AFOS 2023 Taiwan

Asian Federation of Osteoporosis Society

Oct 13-15, 2023

Linkou Chang Gung Memorial Hospital,
International Conference Hall,
Taoyuan City, Taiwan

Day1 13th OCT. FRI.

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Asian Federation of Osteoporosis Society

Time	Hall 1	Hall 2
14:10 14:30	**Open Ceremony** Flow: Hsuan-Yu Chen 陳宣佑 Emcee: Christina Soong 宋子茜	
14:30 15:00	**Plenary lecture 1** Moderators: Jawl-Shan Hwang 黃兆山、Chih-Hsing Wu 吳至行、Rong-Seng Yang 楊榮森 Speaker: **Burden of osteoporosis in Asia-Pacific region** Jung-Fu Chen 陳榮福	
15:00 15:30	**Plenary lecture 2** Moderators: Jawl-Shan Hwang 黃兆山、Chih-Hsing Wu 吳至行、 Rong-Seng Yang 楊榮森、Jung-Fu Chen 陳榮福 Speaker: **How can we enhance the assessment of fracture risk** Eugene McCloskey (video-recorded)	
15:30 16:00	**Break**	
Time	**Hall 1**	**Hall 2**
16:00 17:30	**Symposium 1:** Optimize bone health before becoming fragility. Moderators: Fang-Ping Chen 陳芳萍、Unnop Jaisamrarn Speaker: **1.Tips for dealing with bone loss during menopausal transition** Unnop Jaisamrarn **2.Treatment of osteoporosis in the young menopausal woman** Ang Seng Bin **3.Bone Health Optimization, Optimizing Surgical Outcome** Joon-Kiong Lee	**Symposium 2:** Decoding osteoporosis: From small cells to big data Moderators: Chung-Hwan Chen 陳崇桓、 Wei-Chieh Hung 洪暐傑、Hsuan-Yu Chen 陳宣佑 Speaker: **1.Unveiling the Impact of Sex Hormone Receptor Signaling: From Hormone Deficiency to Hormone Therapy in Bone Health and Disease** Hong-Yo Kang 康宏佑 **2.Analyzed real world data like a randomized controlled trial - an osteoporosis drug study example** Edward Lai 賴嘉鎮 **3.Screening of Osteoporosis and Sarcopenia Using Hip Radiographs via Deep Learning Algorithm** Yu-Pin Chen 陳昱斌
18:00 20:00	**Faculty Night** (By Invitation)	

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Time	Hall 1	Hall 2
08:30 09:00	**Plenary lecture 3** Moderators: Jawl-Shan Hwang 黃兆山、Rong-Sen Yang 楊榮森、Vilai Kuptniratsaikul Speaker: **Elucidating very high risk: build bone first to prevent imminent fracture** Serge Ferrari (video-recorded)	
09:00 09:30	**Plenary lecture 4** Moderators: Jawl-Shan Hwang 黃兆山、Rong-Sen Yang 楊榮森、Vilai Kuptniratsaikul Speaker: **Current status and achievements of osteoporosis care in Taiwan** Jawl-Shan Hwang 黃兆山	
09:30 10:00	**Plenary lecture 5** Moderators: Jawl-Shan Hwang 黃兆山、Rong-Sen Yang 楊榮森、Vilai Kuptniratsaikul Speaker: **Effect of osteoporotic fracture and anti-osteoporosis treatment on mortality** Chih-Hsing Wu 吳至行	
10:00 10:30	**Break**	
Time	**Hall 1**	**Hall 2**
10:30 12:00	**Symposium 3** Individualize the treatment of osteoporosis Moderators: Shue-Fen Luo 羅淑芬、Yin-Fan Chang 張尹凡、Satoshi Mori Speaker: **1.Optimize the treatment outcomes for very high risk osteoporosis patients** Fernando Marin **2.Denosumab sequential therapy: Known and Unknown** Shau-Huai Fu 傅紹懷 **3.Use of Raloxifene in Treatment of Osteoporosis** Kyu Ri Hwang	**Symposium 4** Management for osteoporotic fractures: Not just operation Moderators: Chung-Hwan Chen 陳崇桓、Hongsen Chiang 江鴻生、Joon-Kiong Lee Speaker: **1.Fix and Treat Experience from Europe. How to save lives in Patients with Fragility fractures: The role of orthopedic surgeon** Francisco Javier Nistal Rodríguez **2.Osteoporotic hip Fracture surgical treatment and postoperative care** Kwang-Kyoun Kim **3.Fragile Fracture, Once is Enough** Huipeng Shi (video-recorded)
12:00 12:30	**TOA General Meeting** **中華民國骨質疏鬆症學會會員大會**	
12:30 13:10	**Lunch Symposium** (Sponsored by ZP THERAPEUTICS) Moderators: Chi-Chien Niu 牛自健 Speaker: **Update of the Management of Severe Osteoporosis with Teriparatide** Fernando Marin	

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Time	Hall 1	Hall 2
13:30 15:30	**Symposium 5** Glucocorticoid induced osteoporosis and secondary osteoporosis Moderators: Tien-Tsai Cheng 鄭添財、 Swan Sim Yeap、 Julie Li-Yu Speaker: **1.What's new in glucocorticoid- induced osteoporosis?** Swan Sim Yeap **2.Secondary Causes of Bone Loss** Julie Li-Yu **3.RA-related Osteoporosis/fracture** Chung-Yuan Hsu 許鐘元 **4.Application of Trabecular Bone Score for Fracture Risk Assessment in Rheumatic Patients** Jia-Feng Chen 陳嘉峯	**Symposium 6** Long term care of fragile patients Moderators: Wing Chan 陳榮邦、Ching-Lin Tsai 蔡清霖、 JChien-An Shih 施建安 Speaker: **1.Set your target: treatment goal with short and long term denosumab to prevent fracture** Serge Ferrari (video-recorded) **2.Sarcopenia and frailty** Vilai Kuptniratsaikul **3.Japanese action preventing secondary fragility fracture** Satoshi Mori **Industry Symposium (Sponsored by AIM)** From Pixels to Prevention: AI-Powered Digital Radiogrammetry Democratizes Osteoporosis Diagnosis Speaker: Qingzong Tseng 曾慶宗
15:30 16:00	**Break**	
16:00 17:30	**Symposium 7** Treatment and prevention of osteoporosis in Taiwan for the past 25 years Moderators: Chih-Hsing Wu 吳至行、 Ding-Cheng Chan 詹鼎正、 Ang Seng Bin Speaker: **1.Cost and effectiveness analyses of the anti-osteoporosis medication in patients with hip fracture in Taiwan: A population-based national claims database analysis** Chen-Yu Wang 王貞予 **2.Long dosing intervals of antiosteoporosis medications decrease societal fracture risk: a 11-year nationwide population-based cohort study** Shau-Huai Fu 傅紹懷 **3.Asia-Pacific Consensus on Osteoporosis Prevention in Postmenopausal Women with Low Bone Mass or Osteoporosis without Fractures** Chun-Feng Huang 黃駿豐	**Symposium 8** Anti-osteoporosis medication-related Osteonecrosis of Jaws Moderators: Jang-Jaer Lee 李正喆、 Ken-Chung Chen 陳畊仲、 Sung-Yen Lin 林松彥 Speaker: **1.Reliability of nonspecific symptoms or clinical findings of MRONJ at early stages: The Japanese Osteoporosis Intervention Trial-05 (JOINT-05)** Akira Taguchi **2.Management approaches and their outcomes of MRONJ** Ken-Chung Chen 陳畊仲 **3.Prognosis of MRONJ in patients Using Antiresorptive Agents** Ling-Ying Wei 魏鈴穎

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Time	Hall 3 (Mandarin)
08:30 10:00	**TOA Section 1** Moderators: Chun-Feng Huang 黃駿豐、Ta-Wei Tai 戴大為、Jen-Jia Yang 楊鎮嘉 Speaker: **1.2023台灣成人骨質疏鬆症防治之共識及指引** The Consensus and Guidelines for the prevention and treatment of adult osteoporosis in Taiwan in 2023 Chun-Feng Huang 黃駿豐 **2.從0到1: 嘉基骨鬆中心的FLS金牌之路** From Ground Zero to Glory: Charting the Path to a Gold Medal in Fracture Liaison Services at the Osteoporosis Center of Ditmanson Medical Foundation Chia-Yi Christian Hospital Cheng-Yi Wu 吳政誼 **3.掌握關鍵增肌顧骨，遠離健康隱形殺手** Master your Musculoskeletal Health, Keeping Sarcopenia and Osteoporosis Away Der-Sheng Han 韓德生
10:00 10:30	**Break**
10:30 12:00	**TOA Section 2** Moderators: Hsuan-Jui Chang 張軒睿、Huei-Kai Huang 黃暉凱 Speaker: **4.骨鬆用藥衛教重點 Considerations in Medication Treatment for Osteoporosis** Szu-Han Lin 林思涵 **5.幻變的衛生教育：魔術的創新應用與實踐** Transforming Health Education with a Touch of Magic: An Innovative Approach Kuan Ting Lee 李貫廷
12:00 12:30	**TOA General Meeting** **中華民國骨質疏鬆症學會會員大會**
13:30 15:30	**TOA Section 3** Moderators: Tien-Ching Lee 李天慶、Szu-Han Lin 林思涵 Speaker: **6.骨鬆衛教與簡報工作坊(I)：用故事深入人心** Osteoporosis Health Education and Presentation Workshop(I): Through Heart-touching Narratives Huai-Jing Yu 余懷瑾 **7.骨鬆衛教與簡報工作坊(II)：用簡報說服受眾** Osteoporosis Health Education and Presentation workshop (II): Persuade Your Audience through Effective Presentation Wei-Min Chu 朱為民
15:30 16:00	**Break**
16:00 17:30	**台灣痠痛研究學會&中華民國骨質疏鬆症學會聯合學術研討會** Taiwan Sng Society & Taiwanese Osteoporosis Association Joint Academic Symposium Moderators: Der-Sheng Han 韓德生、Chih-Cheng Chen 陳志成 Speaker: **1.Theory of "sng pain"** Chih-Cheng Chen 陳志成 **2.New Insights into the Molecular Mechanisms Contributing to Osteoporosis Development** Feng-Sheng Wang 王逢興 **3.Sng and osteoporotic fractures** Jiann-Her Lin 林建和

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Time	Hall 4
AFOS Oral Presentation Competition Moderators: Gau-Tyan Lin 林高田、Chun-Han Hou 侯君翰、Yi-Jan Gau 高義然、Shau-Huai Fu 傅紹懷、Ching-Lung Cheung	
13:30 13:40	A01 Sequential Therapy with Denosumab and Zoledronate for Osteoporosis Management A Randomized Controlled Trial Hung-Kuan Yen
13:40 13:50	A02 Treatment Persistence and Medication Switch Associated with Subsequent Fractures after Osteoporotic Fractures Sung-Yen Lin
13:50 14:00	A03 The First-Year Results of Denosumab Sequential Therapy (DST) Trial – An Open-label Multi-institutional Randomised Controlled Trial to Investigate the Better Strategy for Sequential Therapy with Zoledronate after Denosumab Cessation Chia-Che Lee
14:00 14:10	A04 Nitrogen-containing bisphosphonate was associated with a lower risk of dementia in patients with fragility fractures: a population-based cohort study in Hong Kong Chor-Wing Sing
14:10 14:20	A05 Lower risk of subsequent fracture among hip fracture patients: Long dosing interval of antiosteoporosis medication matters Chen-Yu Wang
14:20 14:30	A06 Drug Adherence And Treatment Duration Of Denosumab Have An Influence On Patient' All-cause Mortality After Hip Fracture Surgery Yi-Lun Tsai
14:30 14:40	A07 Utilize Polygenic Risk Score to Predict Fragility Fracture and Improve the Performance of FRAX in Patients with Osteoporosis Jian-Jiun Chen
14:40 14:50	A08 Fracture risk assessment from 2D DXA scan by supervised machine learning modeling Heesun Choi
14:50 15:00	A09 Application of deep learning algorithm to detect and visualize vertebral fractures on plain radiographs Hsuan-Yu Chen
15:00 15:10	A10 Establish and Validate the Reliability of Predictive Models in Bone Mineral Density by Deep Learning as Examination Tool for Women Wei-Chieh Hung
15:10 15:20	A11 Revolutionizing Osteoporosis Detection: AI-Enhanced Chest X-Ray Unveils Bone Mineral Density Wen-Hui Fang
15:20 15:30	A12 Risk factors for mortality, fractures and falls among patients participating in a Fracture Liaison Service program: a machine learning approach Christina Soong
15:30-16:00 Break	
16:00 16:10	A13 Measurement of the areal and volumetric bone mineral density of the proximal femur from hip X-rays Keisuke Uemura
16:10 16:20	A14 Screening of fracture risk and osteoporosis among older long-term care residents: A before–after intervention study Cheng Yo Lai
16:20 16:30	A15 Optimal Osteoporosis Treatment Candidates in Long-Term Care and Nursing Home Residents: Balancing Mortality Considerations Ting-En Tseng
16:30 16:40	A16 Epidemiology of hip fractures in Thailand Natthinee Charatcharoenwitthaya
16:40 16:50	A17 A Nomogram for Prediction of 1-Year Postoperative Mortality Risk in geriatric patients with a hip fracture Cheng-Yi Wu
16:50 17:00	A18 Comprehensive Geriatric Assessment for identifying mortality risk in older patients after hip fracture surgery Nai-Chen Shih
17:00 17:10	A19 The Effects of Omega-3 Polyunsaturated Fatty Acids on Muscle Protein Synthesis: A Systematic Review and Meta-analysis Atiporn Therdyothin
17:10 17:20	A20 The intercorrelation of vitamin D deficiency and SPP1 (Osteopontin) genetic polymorphisms with bone mineral density in middle-aged women. A cross-sectional study Ying-Hao Su
17:20 17:30	A21 Effects of palm tocotrienol on cartilage and subchondral bone in ovariectomized rats with osteoarthritis Kok-Yong Chin

Day3 15th OCT. SUN.

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Time	Hall 1
08:30 10:00	**TOA & Endocrine Society Keynote Symposium 1:** Diabetes and osteoporosis Moderators: Keh-Sung Tsai 蔡克嵩、Jung-Fu Chen 陳榮福、Shih-Te Tu 杜思德、Ching-Lung Cheung Speaker: **1.Bone as an endocrine organ** Ching-Lung Cheung **2.Diabetes and Bone** Yoon-Sok Chung **3.Bone fragility in diabetes mellitus** Natthinee Charatcharoenwitthaya
10:00 10:30	**Break**
10:30 11:30	**TOA & Endocrine Society Keynote Symposium 2:** Rare forms of osteoporosis Moderators: Jawl-Shan Hwang 黃兆山、Feng-Hsuan Liu 劉鳳炫、Natthinee Charatcharoenwitthaya Speaker: **1.Treatment of osteoprosis in HIV patients** Chien-An Shih 施建安 **2.Iron Overload Associated Endocrine Dysfunction Leading to Lower Bone Mineral Density in Thalassemia Major** Shyang-Rong Shih 施翔蓉
11:30 11:45	**Announcement of Asia-Pacific Consensus in Sequential Therapy of Osteoporosis** Moderators: Chih-Hsing Wu 吳至行 Speaker: Ta-Wei Tai 戴大為
11:45 12:30	**Awards Presentation & Closing Ceremony** Flow: Hsuan-Yu Chen 陳宣佑 Emcee: Christina Soong 宋子茜

Name: Chen, Jung-Fu 陳榮福
Sex: male
Birth Date: July. 22 1959
Citizenship: Taiwan, Republic of China
Office Address & Tel No:
123, Ta-Pei Road, Niao-Sung District, Kaohsiung City, Taiwan, R.O.C.
Language: Mandarin, Taiwanese and English
Education:M.D., Graduated June 1984, Taipei Medical College, Taipei, Taiwan, R.O.C.

Employment Record:

July 1990-Now: Attending Physician, Division of Endocrinology and Metabolism, Chang Gung Memorial Hospital
July 1998: Clinical lecturer of Chang Gung Memorial Hospital
May 1999: Chief of department of Health Examination of Chang Gung Memorial Hospital at Kaohsiung
July 2006: Chief of department of Nutrition therapy, Chang Gung Memorial Hospital, Kaohsiung
August 2007: Chief of department of General Medicine of Chang Gung Memorial Hospital at Kaohsiung
July 2009: Chief of department of Health Examination of Chang Gung Memorial Hospital at Kaohsiung
October 2013: Vice Chief of Department of Internal Medicine of Chang Gung Memorial Hospital at Kaohsiung
July 2015: Chief of department of Endocrinology and Metabolism of Chang Gung Memorial Hospital at Kaohsiung

Licensure: Chinese License No. 013205

Board Certification:

June 1990, Internal Medicine, No.: 2405
March 1992, Endocrinology and Metabolism, No.: 0166

Society:

Jan 1999: Certified Clinical Densitometrist (CCD) of International Society of Clinical Densitometry (ISCD).
July 1999: Member of trustee board of Taiwan Osteoporosis Foundation & vice chairperson of Publications Committee
Mar. 2004: Member of trustee board of Diabetes Association of the Republic of China
Aug. 2009: President of the Taiwan Osteoporosis Association

Burden of osteoporosis in Asia-Pacific region

高雄長庚醫院 內分泌暨新陳代謝科 陳榮福
Jung-Fu Chen, CGMH, KS, Taiwan

Osteoporosis has already become a significant health concern worldwide, including in the Asia-Pacific region. The burden of osteoporosis in this region is so substantial due to several factors, including demographic changes, lifestyle shifts such as sedentary habits, urbanization, and varying levels of healthcare infrastructure and changing dietary patterns, certainly especial due to rapid aging of populations. By 2050, one in four people in Asia and the Pacific will be over 60 years old. The population of older persons (aged over 60) will triple between 2010 and 2050, reaching close to 1.3 billion people.

According to some study and review, it is estimated Osteoporosis may affect 10–30% of women aged 40+, and up to 10% of men in Asia Pacific. Fractures can impact 500–1000 adults aged 50+per 100,000 person-years. It is well known during the next few decades, osteoporotic fractures are predicted to increase dramatically in the Asia-Pacific region and by 2050 it is projected that up to half of all hip fractures will occur in Asia.

Osteoporosis still currently remain as a chronic disease characterized by under-appreciated, under-valued, under-treated and under-resourced disorder of high penetrance which the unmet care gap and burden should be recongnized and improved. Governments and healthcare systems must work together to prevent, diagnose and manage to reduce the immense healthcare costs and associated mortality.

Eugene McCloskey is Professor in Adult Bone Diseases in the Academic Unit of Bone Metabolism and Mellanby Centre for Musculoskeletal Research at the University of Sheffield, and is current Director of the MRC Versus Arthritis Centre for Integrated research in Musculoskeletal Ageing (CIMA).

In addition to clinical work, he has a long-standing research career in bone health ranging from malignancy and bone (e.g. breast cancer, multiple myeloma), through research technologies (e.g. broadband ultrasound attenuation, vertebral fracture definition) to epidemiology and the development of clinical tools and guidelines. He contributed to the development of the FRAX tool and validation and enhancement of the FRAX tool remains the primary focus of his research work. The online version of FRAX (www.frax.shef.co.uk/frax) processes approximately 3 million fracture risk calculations per annum and provides tools that cover approximately 85% of the global population. In 2016, he was awarded the IOF Medal of Achievement, presented annually to recognise an individual researcher who has significantly advanced the field of osteoporosis through original and outstanding scientific contributions. In 2018, he was honoured with the ECTS Philippe Bordier Award for a significant clinical contribution to the field of bone and calcified tissue.

How can we enhance the assessment of fracture risk? An introduction to FRAXplus

Professor Eugene McCloskey
University of Sheffield, Sheffield, UK

The FRAX® algorithms are the most widely used clinical tools for the calculation of fracture risk. The result represents the average 10-year probability of a major osteoporotic fracture (MOF) or hip fracture alone, given a risk factor profile in an individual. It is widely recognised that the calculation could be refined by more granular data about existing risk factors (e.g. glucocorticoid dose, number of prior fractures, recency of fracture etc.) or by inclusion of additional risk factors (e.g. falls, type 2 diabetes mellitus etc.). Several analyses have examined the potential impact of these adjustments; for example, for several years it has been possible to adjust the FRAX probability outputs for additional information about trabecular bone score (TBS) via a link to a separate webpage. Requests from the clinical community have led to the development of an optional fee-based add-on to FRAX, FRAXplus, which has recently been released in a beta version.

FRAXplus brings together a number of adjustments that can illustrate the potential impact on FRAX fracture probabilities. These include trabecular bone score, recency of fracture (by site and time within the last two years), the number of self-reported falls in the previous year, glucocorticoid dose, and duration of type 2 diabetes mellitus. For example, a 68 year old Spanish woman, BMI 24, the FRAX MOF probability would increase from 9.7% to 15% if a previous fracture at any time was further explored by being entered as a vertebral fracture within the last 6-12 months. Additional adjustments to be made available soon include the number of prior fractures (regardless of recency), discordance between lumbar spine and femoral neck BMD T-scores, and hip axis length.

Limitations of these adjustments are readily acknowledged; apart from TBS, the adjustments for which have been validated in a meta-analysis of multiple cohorts, these adjustments have largely been derived from post hoc analyses within single cohorts and have not yet been externally validated. Nonetheless, they provide a useful illustration of the potential impact of these factors on FRAX estimates of fracture probability.

Work is ongoing to update the FRAX tool with new information about existing risk factors and potential new risk factors. In the interim, FRAXplus provides access to additional information about risk factors that are not currently available within the FRAX tool itself. Feedback on the use and utility of FRAXplus will inform future refinements of the tool.

Unnop Jaisamrarn MD, MHS

Prof. Unnop Jaisamrarn is now working as the Chief of WHO Collaborating Centre for Research in Human Reproduction in the Department of Obstetrics and Gynecology, Faculty of Medicine at Chulalongkorn University in Bangkok, Thailand. In his present appointment, he is also Senior Executive Advisor for International Affairs of Faculty of Medicine.

Currently, he serves on the board of various professional societies. Since 2022 he is the President of the Thai Menopause Society. He was also the President of the Thai Osteoporosis Foundation during 2020-2021. He has been working for The Royal Thai College of Obstetricians & Gynecologists since 1997. He was the Secretary General of the College during 2019-2021. Internationally, his present appointment includes the Chairman of the Sexual & Reproductive Health Committee of the Asia & Oceania Federation of Obstetrics and Gynaecology (AOFOG), Council Member of the Asia Pacific Menopause Federation (APMF) and the Asian Federation of Osteoporosis Societies (AFOS), Steering Committee Member of the Council of Affiliated Menopause Society under the International Menopause Society.

Prof. Unnop Jaisamrarn has been activity working for World Health Organization for almost 30 years. His current roles include a Member of South-East Asia Regional Technical Advisory Group and a Committee Member of Research Project Review Panel, Department of Reproductive Health and Research, WHO

He has been involved in clinical trials and authored many international publications on family planning and reproductive health, hormonal replacement therapy, transgender health, osteoporosis and HPV vaccine. He has given a number of lectures and conducted many training programs in the field of family planning and reproductive health, menopause and osteoporosis, both locally and internationally.

Prof. Unnop Jaisamrarn received his medical doctor’s degree (1st class honors) from Chulalongkorn University in 1986 and completed his postgraduate training with awards in Obstetrics and Gynaecology in 1992. He received Certificate in Epidemiology from University of California at Los Angeles and University of Hawaii at Manoa, USA in 1994. He also was honored with the Family Planning Scholarship, international award. In 1995-1996, he underwent Postgraduate Medical Training in Reproductive Endocrinology at Johns Hopkins Hospital and received MHS (Reproductive Health) from Johns Hopkins University, Baltimore, USA.

Tips for dealing with bone loss duringmenopausal transition

Unnop Jaisamrarn MD, MHS
Department of Obstetrics and Gynecology, Faculty of Medicine,
Chulalongkorn University, Bangkok, Thailand

Osteoporosis, characterized by low bone mass and increased fracture risk is a common disease in postmenopausal women. This asymptomatic skeletal disease is often underdiagnosed and undertreated. A prevalence of 30% of osteopenia and 17% of osteoporosis have been reported in Thai women.

Most women reach their peak bone mass at age 30-35, after which bone loss occurs gradually. Bone resorption begins increasing 2 years before the final menstrual period, peaks approximately 1.5 years after that, and then plateaus. This period of menopause transition is critical for bone health, with rapid losses in bone mass and strength occurring in a 3-year window bracketing the date of the final menstrual period. Declines in bone mass are accompanied by deleterious changes in bone macrostructure and microarchitecture, which may be captured by changes in composite strength indices and indices of trabecular thickness and connectivity. The onset of the rapid bone loss phase is preceded by changes in sex steroid hormones and increases in markers of bone resorption, measurements of which may be clinically useful in predicting the onset of the rapid loss phase.

Fractures during the menopause transition are not uncommon, although women are still in midlife and very few meet criteria for osteoporosis. These findings point to the importance of early screening and intervention to ward off osteoporosis and fractures in later years. FRAX has been widely used for osteoporosis screening in midlife while BMD measurement should be considered in some women at earlier age than recommended in most guidelines.

The importance of life style modification and a healthy diet cannot be ignored, especially the need to maintain an adequate calcium and vitamin D intake. Currently approved pharmacologic prevention and/or treatment options for osteoporosis in midlife women include estrogen and selective estrogen-receptor modulators (SERMs), Choice of treatment should be based on a balance of benefit, risk and cost.

Ang Seng Bin

Treatment of osteoporosis in the young menopausal woman

Ang Seng Bin

Dato' Dr. **Joon-Kiong Lee** DSPN, DJN
MBBS(Mal), FRCS, MS ORTHO(Mal), AM(Mal), CCD

1. Deputy Medical Director, Chair of the Surgical Committee at Beacon Hospital, Petaling Jaya, Selangor, Malaysia.
2. President, Fragility Fracture Network Malaysia (FFNM) and the Lead for FFNM Fracture Liaison Service (FLS) Framework
3. President, Malaysian Bone Health Optimization Network (MyBONe)
4. Immediate Past President, Asia Pacific Osteoporosis and Fragility Fracture Society (APOFFS), a section of Asia Pacific Orthopaedic Association (APOA)
5. Past President of ISCD (International Society for Clinical Densitometry) with ISCD Dr. Paul D. Miller Service Award in 2018 and Dr John P. Bilezikian ISCD Global Leadership Award 2023, Course Director for ISCD Orthopedic Osteoporosis and Densitometry Course.
6. Chair of the Asia Pacific Regional Advisory Council (RAC) of the International Osteoporosis Foundation (IOF) with the 2020 IOF President's Award.
7. Co-Chair of the Asia Pacific Fragility Fracture Alliance (APFFA) and Co-Editor of the APFFA Hip Fracture Registry Toolkit.
8. Founding and Past President of the Osteoporosis Awareness Society of Kuala Lumpur and Selangor (OASKLS) and also the Past President of Malaysian Osteoporosis Society (MOS)
9. A member of the steering committee for the Asia Pacific Bone Academy (APBA) and South East Asia, India and Hong Kong (SEAIHK) Bone Academy.

Bone Health Optimization, Optimizing SurgicalOutcome

Dato' Dr. Joon-Kiong Lee DSPN, DJN
MBBS(Mal), FRCS, MS ORTHO(Mal), AM(Mal), CCD

There has been an increase in the number of patients presenting to orthopaedic surgeon for elective surgery worldwide. These include total knee replacement, total hip replacement and spinal surgery. Most of these patients are at the older age group. Many of them have not been diagnosed having osteoporosis or osteopenia prior to their elective surgeries. Many have never experienced a fragility fracture before. Some have been diagnosed having osteoporosis but never received anti-osteoporosis treatment.

Elective implant surgeries for knee, hip and spine are known to have excellent long term result and survival. However, periprosthetic fracture, septic loosening are real clinical problems and there is increasing number of patients presenting with these two problems.

It is of utmost important to assess patients skeletal health status by various clinical methods such as DXA scan, routine pre-operative x rays of hips, knees or spine. Patient's skeletal condition can also be assessed intra-operatively with good correlation between these intraoperative findings with patient's DXA scan result.

Patient's skeletal fragility can be treated with anti-osteoporosis medicines pre-operatively or post-operatively. The same approach and principles are used to treat post-menopausal osteoporosis. To start treating with anti-resorptive agents, bone forming or dual action drugs, all depends on the risk profile and risk stratification.

Treatment of the underlying osteoporosis, osteopenia and poor bone quality and density are meant to reduce the incidence of periprosthetic fracture or aseptic loosening.

CURRICULUM VITAE: Updated Sep 15, 2023

Hong-Yo Kang, PROFESSOR

Position/s:

Professor- Graduate Institute of Clinical Medical Sciences, Chang Gung University, Taiwan
Professor (joint appointment)- Division of Endocrinology and Metabolism, Kaohsiung Chang Gung Memorial Hospital, Taiwan Adjunct Professor- Department of Biological Sciences, National Sun Yat-Sen University, Taiwan
Steering Committee member- Food and Drug Administration, Ministry of Health and Welfare, Executive Yuan, Taiwan
Council member- The Chinese Physiological Society
Executive supervisor-Taiwan Society for Endocrinology and Metabolism

Educational Background:

B.S. Pharmacy- National Taiwan University, Taipei, Taiwan
M.S. Microbiology- National Taiwan University, Taipei, Taiwan
Ph. D. Endocrinology-Reproductive Physiology- University of Wisconsin, Madison, WI, USA.

Post-doctoral Training:

Post-doctoral fellow, Departments of Pathology and Urology, George Whipple Lab for Cancer Research Laboratories, University of Rochester, Rochester, NY, USA. 1999-2000

Awards:

1. Who is Who of Taiwan in Biotechnology and Medicine 2020
2. Outstanding Research Award, Asia Pacific Society for Biology and Medical Sciences 2019 Annual Meeting Conference
3. The Research Award of Colleges and Universities, Ministry of Science and Technology, Taiwan. 2018-2020
4. Principal investigator of Distinguished Scholars Research Project, Ministry of Science and Technology, Taiwan. 2012-2015
5. Special Outstanding Talent Award, Ministry of Science and Technology, Taiwan. 2010-2017
6. Young Investigator Award for 2006 International Osteoporosis Foundation of World Congress on Osteoporosis 2006

Past Positions:

Professor (joint appointment), Department of OB-GYN, Kaohsiung Chang Gung Memorial Hospital, Taiwan-2016-2023
Consultant Director, Center for Menopause and Reproductive Medicine, Kaohsiung Chang Gung Memorial Hospital, Taiwan. 2006-2015
Scientific Advisor, Graduate Institute of Medical Sciences, Department of Medical Research, Changhua Christian Hospital and Chang Jung Christian University, Taiwan. 2003-2005

Research Interests:

Sex Hormones, Molecular Endocrinology, Androgen Receptor, Skeletal Sexual Dimorphism

Unveiling the Impact of Sex Hormone Receptor Signaling: From Hormone Deficiency to Hormone Therapy in Bone Health and Disease

Hong-Yo Kang,
Chang Gung University, Taiwan

Sex hormones also referred to as sex steroids and gonadal steroids, belong to the class of steroid hormones, which includes estrogens and androgens. These hormones interact with specific receptors in the body, known as sex hormone receptors, and have traditionally been recognized for their pivotal roles in regulating normal reproductive functions. However, sex hormones are not only essential for bone growth and development but also for the maintenance of bone mass.

Conditions characterized by hormonal deficiencies, such as menopause, hypogonadism, hormone-insensitive syndromes, and cancers undergoing hormone deprivation therapy, are strongly linked to adverse effects on bone health. This includes significant bone loss and an elevated risk of fractures. In this context, we will provide an overview of the impact of sex hormones on the skeletal system and the actions of hormone receptors from a comprehensive analysis of in vitro and in vivo studies conducted in both animals and humans. Furthermore, we will decipher the underlying molecular mechanisms how hormonal deficiencies can lead to imbalances in bone development and homeostasis.

Notably, we delve into the functions of the androgen receptor (AR) signaling pathways by using AR transgenic and AR knockout (ARKO) mouse models that have recently shed light on the AR role in androgen effects on bone homeostasis. We will present compelling evidence to support the notion that experimental androgen therapy can confer significant benefits to the skeletal healing. These findings open up new avenues for using androgens as potential osteoanabolic steroids, which could contribute to enhancing bone fracture repair.

In conclusion, our research suggests that the judicious application of localized hormone therapies, administered at low effective doses for a limited duration, holds promise as a potential approach for the treatment of fractures as well as building stronger bones.

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3. Lin PW, Kan KC, Tsai MY, Shyr CR, Chang C, Huang KE, Kang HY.The Differential Effects of Sex Hormones on the Bone Metabolism in Mice with Androgen Receptor Deficiency. Adaptive Medicine 10(4): 143-154, 2018

賴嘉鎮 **Edward Chia-Cheng Lai,** Ph.D., FISPE

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Bio

Edward is an Associate Professor at the School of Pharmacy, National Cheng Kung University, Taiwan. He has expertise in the use of a variety of healthcare databases across Asia, Oceania, North America, and Europe in the conduct of international multi-database pharmacoepidemiologic research. His research interests include the safety and comparative effectiveness of psychotropic, rheumatologic, and oncologic medications. He has published 100+ research articles in top journals such as BMJ, Annals of Internal Medicine, and Lancet Psychiatry. He has served as an Associate Editor of Pharmacoepidemiology and Drug Safety since 2013. He served as the chair of the Asian Pharmacoepidemiology Network (AsPEN). He is an active Neurological and Mental Health Global Epidemiology Network (NeuroGEN) member. He was awarded the Fellow of the International Society for Pharmacoepidemiology (FISPE) designation in 2023.

EXPERTISE

Pharmacoepidemiology; International Pharmacoepidemiologic Studies; Real-world Analysis; Real-world Evidence; Comparative Effectiveness Research; Methodology; Signal Detection; Systematic Review and Meta-Analysis; Clinical Pharmacy; Biostatistics; Quantitative and Outcome Research.

WORK EXPERIENCES

2020- Associate Professor, School of Pharmacy, National Cheng Kung University, Tainan, Taiwan

2016-2020 Assistant Professor, School of Pharmacy, National Cheng Kung University, Tainan, Taiwan

Updated 2023 July

Analyzed real word data like a randomized controlled trial-an osteoporosis drug study example

Edward Lai
Taiwan

While randomized controlled trials (RCTs) are the gold standards for evaluating efficacy and safety, they sometimes fail to generalize across wider patient populations, varying medications, or co-morbidities. Real-world data (RWD) has emerged as a vital resource, offering insights from real-life patient experiences. Unlike RCTs that prioritize controlled environments and selective participant criteria, RWD includes the complexity and heterogeneity of the clinical setting, generating patient outcomes in a broader range of scenarios. RWD can come from various sources such as electronic health records, claims databases, and patient registries. Integrating these databases into regulatory decision-making marks a new phase in drug evaluation. This presentation will underscore the significance of RWD and its potentials. I will use an osteoporosis drug study as an example, discussing how to integrate diverse databases for regulatory decisions.

Yu-Pin Chen, MD, PhD
E-MAIL: 99231@w.tmu.edu.tw
Profession: Orthopedic trauma, Hand and wrist surgery, Hip fracture, Osteoporosis and Sarcopenia

Education:

Doctor of Philosophy, Institute of Clinical Medicine, National Yang-Ming University, Taipei, Taiwan (Sep, 2015 -May, 2021)
Bachelor of Medicine, College of medicine, National Taiwan University, College of Medicine, Taipei, Taiwan (Sep, 2002 - Jun, 2009)

Qualifications:

- Member of Taiwan Orthopedic Association
- Member of Taiwan Society for Surgery of the Hand
- Member of Taiwan Society for Surgery of the Foot and Ankle
- Member of Taiwanese Osteoporosis Association
- Member of International Society of Orthopaedic Surgery and Traumatology

Current Position:

- Director, Care Center for Osteoporosis and Sarcopenia, Wan Fang Hospital, Taipei, Taiwan
- Deputy Director, Department of Business Development, Wan Fang Hospital, Taipei, Taiwan
- Assistant Professor, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

Present and past working experiences:

- Attending physician, Department of Orthopedic Surgery, Wan Fang Hospital, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan (Dec, 2015 - present)
- Resident training, Department of Orthopedic Surgery, Wan Fang Hospital, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan (Aug, 2010 - Nov, 2015)

Overseas training experiences:

- Travelling fellowship training for sports, foot and ankle surgery under Prof. Nicola Maffulli at UNIVERSITÁ DEGLI STUDI DI SALERNO, Salerno, Italy (Aug, 30, 2018 – Oct, 22, 2018)

Screening of Osteoporosis and Sarcopenia Using Hip Radiographs via Deep Learning Algorithm

Yu-Pin Chen MD,PhD
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Abstract

Background

Dual-energy X-ray absorptiometry (DXA) is recognized as the gold standard for diagnosing osteoporosis and assessing low muscle mass. However, its utilization for osteoporosis and sarcopenia screening is infrequent. Our study seeks to introduce and validate a convolutional neural network (CNN) model, featuring a controllable layer and an image pre-processing algorithm. The objective is to facilitate osteoporosis and low muscle mass screening in the proximal hip area using straightforward hip radiographs.

Method

We used a dataset of 1730 patients over 50 years old to train and test the CNN model for osteoporosis screening. This data included DXA assessments for T-scores corresponding to the proximal hip regions. Training utilized 2473 unilateral hip images from 1430 patients, while testing used 497 unilateral hip images from 300 patients.

For low muscle mass detection, a dataset of 1176 patients over 50 years old, with DXA assessments matching appendicular lean muscle mass, was employed. In this instance, training and testing of the CNN model involved data from 996 and 242 patients, respectively.

Results

The screening tool we proposed exhibited excellent performance in osteoporosis screening, achieving a sensitivity of 97.2%, specificity of 95.6%, PPV of 95.7%, NPV of 97.1%, and an AUC of 0.96. Incorporating patient factors like age, body mass index, and sex as features in the training metric enabled our CNN model to predict the T-score in the targeted hip areas directly, exhibiting a strong correlation with the DXA-measured T-score ($r=0.996$, $p<0.001$).

For low muscle mass screening, the proposed tool displayed robust performance, with a sensitivity of 80.7%, specificity of 84.5%, accuracy of 82.8%, precision of 81.6%, and an AUC of 0.89.

Conclusion

The proposed CNN model shows immense potential for future use in population-based opportunistic screenings for osteoporosis and sarcopenia. This approach can widen the reach to at-risk populations, offering a cost-effective and highly adaptable solution.

Serge Ferrari, MD

Professor of Medicine and Chairman of the Academic Department of Medicine, Geneva Faculty of Medicine Head, Service and Laboratory of Bone Diseases, Geneva University Hospital (HUG)

Education

1982-1989.1	Pre-graduate studies, MD, Geneva Faculty of Medicine
1988	Certificate in Cell and Molecular Biology (programme MD-PhD), Geneva Faculty of Sciences
1989	Certificate of the Educational Council for Foreign Medical Graduates (ECFMG)
1991	Doctorate in Medicine, UNIGE
1997	Specialty Board examination (FMH) Internal medicine
1997	Limited License du Board of Registration in Medicine, Commonwealth of Massachusetts

Academic Career

07.1999-06.2001	Instructor in Medicine, Harvard Medical School
2004	Privat Docent, Geneva Faculty of Medicine (Title: Genetics of Osteoporosis)
04.2001-03.2007	SNF granted Assistant Professor, UNIGE and Research Laboratory of Bone Diseases, HUG
10.2007-12.2012	Adjunct professor, Geneva Faculty of Medicine, UNIGE
01.01.2013	Associate professor, Geneva Faculty of Medicine, UNIGE
01.10.2014-	Full professor, UNIGE, and Head, Service of Bone Diseases, HUG
2019-2023	Director, Academic Department of Medicine, UNIGE

Employment

10.1997-06.1998	Clinical Fellow, Div. of Endocrinology and Metabolism, Beth Israel Deaconess Medical Center, Boston, USA
10.1997-06.2001	Research Fellow (post-doc), Research Laboratory of Bone and Mineral Metabolism, Beth Israel Deaconess Medical Center, Boston, USA
07.1999-06.2001	Associate in Medicine, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, USA
04.2001-03.2007	Senior Research Associate Research Laboratory of Bone Diseases, HUG
01.10.2007-	Senior Medical Doctor (Médecin-adjoint agrégé), Service of Bone Diseases, Department of Rehabilitation and Geriatrics, then Dept of Medicine, HUG
01.10.2014-	Head, Service and Research Laboratory of Bone Diseases, HUG

Institutional responsibilities

- President of the committee for Medical Doctorates, Geneva Faculty of Medicine

Research areas

Genetics of osteoporosis, Role of bone micro-architecture in fragility fracture risk, Molecular mechanisms of bone modelling and remodelling (genetic mouse models), Pre-clinical and clinical evaluation of osteoporosis drugs, Mechanisms of bone fragility in diabetes

Major Recent Awards

- International Award for Publishing Excellence in The Journal of Clinical Endocrinology & Metabolism (2012)
- Steven Boonen/European Calcified Tissue Society (ECTS) clinical research award (2014)
- Olof Johnell Science award of the International Osteoporosis Foundation (IOF) (2016)
- L Raisz esteemed award of the American Society of Bone and Mineral Research (ASBMR) (2022)

Boards of Medical Societies:

- President of the Swiss Association against Osteoporosis (ASCO/SVGO) (2018-; Vice-President since 2012))

Scientific Committees:

- Evaluation committee for Postdoc. mobility grants of the Swiss National Science Foundation (SNF)
- Scientific advisory board of the Novartis Foundation for bio-medical research
- Vice-Chair of the Council of Scientific Advisors, The International Osteoporosis Foundation (IOF)
- Co-chair of the Steering committee on the Capture-the-fracture program, IOF
- Chair of the steering committee of the International Bone Academy

Elucidating very high risk: build bone first to prevent imminent fracture

Prof. Serge Ferrari, MD, Switzerland

Increases in bone mineral density (BMD) with osteoporosis treatment are associated with reduced fracture risk. Increasing BMD is therefore a goal of osteoporosis therapy. TH and FN T-scores achieved at month 12 were associated with subsequent nonvertebral and vertebral fracture rates and the relationships were independent of treatment received. LS T-score at 12 months was associated with vertebral but not nonvertebral fracture risk.

The probability of achieving the target BMD of T-score > -2.5 in those with a baseline TH T-score equal to -3.0 was 61% with romosozumab/denosumab, 38% with romosozumab/alendronate, and 9% with alendronate. In those with a baseline LS T-score equal to -3.0, the probability of achieving a T-score > -2.5 was 93% with romosozumab/denosumab, 81% with romosozumab/alendronate, and 55% with alendronate.

A post-hoc analysis of FRAME study showed that there was a greater numeric reduction in nonvertebral fracture risk among subjects at higher risk (10-year major osteoporotic fracture risk of ≥20% or hip fracture risk of ≥3%). There was an observed treatment effect with romosozumab in the high-risk group (p=0.029) but not in the low-risk group.

Another post-hoc analysis of FRAME study evaluated the efficacy of romosozumab in women who had no prior fracture but met other criteria for very high fracture risk (VHFR): lumbar spine or total hip T-score < -3.0 and/or Fracture Risk Assessment Tool probability of major osteoporotic fracture >30% or hip fracture >4.5%. At year 1, romosozumab versus placebo reduced the incidence of new vertebral fracture (relative risk reduction [RRR]: 76%), clinical fracture (RRR: 60%), and nonvertebral fracture (RRR: 54%) (all P<0.05). This fracture reduction was maintained through year 2.

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5. Cosman F, et al. J Bone Miner Res. 2018;33:1407-1416.
6. McClung MR, et al. Endocrine Practice 2023,29:716-722.

Jawl-Shan Hwang, MD

Position/s:

President, Asian Federation of Osteoporosis Societies(AFOS)
President, The Taiwanese Osteoporosis Association (TOA)
Assistant Professor in Endocrinology and Metabolism, Chang Gung Memorial Hospital, Chang Gung University, Taiwan, Republic of China

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Educational Background:

MD China Medical College, Taiwan

Post-Graduate Training:

Medical Resident, Chang Gung Memorial Hospital, Taipei
Endocrinology and Metabolism Fellow, Chang Gung Memorial Hospital, Taipei

Past Positions:

1993 - 1996
Resident in Department of Internal Medicine
Chang Gung Memorial Hospital, Taipei, Taiwan
1996 - 1998
Fellowship in Section of Division of Endocrinology and Metabolism
Chang Gung Memorial Hospital, Taipei, Taiwan
Chang Gung Memorial Hospital, Taipei, Taiwan

Research Interests:

Osteoporosis, fracture liaison service, diabetes complication

Current status and achievements of osteoporosis care in Taiwan

Jawl-Shan Hwang, MD

Osteoporosis is a major public health problem in many countries, as well as in Taiwan. As the fast aging of Taiwan's population, the incidence of osteoporosis and fractures has risen rapidly, according to a previous screening study for people over 50 years in Taiwan, the prevalence of osteoporosis in Taiwan were 38% (female) and 24% (male), it is estimated that approximately one-third of Taiwanese women will have a fracture of the vertebrae, hip or wrist in their lifetime, men also have an approximately one-fifth risk, the increasing in prevalence and remains largely underdiagnosed and undertreated. Moreover, the hip fracture incidence in Taiwan was among the highest in Asia Pacific region.

In Taiwan, the National Health Insurance (NHI) system covers a variety of acute and chronic diseases. However, for osteoporosis care, bone density screening is not provided, reimbursement is only available in cases of endocrine disorder or previous fracture with limited follow-up monitoring. In addition, most treatment options are available to treat or prevent osteoporosis, but reimbursement of osteoporosis drugs is more stringent in Taiwan than in other countries. Currently, Taiwan's NHI only covers secondary fracture prevention with anti-osteoporosis drugs. Thus, many patients at high risk for osteoporotic fractures do not receive appropriate treatment.

For facing these challenges, Taiwanese Osteoporosis Associations (TOA) was established in 1997 to promote better bone health education, research, and policy changes to improved outcomes of osteoporosis-related complication, therefore, early BMD testing, treatment initiation, and adherence to treatment and reductions refracture incidence and mortality. Recently, TOA has certified 588 osteoporosis specialists, 31 Fracture Liaison Service (FLS) sites, and more certified osteoporosis comprehensive care centers. Fortunately, in recent study up to 2019, the number of prevalent osteoporosis cases still slightly increased, but the age standardized prevalence and incidence of osteoporosis showed a steady downward trend. In addition, the overall incidence rates of hip and spine fractures decreased significantly. This improvement may be due to the fact that Taiwan has multiple strategies to improve osteoporosis awareness and implemented osteoporosis comprehensive care and other policy improvements

Wu, Chih-Hsing, MD, CCD, CDT.
(Also named as Paulo Wu)

Professor

- Institute of Gerontology, College of Medicine, NCKU
- Director, Department of Family Medicine, National Cheng Kung University Hospital, College of Medicine, NCKU
- Obesity, Osteoporosis and Body Composition Research Clinic
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Academic Training

M.D.	China Medical College, Tai-Chung, Taiwan (1982-1989)

Academic Course

2022~Present	Professor, Institute of Gerontology, College of Medicine, National Cheng Kung University, Tainan, Taiwan.
2021~Present	Director, Department of Family Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan
2019~Present	Director, Department of Family Medicine, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Taiwan.
1993~Present	Visiting Staff, Department of Family Medicine, National Cheng Kung University Hospital, Taiwan.
2021~2022	Associate Professor, Institute of Gerontology, College of Medicine, National Cheng Kung University, Tainan, Taiwan.
2002~2021	Associate Professor, Department of Family Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan
2005~2006	Visiting Scholar and Research Fellow, Obesity Research Center, Body Composition Unit, St Luke's Roosevelt Hospital Center, Columbia University, New York, USA
2000~2000	Clinical researchers, 2nd Department of Internal Medicine, National Kyoto University Graduate Medical School, Japan.
1997~2002	Clinical Teacher, National Cheng Kung University Medical Center, Taiwan.
1996~2002	Lecturer, Department of Family Medicine, National Cheng Kung University, Medical Center, Taiwan.
1992~1993	Chief Resident, Department of Family Medicine, National Cheng Kung University Hospital, Taiwan.
1989~1992	Resident, Department of Family Medicine, National Cheng Kung University Hospital, Taiwan.

Publications

- 200 and more original articles (osteoporosis, sarcopenia, obesity and metabolism, body composition, Geriatric and Family medicine)

Effect of osteoporotic fracture and anti-osteoporosis treatment on mortality

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Abstract

Mortality after osteoporotic fractures, especially the hip fracture, is high. The pharmacological intervention may reduce the total mortality in osteoporotic fracture. However, there are limited and inconclusive studies about different anti-osteoporosis medications (AOMs) usage and mortality. We conducted the serial studies enrolled more than 23 million population in average from the 2008-2019 National Health Insurance Research Database (NHIRD) and the Cause of Death Data which were provided by Health and Welfare Data Science Center (HWDC). The hazard ratio (HR) of AOMs in decreasing mortality are listed:

1. Compared with non-user, the hip fracture HR 0.69 and vertebral fracture HR 0.84 in aged 40 over; hip fracture HR 0.75 and vertebral fracture HR 0.74 in old adults; hip fracture HR 0.76 and vertebral fracture HR 0.72 in the oldest-old adults.
2. Patients who received AOMs for more than 1, 2, and 3 years exhibited proportional reductions in all-cause mortality (HR 0.57, 0.42 ,and 0.29, respectively).
3. Compared with nonuse, zoledronic acid HR0.77, followed by ibandronate HR 0.85 and alendronate/risedronate HR 0.93.
4. Compared with non-user after hip fracture, who had ever used oral bisphosphonates (alendronate and risedronate HR 0.81, ibandronate HR 0.76, zoledronic acid HR 0.70 and denosumab HR 0.64. Patients receiving denosumab and zoledronic acid did not show a significant difference in mortality (HR 0.94; 95% CI, 0.85–1.03).
5. In the total fracture group, compared with raloxifene and bazedoxifene, we found that alendronate/risedronate HR 0.83, denosumab HR 0.86, zoledronic acid HR 0.78. Similar trends were observed in the hip, vertebral, or nonhip/nonvertebral fracture groups. Subjects receiving long-acting zoledronic acid showed the lowest mortality in the subanalysis according to sex or age over 65 years.

Ref:

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5. Li CC, et al, Aging (Albany NY) 2022, 14.5: 2239.;
6. Tai TW, et al. BONE 2022; 154:116216.;
7. Tsai YL, et al. Osteoporos Int 2023: in press.

Fernando Marin, MD, PhD is a former Senior Medical Fellow at Eli Lilly and Company. He is a board-certified Endocrinologist with special interest in metabolic bone diseases, female endocrinology and pituitary disorders.

He is currently appointed as a Consultant Endocrinologist and Associate Professor of Endocrinology in the Quironsalud University Hospital and the European University, Madrid, Spain.

Dr. Marin received his medical and PhD degrees from the University Complutense, Madrid, Spain, and completed his residency in Endocrinology at Hospital Universitario Puerta de Hierro, Madrid. He also received a diploma of Health Sciences Statistics from the Autonomous University of Barcelona.

Dr. Marin has been Associate Professor of the Department of Cell Biology, University Complutense of Madrid, and completed his post-doctoral Fellowship in Endocrine Pathology at the St. Michael's Hospital (Prof. Kalman Kovacs), University of Toronto, Canada.

In 2001, Dr. Marin was appointed as European Team Physician in Lilly. He has supported the European Regulatory Team for the European medical activities of Raloxifene (Evista®), the registration of Teriparatide (Forteo®) and its new indications, and the newer compounds in the autoimmune, muscle, bone and joint portfolio. Before leaving Lilly, he was the Therapeutic Area Medical Leader for the Lilly´s Musculoskeletal portfolio in the International Business Unit.

Dr. Marin has designed and been the lead research physician of numerous clinical trials and observational studies with Teriparatide, including VERO, MOVE, EuroGIOPs, EUROFOS, EFOS, ExFOS and the ALAFOS Observational Study.

Dr. Marin is the lead author or co-author of 112 full-papers in various fields of Internal Medicine and Endocrinology in peer-reviewed journals (New England Journal of Medicine, The Lancet, American Journal of Medicine, Journal of Clinical Endocrinology and Metabolism, Journal of Bone and Mineral Research, Bone, etc.), seven book chapters on Pharmacology of Selective Estrogen Receptor Modulators (SERMs) and Teriparatide, and 130 Congress Communications. He is currently a member of several scientific societies including the American Society for Bone Mineral Research and the Endocrine Society.

Optimize the treatment outcomes for very high risk osteoporosis patients

Fernando Marin[1]

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Current guidelines for the pharmacological treatment of osteoporosis support that osteoanabolic agents should be considered as first line therapy for patients with osteoporosis at very high risk, including those with prior osteoporotic fractures -especially if these are multiple and/or recent (within the past 12 months)-, very low bone mineral density (BMD) or having an inadequate clinical response to prior antiresorptive drug therapies.

Pharmacotherapeutic options to increase bone formation include PTH-receptor agonists (teriparatide and abaloparatide) that stimulates osteogenesis by predominantly increasing bone remodeling with a positive balance in bone formation, and romosozumab, a monoclonal antibody that binds to and inhibits sclerostin, a natural inhibitor of bone formation, produced by osteocytes, thereby increasing BMD via its dual effects on modeling-based bone formation and inhibition of bone resorption.

Teriparatide is self-administered with daily injections for a maximum treatment duration of 24 months in most countries, while romosozumab is administered by a healthcare provider as two subcutaneous injections once monthly for 12 months and should be followed by a potent antiresorptive, such as alendronate, in order to achieve statistically significant anti-fracture results at non-vertebral sites and the hip.

Recent active-comparator clinical trials have shown than teriparatide and romosozumab are superior to oral bisphosphonates for reducing vertebral fracture risk, and they produce greater BMD gains when used before rather than after antiresorptives. Teriparatide has also showed a superior anti-vertebral fracture effect compared with weekly risedronate in patients who have been treated with bisphosphonates in the past, an important finding given the frequent sequential use of this drug after bisphosphonates.

Potential side effects with teriparatide include hypercalcemia, leg cramps, nausea, and orthostatic hypotension. A recent pharmacovigilance study from the safety database of Food and Drug Administration identified a potential signal for elevated major cardiovascular events with romosozumab, particularly in Japan, therefore, patients should be carefully evaluated to rule out very high cardiovascular risk.

Because direct comparisons of the fracture benefits of osteoanabolic therapies are limited, choosing between these drugs should be based on the patient's unique clinical characteristics, including previous antiresorptive therapy, baseline bone turnover, use of concomitant drugs, etc. Cost, coverage by insurance, convenience of administration and length of clinical experience may influence patient preference.

Disclosures of Interest: Dr. F. Marin is a previous employee of Eli Lilly & Company.

傅紹懷 **Shau-Huai, Fu,** M.D. & Ph.D.

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EDUCATION:

- **Department of Public Health, College of Medicine, National Cheng Kung University,** Tainan, Taiwan
  Ph. D., 2019/07-2022/12
- **School of Medicine, College of Medicine, National Taiwan University, Taipei, Taiwan**
  M.D., 2001/09-2008/06

POSITION/WORKING EXPERIENCES:

- **Orthopedic Department, National Taiwan University Hospital, Taipei, Taiwan**
  Assistant Professor, 2023/07~
- **Orthopedic Department, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan**
  Attending Physician, 2015/07~
- **Trauma Team, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan**
  Executive Secretary, 2016/07~2018/07

HONORS AND AWARDS:

1. 2016 AAOS Highlight Poster (Florida, USA)
2. 2016 The Taiwanese Osteoporosis Association Oral presentation: Third place
3. 2017 ISPE Spotlight Poster (Montreal, Canada)
4. 2019 The Taiwanese Osteoporosis Association Paper Competition: First place
5. 2021 The Taiwanese Osteoporosis Association Young Investigator Award: First place
6. 2022 WCO-IOF-ESCEO Young Investigator Award

Research Interest:

Osteoporosis, Sarcopenia, Orthopedic traumatology, Arthroplasty, Orthopedic oncology

Denosumab Sequential Therapy: Known and Unknown

Shau-Huai, Fu, MD, PhD.
Taiwan

Denosumab is acclaimed for its ability to inhibit the receptor activator of nuclear factor κ-B ligand (RANKL). Long-term administration of denosumab, spanning up to a decade, has consistently improved bone mineral density (BMD) at crucial sites such as lumbar spine and total hip, resulting in reduced fracture risks. However, discontinuation of denosumab often triggers accelerated bone turnover and subsequent decline of bone mass accumulated during treatment. This reduction typically occurs about 12 months after the last denosumab administration. This "rebound effect", characterized by an increase in vertebral fractures during the period of expedited bone loss, renders sudden denosumab discontinuation ill-advised. Therefore, it is crucial to identify suitable follow-up interventions when denosumab treatment is discontinued.

Reference:

1. Anastasilakis AD, Polyzos SA, Makras P, Aubry-Rozier B, Kaouri S, Lamy O. Clinical Features of 24 Patients With Rebound-Associated Vertebral Fractures After Denosumab Discontinuation: Systematic Review and Additional Cases. J Bone Miner Res 2017; 32(6): 1291-6.
2. Bone HG, Bolognese MA, Yuen CK, et al. Effects of denosumab treatment and discontinuation on bone mineral density and bone turnover markers in postmenopausal women with low bone mass. J Clin Endocrinol Metab 2011; 96(4): 972-80.
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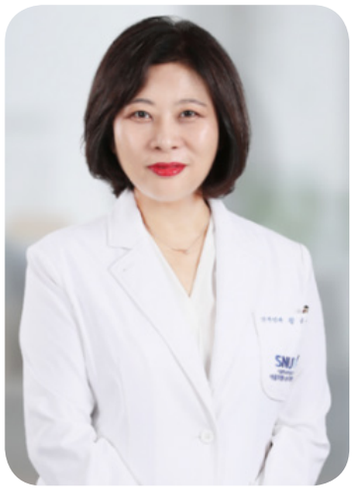
5. Anastasilakis AD, Papapoulos SE, Polyzos SA, Appelman-Dijkstra NM, Makras P. Zoledronate for the Prevention of Bone Loss in Women Discontinuing Denosumab Treatment. A Prospective 2-Year Clinical Trial. J Bone Miner Res 2019; 34(12): 2220-8.
6. Sølling AS, Harsløf T, Langdahl B. Treatment With Zoledronate Subsequent to Denosumab in Osteoporosis: A 2-Year Randomized Study. J Bone Miner Res 2021; 36(7): 1245-54.



Kyuri Hwang, M.D., Ph.D.

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EDUCATION:

Graduate:

1997.2 M.D., Seoul National University College of Medicine, Seoul, Republic of Korea
2004.2 M.S., Seoul National University Postgraduate School, Seoul, Republic of Korea
2011.2 Ph.D., Seoul National University Postgraduate School, Seoul, Republic of Korea

TRAINING:

Postgraduate:

1997.3 - 1998. 2: Internship, Seoul National University Hospital, Seoul, Republic of Korea
1999.3 - 2003. 2: Residency, Dept. of OB/GYN, Seoul National University Hospital, Seoul, Republic of Korea
2003.3 - 2004. 2: Fellowship, Reproductive Endocrinology Medicine, Dept. of OB/GYN, Seoul National University Hospital, Seoul, Republic of Korea

MAJOR PROFESSONAL SOCIETIES:

Korean Association of Obstetricians and Gynecologists -Regular member
Obstetrics & Gynecology Science - Associate editor
Korean Society for Bone and Mineral Research- Director of insurance and policy committee
Korean Society of Gynecologic Endocrinology- Director of textbook publication committee
Korean Society of Menopause- Director of publishing newsletter committee
Korean Society of Psychosomatic Obstetrics and Gynecology- Director of scientific affairs committee
Korean Society of Endometriosis - Director of textbook publication committee

Use of Raloxifene in Treatment of Osteoporosis

Kyuri Hwang

Raloxifene represents an antiresorptive therapy that can be recommended for the prevention and treatment of osteoporosis in postmenopausal women. There is strong evidence that raloxifene increases bone density and reduces vertebral fractures, although the effect on bone density is less than that seen with other antiresorptive agents such as bisphosphonates and denosumab.

In the MORE study, raloxifene does not adversely affect the blood pressure-regulating hormone levels of plasma renin, angiotensin-based enzymes, aldosterone and blood pressure levels, and significantly reduces blood total cholesterol and low-density lipoprotein-cholesterol levels. The positive effect on serum lipid profile was more pronounced in patients with type 2 diabetes. In addition, in the RUTH study targeting postmenopausal women with cardiovascular disease or other risk factors, raloxifene did not increase the risk of coronary artery disease. Another small group analysis of women under the age of 60 using raloxifene, the risk of coronary artery disease was decreased below 49%. In other words, although there may be differences depending on the degree of risk, it can be seen that raloxifene does not have a negative effect on cardiovascular disease and may reduce the risk in some high-risk groups.

The main concern when prescribing SERM preparations is the risk of venous thromboembolism (VTE). Raloxifene should not be prescribed to women with a significant past history of VTE. Fortunately, there were no reports of VTE in a study targeting Asians, and in a study of Korean patients. Therefore, there is no basis for avoiding medication due to concerns about VTE. In addition, raloxifene has the advantage that it can be used even by those with reduced kidney function, as some postmenopausal women with high glucose levels often have abnormal kidney function.

The concept of bone health should include not only ‘bone mass’ but also ‘bone quality’. However, current bone resorption inhibitors such as bisphosphonate and denosumab may deteriorate bone quality in the process of excessively suppressing bone resorption, and thus, there is a concern about side effects such as MRONJ when used for a long time. On the other hand, raloxifene adequately inhibits bone resorption to the pre-menopausal level, and is safe for long-term use without requiring a drug-holiday, allowing the effect of reducing the risk of vertebral fractures to continue. Also, it is safe for postmenopausal women to take raloxifene in the long term, for prevention of fracture at the osteopenia stage. Although the incidence of fracture is markedly elevated in osteoporosis, the absolute number of fractures is much higher in patients with osteopenia.

In conclusion, raloxifene is recommended as an option for prevention and treatment of osteoporosis-related spinal fractures, especially for those who are deemed at an increased risk for both breast cancer and spine fracture. However, periodic evaluation of bone density in the hip is necessary as when there is ongoing site-specific bone loss despite compliance with raloxifene, the patient and clinician should consider another treatment option that offers broader skeletal benefits at the level of the hip as well as the spine.

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Specialist Qualification

- Specialist in Trauma and Orthopaedic Surgery, Ministry of Education and Science. July 2006.

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- Graduated from the Faculty of Medicine, University of Valladolid, June 2001

PROFESSIONAL CATEGORY AND PRESENT POSITION :

- Licensed Specialist Hospital Universitario Rio Hortega from July 2006 until now.

PROFESSIONAL EXPERIENCE :

- Medical Resident of Orthopaedic Surgery and Traumatology Hospital Universitario Rio Hortega, Valladolod, July 2001-July 2006.
- Spanish National Exchange Officer for the International Medical Student Association from 1999 to 2001

TEACHING EXPERIENCE :

- Associated Profesor, Medical School, University of Valladolid, 2015 til now
- Honorary collaborator Attached to the Department of Surgery, University of Valladolid from 2006 until 2015

RESEARCH ACTIVITIES:

- Researcher in collaboration with Synthes for PFNA Augmentation system development

Fix and Treat Experience from Europe. How to save lives in Patients with Fragility fractures: The role of orthopedic surgeon

Francisco Javier Nistal Rodríguez
Spain

In this presentation we will show how to address fragility fractures through the “Fix and Treat” concept.

It was born in 2013 with the idea that the orthopedic surgeon becomes aware of addressing fragility fractures in a global way, not only from a surgical point of view but also from a medical one, emphasizing in secondary prevention after a fragility fracture.
Through clinical cases we will address the problem of surgical management of fragility fractures but also the same problem in terms of secondary prevention.

In the same way that perfect preoperative planification is imperative for the surgical management of these fractures,as we only have one chance oe the well known “one shot surgery” , the same is necessary for secondary prevention, perfect planning of our treatment, otherwise mechanical failure or new fragility fractures will appear with the devastating consequences that this can have for the patient.

By a perfect planification through the fix and treat program orthopaedic surgeons an save lives by decreasing the number of new fragility fractures, decrease mechanical failures and improving quality of live of our patients.

PERSONAL DATA:

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Visiting doctor (2006.5~2006.6): Russian Illizarov Scientific Center, fractures and deformity correction process training, Krugan, Russia
Travel fellow (2008.3~2008.5): Utah Hip and Knee Center Utah, USA (supervisor, Dr. Kim C. Bertin)
Visiting professor (2014.12~2016.6): Department of Orthopedic surgery, Stanford University Hospital (Supervisor, Professor SB Goodman)

PROFESSIONAL CAREER:

1. Professor (2020 ~ present): Department of Orthopaedic Surgery, Konyang University School of Medicine
2. Chief of Hip and Knee Joint Center (2016 ~ present): Department of Orthopaedic Surgery Konyang University School of Medicine
3. Secretory general of Korean Society of Osteoporosis (2022 ~ present)
4. Secretory general of Korean Society of Geriatric Musculoskeletal Medicine (2022~ present)

Osteoporotic hip Fracture surgical treatment and postoperative care

Kwang-Kyoun Kim
Konyang University Hospital

Osteoporotic hip fracture is a major health problem due to increased mortality, morbidity, and functional impact in these patients. Less than 50% of people who survive a hip fracture will walk unaided again, and The cumulative mortality after 1 year of a hip fracture occurrence ranges between 20 and 40%.

The majority of hip fractures are treated surgically. Surgical methods include internal fixation or artificial joint replacement, depending on the fracture location, stability, severity of osteoporosis, patient's age, and pre-injury level of mobility. In geriatric hip fracture patients at very high risk of hip dislocation, total hip replacement using a dual mobility cup is performed.

The use of osteoporosis medication after hip fracture surgery is very important to prevent refracture. Fracture healing process proceeds in four stages: inflammation, soft callus formation, hard callus formation, and remodeling, and osteoblasts and osteoclasts are involved in each stage. Therefore, there have been studies on the effect of administering osteoporosis medications after surgery on fracture healing. Some osteoporosis medications increase the strength of callus by increasing the quantity, quality, or mineralization of callus, and positive results in fracture healing have been reported.

Post-operative rehabilitation is very important in recovering the patient's pre-operative mobility level. To achieve this, post-fall syndrome is identified and prompt treatment is implemented (medical emergency). Post-operative rehabilitation requires Fragility Fracture Integrated Rehabilitation Management (FIRM), which includes evaluation, education, physical therapy, and occupational therapy, rather than simple control of weight bearing.

Fracture liaison service (FLS) is necessary to reduce the ‘Care-Gap’ and prevent secondary fractures in patients with hip fractures. FLS provides integrated management of hip fracture patients through Identify fragility fracture patient, Investigate and fracture risk assessment, DXA, monitoring for initiation and adherence. Many countries have implemented FLS and reported reduced refracture rates, mortality, and increased economic benefits.

In summary, appropriate surgical methods (including surgical timing), post-operative osteoporosis treatment, and Fragility Fracture Integrated Rehabilitation Management are very important in recovering to the patient’s pre-operative mobility level, and FLS is necessary to manage this.

CURRICULUM VITAE: Updated September 22, 2023

Huipeng Shi, MD, CCD, CDT, MBA

Position/s:

Deputy Director of Dept. Orthopedics, National Center for Orthopaedics, Shanghai 6th People's Hospital affiliated to Medical College of Shanghai Jiao Tong University 2007 - 2023
Director of Dept. Orthopedics, Shanghai 6th People's Hospital, Fu Jian, Regional Medical Center of China, 2021-2022
Director of Dept. Orthopedics, Shanghai 6th People's Hospital, South branch, 2013-2014
Director of Dept. Orthopedics, Shanghai 6th People's Hospital, Jinshan Central 2009-2010
Educational Background:
Bachelor of Clinical Medicine, Shanghai Medical University, Shanghai, P.R. China
Master of Medicine, Soochow University
MBA, The University of Hong Kong

Post-doctoral Training:

1992 - 2007 Resident & Doctor in Charge, Dept. Orthopedics, Shanghai 6th People's Hospital affiliated to Shanghai Jiao Tong University
2000 Visiting scholar, Dept. Orthopedics, St. Vinzenz-Hospital Cologne, German
2013 Visiting scholar, OII, University of Oxford, UK.

Certification

Certified Clinical Densitometrist – International Society for Clinical Densitometry (ISCD) 2001–2024

Awards

2020, Clinician of the year, ISCD
2019, Best Recommended National Volunteer Program of China
2016, Silver award of International Invention Exhibition, Geneva, 2016; Laser calibrating equipment with cantilever construction
2013 Funder: University of Oxford (R01) Title: Fragile Fracture, Once Is Enough (OIE)
2009, Golden award of China International Patent and Brand Expo, Wuxi Jiangsu
2008 Golden award of China International Patent and Brand Expo, Shunde Guangdong; Arch orthosis for trauma
2006 Best Technology Award of International Osteoporosis Assembly-Bone &Joint; Beijing.

Recently Research:

2009-2011 Funder: Shanghai Jiao Tong University (R01) Title: Internal fixator for fragile intertrochanteric fracture
2018 Funder: National Social Science Fund (R10) Title: An Analysis and Support study on the Relationship between Doctors and Patients under Big Data
2020 Funder: Shanghai Science & Technology Committee (R03) Title: Application of artificial intelligence in rehabilitation patients after fracture (Present/Pending)

Medical Organization/s:

2017-2022 Chairman of China Fragile Fracture Alliance, China Health Promotion Foundation (CHPF)
2022 - present Chairman of China Panel, ISCD
2023 - present Chairman of China Densitometry and Osteoporosis diagnosis Committee (CHPF)

Fragile Fracture, Once is Enough

Huipeng Shi, MD, CCD, CDT
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Abstract

Background: The early recovery of hip function after hip fracture surgery values more attention, especially for patients with delayed surgery of longer than 48 hours. We aim to evaluate the associations of in-hospital surgical waiting time with the functional outcomes (Harris Hip score, Parker Mobility Score and EuroQol 5 dimensions VAS score) in elderly patients who sustained hip fractures.

Materials and Methods: Data on sociodemographic and clinical factors were prospectively collected using a multicenter hip fracture registry system. Participants in the cohort underwent a 12-months follow-up investigation. After adjusting potential confounders identified by the directed acyclic graphs, the associations between surgical waiting time longer than 48 hours and functional outcomes were estimated by log-binomial regression and multivariable linear regression models with generalized estimating equations.

Results: Of 863 survival participants with available functional data at 12 months after surgery, an increased risk was obtained from receiving surgery after 48 hours and the poor functional outcomes (HHS<80: RR=1.56, 95%CI 1.00, 2.51; PMS<7: RR=1.49, 95%CI 1.13, 2.01; EQ-5D VAS<80: RR=1.97, 95%CI 1.57, 2.47). In-hospital waiting time>48 hours were time-invariantly associated with lower PMS during recovery (-0.44 units 95%CI -0.70, -0.18). In addition, delayed surgery was time-varying associated with HHS and EQ-5D VAS. Conclusions: The associations between in-hospital waiting time and postoperative functional score suggest that delayed surgery can lead to poor functional outcomes, especially in patients waiting longer than 72 hours from injury. Delayed surgery mainly impacting hip function and mobility recovery with a slower speed in early recovery of the first three months. More attentions should be paid to mechanisms behind the associations between delayed surgery on general healthy status.

Ref: 1. Investigators HA. Accelerated surgery versus standard care in hip fracture (HIP ATTACK): an international, randomised, controlled trial. Lancet. 2020;395(10225):698-708. 2. Yin J, Zhu H, Gao Y, Zhang C. Vascularized Fibular Grafting in Treatment of Femoral Neck Nonunion: A Prognostic Study Based on Long-Term Outcomes. J Bone Joint Surg Am. 2019;101(14):1294-300.

Fernando Marin, MD, PhD is a former Senior Medical Fellow at Eli Lilly and Company. He is a board-certified Endocrinologist with special interest in metabolic bone diseases, female endocrinology and pituitary disorders.

He is currently appointed as a Consultant Endocrinologist and Associate Professor of Endocrinology in the Quironsalud University Hospital and the European University, Madrid, Spain.

Dr. Marin received his medical and PhD degrees from the University Complutense, Madrid, Spain, and completed his residency in Endocrinology at Hospital Universitario Puerta de Hierro, Madrid. He also received a diploma of Health Sciences Statistics from the Autonomous University of Barcelona.

Dr. Marin has been Associate Professor of the Department of Cell Biology, University Complutense of Madrid, and completed his post-doctoral Fellowship in Endocrine Pathology at the St. Michael's Hospital (Prof. Kalman Kovacs), University of Toronto, Canada.

In 2001, Dr. Marin was appointed as European Team Physician in Lilly. He has supported the European Regulatory Team for the European medical activities of Raloxifene (Evista®), the registration of Teriparatide (Forteo®) and its new indications, and the newer compounds in the autoimmune, muscle, bone and joint portfolio. Before leaving Lilly, he was the Therapeutic Area Medical Leader for the Lilly´s Musculoskeletal portfolio in the International Business Unit.

Dr. Marin has designed and been the lead research physician of numerous clinical trials and observational studies with Teriparatide, including VERO, MOVE, EuroGIOPs, EUROFOS, EFOS, ExFOS and the ALAFOS Observational Study.

Dr. Marin is the lead author or co-author of 112 full-papers in various fields of Internal Medicine and Endocrinology in peer-reviewed journals (New England Journal of Medicine, The Lancet, American Journal of Medicine, Journal of Clinical Endocrinology and Metabolism, Journal of Bone and Mineral Research, Bone, etc.), seven book chapters on Pharmacology of Selective Estrogen Receptor Modulators (SERMs) and Teriparatide, and 130 Congress Communications. He is currently a member of several scientific societies including the American Society for Bone Mineral Research and the Endocrine Society.

Update of the Management of Severe Osteoporosis with Teriparatide

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PTH and its analogs represent a class of bone anabolic agents for the treatment of severe osteoporosis. Teriparatide, also referred as human parathyroid hormone (1-34) (hPTH [1-34]) has an identical sequence to the 1–34 N-terminal amino acids sequence (the biologically active region) of the 84-amino acid human parathyroid hormone. Intermittent PTH administration directly acts on preosteoblasts and osteoblasts to induce differentiation of committed osteoblast precursors, to increase the osteoblast activity, and to prolong osteoblast survival by reducing osteoblast apoptosis, and to activate quiescent lining cells. It has been estimated that approximately 70% of the bone anabolic effect of teriparatide is remodeling-dependent at the cancellous and endocortical bone, the remaining 30% being modeling-dependent. The formation of new bone with intermittent injections of teriparatide permits restoration of bone microarchitecture, including improved trabecular connectivity and enhanced cortical thickness. Bone formation is also induced on the outer periosteal surface, possibly affecting bone size and geometry, with additional beneficial effects on bone strength. Based on this mechanism of action, interpretation of the changes in areal bone mineral density (aBMD) induced by teriparatide at cortical sites is complex because they are affected not only by alterations in volumetric bone density but also in cortical width, cortical porosity, matrix mineralization, and bone size, which have independent and differing effects on bone strength.

The pivotal clinical trial involved over 1600 postmenopausal women with prior vertebral fractures. Teriparatide strikingly reduced vertebral and non-vertebral fracture incidence compared with the placebo group by 65% and 53% respectively after a median treatment duration of 19 months. Further pivotal, registration trials in men with osteoporosis, and glucocorticoid-induced osteoporosis facilitated the regulatory approval of these additional indications for use of teriparatide.

In the VERO trial, the effect of teriparatide versus risedronate on incident fractures in 1260 women with severe osteoporosis was investigated. After 24 months, new vertebral fractures, occurred in 5.4% of patients in the teriparatide group and 12.0% of patients in the risedronate group, corresponding to a 56% relative risk reduction. The incidence of clinical fractures, a pool of clinical vertebral and non-vertebral fractures, was also statistically significant lower with teriparatide (4.8%) compared with risedronate (9.8%), a 52% relative risk reduction.

Clinical trial data and real-world evidence results suggests that the full 24-month treatment course is important to achieve the best clinical outcomes and have shown that treatment with teriparatide is well tolerated and associated with relatively minor adverse effects and an improvement in the health-related quality of life.

Disclosures of Interest: Dr. F. Marin is a previous employee of Eli Lilly & Company.

Dr **Swan Sim YEAP**
MBChB (Dundee), MD (Dundee), FRCP (Edinburgh), FRCP (London), CCD (USA), CCST (UK), FAM (Malaysia)

Dr Yeap is a Consultant Rheumatologist at Subang Jaya Medical Centre, Selangor, Malaysia. Her previous appointments include Associate Professor and Head of the Rheumatology Unit at the Department of Medicine, University of Malaya, Malaysia.

She is the current President of the Malaysian Osteoporosis Society, a Past President of the Malaysian Society of Rheumatology, and was previously a Vice-President of the Asia-Pacific League of Associations for Rheumatology (APLAR), Asian Federation of Osteoporosis Societies (AFOS) and Persatuan SLE Malaysia. She is currently the Finance Committee Chairperson for APLAR.

She was the Chairperson of the Working Group for the 2022 Clinical Guidance on the Management of Osteoporosis, was the Co-Chairperson of the Working Group for the 2012 and 2015 Clinical Guidance on the Management of Osteoporosis. She was involved in the Clinical Practice Guidelines on the Management of Osteoarthritis of the Hip and Knee as an Expert Panel Committee Member in 2002 and was the Review Committee Chairperson for the 2012 edition. She also served as Editor and Expert Panel Committee Member of the CPG on the Management of Gout (2003–2004, 2006-2008). She is a member of the National Rheumatology Sub-Specialty Credentialing Committee and was the Chairperson from 2001-2014. Her research interests focus on osteoporosis, rheumatoid arthritis and systemic lupus erythematosus.

What's new in glucocorticoid - induced osteoporosis?

Speaker: Dr Swan Sim YEAP

Glucocorticoid-induced osteoporosis (GIOP) remains the most common cause of secondary osteoporosis (OP). This lecture will present information from some of the recent publications, focusing on the latest adult GIOP guidelines from the American College of Rheumatology (ACR) and Belgian Bone Club, a recent guideline on paediatric GIOP from Argentina, and new information on treatment options.

The previous ACR guidelines classified patients into moderate to high, and low fracture risk, to determine treatment options. The latest guidelines classifies patients in high, moderate and low fracture risk, in keeping with postmenopausal OP guidelines, and also adds a new category of very high fracture risk defined by prior osteoporotic fracture(s) or bone mineral density (BMD) T score ≤ -3.5 or FRAX (glucocorticoid [GC]-adjusted) 10-year risk of major osteoporotic fracture (MOF) ≥30% or hip ≥4.5% or high GC ≥30 mg/day for >30 days or cumulative doses ≥5 g/year. For this very high risk group, there is a strong recommendation for treatment with bisphosphonates (BP) over no treatment, and a conditional recommendation for treatment with anabolic agents/denosumab (Dmab) over BP. As part of the BMD assessment, both the ACR and Belgian Bone Club recommend imaging for vertebral fractures, either by using the vertebral fracture assessment (VFA), or a lateral spine x-ray. For paediatric patients on GC, treatment is suggested only for those who have had a fracture (vertebral fracture or long bone fracture) and BMD Z score ≤ -2 SD. For these patients, IV BP are recommended as first line treatment, followed by oral BP.

Two reviews/meta-analysis published this year confirmed the value of certain treatments for GIOP. A network meta-analysis comparing Dmab and teriparatide (r-PTH) to oral BP showed that both Dmab and r-PTH increased lumbar spine BMD more than oral BP, and r-PTH reduced vertebral fractures more than oral BP. In an umbrella review that compared drugs with placebo/calcium ± vitamin D, there was moderate-to high-level evidence suggesting that r-PTH, BP, and Dmab can improve BMD in patients with GIOP. Finally, studies have been published that show the efficacy of romosozumab in GIOP.

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Associate Professor II, UST Faculty of Medicine & Surgery (FMS)
Chief – Section of Rheumatology, USTFMS and Chinese General Hospital
International Health Policy Module Leader, UST FMS Master in Public Health International (MPHI)
Head – Rheumatology Center (formerly Joint & Bone Center), UST Hospital since 2006
Chairman – Department of Medical Education and Research (DMER) – CGHMC - Jan 2016 –Dec 2023

Educational Background:

B.S. Medical Technology - University of Santo Tomas
Doctor of Medicine - University of Santo Tomas
Master of Science in Public Health – Major in Biostatistics – UP Manila, CPH

Post-doctoral Training:

Residency in Internal Medicine, Chinese General Hospital & Medical Center (CGHMC) 1994-1996
Fellowship Training In Rheumatology & Clinical Immunology, University of Santo Tomas Hospital 1997-1999
Research Fellowship Training in Rheumatology, University of Pennsylvania, Philadelphia, Pennsylvania, USA 1999 (under Prof HRSchumacher)

Certification:

Certified Clinical Densitometrist – International Society for Clinical Densitometry (ISCD) - Oct 2001 – 2024

Awards:

1. Silver Series Awardee (AY2020-2022) in Research, UST Office of Vice-Rector for Research and Innovation
2. Life Fellow, Philippine College of Physicians 2018
3. Life Member, Philippine Medical Association
4. Life Member, Manila Medical Society
5. Philippine College of Physicians Exemplar in Clinical Research 2014
6. Recipient of International Publication Award 2008-2010 given by UST Office of the Vice-Rector for Academic Affairs and Research, August 29, 2012
7. Japan College of Rheumatology 2006 International Scholarship Awardee in Nagasaki Japan
8. Clinical Research Fellow 1999- Asia Pacific League of Associations for Rheumatology (APLAR) in Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania, USA under Prof. Ralph H. Schumacher Jr., MD

Medical Organization/s:

Vice-Chair – ISCD Asia Pacific Regional Panel – 2023-2026
Asia Representative – International Society for Clinical Densitometry since 2017
International Faculty – ISCD Osteoporosis Essentials
Treasurer, Rheumatology Educational Trust Foundation, Inc. (RETFI) since 2004
Chair – Osteoporosis Special Interest Group of PRA - since Feb 2019
Philippine Co-Representative to Asian Federation of Osteoporosis Societies

Past Positions:

Immediate Past President, Osteoporosis Society of the Phils Foundation, Inc. (OSPFI) 2017– 2021
Immediate Past President, Philippine Rheumatology Association (PRA) Feb 2018 - 2020

Research Interests:

Osteoporosis, Sarcopenia, Gout, SLE, Rheumatoid arthritis

Secondary Causes of Bone Loss

Julie Li-Yu, MD, MSPH, FPCP, FPRA
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The most common causes of bone loss are menopausal status and age-related osteoporosis. However, secondary causes of osteoporosis in premenopausal women equally and significantly contribute to increasing morbidity in a young individual. Guidelines for diagnosis and treatment of postmenopausal women based on BMD does not apply to premenopausal women since low BMD alone cannot be used to define osteoporosis in a premenopausal woman but rather serves as indication to evaluate and work-up patient further. Bone mineral density screening in pre-menopausal woman is not routinely recommended. Most if not all premenopausal women with low BMD have identifiable secondary cause of bone loss, including pregnancy and lactation induced bone loss, though one may consider an idiopathic cause if there's no known primary or secondary causes after extensive evaluation. One should likewise be aware of malignancy associated vertebral compression fractures which is equally prevalent among elderly patients. In some cases, a fracture can be a first sign of cancer.

Some basic lab tests that can be pursued include blood count, renal and liver function tests, calcium and vitamin D levels, hormonal assays, 24 hour urine collection for calcium and creatinine. Imaging studies can help in differentiating characteristic features of malignancy associated spinal fractures vs benign condition.

Common medical conditions include diabetes (types 1 and 2), hyperthyroidism, hyperparathyroidism, gastrointestinal malabsorption, systemic inflammatory conditions like rheumatoid arthritis, HIV infection, bone metastasis, and multiple myeloma. Medications used include glucocorticoids (most common), anti-depressant, anti-seizure meds, anticoagulants, depot medroxyprogesterone acetate, GnRH agonists, thiazolidinediones, proton pump inhibitors, aromatase inhibitors, antiretroviral therapies, chemotherapeutic drugs, vitamin A and synthetic retinoids, cyclosporine, among others.

References:

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3. Takigawa T, Tanaka M, Sugimoto Y, Tetsunaga T, et al. Discrimination between manlignant and benign vertebral fractures using MRI. Asian Spine Journal 2017;11:478-483.
4. Bredella MA, Essary B, Torriani M, Ouellette HA, et al. Use of FDG-PET in differentiating benigh from malignant compression fractures. Skeletal Radiol 2008;37:405-413

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Academic Appointment:

1. Assistant professor of Ministry of Education, 2018/02-now
2. Clerks' clinical tutor of Chung Shan Medical University 2016/03/14-2016/9/14
3. Lecturer of Shu-Zen junior College of Medicine and Management, Sep 2016- now
4. Mentor of Resident physician of Department of Internal Medicine, Kaohsiung Chang Gung Memorial Hospital, Mar 2017-Aug 2017, Mar 2020-Aug 2020

Employment Record:

1. Resistent, Department of Internal Medicine, Chang Gung Memorial Hospital-Kaohsiung Medical Center, July 2006- June2009
2. Fellow, Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, Chang Gung Memorial Hospital-Kaohsiung Medical Center, July 2009-June 2011
3. Attending, Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, Chang Gung Memorial Hospital-Kaohsiung Medical Center, July 2011-now
4. Attending, Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, Qi-shan Hospital Department of Health, Executive Yuan, R.O.C, Aug 2011 -now
5. Attending, Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, Feng-Shan Chang Gung Memorial Hospital, Jul 2015-now
6. Director of Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, Xiamen Chang Gung Hospital, Apr 2013 - Jun 2015
7. Deputy Director of Kaohsiung Chang Gung Rheumatology Department (2020-now)
8. Secretary-General of the Taiwan College of Rheumatology (2023-now)

RA-related Osteoporosis/fracture

Chung-Yuan Hsu

Rheumatoid arthritis (RA) is an autoimmune disease notorious for its impact on joint health. However, beyond joint pain and inflammation, RA brings another stealthy adversary into the arena: osteoporosis and fractures. These silent threats to bone health can significantly affect the quality of life for individuals living with RA.

Osteoporosis, characterized by weakened and brittle bones, increases the risk of fractures, even from minor accidents or routine activities. The relationship between RA and osteoporosis is multifaceted:

1. Inflammation: The chronic inflammation seen in RA sets the stage for bone troubles. Inflammatory molecules disrupt the delicate balance between bone formation and resorption, leading to gradual bone loss.
2. Corticosteroids: Many RA patients rely on corticosteroid medications to manage symptoms. Unfortunately, long-term use of these drugs can accelerate bone loss, further elevating the risk of fractures.
3. Limited Mobility: RA pain and joint damage often limit physical activity, making individuals more susceptible to falls and fractures.
4. Nutritional Challenges: RA-related dietary restrictions and reduced appetite may result in insufficient intake of essential bone-strengthening nutrients like calcium and vitamin D.

Preventing and managing RA-related osteoporosis and fractures require a comprehensive approach:

Medication Management: Rheumatologists explore alternatives to corticosteroids, focusing on disease-modifying antirheumatic drugs (DMARDs) to control inflammation and joint damage.

1. Bone Density Monitoring: Regular bone density assessments, such as dual-energy X-ray absorptiometry (DXA) scans, are essential for early detection of osteoporosis.
2. Lifestyle Adjustments: Patients are encouraged to maintain a healthy lifestyle, incorporating weight-bearing exercises, a diet rich in calcium and vitamin D, and precautions to prevent falls.
3. Pharmacological Interventions: In some cases, specific osteoporosis medications like bisphosphonates or denosumab may be recommended.

In conclusion, RA-related osteoporosis and fractures are formidable adversaries. By adopting proactive measures such as early diagnosis, judicious medication management, and lifestyle adaptations, individuals with RA can navigate this fragile connection and improve their overall well-being. Collaboration with healthcare providers is key to integrating bone health management into the broader RA treatment plan, ultimately mitigating fracture risks, and offering hope for a brighter future despite the challenges of living with RA.

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Sep, 2000~June, 2007, Kaohsiung Medical University, Kaohsiung city, Taiwan.

Post-Graduate Education: nil

Employment Record:

1. Oct.2008~Sep.2011, resident of internal medicine depart of Kaohsiung Chang-Gung Memorial hospital.
2. Oct.2011~Sep,2013, fellowship in division of Rheumatology, Allergy and Immunology, Kaohsiung Chang-Gung Memorial hospital.
3. Oct.2013~now, Attending physician in division of Rheumatology, Allergy and Immunology, Kaohsiung Chang-Gung Memorial hospital.

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Taiwan Rheumatology Association, Rheumatologist, NO. 349
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Taiwan Society of Internal Medicine Specialist, NO. 041179
Taiwan Society of Critical Care Medicine, NO. 02805
The Taiwanese Osteoporosis Association, Osteoporosis Specialist, NO. 122
The International Society for Clinical Densitometry (ISCD), Certified Clinical Densitometrist.

Professional Affiliations:

Taiwan Rheumatology Association
The Chinese Society of Immunogy, Republic of China
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The Taiwanese Osteoporosis Association Taiwan Society of Critical Care Medicine Taiwan Society of Ultrasound Medicine

Application of Trabecular Bone Score for Fracture Risk Assessment in Rheumatic Patients

Jia-Feng Chen

Division of Rheumatology, Allergy, and Immunology, Department of Internal Medicine, Kaohsiung Chang Gung Memorial Hospital and Chang Gung University, College of Medicine, Kaohsiung, Taiwan

Trabecular bone score (TBS) of lumbar spine is a dual X-ray densitometry (DXA)-based tool to evaluate bone microarchitecture, providing information on bone quality in metabolic bone diseases, and bridging the gap that DXA cannot detect bone quality. Several studies have shown the clinical utility of TBS in secondary osteoporosis, including glucocorticoid induced osteoporosis, osteoporosis associated with diabetes, chronic kidney disease or hyperthyroidism. Rheumatic diseases are characterized by profound and systemic inflammation, increasing bone resorption and leading to fragility fracture. This presentation will show current evidence on the clinical application of TBS in rheumatic diseases.

Serge Ferrari, MD

Professor of Medicine and Chairman of the Academic Department of Medicine, Geneva Faculty of Medicine Head, Service and Laboratory of Bone Diseases, Geneva University Hospital (HUG)

Education

1982-1989.1	Pre-graduate studies, MD, Geneva Faculty of Medicine
1988	Certificate in Cell and Molecular Biology (programme MD-PhD), Geneva Faculty of Sciences
1989	Certificate of the Educational Council for Foreign Medical Graduates (ECFMG)
1991	Doctorate in Medicine, UNIGE
1997	Specialty Board examination (FMH) Internal medicine
1997	Limited License du Board of Registration in Medicine, Commonwealth of Massachusetts

Academic Career

07.1999-06.2001	Instructor in Medicine, Harvard Medical School
2004	Privat Docent, Geneva Faculty of Medicine (Title: Genetics of Osteoporosis)
04.2001-03.2007	SNF granted Assistant Professor, UNIGE and Research Laboratory of Bone Diseases, HUG
10.2007-12.2012	Adjunct professor, Geneva Faculty of Medicine, UNIGE
01.01.2013	Associate professor, Geneva Faculty of Medicine, UNIGE
01.10.2014-	Full professor, UNIGE, and Head, Service of Bone Diseases, HUG
2019-2023	Director, Academic Department of Medicine, UNIGE

Employment

10.1997-06.1998	Clinical Fellow, Div. of Endocrinology and Metabolism, Beth Israel Deaconess Medical Center, Boston, USA
10.1997-06.2001	Research Fellow (post-doc), Research Laboratory of Bone and Mineral Metabolism, Beth Israel Deaconess Medical Center, Boston, USA
07.1999-06.2001	Associate in Medicine, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, USA
04.2001-03.2007	Senior Research Associate Research Laboratory of Bone Diseases, HUG
01.10.2007-	Senior Medical Doctor (Médecin-adjoint agrégé), Service of Bone Diseases, Department of Rehabilitation and Geriatrics, then Dept of Medicine, HUG
01.10.2014-	Head, Service and Research Laboratory of Bone Diseases, HUG

Institutional responsibilities

- President of the committee for Medical Doctorates, Geneva Faculty of Medicine

Research areas

Genetics of osteoporosis, Role of bone micro-architecture in fragility fracture risk, Molecular mechanisms of bone modelling and remodelling (genetic mouse models), Pre-clinical and clinical evaluation of osteoporosis drugs, Mechanisms of bone fragility in diabetes

Major Recent Awards

- International Award for Publishing Excellence in The Journal of Clinical Endocrinology & Metabolism (2012)
- Steven Boonen/European Calcified Tissue Society (ECTS) clinical research award (2014)
- Olof Johnell Science award of the International Osteoporosis Foundation (IOF) (2016)
- L Raisz esteemed award of the American Society of Bone and Mineral Research (ASBMR) (2022)

Boards of Medical Societies:

- President of the Swiss Association against Osteoporosis (ASCO/SVGO) (2018-; Vice-President since 2012))

Scientific Committees:

- Evaluation committee for Postdoc. mobility grants of the Swiss National Science Foundation (SNF)
- Scientific advisory board of the Novartis Foundation for bio-medical research
- Vice-Chair of the Council of Scientific Advisors, The International Osteoporosis Foundation (IOF)
- Co-chair of the Steering committee on the Capture-the-fracture program, IOF
- Chair of the steering committee of the International Bone Academy

Set your target: treatment goal with short and long term denosumab to prevent fracture

Serge Ferrari, MD, Switzerland

There are various factors to consider when treating osteoporosis short or long term. First, the drug. Does long-term (>3–5 years) treatment further improve BMD and reduce fracture risk? Does long-term (>3–5 years) treatment increase risk of serious AEs more than the benefits over time? Does long-term exposure to the drug complicate therapy withdrawal? Second, the patient. What is the patient's baseline risk? What is the treatment goal/target for this patient?

Based on the relationship shown between total hip T-score and nonvertebral fracture by age and prior fracture on long-term denosumab, we know that fracture risk is reduced with long-term denosumab for 1 T-score improvement in hip BMD.

Osteoporosis is a chronic condition that generally requires long-term monitoring and therapy. Even though the maximum follow-up time for published clinical data on the long-term effects of denosumab treatment is 10 years, there is no absolute limit on treatment duration. In some patients at continued high risk for fracture, treatment with denosumab should be continued indefinitely.

References:

1. Ferrari S, et al. J Bone Miner Res 2019;34:1033–40.
2. Kendler DL, et al. Adv Ther 2022;39:58–74.
3. Everts-Graber J, et al. Bone 2022;163:116498.

Vilai Kuptniratsaikul, M.D

QUALIFICATIONS

- Master of Science (M.Sc.)., in Clinical Epidemiology, Chulalongkorn University 2004
- Cert. in Geriatric Rehabilitation, Case Western Reserve University, Ohio, USA 1993
- Dip. Thai Board in Rehabilitation Medicine, Thai Medical Council 1991
- Grad. Dip. in Clinical Sciences (Rehabilitation), Mahidol University 1989
- M.D., Faculty of medicine Siriraj Hospital, Mahidol University 1985

HONORS AND AWARDS

- Innovative Research Award of Faculty of Medicine Siriraj Hospital, in 2018, for Underwater Treadmill machine
- Clinical Research Award of Faculty of Medicine Siriraj Hospital, in 2014, entitled "Efficacy and Safety of Curcuma domestica Extracts Compared to Ibuprofen in Patients with Knee Osteoarthritis: A Multicenter Study." published in Clin Interv Aging 2014.
- Clinical Research Award of Faculty of Medicine Siriraj Hospital, in 2011, entitled "Efficacy and Safety of Derris scandens Benth extracts in Patients with Knee Osteoarthritis" published in J Altern Complement Med 2011.

APPOINTMENTS

•President	Thai Osteoporosis Foundation	2022-2023
•President	Royal College of Physiatrists of Thailand	2019-2020
•Chairman	Department of Rehabilitation Medicine,Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILAND	2008-2015
•Assistant Dean for Student Affairs	Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILAND	1995-2000
•Associate Professor	Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILAND	1997-present

EDUCATION AND TRAINING

•Postgraduate study

•Clinical epidemiology	Clinical Epidemiology Unit, Faculty of Medicine, Chulalongkorn University, Bangkok, THAILAND	2002-2004
•Research fellow in Geriatric Rehabilitation	MetroHealth Medical Center, Case Western Reserve University, Ohio, 44109, USA	1992–1993
•Residency	Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University Bangkok, THAILAND	1988–1991

•Associate Professor

PROFESSIONAL MEMBERSHIP

- Medical Council of Thailand
- Royal College of Physiatrists of Thailand
- Thai Osteoporosis Foundation
- Thai Society of Gerontology and Geriatric Medicine
- Thai Arthritis Foundation
- Board of Journal of Thai Rehabilitation Medicine

PUBLICATIONS

1. Kuptniratsaikul V, Chaiworapuek W, Kovintaset K, Meesawang M, Chinsawangwatanakul P, Danoi A. Pain management and strength gains compared between pneumatic partial weight support treadmill and underwater treadmill in overweight patients with knee osteoarthritis: A randomized controlled trial. Clin Rehabil 2022: 36(9):1214-28.
2. Srisuppaphon D, Lukkanapichonchut P, Intaratep N, Kuptniratsaikul V. Long-Term Rehabilitation Outcomes of Neurological Patients: A Multicenter Study. Siriraj Med J 2022; 74: 562-9.
3. Kuptniratsaikul V, Chaiworapuek W, Kovintaset K, Meesawang M, Chinsawangwatanakul P, Danoi A. Pain management and strength gains compared between pneumatic partial weight support treadmill and underwater treadmill in overweight patients with knee osteoarthritis: A randomized controlled trial. Clin Rehabil 2022:36(9):1214-28.
4. Phoobangkerdphol C, Limampai P, Dasri S, Kuptniratsaikul V. Walking meditation versus balance training for improving balance abilities among older adults with history of fall: A randomized controlled trial. Clin Rehabil 2022;36(4):538-49.
5. Kuptniratsaikul V, Bun-in J, Limampai P, Pooliam J. Post stroke anxiety at one year after rehabilitation: A multicenter study. Topics Geriatr Rehabil 2021;38:49-55.

Sarcopenia and frailty

Vilai Kuptniratsaikul

One of the most common presentations of aging is a functional decline resulting from degenerative physiological changes in the aging population. Aging is accompanied by gradual, progressive changes in all biological systems. It affects physical, cognitive, psychological, and social abilities. Sarcopenia and frailty are two important conditions that become increasingly prevalent with age. Sarcopenia is an age-related syndrome mainly represented by a reduction in muscle mass and strength and difficulties performing activities of daily living, while frailty can be defined as multi-system impairment associated with increased vulnerability to stressors. Frailty is a physiological decline in many biological systems resulting in poor health, weight loss, moderate to severe dependency on activity of daily living, recurrent hospitalization, and death. Frailty and sarcopenia in combination are more predictive of mortality than either condition alone. They cooccur in hospitalized older adults and are often unidentified and untreated in community settings.

To treat older hospitalized patients with probable sarcopenia, sarcopenia, or frailty, it is recommended that a structured and supervised multi-component exercise program be combined with nutritional supplements. Concerning exercise, it composes of resistance (muscle strengthening), balance, and functional mobility training. Those exercise should be prescribed as early as possible, regularly, and continuing throughout life. Exercise was considered as a long-term commitment to maintain physical performance and overall health. In addition, nutritional support aims to optimize energy and protein intake. Nutrition is a modifiable risk factor for frailty, and dietary change can be considered in strategies to prevent and treat frailty. However, both nutritional interventions and exercise programs should be tailored to individual needs and capabilities.

What are the differences between sarcopenia and frailty?

Sarcopenia and frailty are two distinct yet interrelated conditions that often coexist in older adults. While sarcopenia primarily focuses on the decline in muscle mass and function, frailty is a wider range of age-related changes, including cognitive decline, decreased physiological reserve, and increased susceptibility to adverse health outcomes. Frailty is often assessed using various criteria, such as unintentional weight loss, exhaustion, low grip strength, slow gait speed, and low physical activity. There is an overlap between sarcopenia and frailty, particularly in terms of physical aspects such as low grip strength, gait speed, and muscle mass. These measures are commonly used to assess both conditions and have been associated with a wide range of aging outcomes. Frailty is a more comprehensive concept that includes additional factors beyond muscle mass and function.

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Education:

1975 – 1981 Medical School : Kanazawa University, School of Medicine JAPAN
1992 Degree: Ph.D. (University of the Ryukyus)

Research and Faculty appointment:

1985–1987 Clinical assistant, Department of Orthopedic Surgery, University of the Ryukyus, Japan
1987–1989 Research Associate, Radiobiology Div. University of Utah (USA)
1989–1990 Research Associate, Department of Anatomy, West Virginia University (USA)
1990–1991 Research Associate, Department of Anatomy, Indiana University (USA)
1991–1994 Clinical assistant, Department of Orthopedic Surgery, University of the Ryukyus, Japan
1994–2007 Associate professor, Department of Orthopedic Surgery, Kagawa University
2007–2020 Director of Bone & Joint Surgery, Seirei Hamamatsu General Hospital
2012–2019 Chief Director, Orthopedic Surgery, Seirei Hamamatsu General Hospital
2020- Senior director of Bone & Joint Surgery,
Director of Osteoporosis Center, Seirei Hamamatsu General Hospital

Memberships:

Japanese Orthopedic Association
Committee member of Certification Board, Osteoporosis Committee advisor
Japanese Society of Bone and Mineral Research, Board member
Japanese Osteoporosis Society, Board member
Japan College of Rheumatology
Japanese Association of Rehabilitation
Japanese hip Society
Japanese Society for Replacement Arthroplasty

Japanese action preventing secondary fragility fracture

Satoshi Mori, MD. Ph.D.
Senior director of Bone & Joint Department
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Aging society as well as expansion of global population is to be a serious country risk. Aging speed is different among the regions. In particular aging speed in Asian area is notably high. Japan has faced rapid aging last 30 years earlier than the other Asian countries and has become the second highly aged country in the world (1st Monaco), where the elderly population rate (over 65 years) has reached 29.9% in 2022. Japanese society, the most rapidly and highly aged country would be a model of rapid aging Asia. Japanese life expectancy in 2021 is 85.6 in women(1st), 81.5 in men(3rd), while Japanese healthy life expectancy in 2023 is estimated as 75.5 in women, 72.6 in men, both the highest in the world. The gap between both life expectancies is 10 years in women and 9 years in men means Japanese elderly live dependently last 10years of their lives. Japanese national survey 2019 has reported that “Fracture and fall” is one of major causes of nursing care ranked at 4th (12.5%) (1st dementia:17.6%, 2nd stroke:16.1%, 3rd weakness:12.8%). It is expected that Japanese hip fracture incidence would keep increasing next 20 years. In order to restore patient function and prevent subsequent fractures, a systematic approach to fragility fracture treatment such as multidisciplinary and multi-professional cooperation has been proceeded in Japan.

In 2000 nursing care insurance and certification system supporting independent elderly has been introduced. In 2006 additional medical fee has been approved for community clinical cooperation hip fracture path. In 2022 further addition has been approved for hip fracture liaison service and acute surgery. Hip fracture 1 year follow-up survey carried by Japanese Orthopedic Association showed 1 year mortality as 10%, return home rate as 45%, osteoporotic drug therapy rate improved 24% (47% at 1year from 23% at fracture). Real world clinical trial of prospective, randomized, open-label, blinded-endpoint trial designed for highly aged (>75 years) Japanese osteoporotic women to test the efficacy of once weekly teriparatide-alendronate sequential therapy against alendronate monotherapy showed the significant reduction of morphometric vertebral fracture incidence and non-inferiority of no vertebral fracture (Hagino 2021, Mori 2022).

Qingzong Tseng, PhD
曾慶宗 博士
Alpha Intelligence Manifold 采豐智匯股份有限公司 Director, Clinical Data Science

PROFESSIONAL EXPERIENCE:

Data Scientist, The Turing Centre for Living ystems (CENTURI), Marseille, France
Director of R&D, AeonAstron 柏登生醫 , Taipei, Taiwan
Director of R&D, MiCareo 上準微流體 , Taipei, Taiwan
Research fellow, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany
Research engineer, Commissariat à l'Energie Atomique (CEA), Grenoble, France

EDUCATION:

PhD , Physics
Université de Grenoble, France
MSc , Applied Physics
ENS Cachan, Université Paris-Saclay, France
BSc, Zoology
National Taiwan University, Taiwan

AWARDS/HONORS:

EMBO and Marie Curie Fellowship, EMBL, 2011
American Society of Cell Biology (ASCB) annual meeting minisymposium invited speaker award, 2010
IRTELIS scholarship, IRTSV, Commissariat à l'Energie Atomique, 2008
Erasmus Mondus scholarship , European Commission, 2006.

From Pixels to Prevention: AI-Powered Digital Radiogrammetry Democratizes Osteoporosis Diagnosis

骨密度 AI 解碼：融合人工智慧與數位放射計量法，實現廣泛骨質疏鬆篩檢

Cheng Wei Lina, Chia-Hung Lina, Yu-Ming Jiana,c, Yen-Jun Laib, Qingzong Tsenga
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Abstract

Underdiagnosis is known to be a significant barrier to effective disease management in osteoporosis1. Unlike Dual-energy X-ray Absorptiometry (DXA), which measures the bone mineral density (BMD) based on the absorptiometric principle using different X-ray energy levels, radiogrammetry measures BMD based on morphological parameters using conventional radiographs2,3. It is relatively inexpensive, and readily accessible to most healthcare service providers around the world. Driven by the advances in computerized image analysis, Digital Radiogrammetry (DXR) has initially shown encouraging ability in BMD measurement for the appendicular skeletons. However, it has not yet demonstrated its general applicability for BMD measurement at the axial skeleton, which is considered more crucial in osteoporosis management.

In the current study, we developed an artificial intelligence (AI) algorithm for estimating the BMD of axial skeleton by combining the feature discovery capability of convolutional neural networks (CNN) and the conventional wisdom of radiogrammetric principles. BMD of the Total Hip and Femoral Neck can be calculated from a plain anteroposterior (AP) pelvic radiograph. Our studies have shown that radiogrammetric features, rather than absolute pixel intensity (X-ray attenuation), are critical for a consistent and accurate BMD estimation. Performance validation study using data from primary care clinics and medical centers showed high correlation with the BMD measured by DXA (Pearson r = 0.919 and 0.868 for Total Hip and Femoral Neck). Substantiated by reliable BMD estimation, our software DeepXrayTM Coxa further predicted individual patient's osteoporosis status (lowest DXA T-score ≤ -2.5) with a positive predictive value (PPV) of 90% and negative predictive value of 91% under a predefined disease prevalence rate of 20%.

By augmenting existing Xray hardware installations, AI-powered radiogrammetry can serve as an efficient pre-screening tool to bolster patient awareness of osteoporosis and mitigate healthcare burdens due to underdiagnosis.

1. Miller PD. Underdiagnoses and Undertreatment of Osteoporosis: The Battle to Be Won. The Journal of Clinical Endocrinology & Metabolism 2016;101(3):852–9.
2. Barnett E, Nordin BEC. The radiological diagnosis of osteoporosis: A new approach. Clinical Radiology 1960;11(3):166–74.
3. Nazia Fathima S M, Tamilselvi R, Parisa Beham M. A Comprehensive Survey on Bone Densitometry Methods. International Research Journal of Engineering and Technology 2020;7(10):1821.

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Assistant Investigator National Center for Geriatrics and Welfare Research
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Polypharmacy, osteoporosis, pharmacoepidemiology, health economic and outcome research, community health promotion

Education:

1. Ph.D. School of Pharmacy, College of Medicine, National Taiwan University, Taiwan,2014-2019
2. M.S. Graduate Institute of Clinical Pharmacy, College of Medicine, National Taiwan University, Taiwan, 2011-2013
3. B.S. School of Pharmacy, College of Medicine, National Taiwan University, Taiwan, 2003-2007

Professional Positions:

1. Assistant Investigator, National Center for Geriatrics and Welfare Research, National Health Research Institutes, Taiwan, 2021-Present
2. Pharmacist, National Taiwan University Hospital, Yunlin Branch, 2020-2021
3. Research Assistant, Graduate Institute of Clinical Pharmacy, College of Medicine, National Taiwan University, Taiwan (2013-2014)
4. Intern, University of Southern California School of Pharmacy, USA, 2013
5. Pharmacist, Xingyou Pharmacy, Taipei, Taiwan, 2010-2011
6. Research Assistant, Graduate Institute of Clinical Pharmacy, College of Medicine, National Taiwan University, Taiwan, 2007-2010

Awards:

1. Best Pharmacist Award from the Pharmacy Department of National Taiwan University Hospital (2010)
2. Feng Cheng News and Commentary Essay Award from National Taiwan University College of Medicine (2013)
3. Longyan Corporation Research Excellence Award for Graduate Students (2015-2019)
4. Research Excellence Award for Graduate Students from the College of Pharmacy, National Taiwan University (2016-2019)
5. Research Excellence Award from the New Century Health Care Foundation (2016-2019)
6. ISPE Scholarship - International Society for Pharmacoepidemiology Research Presentation Award (2019)
7. Outstanding Graduate Student Thesis Award from National Taiwan University College of Medicine (2020)
8. First Prize in Oral Presentation at the 2020 Taiwan Osteoporosis Society Annual Meeting (2020)
9. Oral Presentation Award at the 2020 Taiwan Joint Pharmaceutical Seminar (2020)
10. Best Pharmacist Award from National Taiwan University Hospital Yunlin Branch (2020)

Cost and effectiveness analyses of the anti-osteoporosis medication in patients with hip fracture in Taiwan: A population-based national claims database analysis

Chen-Yu Wang

The global aging population is increasing the burden of osteoporosis-related diseases, leading to considerable attention and effort from countries worldwide.

In Taiwan's osteoporosis epidemiology, the prevalence of osteoporosis is increasing, while the prevalence rate is decreasing. Notably, the proportion of individuals aged 85 and above with osteoporosis is growing, emphasizing the impact of aging on healthcare burdens. The incidence rate of major osteoporotic fractures is decreasing annually, underscoring the importance of ongoing screening and preventive strategies. For instance, the hip fracture incidence rate decreased from approximately 350 per 100,000 people in 2008 to 250 per 100,000 people in 2019. This positive trend aligns with a systematic review published in the Lancet Healthy Longevity journal in 2021, indirectly indicating the success of osteoporosis prevention efforts in Taiwan.

Regarding healthcare economic burdens, our study reveals that the increase in the overall osteoporosis population from 56,036 individuals to 58,858 individuals resulted in nearly a 40% rise in annual healthcare expenses under Taiwan's national health insurance program. This increase was from 7,787,174,772 New Taiwan Dollars in 2008 to 10,938,075,731 New Taiwan Dollars in 2018. The additional one-year healthcare cost per individual with a hip fracture was approximately 119,185 New Taiwan Dollars, while for vertebral fractures, it was 56,913 New Taiwan Dollars. The estimated hip fracture costs were consistent with previous research, whereas vertebral fracture costs exhibited an upward trend.

Finally, international studies on the cost-effectiveness of osteoporosis treatment consistently indicate favorable outcomes. Based on our research using Taiwan's national health insurance data, it is evident that initiating and maintaining proper adherence to anti-osteoporotic medication among fracture-prone populations results in cost savings, obviating the need to calculate the expenses associated with individual fractures. Initiating treatment at the appropriate time and ensuring good medication adherence yield the best cost-effective outcomes.

傅紹懷 **Shau-Huai, Fu,** M.D. & Ph.D.

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EDUCATION:

- **Department of Public Health, College of Medicine, National Cheng Kung University,** Tainan, Taiwan
  Ph. D., 2019/07-2022/12
- **School of Medicine, College of Medicine, National Taiwan University, Taipei, Taiwan**
  M.D., 2001/09-2008/06

POSITION/WORKING EXPERIENCES:

- **Orthopedic Department, National Taiwan University Hospital, Taipei, Taiwan**
  Assistant Professor, 2023/07~
- **Orthopedic Department, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan**
  Attending Physician, 2015/07~
- **Trauma Team, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan**
  Executive Secretary, 2016/07~2018/07

HONORS AND AWARDS:

1. 2016 AAOS Highlight Poster (Florida, USA)
2. 2016 The Taiwanese Osteoporosis Association Oral presentation: Third place
3. 2017 ISPE Spotlight Poster (Montreal, Canada)
4. 2019 The Taiwanese Osteoporosis Association Paper Competition: First place
5. 2021 The Taiwanese Osteoporosis Association Young Investigator Award: First place
6. 2022 WCO-IOF-ESCEO Young Investigator Award

Research Interest:

Osteoporosis, Sarcopenia, Orthopedic traumatology, Arthroplasty, Orthopedic oncology

Long dosing intervals of antiosteoporosis medications decrease societal fracture risk: a 11-year nationwide population-based cohort study

Shau-Huai, Fu, MD, PhD.
Taiwan

Antiosteoporosis medications (AOMs), with its widely validate effectiveness, has been shown to reduce fracture-related morbidities and costs.1 Some previous studies suggested that prescribing long dosing interval (DI) AOM could lead to patients' better compliance, which is considered the cornerstone of the disease management. Some studies, on the other hand, reported that the therapeutic effect was more promising when the compliance rates were 75% or higher6 despite the real-world adherence to certain types of AOM was reportedly suboptimal. However, to the best of our knowledge, no previous study has demonstrated the better compliance, by elongating the dosing interval, was related to a lower post-treatment fracture risk. Therefore, in this study, we aimed to validate the two hypotheses: (1) the increased popularity of long DI AOMs (e.g., parenteral AOMs) in Taiwan was associated with better adherence to AOM therapy, and (2) the causal better adherence was related to lower societal fracture risk.

Reference:

1. Compston JE, McClung MR, Leslie WD. Osteoporosis. Lancet. 2019;393(10169):364-376.
2. Siris ES, Harris ST, Rosen CJ, et al. Adherence to bisphosphonate therapy and fracture rates in osteoporotic women: relationship to vertebral and nonvertebral fractures from 2 US claims databases. Mayo Clin Proc. 2006;81(8):1013-1022.
3. Ross S, Samuels E, Gairy K, Iqbal S, Badamgarav E, Siris E. A meta-analysis of osteoporotic fracture risk with medication nonadherence. Value Health. 2011;14(4):571-581.
4. Imaz I, Zegarra P, González-Enríquez J, Rubio B, Alcazar R, Amate JM. Poor bisphosphonate adherence for treatment of osteoporosis increases fracture risk: systematic review and meta-analysis. Osteoporos Int. 2010;21(11):1943-1951.
5. Cramer JA, Gold DT, Silverman SL, Lewiecki EM. A systematic review of persistence and compliance with bisphosphonates for osteoporosis. Osteoporos Int. 2007;18(8):1023-1031.
6. Fatoye F, Smith P, Gebrye T, Yeowell G. Real-world persistence and adherence with oral bisphosphonates for osteoporosis: a systematic review. BMJ Open. 2019;9(4):e027049. Published 2019 Apr 14.
7. Koller G, Goetz V, Vandermeer B, et al. Persistence and adherence to parenteral osteoporosis therapies: a systematic review. Osteoporos Int. 2020;31(11):2093-2102.

CURRICULUM VITAE: Updated Aug 30, 2023

Chun-Feng Huang, MD, Ph.D.

Position/s:

Assistant Professor, Faculty of Medicine, School of Medicine, National Yang Ming Chiao Tung University

Chief – Department of Family Medicine, En Chu Kong Hospital

Educational Background:

Doctor of Medicine, National Yang Ming Chiao Tung University, School of Medicine, Taiwan

Ph.D., Taipei Medical University, Graduate Institute of Clinical Medicine, Taiwan

Certification:

Certified Clinical Densitometrist – International Society for Clinical Densitometry (ISCD)

Board Certified in Family Medicine, Hospice and Palliative Medicine, Integrative Medicine, and Osteoporosis

Awards

1. 2010-2015 - Principal Investigator, Mountain and Offshore Healthcare Plan for Yilan County National Health Insurance, Taiwan
2. 2013-2015 - Principal Investigator, Healthcare Services for Correctional Institutions in Yilan County, Taiwan
3. 2014-2016 - Chairman, Yilan County Kang Tai Community Development Association, Taiwan
4. 2015-2017 - Director, Taipei Smart City IoT Association, TaiwanLife Fellow, Philippine College of Physicians
5. 2016-2022 - Director of Family Medicine, National Yang Ming Chiao Tung University Hospital, Taipei, Taiwan
6. 2020-Present - Reviewer, Center for Drug Evaluation, Taiwan Food and Drug Administration
7. First Prize of Annual Academic Conference, Taiwan Association of Family Medicine, in 2011 and 2018

Medical Organization/s:

1. 2017-2020 - Deputy Chairman, Prevention and Healthcare Committee, Taiwan Association of Family Medicine
2. 2020-Present - Deputy Secretary General, Taiwan Association of Family Medicine
3. 2019-2021 - Secretary General, Taiwan Osteoporosis Association
4. 2021-Present - Director, Taiwan Osteoporosis Association

Research Interests:

Metabolomics, Osteoporosis, Sarcopenia, Gerontology

Recently Published Works:

1. Huang CF, Lin SC, Chen HM, Wu CH, Tu ST, Yang RS, Huang WJ, Hwang JS, Chan DC. Osteoporosis care after hip fracture: Observation from national health insurance database and fracture liaison services. J Formos Med Assoc. 2023 Jul 12:S0929-6646(23)00253-X.
2. Huang CF, Chen JF, Reid IR, Chan WP, Ebeling PR, Langdahl B, Tu ST, Matsumoto T, Chan DC, Chung YS, Chen FP, Lewiecki EM, Tsai KS, Yang RS, Ang SB, Huang KE, Chang YF, Chen CH, Lee JK, Ma HI, Xia W, Mithal A, Kendler DL, Cooper C, Hwang JS, Wu CH. Asia-pacific consensus on osteoporotic fracture prevention in postmenopausal women with low bone mass or osteoporosis but no fragility fractures. J Formos Med Assoc. 2023 Feb 10:S0929-6646(23)00035-9.
3. Huang CF, Mao TY, Hwang SJ. The Effects of Switching from Dipeptidyl Peptidase-4 Inhibitors to Glucagon-Like Peptide-1 Receptor Agonists on Bone Mineral Density in Diabetic Patients. Diabetes Metab Syndr Obes. 2023 Jan 11;16:31-36.
4. Tai TW, Huang CF, Huang HK, Yang RS, Chen JF, Cheng TT, Chen FP, Chen CH, Chang YF, Hung WC, Han DS, Chan DC, Tsai CC, Chen IW, Chan WP, Chang HJ, Hwang JS, Wu CH. Clinical practice guidelines for the prevention and treatment of osteoporosis in Taiwan: 2022 update. J Formos Med Assoc. 2023 Feb 11:S0929-6646(23)00007-4.
5. Lin CW, Mao TY, Huang CF. A Novel Game-Based Intelligent Test for Detecting Elderly Cognitive Function Impairment. Comput Math Methods Med. 2021 Nov 29;2021:1698406.
6. Chun-Feng Huang, Ming-Shi Shiao, Tso-Yen Mao. Effects of low dose metformin on prefrailty among middle- aged and elderly pre-diabetic people. JCSM Rapid Communications, 2022, Jan; 5: 33–39.
7. Tai TW, Li CC, Huang CF, Chan WP, Wu CH. Treatment of osteoporosis after hip fracture is associated with lower all-cause mortality: A nationwide population study. Bone. 2022 Jan;154:116216.
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Asia-Pacific Consensus on Osteoporosis Prevention in Postmenopausal Women with Low Bone Mass or Osteoporosis without Fractures

Chun-Feng Huang, MD, Ph.D.
Taiwan

Osteoporotic fractures are a major public health issue, especially among postmenopausal women, and are projected to rise significantly in Asia by 2050. To draw attention to the prevention of osteoporotic fractures in postmenopausal women with low bone mass or osteoporosis but no fragility fractures, and to establish a consistent intervention method, the Taiwanese Osteoporosis Association (TOA) hosted a “Postmenopausal Osteoporotic Fracture Prevention (POFP) in Asia-Pacific” meeting in Taipei on October 31, 2020, with experts from the AP region to review the standard strategies for preventing osteoporotic fractures.

The following statements of consensus were developed. Important suggestions include:

1. Pharmacological therapy can be used for fracture prevention in high-risk women even without prior fractures.
2. Raloxifene, alendronate and risedronate have good evidence for fracture prevention.
3. Zoledronic acid, denosumab and romosozumab are also options.
4. Menopausal hormone therapy may be used with caution.
5. Efficacy can be monitored via bone markers, BMD and fractures.
6. Cost coverage of pharmacological prevention should be considered in high-risk individuals.
7. More research is needed on long-term treatment, comparisons between drugs, ethnic factors, etc.
8. Non-pharmacological approaches like calcium/vitamin D, exercise and fall prevention are also important.

In summary, the experts advocate pharmacological fracture prevention in high-risk Asian postmenopausal women and provide clinical recommendations, while calling for more research specifically in Asian populations.

Akira Taguchi, DDS, PhD
Born: August 22, 1962, Niigata, Japan

Present position:

Chair and Professor, Dept. of Oral and Maxillofacial Radiology, School of Dentistry, Matsumoto Dental University
Professor, Dept. of Hard Tissue Research, Graduate School of Oral Medicine, Matsumoto Dental University
Head, Radiology Clinic, Matsumoto Dental University Hospital
Honorary Professor, School of Dentistry, The University of Hong Kong

Examinations:

1988 Dentist's License (D.D.S), Hiroshima University, Japan
1992 Doctor of Dental Science (Ph.D.), Hiroshima University, Japan
1996 Board Certification, Japanese Society for Oral and Maxillofacial Radiology

Other credentials:

2007 Postgraduate Certificate of Clinical Dental Research Methods (University of Washington)
2008 Postgraduate Certificate of Evidenced-Based Diagnostics (Oxford University)

Professional career:

1992-1995 Research Associate, Dept. of Oral and Maxillofacial Radiology, Hiroshima University
1995-2006 Assistant Professor, Dept. of Oral and Maxillofacial Radiology, Hiroshima, University
1996-1997 Visiting Professor, Dept. of Oral Medicine, University of Washington
2006-2008 Clinical Associate Professor, Dept. of Oral and Maxillofacial Radiology, Hiroshima University Hospital
2008- Chair and Professor, Dept. of Oral and Maxillofacial Radiology, School of Dentistry, Matsumoto Dental University
2010-2013 Vice Director, Matsumoto Dental University Hospital
2011- Visiting Scholar, Research Institute of Radiation Biology and Medicine, Hiroshima University
2013-2017 Part-time Lecturer, The Institute of Medical Science, The University of Tokyo
2017- Honorary Professor, School of Dentistry, The University of Hong Kong
2017- Visiting Professor, School of Dentistry, Hiroshima University

Other professional activities:

2009- Councilor of Japanese Society of Medical Imaging
2010- Practice Committee member of the A-TOP (Adequate Treatment of Osteoporosis) in the Japan Osteoporosis Society (JOS)
2012- International ONJ Task Force member
2013- Councilor of the Japan Osteoporosis Society(JOS)
2015- Editorial Board of Osteoporosis and Sarcopenia
2015- Council of the Asian Federation of Osteoporosis Societies (AFOS)
2019- Councilor of the Japanese Society for Bone and Mineral Research (JSBMR)
2019- Auditor of the Japan Osteoporosis Society (JOS)
2021- Editorial Board of Journal of Bone and Mineral Metabolism (JBMM)
2022- ONJ member of Japanese Society of Oral and Maxillofacial Surgeons

Awards:

2004 7th Awards from the Hiroshima University Alumni Association (Clinical Research)
2005 Outstanding Research Award from Japanese Society for Oral and Maxillofacial Radiology
2007 Research Award from the Japanese Gynecology Meeting on Osteoporosis
2012 Research Award from the Japan Osteoporosis Society
2017 Outstanding Research Award from Japanese Society for Bone and Mineral Research
2023 Research Award from Japan Osteoporosis Foundation

Reliability of nonspecific symptoms or clinical findings of MRONJ at early stages: The Japanese Osteoporosis Intervention Trial-05 (JOINT-05)

Akira Taguchi, DDS, PhD;
Adequate Treatment of Osteoporosis (A-TOP) Research Group
Japan

Abstract

Introduction:

To investigate the differences in the incidence rates of suspected stage 0/1 osteonecrosis of the jaw (ONJ) and incidence risk of relevant clinical findings of suspected stage 0 ONJ between patients treated with sequential therapy comprising weekly teriparatide for 72 weeks followed by alendronate for 48 weeks versus those who received monotherapy with alendronate for 120 weeks.

Materials and Methods:

Suspected stage 0/1 ONJ was defined by nonspecific symptoms. Tooth mobility and periodontal symptoms (gingival bleeding, swelling, and/or pain) were selected as clinical findings of suspected stage 0 ONJ. Poisson regression models were applied to calculate the incidence rate ratios of suspected stage 0/1 between the teriparatide group and alendronate group. Generalized linear models were used to calculate the risk ratios of clinical findings between groups.

Results:

Two hundred and sixty-one participants in the teriparatide group and 344 in the alendronate group answered a structured questionnaire on oral health and were included in this study. There were no significant differences between the groups in the incidence rate of suspected stage 0/1 ONJ at both 72 and 120 weeks. The risk ratio of the teriparatide group to alendronate group for tooth mobility was 0.34 (95% confidence interval [CI] 0.13–0.88, p=0.02) at 72 weeks and 0.90 (95% CI 0.40–2.03, p=0.83) at 120 weeks. The incidence rate of tooth mobility related to periodontal symptoms decreased in the teriparatide group and increased in the alendronate group during the study.

Conclusion: Tooth mobility accompanied by clinical periodontal symptoms may be a useful early sign of stage 0 ONJ.

Ken-Chung Chen, DDS, MS, PhD

Position/s:
Assistant Professor, School of Dentistry, College of Medicine, National Cheng Kung University
Chief, Division of Oral and Maxillofacial surgery, Department of Stomatology, National Cheng Kung
University Hospital

Educational Background:
PhD - Biomaterial, Department of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan
Master of Science - Oral science, Institute of Oral Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan
Doctor of Dental Surgery - Department of Dentistry, College of Oral Medicine ,Chung Shan Medical University, Taichung, Taiwan

Certification:
Diplomate, Association of Oral and Maxillofacial Surgery Taiwan (R.O.C)

Awards:
2005 Best poster presentation, Annual congress of Taiwanese Association of Oral and Maxillofacial Surgery
2006 Best oral presentation, Annual congress of Taiwanese Association of Oral and Maxillofacial Surgery
2006 Best Oral presentation, 7th Asian Congress of Oral and Maxillofacial Surgery
2008 Best oral presentation, Annual congress of Taiwanese Association of Oral and Maxillofacial Surgery
2009 MEDARTIS Award of Poster, 54th Congress of the Japanese Society of Oral and Maxillofacial Surgeons
2014 Best oral presentation, Annual congress of Taiwanese Association of Oral and Maxillofacial Surgery

Research Interests:
MRONJ, Biomaterial, Bone biology and regeneration, Computer-assisted surgery, Oral cancer surgery

Management approaches and their outcomes of MRONJ

Ken-chung Chen, DDS, MS, PhD
Taiwan

Antiresorptive agents have become indispensable in managing osteoporosis and cancer-related bone metastasis, effectively preventing fractures and alleviating pain from skeletal-related events(SREs) while improving the quality of life for patients. However, the emergence of Medication-Related Osteonecrosis of the Jaw (MRONJ) has introduced a clinical dilemma—Should patients undergoing oral surgery or those already afflicted with MRONJ continue their medication?

Our goal is to enable patients to maintain antiresorptive agent therapy, irrespective of any oral health issues they may face.

However, MRONJ presents challenges, particularly among high-risk patients such as those undergoing chemotherapy, individuals with comorbidities, or patients with jawbone osteosclerosis, where surgical success rates are lower. This phenomenon is presumed to involve compromised blood supply to soft and hard tissues and diminished wound healing capacity.

To address these challenges, we have implemented several surgical techniques and biomaterials to enhance wound vascularization and growth factor provision, thereby improving treatment outcomes for patients with poor prognoses. Most MRONJ patients can safely resume antiresorptive agents after surgical intervention at our institution.

In this presentation, we will share our experiences and insights, ensuring that MRONJ ceases to be an obstacle to the continued use of antiresorptive agents, thus enhancing patients' quality of life.

References:

1. Salvatore L Ruggiero et al. American Association of Oral and Maxillofacial Surgeons' Position Paper on Medication-Related Osteonecrosis of the Jaws-2022 Update J Oral Maxillofac Surg. 2022 ;80(5): 920-943
2. Wei-Pang Chung et al. Long-term use of denosumab and its association with skeletal-related events and osteonecrosis of the jaw Sci Rep. 2023 ;13(1): 8403

Ling-Ying Wei, DDS, PhD

Position/s:
Assistant professor, School of Dentistry, National Taiwan University, Taiwan, since 2021
Visiting staff, Department of Dentistry, Beihu Branch of National Taiwan University Hospital, since 2019
Chairman of Publication Board, Taiwanese Association of Oral and Maxillofacial Surgeons, since 2019

Educational Background:
D.D.S., National Taiwan University, Taiwan, 2008
PhD, Clinical Dentistry, National Taiwan University, Taiwan, 2019

Certification:
Diploma of Oral and Maxillofacial Surgery, R.O.C. 2015

Research Interests:
Medication-related osteonecrosis of jaws, tumor immunology

Prognosis of MRONJ in patients Using Antiresorptive Agents

Ling-ying Wei, DDS, PhD

Alteration of bone turnover by antiresorptive agents impairs wound healing of jaw bones, and potentially results in an adverse event termed medication-related osteonecrosis of the jaws (MRONJ). Prevalence, risk factors and prevention strategy for MRONJ were extensively investigated in recent years, but only a relatively small number of studies have focused on its treatment outcome and the proposed prognostic factors varied greatly. We systematically reviewed the prognostic factors in patients undergoing treatment for MRONJ and 33 studies met the inclusion criteria out of 1388 screened citations. We grouped the prognostic factors into 5 categories: medication-related, underlying conditions, lesion-related, serum markers, and treatment modality for analysis. A medication-related factor significantly associated with better treatment outcome was discontinuation of anti-resorptive therapy (ART). As for underlying conditions, malignancy, especially multiple myeloma was associated with worse treatment outcome. Among lesion-related factors, better treatment outcome was noted for maxillary lesions and lesions with sequestrum formation. In contrast, lesions of advanced stages and those with periosteal reaction had poor treatment outcome. Regarding treatment modality, surgical therapy was associated with a better chance of healing. Results of our meta-analysis helped identify prognostic indicators of MRONJ and will assist decision-making in the clinical setting.

CHUN-FENG HUANG, MD, Ph.D.

Position/s:

Assistant Professor, Faculty of Medicine, School of Medicine, National Yang Ming Chiao Tung University

Chief – Department of Family Medicine, En Chu Kong Hospital

Educational Background:

Doctor of Medicine, National Yang Ming Chiao Tung University, School of Medicine, Taiwan

Ph.D., Taipei Medical University, Graduate Institute of Clinical Medicine, Taiwan

Certification:

Certified Clinical Densitometrist – International Society for Clinical Densitometry (ISCD)

Board Certified in Family Medicine, Hospice and Palliative Medicine, Integrative Medicine, and Osteoporosis

Awards

1. 2010-2015 - Principal Investigator, Mountain and Offshore Healthcare Plan for Yilan County National Health Insurance, Taiwan
2. 2013-2015 - Principal Investigator, Healthcare Services for Correctional Institutions in Yilan County, Taiwan
3. 2014-2016 - Chairman, Yilan County Kang Tai Community Development Association, Taiwan
4. 2015-2017 - Director, Taipei Smart City IoT Association, TaiwanLife Fellow, Philippine College of Physicians
5. 2016-2022 - Director of Family Medicine, National Yang Ming Chiao Tung University Hospital, Taipei, Taiwan
6. 2020-Present - Reviewer, Center for Drug Evaluation, Taiwan Food and Drug Administration
7. First Prize of Annual Academic Conference, Taiwan Association of Family Medicine, in 2011 and 2018

Medical Organization/s:

1. 2017-2020 - Deputy Chairman, Prevention and Healthcare Committee, Taiwan Association of Family Medicine
2. 2020-Present - Deputy Secretary General, Taiwan Association of Family Medicine
3. 2019-2021 - Secretary General, Taiwan Osteoporosis Association
4. 2021-Present - Director, Taiwan Osteoporosis Association

Research Interests:

Metabolomics, Osteoporosis, Sarcopenia, Gerontology

Recently Published Works:

1. Huang CF, Lin SC, Chen HM, Wu CH, Tu ST, Yang RS, Huang WJ, Hwang JS, Chan DC. Osteoporosis care after hip fracture: Observation from national health insurance database and fracture liaison services. J Formos Med Assoc. 2023 Jul 12:S0929-6646(23)00253-X.
2. Huang CF, Chen JF, Reid IR, Chan WP, Ebeling PR, Langdahl B, Tu ST, Matsumoto T, Chan DC, Chung YS, Chen FP, Lewiecki EM, Tsai KS, Yang RS, Ang SB, Huang KE, Chang YF, Chen CH, Lee JK, Ma HI, Xia W, Mithal A, Kendler DL, Cooper C, Hwang JS, Wu CH. Asia-pacific consensus on osteoporotic fracture prevention in postmenopausal women with low bone mass or osteoporosis but no fragility fractures. J Formos Med Assoc. 2023 Feb 10:S0929-6646(23)00035-9.
3. Huang CF, Mao TY, Hwang SJ. The Effects of Switching from Dipeptidyl Peptidase-4 Inhibitors to Glucagon-Like Peptide-1 Receptor Agonists on Bone Mineral Density in Diabetic Patients. Diabetes Metab Syndr Obes. 2023 Jan 11;16:31-36.
4. Tai TW, Huang CF, Huang HK, Yang RS, Chen JF, Cheng TT, Chen FP, Chen CH, Chang YF, Hung WC, Han DS, Chan DC, Tsai CC, Chen IW, Chan WP, Chang HJ, Hwang JS, Wu CH. Clinical practice guidelines for the prevention and treatment of osteoporosis in Taiwan: 2022 update. J Formos Med Assoc. 2023 Feb 11:S0929-6646(23)00007-4.
5. Lin CW, Mao TY, Huang CF. A Novel Game-Based Intelligent Test for Detecting Elderly Cognitive Function Impairment. Comput Math Methods Med. 2021 Nov 29;2021:1698406.
6. Chun-Feng Huang, Ming-Shi Shiao, Tso-Yen Mao. Effects of low dose metformin on prefrailty among middle- aged and elderly pre-diabetic people. JCSM Rapid Communications, 2022, Jan; 5: 33–39.
7. Tai TW, Li CC, Huang CF, Chan WP, Wu CH. Treatment of osteoporosis after hip fracture is associated with lower all-cause mortality: A nationwide population study. Bone. 2022 Jan;154:116216.
8. Lee WJ, Peng LN, Lin CH, Chen RC, Lin SZ, Loh CH, Kao SL, Hung TS, Chang CY, Huang CF, Tang TC, Huang ST, Wen YW, Hsiao FY, Chen LK; Taiwan Integrated Geriatric Care Study Group. Effects of incorporating multidomain interventions into integrated primary care on quality of life: a randomised controlled trial. Lancet Healthy Longev. 2021 Nov;2(11):e712-

2023 台灣成人骨質疏鬆症防治之共識及指引

黃駿豐 Chun-Feng Huang, MD, Ph.D.
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中華民國骨質疏鬆學會於 2023 年 5 月發布最新版的《台灣成人骨質疏鬆症防治之共識及指引》,該指引由多位台灣骨質疏鬆症領域的專家共同編輯,並諮詢多個相關醫學學會,代表台灣對骨質疏鬆症防治的基本共識。

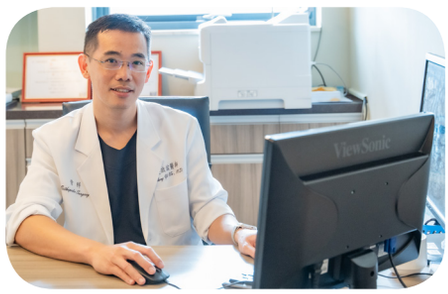
指引中 Def 了骨質疏鬆症的定義,強調它是一種會降低骨質量和質量,增加骨折風險 的疾病。診斷時應測量骨密度,並與年輕成年人的平均骨密度作比較計算出 T 值,根據 T 值判 定骨質流失的嚴重程度。指引詳述骨質疏鬆症的流行病學概況,並依統計數據指出隨著台 灣人口結構的高齡化,骨質疏鬆症的患病率持續上升,已成為公共衛生的重要議題。

新版指引提出骨質疏鬆症的篩檢建議,包括評估臨床風險因子、骨密度檢測、X 光檢查等。另外,運用骨折風險評估工具 (FRAX) 可提高骨折風險的預測精準度。指引也特別討論肌少症的定義、診斷和治療,因為肌少症與骨質疏鬆症有密切病生理關聯。

在治療方面,新版指引提出完整的非藥物治療建議,包括補充鈣和維生素 D、運動、日常生活型態的調整等。藥物治療部分則詳細討論各種藥物的適應症、臨床證據和副作用,並考量台灣的健保給付規定。新版指引特別強調,骨質疏鬆症需要長期治療,不能輕易中斷。 例如使用造骨細胞生成劑 (如 teriparatide) 或抑制 RANKL 單株抗體 (denosumab) 後,若停藥會使 骨密度快速流失,因此需接續使用其他抗骨質再吸收藥物以保護骨密度 (sequential therapy)。

整體而言,此份指引全面地總結台灣骨質疏鬆症的防治策略,其建議代表台灣此領域的最新共識,可提供醫護人員臨床診治的重要參考。隨著台灣人口的快速老化,骨質疏鬆症 已成為影響許多老年人健康的重要疾病,需要醫界同仁共同努力加強防治。

2023 台灣成人骨質疏鬆症防治之共識及指引為臨床一線工作制定明確的診斷、評估 和治療方針,有助提升骨質疏鬆症患者的照護品質。



Cheng-Yi Wu, M.D.

Position/s:
Attending Physician, Department of Orthopedics, Chia-Yi Christian Hospital, Chiayi, Taiwan
Chief of Osteoporosis Center, Chia-Yi Christian Hospital
Director of Orthopedic Ward, Chia-Yi Christian Hospital
Chief Executive Officer for Anxin Clinic, Chiayi, Taiwan
Director of Chiayi City Medical Association

Educational Background:
Doctor of Medicine—National Cheng Kung University, Tainan, Taiwan
Post-doctoral Training:
Intern doctor, National Cheng Kung University Hospital, Tainan, Taiwan 2009-2010
Resident training of Orthopaedic science, Chia-Yi Christian Hospital, Chiayi, Taiwan 2011-2016
Certification:
Board certified in Medicine
Board certified in Orthopaedics in Taiwan
Academic Teaching Rank Accreditation Certificate Lecturer
Expertise:
Treatment of Osteoporosis
Minimally Invasive Spinal Surgery
Ultrasound-Guided Regenerative Therapy and Prolotherapy

Recently peer reviewed publications:

1. Lin, C. H., Yen, Y. S., & Wu, C. Y. (2023). Ultrasound-guided nerve hydrodissection of cervical nerve roots for cervical radicular pain in patients with mild and moderate to severe stenosis: a retrospective cohort study. Scientific reports, 13(1), 13817. https://doi.org/10.1038/s41598-023-40376-2
2. Wu, C. Y., Tsai, C. F., & Yang, H. Y. (2023). Utilizing a nomogram to predict the one-year postoperative mortality risk for geriatric patients with a hip fracture. Scientific reports, 13(1), 11091. https://doi.org/10.1038/s41598-023-38297-1
3. Wu, C. Y., Huang, J. W., Lin, C. H., & Chih, W. H. (2023). Preoperative overweight and obesity do not cause inferior outcomes following open-wedge high tibial osteotomy: A retrospective cohort study of 123 patients. PloS one, 18(1), e0280687. https://doi.org/10.1371/journal.pone.0280687
4. Lin, S. J., Wu, C. Y., Tsai, C. F., & Yang, H. Y. (2023). Hysterectomy and risk of osteoarthritis in women: a nationwide nested case-control study. Scandinavian journal of rheumatology, 1–8. Advance online publication. https://doi.org/10.1080/03009742.2022.2153985
5. Wu, C. Y., Lee, H. S., Tsai, C. F., Hsu, Y. H., & Yang, H. Y. (2022). Secular trends in the incidence of fracture hospitalization between 2000 and 2015 among the middle-aged and elderly persons in Taiwan: A nationwide register-based cohort study. Bone, 154, 116250. https://doi.org/10.1016/j.bone.2021.116250

從 0 到 1: 嘉基骨鬆中心的 FLS 金牌之路
From Ground Zero to Glory: Charting the Path to a Gold Medal in Fracture Liaison Services at the Osteoporosis Center of Ditmanson Medical Foundation

Cheng-Yi Wu, M.D. Taiwan
Chia-Yi hristian Hospital

The Osteoporosis Center was born out of a deep concern for osteoporosis in today's fast-paced world, where its risks often go unnoticed. Director Wu Cheng-Yi succinctly reminds us that while osteoporosis may not cause pain, fractures do, emphasizing the suffering it brings. The center's mission to "prevent every fracture" and goal of "Bone Health Optimization (BHO)" merge medical expertise with humanity, offering a fresh perspective on osteoporosis.

The center's remarkable certifications, including the "Osteoporosis Collaborative Care Full Gold Certification" and "Advanced Friendly Institution Certification" from the Osteoporosis Society, serve as both endorsements and acknowledgments of the team's tireless efforts. They signify a substantial improvement in regional medical services and symbolize professionalism, dedication, care, and compassion. With the mission to "prevent every fracture and protect the people of ChiaYi," we aspire to make a profound impact on osteoporosis prevention and treatment.

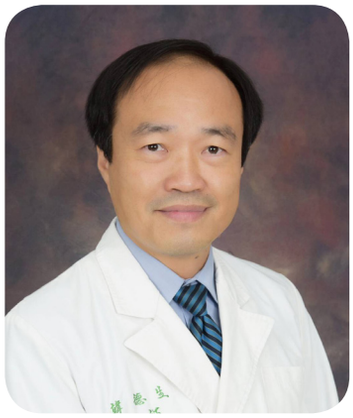
Our services cater to a diverse range of individuals, from the elderly to those with osteoporosis-related conditions. We provide meticulous care, offering specialized medical treatment and comprehensive health consultations. Personalized preventive measures are available for special groups like corticosteroid users and diabetes patients to reduce fracture risks.

Innovative methods, such as interactive health seminars and user-friendly educational materials, empower patients with osteoporosis-related knowledge. We establish an interactive platform for patients to engage with healthcare professionals, ensuring clarity and enhancing their sense of health control.

Our commitment to health education extends beyond the hospital. We actively engage in community outreach, organizing health education activities in schools and community organizations. These activities, including talks, workshops, and health check-ups, raise public awareness of osteoporosis, integrating the "BHO" concept into everyday life and motivating individuals to improve their lifestyles to reduce fracture risks.

At the Chia-Yi Christian Hospital Osteoporosis Center, patients facing significant surgeries find courage and determination by embracing the "BHO" concept. Through preoperative bone density assessments, we ensure safer surgeries. Post-surgery, patients express gratitude, reflecting the center's mission to provide hope and knowledge, guiding them to a healthier future.

Our center is not just a medical institution; it's a compassionate family. We blend professionalism and compassion, striving for excellence in every achievement. Our motto, "Prevent every fracture, ensuring it doesn't afflict the people of Chia-Yi," drives our unwavering commitment to bringing health and happiness to every patient, leading to extraordinary outcomes.



Der-Sheng Han, MD, PhD, EMBA
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POSITION TITLE:

- Medical Director, National Taiwan University Hospital Beihu Branch.
- Clinical Professor, Department of Physical Medicine and Rehabilitation, College of Medicine, National Taiwan University.
- Director, Taiwan Osteoporosis Association
- Director, Taiwan Society of Neurorehabilitation
- Director, Taiwan Academy of Physical Medicine and Rehabilitation
- Education Committee, International Society of Physical and Rehabilitation Medicine

EDUCATION:

1995-2000: MD, College of Medicine, Kaohsiung Medical University, Taiwan
2004-2011: PhD, Graduate Institute of Clinical Medicine, National Taiwan University, Taiwan.
2018-2020: EMBA, Division of International Business, College of Management, National Taiwan University, Taiwan.

FIELD OF SPECIALTY:

Dr. Han's research interests are on muscle biology, sarcopenia, exercise and fitness, molecular biology, and geriatric rehabilitation. He has published over 90 research articles in the related fields.

SELECTED PUBLICATION:

1. Han DS#, Wu WK#, Liu PY, Hsu HC, Kuo CH, Wu MS*, Wang TG*. Differences in the gut microbiome and reduced fecal butyrate in elders with low skeletal muscle mass. Clinical Nutrition 2022 May 23;41(7):1491-1500. (IF:7.938)
2. Hsiao MY, Chang KV, Wu WT, Huang KC, Han DS*. Grip Strength and Demographic Variables Estimate Appendicular Muscle Mass Better Than Bioelectrical Impedance in Taiwanese Older Persons. JAMDA 2020. https://doi.org/10.1016/j.jamda.2020.08.003 (IF:6.462)
3. Chang KV, Wu WT, Huang KC, Han DS*. Effectiveness of Early versus Delayed Exercise and Nutritional Intervention on Segmental Body Composition of Sarcopenic Elders- A Randomized Controlled Trial. Clinical Nutrition 2020 Jul 14; S0261-5614 (20)30354-X. doi: 10.1016/j.clnu.2020.06.037. (IF:7.938, Nutrition: 9/84)
4. Chang KV, Wu WT, Huang KC, Han DS*. Segmental Body Composition Transitions in Stroke Patients: Trunks are Different from Extremities and Strokes are as Important as Hemiparesis. Clinical Nutrition 2019 https://doi.org/10.1016/j.clnu.2019.08.024. (IF:7.938)
5. Chang KV, Chen JD, Wu WT, Huang KC, Hsu JT, Han DS*. Association between Loss of Skeletal Muscle Mass, and Mortality and Tumor Recurrence in Hepatocellular Carcinoma: A Systematic Review and Meta-analysis. Liver Cancer 2017. DOI:10.1159/000484950 (9.024)
6. Chang KV, Hsu TH, Wu WT, Huang KC, Han DS. Is Sarcopenia Associated with Depression? A Meta-analysis of Observational Studies. Age and Ageing 2017; 46: 738–746. (IF:8.222)

Master your Musculoskeletal Health, Keeping Sarcopenia and Osteoporosis Away

掌握關鍵增肌顧骨，遠離健康隱形殺手

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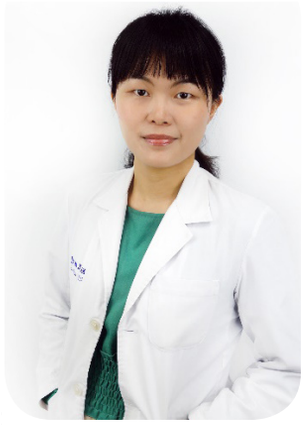
National Taiwan University Hospital Beihu Branch
Taipei, Taiwan

In this review, I will stress the importance of musculoskeletal health to prevent sarcopenia and osteoporosis. There exists complex interplay of muscle health, aging, malnutrition, and chronic diseases. Nutrition and exercise are the mainstay to the bone and muscle health in the aged population. The nutrition and exercise strategies for maintaining muscle mass and strength in the elderly will be introduced. Effectiveness of oral nutritional supplements on maintaining overall health status in the elderly will also be discussed.



Szu-Han Lin, MD

Current Positions:

Attending Physician, Division of Endocrinology and Metabolism, Department of Internal Medicine, Changhua Christian Hospital, since December 2022.
Concurrent Attending Physician, Division of Endocrinology and Metabolism, Department of Internal Medicine, Yunlin Christian Hospital, since December 2022:
Vice Secretary General, 13th Annual Meeting of the Osteoporosis Society since 2022

Educational Background:

2006-2013: Taipei Medical University, Medical School,
2020-2022: Master's in Epidemiology, Graduate Institute of Public Health, Yang Ming Chiao Tung University

Professional Experience:

2014-2017: Resident Physician, Department of Internal Medicine, Changhua Christian Hospital
2017-2019: Fellow, Division of Endocrinology and Metabolism, Department of Internal Medicine, Changhua Christian Hospital
2019-2022.11: Attending Physician, Division of Endocrinology and Metabolism, Department of Internal Medicine, Yunlin Christian Hospital
2019-2023.01: Chief, Division of Endocrinology and Metabolism, Yunlin Christian Hospital
2020-2023.01: Director, Diabetes Center, Yunlin Christian Hospital
2020: Certified Diabetes Educator
2023: Specialist in Osteoporosis

骨鬆用藥衛教重點

Considerations in Medication Treatment for Osteoporosis

By Szu-Han, Lin, MD

Key Considerations for Osteoporosis Medication Intervention:
Why start using osteoporosis medications?
What mechanisms do osteoporosis medications employ?
When should bone density monitoring be accompanied by bone metabolism index tracking?
Understanding the high-risk factors for osteoporosis is essential. It's recommended to undergo bone density testing.

For those looking to prevent osteoporosis, please keep the following in mind.
Maintain a balanced diet and ensure adequate calcium and vitamin D intake.
Avoid smoking, excessive alcohol consumption, and the overconsumption of caffeinated beverages. Engage in regular exercise to increase bone density, strengthen muscles, improve coordination, balance, and reduce the risk of falls and fractures.-Exposure to sunlight for 10 to 15 minutes daily can help activate vitamin D in your body, promote calcium absorption, and strengthen your bones. Which kind of osteoporosis medication will benefit for prevent osteoporosis.

If you've been diagnosed with osteoporosis or have experienced fragility fractures, in addition to maintaining a healthy lifestyle and adequate vitamin D and calcium intake, you may need to consider medication therapy. In educating patients about osteoporosis medications, consider the following based on the specific medication:

The administration method of the medication (oral, subcutaneous injection, intravenous injection, fasting before taking). Educate patients about why starting medication therapy is necessary, as different medications have distinct indications and risks. Specific medication precautions, such as the risk of fatal stroke and embolism with selective estrogen receptor modulators (SERMs), the inability to relieve menopausal symptoms, and proper posture and dental care when using bisphosphonates, and the potential rebound effect after discontinuing denosumab, sequential therapy. Emphasize that osteoporosis treatment requires long-term care and vigilance. Monitoring bone density, typically every two years, may involve spine X-rays and the FRAX risk assessment tool. Patients should refer to shared decision-making (SDM)

李貫廷 **Lee, Kuan-Ting,** MD, MBA

學歷：
國立臺灣大學醫學士 (2002-2010)
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經歷：
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醫學證照：
家庭醫學科專科醫師
骨質疏鬆症專科醫師
肥胖醫學專科醫師
安寧緩和醫學專科醫師
糖尿病共同照護網資格醫師
戒菸治療資格醫師
初期慢性腎臟病醫療給付資格醫師
慢性阻塞性肺病醫療給付資格醫師
友善性病門診專業醫師
病人自主權利法核心講師

醫學得獎紀錄：
2017-2022 年連續 6 年衛生福利部健保署糖尿病照護品質卓越獎

魔術得獎紀錄與經歷：
2008 年臺灣魔術發展協會魔術大賽舞台魔術冠軍
2008 年亞洲聯合魔術大會亞洲之夜表演嘉賓
臺灣魔術發展協會第四屆理事

幻變的健康教育：魔術的創新應用與實踐
Transforming Health Education with a Touch of Magic: An Innovative Approach

李貫廷 , Lee, Kuan-Ting, MD, MBA

骨質疏鬆症在 **21** 世紀已經成為一個重大的公共衛生問題，受到密切關注。儘管如此，高危險族群往往未能接受適當的檢查和預防教育。這突顯了健康教育在防範此類疾病中的核心作用。

健康教育不僅提供必要的健康訊息，而且激勵民眾採取確切的步驟來實現他們的健康目標。傳統的教育方法，如講座和宣傳材料，由於其形式單一和內容單調，常常未能達到預期效果。

健康推廣策略的創新持續引起醫療專家學者和社區工作者的關注。其中，將魔術作為健康教育的一種媒介，顯示出顯著的效果。魔術作為一門古老而吸引人的藝術形式，可以將原本乏味的健康訊息轉化為生動有趣的展示，從而更易被受眾接受。

本演講將探討使用魔術作為健康教育工具的創新方法。講者身兼醫師和魔術師的身份，將從多個角度深入探討這一主題：

1. 理論基礎和優勢解析：為什麼選擇魔術作為健康教育的工具？
2. 魔術衛教的實證文獻：展示相關研究和證據支援此創新策略的效果。
3. 個人實戰與經驗分享：講者將分享其在實際操作中的經驗和見解。
4. 魔術醫學的九大應用：深入探討魔術除了衛教之外的其他應用領域。

透過這次演講，期望能夠展開一場有意義的對話，進一步推動魔術在健康教育領域的應用，並探討其在醫療保健領域的更多可能性。

余懷瑾

江湖人稱「仙女老師」　粉絲專頁：仙女老師余懷瑾　演講與授課邀約：

認證：

美國 AL 加速式學習引導師認證、美國 ATD 培訓大師認證、美國 ATD 學習效果評估認證、中國蒲公英大學講師

獲獎：

教育大愛菁師獎、中國星教師年度榜樣、全國 SUPER 教師、臺北市特殊優良教師導師類、台大 SUPER 教案獎第六與第七屆壹等獎、台北市教學卓越獎、全國創意教學獎特優等獎項。

主要授課課程：

故事影響力、內部講師訓、溝通與表達、跨世代領導

著作：

1.《慢慢來，我等你》-- 四塊玉文創出版社
2.《故事力》-- 四塊玉文創出版社
3.《仙女老師的有溫度課堂》-- 商周出版社
4.《不怕輸，就怕放棄》-- 商周出版社

授課企業：

科技 / 製造業 / 營造業：台積電、鴻海科技、聯電、仁寶電子、安富利科技、傑太日煙、美律實業、三陽工業、晶元光電、工研院、瑞助營造、日立江森、中原造像、奧迪福斯汽車、裕隆汽車、台灣巴斯夫、宏華國際、甲骨文公司、中國端子、南亞科技、工研院、光寶科技、汎球生物科技、納智捷、蔡司台灣、和泰汽車、佳霖科技、安博航太、崴正營造、中強光電、台林電通、第一傳動、台灣村田

時尚 / 電商：CHANEL、Dior 、Line 、Cartier 、台灣萊雅、雅詩蘭黛、樂天

金融保險：新光人壽、新光銀行、國泰人壽、國泰世華、國泰金控、澳盛銀行、磊山保經、大誠保經、友邦人壽、安達人壽、安永聯合會計師事務所、中華櫃買中心、台北富邦、威盛保經、南山人壽、法巴人壽、國泰投信、遠東銀行

醫療業：費森尤斯卡比、惠氏、白蘭氏、台耀化學、星和醫美、新光醫院、台安醫院、台中榮民總醫院、義大醫院、耕莘醫院、柳營奇美醫院、成大醫院、馬偕醫院、門諾醫院、振興醫院、郭綜合醫院、台耀化學、TFC 臺北婦產科診所生殖中心、美瑞特醫療器材、台北市藥師公會、醫藥品查驗中心、高醫

政府單位 / 公益團體 / 文化：龍騰文化、桃園市青年事務局、臺灣高鐵、輕適能運動空間、中華人文關懷協會、中華創造學會、YMCA、國際扶輪 3510 地區年會、兒福聯盟、仰德扶輪社、真書軒、無憂花學堂、Fun 學趣、雜學校、永齡基金會、金車基金會、博幼基金會、慈濟基金會、心路基金會、世界展望會、台中傑人教育基金會、翰林出版、桃園市保險業務職業工會、心路基金會、PTWA 、IMC 、快樂學習協會、台灣公益聯盟、長頸鹿美語

媒體：達摩媒體、iWIN 網路內容防護機構、YAHOO

服務：美僑商會、統一超商、曼都髮型、艾肯開發、瓏山林渡假飯店、小林髮廊、永慶房屋、瑞商福維克、太平洋崇光百貨

骨鬆衛教與簡報工作坊 (I)- 用故事深入人心

余懷瑾

你是否有衛教時，對方聽不懂你說的話，
回到家後腦袋一片空白，
老是重複問 一樣的問題？

要怎麼樣能讓人們聽得懂，記得住，帶得走呢？

將專業包裝在故事裡，故事通俗易懂。
你會發現對方的眼神變得專注，
手機放了下來，甚至會提問，記筆記，
跟你多了更多的互動與感謝的語言，
這就是故事的魅力，
走進人們的心裡，產生改變。

仙女老師 TED 影片

愛心 · 品質 Compassion Quality

臺中榮民總醫院 Taichung Veterans General Hospital

創新 · 當責 Innovation Accountability

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Current Position:

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2022-Present Researcher, Department of Epidemiology on Aging, Geriatrics and Gerontology, National Center for Geriatrics and Gerontology, Aichi, Japan
2020-Present Deputy Director, Tobacco Treatment and Management Center, Taichung Veterans General Hospital, Taiwan
2022-Present Assistant Professor, Department of Post-Baccalaureate Medicine, College of Medicine, National Chung Hsing University, Taichung, Taiwan
2021-Present Assistant Professor, School of Medicine, National Yang Ming Chiao Tung University, Taiwan
2020-Present Director, Taiwan Society of Home Health Care
2020-Present Deputy Secretary General, Taiwan Environmental and Occupational Medicine Association

Education:

1. MD, 2001-2008, School of Medicine, National Defense Medical Center, Taiwan
2. MS, 2013-2015, Institute of Medicine, School of Medicine, Chung Shan Medical University, Taiwan
3. PhD, 2015-2019, Institute of Medicine, School of Medicine, Chung Shan Medical University, Taiwan
4. MS, 2020-2022, Institute of Health Policy and Management, National Taiwan University

Awards:

1. Best Oral Presentation Award, Asian Conference for Frailty and Sarcopenia (2022)
2. Best Poster Award, Taiwan Academy of Hospice Palliative Medicine (2021)
3. Honorary Member of The Phi Tau Phi Scholastic Honor Society (2015)
4. Best Poster Award, Taiwan Association of Gerontology and Geriatrics (2015)

Major Research Interests:

Geriatrics Medicine, Big data and Machine learning, Palliative Care, Medical Education
More information: http://www.weiminchu.com/

骨鬆衛教與簡報工作坊（II）：用簡報說服受眾
Osteoporosis Health Education and Presentation Workshop (II): Persuade Your Audience through Effective Presentation

Wei-Min Chu, MD, MS, PhD
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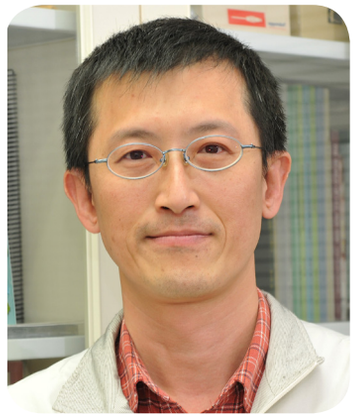
As a qualified osteoporosis health educator, it's crucial to effectively engage your audience when giving presentations and speeches to various groups in different settings. Often, despite your expertise and content, you might struggle to capture your audience's attention and maintain their focus. You may notice that at the beginning of your presentations, your audience appears disengaged, some may even start using their smartphones, or their minds wander because of a lack of a well-structured presentation and the skills for precise interaction.

In this workshop, Dr. Wei-Min Chu will share insights on how to enhance your presentation skills immediately using simple principles. You will learn to improve your presentation structure, enhance your ability to engage your audience in real-time interactions, and refine your storytelling skills. The goal is to create a perfect professional presentation that can be readily applied in your everyday health education, presentations, and speeches.

Reference:

1. 故事力 / 四塊玉文創 2019 https://reurl.cc/p5WArQ



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2016-2023: Research fellow, IBMS, Academia Sinica, Taipei, Taiwan
2011-2016: Associate research fellow, IBMS, Academia Sinica, Taipei, Taiwan
2003-2011: Assistant research fellow, IBMS, Academia Sinica, Taipei, Taiwan
1998-2003: Postdoctoral fellow, NIMH, NIH, USA
1994-1997: Ph.D. Department of Anatomy, University College London, UK
1988-1990: M.Sc. Zoology, National Taiwan University, Taipei, Taiwan
1984-1988: B.Sc. Zoology, National Taiwan University, Taipei, Taiwan

Research Experience:
My basic research interest is to understand the molecular mechanism and genetic control of sng and pain sensation, as well as neurosensory mechanotransduction. I have accomplished works relating to functional characterization of sensory neuron-specific ion channels, including ATP-gated ion channels (P2X3), acid-sensing ion channels (ASICs), and stretch-activated ion channels, as well as substance P-mediated antinociceptive pathways.

Selected Publications (up to five)
1. Hung CH, Tsai MH, Wang PS, Liang FW, Hsu CY, Lee KW, Fong YO, Han DS, Lee CH, Lai CL, Chen CC* (2023) Oxidative stress involves phenotype modulation of morbid soreness symptoms in fibromyalgia. RMD Open 2023 Mar;9(1):e002741.
2. Han DS, Lee CH, Shieh YD, Chang CT, Li MH, Chu YC, Wang JL, Chang KV, Lin SH, Chen CC* (2022) A role for substance P and acid-sensing ion channel 1a in prolotherapy with dextrose-mediated analgesia in a mouse model of chronic muscle pain. Pain 163.
3. Lim J, Tai HH, Liao WH, Chu YC, Hao CM, Lee CH, Lin SS, Hsu S, Chien YC, Lai DM, Chen WS, Chen CC*, Wang JL* (2021) ASIC1a is required for neuronal activation via low-intensity ultrasound stimulation in mouse brain. Elife 10: e61660.
4. Hung CH, Lee CH, Tsai MH, Chen CH, Lin HF, Hsu CY, Lai CL, Chen CC* (2020) Activation of acid-sensing ion channel 3 by lysophosphatidylcholine 16:0 mediates psychological stress-induced fibromyalgia-like pain. Annals of the Rheumatic Diseases 79(12):1644-1656
5. Lin JH, Hung CH, Han DS, Chen ST, Lee CH, Sun WZ, Chen CC* (2018) Sensing acidosis: nociception or sngception? J Biomed Sci 25:85

Theory of “sng pain”

Chih-Cheng Chen

Tissue acidosis is a physiological or pathological phenomenon occurring during tissue injury inflammation, ischemia, fatiguing exercise, and tumor growth. In cases of osteoarthritis and rheumatoid arthritis, chronic pain is closely associated tissue acidosis ranging from ranging from pH7.3 to pH 6.2, or lower. However, the perception of acid-sensation can be regarded as one of the most mysterious somatosensory functions. Although soreness is commonly used to described the perception of acid sensation, it may not precisely address the nature of acid-sensation. This muscle soreness is defined as pain resulting from overuse in the English dictionary. Intriguingly, in Chinese societies, such soreness (or acid-related pain) is often described as a compound word “sng-pain” (痠 痛), in which sng (pronounced as /səŋ/) is the romanization form of the Taiwanese word 痠 that represents the state of feeling sore. Although chronic sng (or soreness) is a major complaint in many chronic pain diseases (e.g., fibromyalgia, degenerative spine diseases), sng is notoriously ignored in current medicine and is always treated as a mild symptom of pain. Accumulating evidence has shown that sng (or soreness) and pain are 2 distinct symptoms in chronic pain diseases, such as fibromyalgia and degenerative spine diseases. Physiologically, sensing tissue acidosis is an important function of somatosensory nervous system to response to noxious stimuli. However, the nature of acid or soreness sensation is not always nociceptive and could be also antinociceptive as a sign of successful analgesia for acupuncture and many forms of physical therapy. Therefore, we propose a new theory of “sngception (sng-ception)” to describe the response of the somatosensory nervous system to sense tissue acidosis and to distinguish it from nociception (pain sensation). Sngception could partially overlap with nociception, but it could also transmit antinociception, proprioception, and pruriception. From clinical aspect, we have demonstrated sng (soreness) and pain are two distinguishable clinical symptoms with different clinical impacts on patients of chronic low-back pain and fibromyalgia. Now our theory of “sngception” is challenging the central dogma of pain biology. We suspect a substantial portion of chronic sng might be inappropriately diagnosed as “intractable pain”. Accordingly, understand the patients’ sng will thus largely change the doctors’ diagnosis and therapeutic strategies for sng-pain control. Therefore, we would like to propose the Taiwan Sng Medicine Initiative to promote the studies of sng and sngception to understand the prevalence of chronic sng and nosography of sng-associated diseases. We, the sng-pain researchers, need to re-examine the “pain” we have learned, understood, and misunderstood. Eventually, we need to define a set of Sng taxonomy to distinguish the difference between sng and pain and develop new clinical strategies for sng control. Welcome to the new frontier of science, the sngception.

FENG-SHENG WANG, MS, PhD

Position(s):
Full Investigator, Kaohsiung Chang Gung Memorial Hospital, Taiwan
2010- Professor, Graduate Institute of Clinical Medical Sciences, School of Medicine, Chang Gung University, Taiwan 2010-
Director, Center for Laboratory Animals, KCGMH 2010-
Director, Core Laboratory for Phenomics & Diagnostics, KCGMH 2015-
Director, Core Laboratory for Gnotobiotic Animals, KCGMH 2020- Deputy Chairman, Research Program Review Committee, KCGMH 2021-

Educational Background:
PhD of Animal Science, National Taiwan University, Taipei

Post-doctoral Training:
Postdoctoral Fellow, KCGMH, Taiwan 1999-2001

Awards:
Sigma Xi The Scientific Research Honor Society 2023
Outstanding Innovative Research Grant, National Health Research Institute (NHRI), Taiwan 2022
World's Top 2% Scientist-Lifelong Scientific Impact listed by Stanford University 2021
World's Top 2% Scientist-Scientific Impact listed by Stanford University 2021, 2022
Top Award, Osteoarthritis Research Society International (OARSI) 2020
Award for Continual Innovative Research Programs, NHRI, Taiwan 2011, 2020
Top Award, Osteoarthritis Research Society International (OARSI) 2020
Outstanding Contribution in Reviewing for Bone 2015, 2017
Top Reviewer Award of Clinical Orthopedic Related Research 2016
Research Paper Award of Taiwan Orthopedic Research Society 2012, 2013

Organizations:
Taiwan Ambassador for European Orthopaedic Research Society 2020- Scientific Committee Member, European Orthopaedic Research Society 2020-
Scientific Committee Member, The International Combined Orthopaedic Research Societies 2021
Member, Osteoarthritis Research Society International (OARSI) 2019- Associate Editor, Clinical Orthopaedic Related Research 2016- Member, American College of Rheumatology 2014-
Council Member, Taiwan Orthopedic Research Society 2010- Editorial Board Member, Acta Pharmacologicia Sinica 2008-

Past Positions:
Deputy Director, Department of Medical Research, KCGMH

Research Interests:
Skeletal remodeling; Cartilage biology; Aging & Mitochondrial function; Mesenchymal stem cell biology; Epigenetics; Phenomics

New Insights into The Molecular Mechanisms Contributing to Osteoporosis Development

Feng-Sheng Wang, MS, PhD
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Osteoporosis develops cumulative reductions in bone mineral density, microstructures, and biomechanical strength. Aging, sex hormone loss, metabolic disorders, or disuse puts bone at risk of the skeletal disorder. Senescence, bone anabolic capacity loss, and marrow adiposis in osteogenic cells together with excessive resorption governed by over-activated osteoclasts are prominent features of osteoporotic microenvironment. A plethora of pathways, including vitamin D, parathyroid hormone, and Wnt/Wnt inhibitor sclerostin is indispensable in osteoblastic activity or shift bone- marrow mesenchymal progenitor cells away from adipocytes, keeping bone formation. Osteoclast- regulatory factors, like RANKL, inflammatory cytokines, cathepsin, and vitamin K steer macrophages into osteoclastogenic cells and control resorption capacity of osteoclasts.

Epigenetic changes in DNA methylation, histone post-translational modification or small/long/circular non-coding RNAs, which change epigenomic landscapes regulating gene transcription or protein translation are correlated with osteoporosis development. DNA methyltransferases, histone lysine methyltransferases/demethylases, histone acetylase/deacetylase or microRNAs are required to osteogenic differentiation capacity and bone mass homeostasis. Specifically, loss in microRNA-29a (miR-29a) or histone 3 lysine 27 demethylase (UTX) in osteoblasts is correlated with human osteoporosis. miR-29a knockout mice and Utx knockout mice, specifically in osteoblasts, develop signs of severe osteoporosis and fatty marrow.

Skeletal tissue is mechanosensitive; and adapts mechanical stimulation or moderate exercise by mechanoreceptors in bone cells into anabolic signaling, which promotes bone mass homeostasis and microstructure integrity. Exercise hormone FNDC5 and its cleaved fragment Irisin regulate mitochondrial energy metabolism, enhancing osteogenic activity. Decreased serum Irisin is correlated with aged human osteoporosis. Mice overexpressing Fndc5 in osteoblasts compromises estrogen deficiency-mediated loss in bone mass, trabecular microarchitecture, and mechanical strength. Gut microorganisms change host immune responses or produce metabolites, regulating bone formation and osteoclastic activity. Gut microbiota dysbiosis enhances IL-17 signaling and osteoclastic resorption. Gut microbiota transplantation from healthy donors improves estrogen deficiency-induced body adiposis and bone loss. This speech shed light onto epigenetic, mechanosensitive, and interkingdom regulatory mechanisms, which contribute to bone integrity and osteoporosis development; and highlights the perspective of treatment options for delaying osteoporotic disorders.

林建和 **Jiann-Her Lin,** MD., PhD.

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臺北醫學大學附設醫院神經外科主治醫師
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學歷：
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國立陽明大學學士

經歷：
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三軍總醫院神經外科
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研究重點與成果：
主要針對脊椎疼痛 (spinal pain) 之診斷與治療，藉由臨床研究觀察到的現象，轉譯到基礎實驗驗證並探討其機制。

1. 從臨床經驗發現痠 (sng) 與痛不一樣的證據，並與中研院陳志成老師合作提出痠覺理論。
2. 建立動物模型以探討腰椎神經根病變中，下肢深層疼痛與神經受損的重要臨床現象，其關係、機制及診斷。
3. 運用大數據及 AI 技術建立骨鬆性骨折術後二次骨折模型來修正治療指引與照護，以改善病患術後滿意度與復發率。

期刊發表：https://www.researchgate.net/profile/Jiann-Her-Lin-2

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Sng and osteoporotic fractures

Meng-Lei Su[3,4,] *Jiann-Her Lin[1,2,3,4]

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Aim of the Study:

Vertebroplasty (VP) is a prevalent treatment option for osteoporotic vertebral compression fracture (OVCF), but patients frequently report a non-painful sensation called of 'sng'(pronounced sng, 痠) in the Chinese language after vertebroplasty. Despite its commonality, this symptom is rarely assessed in isolation, leading to a potential gap in understanding its impact on the overall outcomes of VP. The purpose of this study is to investigate the prevalence and impacts of soreness or sng on outcome of vertebroplasty by introducing Visual Analogue Scale (VAS) of sng on back.

Materials and methods:

This prospective cohort study recruited patients who receive vertebroplasty for OVCF. Participants completed the patient-reported outcome measures at one week before and one year after vertebroplasty. The patient-reported outcome measures included (1) VAS for back pain and back sng (2) Oswestry Disability Index (ODI) and (3) RAND 36-item Short Form Health Survey.

Results:

A total of 172 consecutive patients were included and 92 dropped out at follow-up. Preoperatively, the prevalence of back sng was lower than back pain; postoperatively, the prevalence of sng was higher than pain and the reduction of sng on back were significantly less than pain postoperatively. Back sng were not associated with preoperative but associated with postoperative physical HRQoL. Postoperative back sng and preoperative back pain were independently associated with MCID achievement after adjustment for confounders.

Conclusion:

Soreness or sng should be assessed independently from pain in patients receiving VP for OVCF because soreness or sng had substantial clinical impacts on the outcome of VP.

Key word: Pain; Patient satisfaction; Osteoporosis; Vertebral compression fractures

Ching-Lung Cheung

Academic qualifications:

B.Sc. (2004) Applied Biology with Biotechnology, The Hong Kong Polytechnic University
Ph.D. (2008) Epidemiology, The University of Hong Kong
M.A. (2020) Buddhist Studies, University of Kelaniya, Sri Lanka

Academic appointments:

- Post-Doctoral Fellow and Research Fellow, Institute for Aging Research, Hebrew SeniorLife, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, USA (2008-2009)
- Research Associate, Dept of Computational & Mathematical biology, Genome Institute of Singapore, A*STAR, Singapore (2009-2010)
- Post-doctoral fellow, the University of Hong Kong (2010-2013)
- Research Assistant Professor, the University of Hong Kong (2013-2015)
- Assistant Professor, the University of Hong Kong (2015-2021)
- Associate Professor, Department of Pharmacology and Pharmacy, the University of Hong Kong, HKSAR (2021- Present)

Awards:

- Early Career Award, The Research Grants Council, University Grants Committee, HKSAR (2016)
- The most promising young research award, Food and Health Bureau, The Government of the Hong Kong Special Administrative Region (2021)

Service to professional organizations:

- Editorial Board, Journal of Clinical Endocrinology & Metabolism (Present)
- Associate Editor, Osteoporosis and Sarcopenia (Present)
- President, Osteoporosis Society of Hong Kong (Present)
- Elected committee member, American Society of Bone and Mineral Research ASBMR (2016-2019)

Five selected recent original articles (full list N=140): (*corresponding author)

1. Tang CTL, Sing CW, Kwok TCY, Li GHY, **Cheung CL*** (2021) Secular trends in fall-related hospitalizations in adolescents, youth and adults: a population-based study. **Lancet Regional Health - Western Pacific:**12;100183
2. Zhang X, Man KW, Li GHY, Tan KCB, Kung AWC, **Cheung CL*** (2022) Osteoporosis is A Novel Risk Factor of Infections and Sepsis: A Cohort Study. **EClinicalMedicine**;49:101488
3. Zhang X, Hsu WWQ, Sing CW, Li GHY, Tan KCB, Kung AW, Wong JSH, Wong IC, **Cheung CL*** (2022) Low Bone Mineral Density with Risk of Dementia: A Prospective Cohort Study. **J Am Med Dir** Assoc;23(10):1719.e9-e19
4. Li GHY, **Cheung CL***, Tan KC, Kung, AWC, Kwok TCY, Lau WCY, Wong JS, Hsu WWQ, Fang C, Wong ICK. (2023) Development and validation of sex-specific hip fracture prediction models using electronic health records: a retrospective, population-based cohort study. **EClinicalMedicine;58:**101876
5. Sing CW, Lin TC, Bartholomew S, J SB, Bennett C, Beyene K, Bosco-Levy P, Bradbury BD, Chan AHY, Chandran M, Cooper C, de Ridder M, Y CD, Droz-Perroteau C, Ganesan G, Hartikainen S, Ilomaki J, Jeong HE, Kiel DP, Kubota K, Chia-Cheng Lai E, Lange JL, Lewiecki EM, Lin J, Liu J, Maskell J, de Abreu MM, O'Kelly J, Ooba N, Pedersen AB, Prats-Uribe A, Prieto-Alhambra D, Qin SX, Shin JY, Sørensen HT, Tan KB, Thomas T, Tolppanen AM, Mc KV, Wang GH, Watcharathanakij S, J SW, **Cheung CL***, Wong IC. (2023) Global epidemiology of hip fractures: secular trends in incidence rate, post-fracture treatment, and all-cause mortality. **J Bone Miner Res.** (Accepted)

Bone as an endocrine organ

Ching-Lung Cheung
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Bone is important for locomotion and the major reservoir of calcium. Indeed, it is also an endocrine system affecting non-skeletal outcomes, at least partly, via the secretion of bone-secreting factors (osteokines). There are several physiological systems and functions affected by bone metabolism, including the hematopoietic system, cognitive function, and particularly energy metabolism.

The discovery of the role of osteocalcin in regulating energy metabolism in the 2000s attracted much attention to the endocrine role of the skeleton. Osteoblasts synthesize osteocalcin, which regulates energy metabolism by affecting beta-pancreatic cells and adipocytes. Since then, osteoblast-derived lipocalin 2 regulates glucose homeostasis through inducing insulin secretion. In addition, it also affects glucose tolerance, insulin sensitivity, and food intake. These animal studies demonstrate the important role of bone in regulating energy metabolism. In this seminar, the speaker will first review the evidence generated from animal studies and discuss the relevant clinical studies, including the recent study conducted in the Hong Kong Osteoporosis Study using cross-sectional, longitudinal, and Mendelian Randomization analyses.

Yoon-Sok (Martin) Chung is currently a professor of the Department of Endocrinology and Metabolism at the Ajou University School of Medicine, and Director of the Ajou Institute on Aging at the Ajou University Medical Center, Suwon, South Korea. He graduated from Yonsei University College of Medicine, and trained at the Severance Hospital in Seoul, South Korea. Dr. Chung received PhD degree in growth hormone research at the Yonsei University College of Medicine. His major research interests are basic and clinical aspects of bone and muscle diseases including osteoporosis and sarcopenia. Professor Chung had contributed to medical student education as the Director of the Office of the Medical Education in Ajou University School of Medicine (2010~2018). Among many social and academic organizations related to endocrinology in South Korea, he had been the President of the Korean Society of Osteoporosis (2015~2016) and the current President of the Korean Endocrine Society (2023~2024). Dr. Chung is currently serving as the Member of the Nominating Committee of the Endocrine Society, and the Executive Board Member of the Korea Women's Health and Osteoporosis Foundation. He has been appointed as the Editor-in-Chief of the Asian Federation of Osteoporosis Societies (AFOS) Journal (Osteoporosis and Sarcopenia) since 2015. Also, Dr. Chung has served as one of the Associate Editors of the Postgraduate Medical Journal since 2016.

Diabetes and Bone

Yoon-Sok Chung

Department of Endocrinology and Metabolism, Ajou University School of Medicine; Ajou Institute on Aging, Ajou University Medical Center, Suwon, South Korea

Diabetes Mellitus (DM) are generally known for risk factor for abnormal bone metabolism. Type 1 DM show low bone mass and high fracture rate. Type 2 DM revealed to have normal range bone mass (bone mineral density), but poor bone quality and resulting in high fracture rate.

Microarchitecture study revealed that low quality cortical bone parameters in type 2 DM and deranged trabecular bone parameters in type 1 DM. Long-term type 2 DM is associated with low bone turnover rate and high advanced glycation end (AGE) product. Trabecular bone score (TBS) in DM patient is lower than normoglycemic subject.

Fall risk is increased in DM patients probably due to diabetic complications and higher incidence of hypoglycemia. Fracture Risk Assessment Tool (FRAX) is already recognizing type 1 DM as risk factor and recently updated with type 2 DM as new risk factor (www.fraxplus.org).

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Natthinee Charatcharoenwitthaya, M.D.

Position:

- Head of Endocrinology Unit, Department of Medicine, Faculty of Medicine, Thammasat University, Thailand
- Vice president of the Thai Osteoporosis Foundation (TOPF)
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Qualifications:

- M.D.
  Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand.
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- Certificate of Postdoctoral Fellowship in Endocrinology and Metabolism
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Areas of interest:

Osteoporosis and metabolic bone diseases

Bone fragility in diabetes mellitus

Assoc. Prof. Natthinee Charatcharoenwitthaya, M.D.

Bone fragility has emerged as a common and severe complication of diabetes mellitus (DM), particularly among older individuals with multiple risk factors for falls and fractures. Diabetic osteopathy is defined as alterations in bone mineral density (BMD), bone growth, and bone remodeling processes, ultimately leading to increased bone fragility and susceptibility to fracture.

Fragility fractures in diabetic patients may occur at any skeletal site but are particularly common in the hip and the spine. Patients with type 1 DM have a higher fracture risk than those with type 2 DM, with this elevated risk emerging in childhood and persisting throughout life. Hip fracture incidences occur 10-15 years earlier than those without DM. In contrast, fracture risk appears relatively neutral in newly diagnosed type 2 DM patients but increases with prolonged diabetes duration. Several risk factors for bone fragility have been reported, including extended duration of diabetes, suboptimal glycemic control, vascular complications, an increased propensity for falls, and specific diabetic medications such as pioglitazone, sulfonylurea, and insulin.

The pathogenesis of bone fragility in DM is complex and not fully elucidated. Excessive accumulation of advanced glycation end products (AGEs) within the bone extracellular matrix disrupts enzymatic crosslinking and augments non-enzymatic crosslinks in bone collagen, resulting in diminished bone formation and propagation of microcracks. Activation of the receptor for AGEs expressed in bone cells enhances the production of inflammatory cytokines and reactive oxygen species, further compromising bone quality. Concurrently, reduced microvascular blood flow (microvascular disease) alters bone remodeling and disrupts bone microarchitecture, leading to cortical porosity and increased bone fragility. Together with an elevated risk of falling, the risk of fracture increases.

BMD assessment by DXA and FRAX scores tend to underestimate the fracture risk in both type 1 and type 2 DM. Adjusting BMD with a correction factor of -0.5 and appropriately adjusting for type 2 DM in FRAX calculations are proposed to attenuate the impact of type 2 DM on incident fractures. Post-hoc analyses of randomized controlled trials and observational studies have shown similar effects of osteoporosis drugs on BMD and fracture risk in patients with DM and without DM. Therefore, diabetic patients should receive treatment for osteoporosis in the same way as nondiabetic patients. Routine evaluation of bone health and appropriate management are essential in reducing fractures in diabetic patients.

Dr. **Chien-An Shih,** MD, PhD
Last updated: August 31, 2023

Professional Positions:

1. Assistant Professor, National Cheng Kung University
2. Attending Physician, Orthopedics, National Cheng Kung University Hospital
3. Chief Executive Officer, Disease Specific Care for Developmental Dysplasia of the Hip, National Cheng Kung University Hospital
4. Deputy Secretary-General, Taiwanese Osteoporosis Association
5. Taiwan Member, Asia Pacific Paediatric Orthopaedic Society

Education:

B.S., School of Medicine, National Cheng Kung University
Ph.D., Biomedical Engineering, National Cheng Kung University

Post-Doctoral Training:

Orthopedic Residency, National Cheng Kung University Hospital & Medical Center, 2013-2016
Fellowship, Tokushima University Hospital, Tokushima, 2018
Attending Physician, Dou-Liu branch, National Cheng Kung University Hospital, 2019-2020

Certifications:

1. Certified Osteoporosis Specialist, Taiwanese Osteoporosis Association
2. Certified Orthopedic Specialist, Taiwan Orthopaedic Association
3. Certified Pediatric Orthopedic Specialist, Taiwan Pediatric Orthopedic Society
4. Certified Pediatric Hip Ultrasound Technician, Taiwan Pediatric Orthopedic Society

Awards and Honors:

1. Certificate of Appreciation, National Earthquake Disaster Relief, 2016
2. HWBI Scholarship Awards, International Society of Biomechanics (ISB), 2017
3. Instructional Innovation Award, National Cheng Kung University Hospital, 2017 & 2022
4. Young Attending Physician Award, National Cheng Kung University Hospital, 2019
5. The Most Potential Award, Biodesign Course, National Cheng Kung University, 2020

Research Interests:

1. AI applications in pediatric and orthopedic ultrasound research
2. Osteoporosis and associated studies, particularly osteogenesis imperfecta (fragile bone disease)
3. Biomechanical research
4. Meta-analytic research, including pairwise meta-analysis and network meta-analysis
5. Big Data Analytics using NHIRD
6. Orthopedic specialties: pediatric surgery, foot and ankle surgery, and trauma surgery.

Treatment of osteoprosis in HIV patients

Chien-An Shih, MD, PhD
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This abstract delves into the intricate relationship between osteoporosis and individuals living with HIV (PLWH). With the ever-increasing efficacy of antiretroviral therapies (ART), the health landscape of HIV-positive individuals is evolving. Life expectancy in PLWH has now largely paralleled that of the HIV-uninfected population. As a result, age-related ailments, particularly osteoporosis, are on the rise among PLWH.

PLWH face a heightened risk of fractures, which typically present about a decade earlier than in the broader population. The steepest decline in bone density coincides with viral replication and the initiation of immune reconstitution during the early stages of ART. Bone Mineral Density (BMD) assessments remain paramount in estimating fracture risk, especially in postmenopausal women, men aged over 50, and HIV-positive individuals with osteoporosis risk factors. For those requiring osteoporosis treatments, bisphosphonates are the preferred choice. It is also recommended to supplement with calcium and vitamin D during the commencement of ART to mitigate bone density reduction. While certain ART regimens may help enhance BMD, they aren't as effective as bisphosphonates.

In conclusion, as the life expectancy of PLWH aligns more with the general population, age-related challenges such as osteoporosis become more pronounced. The risks of fractures for PLWH are both elevated and present earlier compared to the wider community. Recognizing and treating osteoporosis in PLWH is essential, with bisphosphonates emerging as the foremost treatment strategy.

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Shyang-Rong Shih, M.D.

Education

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Positions

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Director, Endocrine Society of R.O.C.
the Chairman of Thyroid Committee of Endocrine Society of R.O.C.
Supervisor, Taiwan Neuroendocrine Tumor Society

Associated Publications

1. Lin KY, Kuo YT, Cheng MF, Chen PL, Wang HP, Cheng TY, Chang CH, Kao HF, Yang SH, Li HY, Lin CH, Chou YT, Chung AK, Wu WC, Lu JY, Wang CY, Hsih WH, Wen CY, Yang WS, Shih SR. Traits of patients with pituitary tumors in multiple endocrine neoplasia type 1 and comparing different mutation status. The Journal of Clinical Endocrinology and Metabolism. J Clin Endocrinol Metab. 2023 Jun 30;dgad387.
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Iron Overload Associated Endocrine Dysfunction Leading to Lower Bone Mineral Density in Thalassemia Major

Shyang-Rong Shih.

Patients with thalassemia major (TM) have a higher frequency of fracture and lower bone mineral density (BMD) than the general population. Transfusion related iron overload could lead to endocrine dysfunction, such as hypogonadism, hypothyroidism and growth hormone (GH) deficiency. These endocrine dysfunctions are important pathogeneses linking TM, a higher risk of fracture and low BMD.

In addition to endocrine dysfunction, other pathogeneses have been proposed, such as malnutrition, ineffective erythropoiesis-related bone marrow expansion, and insulin deficiency. Transfusion-related iron deposition in the pancreas could also lead to insulin deficiency. Insulin is an osteogenic factor capable of stimulating osteoblast proliferation and differentiation. Good glycemic control is also important for bone health. Fibroblast growth factor 23 (FGF23) is also important in bone metabolism. It inhibits the formation of the active form of vitamin D and increase phosphaturia. FGF23 also regulates bone cell number, activity and differentiation, and the mineralization of the matrix.

We had tried to identify major mineral and hormonal factors related to low BMD in adult patients with TM. We found that hypothyroidism, higher HbA1c, and lower adrenocorticotropin were predictors of abnormal BMD in patients with β-TM. Whether the correction of these factors improves BMD warrants further research.

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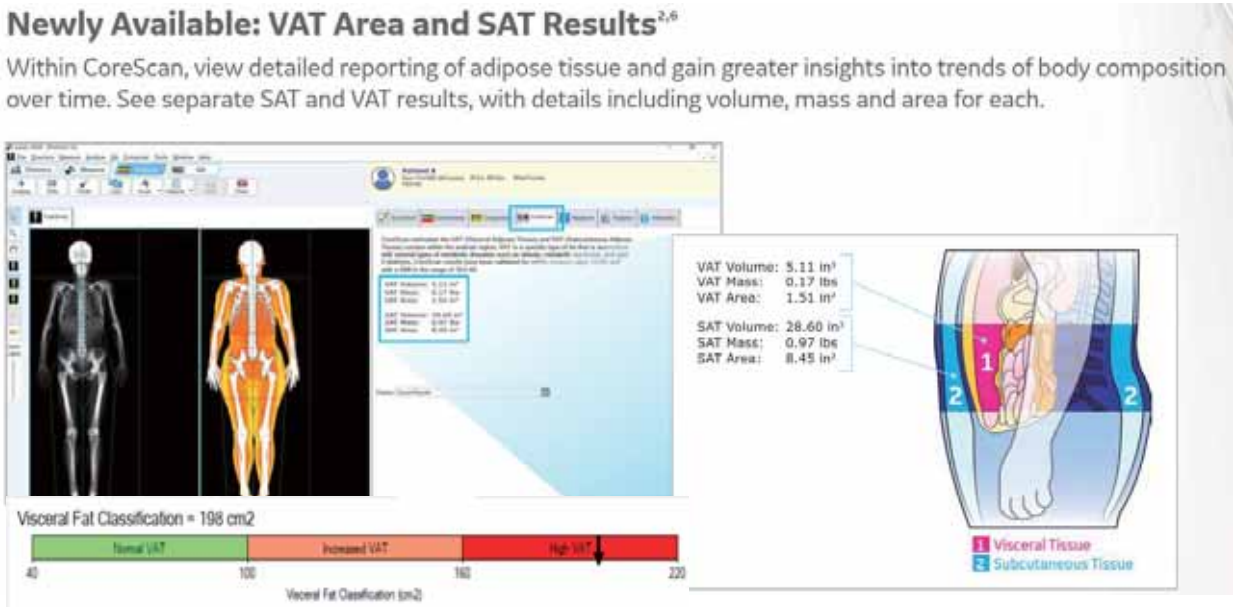

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- EWGSOP – European Working Group on Sarcopenia in older People.
- FNIH - Foundation for National Institutes of Health Sarcopenia Project.
- IWGS – International Working Group on Sarcopenia.

TBS (Trabecular Bone Score)

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VIAS-2023-0055-202306
製作日期：2023/08/02

監測骨質疏鬆治療新觀點–
羅氏骨代謝指標有效改善患者管理

血清 *CTx* 被 *IOF-IFCC* (國際骨鬆基金會) 骨標記物標準工作組選擇作為骨吸收的標記物[1]

血清 *P1NP* 被 *IOF-IFCC* (國際骨鬆基金會) 骨標記物標準工作組選擇作為骨質形成的標記物[1]

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1. Vasikaran et al., Osteoporos Int 2011, 22:391–420

MC-TW-00226

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[禁忌] 低血鈣-在開始使用Reosteo® 作治療前，應先有效地治療低血鈣，及其他骨障礙症和礦物質代謝。已知對本產品中任一成分會過敏。無法站立或坐直30分鐘以上。

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References：瑞骨卓® 150毫克膜衣錠仿單 ; International Journal of Women's Health 2009:1, 7 ; Osteoporos Int (2012) 23:696-699

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我們在生殖醫學、心臟疾病、皮膚病、過敏和氣喘等一系列領域擁有60多種藥物和其他產品的强大基礎。我們將這些重要的療法帶到世界各地，足跡遍布全球，爲140多個市場提供服務。

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藥效持續
每日一錠[2]

腸胃道
耐受性佳[3]

References: 1.ARCOXIA ® Prescribing Information. Organon Taiwan, Oct, 2021. 2 Malmstrom K et al.A randomized, double-blind, parallel-group study comparing the analgesic effect of etoricoxib to placebo, naproxen sodium, and acetaminophen with codeine using the dental impaction pain model. *Clin J Pain*. 2004;20(3):147-155. 3.Combe Bet al. Cardiovascular safety and gastrointestinal tolerability of etoricoxib vs diclofenac in a randomized controlled clinical trial (The MEDAL study). *Rheumatology(Oxford)*. 2009;48(4)425-432

Selective Safety Information (SSI). Short Version (Chinese). ARCOXIA tablet 30,60, 90, 120 mg 萬克適 .
Based on MK0663-TWN-2021- RCN000019617. Last Update: Aug. 2023

TW-CXB-110011 心血管栓塞事件
1.NSAIDs 藥品會增加發生嚴重心血管栓塞事件之風險，包括心肌梗塞和中風，且可能為致命的。此風險可能發生在使用該類藥品的初期，且使用藥品的時間越長，風險越大。
2. 進行冠狀動脈繞道手術 (Coronary artery bypass graft, CABG) 之後 14 天內禁用本藥。

適應症：骨關節炎 (OA) 與類風濕性關節炎 (RA) 之表徵與症狀的急慢性治療、治療急性痛風性關節炎、治療原發性經痛、治療僵直性脊椎炎、治療牙科手術後疼痛、治療婦科手術後疼痛。應依據個別病人的整體危險性評估結果，來決定是否給予 COX-2 選擇性抑制劑類藥物。

劑量與用法：ARCOXIA 為口服用藥。ARCOXIA 可與食物併服，亦可不與食物併服。ARCOXIA 的治療療程應儘可能縮短並使用最低的有效日劑量。
骨關節炎：建議劑量為每日一次 30 毫克或 60 毫克。
類風湿性關節炎、僵直性脊椎炎：建議劑量為每日一次 60 毫克或 90 毫克。最低有效每日劑量為 60 毫克。
急性痛風性關節炎、原發性經痛：建議劑量為每日一次 120 毫克。ARCOXIA 120 毫克應僅用於急性症狀期，治療時間不可超過八天。
牙科手術後疼痛：建議劑量為每日一次 90 毫克，最高劑量不得超過每日一次 90 毫克，最多可使用 3 天。
婦科手術後疼痛：建議劑量為每日一次 90 毫克，起始劑量應於手術前先給藥。最高劑量不得超過每日一次 120 毫克。最多可使用 5 天。較各適應症之建議劑量更高的劑量不是未能顯現額外的療效，就是尚未經過研究。因此，各適應症之每日最高劑量建議如下：骨關節炎每日最高劑量不超過 60 毫克。類風濕性關節炎每日最高劑量不超過 90 毫克。僵直性脊椎炎每日最高劑量不超過 90 毫克。急性痛風每日最高劑量不超過 120 毫克。原發性經痛每日最高劑量不超過 120 毫克。牙科手術後急性疼痛的每日最高劑量不超過 90 毫克。婦科手術後急性疼痛的每日最高劑量不超過 120 毫克。因為隨著 COX-2 選擇性抑制劑使用劑量增加與時間增長，可能會增加心血管的危險性，應儘可能以最短時間與最低有效每日劑量治療。對於病人在解除症狀與治療效果的需求，應予以定期評估。
高齡、性別、種族：ARCOXIA 的劑量並不須因高齡，或依據性別或種族來進行任何調整。
肝功能不全：對輕度肝功能不全的病人 (Child-Pugh 分數為 5-6) 不可使用超過每日一次 60 毫克的劑量。對中度肝功能不全的病人 (Child-Pugh 分數為 7-9) 應降低劑量；不可使用超過每隔一日 60 毫克的劑量。對嚴重肝功能不全的病人 (Child-Pugh 分數 >9)，目前並無任何臨床或藥物動力學方面的相關資料 (見注意事項)。
腎功能不全：對後期腎病人者 (肌酸肝廓清率<30 mL/min) 並不建議使用 ARCOXIA 治療。對腎功能不全程度較輕的病人 (肌酸肝廓清率 30 mL/min) 無須調整其劑量 (見注意事項)。

安全性資訊摘要
禁忌症：ARCOXIA 禁用的患者：對本品之任何成分過敏。充血性心衰竭 (NYHA II-IV)。已知患有缺血性心臟疾病、週邊動脈疾病和 / 或腦血管疾病 (包括最近做過冠狀動脈繞道手術或血管修復手術)。進行冠狀動脈繞道手術 (Coronary artery bypass graft, CABG) 之後 14 天內禁用本藥。血壓持續高於 140/90 mmHg 且無法有效控制之高血壓病人。

注意事項：臨床試驗顯示，與安慰劑及某些 NSAIDs(naproxen) 比較，COX-2 選擇性抑制劑類藥物可能與增加栓塞事件 (尤其是心肌梗塞和中風) 的危險性有關。因為 COX-2 選擇性抑制劑的使用劑量與時間可能會增加心血管的危險性，應儘可能以最短時間與最低有效每日劑量治療。對於病人在解除症狀與治療效果的需求應予以定期評估。對於有明顯的心血管事件危險因子 (例如：高血壓、高血脂症、糖尿病、吸煙) 的病人，在使用 ARCOXIA 治療時應該經過謹慎評估。由於 COX-2 選擇性抑制劑對血小板並不具有作用，因此不可以此類藥物取代阿斯匹靈用於預防心血管疾病。由於 etoricoxib(此類藥物的一種) 並不會抑制血小板凝集作用，因此不可停止抗血小板療法。Etoricoxib、其他 COX-2 選擇性抑制劑和 NSAIDs 與 acetylsalicylic acid(即使是低劑量) 併用時，會更增加胃腸副作用的危險 (胃腸的潰瘍或其他胃腸的併發症)。目前尚未有長期臨床試驗充分的評估比較 COX-2 選擇性抑制劑 +acetylsalicylic acid 與 NSAIDs+acetylsalicylic acid 對胃腸安全性差異。對後期腎病人者，並不建議使用 ARCOXIA 治療。目前對肌酸肝廓清率<30 mL/min 之病人的臨床經驗極為有限 ,如果這類病人一定要使用 ARCOXIA 治療時 建議應嚴密監視病人的腎功能。長期投予 NSAIDs 曾經造成腎乳突壞死及其它腎臟傷害。腎臟前列腺素對維持腎臟灌流量可能扮演著一種代償作用的角色。因此，在腎臟灌流量減低的情況下，投予 ARCOXIA 可能會導致前列腺素生成量降低，繼而導致腎血流 (renal blood flow) 降低，並因而造成腎功能損害。最可能發生這種反應的病人包括腎功能原先就明顯受損的病人、代償不良性心臟衰竭病人、以及肝硬化病人。對這類病人應考慮進行腎功能的監視。對有明顯脫水現象的病人，當要開始以 ARCOXIA 治療時，應多加小心。在開始以 ARCOXIA 治療之前 建議應先補充病人的水份。和其他已知會抑制前列腺素合成的藥物一樣 有些使用 ARCOXIA 的病人曾出現體液滯留 水腫和高血壓的現象。對先前曾有水腫現象、高血壓、或心臟衰竭的病人，在使用 ARCOXIA 時，應考慮發生體液滯留、水腫或高血壓的可能性。所有 NSAIDs (包括 etoricoxib，被認為與新發生或再復發的充血性心衰竭有關聯 (見副作用)。特別是在高劑量時 服用 etoricoxib 可能比其他 NSAIDs 和 COX-2 選擇性抑制劑使用者 較常發生高血壓也較嚴重。因此，使用 etoricoxib 治療期間，應特別注意監控血壓。如果血壓顯著升高，應該考慮其他治療方法。

懷孕：和其他已知會抑制前列腺素合成的藥物一樣，在懷孕後期應避免使用 ARCOXIA，因為可能會導致動脈導管過早閉鎖。目前並無任何適當且控制良好的孕婦研究。只有在潛在效益確定超越對胎兒的潛在危險時，才可於懷孕的最初六個月期間使用 ARCOXIA。

授乳母親：Etoricoxib 會分泌進入授乳大鼠的乳汁中，目前尚不確知本藥是否會分泌進入人類的乳汁。由於許多藥物都會分泌進入人類乳汁，而且餵哺母乳的嬰兒可能會因本藥抑制前列腺素合成而產生副作用，因此，應謹慎考慮本藥對母親的重要性，並據以決定要停止餵哺母乳或是停用本藥。

小兒之使用：對小兒病患之安全性及有效性尚未確立。

老年人之使用：在老年人 (65 歲以上) 體內的藥物動力學情形和年輕人類似。臨床研究顯示，在老年患者中的不良經驗發生率要比年輕患者高；但在 etoricoxib 組與對照組間的相對差異方面，在老年人與年輕人大致相當。不可排除某些老年人對藥物作用較為敏感的可能性。

藥物交互作用
Warfarin：在長期穩定使用 warfarin 治療的受試者中，每日投予 120 毫克的 ARCOXIA 會使凝血酶原時間的國際標準化比值 (International Normalized Ratio; INR) 升高約 13%。對接受 warfarin 或類似藥物治療的患者，當開始使用 ARCOXIA 治療或改變 ARCOXIA 的治療方式時，應進行標準的 INR 值監視程序，特別是在最初幾天。
Rifampin：ARCOXIA 和 rifampin 合併投予會使 etoricoxib 的血中濃度下面積 (AUC) 降低 65%。因此，將 ARCOXIA 和 rifampin 合併投予時，應考慮此項交互作用。
Methotrexate：有兩項研究曾探討過對接受每週一次 7.5 至 20 毫克之 methotrexate 治療的類風濕性關節炎病人連續 7 天投予每日 60、90 或 120 毫克之 ARCOXIA 的影響。結果 60 與 90 毫克的 ARCOXIA 對 methotrexate 的血中濃度 (依據 AUC 的估算結果) 或腎臟廓清率並無任何影響。在其中一項研究中，120 毫克的 ARCOXIA 對 methotrexate 的血中濃度 (依據 AUC 的估算結果) 或腎臟廓清率並無任何影響。在另一項研究中 ,120 毫克的 ARCOXIA 使 methotrexate 的血中濃度 (依據 AUC 的估算結果) 升高 28%，並使 methotrexate 的腎臟廓清率降低 13%。將劑量高於每日 90 毫克的 ARCOXIA 和 methotrexate 同時投予時，應考慮監視與 methotrexate 相關的毒性反應。
利尿劑、血管
利尿劑、血管收縮素轉化酶 (ACE) 抑制劑及血管收縮素 II 接受體拮抗劑 (AIIAs)：報告顯示，NSAIDs 包括 COX-2 選擇性抑制劑可能會降低利尿劑、ACE 抑制劑和 AIIAs 的抗高血壓作用。對同時使用 ARCOXIA 與這些藥物的病人，應考慮此項交互作用。
對於腎功能受損 (例如：老年病人或低容血症 (volume-depleted) 病人包括接受利尿劑治療的病人) 正在使用非類固醇抗發炎藥物包括 COX-2 選擇性抑制劑的病人，併用 ACE 抑制劑或 AIIAs 治療的腎功能嚴重病人，可能導致腎功能更趨惡化，包括可能急性腎衰竭。但這些影響通常是可逆的。因此，併用時應小心，尤其是老年人。
鋰劑：報告顯示，非選擇性的 NSAIDs 與 COX-2 選擇性抑制劑可能會升高鋰劑的血中濃度。對同時使用 ARCOXIA 和鋰劑的病人，應考慮此項交互作用。
阿斯匹靈：ARCOXIA 可與用於預防心血管疾病的低劑量阿斯匹靈併用。在穩定狀態下，每日一次 120 毫克的 etoricoxib 並不會對低劑量阿斯匹靈 (每日一次 81 毫克) 的抗血小板活性造成任何影響。不過 和單獨使用 ARCOXIA 相比較 將 ARCOXIA 和低劑量的阿斯匹靈合併投予會升高胃腸道潰瘍或其他併發症的發生率 (見注意事項)。
口服避孕藥：連續 21 天，同時併服 60 毫克的 ARCOXIA 和含有 35 微克之 ethinyl estradiol (EE) 與 0.5 至 1 毫克之 norethindrone 的口服避孕藥，會使 EE 的穩定狀態下 AUC0-24hr 升高 37%；連續 21 天，將 120 毫克的 ARCOXIA 和相同的口服避孕藥同時投予，或間隔 12 小時分別投予，會使 EE 的穩定狀態下 AUC0-24hr 升高 50 至 60%；當要選擇一種適當的口服避孕藥和 ARCOXIA 併用時，應考慮這種 EE 濃度升高的現象。增加 EE 使用量會增加服用口服避孕藥的副作用 (例如：婦女的靜脈血栓性栓塞的危險)。
賀爾蒙補充療法：連續 28 天，投予 120 毫克的 ARCOXIA 和含有結合型雌激素 (0.625 mg PREMARINTM) 的賀爾蒙補充劑，會使 unconjugated estrone、equilin 和 17-β-estradiol 的平均穩定狀態下 AUC0-24hr 分別升高 41%、76% 和 22%。長期使用 ARCOXIA 的慢性治療建議劑量 30 毫克、60 毫克和 90 毫克的作用尚未被研究。ARCOXIA 120 毫克對於 PREMARINTM 的 estrogenic 成分的穩定狀態下 AUC0-24hr 的影響比 PREMARINTM 單獨服用且劑量從 0.625 增加到 1.25 毫克的 estrogenic 成分的穩定狀態下 AUC0-24hr 的影響還小一半。這些體內濃度升高的臨床意義不明，且尚未研究較高劑量的 PREMARINTM 併用 ARCOXIA 的影響。對於使用 ARCOXIA 在選擇停經後賀爾蒙治療時，應考慮 estrogenic 濃度升高的現象。
其他：在藥物交互作用研究中，ARCOXIA 對 prednisone/prednisolone 或 digoxin 的藥物動力學並無具臨床重要性的影響。
制酸劑與 ketoconazole(一種強力的 CYP3A4 抑制劑) 對 ARCOXIA 的藥物動力學並無具臨床重要性的影響。

副作用：下列藥物相關不良反應曾見於針對 OA、RA 或慢性下背痛病患治療達 12 週之臨床研究的報告中。在以 ARCOXIA 治療之病患所發生的不良反應中，發生率之 1% 且高於安慰劑者包括：虛弱無力 / 疲倦、眩暈、下肢水腫、高血壓、消化不良、胃灼熱、噁心、頭痛、ALT 升高、AST 升高。

其他仿單內容，處方前，請詳閱藥品仿單及說明書。

萬克適® 錠
ARCOXIA® (etoricoxib)

ORGANON

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北衛藥廣字號112090074號

FOSAMAX PLUS®

FOSAMAX PLUS® Alendronate70 mg / Colecalciferol 5600 IU

福善美保骨錠，一周一錠，補充骨質關鍵[1]

臨床使用經驗豐富

給藥易調整耐受性佳

口服使用方便性高

同時補充維生素 D 減少額外花費與服用頻率

FOSAMAX PLUS® Tablets 福善美保骨錠 ®

適應症
停經婦女骨質疏鬆症之治療。治療男性骨質疏鬆症，以增加骨密度。

用法用量
建議劑量為每週一次，每次一錠 70 毫克 /5600 國際單位錠劑。
FOSAMAX PLUS 必須於當天食用第一份食物、飲料或其他藥物至少半小時之前以一杯白開水一起併服。其他飲料 (包括礦泉水)、食物及一些藥物可能會降低 alendronate 之吸收。
為了促使藥錠抵達胃部進而減少對食道部位刺激的可能性，FOSAMAX PLUS 必須只能在早晨起床後以一整杯的白開水併服，而且病人在服藥後至少維持上半身直立 30 分鐘，並一直到吃過當天第一份食物之後才可躺下。
FOSAMAX PLUS 不可在睡前或未起床前服用。若沒有依照這些指示服用的話，將可能增加食道部位不良反應的危險性。
對於每星期服用一錠 FOSAMAX PLUS 的病人，應教導他們如果忘記服藥時，應該在他們想起來後的早晨服用一粒錠劑。在同一天內不可服用二粒錠劑，而且必須根據原先排定的日期，回復到每星期一次一錠的用法。
如果來自飲食的鈣質攝取量不足時，病人應補充足夠之鈣質及 / 或維生素 D。
對於年老者或患有輕度至中度腎臟功能不全的病人 (creatinine 排除率 35-60 mL/min) 不須調整劑量。
FOSAMAX PLUS 不建議使用於較嚴重腎功能不全之病人 (creatinine 排除率 < 35 mL/min)，因尚缺乏這類病人之使用經驗。
使用雙磷酸鹽類治療的所有病人，基於療效及潛在風險的考量，應定期重新評估繼續治療的需要，特別是使用 Fosamax Plus 五年以上的病人。

安全性資訊摘要
禁忌症
- 會延遲食道排空的食道不正常現象，如食道狹窄或弛緩不能。
- 無法站立或坐直至少 30 分鐘者。
- 對本產品中任何成分過敏者。
- 低血鈣症。

警告
Alendronate Sodium
如同其他含 bisphosphonates 的製劑一樣，FOSAMAX PLUS 可能會造成上消化道黏膜的局部刺激。
服用 alendronate 的病人曾發生如食道炎、食道潰瘍及食道黏膜糜爛，極少伴隨食道狹窄或穿孔之食道方面的不良反應。
若病人服用 FOSAMAX PLUS 後躺下，或沒有伴服一整杯的白開水，或食道刺激的情況發生後仍繼續服用 FOSAMAX PLUS，則產生嚴重食道方面不良反應的危險性會較大。因為 alendronate 有可能刺激上消化道黏膜及可能惡化潛在的消化道疾病，所以對於患有上消化道問題，如吞嚥困難、食道疾病 (包括已知的巴瑞特氏食道症)、胃炎、十二指腸炎或潰瘍的病人，使用 FOSAMAX PLUS 時須特別注意。
病人不可咀嚼或吸吮錠劑，因為有可能會引起口咽部位的潰瘍。
須特別告知病人不可在睡前或起床前先服用 FOSAMAX PLUS，且須告知病人若不遵守指示服藥，可能會增加發生消化道問題的危險性。
須告知病人若產生食道方面的症狀時 (如吞嚥困難或疼痛、後胸疼痛或新發生的心口灼熱，或心口灼熱惡化)，則須停止使用 FOSAMAX PLUS 並洽詢醫師。

牙科
已有病人服用 bisphosphonates 包含 FOSAMAX 發生顎骨壞死 (ONJ) 之報告。已知發生顎骨壞死的危險因子，包括侵入性牙科手術 (例如：拔牙、植牙、骨骼手術)、癌症、伴隨的治療 (如化學療法、放射治療、皮質類固醇治療、血管生成抑制劑治療)、不良的口腔衛生習慣、以及同時發生的疾病 (如牙周病和 / 或其他先前有口腔疾病病史、貧血、凝血病變、感染及假牙裝配不當) 及抽菸。顎骨壞死之風險會隨著用藥時間增加而提高。
對於需要進行侵入性牙科手術的病人，停用雙磷酸鹽類藥物治療可能可以降低顎骨壞死之風險。應由主治醫師及 / 或口腔外科醫師依臨床診斷主導對病人的處置計畫 (management plan)，包括每個病人的個別的效益 / 風險評估。
使用雙磷酸鹽類藥物治療時發生顎骨壞死的病人應接受口腔外科醫生的治療照護。在這些病人中，過度的牙科手術可能會使症狀更加惡化。應以個別的效益 / 風險評估結果為基礎來判斷停止使用雙磷酸鹽類藥物治療。

骨骼、關節及肌肉
服用 bisphosphonates 的病人曾發生骨骼、關節及 / 或肌肉疼痛，於上市後經驗中得知，這些症狀極少被判定為嚴重及 / 或失能，發生這些症狀的時間從開始治療後一天至數個月都有，大多數的病人都於停藥後症狀緩解，有些病人再次服用同一藥品或其他 bisphosphonates 製劑時症狀復發。
少數長期 (通常在三年以上) 以 bisphosphonates 治療的病人曾發生股骨轉子下及近端股骨幹的低能量骨折。部份是發生於無明顯創傷的壓力性骨折 (其中部分為骨質不良性骨折)。有些病人在發生完全骨折之前數週到數月，在其受影響的部位有前驅性的疼痛症狀，通常與壓力性骨折的造影特徵有相關。
使用雙磷酸鹽類藥品曾有非典型股骨骨折案例報告。病人使用此類藥品後，若感覺大腿或鼠蹊部疼痛，醫師應評估是否為壓力性股骨骨折。對於懷疑有壓力性骨折的病人應該加以評估，包括已知的原因和風險因素評估 (例如，維生素 D 缺乏、吸收不良、糖皮質激素的使用、先前的壓力性骨折、下肢關節炎或骨折、激烈的或增強的運動、糖尿病、長期酗酒)，且接受適當的骨科治療。在評估期間根據個別利益 / 風險評估，有壓力性骨折的病人應考慮中斷 bisphosphonate 治療。
服用 FOSAMAX PLUS 前須先治療其低血鈣症。若病人有其他疾病影響礦物質代謝 (如維生素 D 缺乏) 亦須給予有效地治療。

懷孕和授乳
懷孕｜FOSAMAX PLUS 尚未對懷孕婦女進行研究，故不應給予服用。
哺乳｜FOSAMAX PLUS 尚未對授乳婦女進行研究，故不應給予服用。

交互作用
Alendronate Sodium｜
- 鈣補充劑、制酸劑、以及某些口服藥物可能會干擾 alendronate 的吸收。因此，病人服用 FOSAMAX PLUS 之後，應等候至少半小時再使用其它的口服藥物。
- 非類固醇抗發炎藥 (NSAIDs)：使用 NSAID 會伴隨發生胃腸道刺激作用，因此，和 FOSAMAX PLUS 合併使用時應謹慎。
- 含鈣和其它多價陽離子的產品可能會干擾 alendronate 的吸收。

Colecalciferol｜
Olestra、礦物油、orlistat 和膽酸結合劑 (如 cholestyramine、colestipol) 可能會減弱維生素 D 的吸收作用。抗癲癇藥物、cimetidine 與 thiazides 類藥物可能會增進維生素 D 的分解作用。

特殊族群
兒童｜在兒童和成人所觀察到 alendronate 的口服生體可用率相當，然而，不建議將 FOSAMAX PLUS 使用於兒童。
性別｜在生體可用率及靜脈注射一劑 alendronate 後經尿液排出的劑量比率方面，男性和女性的表現大致相當。
老年人｜Alendronate 在老年人體內的生體可用率與移行概況 (尿液排泄) 和較年輕的病人大致相當。因此並不須調整 alendronate 的劑量。
腎功能不全｜對輕至中度腎功能不全 (肌酸酐廓清率為 35 至 60 mL/min) 的病人，並不須調整劑量。FOSAMAX PLUS 並不建議用於腎功能不全狀況較為嚴重 (肌酸酐廓清率 <35 mL/min) 的病人，因為目前仍缺乏對腎衰竭病人使用 alendronate 的經驗。
腎功能不全的病人形成活性 1,25-dihydroxyvitamin D3 代謝物的能力會降低。
肝功能不全｜由於有證據顯示，alendronate 在體內並不會代謝或經由膽汁排泄，因此並未曾針對肝功能不全的病人進行過任何研究。不須調整劑量。有吸收不良問題的病人可能會因膽汁生成不足而無法充分吸收維生素 D3。
種族｜目前尚未曾研究過種族所造成的藥物動力學差異。

副作用
臨床研究
在這些研究中，被研究人員認定為可能、很可能或確定和藥物有關，且在 FOSAMAX 治療組或安慰劑組中之發生率 1% 的不良經驗：腹痛 (福善美 6.6% 相較於安慰劑 4.8%)、消化不良 (3.6%, 3.5%)、食道潰瘍 (1.5%, 0%)、吞嚥困難 (1.0 %, 0%)、和腹脹 (1.0%, 0.8%)、肌肉骨骼 (骨骼、肌肉或關節) 疼痛 (4.1%, 2.5%)、便秘 (3.1%, 1.8%)、腹瀉 (3.1%, 1.8%)、脹氣 (2.6 %, 0.5%)、和頭痛 (2.6%, 1.5%)。
每週一次 FOSAMAX 70 毫克的整體安全性及耐受性概況和每日 FOSAMAX 10 毫克大致相當。

其他仿單內容，處方前請詳閱藥品仿單說明書。

ORGANON

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北市衛藥廣字第 111070273 號

1. FOSAMAX PLUS® Prescribing Information. Organon Taiwan, May 2015.

安怡 Anlene

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