14 November 2009.

Workshop on quantitative imaging of bone. Osteoporosis Global Expert Forum, Philadelphia, PA, 14-16 April 2010

Hangartner TN: Bone density assessment in Gaucher Disease. Shire Bone Working Group, Cologne, Germany, 29 June 2010.

Hangartner TN: Bone biomarkers. FDA Gaucher Workshop, Washington, DC, 20 September 2010.

8. Unpublished Conference Presentations

Overton TR, Hangartner TN, Bettcher KB: Gamma-ray computed tomography (γ-CT): a new technique in the evaluation of renal osteodystrophy. Combined Meeting, Canadian and Australian College of Medicine, Melbourne, Australia, 1980.

Hangartner TN: Use of peripheral CT measurements of bone mass. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 25-30 July 1982.

Harley CH, Hangartner TN, Overton TR: In-vivo skeletal activation monitored by peripheral CT. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 25-30 July 1982.

Hangartner TN, Heath RF: Computational design problems in CT data acquisition and analysis for bone density measurements. Third International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Banff, Canada, 24-28 October 1982.

Hangartner TN, Overton TR, Harley CH: Double blind study of activation by vitamin D. Sun Valley Workshop on Morphological Aspects of Bone, Sun Valley, ID, 7-12 August 1983.

Hangartner TN: A high precision computed tomography scanner for bone and soft-tissue densitometry. Fourth Annual Heritage Medical Research Days, Edmonton, Canada, 15-16 November 1984.

Hangartner TN, Overton TR, Harley CH: Transient bone density changes following a pulse of ergocalciferol in postmenopausal women. Fourth Annual Heritage Medical Research Days, Edmonton, Canada, 15-16 November 1984.

Hangartner TN: Definition of osteopenia by lateral radiographs. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 4-9 August 1985.

Wells DM, Hangartner TN: Calibration of a new CT scanner: effects of modified re-binning on image reconstruction. Fifth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Bretton Woods, NH, 14-18 October 1985.

D'Amico DA, Hangartner TN: Edge detection of bone using cross-correlation of radial profiles and mathematical morphology. Fifth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Bretton Woods, NH, 14-18 October 1985.

Overton TR, Hangartner TN, Bettcher KB, Harley CH: Axial and peripheral skeleton responses to challenge with oral 1,25 $(OH)_2$ D_3 in chronic renal failure (CRF). Fifth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Bretton Woods, NH, 14-18 October 1985.

Hangartner TN, Belch AR, Overton TR, Harley CH: Osteopenia in multiple myeloma. Fifth International Workshop on Bone and Soft-Tissue Densitometry Using Computed Tomography, Bretton Woods, NH, 14-18 October 1985.

D'Amico DA, Hangartner TN: Two algorithms for detecting bone edges in quantitative computed tomography. Fifth Annual Heritage Medical Research Days, Calgary, Canada, 21 November 1985.

Hangartner TN: Change of "bone density" after strontium infusion in dogs. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 10-15 August 1986.

Hangartner TN: Correction of scatter in CT images. Sixth International Workshop on Bone and Soft-Tissue Densitometry, Buxton, England, 22-25 September 1987.

Overton TR, Hangartner TN: Peripheral and axial bone density changes following skeletal challenge with oral phosphate. Sixth International Workshop on Bone and Soft-Tissue Densitometry, Buxton, England, 22-25 September 1987.

Hangartner TN: Disuse osteopenia: spinal cord injury. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 6-10 August 1990.

Hangartner TN: Effects of functional electrical stimulation (FES) on bone density in spinal-cord injured patients. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 2-6 August 1993.

Hangartner TN: The measurement of cortical bone by CT. Sun Valley Workshop on Morphological Aspects of Bone Biology, Sun Valley, ID, 7-11 August 1995.

Hangartner TN: Biomedical Imaging. Invited presentation for Plenary Session, 15th Southern Biomedical Engineering Conference, Dayton, OH, 29-31 March 1996.

Miller ME, Hangartner TN: The association between temporary brittle bone disease and decreased fetal movement. Poster presentation at 1996 Gordon Research Conference on Bioengineering and Orthopaedic Sciences, Andover, NH, 28 July-2 August 1996.

Miller ME, Hangartner TN: CT bone density measurements in infants with temporary brittle bone disease associated with decreased fetal movement/intrauterine confinement and controls. 27th International Workshop on Hard Tissue Biology, Sun Valley, ID, 11-15 August 1997.

Swedlund SK, Hangartner TN: Comparison of assessment tools in treatment of osteoporosis. Poster presentation at 16th Annual Research Day, The Ohio Academy of Family Physicians, Athens, OH, 9 May 1998.

Miller ME, Hangartner TN: Computed tomography bone density measurements in osteogenesis imperfecta - type I. Poster presentation at 1998 Gordon Research Conference on Bioengineering and Orthopaedic Sciences, Andover, NH, 26-31 July 1998.

Hangartner TN: Phantom for quality assurance and control in dual-energy absorptiometry. Non Spine Quality Assurance Symposium, Monterey, CA, 21 July 2002.

Hangartner TN, Short DF: Improved cortical analysis using computed tomography. 15th International Bone Densitometry Workshop, Monterey, CA, 22-25 July 2002.

Varghese BA, Miller ME, Hangartner TN: Assessment of bone strength through finite element analysis based on radiographs of the forearm. Second Dayton Engineering Sciences Symposium, Dayton, OH, 30 October 2006.

Hangartner TN: T or Z; how to spell DXA? 13th North American LSD Registries Meeting, Dallas, TX, 13-14 May 2010.

9. Media Presentations

Hangartner TN, Gruber JS: Osteoporosis. TV broadcast in the series *Doctor on Call,* Dayton, OH, 31 January 1988.

Hangartner TN, Gruber JS, Stoia R: Osteoporosis. TV broadcast in the series *Issues and Formats,* Dayton, OH, 8 April 1990.

10. Local Seminars and Continuing Education Presentations

Hangartner TN: Computer assisted tomography: technical aspects of a revolutionary diagnostic instrument. Department of Physics, University of Alberta, Edmonton, Canada, 15 February 1980.

Hangartner TN: Quantitative computed tomography of bone. Department of Physics, University of Alberta, Edmonton, Canada, 15 February 1985.

Hangartner TN: The use of computed tomography for the quantification of bone density. Wright State University, Dayton, OH, 4 April 1985.

Hangartner TN: Evaluation of the coherence therapy of bone by computed tomography. Kettering Medical Center, Dayton, OH, 5 April 1985.

Hangartner TN: Non-invasive measurement of bone. University of Alberta, Edmonton, Canada, 4 November 1985.

Hangartner TN: Non-invasive measurement of bone. Orthopedic Grand Rounds, Miami Valley Hospital, Dayton, OH, 31 January 1987.

Hangartner TN: Osteoporosis -- non-invasive bone measurements. OB/GYN Grand Rounds, Miami Valley Hospital, Dayton, OH, 4 February 1987.

Hangartner TN: Radiologic detection and follow-up of osteoporosis. Internal Medicine Grand Rounds, Miami Valley Hospital, Dayton, OH, 25 February 1987.

Hangartner TN: Coherence therapy of bone in osteoporosis. Good Samaritan Hospital and Wright State University Integrated Grand Rounds in Internal Medicine, Dayton, OH, 14 September 1987.

Hangartner TN: Bone measurements. Public seminar, Miami Valley Hospital, Dayton, OH, 20 April 1988.

Hangartner TN: Bone density measurements. Orthopaedic Basic Science Lecture, Miami Valley Hospital, Dayton, OH, 10 May 1988.

Hangartner TN: I. Radiologic bone measurements, II. Coherence therapy of bone. Continuing education seminar for sonographers, Joint Township District Memorial Hospital, St. Marys, OH, 16 August 1988.

Hangartner TN: Quantitative computed tomography for the precise measurement of bone. Seminar in Physics, Wright State University, Dayton, OH, 5 October 1988.

Hangartner TN: Osteoporosis: Who has it, who gets it and how to prevent it? The Fortnightly Club, Piqua, OH, 13 January 1989.

Hangartner TN: Screening for osteoporosis? Family Practice Grand Rounds, Miami Valley Hospital, Dayton, OH, 23 February 1989.

Hangartner TN: OsteoQuant. In service, Medical Imaging Department, Miami Valley Hospital, Dayton, OH, 4, 18, 21 April 1989.

Hangartner TN: Osteoporosis prevention. American Business Women Association, Trotwood, OH, 15 May 1990.

Hangartner TN: Osteoporosis: disease, prevention and treatment. Mercy Medical Center, Springfield, OH, 17 May 1990.

Hangartner TN: Osteoporosis. Montgomery County Joint Vocational School, Dayton, OH, 6 December 1990.

Hangartner TN: Bone density measurements. Orthopaedic Basic Science Lecture, Miami Valley Hospital, Dayton, OH, 16 April 1991.

Hangartner TN: Detection and management of osteoporosis. Internal Medicine Grand Rounds, Miami Valley Hospital, Dayton, OH, 5 June 1991.

Hangartner TN: Bone loss in spinal cord injured patients. Rehabilitation Center, St. Elizabeth Medical Center, Dayton, OH, 26 September 1991.

Hangartner TN: Bone measurement methods. Seminar in Biomedical and Human Factors Engineering, Wright State University, Dayton, OH, 6 April 1992.

Hangartner TN: How well do radiologic methods work for quantitative assessment of bone? Seminar in Physics, Wright State University, Dayton, OH, 15 October 1992.

Hangartner TN: Bone density measurements. Orthopaedic Basic Science Lecture, Miami Valley Hospital, Dayton, OH, 30 March 1993.

Hangartner TN: Osteoporosis: disease, prevention and treatment. Downtown Senior Center, Dayton, OH, 15 September 1993.

Hangartner TN: Osteoporosis: disease, prevention and treatment. Wesley Community Center, Dayton, OH, 29 September 1993.

Hangartner TN: Radiation: the good, the bad and the ugly. Honors Seminar for metropolitan Dayton high school seniors, Wright State University, Dayton, OH, 17 February 1994.

Hangartner TN: Osteoporosis: How do we detect it, and how can it be managed? Good Samaritan Hospital, Dayton, OH, 10 May 1994.

Hangartner TN: Bone measurement in osteogenesis imperfecta. Ohio Chapter of the Osteogenesis Imperfecta Support Group, Childrens' Medical Center, Dayton, OH, 9 July 1994.

Hangartner TN: Radiation: what it is and what it does. Honors seminar for metropolitan Dayton high school students, Wright State University, Dayton, OH, 20 October 1994.

Hangartner TN: Osteoporosis. American Legion Post 675, Dayton, OH, 21 April 1995.

Hangartner TN: Osteoporosis. Women's Group, Grace Community Church, Huber Heights, OH, 2 May 1995.

Hangartner TN: Bone up on health. Women's health program on osteoporosis, Ohio State University Extension, Montgomery County, Dayton, OH, 18 April 1996.

Hangartner TN: Osteoporosis 1996: Radiologic diagnosis and follow-up of FDA-approved treatments. OB/GYN Grand Rounds, Miami Valley Hospital, Dayton, OH, 31 July 1996.

Hangartner TN: Quantitative imaging of bone. President's Research Colloquium, Wright State University, Dayton, OH, 5 March 1997.

Hangartner TN: Osteoporosis. Celiac Sprue Support Group, Dayton, OH, 18 November 1997.

Hangartner TN: Plenary presentation and several workshops at a continuing medical education program on bone densitometry, Indiana University, Indianapolis, IN, 30-31 October, 1997.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 9 - 10 December 1997.

Hangartner TN: Osteoporosis. Progressive Mothers, Southminster Presbyterian Church, Dayton, OH, 20 February 1998.

Hangartner TN: Quantitative imaging of bone. Engineering Ph.D. Seminar, Wright State University, Dayton, OH, 17 April 1998.

Hangartner TN: Plenary presentation and several workshops at a continuing medical education program on bone densitometry, Indiana University, Indianapolis, IN, 11-13, May 1998.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 19-20 May, 27-28 October 1998.

Hangartner TN: The measurement of bone density and its interpretation in disuse osteoporosis. Physical Medicine Grand Rounds, Miami Valley Hospital, Dayton, OH, 24 August 1998.

Hangartner TN: Osteoporosis. Asbury Apartments, Dayton, OH, 23 September 1998.

Hangartner TN: Plenary presentation and several workshops at a continuing medical education program on bone densitometry, Cincinnati, OH, 19-21 November 1998.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 11-12 May, 27-28 October 1999.

Hangartner TN: Plenary presentation and several workshops at a continuing medical education program on bone densitometry, Indiana University, Indianapolis, IN, 27-28, May 1999.

Hangartner TN: Osteoporosis. Sunrise Center, Dayton, OH, 10 June 1999.

Hangartner TN: Osteoporosis. Sycamore Hospital, Dayton, OH, 25 October 1999.

Hangartner TN: Correction procedures in quantitative computed tomography I. Seminar in Applied Mathematics, Wright State University, Dayton, OH, 24 January 2000.

Hangartner TN: Biomechanics of bone. Orthopaedic Basic Science Lecture, Miami Valley Hospital, Dayton, OH, 29 February 2000.

Hangartner TN: Osteoporosis. Canterbury Court, West Carrollton, OH, 11 April 2000.

Hangartner TN: Correction procedures in quantitative computed tomography II. Seminar in Applied Mathematics, Wright State University, Dayton, OH, 4 May 2000.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 9-10 May, 26-27 September 2000.

Hangartner TN: Radiation: the good, the bad and the ugly. Honors Seminar for metropolitan Dayton high school seniors, Wright State University, Dayton, OH, 11 May 2000.

Hangartner TN: Osteoporosis. Senior Center, Miamisburg, OH 14 June 2000.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 23-24 January, 15-16 May, 25-26 September 2001.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 12-13 February, 21-22 May, 12-13 November 2002.

Hangartner TN: Osteoporosis: What is wrong with the bone, how to find out what is wrong, and how to assess if it gets better or worse? Center for Women's Health Care, Miami Valley Hospital, Dayton, OH, 13 & 15 May 2002.

Hangartner TN: Osteoporosis: How you get it, how to find out if you have it, and what to do about it? Club Horizon, Miami Valley Hospital, Dayton, OH, 30 May 2002.

Hangartner TN: Osteoporosis. Kettering Optimist Club, 18 June 2002.

Hangartner TN: Osteoporosis: Disease, incidence and treatment. Dayton Business and Professional Women's Association, 12 February 2003.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 18-19 February, 20-21 May, 2-3 December 2003.

Hangartner TN: Radiologic assessment of bone. Orthopaedic Basic Science Lecture, Miami Valley Hospital, Dayton, OH, 6 May 2003.

Hangartner TN: Osteoporosis. Holy Trinity Church, Dayton, OH 15 May 2003.

Hangartner TN: Quantitative imaging of bone. Imaging Science and Biomedical Engineering Seminar, The University of Manchester, Manchester, UK, 10 November 2003.

Hangartner TN: Selected topics in computed tomography. Seminar series for radiology group of the Imaging Science and Biomedical Engineering unit, The University of Manchester, Manchester, UK, 19 January - 30 April 2004.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 23-24 March, 10-11 August, 16-17 November 2004.

Hangartner TN: Osteoporosis: Does it affect you? Miracle Women, East End Community Center, Dayton, OH 23 September 2004

Hangartner TN: T- and Z-scores: What bone measurements tell us. Workshop in *Bone Health Seminar: "Healthy Bone - A strong Future."* Wright State University, 29 September 2004.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 15-16 February, 17-18 May, 9-10 August, 8-9 November 2005.

Hangartner TN: Osteoporosis, Café Scientifique, Cox Arboretum, Dayton, OH, 24 March 2005.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 21-22 February, 9-10 May, 8-9 August, 14-15 November 2006.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 20-21 March, 8-9 May, 7-8 August, 13-14 November 2007.

Hangartner TN: Quantitative imaging of bone by computed tomography. Wallace Kettering Neuroscience Institute, Kettering, OH, 20 April 2007.

Hangartner TN: Radiation: the good, the bad and the ugly. Dayton Honors Society Seminar, Wright State University, 4 March 2008.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 11-12 March, 3-4 June, 9-10 September, 2-3 December 2008.

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 10-11 March, 2-3 June, 22-23 September 2009.

Hangartner TN: Clinical course for DXA operators. Newly developed and taught 24-25 April 2009

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 9-10 March, 6-7 July, 9-10 November 2010.

Hangartner TN: Clinical course for DXA operators. 9-10 April 2010

Hangartner TN: Basic education for general x-ray machine operators, Wright State University, Dayton, OH, 8-9 March, 12-13 July, 15-16 November 2011.

Hangartner TN: Clinical course for DXA operators. 8-9 April 2011