Osteogenesis Imperfecta
Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

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Osteogenesis Imperfecta Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

Date / Venue May 21st - 22nd, 2011
Shangri-La's Far Eastern Plaza Hotel, Taipei

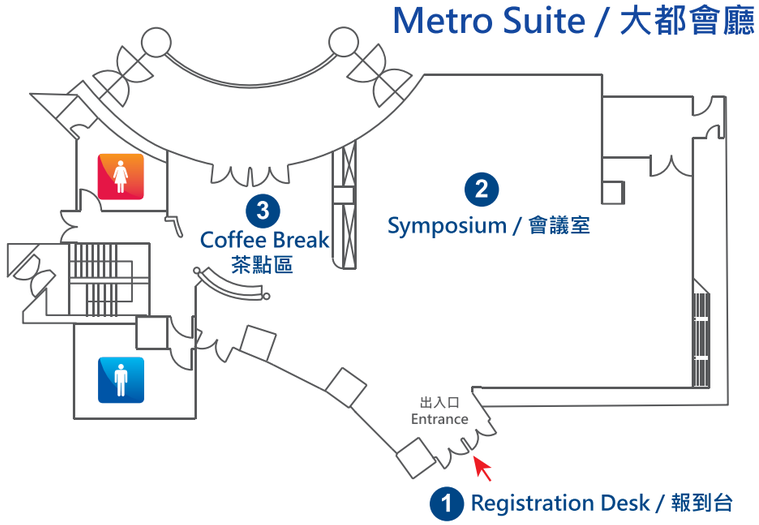
時間 / 地點 2011年5月21日-5月22日
香格里拉台北遠東國際飯店

Program Book

Organizer / 主辦單位	Taiwan Osteogenesis Imperfecta (OI) Association 社團法人先天性成骨不全症關懷協會
Co-organizer / 協辦單位	Taiwan Foundation for Rare Disorders 財團法人罕見疾病基金會 Friends of Youth Corps Association, Taipei 台北市救國團之友聯誼會
Support / 補助單位	Ministry of the Interior 中華民國內政部 Ministry of Foreign Affairs, R. O. C. (Taiwan) 中華民國外交部 Bureau of Health Promotion, Department of Health, R. O. C. (Taiwan) 行政院衛生署國民健康局
Sponsor / 贊助單位	Advance Mercantile Company Limited 一大亨貿易股份有限公司

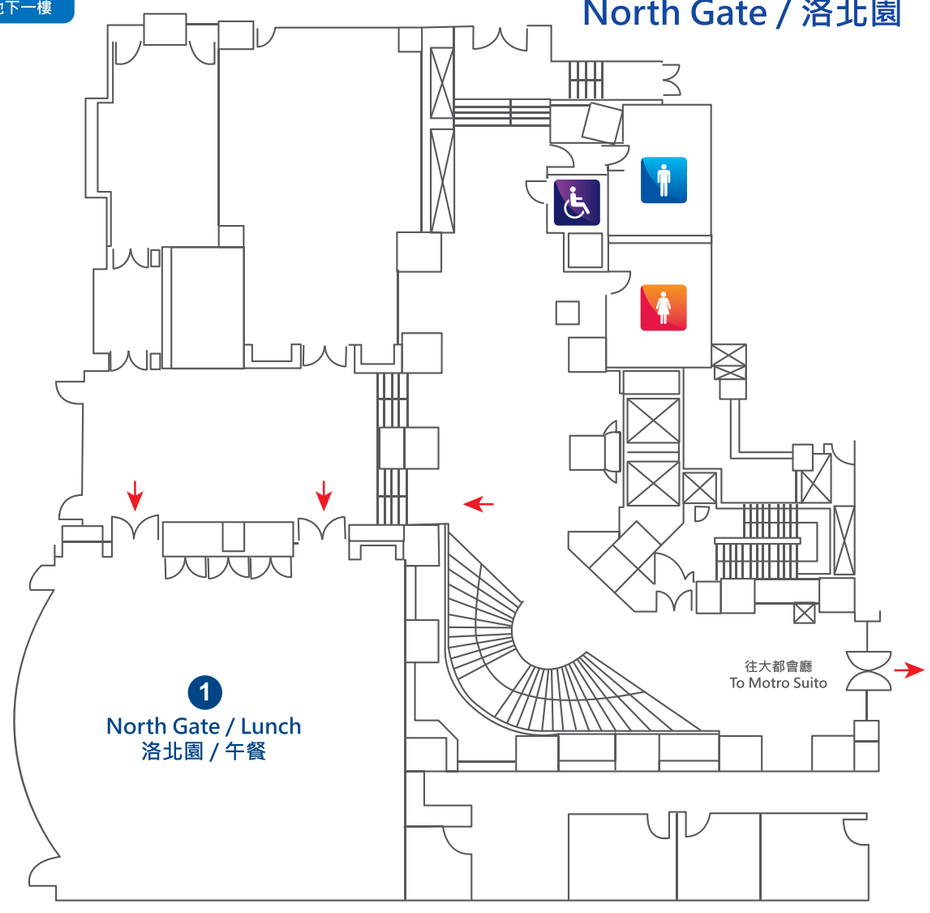
Level B1 地下一樓

Metro Suite / 大都會廳



Level B1 地下一樓

North Gate / 洛北園



2011 Osteogenesis Imperfecta (OI) Symposium -- US and Taiwan
2011 臺美先天性成骨不全症醫療交流會議
Program at-a-glance
B1 Level, Metro Suite, Far Eastern Plaza Hotel, Taipei / 台北遠東國際大飯店B1大都會廳

Moderator 主持人	2011/05/21 Saturday 星期六		2011/05/22 Sunday 星期日		Moderator 主持人	Date / 日期
	Kuan-Ju Chen / 陳冠如 Deputy Executive Director, Taiwan Foundation for Rare Disorders, Taiwan 罕見疾病基金會 / 副執行長		Ken N Kuo / 郭耿南 Professor of Orthopedic Surgery, Rush Univ., Chicago, USA Professor, Dept. of Orthopedics surgeon, Nat'l Taiwan Univ. Hospital, Taiwan 美國芝加哥洛許大學醫學中心 / 教授 台大醫院骨外科 / 教授、兼任主治醫生			
Time / 時間	Session / 講題	Speaker / 講員	Session / 講題	Speaker / 講員	Time / 時間	
08:00 -- 08:30					08:00 -- 08:30	
08:30 -- 09:00					08:30 -- 09:00	
09:00 -- 09:10 (10 min / 分)	Opening Remarks 引言及歡迎	Dr. James G Gamble 詹姆斯·甘柏 醫師	OI Medical Meeting: Introduction 專業醫療會議:介紹		09:00 -- 09:15 (15 min / 分)	
09:10 -- 09:50 (40 min / 分)	OI means Opportunity Ignited 成骨不全即是機會的點燃	Professor, Dept. of Orthopaedics Surgery, School of Medicine, Stanford Univ., USA Lucile Packard Children's Hospital, Stanford, Palo Alto, USA 史丹佛大學醫學中心 羅帕卡德兒童醫院(美國加州)骨科	Osteogenesis Imperfecta: An Orthopaedic Perspective 先天性成骨不全症： 骨科觀點	Dr. James G Gamble 詹姆斯·甘柏 醫師 Professor, Dept. of Orthopaedics Surgery, School of Medicine, Stanford Univ., USA Lucile Packard Children's Hospital, Stanford, Palo Alto, USA 史丹佛大學醫學中心 羅帕卡德兒童醫院(美國加州)骨科	09:15 -- 09:45 (30 min / 分)	
09:50 -- 10:00 (10 min / 分)	Discussions / 討論		Discussions / 討論		09:45 -- 09:55 (10 min / 分)	
10:00 -- 10:40 (40 min / 分)	Osteogenesis Imperfecta: Current Research and Treatment OI研究近況與治療	Dr. Jay R. Shapiro 傑伊·傑匹羅 醫師 OI Program Director, Kennedy Krieger Inst., Johns Hopkins, USA Professor, Dept. of Physical Medicine and Rehabilitation, Johns Hopkins Univ., USA 甘迺迪克瑞格研究機構、約翰霍普金斯大學 / 骨科與成骨不全症部門主任	Wellness Concerns for the OI Child and Adult 兒童與成人OI的保健及照護	Dr. Jay R. Shapiro 傑伊·傑匹羅 醫師 OI Program Director, Kennedy Krieger Inst., Johns Hopkins, USA Professor, Dept. of Physical Medicine and Rehabilitation, Johns Hopkins Univ., USA 甘迺迪克瑞格研究機構、約翰霍普金斯大學 / 骨科與成骨不全症部門主任	09:55 -- 10:25 (30 min / 分)	
10:40 -- 10:50 (10 min / 分)	Discussions / 討論		Discussions / 討論		10:25 -- 10:35 (10 min / 分)	
10:50 -- 11:00 (10 min / 分)	Coffee Break / 茶敘		Coffee Break / 茶敘		10:35 -- 10:45 (10 min / 分)	
11:00 -- 11:20 (20 min / 分)	The Osteogenesis Imperfecta (OI) Registry 成骨不全症資料登錄	Dr. Caden Feng-Shu Brennen 張鳳書 女士 OI Registry Manager, Bone and Osteogenesis Imperfecta Dept., Kennedy Krieger Inst., Johns Hopkins, USA 甘迺迪克瑞格研究機構 / 成骨不全症登錄管理者	Clinical and Genetic Overview of Osteogenesis Imperfecta (OI) – Taiwan Experience 成骨不全症（OI）之臨床及遺傳學觀—台灣經驗	Dr. Shuan-Pei Lin 林炫沛 醫師 Dept. of Pediatrics, Mackay Memorial Hospital, Taiwan 馬偕紀念醫院小兒遺傳科 / 資深主治醫師 一般兒科主任醫學研究部生化遺傳組 / 組長	10:45 -- 11:00 (15 min / 分)	
11:20 -- 11:30 (10 min / 分)	Discussions / 討論		Discussions / 討論		11:00 -- 11:10 (10 min / 分)	
11:30 -- 11:55 (25 min / 分)	Impact of Rare Disease Prevention and Orphan Drug Act for OI 罕見疾病防治及藥物法對OI的重要與影響	Ms. Kuan-Ju Chen 陳冠如 女士 Deputy Executive Director, TFRD, Taiwan 罕見疾病基金會 / 副執行長	OI Scoliosis Treatments – Taiwan Experience 先天性成骨不全症的脊椎側彎治療 - 台灣經驗	Dr. Kuan-Wen Wu 吳冠汶 醫師 Dept. of Orthopedics surgery, Nat'l Taiwan Univ. Hospital, Taiwan 台大醫院雲林分院骨科部 / 主治醫師	11:10 -- 11:25 (15 min / 分)	
11:55 -- 12:20 (25 min / 分)	Taiwan OI Association Overview 先天性成骨不全症關懷協會 背景及現況	Mr. Jian Chi Chen 程健智 先生 Former Secretary General, TOIA, Taiwan 社團法人先天性成骨不全症關懷協會 / 前秘書長	Discussions / 討論		11:25 -- 11:35 (10 min / 分)	
12:20 -- 12:35 (15 min / 分)	Panel Q & A 綜合問與答時間		Panel Discussions US and Taiwan OI Medical Collaboration Opportunities 綜合討論 台美醫療合作機會		11:35 -- 12:20 (45 min / 分)	
12:35 -- 14:00 (85 min / 分)	Lunch & Members Talent Show B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei 午餐、會員才藝表演 台北遠東國際大飯店B1洛北園		Closing Remarks B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei 閉幕與感謝 台北遠東國際大飯店B1洛北園		12:20 -- 12:35 (15 min / 分)	
14:00 -- 14:10 (10 min / 分)	Scholarship Awards 獎學金頒獎		Lunch B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei 午餐 台北遠東國際大飯店B1洛北園		12:35 -- 14:00 (85 min / 分)	
14:10 -- 15:40 (90 min / 分)	Medical Consultations 醫療諮詢				14:00 -- 14:10	
15:40 -- 16:00 (20 min / 分)	Coffee Break / 茶敘				14:10 -- 15:40	
16:00 -- 16:30 (30 min / 分)	Members Annual Meeting 會員大會				15:40 -- 16:00	
16:30-- 18:30					16:00 -- 16:30	
18:30 -- 20:00 (90 min / 分)	Banquet 6F, Shang Place, Far Eastern Plaza Hotel, Taipei (Private Invitation) 晚宴 台北遠東國際大飯店6F香宮 (僅限邀請入場)				16:30-- 18:30	
					18:30 -- 20:00	

Registration & Reception

Osteogenesis Imperfecta
Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

Symposium Program

May 21st - 22nd, 2011

Taipei, Taiwan

社團法人先天性成骨不全症關懷協會
Taiwan Osteogenesis Imperfecta (OI) Association

總統賀電

華總二榮電：100040432 號

先天性成骨不全症關懷協會蔡理事長淑慧、各位貴賓暨全體與會人士公鑒：

欣悉訂於本（100）年 5 月 21 日舉辦「臺美先天性成骨不全症醫療交流會議」，特電致賀；謹向遠道而來貴賓表達誠摯歡迎之意。至盼藉由此項盛會，結合社會珍貴資源，建構醫療諮詢平台，推展預防篩檢宣導，提供就學就業輔助，共同為營造高度人文關懷之優質國度貢獻心力。敬祝活動圓滿成功，諸位健康愉快。

馬　英　九

中　華　民　國　100　年　5　月　2　日

目錄 Contents

Osteogenesis Imperfecta Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

Osteogenesis Imperfecta
Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

Preliminaries
前言

May 21st - 22nd, 2011
Taipei, Taiwan

Welcome Message / 歡迎詞

Dear Participants at OIS 2011,
It is a great honor and privilege to be standing before you today and host the 2011 Osteogenesis Imperfecta Symposium - US and Taiwan in Taipei, Taiwan!

As we all know, Taiwan OI Association strives for the best welfare for OI patients since its establishment in 1999. In the past few years, it has focused on public education in raising public awareness for the brittle bone disorder, to achieve for better medical treatment and to ensure a friendly and safe environment. However, physician population ratio, medical accessibility, and medical consensus within medical professionals in Taiwan are continuing challenges for OI.

Through this symposium, 9 lectures, 1group medical consultation and 2 panel discussions, we look forward to seeking the best way of medical treatment, reducing frequency in nailing replacement surgery, improving success rate of surgery and having chances for medical collaborations via all the experts' sharing and exchange of their advanced knowledge as well as precious experience. We earnestly want to learn more effective way of OI medical treatments and care from the US.

In addition, we hope to raise public awareness of OI and reach doctors consensus on medical treatment, eventually to involve more medical specialties for further studies and researches. I am sure that the feedback and beneficial results of this symposium will ultimately achieve the goal of improving OI medical care quality.

Finally, taking this wonderful opportunity, I encourage our members continually to show the passion of life with a grateful heart and grow from being served to serve and contribute to the society.
Sincerely yours,

S. H. Tsai
Chair, Osteogenesis Imperfecta (OI) Symposium - US and Taiwan
President, Taiwan Osteogenesis Imperfecta Association

各位學者先進您好：

很榮幸於今、明兩天，在台北遠東國際飯店舉行2011　年「臺美先天性成骨不全症醫療交流會議」 (Osteogenesis Imperfecta (OI) Symposium - US and Taiwan)。

協會成立11年來，一直秉持著為病友謀取最大的福利，近幾年來更著重於對大眾的宣導，從認識我們進而接納我們，期盼共創一個友善的環境。然而，在服務病友上也發現了一些問題，特別是在OI的治療上，協會就力不從心，因為病友分布全省、專業醫師不足、病友就醫不便、治療方式不一等，都是要克服的難題。

有鑑於美國對OI的治療頗有成效，OI家長也想了解美國對此相關的醫學知識及治療經驗，這次，很感謝陳常務理事佳玉小姐大力的邀請到美國治療OI的相關專業醫生、人員，他們對OI病患的治療都有豐富的經驗及專業研究，非常歡迎他們願意遠道而來跟本國病友、家長與醫生做交流。期望這次醫學交流能讓兩國醫生有合作的機會，尋求最佳的治療方式，提高手術成功率，使病友免於頻繁的骨釘置換手術；此外更希望能引起大眾對先天性成骨不全症的重視，進而使台灣醫生達成共識，能有更多的專業醫生願意加入研究，這才是病友之福。

此次會議議程涵蓋9個分別對於OI治療與照護專題演講、1個小組醫療諮詢、2個綜合討論時段供協會的會員、病友、家屬及醫生們學習與經驗交流，藉以推動並提升台灣地區OI治療與護理的水平與品質。

最後，更期許病友們將生命的熱愛，以感恩的心，由被服務成為貢獻社會，盡一己之力的一群。

您們的參與就是我們的榮幸，謹代表所有的病友誠摯的歡迎您，並感謝您。

蔡淑慧
臺美先天性成骨不全症醫療交流會議 大會主席
社團法人先天性成骨不全症關懷協會 理事長

S. H. Tsai / 蔡淑慧

Education
Bachelor of Arts, Chinese Literature
Taiwan Soochow University

Experience
President, Taiwan Osteogenesis Imperfecta Association (TOIA), 2009-present
OI School Educator, Taiwan Osteogenesis Imperfecta Association
TOIA Choir Song leader
School and Police Volunteer

Awards
2008 Taipei County Best Mother Award
2010 Mercy Love Award

學歷
東吳大學中文系

經歷
先天性成骨不全症關懷協會 理事長
先天性成骨不全症關懷協會 宣導講師
玻璃娃娃天使合唱 團長
新北市學校、警察志工

優良事蹟
榮獲97年度台北縣模範母親
榮獲99年度大愛獎

Welcome Message / 歡迎詞

As a member of the Taiwan OI Association (TOIA), it's my great honor to extend the warmest welcome to all participants in this Osteogenesis Imperfecta (OI) Symposium -- US and Taiwan, May 21 to 22, 2011, in Taipei, Taiwan. I'd like to deliever a heartfelt appreciation to you for being part of this international effort to care for people with OI. Also, it is a great opportunity and privilege for TOIA co-organizing with Taiwan Foundation for Rare Disorders (TFRD), and getting support from the Advance Mercantile Company Limited to have distinguished guests from the US.

For more than eleven years, TOIA has been aimed to improve quality of life in OI by assisting members in receiving medical information, support networks, and fulfilling the needs in terms of education, employment and independence. As a representative for OI in Taiwan, TOIA has strived to build public awareness through school and media education, and generate additional support among individuals, communities, and medical professionals in recent years.
However, we have particularly encountered challenges in having advanced and proper surgical rodding in OI treatments. Being a type III mild OI and experienced fractures and loosening of nailing after surgery then had an opportunity for the rodding surgeries in the US at the age of ten, I can not stress enough the importance and need to have skilled surgical interventions with advanced biomaterials in OI patients for rehabilitation, bone strengthening , and overall health achievement in later life. This initiates the idea of our first international medical meeting.

On the first day, the symposium will focus on OI health education for families and members to better understand OI medical treatment and care, and to meet with US medical doctors for medical consultations in small groups in the afternoon. On the second day, the medical meeting provides an excellent opportunity for different specialties including orthopedists, geneticists, endocrinologists, and rehabilitation specialists between Taiwan and the US to share their medical knowledge and experience in OI, especially in implanting rods and treatment with medications. In the end, we hope for possible medical collaborations with the US.

It is a great honor for OIS 2011 to have distinguished eminent experts from the US and the local to give inspiring speeches and share their experience. I believe it will be a marvelous chance to grade up not only the horizen but also the professional toward the field of the OI for all our colleagues and friends.

I wish to thank all of you for your presence and engagement to make this event successful and valuable to all OI members of TOIA.
With warmest regards,

Rosalind Chia-Yu Chen,
Managing Director, Taiwan Osteogenesis Imperfecta Association

身為本協會的一員，有幸在此並誠摯地感謝各位蒞臨參與「臺美先天性成骨不全症醫療交流會議」(Osteogenesis Imperfecta Symposium - US and Taiwan)，關心先天性成骨不全症(OI)治療與照護等議題。並感謝協辦單位「財團法人罕見疾病基金會」、「台北市救國團之友聯誼會」及各贊助單位的支持。

協會自1999年12月成立以來，承蒙各界對先天性成骨不全症(OI)病友的照顧，秉持致力於提供病友醫療資訊及相互扶持的力量，近年來進而鼓勵病友超越身體限制，協助就學、發展才能及就業，培養病友自立，來回饋社會的關心及支持。有鑑於病友骨質脆弱時常骨折，國內目前無廠商提供適合病友的骨釘，常需經歷多次骨釘換置手術，讓原本不易累積骨質的情況益加挑戰，因本身為OI第3型患者，幼年骨折無數次，亦曾經歷術後骨釘脫落，之後有幸赴美手術，體會永久性並適合病友的骨釘及技術對日後復健、增強骨骼、與整體健康及活動上影響深遠，為此協會舉辦這場臺美交流會議。

會議首日著重病友及家屬與美國OI專家進行醫療資訊及保健教育與諮詢，第二天議程透過國內外專科醫師分享其豐富專業的手術技術與治療經驗，包括OI藥物之療效，期能對成骨不全症的醫療方式及照護有更深及正確的認識，所邀請之相關專科醫師包括骨科、小兒科、遺傳科、復健科以及內分泌等。除此之外，亦盼未來能有機會透過與美國醫療技術的合作，可以為病友帶來更好的醫療及生活品質。

最後再次感謝這次遠道而來的美國著名醫師及講者，以及各位的撥冗參與及支持，您的參與對臺灣OI病友意義重大，更是我們的榮幸。

陳佳玉
社團法人先天性成骨不全症關懷協會 常務理事

Rosalind Chia-Yu Chen / 陳佳玉

Education

MHA, Master of Health Administration, 1998-2000
School of Policy, Planning and Development, University Of Southern California, CA
Graduate Certificate in Administration of Long Term Care
Bachelor of Arts, Economics, 1993-1997
San Francisco State University, CA
Dean's Honor List, College of Behavior and Social Science

Current Position / Professional Experience

Managing Director, Taiwan Osteogenesis Imperfecta Association, 2007-present
Research Assistant, Dr. Mark L Wahlqvist Research Office, Division of Preventive Medicine and Health Services Research, Institute of Population Health Sciences, National Health Research Institutes, Taiwan, 2006-Present

- International conference organization, research data analysis and paper publications
- Project "Healthy Ageing Policy: A health initiate in Taiwan"
- Project "Study of Public's Health Literacy in Taiwan"
- Project "Development and Promotion of Evidence-based Medicine and Clinical practice Guidelines"

Financial Analyst/Reimbursement Specialist, CareNet Health System, Costa Mesa, CA, 2002-2005

- Home health reimbursement and case management
- Contracting and growth planning analysis

Marketing Assistant, China Pearl Import Inc, San Marino, CA, 2001-2002

- Inventory control/Month end closings and account reconciliation
- Direct and indirect merchandise cost analysis/Department store marketing submissions

Administrative Residency, San Gabriel Valley Medical Center, CA, 1999-2000
Certificate in Service Excellence Leadership Training

Managed care contracting/ System transition from UniHealth to Catholic Healthcare West

- Projects in educational, operational and service line strategic planning in hospital settings

Publication

- YH Chang, RCY Chen, ML Wahlqvist, MS Lee. Frequent shopping by men and women increase survival in the older Taiwanese population. J Epidemiol Community Health, April 2011 (press release).
- ML Wahlqvist, MS Lee, J Lau, KN Kuo, CJ Huang, WH Pan, HY Chang, R Chen, YC Huang. The opportunities and challenges of evidence-based nutrition (EBN) in the Asia Pacific region: clinical practice and policy-setting. Asia Pac J Clin Nutr. 2008;17(1):2-7.
- RCY Chen, YH Chang, MS Lee, ML Wahlqvist. Dietary diversity may enhance survival related to cognitive impairment in Taiwanese elderly. (Under review)
  MS Lee, RCY Chen, ML Wahlqvist, YC Huang. Physical Function Mitigates the Adverse Effects of Chronic Energy Deficiency and Sarcopenia on Mortality in Free-living Older Taiwanese. (Under review)
- YH Chang, RCY Chen, MS Lee, ML Wahlqvist. The healthcare costs of the Metabolic Syndrome in elderly Taiwanese Men occur later and greater than in Women. (Manuscript preparation)

● 教育背景

美國南加州大學，醫療管理碩士，1998-2000年
長期照護管理證書 2000年
美國舊金山州立大學，經濟學學士，1993-1997年

● 現職及經歷

社團法人先天性成骨不全症關懷協會，常務理事，2007年-迄今
國家衛生研究院, 群體健康科學研究所醫藥保健組，馬克。華偉士教授研究室研究助理，2006年-迄今

-國際會議籌辦及經濟統計研究分析與期刊文章發表
-實證醫學研究計畫
-臺灣健康識能研究計畫
-臺灣健康老化研究計畫

美國CareNet Health System家居醫療公司，財務分析師/收支專員，2002- 2005年

-收支控制與成長分析/專案企劃與督導執行
-各部門溝通合作與管理/擴建醫療體系與推動
-總裁顧問與各項財務報告與分析

美國China Pearl Import公司，業務經理特別助理，2001- 2002年

-產品成本與利潤分析策劃/貨存規劃與管理/應用MAS90會計軟體
-支援業務部門執行產品異業結盟行銷活動/產品文宣圖片目錄資料製作

美國加州聖蓋博醫院，實習生，1999- 2000年

-協助溝通與策劃本院與分院之市場醫療服務創新與品質提升
-協助醫院合約之完成與評估/各部門之管理與溝通合作
-協助醫院目標管理/經營管理相關專案/病友及訪客建言處理

● 文章發表

YH Chang, RCY Chen, ML Wahlqvist, MS Lee. Frequent shopping by men and women increase survival in the older Taiwanese population. J Epidemiol Community Health, April 2011流行病學與社區健康期刊 (press release).
ML Wahlqvist, MS Lee, J Lau, KN Kuo, CJ Huang, WH Pan, HY Chang, R Chen, YC Huang. The opportunities and challenges of evidence-based nutrition (EBN) in the Asia Pacific region: clinical practice and policy-setting. Asia Pac J Clin Nutr. 2008;17(1):2-7. 亞太臨床營養期刊
RCY Chen, YH Chang, MS Lee, ML Wahlqvist. Dietary diversity may enhance survival related to cognitive impairment in Taiwanese elderly. (Under review)
MS Lee, RCY Chen, ML Wahlqvist, YC Huang. Physical Function Mitigates the Adverse Effects of Chronic Energy Deficiency and Sarcopenia on Mortality in Free-living Older Taiwanese. (Under review)
YH Chang, RCY Chen, MS Lee, ML Wahlqvist. The healthcare costs of the Metabolic Syndrome in elderly Taiwanese Men occur later and greater than in Women. (Manuscript preparation)

Symposium Committees / 大會委員

● Organizing Committee / 籌備委員

Chair	/ 主席	S. H. Tsai	/ 蔡淑慧
Vice Chair	/ 副主席	Jinming Kuo	/ 郭進銘
Treasure	/ 財務長	Cheng-Sung Chen	/ 陳振盛
Secretariat	/ 秘書	Apple Lin	/ 林榆芬

● Committee / 學術委員 (In Alphabetical Order of the Last Name)

Chair	/ 主席	S. H. Tsai	/ 蔡淑慧
		Chao-Chyun Chang	/ 張超群
		Jiahao Chen	/ 陳家傲
		Rosalind Chen	/ 陳佳玉
		Huang-Ching Cheng	/ 鄭煌清
		Jinming Guo	/ 郭進銘
		Joanne Lee	/ 李美緣
		Chun -Chieh Lin	/ 林君潔
		Yu-Chih Lin	/ 林煜智
		Jianmin Wang	/ 王建民
		Xiuwen Xiao	/ 蕭琇文
		Shuhua Yang	/ 楊淑華

Acknowledgements / 致謝

The Organizing Committee would like to extend its great gratitude to the following sponsors who generously contribute and support to the success of the 2011 Osteogenesis Imperfecta (OI) Symposium - US and Taiwan.

感謝以下單位及廠商惠予支持，鼎力相助「2011臺美先天性成骨不全症醫療交流會議」。

● Cooperating Organization / 協辦單位

Taiwan Foundation for Rare Disorders
財團法人罕見疾病基金會

Friends of Youth Corps Association, Taipei
台北市救國團之友聯誼會

Ministry of the Interior
中華民國內政部

Ministry of Foreign Affairs, R. O. C. (Taiwan)
中華民國外交部

Bureau of Health Promotion, Department of Health, R. O. C. (Taiwan)
行政院衛生署國民健康局

● Sponsor / 贊助單位

Advance Mercantile Company Limited
一大亨貿易股份有限公司

Osteogenesis Imperfecta Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

General
一般會議資訊

May 21st - 22nd, 2011

Taipei, Taiwan

General Information for OIS 2011 / 會議相關資訊

● Date / 日期

21 - 22, May, 2011 (Sat. - Sun.)
2011年5月21至22日 (星期六至日)

● Organizer / 主辦單位

Taiwan Osteogenesis Imperfecta (OI) Association
社團法人先天性成骨不全症關懷協會

● Co-organizer / 協辦單位

Taiwan Foundation for Rare Disorders
財團法人罕見疾病基金會

● Symposium Venue / 會議地點

B1 Level, Metro Suite, Shangri-La's Far Eastern Plaza Hotel, Taipei
香格里拉台北遠東國際大飯店B1大都會廳

Address: 201 Tun Hwa S. Road, Sec. 2, Taipei 106, Taiwan, R. O. C.
106台灣台北市敦化南路二段201號

● Official Language / 大會語言

English is official language for Osteogenesis Imperfecta (OI) Symposium. Interpretation Service will be offered via receivers.
本次大會共同使用語言為英文，現場提供口譯服務。

● Registration / 註冊報到

Registration Desk / 報到台
B1 Level, Metro Suite, Shangri-La's Far Eastern Plaza Hotel, Taipei
香格里拉台北遠東國際大飯店B1大都會廳

Service Hour / 服務時間

	Date / 日期		Time / 時間
2011/05/21	Saturday	星期六	08:30 - 16:00
2011/05/22	Sunday	星期日	08:30 - 11:10

● Badges / 識別證

Participant is required to wear **Name Badge** all the time for recognition when attending each symposium programs.
為控管會議品質的進行與進出人員，所有與會者者皆須配戴大會識別證，以便識別與服務。

Chair	主持人	Access to all the 2011 OIS - US and Taiwan programs. 可參與大會所有議程活動。
Invited Speaker	大會邀請講員	
Attendee	OI病友	
Delegate	一般與會者	
Accompany Person	與會眷屬	
Staff	工作人員	Please reach the staff if any assistance needed. 若會議當日需協助，可洽詢工作人員。

Social Programs / 會議活動

● Opening Remarks / 引言及歡迎

Date / 日期 2011/05/21 Saturday 星期六
Time / 時間 09:00 - 09:10
Venue / 地點 B1 Level, Metro Suite, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店B1大都會廳

● Medical Consultations / 醫療諮詢

Date / 日期 2011/05/21 Saturday 星期六
Time / 時間 14:10 - 15:40
Venue / 地點 B1 Level, Metro Suite, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店B1大都會廳

● Banquet / 會議晚宴

Date / 日期 2011/05/21 Saturday 星期六
Time / 時間 18:30 - 20:00
Venue / 地點 6 F, Shang Place, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店6F香宮

● Closing Remarks / 閉幕與感謝

Date / 日期 2011/05/22 Sunday 星期日
Time / 時間 12:20 - 12:35
Venue / 地點 B1 Level, North Gate, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店B1洛北園

● Symposium Lunch / 午餐

Time / 時間 12:35 - 14:00
Venue / 地點 B1 Level, North Gate, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店B1洛北園

● Children's Care/ 孩童照顧

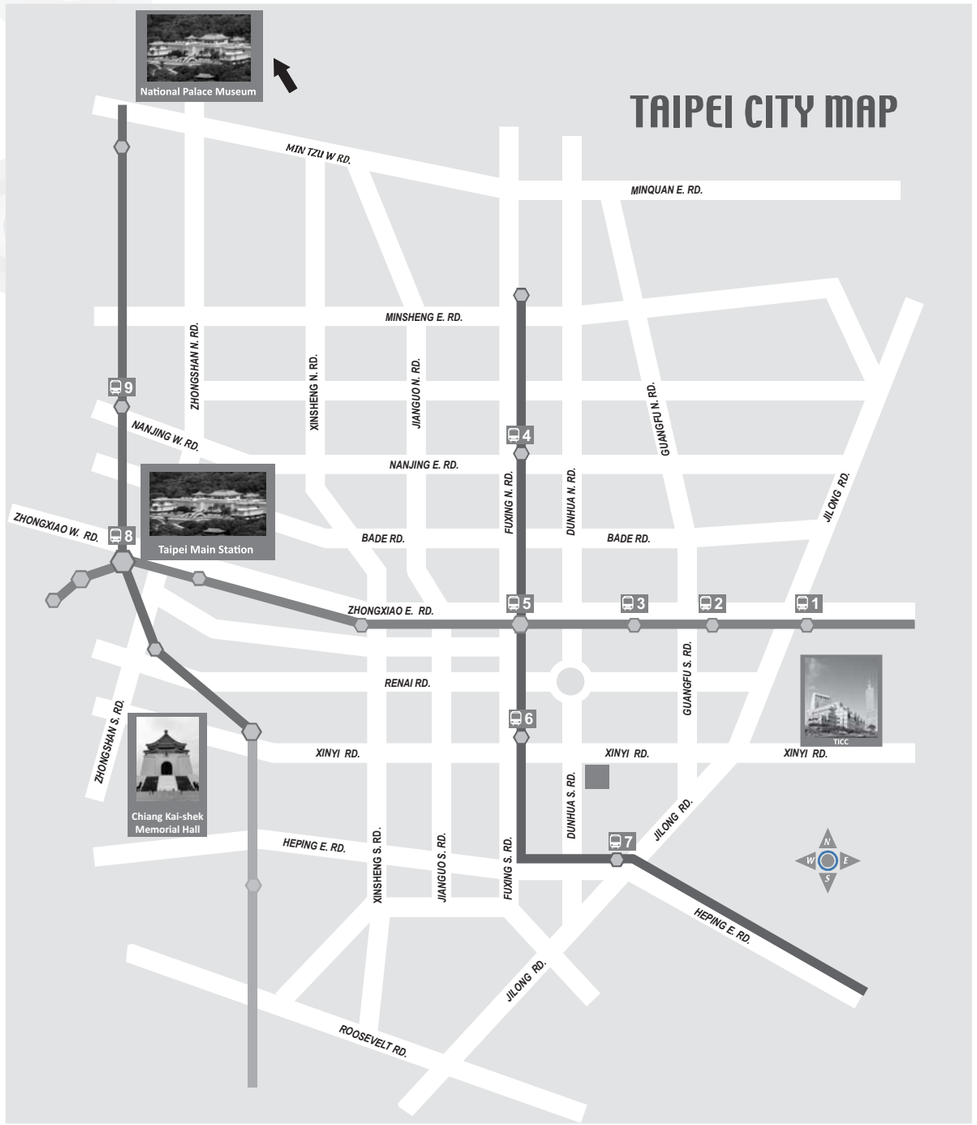
In order to make each TOIA member much easy to join the symposium and have further realize the OI, 2011 OIS - US and Taiwan Organizing Committee provides child half-day care and education program for children on May 21, 2011. In the afternoon, parents could attend the Medical Consultations with children.

為了使協會每一位會員皆能專心參與大會議程及更了解OI的醫療與照護，大會於2011年5月21日當天議程上午另安排志工於洛北園看顧孩童病友，並安排活動課程等。當日下午醫療諮詢時間，屆時再攜孩童一同參與諮詢。

Time / 時間 08:30 - 12:35
Venue / 地點 B1 Level, North Gate, Shangri-La's Far Eastern Plaza Hotel
香格里拉台北遠東國際大飯店B1洛北園

Travel Information / 旅遊資訊

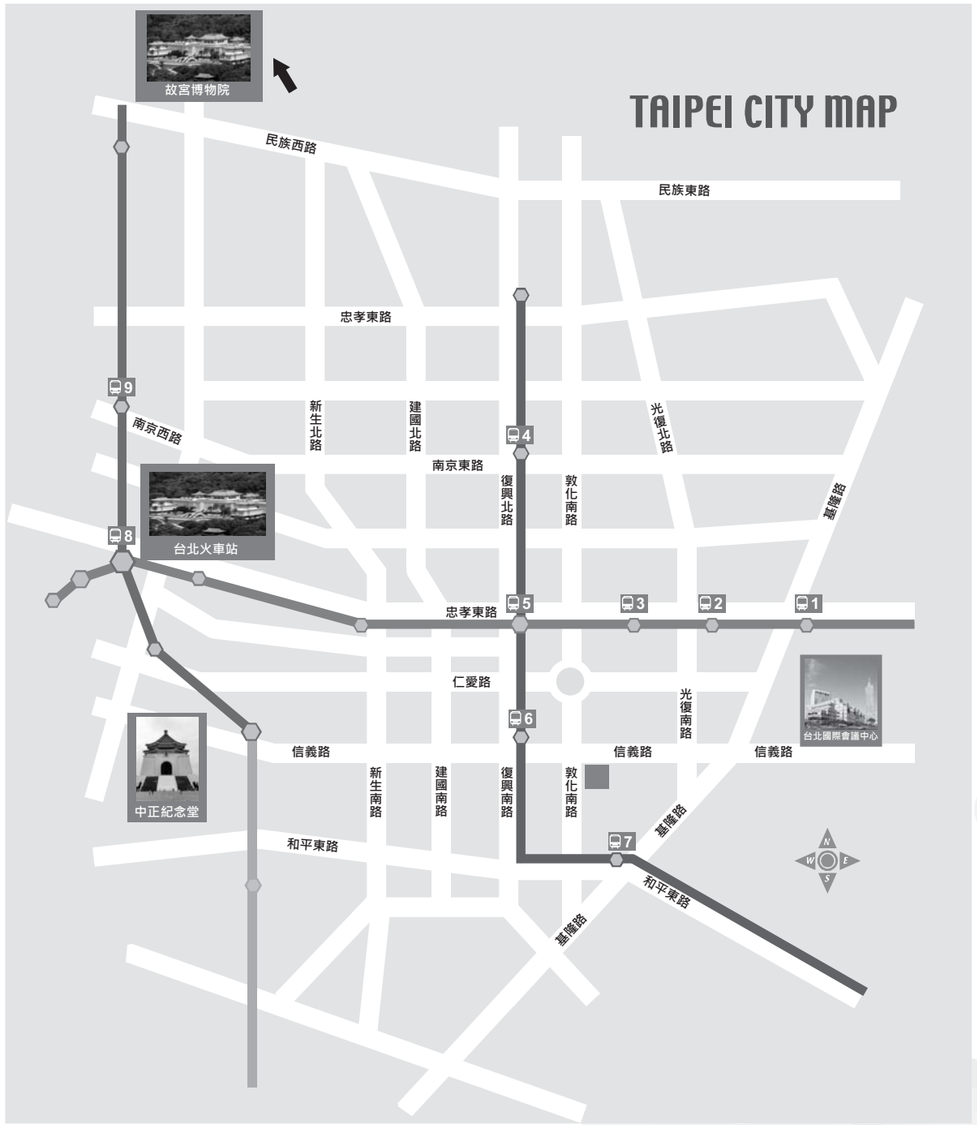
● Map for the Symposium Venue & Taipei City Map/ 會場地圖 & 台北市地圖



■ OIS 2011 - US and Taiwan
Shangri-La's Far Eastern Plaza Hotel

MRT STATION

1 Taipei City Hall Station
2 Sun Yat-Sen Memorial Hall Station
3 Zhongxiao Dunhua Station
4 Nanjing E. Rd. Station
5 Zhongxiao Fuxing Station
6 Daan Station
7 Liuzhangli
8 Taipei Main Station
9 Zhongshan Station



■ OIS 2011 - US and Taiwan
臺美先天性成骨不全症醫療交流會議會場
香格里拉台北遠東國際大飯店 (由安和路口進)

MRT STATION

1 市政府
2 國父紀念館
3 忠孝敦化
4 南京東路
5 忠孝復興
6 大安
7 六張犁
8 台北車站
9 中山

Information on Taiwan / 臺灣旅遊資訊

● Climate

May is the warm season in Taiwan with average temperature around 20~24°C

● Currency and Banks

The Country's currency is the New Taiwan dollar (NT$). The exchange rate in recent months is around NT$30~31 for US$1. Foreign currencies can be exchanged at hotels, airports and government-designated banks. Major credit cards are widely accepted, and traveler's checks may be accepted by tourist-oriented shops and at most international tourist hotels and banks. Banks open whole day from 09:00 to 15:30, Mon-Fri and closed at weekend and public holidays.

● Electricity & Water

Taiwan uses electric current of 110 volts at 60 cycles, appliances from Europe, Australia or South-East Asia will need an adapter or transformer. Drinking water served at hotels and restaurants is distilled or boiled. Tap water is suggested to be boiled before drinking.

● Time Zone

Taiwan is 8 hours ahead of Greenwich Mean Time (GMT).

● Transportation

Taipei is geographically compact with plentiful taxis, buses and Mass Rapid Transit (MRT). The Conference Venue, TICC, is easily accessed within central Taipei with a short ride by taxi or MRT (to Taipei City Hall). Detailed MRT information is available at the Taipei Rapid Transit Corporation website: www.trtc.com.tw

● Languages

Mandarin is the official language in Taiwan, though other dialects are also spoken. Many people can speak English for communication; however, most taxi drivers do not.

● Useful Numbers

Taoyuan Int'l Airport	Tel: + 886-3-398-2050
Tourism Bureau	Tel: + 886-2-2717-3737
Foreign Affairs Division	Tel: + 886-2-2348-2999

● 氣候

台灣十月底的氣候十分怡人，非常適合觀光旅遊。平均溫度在攝式18-22度。

● 電壓

台灣使用的電壓為110 V，60 Hz。

● 貨幣

台灣使用新台幣〈NT$〉為通用貨幣。近期匯率約為32-33台幣兌換1美元。在飯店、機場及特定的銀行皆可兌換。大部份的信用卡在台灣都可以使用，部份以遊客為主的商店、飯店及銀行亦可收受旅行支票。銀行營業時間為週一至週五上午九點至下午三點半，週末及國定假日不營業。

● 捷運系統

密集的班車搭配接駁公車系統，形成了都會便捷交通路網，帶給民眾前所未有之便利性。遊客也因而得以輕鬆休閒的方式飽覽捷運沿線許多風光明媚的景色。捷運站內設有投幣式自動售票機，提供售票服務(各站皆備有換幣機)。「單程票」票價依各站距離遠近由NT$20至NT$65不等(票價查詢)。而由服務台出售之「一日票」，票價NT$200，在有效期間內可不限次數及時間搭乘捷運各線（不含貓空纜車），每次搭乘限一人使用。想要在一日內悠遊捷運沿線景點的旅客可多加利用。

台北捷運公司網站: www.trtc.com.tw

Osteogenesis Imperfecta
Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

Symposium Information
會議資訊

May 21st - 22nd, 2011
Taipei, Taiwan

Program at-a-glance / 會議議程

2011 Osteogenesis Imperfecta (OI) Symposium -- US and Taiwan
Program at-a-glance
B1 Level, Metro Suite, Far Eastern Plaza Hotel, Taiepi

Saturday, May 21			Sunday, May 22		
Moderator	Kuan-Ju Chen Deputy Executive Director, Taiwan Foundation for Rare Disorders, Taiwan		Ken N Kuo Professor of Orthopedic Surgery, Rush Univ., Chicago, USA Professor, Dept. of Orthopedics surgeon, Nat'l Taiwan Univ. Hospital, Taiwan		Moderator
Time	Session	Speaker	Session	Speaker	Time
08:00 -- 08:30					08:00 -- 08:30
08:30 -- 09:00					08:30 -- 09:00
09:00 -- 09:10 (10 min)	Opening Remarks		OI Medical Meeting: Introduction		09:00 -- 09:15 (15 min)
09:10 -- 09:50 (40 min)	OI means Opportunity Ignited	Dr. James G Gamble Professor, Dept. of Orthopaedics Surgery, School of Medicine, Stanford Univ., USA Lucile Packard Children's Hospital, Stanford, Palo Alto, USA	Osteogenesis Imperfecta: An Orthopaedic Perspective	Dr. James G Gamble Professor, Dept. of Orthopaedics Surgery, School of Medicine, Stanford Univ., USA Lucile Packard Children's Hospital, Stanford, Palo Alto, USA	09:15 -- 09:45 (30 min)
09:50 -- 10:00 (10 min)	Discussions		Discussions		09:45 -- 09:55 (10 min)
10:00 -- 10:40 (40 min)	Osteogenesis Imperfecta: Current Research and Treatment	Dr. Jay R. Shapiro OI Program Director, Kennedy Krieger Inst., Johns Hopkins, USA Professor, Dept. of Physical Medicine and Rehabilitation, Johns Hopkins Univ., USA	Wellness Concerns for the OI Child and Adult	Dr. Jay R. Shapiro OI Program Director, Kennedy Krieger Inst., Johns Hopkins, USA Professor, Dept. of Physical Medicine and Rehabilitation, Johns Hopkins Univ., USA	09:55 -- 10:25 (30 min)
10:40 -- 10:50 (10 min)	Discussions		Discussions		10:25 -- 10:35 (10 min)
10:50 -- 11:00 (10 min)	Coffee Break		Coffee Break		10:35 -- 10:45 (10 min)
11:00 -- 11:20 (20 min)	The Osteogenesis Imperfecta (OI) Registry	Dr. Caden Feng-Shu Brennen OI Registry Manager, Bone and Osteogenesis Imperfecta Dept., Kennedy Krieger Inst., Johns Hopkins, USA	Clinical and Genetic Overview of Osteogenesis Imperfecta (OI) – Taiwan Experience	Dr. Shuan-Pei Lin Dept. of Pediatrics, Mackay Memorial Hospital, Taiwan	10:45 -- 11:00 (15 min)
11:20 -- 11:30 (10 min)	Discussions		Discussions		11:00 -- 11:10 (10 min)
11:30 -- 11:55 (25 min)	Impact of Rare Disease Prevention and Orphan Drug Act for OI	Ms. Kuan-Ju Chen Deputy Executive Director, TFRD, Taiwan	OI Scoliosis Treatments – Taiwan Experience	Dr. Kuan-Wen Wu Dept. of Orthopedics surgery, Nat'l Taiwan Univ. Hospital, Taiwan	11:10 -- 11:25 (15 min)
11:55 -- 12:20 (25 min)	Taiwan OI Association Overview	Mr. Jian Chi Chen Former Secretary General, TOIA, Taiwan	Discussions		11:25 -- 11:35 (10 min)
12:20 -- 12:35 (15 min)	Panel Q & A		Panel Discussions US and Taiwan OI Medical Collaboration Opportunities		11:35 -- 12:20 (45 min)
12:35 -- 14:00 (85 min)	Lunch & Members Talent Show B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei		Closing Remarks B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei		12:20 -- 12:35 (15 min)
14:00 -- 14:10 (10 min)	Scholarship Awards		Lunch B1 Level, North Gate, Far Eastern Plaza Hotel, Taipei		12:35 -- 14:00 (85 min)
14:10 -- 15:40 (90 min)	Medical Consultations				14:00 -- 14:10
15:40 -- 16:00 (20 min)	Coffee Break				14:10 -- 15:40
16:00 -- 16:30 (30 min)	Members Annual Meeting				15:40 -- 16:00
16:30-- 18:30					16:00 -- 16:30
18:30 -- 20:00 (90 min)	Banquet 6F, Shang Place, Far Eastern Plaza Hotel, Taipei (Private Invitation)				16:30-- 18:30
					18:30 -- 20:00

Registration & Reception

2011 臺美先天性成骨不全症醫療交流會議
會議議程
台北遠東國際大飯店B1大都會廳

5 月21日 / 星期六			5月22日 / 星期日		
主持人	陳冠如 罕見疾病基金會 / 副執行長		郭耿南 美國芝加哥洛許大學醫學中心 / 教授 台大醫院骨外科 / 教授、兼任主治醫生		主持人
時間	講題	講員	Session / 講題	Speaker / 講員	時間
08:00 -- 08:30					08:00 -- 08:30
08:30 -- 09:00					08:30 -- 09:00
09:00 -- 09:10 (10 分)	引言及歡迎		專業醫療會議:介紹		09:00 -- 09:15 (15 分)
09:10 -- 09:50 (40 分)	成骨不全即是機會的點燃	詹姆斯·甘柏 醫師 史丹佛大學醫學中心 關帕卡德兒童醫院(美國加州)骨科	先天性成骨不全症： 骨科觀點	詹姆斯·甘柏 醫師 史丹佛大學醫學中心 關帕卡德兒童醫院(美國加州)骨科	09:15 -- 09:45 (30 分)
09:50 -- 10:00 (10 分)	討論		討論		09:45 -- 09:55 (10 分)
10:00 -- 10:40 (40 分)	OI研究近況與治療	傑伊·傑匹羅 醫師 甘迺迪克瑞格研究機構、約翰霍普金斯大學 / 骨科與成骨不全症部門主任	兒童與成人OI的保健及照護	傑伊·傑匹羅 醫師 甘迺迪克瑞格研究機構、約翰霍普金斯大學 / 骨科與成骨不全症部門主任	09:55 -- 10:25 (30 分)
10:40 -- 10:50 (10 分)	討論		討論		10:25 -- 10:35 (10 分)
10:50 -- 11:00 (10 分)	茶敘		茶敘		10:35 -- 10:45 (10 分)
11:00 -- 11:20 (20 分)	成骨不全症資料登錄	張鳳書 女士 甘迺迪克瑞格研究機構 / 成骨不全症登錄管理者	成骨不全症（OI）之臨床及遺傳學觀—台灣經驗	林炫沛 醫師 馬偕紀念醫院小兒遺傳科 / 資深主治醫師 一般兒科主任醫學研究部生化遺傳組 / 組長	10:45 -- 11:00 (15 分)
11:20 -- 11:30 (10 分)	討論		討論		11:00 -- 11:10 (10 分)
11:30 -- 11:55 (25 分)	罕見疾病防治及藥物法對OI的重要與影響	陳冠如 女士 罕見疾病基金會 / 副執行長	先天性成骨不全症的脊椎側彎治療 - 台灣經驗	吳冠彣 醫師 台大醫院雲林分院骨科部 / 主治醫師	11:10 -- 11:25 (15 分)
11:55 -- 12:20 (25 分)	先天性成骨不全症關懷協會背景及現況	程健智 先生 社團法人先天性成骨不全症關懷協會 / 前秘書長	討論		11:25 -- 11:35 (10 分)
12:20 -- 12:35 (15 分)	綜合問與答時間		綜合討論 台美醫療合作機會		11:35 -- 12:20 (45 分)
12:35 -- 14:00 (85 分)	午餐、會員才藝表演 台北遠東國際大飯店B1洛北園		閉幕與感謝 台北遠東國際大飯店B1洛北園		12:20 -- 12:35 (15 分)
14:00 -- 14:10 (10 分)	獎學金頒獎		午餐 台北遠東國際大飯店B1洛北園		12:35 -- 14:00 (85 分)
14:10 -- 15:40 (90 分)	醫療諮詢				14:00 -- 14:10
15:40 -- 16:00 (20 分)	茶敘				14:10 -- 15:40
16:00 -- 16:30 (30 分)	會員大會				15:40 -- 16:00
16:30-- 18:30					16:00 -- 16:30
18:30 -- 20:00 (90 分)	晚宴 台北遠東國際大飯店6F香宮 (僅限邀請入場)				16:30-- 18:30
					18:30 -- 20:00

報到、接待

Symposium Information / 會議資訊

● Main Theme / 會議主旨

strengthen member mutual supports, understand Osteogenesis Imperfecta and raise public awareness. To improve medical treatment and quality of life for people affected by OI through international collaborations.

凝聚先天性成骨不全症患者相互支持力量，正確認識疾病並提高公眾意識，促進國際交流與醫療技術合作，進而提升病友身心健康及生活品質。

● Moderators & Invited Speakers / 邀請主持人及講員 (In Alphabetical Order of the Last Name)

Moderators / 主持人	Kuan-Ju Chen	/ 陳冠如	Deputy Executive Director, Taiwan Foundation for Rare Disorders, Taiwan 罕見疾病基金會 / 副執行長
	Ken N Kuo	/ 郭耿南	Professor of Orthopedic Surgery, Rush Univ., Chicago, USA Professor, Dept. of Orthopedics surgeon, Nat'l Taiwan Univ. Hospital, Taiwan 美國芝加哥洛許大學醫學中心 / 教授 台大醫院骨外科 / 教授、兼任主治醫生
Invited Speakers / 邀請講員	Caden Feng-Shu Brennen	/ 張鳳書	OI Registry Manager, Bone and Osteogenesis Imperfecta Dept., Kennedy Krieger Inst., Johns Hopkins, USA 甘迺迪克瑞格研究機構 / 成骨不全症登錄管理者
	Kuan-Ju Chen	/ 陳冠如	Deputy Executive Director, Taiwan Foundation for Rare Disorders, Taiwan 罕見疾病基金會 / 副執行長
	Jian Chi Chen	/ 程健智	Former Secretary General, TOIA, Taiwan 社團法人先天性成骨不全症關懷協會 / 前秘書長
	James G Gamble	/ 詹姆斯．甘柏	Professor, Dept. of Orthopaedics Surgery, School of Medicine, Stanford Univ., USA Lucile Packard Children's Hospital, Stanford, Palo Alto, USA 史丹佛大學醫學中心 爾帕卡德兒童醫院(美國加州)骨科
	Shuan-Pei Lin	/ 林炫沛	Dept. of Pediatrics, Mackay Memorial Hospital, Taiwan 馬偕紀念醫院小兒遺傳科 / 資深主治醫師 一般兒科主任醫學研究部生化遺傳組 / 組長
	Jay R. Shapiro	/ 傑伊．傑匹羅	OI Program Director, Kennedy Krieger Inst., Johns Hopkins, USA Professor, Dept. of Physical Medicine and Rehabilitation, Johns Hopkins Univ., USA 甘迺迪克瑞格研究機構、約翰霍普金斯大學 / 骨科與成骨不全症部門主任
	Guan-Wen Wu	/ 吳冠彣	Dept. of Orthopedics surgery, Nat'l Taiwan Univ. Hospital, Taiwan 台大醫院雲林分院骨科部 / 主治醫師

Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

Moderators & Invited Speakers

May 21st - 22nd, 2011

Taipei, Taiwan

Moderators & Invited Speakers

Moderator - Kuan-Ju Chen

● Personal Data

Birth date: Oct.30,1974
Sex: Female
Address: 6F., No.20., Chang Chun Road., Taipei104, Taiwan, R.O.C.
Phone: 886-2-25210717 ext 107
Fax: 886-2-25673560
E.mail: ms01@tfrd.org.tw

● Education

Aug 2003~Dec. 2003 -Duke University Medical Center 杜克大學醫學中心
-Department of Medical Genetics
-Short-Term Training in Genetic Counseling
-North Carolina, Unite State

Sep 1997 - June 1999 -National Yang-Ming University 陽明遺傳所
-School of Life Science
-Institute of Genetics
-Taipei, Taiwan
Master of Science in Genetics, June 1999.
Thesis: Molecular Genetic Study of a Novel Phenylketonuria Mutation
Thesis Advisor: Dr. Tsung-Sneng Su 苯酮尿症的基因研究

Oct 1993 - June 1997 -National Taiwan University台大植物系
-College of Science
-Department of Botany
-Taipei, Taiwan
Bachelor of Science, June 1997
GPA 3.33

● Work Experience

Nov 2000 - Current -Taiwan Foundation for Rare Disorders 財團法人罕見疾病基金會
-Taipei, Taiwan
Dep.Executive Director Mar. 2005~current 副執行長
Chief of Medical Service Sep. 2001~Feb. 2005 醫療服務組組長
Duty:

- ◆ On job training of genetic counseling by Shuan-Pei Lin M.D. (Department of Pediatrics, Mackay Memorial Hospital) and Wuh-Liang Hwu, M.D., Ph.D. (Department of Pediatrics, National Taiwan University Hospital) at first nine months
- ◆ Provide the genetic counseling service for people who are victims of the rare disorders
- ◆ Organize the division of medical service which includes four genetic counselors and one nutritionist
- ◆ Coordinate the "International Testing Referring Center" for diagnosis of the rare disorders
- ◆ Design the working procedure of the Expanded Newborn Screening by using tandem mass spectrometry in Kinmen County of Taiwan
- ◆ Edit the brochures of the rare disorders, including wilson disease, glycogen storage disease and tuberous sclerosis
- ◆ Attend and speak at many invited talks about knowledge the rare disorders and current issues of the patients for academic students and general public

Nov 1999 - Oct 2000 -Institute of Molecular Biology, Academia Sinica 中央研究院助理
-Taipei, Taiwan
Research Assistant in the Genetic and Development Lab Supervisor: Dr. Henry Y. Sun
Duty:

- ◆ Raised antibody against EYE GONE which is an important factor in Drosophila eye development
- ◆ Constructed of the clone of the homothorax and tried to find out the regulation region of this gene

● Fields of Interests

Molecular genetic study of human genetic disease
Genetic Counseling of the rare disorders
Bioethics of genetic testing
Patient and community education

● Publications

Identification and characterization of a novel liver-specific enhancer of the human phenylalanine hydroxylase gene
Chen KJ, Chao HK, Hsiao KJ, Su TS
Hum Genet 2002 Mar; 110(3):235-243

● Award and Honor

Jun 1999 Yin Hsun-Ruo Scholarship for First Place in the Master Thesis Competition of National Yang-Ming University

July 1998 and July 1999 Dr. Chen-Ki Yang Medical Education Scholarship of Graduate Students

Sep 1998 - Jun 1999 Ministry of Education Scholarship of Graduate Students

2009 Certified Genetic Counselor by Taiwan Human Genetics Society

Moderator - Ken N Kuo

• Personal Data

Chair Professor, College of Medicine, Taipei Medical University
Visiting Professor, Division of Health Services Research and Preventive Medicine
Attending Orthopaedic Surgeon, Children Hospital, National Taiwan University Hospital
E-mail: kennank@nhri.org.tw; kennank@aol.com

• Education

Orthopedic Residency, University of Illinois Medical Center, Chicago
Pediatric Orthopedic Fellowship, Hospital for Sick Children, Great Ormand Street, London and University of Edinburgh, Scotland
M. D. National Taiwan University, College of Medicine

• Professional experiences

Chair Professor, College of Medicine, Taipei Medical University
Acting Associate Director, Institute of Population Health Science, NHRI (2008-2010) Director and PI, Center for Health Policy Research and Development, NHRI (2006-2010)
Attending Orthopedic Surgeon, National Taiwan University Hospital (2003-)
Professor of Orthopedic Surgery, Rush Medical College, Rush University (1989-)
Associate Chairman of Education, Rush Medical College, Rush University (1995-2003)
Director, Orthopedic Residency Program, Rush University (1987-1995)
Active Orthopedic Attending Surgeon, Shriner's Hospital for Children, Chicago (1974-)

• Research Interests

Research interests in children orthopaedics include gait and motion analysis, clubfoot outcome study, developmental dysplasia of the hips, and hip instability in cerebral palsy children. In the filed of health policy research: graduate medical education, evidence based medicine and clinical practice guidelines, medical specialty manpower, health literacy, drug policy, physician manpower projection and physician scientists survey.

• Accomplishments

In the field of pediatric orthopedics, he is a well recognized internationally, and has served different capacities in international and North American societies. As a prominent teacher in the field, he has organized many international instructional courses in Taiwan, China, Malaysia, India, etc. He has received Golden Apple Award for the best teacher at Rush University Medical Center. In 1996, he was elected as one of the 20 best orthopedic surgeons in USA chosen from 350 leading academic centers. He continues to serve as editorial review in several prestigious orthopedic journals in North America and Europe.

In the field of health policy research, he had conducted many projects, including physician manpower study in Taiwan, physician manpower projection, Taiwan Tobacco Control Forum, Institutional Review Board Accreditation in Taiwan, development of evidence based medicine and clinical practice guidelines as well as education and promotion, e-learning development. He serves at advisory capacity to Department of Health in Taiwan in graduate medical education, health promotion, and international health corporation. He was also a major organizer in many international health policy conferences. One of the significant recent works was coordinating the forum for Healthy People 2020 in Taiwan and published white paper and technical report.

• Pediatric Orthopaedic Surgery Publications

• Selected Recent Scientific Journal Publications

◆ Aik, S., Smith, P.A., Kuo, K.N (corresponding author): Rectus Femoris Transfer for Children with Cerebral Palsy-A Long Term Outcome. J. of Pediatr. Orthop, 23:672, 2003.
◆ Verma, N.N., Kuo, K.N., Gitelis, S. (corresponding author): Acetabular osteoarticular allograft reconstruction following pelvic resection for Ewing's sarcoma. Clin Orthop and Rel Res, 419:149, 2004
◆ Huang, SC, Kuo, KN: Relationship of anatomic classifications to degenerative change in untreated developmental dysplasia of the hip, J. Formosa Med. Assoc. 104:349, 2005
◆ Yong, SM, Smith, PA, Kuo, KN (corresponding author): Dorsal bunion following clubfoot surgery: outcome of reverse Jones procedure, J. of Pediatr. Orthop 27:7:1-7, 2007
◆ Smith, PA, Hassani, S, Graf, A, Flanagan, A, Reiners, K, Kuo, KN, Roh, JY, Harris, G: Brace Evaluation in Children with Diplegic Cerebral Palsy with a Jump Gait Pattern, Journal of Bone and Joint Surgery, 91:356-365, February 2009
◆ Wu, KW, Huang, SC, Kuo, KN, Wang, TM: The use of the Bio-absorbable screw in a split anterior tibial tendon transfer: A preliminary result, J of Pediatr. Orthop-B 18:69-72, March 2009
◆ Kuo, KN, Smith, PA: Correcting Residual Deformity Following Clubfoot Releases: Clinical Orthopaedics and Related Research, 467:1326-1333, May 2009
◆ Graf A, Hassani S, Krzak J, Long J, Caudill A, Flanagan A, Eastwood D, Kuo KN, Harris G, Smith P: Long-term outcome evaluation in young adults following clubfoot surgical release, Journal of Pediatric Orthopaedics, 30(4):379-85, June 2010
◆ Chang, CH, Chen, YY, Wang, CJ, Lee, ZL. Kuo, KN (corresponding author): Dynamic displacement of femoral head by Hamstring stretching in children with cerebral palsy, JPO 30(5): 475-478, July 2010
◆ Chen, WH, Chang, CH, Chen, YY, Liu, WJ, Chua, C, Tsai, ST, Kuo, KN (corresponding author): Natural progression of hip dysplasia in newborns: A reflection of hip ultrasonographic screenings in newborn nursery. Journal of Pediatric Orthopaedics-B, 19(5):418-423 September 2010
◆ Wu, KW, Wang, TM, Huang, SC, Kuo, KN (Corresponding author), Chen, CW: Analysis of Osteonecrosis following Pemberton Acetabuloplasty in Developmental Dysplasia of the Hip: A Long-Term Result. Journal of Bone and Joint Surgery, 92:2083-2094, September 2010
◆ Chang, CH, Yang, WY, Kao, HK, Shih, CH, Kuo, KN (corresponding author): Predictive value for femoral head sphericity from early radiographic signs in surgery for developmental dysplasia of the hip, Journal of Pediatric Orthopaedics, 31(3) 240-245 April-May 2011

• Selected Recent Book Chapters

◆ Khazzam, M, Smith, PA, Hassani, S, Harris, GF, Kuo, KN; Functional gait analysis in Children following clubfoot releases. Foot and Ankle Motion Analysis: Biomedical Engineering, Ed: Harris JF and Smith, PA, CRC Press, October 27 2006
◆ Kuo, K.N.: Joint aspiration, Pediatric Orthopedic Secrets, 3rd Edition, Staheli L. and Song, K. (Ed), Publisher Lippincott, Williams and Wilkins, October 2006
◆ Kuo, K.N.: Anterior Tibial Tendon Transfer, in Master Techniques in Orthopaedic Surgery, Pediatric, Ed. Tolos, VT. and Skaggs, DL. Publisher: Lippincott, Williams and Wilkins, Philadelphia, 2007

• Health Policy Related Publications

• Selected Scientific Journal Publications

◆ Chang, CI, Chan, DC. Kuo, KN, Hsiung, CA, Chen, CY: Vitamin D insufficiency and frailty syndrome in older adults living in a Northern Taiwan Community: Archives of Gerontology and Geriatrics, 50 Suppl. S17-S21, 2010
◆ Wu, CY, Wu,, MS, Kuo, KN. Chen, YJ, Lin, JT: Effective reduction of gastric cancer risk with regular use of NSAIDs in Helicobacter pylori-infected subjects, Journal of Clinical Oncology, 28(18):2952-2957, June 2010
◆ Chen. LK, Lu, HM, Shih, SF, Kuo, KN, Chen, CL, Huang, LC: Poverty related risk for potentially preventable hospitalisations among children in Taiwan: BMC Health Services Research 10:196, July 2010
◆ Lee YC, Huang YT, Tsai, YW, Huang SH, Kuo, KN (corresponding author), McKee, M, Nolte, E.: The impact of National Health Insurance on Population Health, The Experience of Taiwan, BMC Health Service Research, 10:225, August 2010

- Chiu YW, Weng YH, Lo HL Shih YH, Hsu CC, Kuo KN (corresponding author): Impact of a nationwide outreach program on the diffusion of evidence-based practice in Taiwan, International Journal for Quality in Health Care, 22(5): 430-436 October 2010
- Lee, SY, Tsai, TI, Tsai, YW, Kuo, KN: Health Literacy, Health Status, and Healthcare Utilization of Taiwanese Adults: Results from a National Survey: BMC Public Health, 10:614 October 2010
- Wu CY, Chan FK, Wu MS, Kuo KN, Wang CB, Tsao CR, Lin JT. Histamine-2-receptor antagonist as an alternative to proton pump inhibitor in patients receiving clopidogrel, Gastroenterology 139:1165-1171 October 2010
- Tsai, TI, Lee, SY, Tsai, YW, Kuo, KN (corresponding author): Methodology and validation of Health Literacy Scale Development in Taiwan. Journal of Health Communication, 16(1): 50-61, January 2011
- Tsai YW, Wen YW, Huang WF, Chen PF, Kuo KN, Hsiao FY: Cardiovascular and gastrointestinal events of three antiplatelet therapies: clopidogrel, clopidogrel plus proton-pump inhibitors, and aspirin plus proton-pump inhibitors in patients with previous gastrointestinal bleeding, J Gastroenterology, 46(1) 39-45, Jan 2011
- Hsu CC, Lee, CH, Hwang SJ, Huang SW, Yang WC, Chang YK, Tsai DFC, Kuo KN: Outcome of overseas kidney transplantation in chronic hemodialysis patients in Taiwan, Nephrology, 16(3) 341-348, March 2011
- Hsu CC, Chang SY, Huang MC, Hwang SJ, Yang YC, Tai TY, Yang HJ, Chang CT, Chang CJ, Loh CH, Shih YT, Li YS, Shin, SJ, Kuo, KN: Association between Insulin Resistance and Development of Albuminuria in Type 2 Diabetes: A Prospective Cohort Study, Diabetes Care, 34(4) 982-987 April 2011

• Selected Book Publications and Reports

- Graduate Medical Education for Medical Specialties; July, 2003
- Evidence Based Medicine and Epidemiological Application, May 2004
- Guide for Writing Evidence Based Clinical Practice Guidelines, June 2004
- A Study of Taiwan Medical Specialty Manpower Distribution, Part I, December 2004, and Part II, December 2005
- Institutional Review Board Accreditation Standard, December, 2004
- Taiwan Tobacco Control Forum, A white paper, June 2005
- Taiwan Physician Scientist Education and Development, December, 2005
- Kuo, K.N., Editor: Evidence-Based Decision Making in Health Care, in Chinese, December, 2006 in Taiwan
- Taxation of Betel Nut -A project on Betel Nut Control. 2007.10
- Physician training, practice environment and public education, 2008.03
- Healthy People 2020, Taiwan, 2008.05
- Healthy People 2020-Technical Report, Taiwan, 2008.09
- How to write a guideline: From start to finish, 2009. 05
- Health People 2020-White paper- second edition (revised) 2009, 08
- Physician Training in Taiwan-present and future 2009. 12
- Dental Workforce 2020: Education, Supply and Demand 2010. 12
- Nurse Workforce and Nurse Practitioner System: Vision and Challenge 2010.12
- Public Health Education & Workforce: Current Status & Perspective 2010.12

Invited Speaker - Caden Feng-Shu Brennen

• Education

Master of Science in Bioscience Regulatory Affairs Graduation date: May 2009
Johns Hopkins University, Baltimore, MD, U.S.A.
Master of Science in Medical Biotechnology and Laboratory Science Graduation date: June 2005
Chang Gung University, Taiwan
G.P.A = 3.63
Bachelor of Science in Life Science
Tzu Chi University, Taiwan Graduation date: June 2003
G.P.A= 3.7 (rank: 4th/41)

• Research And Work Experiences

Clinical Research Coordinator/ Osteogenesis Imperfecta Registry Manager July 2009-Present
Bone Center and OI Program, Kennedy Krieger Institute
Coordinates and administers research study associated activities.
Manages all aspects of the OI Registry including member registration, promotion, investigator utilization, and internal review board (IRB) process

Clinical Research Assistant Jan 2009-Jun 2009
Genitourinary Oncology Research Program, Johns Hopkins School of Medicine
Assist the clinical research data manager of ongoing prostate cancer research studies.
The responsibilities include organizing research participants charts and case report forms (CRF) to ensure efficient data collection and data entry, assisting in analysis and verification of the accuracy of research patient data, blood sample collection, participating in research meetings as needed.
Internship
Center of Devices and Radiological Health, Food and Drug Administration (FDA) July 2008-Dec 2008
Project: Traceability/ Compatibility Analysis of the IEC 62304 Standard for Medical Device Software and the FDA Guidance for the Content of Pre-market Submission for Software Contained in Medical Devices
Mentor: John F. Murray Jr. Software Compliance Expert, Office of Compliance ,CDRH, FDA

Medical Lab Technician July 2005- July 2006
Department of Ophthalmology, National Taiwan University Hospital
Examined the role of MAPK pathway in Age-Related Macular Degeneration (ARMD).
Found an abnormal activated MAPK pathway in ARMD patient primary culture cells.

Masters Student Sep 2003 - July 2005
Department of Medical Biotechnology and Laboratory Science, Chang Gung University
Researched the role of Disabled-2 in plakoglobin-mediated Wnt signaling pathway.
Determined that plakoglobin and Disabled-2 participated in leukemogenesis.

Teaching Assistant June 2004- Sep 2004
Department of Medical Biotechnology and Laboratory Science, Chang Gung University
Assisted the professor in teaching the Advanced Biotechology Laboratory course materials to graduate students.
Taught graduate students the experimental principles of biotechnology and helped them troubleshooting experiments and assignments.
Undergraudate Student

College of Life Science, Tzu Chi University Sep 1999 - July 2003
Student Research project in stem cells
Research project : Quantitative analysis on the expression of stem cell maker genes
Used quantitative PCR to characterize the different stem cell maker genes

• Academic And Professional Honors

Won third place for "Recognition of Excellence in Format and Content" for a presentation given at the 2nd Annual Contest of Master Thesis at Chang Gung University. (2005)
Won the President's Award and received a full scholarship from Tzu Chi University (99-03)

Invited Speaker - Jian-Chi Chen

(CV not available in English)

Invited Speaker - James G Gamble

● Current Position

Professor
Department of Orthopaedic Surgery
Stanford University School of Medicine
Packard Children Hospital at Stanford
Stanford University Hospital and Clinics
Stanford, California 94305-5341

Academic Office
Stanford University Medical Center
300 Pasteur Drive, Edwards R105
Stanford, California 94304-5341
Telephone: 650-723-5286
Fax: 650-723 9370

Clinic Address
Packard Children's Hospital at Stanford
Johnson Pediatric Outpatient Clinic
750 Welch Road
Stanford, California 94305
Telephone: 650 497 8201
Fax: 650 497 8891

● Education

B.A.
Bachelor of Arts
The Ohio State University
Columbus, Ohio; June, 1966

Ph.D.
Doctor of Philosophy
The Ohio State University
Columbus, Ohio; December, 1969
Dissertation: RNA and Protein Synthesis in Heart Mitochondria

M.D.
Doctor of Medicine
Magna Cum Laude
The University of Maryland School of Medicine
Baltimore, Maryland, June, 1975

M.L.A.
Master of Liberal Arts
Stanford University
Stanford, California, June, 1997
Thesis: A Social History of People with Physical Disabilities

● Fellowships

Predoctoral
The Ohio State University
Sponsor: National Institutes of Health
Field: Physiological Chemistry 1966 - 1969

Postdoctoral
The Johns Hopkins University School of Medicine
Sponsor: United States Public Health Service
Field: Molecular Biology and Biochemistry 1969 - 1971

Postdoctoral
Stanford University
Sponsor: National Institute of Child Health and Human Development
Field: Molecular and Cellular Gerontology 1970

• Residency

Resident **PGY 1**	Department of Psychiatry University of Maryland School of Medicine November 1974 - June 1975
Resident **PGY 1**	Division of General Surgery University of Maryland School of Medicine July 1975 - June 1976
Resident **PGY 2**	Division of Orthopaedic Surgery University of Maryland School of Medicine July 1976 - June 1977
Junior Resident **PGY 3**	Division of Orthopaedic Surgery University of Maryland School of Medicine July 1977 - June 1978
Senior Resident **PGY 4**	Division of Orthopaedic Surgery University of Maryland School of Medicine July 1978 - June 1979
Chief Resident **PGY 5**	Division of Orthopaedic Surgery University of Maryland School of Medicine July 1979 - June 1980

• Medical License

California G-48452

• Board Certification

National Board of Medical Examiners, 1975
American Board of Orthopaedic Surgeons, 1981

• Academic Appointments

Instructor	Department of Surgery, Division of Orthopaedic Surgery University of Maryland School of Medicine July 1979 - June 1980
Assistant Professor	Department of Surgery, Division of Orthopaedic Surgery University of Maryland School of Medicine July 1980 - June 1982 Director of Residency Education Kernan Children's Hospital, Baltimore, Maryland January 1981 - June 1982
Assistant Professor	Department of Surgery, Division of Orthopaedic Surgery Stanford University School of Medicine Children's Hospital at Stanford July 1982 - March 1989
Associate Professor	Department of Surgery, Division of Orthopaedic Surgery Stanford University School of Medicine Children's Hospital at Stanford April 1989 - August 1994
Professor	Department of Orthopaedic Surgery Stanford University School of Medicine Packard Children's Hospital at Stanford August 1994 - Present

• Hospital Appointments

University of Maryland Hospital
Baltimore, Maryland, 1980 - 1982
James Lawrence Kernan Children's Hospital
Baltimore, Maryland, 1980 - 1982
Palo Alto Veterans Administration Hospital
Palo Alto, California, 1982 - 2009
Stanford University Hospital and Clinics
Palo Alto, California, 1982 - present
Packard Children's Hospital at Stanford
Palo Alto, California, 1982 - present
Santa Clara Valley Medical Center
San Jose, California, 2010 - present

• Awards And Honors

Maryland Medical Scholar, 1973
Alpha Omega Alpha Honor Medical Society, 1974
Magna Cum Laude, University of Maryland, 1975
Founders Award Eastern Orthopaedic Association 1980
Outstanding Scientific Exhibit Award
Medical and Chirurgical Faculty of Maryland, 1992
Halpern Outstanding Teacher Award, 1994
RC Abrams Memorial Lecturer, Baltimore, Maryland, 2000

• Service Activities

Orthopaedic Consultant	Maryland School for the Blind, 1980 - 1982 Maryland Department of Public Health, 1980 - 1982 California Children's Services, Marin County, 1983 - 2009 Cowell Student Health Center, 1989 - 2001 Vaden Student Health Center, 2001 - 2003
Volunteer Medical Consultant	California Cystic Fibrosis Foundation, 1984 - 1990 Camp Trinity Mainstream Program, 1985 - 1995 Beijing International Committee for Chinese Orphans 2001 -Present Love Without Borders Medical Consultant 2010 - present

AYSO Soccer Coach, 1993 - 1998
YMCA Basketball Coach, 1994 - 1996

• Associations And Professional Societies

American Orthopaedic Association
American Academy of Orthopaedic Surgeons
American Association for the Advancement of Science
American Association for Cerebral Palsy and Developmental Medicine
American Chemical Society
American College of Sports Medicine
American Medical Association
California Medical Association
Maryland Medical and Chirurgical Faculty (Inactive)
Orthopaedic Research Society
Pediatric Orthopaedic Society of North America (Inactive)
Santa Clara Valley Medical Society
University of Maryland Medical Association
Western Orthopaedic Association

• Journal Reviewer

Adolescent Medicine
American Journal of Human Biology
Clinical Orthopaedics and Related Research
Developmental Medicine and Child Neurology
Journal of Adolescent Health
Journal of Bone and Joint Surgery
Perception and Motor Skills
Pediatrics
Pediatric Research
Psychological Reports

• Editorial Board

The Pharos

• International Clinical Experience

Esteli, Nicaragua	Operation Rainbow: 1999, 2000, 2001, 2002, 2003, 2010 Team Leader: 2001, 2002, 2003
Huehuetenango, Guatamala	Operation Rainbow: 2001
Peoples Republic of China	Tianjin Orthopaedic Hospital, Tianjin: 2001, 2002, 2003, 2004, 2005, 2006, 2007 Lanzhou Medical School, 2nd Hospital: 2002 Dunghuang Orthopaedic Hospital: 2003 Yantai Orthopaedic Hospital: 2003, 2004, 2009, 2010 Ningbo Hospital #6: 2005 Chongqing Children's Hospital: 2006 Linyi Children's Hospital: 2007 LangFang Red Cross Orthopaedic Hospital: 2010
Colombia	La Universidad del Valle, Cali: 2011 Fundication Hospitall San Jose Buga: 2011

• Sabbatical Leave

1989 Graduate School of Business
Stanford University, Stanford, California

1996 Universitat Autonomia de Barcelona
Vall d'Hebron Hospital Barcelona, Spain

• Visiting Professor/Guest Lecturer

1982 University Connecticut School of Medicine Farmington, CT. Biochemical Adaptations of Ligaments to Imobilization.
1983 Letterman Army Hospital; Department of Orthopaedics, San Francisco, CA. Sports Medicine and Basic Biochemical Science.
1983 Hawaiian Orthopaedic Association Annual Meeting; Honoluli, Hawaii.
Computerized/Automated Motion Analysis verses Observational Gait Analysis. What Can It Do?
1997 University of Kansas School of Medicine Jager History of Medicine, Witchita, KS. Charles Dickens. A View of Victorian Life and his Literary Children.
1998 University of Wakyama; Pediatric Orthopaedics Wakayama, Japan. Cerebral Palsy: A Social History of Children with Physical Disabiilities.
2000 University of Maryland Medical Systems Baltimore, MD. Endoscopic Assisted Percutaneous Epiphyseodesis; Diagnosis and Treatment of DDH.
2001 1st International Sino-American Pediatric Orthopaedic Symposium Tianjin, PRC. Early Diagnosis and Treatment of Developmental Dysplasia of the Hip. 2002 Lanzhou International Orthopaedic Symposium Lanzhou, PRC Principles of Operative Management of Developmental Dysplasia of the Hip.
2003 International Orthopaedic Symposium. Yantai Medical Center; Yantai, PRC. Evaluation and Treatment of the Child with a Limp.
2004 2nd International Sino-American Pediatric Orthopaedic Symposium. Tianjin, PRC. Meniscus Injuries in Children and Adolescents; Motion Analysis for Orthopaedic Surgeons.
2004 1st Yantai International Pediatric Orthopaedic Symposium. Yantai PRC. Knee Problems in Children and Adolescents
2005 Ningbo International Orthopaedic Symposium. Ningbo, PRC. Management of Pediatric Femoral Fractures; Diagnosis and Treatment of Bucket Handle Meniscus Tears.
2006 3rd International Sino-American Pediatric Orthopaedic Symposium Tianjin, PRC. Evaluation and Treatment of Pes Cavus in Children & Adolescents.
2006 Chongqing Children's Hospital 50th Anniversary Chongqing, PRC. Understanding the Pathophysiology of Osteogenesis imperfecta.
2007 Tianjin Orthopaedic Hospital Fractures About the Knee in Children Linyi Children's Hospital Pediatric Femoral Fractures Treatment of Adolescent Knee Pain Diagnosis & Treatment of Pes Cavus
2009 International Pediatric Orthopaedic Symposium Yantai Shan Hospital, Yantai, PRC.
Developmental Dysplasia of the Hip Unstable Knee Fractures Treatment of Clubfoot
2010 Yantai International Pediatric Symposium Fractures about the Knee in Children Management of Pediatric Femoral Shaft Fractures
2011 Cali, Columbia. Fundacion Hospital del Valle Endoscopic Assisted Epiphyseodesis Pediatric Knee Fractures

• Bibliography

Journal Articles

1. Gamble JG, McCluer RH:
In Vitro Studies with Rifampicin on the Stability of Heart Mitochondrial RNA.
Journal of Molecular Biology 1970; 53: 557 - 559.
2. Gamble JG, Lehninger AL:
Transport of Ornithine and Citrulline Across the Mitochondrial Membrane.
Journal of Biological Chemistry 1973; 248: 610 - 621.
3. Rifenberick D, Gamble JG, Max SR:
Response of Mitochondrial Enzymes to Decreased Muscular Activity.
American Journal of Physiology 1973; 225: 1295 - 1299.
4. Gamble JG:
Calcium and Phosphorus Metabolism. Orthopaedic Review 1980; 9: 47 - 56.
5. Gamble JG, Dhanda AM, Edwards CC, Young JD:
Pseudomonas Infection of the Symphysis Pubis in a Heroin User.
Orthopaedics 1980; 3: 1212 - 1214.
6. Kenzora JE, Edwards CC, Browner B, Gamble JG, DeSilva JB:
Acute Management of Major Trauma Involving the Foot and Ankle with Hoffman External Fixation.
Foot and Ankle 1981; 1: 348 - 361.
7. Gamble JG, Simmons SC:
Bilateral Scaphoid Fractures in a Child.
Clinical Orthopaedics and Related Research 1982; 162: 125 - 128.
8. Gamble JG, Decker JS, Abrams RC:
Short First Ray as a Complication of Multiple Metatarsal Osteotomies.
Clinical Orthopaedics and Related Research 1982; 164: 237 - 240.
9. Freedman M, Gamble JG, Lewis C:
Pitfalls to Avoid. Intrauterine Fracture Simulating a Unilateral Clavicular Pseudoarthrosis.
Journal of the Canadian Association of Radiologists 1982; 33: 37 - 38.
10. Gamble JG, Edwards CC, Max SR:
Enzymatic Adaptations in Ligaments During Immobilization.
American Journal of Sports Medicine 1984; 12: 221 - 229.
11. Gamble JG, Rinsky LA, Bleck EE:
Acetabular Osteomyelitis in Children.
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7. Gamble JG:
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2. Rose JR, and Gamble JG (eds):
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3. Rose JR and Gamble JG (eds):
Human Walking 3rd Edition
Lippincott, Williams, and Wilkins, Philadelphia, 2006. ISBN 0-7817-5954-4

• Scientific Exhibits

The Symphysis Pubis: Anatomy and Pathology of a Commonly Neglected Joint.
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Medical and Chirurgical Faculty of Maryland, Baltimore, 1982.
Back Pain, Spinal Deformity and Posture in Cystic Fibrosis.
North American Cystic Fibrosis Conference, Toronto, 1987.
Anterior Discectomy with and without Instrumentation in the Management of Severe Neuromuscular Scoliosis.
Scoliosis Research Society, Amsterdam, 1989.
Postural Balance Measurements for Children and Adolescents.
American Academy of Orthopaedic Surgeons, San Francisco, 1997.
Endoscopic Assisted verses Percutaneous Epiphyseodesis.
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3. Rifenberick D, Gamble JG, Max SR:
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4. Regan B, Roundsville B, Fleishman S, Philips J, Gamble JG:
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5. Gamble JG, Edwards CC, Max SR:
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6. Gamble JG:
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7. Kenzora JE, Edwards CC, Browner BD, Gamble JG, DeSilva JB:
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8. Gamble JG, Simmons SC, Freedman MT:
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9. Gamble JG, Bleck EE, Rinsky LA, Rose J:
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10. Gamble JG, Rinsky LA, Bleck EE:
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11. Rinsky LA, Bleck EE, Gamble JG:
The Growing Segmental Spinal Instrumentation Technique in Children with Progressive Spinal Deformity.
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13. Rinsky LA, Gamble JG, Bellah J:
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14. Gamble JG, Mochizuki C, Bleck EE:
Coxa Magna Following Congenital Hip Dislocation.
American Orthopaedic Association, Coronado,1985.
15. Gamble JG, Mochizuki C, Rinsky LA, Bleck EE:
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AAOS 53rd Annual Meeting, New Orleans,1986.
16. Gamble JG, Lewis CG, Hadley N, Diamond LS:
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AAOS 53rd Annual Meeting, New Orleans,1986.
17. Gamble JG, Rinsky LA, Bleck EE:
Fracture Nonunion in Patients with Osteogenesis Imperfecta.
The Pediatric Orthopaedic Society of North America, Boston,1986.
18. Gamble JG, Rinsky LA, Bleck EE:
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19. Goodman SB, Gamble JG, Dilley M:
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AAOS 54th Annual Meeting, San Francisco, 1987.
20. Gamble JG, Strudwick J, Rinsky LA, Bleck EE:
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The Pediatric Orthopaedic Society of North America, Toronto, 1987.
21. Gamble JG, Goldberg M:
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American Academy Pediatrics, San Francisco, 1987.
22. Gamble JG, Strudwick J, Rinsky LA, Bleck EE:
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AAOS 55th Atlanta, 1988.
23. Gamble JG, Rinsky LA, Bleck EE:
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Western Orthopaedic Association,Yosemite,1988.
24. Gamble JG, Haimson R, Rinsky LA, Smith RL:
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Colorado Springs, 1988.
25. Wuh H, Rinsky LA, Gamble JG:
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26. Rinsky LA, Gamble JG, Maloney W:
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The Pediatric Orthopaedic Society of North America, San Francisco,1990.
28. Gamble JG, Bassett GS, Mason D, Rinsky L, Bowen JR, Mooney M., Dick D:
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The Pediatric Orthopaedic Society of North America.Dallas,1991.
29. Gamble JG:
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American Academy of Pediatrics, Oakland,1991.
30. Gamble JG:
Developmental Dysplasia of the Hip.
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American Academy of Pediatrics, San Francisco, l992.
31. Gamble JG:
The Motion Analysis Laboratory: What it can do for your Patients.
American Academy of Pediatrics, San Francisco,1995.
32. Gamble JG:
A Social History of Children with Spina Bifida.
2nd international Symposium on Spina Bifida, Kobe, Japan, 1997.
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Electromyographic Differentiation of Mild Diplegic Cerebral Palsy and Idiopathic Toe Walking: Coactivation of the Quadricep and Plantar Flexors.
European Pediatric Orthopaedic Society 17th Meeting , Madrid, 1998.
34. Rose J, Wolff DR, Jones VK, Bloch DA, Gamble JG:
Postural Control in Patients with Cerebral Palsy.
North American Society of Gait and Clinical Movement Analysis, Dallas, March, 1999.
35. Gamble JG:
The Pediatric Orthopaedic Sports Evaluation.
Common Sports Injuries in Children and Adolescents.
13th Annual Pediatric Update, Palo Alto, 2000 - 2005.
36. Gamble JG:
Course Director: Sports Medicine for the Primary Pediatric Practitioner
Pediatric and Adolescent Knee Injuries
Acute and Overuse Injuries in Children and Adolescents
Monterey, California 2007
37. Gamble JG:
Rotation and Angular Deformities in Children
14th Annual Pediatric Update. Palo Alto, 2008
39. Gamble JG, Rinsky LA, Batista E.
How Small is the leg and foot in Children with Unilateral Clubfoot?
Western Orthopaedic Association, Seattle, July 2009.
38. Krane E, Larkin K, Gamble JG:
Pediatric Complex Regional Pain Syndrome Associated with Avascular Necrosis of Bone SPA/AAP
Pediatric Anesthesiology Jacksonville March 2009
39. Imrie M, Rinsky LA, Gamble JG. Management of Leg Length discrepancy.
Pediatric Orthopaedic Society of North America. April 2010.
40. Gamble JG, Rinsky LA, Imrie M:
Endoscopic Assisted Percutaneous Epiphyseodesis
Western Orthopaedic Association, Monterey, California, August 2010.
41. Imrie MN, Vasanawala S, Pun S, Rinsky LA, Gamble JG:
"Nearly Radiation-free" Approach to Treatment of Developmental Dislocations of the Hip (DDH)
American Academy of Orthopaedic Surgeons, San Diego Calif. February 2011.

Invited Speaker - Shuan-Pei Lin

• Personal Data

DATE of BIRTH: October 1, 1955
PROFESSIONAL ASSIGNMENT: Senior Attending Physician and Director of Division of General Pediatrics, Department of Pediatrics and Medical Research, Mackay Memorial Hospital; Associate Professor, Department of Early Childhood Care and Education, Mackay Medicine, Nursing & Management College and National Taipei University of Nursing and Health Sciences, Taipei, Taiwan
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PHONE: +886-2-2543-3535 ext. 3089~3090
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• Education

Provincial Taichung First Senior High School, Tiachung, Taiwan
School of Medicine, Kaohsiung Medical University

• Experience

06/1982 ~ 06/1986	Resident and Chief Resident, Department of Pediatrics, Mackay Memorial Hospital
07/1986 ~ 06/1992	Attending Physician, Department of Pediatrics, Mackay Memorial Hospital, Taipei, Taiwan
07/1988 ~ 06/1989	Chief, Department of Pediatrics, Mackay Memorial Hospital-Taitung Branch Hospital, Taitung, Taiwan
07/1989 ~ 06/1991	Clinical Fellow, Department of Human Genetics, Yale University School of Medicine, Conn., U.S.A.
07/1992 ~ present	Senior Attending Physician, Department of Pediatrics, Mackay Memorial Hospital, Taipei, Taiwan
07/1994 ~ present	Director, Division of Genetics & Metabolism, Department of Medical Research, Mackay Memorial Hospital, Taipei, Taiwan
08/1997 ~ 06/2009	Director, Division of Genetics, Department of Pediatrics, Mackay Memorial Hospital, Taipei, Taiwan
06/1999 ~ 04/2011	Member of Directors of the Board, Taiwan Foundation of Rare Disorders, Taipei, Taiwan
11/2000 ~ 10/2005	Chairperson, Sub-committee of Medical Genetics, Taiwan Pediatric Association, Taipei, Taiwan
04/2005 ~ 03/2008	Board Director, Taiwan Pediatric Association, Taipei, Taiwan
02/2009 ~ present	Associate Professor, Department of Infant and Child Care, National Taipei University of Nursing and Health Sciences, and Department of Early Childhood Care and Education, Mackay Medicine, Nursing & Management College, Taipei, Taiwan
03/2009 ~ 05/2010	President, International Prader-Willi Syndrome Organization (IPWSO)
04/2011 ~ present	Managing Director of the Board, Taiwan Foundation of Rare Disorders, Taipei, Taiwan

• Professional Certificates

Specialist Certificate, Taiwan Pediatric Association (TPA)
Specialist Certificate, Family Physician Association of R.O.C.
Specialist Certificate, Sub-committee of Medical Genetics, TPA
Specialist Certificate, Sub-committee of Metabolism and Endocrinology, TPA
Specialist Certificate, Association of Critical Care Medicine, R.O.C.

• Original Articles

Dr. SP Lin has published 188 papers, with more than 152 SCI papers, since 1985.

Invited Speaker - Jay R. Shapiro

• Position Title

Director, Bone and Osteogenesis Imperfecta Program, Kennedy Krieger Institute

• Institution and Location

Franklin and Marshall College, Lancaster, PA Boston University School of Medicine

• Personal Statement

I serve as Director of the Bone and Osteogenesis Imperfecta (OI) Program at the Kennedy Krieger Institute, Baltimore. This program is nationally recognized as a center for the diagnosis and treatment of patients (all ages) with OI. The center treats approximately 250 patients/year. The Center also has developed and operates the Osteogenesis Imperfecta Registry which currently lists 1730 individuals with OI.

• Positions and Honors

2004-present	Professor (part-time faculty), Department of Physical Medicine and Rehabilitation, Johns Hopkins University
1997-present	Director, Bone and Osteogenesis Imperfecta Program, Kennedy Krieger Institute, Baltimore, MD
1999-present	Professor (Adjunct), Department of Medicine, Uniformed Services University of the Health Sciences
2003-2004	Endocrine Practice, (part-time) Physician Associates, Rockville, MD
2000-2003	Director, Interdepartmental Center for Space Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD.
1997-2004	Team Leader (Bone Loss): National Space Biomedical Research Institute, Baylor College of Medicine, Houston, TX
1998-2000	Director, Clinical Evaluation Program, Deployment Health Clinical Center, Walter Reed Army Medical Center, Washington, DC
1993-1998	Professor, Division of Geriatric Medicine and Gerontology, Johns Hopkins University School of Medicine, Baltimore, MD
1997-1998	Special Consultant, Craniofacial Dysplasia and Skeletal Disorders Branch, National Institute of Dental Research, Bethesda, MD
1993-present	Medical Advisory Council, Osteogenesis Imperfecta Foundation
1990-1997	Program Director, General Clinical Research Center, Johns Hopkins Bayview Medical Center
1991-1998	Co-Director, Osteoporosis Clinic, Johns Hopkins Bayview Medical Center, Baltimore, MD

• Honors

1956	Alpha Omega Alpha Honor Society
1987	Sustaining Membership Award, Association of Military Surgeons of the United States
1982	DHHS, U.S. Public Health Service Outstanding Service Award
1982	Founder's Medal, Association of Military Surgeons of the United States
1981	DHHS, U.S. Public Health Service Commendation Medal
1980	Equal Employment Opportunity Award, Clinical Center, National Institutes of Health, Uniformed Services Public Health Service, Department of Health and Human Services

● Selected peer-reviewed publications (from 2000, in chronological order)

1. Engel Jr CC, Liu X, Clymer R, Miller RF, Sjoberg T, Shapiro FR. Rehabilitative care of war-related health concerns. J Occup Environ Med. 42:4, 2000
2. Shapiro JR, Schneider V. Coutermeasure development: Future research targets. J Gravit Physio. 17:P1-P4, 2000.
3. Schultheis L, Ruff CB, Rastogi S, Bloomfield SA, Hogan HA, Fedarko N, Thierry-Palmer J, Ruiz F, Bauss F, Shapiro JR. Disuse Bone Loss in the Hindquarter Suspended Rat: Partial Weightbearing Exercise and Ibandronate Treatment as countermeasures. J Gravit Physiol 7: P13-P15, 2000
4. Shapiro JR, Sponsellor P, Hickman C, McCarthy E, Rossiter K, Santiago H, Bober M. Treatment of Osteogenesis Imperfecta, Type IA with Intravenous Pamidronate. Calcif Tissue Int'l. 2002
5. Yu-Yahiro JA, Michael RH, Dubin NH, Fox, KM Sachs, M, Hawkes WG, Hebel R, Zimmerman SI, Shapiro FR, Magaziner, J Serum and urine markers of bone metabolism during the year after hip fracture. J Am Geriatr Soc, 49:1-7, 2001
6. Shapiro JR, Schneider V. Countermeasure development: future research targets J Gravit. Physiol 7:1-4, 2000
7. Shapiro JR, McCarthy EF, Rossiter K, Ernst K, Gelman R, Fedarko N, Santiago HT, Bober M.. Effect of intravenous Pamidronate on Bone Mineral Density, Bone Histomorphometry and Parameters of Bone Turnover in Adults with type 1A Osteogenesis Imperfecta. Calcified Tissue International, 72:103-12, 2003
8. Grzeski, Wj, Chester R. Frazier Jay R. Shapiro, Paul D. Sponsellor, Pamela Gehron Robey, Neal S. Fedarko. Age-related Changes in Human Bone Proteoglycan Structure: Impact of Osteogenesis Imperfecta. J Biological Chem. 277:43638-47, 2002
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● Ongoing Research Support

Title: Treatment of Adult Osteogenesis Imperfecta Patients with Forteo. 9/1/05-8/31-10
Co-Investigator
The purpose of this research is to evaluate teriparatide treatment of osteoporosis in adult OI patients in whom bisphosphonate treatment is known to be marginally effective.
Title: Charitable and Research Foundation, Rockville, MD June 1, 2000-May 31, 2009
PI:
To establish the Directorship, Osteogenesis Imperfecta Clinic, Kennedy Krieger Institute) and support ongoing clinical research.
These funds have supported the development of the Osteogenesis Imperfecta Registry which is a investigator initiated, research tool, of national scope, for investigators requiring access to a database of these patients.
Title: Bisphosphonates as Countermeasure to Spaceflight Induced Bone Loss. NASA: (USRA Subcontract 04490.072-Bisphosphonate)
Co-Investigator
This research protocol will test the effectiveness of oral and intravenous bisphosphonates in limiting bone loss during 6 months of spaceflight on the International Space Station.
Edward and Stella Van Houten Foundation 2006-2007. $50,000
PI: JR Shapiro: The Impact of Nutrition on Bone Growth in Osteogenesis Imperfecta
Charitable and Research Foundation 2006-2010 $200,000
PI: JR Shapiro: The Osteogenesis Imperfecta Registry

Invited Speaker - Guan-Wen Wu

- **Personal Data**

Name: Kuan-Wen, Wu / M.D.
Birth: April 18th, 1978
Email: wukuanwen@gmail.com

- **Education**

Medical school: National Taiwan University School of Medicine, MD Degree 1996-2003

- **Position**

1. Residency, Department of Orthopedic Surgery of National Taiwan University Hospital. July, 2003 ~ June, 2008.
2. Attending Physician, Department of Orthopedic Surgery of National Taiwan University Hospital, Yun-Lin Branch. July 2008~ now (current position)
3. Lecturer, Department of Orthopedic Surgery of National Taiwan University Hospital, January 2011 ~

Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

May 21, 2011

May 21st - 22nd, 2011

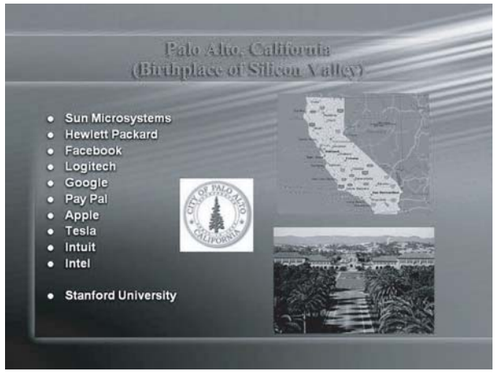
Taipei, Taiwan

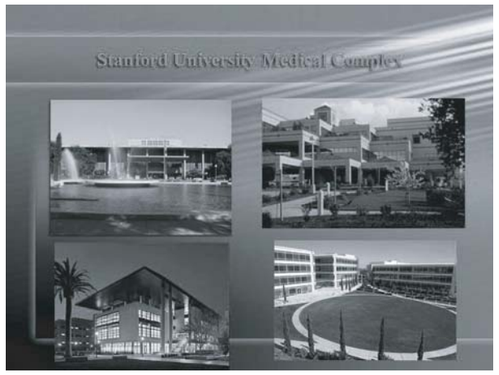
2011 OIS - US and Taiwan
Daily Program

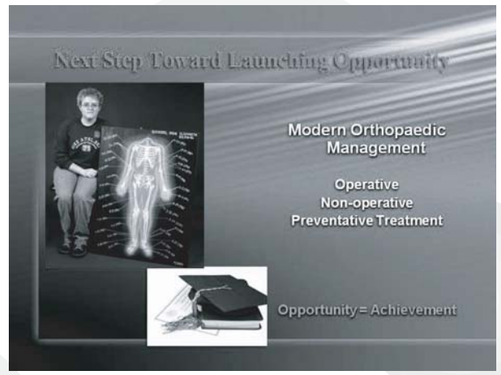
Day 1 - Saturday, May 21, 2011
Moderator: Kuan-Ju Chen (Taiwan)

09:10 - 10:00, Saturday, May 21, 2011
Invited Speaker: Dr. James G Gamble (USA)
B1 Level, Metro Suite

OI means Opportunity Ignited







What is Known ?

1972 *Amer. J Psychiatry*


Osteogenesis Imperfecta: Psychological Function

- 12 Children with OI
  - Ages 6 – 17 years
- Average 50 fractures
  - Multiple long hospitalizations
  - Prolonged immobilizations
  - Multiple operations
- Emotional & Cognitive
  - "Unusually bright cheerful"
  - None had psychopathology
- Average or better school performance

What is Known ?

2003 *Pediatrics*


Temperament and Physical Performance in Children With Osteogenesis Imperfecta

- 35 Children with OI
  - Ages 1 - 12 years
    - Average 7.5
  - 20 girls 15 boys
  - Multiple psychometric scales
- Temperament
  - "Behavior style"
  - Activity, mood, distractibility persistence, regularity, predictability
- No different from peers
- Socially adept from a young age

What is Known ?

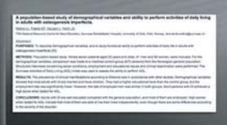
2003 *Am J Medical Genetics*


Personality and Stereotype in Osteogenesis Imperfecta: Behavioral Phenotype or Response to Life's Hard Challenges?

- 55 Adults with OI
  - Ages 19 – 67 years
  - 30 females 25 males
- Articulate in Conversation
  - Bright, talkative, "up"
- Excelled in School
  - Most went to college

What is Known ?

2010 *Disability & Rehabilitation*



- 97 Adults with OI
  - Average age 44 years
  - 56 women 41 men
  - Norway Center Rare Diseases
- High Educational Level
  - 50 % College or University
    - 36 % General population of Norway
  - 75% Employed
- "Social and adaptable"
- (78% Type I, 12% Type IV, 10% Type III)

What is Known ?

1980 *J Bone Joint Surgery*


Aftermath of Osteogenesis Imperfecta: The Disease in Adulthood

- 31 Adults with OI
  - 951 Fractures
    - 91% prior to skeletal maturity
    - 67% Lower extremities
  - 8 women 23 men
  - Ages 17 – 51 years
    - Average 29
  - North Carolina Orthopaedic Hospital
- Educational
  - 33% Attended College
  - 65% Employed
  - 25% Students
- "Intelligent, productive socially & psychologically adapted"

Role of Orthopaedics

Nicholas Andre (1658 – 1759)

Persons with OI Have an Early Experience with Orthopaedic Surgeons

Orthopaedics (*orthos* straight; *paedia* child)

Andre in 1741

Role of Orthopaedics

Goals of Treatment

- Maintain Comfort
  - Treat and prevent fractures
- Minimize deformity
  - Long bone rodding
- Maximize function
  - Work with PT and OT
- Enhance social integration
  - Mobility
  - Independent ADL
  - Education & Employment

Role of Orthopaedics

Methods of Treatment

- Early use of mobility devices and orthotics
- Decrease down time in casts to minimize osteoporosis

Role of Orthopaedics

Methods of Treatment

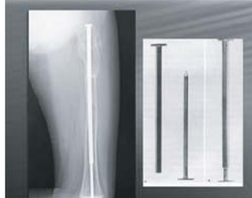
- Rodding of long bones
  - Telescopic Intramedullary rods
- Bailey-Dubow
- Fassier Duval
- Williams Rod
- Flexible rods
- Rush rods

Role of Orthopaedics

Methods of Treatment

- Rodding of long bones
- 1963 Bailey-Dubow: The first Telescopic "Growing" intramedullary rod

Role of Orthopaedics

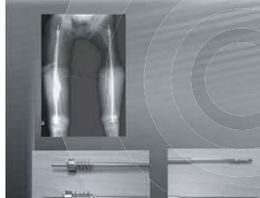


Methods of Treatment

- Rodding of long bones
- 1963 Bailey-Dubow: The first Telescopic "Growing" intramedullary rod


Complications of Intramedullary Rods in Osteogenesis Imperfecta: Bailey-Dubow Rods Versus Nonelongating Rods

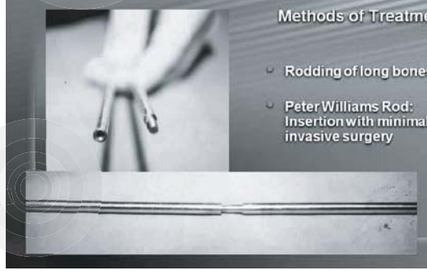
Role of Orthopaedics



Methods of Treatment

- Rodding of long bones
- Fassier- Duval Expanding

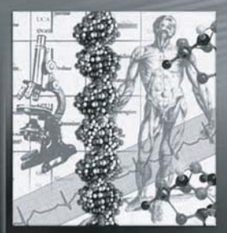
Role of Orthopaedics



Methods of Treatment

- Rodding of long bones
- Peter Williams Rod: Insertion with minimally invasive surgery

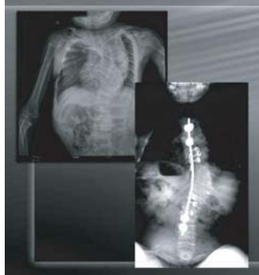
Role of Orthopaedics



Methods of Treatment

- Rodding of long bones
- More Research needed on minimally invasive surgery, on improved implants

Role of Orthopaedics



Methods of Treatment

- Management of Scoliosis
- Non-operative
- Operative
  - Multiple levels of fixation
  - Wires, Hooks, Pedicle screws

Role of Bisphosphonates

Methods of Treatment

- Medical Management
  - 1992 Pamidronate
  - Increases bone density
  - Used "Off Lable" in the USA
- Dr Shapiro's Work

OI = Opportunity Ignited

Provided with

- Protection of the Law
  - Equal opportunity
- Orthopaedic and Medical Management
- What can be Achieved?

Materials & Methods

- Longitudinal study conducted Packard Hospital @ Stanford
- 31 Adults with OI
  - 20 Women 11 Men
  - Average Age 40 yrs
  - Range 26 – 69 years

OI = Opportunity Ignited

31 Adults with OI

- Average 40 yrs (26 – 69)
- Sillence Type
  - Type III 22 (71%)
  - Type IV 3 (10%)
  - Type I 6 (19%)
- Ambulation
  - Independent 13 (42%)
  - Power Chair 18 (58%)

31 Adults with OI

- Educational Achievement
- College Graduate 29 (93%)
- Bachelors 93%
- Masters 10%
- Professional 13%
  - Ph.D 3
  - LLB 1

How does this Compare?

31 Adults with OI		US General Population	
College Graduate	93%	College Graduate (p <.001)	27%
Bachelors	93%	Bachelors	27%
Masters	10%	Masters	9%
Doctorate	13%	Doctorate (p <.05)	3%
Unemployed (High School only)	6% (2)	Unemployed	9%

What are they Doing?

31 Adults with OI

31 Adults with OI

Teachers, Biophysicist, Business owners, IT, Accountant, Real Estate, Lawyer, CPA, Pharmacist, Web Designer, Biochemist, Communications, Newspaper reporter, Software design, Human Relations, Politics

Why these Results?

Academic Achievement

Academic Achievement

- Motivation
- Verbal Ability
- Concentration

Known attributes for success

How did they do it?

Answer: Teamwork!

If I have seen further.... It is by standing on the shoulders of giants.
Sir Isaac Newton 1675

OI = Opportunity Ignited

If I have seen further.... It is by standing on the shoulders of giants.
Sir Isaac Newton 1675

- A child with OI stands on the shoulders of a team of giants
- It is the team that makes it happen....Opportunity Ignited

Xie Xie

10:00 -10:50, Saturday, May 21, 2011
Invited Speaker: Dr. Jay R. Shapiro (USA)
B1 Level, Metro Suite

Osteogenesis Imperfecta: Current Research and Treatment

Brittle bones in Osteogenesis Imperfecta are due to mutations in several genes which regulate the production of type I collagen. Type I collagen is the main structural protein in bone and connective tissue such as tendons and ligaments. Gene mutations change either the amount of type I collagen that is incorporated in bone (less bone collagen formed), or allows the incorporation of abnormal collagen into bone that weakens its strength. The relation of genotype (gene mutations) to phenotype (clinical expression of the mutation) will be discussed. The effectiveness of different bisphosphonate drugs on bone strength in children and adults with OI is discussed. While effective in OI children, the bisphosphonates are less effective in preventing fractures in OI adults.

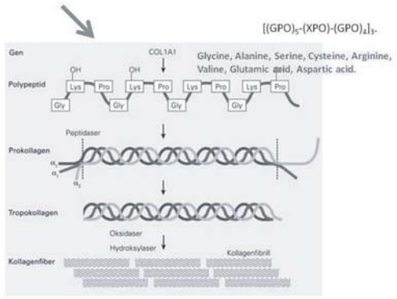
Osteogenesis Imperfecta: Current Research and Treatment

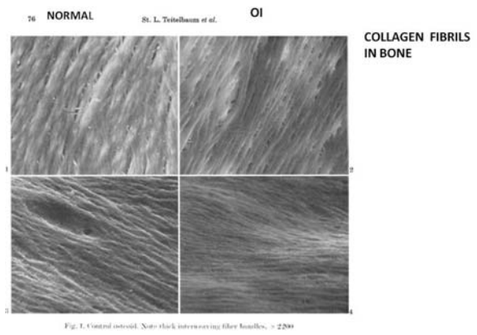
Jay R. Shapiro, MD
Director, Bone and Osteogenesis Imperfecta Dept.
Kennedy Krieger Institute and Johns Hopkins School of Medicine
Baltimore, MD, USA

Topics

- Collagen Mutations in OI
- Genotype/phenotype relationships
- Questions regarding treatment issues in children and adults
- Strategies for the future

COLLAGEN GENES



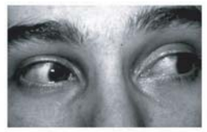


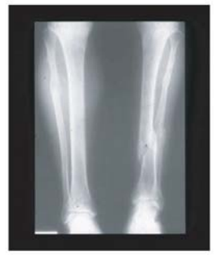
OI Clinical Types and Inheritance

OI Types I-IV

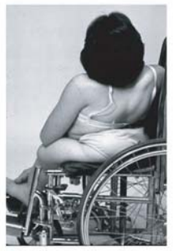
I, II, III IV, V Dominant inheritance

OI Types VI, VII, VIII Recessive Inheritance





OI Type III



Collagen Mutations and Matrix Composition

type I: Null allele (quantitative defect)

premature termination codon due to nonsense mutation or out of frame deletion/insertion

½ normal amount

type II, III, IV: (qualitative defect) substitution of bulkier AA

(Glycine, Alanine, Serine, Cysteine, Arginine, Valine, Glutamic acid, Aspartic acid.

(AA Substitutions, Deletions, Insertions, Duplications, RNA Splice mutations, Frameshifts

OI type V, VI: No collagen mutation identified

Mutant alpha- chain is Incorporated into matrix DOMINANT/NEGATIVE EFFECT

OI Type VII: Recessive

(Glorieux: Northern Nation, Canada)

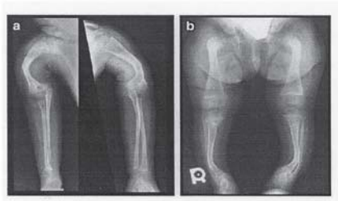


Figure 2. (a) Patient V-3, age 3 years 5 months, showing selective shortening of the humeri (rhizomelia). (b) Patient V-6, age 4 months, showing bilateral coxa vara. Bowing deformity of the lower extremities is also evident.

Gene Mutations in OI Syndromes

COL1A1
collagen, type I, alpha 1
COL1A2
collagen, type I, alpha 2
CRTAP
cartilage associated protein
LEPRE1
leucine proline-enriched proteoglycan (leprecan) 1
PPIB
peptidylprolyl isomerase B (cyclophilin B)

SERPINH1 **(HSP 47)** serpin peptidase inhibitor, clade H (heat shock protein 47), member 1, (collagen binding protein 1)
FKBP65 (FKBP 10)
FK506 binding protein 10, 65 kDa
PLOD2 and **FKBP 10** (Bruck Syndrome Type 2) procollagen-lysine, 2-oxoglutarate 5-dioxygenase

Mutations identified in the CRTAP/LEPRE1 complex disrupt the proline 3 hydroxylation OF Pro986 in type I collagen.

CRTAP + Lepre1

(P3H1)

+

PPIB gene encodes CyPB cyclophylin B

↓

3-OH-Proline 986

Genes and Phenotypes

I II III IV Col(I) α-1 α-2

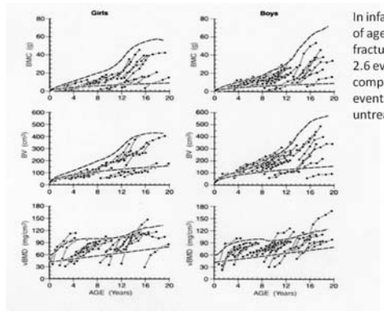
DOMINANT

V VI Mutation unknown

VII VIII CRTAP, LEPRE1, PPIB, HSP 47, FKB165

RECESSIVE

Pamidronate Rx OI: Glorieux and Rauch



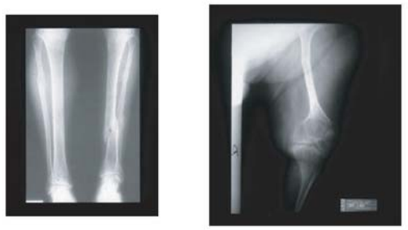
In infants under 2 years of age with severe OI, fracture incidence was 2.6 events per year compared with 6.3 events per year in untreated controls.

Pamidronate and Fracture Rate

Bone density and fracture risk are not the same

Pamironate treatment will increase bone density and decrease fracture rate by ½ in most, but not all OI children.

Genotype and Phenotype Relationships



OI Type V

TREATMENT RECOMMENDATIONS FOR CHILDREN (KKI)

- At the Kennedy Krieger Institute we recommend bisphosphonate treatment in infants born with multiple fractures, long bone deformity and demineralization on skeletal x-rays.
- Although there are no criteria for treating older children, we consider treating children with either a total of 3 fractures or more than 2 fractures in one year including vertebral fractures and with bone mineral content/bone mineral density DXA Z- scores less than -2.0.
- Children approaching puberty are usually not treated because of the effect of puberty in decreasing fracture risk.

Pamidronate Treatment : How Long to Treat ?
Rauch F. et al Histomorphometry

- Average bone mineral density increased by 72% in the first half of the observation period, but by only 24% in the second half. Mean cortical width and cancellous bone volume increased by 87 and 38%, respectively, between baseline and the first time point during treatment ($P < 0.001$ for all changes). Thereafter, cortical width did not change significantly, but there was a trend ($P = 0.06$) toward higher cancellous bone volume.
- Average bone formation rate on trabecular surfaces decreased by 70% after pamidronate treatment was initiated and showed a trend toward a further decline in the second part of the study interval.
- **CONCLUSION:** The gains that can be achieved with pamidronate treatment appear to be largely realized in the first 2-4 yr.

Genotype Phenotype Relationships

- **COL1A1 and COL1A2 mutations**
- **Most common mutation was serine for glycine:**
- **Alpha-1 mutations more severe than alpha-2 mutations**
  - **Shorter stature**
  - **Short stature correlated with *location* in alpha 2 but not in alpha 1 chain**
- **Mutations in first 120 N-terminal AA associated with blue sclerae.**
- **Alpha-1 haploinsufficiency: taller, heavier with higher LS BMD.**

No relation in helical group of LS-BMD or histomorph. results with a(I) chain affected or type of amino acid substituted.

Rauch, F. Eur J Hum Genet. 2010

CURRENT TREATMENT IN OI CHILDREN AND ADULTS

- Calcium and Vitamin D
- Bisphosphonates
  - oral: alendronate, residronate
  - intravenous: pamidronate, Reclast
- Investigational
  - Forteo (teriparatide)
  - Growth Hormone
  - Vibration treatment

Treatment with ***Oral*** Bisphosphonates

- Phillipi (Cochrane, 2008): Evidence suggests oral or intravenous bisphosphonates increase BMD in children and adults with OI. **These were not shown to be different in their ability to increase BMD; it is unclear whether either treatment decreases fractures.**
- Ward L, et al: Conclusions: **Oral ALN** for 2 yr in pediatric patients with OI significantly decreased bone turnover **and increased spine areal BMD but was not associated with improved fracture outcomes**
- Rauch F et al : **Residronate (Peds)**. In contrast, no significant treatment differences in bone mass and density were found at the radial metaphysis and diaphysis, the hip, and the total body. Histomorphometric analysis of transiliac bone biopsies at the end of the study period did not show a significant treatment difference in cortical width, trabecular bone volume, or parameters of bone turnover. **Similarly, there was no detectable treatment effect on vertebral morphometry, second metacarpal cortical width... or number of new fractures.**

Bisphosphonate Effect on Fracture Rate in Adult OI: Shapiro J. et al 2010

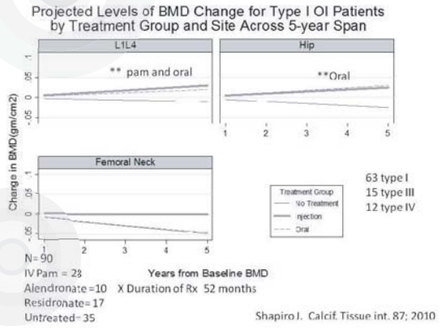
Assessed for 5 year periods before and after Rx

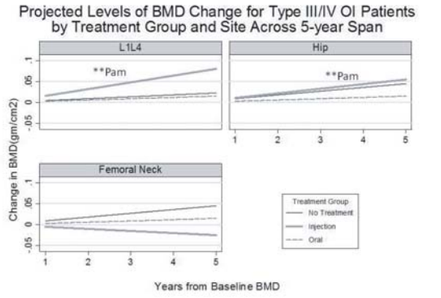
51 treated and 22 non- treated OI adults.

No treatment effect on fracture rate in type I patients

Fracture rate decreased in type III patients (p=0.054) following pamidronate but not after oral bisphosphonates.

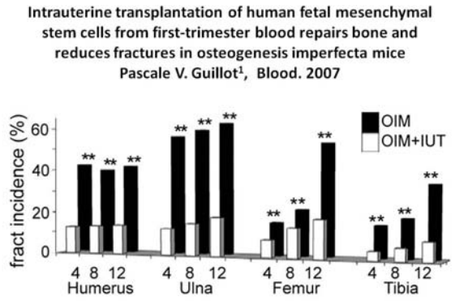
Shapiro J. et al. Calcif. Tissue int. 87; 2010





Shapiro J. Calcif. Tissue int. 87; 2010

Intrauterine transplantation of human fetal mesenchymal stem cells from first-trimester blood repairs bone and reduces fractures in osteogenesis imperfecta mice
Pascale V. Guillot[1], Blood. 2007



New Treatment Strategies: Way in the Future !

Molecular Approach to Severe OI
(Dominant/Negative disease)

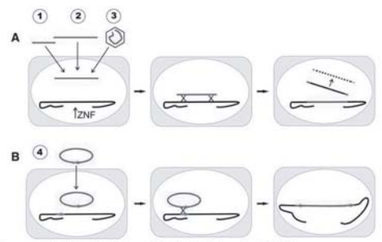
1. Allogeneic bone marrow transplant
2. Inactivate the mutant allele
   - hammerhead ribosomes
   - short intefering RNA (siRNA)
   - micro-RNA
   - Adenoviral insertion of alpha-2(I) cDNA into mesenchymal cells
3. Mesenchymal cells over-expressing a normal COL1A1 allele

Genetc approach to Quantitative Defect: Null allele

1. Inactivate the mutant allele and add a functional allele to the patient's mesenchymal cells and transplant
2. Remove mutant segment of the gene by homologous recombination
   - Zinc finger nucleases to excise and insert

(also applicable to dominant negative OI)

Genetic recombination pathways and their application for genome modification of human embryonic stem cells
Mikko Nieminena, EXPERIMENTALCELLRESEARCH316(2010)2578



1. Linearized plasmid delivery for HR. 2. Linearized BAC delivery for HR. 3. Viral delivery for HR.

Summary

- There are now 8 types and 7 (+) genes responsible for OI
- DNA analysis (not skin biopsy) should be used for diagnosis
- IV bisphosphonate treatment is effective in most children
- Oral bisphosphonate is not effective
- Bisphosphonates are not effective in adults except some type III/IV individuals.

11:00 -11:30, Saturday, May 21, 2011
Invited Speaker: Dr. Caden Feng-Shu Brennen (USA)
B1 Level, Metro Suite

The Osteogenesis Imperfecta (OI) Registry

One of the obstacles to performing quality research on a rare disorder like OI is the difficulty in finding enough people to be part of a study. Today, more than ever before, people with OI have opportunities to participate in research. Being part of the growing OI Registry is one important way they can help enhance the progress of clinical research in OI.

OI Registry website:
http://www.osteogenesisimperfecta.org/oir/

The Osteogenesis Imperfecta (OI) Registry

Caden Feng-Shu Brennen(Chang), MS
OI Registry Manager
Kennedy Krieger Institute,
Baltimore, MD

Agenda

- What is the Osteogenesis Imperfecta Registry?
- What information is in it?
- How does it work?
- Why is it important?

What is the Osteogenesis Imperfecta(OI) Registry?

- The OI Registry is the FIRST on-line confidential OI database which is a joint effort between the Kennedy Krieger Institute and U.S. OI Foundation (Launched in May, 2006)
- The OI Registry is a patient-contributed database composed of demographic information about children and adults with OI.
- The purpose of the OI Registry is to create an up-to-date list of people with OI who can be easily contacted and through that, to encourage the clinical research efforts in OI.

OI Registry population (as of Feb, 2011)

- Over 1740 members.
- Includes people of all ages and all types of OI; deceased persons are included.
- 40 countries represented:
  9% of OIR members live outside of the United States.
- 2 members live in Taiwan (Taipei).

What information is in the OI Registry?

- Member's contact information
- OI history (very inclusive)
  Examples are:
  - Family history
  - Fracture history
  - Child abuse issue
  - Questions related to pregnancy
  - History of heart disorders
- Medical characteristics
- Prior treatments including surgical history
- Educational and employment

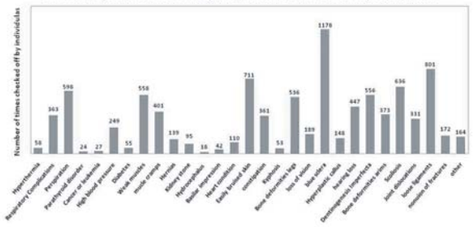
OI Registry members' general information

- Gender:
  64% are female and 36% are males.
- Age:
  48% are under 30.
  34% are over 30 but under 49.
  17% are over 50.
  1% deceased OI patients
- OI type:
  44% reported mild OI.
  12% reported moderate OI.
  26% reported severe OI.
  Others did not report or did not know their type.

Cont'd

- Mobility:
  61% are able to walk unaided.
  17% use either manual or electric wheelchairs.
  7% use crutches and/or a walker.
  2% report no means of mobility.
- Fractures:
  the majority-61%-indicated between 1 to 30 lifetime fractures.
- Child abuse issue:
  31% reported they encountered child abuse issues.

Medical problems OI Registry members have experienced



Medical characteristics reported in high frequency by the OI Registry members include (among many): blue sclera, loose ligaments, easily bruised skin, scoliosis, Dentinogenesis Imperfecta, arm and leg deformities, scoliosis, hearing loss, respiratory complications, weak muscles, muscle cramps.

Why is the OI Registry important?

From Patients and family point of view:

- Members contribute valuable information about their experience with OI and encouraging research that will lead to a better understanding of OI in all age groups and all types.
- Members have opportunities to participate in research.

From OI investigators point of view:

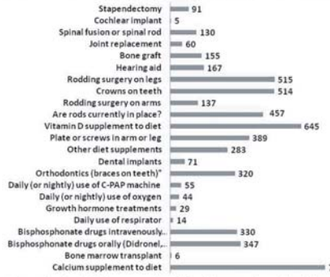
- A pooled database has been shown to promote research.
- Registry facilitates contacting large pool of potential research study participants.
- Registry allows investigators to consider research projects they may have not thought before.

OI Registry brings investigators and potential research study participants together.

Cardiovascular Disease in OI patients

- The OI Registry contains the following question:
  Have you had surgery on aortic or mitral valve?
- 110 of 1485 (7.4 %) gave a positive answer to this question.
- In response to this finding a study titled "Assessment of Medical and Surgical Aspects of Cardiovascular Disease in OI" is underway.
  (collaborating with members of the medical and surgical cardiology program at Johns Hopkins Hospital.)

Surgical and medical treatment OI Registry members have had



Treatments reported in high frequency by OI Registry members include(among many): surgery (rodding), bisphosphonate drugs, supplements (Vitamin D/calcit dental/orthodontic work.

How does the OI Registry work?

- When an approved OI clinical research is available, OI Registry members will be informed by e-mail and instructed how to contact the researcher.
- Participation is completely voluntary and information is secured for confidentiality.
- The Registry does not permit direct access by the investigator to the database or to study subjects.

New questions have been continually added into the Registry based on suggestions from Registry members and medical researches.

Examples:

- Female only question were added in April, 2010.
- Educational and employment question were added in May, 2010.
- Eye- and skin-related questions now have IRB approval and are currently added to the OI Registry.

What's next?

- The OI Registry needs to continue growing.
- On average people with OI report having 2-3 family members who also have OI. People who have already registered are urged to encourage everyone who has OI in their family to register. Parents are encouraged to enroll their children. There is certainly value in the data of deceased individual as well, for retrospective review studies.
- The value of the OI Registry to the community and to researchers increases with increasing numbers of members.

If you are already a part of the OI Registry, please check and update your information to keep it current!

Completed and ongoing research protocols

Completed

1. **A study to assess the effectiveness of teriparatide (FORTEO) for increasing bone mass and improving bone structure in adults affected with Osteogenesis Imperfecta (OI)** (Jay Shapiro, Kennedy Krieger Institute; Eric Orwall, Oregon Health Sciences University; Brendan Lee, Baylor Medical Center)
2. **The Impact of Life Experience of Individuals with Osteogenesis Imperfecta on Reproductive Decision Making.**(Marta Szybowska, Hospital for Sick Children-University of Toronto)
3. **Attitudes of Adults with Osteogenesis Imperfecta Towards Preimplantation Genetic Diagnosis** (Elizabeth S. Janoski, Case Western University)
4. **Bisphosphonate Associated Osteonecrosis (BON) of the Jaw in Children** (Tarak Srivastata, University of Toronto)
5. **Epidemiology Study of the OI Registry Population** (Elizabeth Martin, Oregon Health Science Universisty)

Completed and ongoing research protocols

Ongoing:

1. **Natural History and Outcomes of Treatment of Scoliosis in Osteogenesis Imperfecta** (Paul Sponseller, Johns Hopkins Medical Institutes)
2. **The Impact of Nutrition on Bone Growth in Osteogenesis Imperfecta** (Jay Shapiro, Kennedy Krieger Institute)
3. **Incidence of Open-Angle Glaucoma in OI Individuals** (Rand Allingham, Duke University)
4. **The Genotype and Phenotype of Dentinogenesis Imperfecta** (John Timothy Wright, University of North Carolina)
5. **The Longitudinal Study of Osteogenesis Imperfecta** (Jay Shapiro, Kennedy Krieger Institute; Jessica Adsit, Oregon Health Sciences University; Mary Mullins, Baylor Medical Center)

Thank you

11:30 -11:55, Saturday, May 21, 2011
Invited Speaker: Ms. Kuan-Ju Chen (Taiwan)
B1 Level, Metro Suite

Impact of Rare Disease Prevention and Orphan Drug Act for OI

(Abstract not available as of May 10, 2011)

11:55 -12:20, Saturday, May 21, 2011
Invited Speaker: Mr. Jian-Chi Chen (Taiwan)
B1 Level, Metro Suite

Taiwan OI Association Overview

(Abstract not available as of May 10, 2011)

Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

May 22, 2011

May 21st - 22nd, 2011

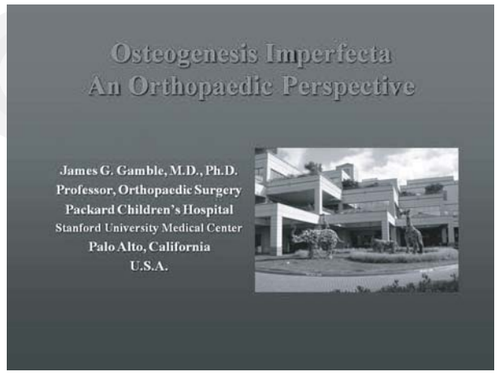
Taipei, Taiwan

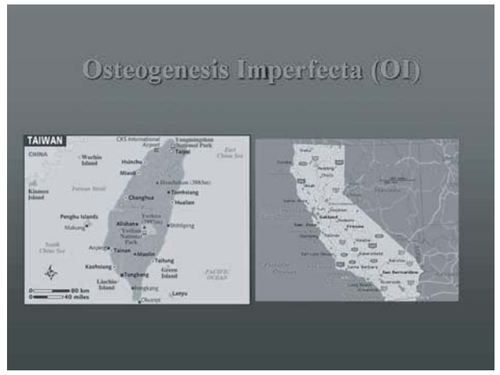
2011 OIS - US and Taiwan
Daily Program

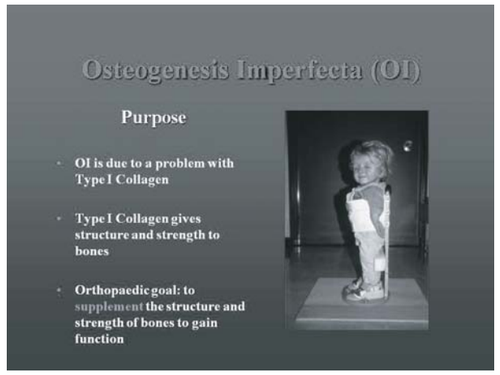
Day 2 - Sunday, May 22, 2011
Moderator: Ken N Kuo (Taiwan)

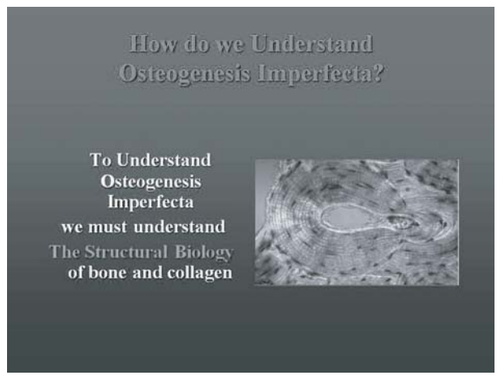
09:15 - 09:55, Sunday, May 22, 2011
Invited Speaker: Dr. James G Gamble (USA)
B1 Level, Metro Suite

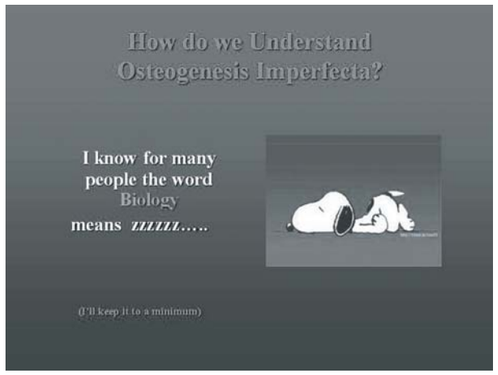
Osteogenesis Imperfecta: An Orthopaedic Perpective

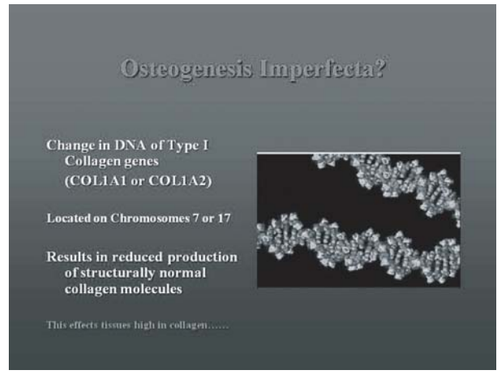


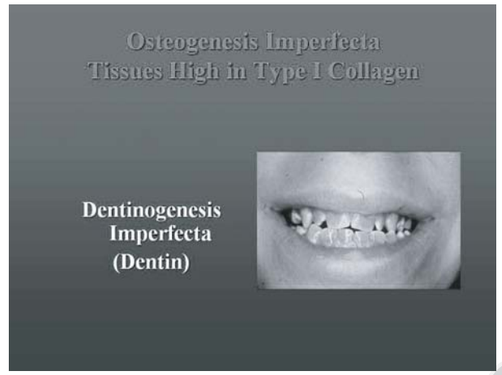


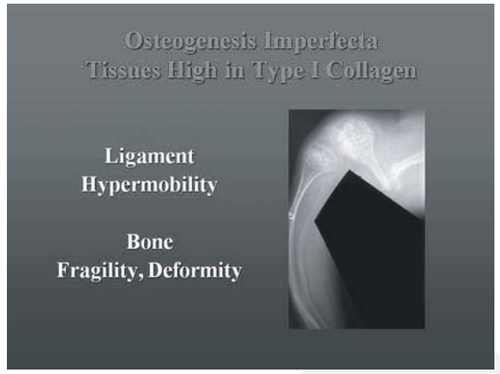


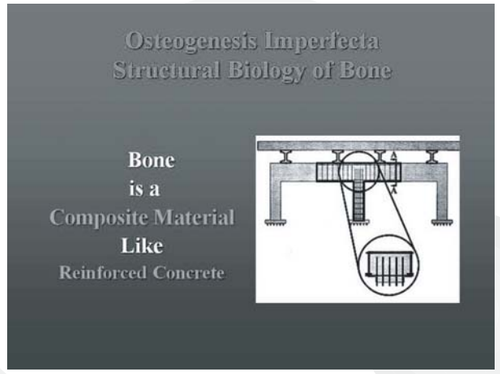








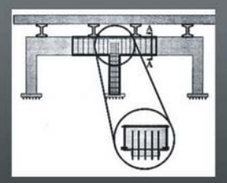




Osteogenesis Imperfecta
Structural Biology of Bone

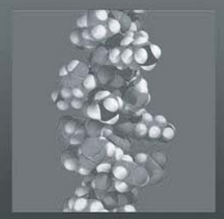
Cement = Calcium

Iron Rod = Collagen



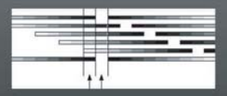
Osteogenesis Imperfecta
A Disease of Type 1 Collagen

The
Iron Rod
Is
insufficient
In
OI



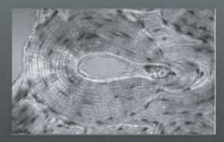
Osteogenesis Imperfecta
Type 1 Collagen

Normal Rod
Is necessary
For Normal
Calcification



Osteogenesis Imperfecta
Type 1 Collagen

Collagen
Orientation
Permits
Bone Formation



Osteogenesis Imperfect
Type 1 Collagen

Normal Collagen
Normal Packing
Normal Bone

Osteogenesis Imperfecta
Type 1 Collagen

Irregular Collagen
Irregular Packing
Weakened Bone

Clinical Phenotypes of OI

Severity
of the
Phenotype
Depends on where
The change in DNA
Occurs

Genotypes of OI
Heterogenous Condition

Mutation Screening
>130 Genotypes
sequenced

Insertions
Deletions
Missense
Nonsense

Clinical Phenotypes: Classification

Sillence J Med Genet 1979; 16:101

- Type I
  - Mild fragility, AD
- Type II
  - Extreme fragility
- Type III
  - Variable, AR, AD
- Type IV
  - Intermediate, AD

Clinical Phenotypes

Sillence J Med Genet 1979; 16:101

Type I

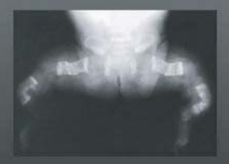
- Most common & mildest
- Normal stature
- Blue sclera
- Dentinogenesis imperfecta
- Late hearing Loss
- Decreased amount of normal Type 1 Collagen (one allele)

Clinical Phenotypes

Sillence. J Med Genet 1979; 16:101

Type II

- Most severe form
- Usually lethal from pulmonary insufficiency
- Multiple prenatal fractures
- Deformity head, trunk, limbs
- Severe collagen deficiency



Clinical Phenotypes

Sillence. J Med Genet 1979; 16:101

Type III

- Most variable form
- Short stature
- Blue sclera
- Barrel-shaped chest
- Scoliosis
- Abnormal collagen molecule

Clinical Phenotypes

Silence. J Med Genet 1979; 16:101

Type III

- Most variable form
- Short stature
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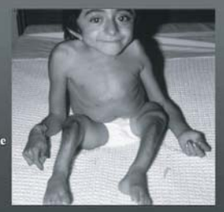
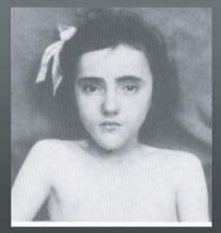


Clinical Phenotypes

Silence. J Med Genet 1979; 16:101

Type IV

- Intermediate severity
- More fractures & shorter than Type I
- Triangular face
- Normal sclera



Clinical Phenotypes

Silence. J Med Genet 1979; 16:101

Type IV

- Intermediate severity
- More fractures & shorter than Type I
- Triangular face
- Normal sclera

Clinical Phenotypes

Glorieux et. al. J Bone Mineral Res 2000; 15:1650

Many Patients do not fit exactly into this Classification

- Bruck Syndrome
- Osteoporosis-pseudoglioma syndrome

Treatment

Goals of Treatment

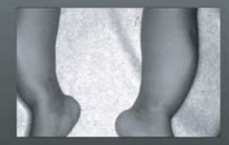
- Decrease fracture frequency
- Correct deformities of the long bones
- Maximize mobility & Independence

Non-surgical Treatment

- Bracing
  - Exoskeleton and Standing Frames
  - Permits upright weight bearing

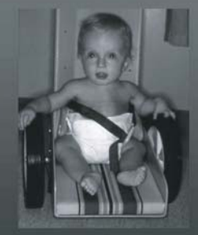
Non-surgical Treatment

- Bracing
  - KAFOs & AFOs
- Physical & Occupational therapy



Non-surgical Treatment

- Mobility
  - Wheelchairs
  - Powerchairs
  - Motor vehicles



Non-surgical Treatment

- Bracing
- Mobility
- Independence

Non-surgical Treatment: Bisphosphonates

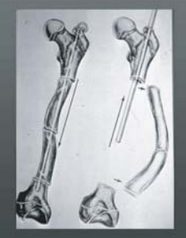
Devogelaer. Skeletal Radiol 1987; 16:360

- Alendronate (Fosamax) Pamidronate (Aredia)
  - Pyrophosphate analogue
    - P-O-P bond
    - P-C-P bond
  - Deposit on bone surface
  - Antiresorptive (enhance

Surgical Treatment

Sofield & Millar. JBJS 1959; 41A: 1371

- Multiple Osteotomy;
- Intramedullary Rodding

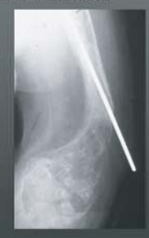


Surgical Treatment

Problems with Rigid Rods

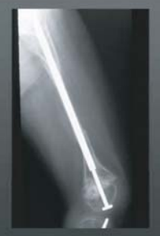
Sofield & Millar. JBJS 1959; 41A: 1371

- Bone tends to outgrow the rod
- Fracture beyond the rod
- Rod tends to back out or cut-out with distal deformity



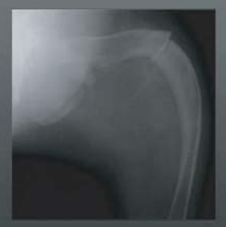
Surgical Treatment
Bailey, Dubow. Surgical Forum 1963; 14: 455

- Use of Telescoping rods with a T-piece at each end
- One end in the proximal epiphysis
- The other end in the distal epiphysis
- As the bone grows the rod "grows"



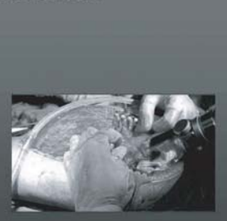
Surgical Treatment

- 13 y/o boy with OI
- Use w/c in the community for 5 years
- Gets around the home by scooting
- Short limb with Pain & motion of thigh



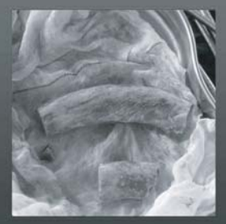
Surgical Treatment

- Expose the bone from trochanter to straight distal portion.
- Osteotomy and remove deformed bone
- Usually is thin and lacks a medullary canal



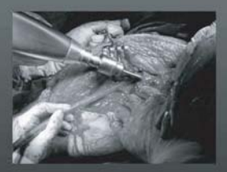
Surgical Treatment

- Save "best fit" bone
- Cut it into relatively straight segments
- Carefully over-ream the segments so rod passes easily through all segments



Surgical Treatment

- Ream proximal femur through trochanter,
- Ream the distal, femur
- Cross Physis with the Rods
  - No growth problems

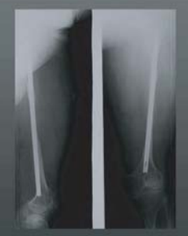


Surgical Treatment

- Insert IM rod from one end, through the overreamed fragments, into the distal femur
- Do not attempt to regain full length
- Usually extra bone for bone graft

Surgical Treatment

- 4 year follow-up
- Union of the osteotomies
- Pain free movement of the hip and knee
- Community ambulator



Surgical Treatment

- Residual LLD
- 3 cm shoe lift

Surgical Treatment
Gamble, Strudwick, Rinsky, Bleck. JPO 1988; 8: 645

- IM Rods protect the bones
- High rate of complications from IM rodding
- Complications from static rods were more complex than those from B-D rods

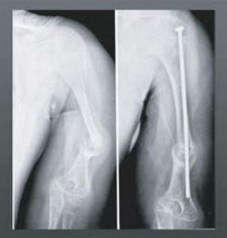
TABLE 3. *Complications following the insertion of 42 Bailey–Dubow rods and 66 nonelongating rods*

	Bailey–Dubow	Nonelongating	
Complications	29 (69%)	36 (55%)	p = 0.16
Reoperations	8 (19%)	19 (29%)	p = 0.36
Replacements	5 (12%)	16 (24%)	p = 0.14
Migrations	11 (26%)	28 (42%)	p = 0.064
Proximal	9	14	
Distal	2	14	
Bent rod	2	2	
Fracture	5	4	
Shaft	2	2	
Beyond rod	3	2	
Nonunion	0	2	
T piece	10	—	
Unscrewed	9	—	
Broken	1	—	
No elongation	1	—	

Problems in OI
Gamble,Rinsky,Strudwick, Bleck. JBJS 1988; 70A: 439

Fracture Nonunion

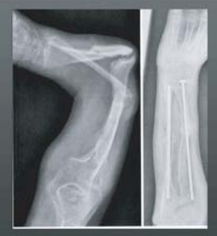
- Population Base: 52 Patients
- 12 Nonunions; 10 Patients
- 20 Percent had a Nonunion
  - 5 Femoral
  - 4 Humeral
  - 1 Radius
  - 1 Ulna
  - 1 Ramus



Problems in OI
Gamble,Rinsky,Strudwick, Bleck. JBJS 1988; 70A: 439

Fracture Nonunion

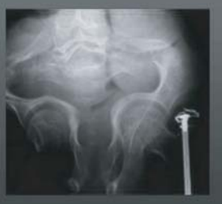
- 9 Patients
  - Excision of nonunion
  - Shortening of bone
  - IM Rodding
  - Bone Graft
- 8/9 Surgical cases united
- 1 Amputation



Problems in OI
Lee, Gamble, Moore, Rinsky. JBJS 1995; 77A: 1352

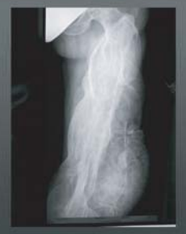
Gastrointestinal

- Protrusio causes inlet and outlet insufficiency



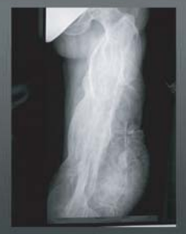
Problems in OI: Hyperplastic Callus
Battle & Shattock. Proc Roy Soc Med 1908; 1: 83

- Rare ~1.5% OI Cases
- Occurs spontaneous, post op, post injury
- Radiograph: Large Mass Calcified Callus



Problems in OI: Hyperplastic Callus
Fairbank & Baker. Brit J Surg 1948; 36: 1-16

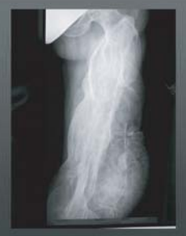
- Confused with Osteosarcoma
- Decreases Joint Motion



Problems in OI: Hyperplastic Callus
Fairbank & Baker. Brit J Surg 1948; 36: 1-16

Differentiation from Osteosarcoma

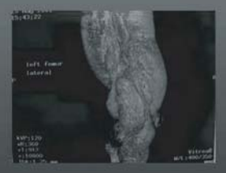
- Absence of Infiltration into soft tissues or medullary bone
- Absence of Cortical Destruction
- Homogenous center of callus without necrosis on MRI



Problems in OI
Case Report
Stanford University

Hyperplastic Callus

- 39 y/o male
- Ph.D. Biophysics
- Professional Musician
- ~9 year h/o hyperplastic callus
- Hip ROM 0-119 degrees
- Knee ROM 10 - 35 degrees
- Ankle in 20 degrees valgus
- Uses Custom KAFO



Problems in OI

Hyperplastic Callus

- Thin layer of quadriceps over large bone mass
- Decreased ROM

Problems in OI

Hyperplastic Callus

- Periosteum stripped fairly easily

Problems in OI

Hyperplastic Callus

- Bone removed until subtile change in character marked old cortical margin

Problems in OI

Hyperplastic Callus

Problems in OI

Hyperplastic Callus

- 4 year follow-up
- Hip ROM 0 - 110 degrees
- Knee ROM 5 - 85 degrees
- Ankle: DF 15 degrees
  PF 25 degrees
- Uses no orthotic

Our Ultimate Goal

A Full Life

Xie Xie

09:55 - 10:35, Sunday, May 22, 2011
Invited Speaker: Dr. Jay R. Shapiro (USA)
B1 Level, Metro Suite

Wellness Concerns for the OI Child and Adult

While considered a disorder of bone, OI also affects other connective tissues throughout the body. Health maintenance in OI requires a team effort involving the pediatrician or internist, the orthopedic surgeon, the physiatrist, (physical medicine and rehabilitation) and the social worker to assist with family, school and work issues. In addition to fracture care, health issues in children include nutrition, dental problems, joint laxity and muscle strength. Sleep apnea can affect children. The period of transition from pediatric to adult care is important. In adults, increased scoliosis, pulmonary and cardiac problems may arise. Hearing assessment is important. Many adult patients have difficulty getting routine physical evaluation in a timely manner. The treatment of decreased bone mass in adults remains unresolved.

Wellness Concerns for the OI Child and Adult

Jay R. Shapiro, M.D.
Director, the Osteogenesis Imperfecta Department
Kennedy Krieger Institute and Johns Hopkins University, Baltimore

Management of the OI Child

- Daily handling of the child
- Fracture management
- Fracture prevention
- Post-surgical management: rehabilitation and physical therapy
- Nutrition: swallowing defect
- Hydrocephalus: developmental issues
- Muscle strength and coordination
- Scoliosis
- Dental Care
- Hearing

Transition from Child to Adult Care Programs

- Age 18-21 years
- Requires coordination between the pediatrician and adult doctors
- Involves a transfer of responsibility from the parents to the young adult
- Requires coordination with the team: internist, orthopedist, physiatrist, and social service.

SKELETAL DISORDERS IN THE ADULT with TYPE I OI

- **PROGRESSIVE BONE LOSS: TREATMENT ISSUES**
- **SCOLIOSIS EVALUATION: late onset change**
- **VERTEBRAL FRACTURES**
- **INTER-VERTEBRAL DISC DISEASE**
- **FRACTURE RECURRENCE IN THE ADULT**
- **FRACTURE NON-UNION: TREATMENT (?)**
- **WHEN TO TREAT SURGICALLY (?)**
- **OSTEOARTHRITIC JOINT PAIN**
- **PAIN DIAGNOSIS AND MANAGEMENT**

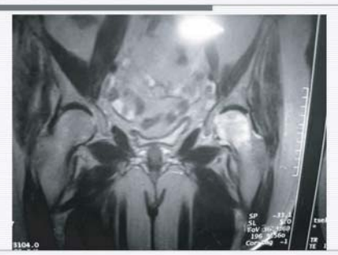
OTHER DISORDERS OCCURRING IN OI PATIENTS

- **HEARING LOSS**
- **HYPERTENSION**
- **HEART VALVE AND BLOOD VESSEL DISORDERS**
- **CHOLESTEROL/LIPID DISORDERS**
- **GENERALIZED MUSCLE WEAKNESS/DISCOMFORT, CRAMPS**
- **VITAMIN D DEFICIENCY**
- **EYE PROBLEMS: KERATOCONUS, SCLEROMALACIA**
- **KIDNEY STONES:**
- **GALL STONES :**
- **DIABETES: BMI > 25**
- **HYPERPLASTIC CALLUS: TYPE V OI**
- **OSTEOSARCOMA: very rare**

Arthritis and OI:

- McKiernan (2005): Survey on the Osteogenesis Imperfecta Foundation web site for 6 weeks.
- 111 adult respondents (78 female). Mean age was 40.8 years.
  - Nearly one-half reported "arthritis"
  - Articular pain, stiffness and instability were dominant in the large, weight-bearing joints of the lower extremities (osteoarthritis)
  - Two-thirds reported joint hyper-mobility, and one-third reported a previous tendon rupture.

Transient Bone Edema in OI



PULMONARY FUNCTION IN OI

- **RESTRICTIVE PULMONARY DISORDER IS MOST COMMON**
- **RELATED TO SCOLIOSIS**
- **SUPERIMPOSED ASTHMA OR BRONCHITIS**
- **MEASURE PULMONARY FUNCTION**
- **OBTAIN SLEEP STUDIES TO EVALUATE SLEEP APNEA**
- **USE SUPPLEMENTAL OXYGEN WHEN NECESSARY**
- **USE CPAP OR BIPAP WHEN INDICATED.**
- **USE BRONCHODILATOR INHALERS, INHALED STEROIDS**
- **USE ANTIBIOTICS WHEN INFECTION IS FOUND**

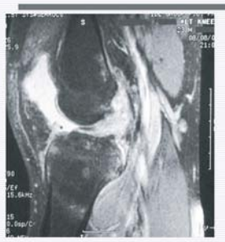
NEUROLOGICAL DISORDERS IN OI

- **NERVE ROOT PAIN SYNDROME**
  - **SCOLIOSIS**
  - **DISC DISEASE**
  - **VERTEBRAL FRACTURES WITH DISC PRESSURE**
- **NERVE COMPRESSION SYNDROMES: elbow, carpal tunnel, spinal stenosis**
- **BASILAR INVAGINATION**
  - **HEADACHE**
  - **CRANIAL NERVE DYSFUNCTION: Nystagmus**
  - **INCREASED REFLEXES**
  - **WEAKNESS OF LIMBS**
  - **TINGLING, SENSORY CHANGES IN EXTREMITIES**

MUSCLE FUNCTION IN OI

- **PRINCIPLE: COLLAGEN IN MUSCLE DECREASED <MECHANICAL STRAIN DECREASES MUSCLE BULK, WEAKENS LIGAMENTS AND TENDONS→ BONE LOSS**
- **MOST PATIENTS HAVE MUSCLE WEAKNESS ON TESTING**
- **TENDON RUPTURE: ACHILLES TENDON, SHOULDER LIGAMENTS**
- **MUSCLE STRENGTHENING EXERCISE IN UPPER AND LOWER EXTREMITIES IS IMPORTANT**

LIGAMENT Injury in OI



Cortes ZE, Maloney MD
Anterior cruciate ligament reconstruction in osteogenesis imperfecta: a case report.
Am J Sports Med. 2004 32:1317.

Surgical Concerns

- Surgery when required TO IMPROVE FUNCTION
- Gimics usually don't work:
  - BMPs
  - Marrow cell preparations
  - Ultrasound is effect uncertain for fracture healing

Osteonecrosis of the Jaw

Occurs in 5-10 % of elderly individuals on high dosed intravenous bisphosphonate

- With cancer
- On chemotherapy
- After dental surgery

Not in OI patients

Bisphosphonates and Mid-shaft Femur Fractures

- Park Wilie et al. found that use of bisphosphonates for 5 years or longer had an associated odds ratio (OR) of hospitalization for subtrochanteric of mid-shaft femoral fracture of 2.74 (95% CI of 1.25 to 6.02) compared to women who were treated for less than 100 days.
- These results reinforce the conclusion that bisphosphonates reduce the incidence of the majority of osteoporotic hip fractures but are associated with an increase in the incidence of the much rarer subtrochanteric and mid-shaft femoral fractures after five years of use.

Calcium Intake

1000-1500 MG DAILY

TYPE OF CALCIUM IS NOT ESSENTIAL

MONITOR URINE CALCIUM EXCRETION PERIODICALLY

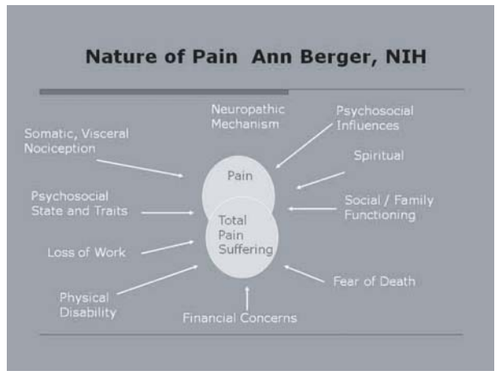
Percentage of Patients Defined as Vitamin D Deficient Based on 25-Hydroxy Vitamin D Serum Levels

Serum 25-hydroxy vitamin D level	Type I OI	Type III OI	Type IV OI	Healthy Canadian Adults[5]	Healthy U.S. Adults age 18 to 29yrs and 49-83 yrs[6]	U.S. Adult In-patients[7]
<10 ng/mL	7%	4%	17%	6%	N/a	22%
<20 ng/mL	56%	40%	50%	34%	36% and 41%	57%
<32 ng/mL	79%	84%	100%	N/a	N/a	N/a

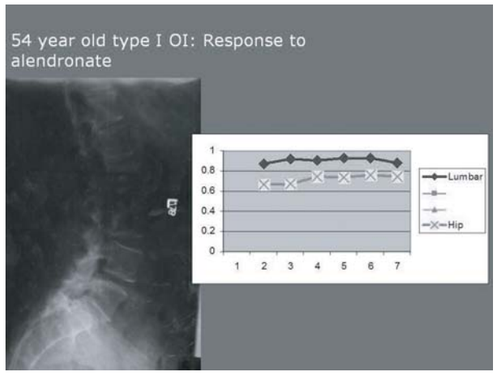
Recommendations for Vitamin D

- MOST WILL REQUIRE 1000-2000 INTERNATIONAL UNITS DAILY
- EITHER D2 OR D3 ARE ACCEPTABLE
- MONITOR SERUM 25-HYDROXY VITAMIN D LEVELS WHEN INDICATED.

Nature of Pain Ann Berger, NIH



54 year old type I OI: Response to alendronate



Summary

- Treatment of OI children and adults requires a team approach
- Both fracture prevention and rehabilitation are important in children
- OI adults should not be "short-changed": they require informed and comprehensive medical and surgical care

10:45 - 11:10, Sunday, May 22, 2011
Invited Speaker: Dr. Shuan-Pei Lin (Taiwan)
B1 Level, Metro Suite

Clinical and Genetic Overview of Osteogenesis Imperfecta (OI) - Taiwan Experience

Shuan-Pei Lin[1,2,3,] MD, Hsiang-Yu Lin1 [1,2,4,] MD, Hui-Ching Chiu [1], MS, and Yi-Ning Su[5], MD
[1] Division of Genetics, Department of Pediatrics, Mackay Memorial Hospital, Taipei; [2]Department of Early Childhood Care and Education, Mackay Medicine, Management and Nursing College and [3]National Taipei University of Nursing and Health Sciences, Taipei; [4] Institute of Clinical Medicine, National Yang-Ming University, Taipei; and [5]Department of Medical Genetics, National Taiwan University Hospital, Taipei, Taiwan

Osteogenesis imperfecta (OI) (MIM 166200, 166210, 259420 and 166220) is a group of genetic disorders that mainly affect the bones. People with this condition have brittle bones that break easily and multiple fractures are common. In severe cases, fracture(s) can occur even before birth, and in milder cases the bone disorder may involve only a few fractures over a person's lifetime. There are at least 8 recognized forms of OI. The types can be distinguished by their clinical symptoms and signs, although their characteristic features overlap. Type I is the mildest form of OI and type II is the most severe; other types of this condition have signs and symptoms that fall somewhere between these two extremes. In recent years, genetic analyses are used to define the different forms of OI. Information regarding the clinical features of this genetic disorder is relatively lacking in Taiwan. This study aimed to characterize the clinical features of OI patients in Taiwan to establish a practical correlation for distinguishing different clinical subtypes of the disorder.

Sixty-two patients with type I, III, or IV OI (25 males and 37 females; age range at last follow-up, 0.4-62.2 years) were enrolled in this clinical and genetic investigation. Retrospective analysis of the medical records revealed that 57 OI patients could be classified into types I (n = 21), III (n = 16), and IV (n = 20). Eleven clinical features examined---height, weight, BMD, blue sclera, hearing loss, dentinogenesis imperfecta, bone deformity, scoliosis, walking ability, fracture rate, and family history---were carefully eva.uated. There were statistically significant differences between these three types in terms of height, weight, BMD, dentinogenesis imperfecta, bone deformity, scoliosis, walking ability, annual fracture rate, and family history. However, no significant differences were noted for blue sclera and hearing loss (Reference: J Formos Med Assoc 2009 Jul; 108: 570-6).
Molecular analyses on the COL1A1 and COL1A2 genes were performed for all the 62 patients and 38 were found to have a COL1A1 mutation and 21 with a COL1A2 mutation. Three patients did not show a mutation on either gene. There were also 2 prenatal diagnoses executed and both disclosed a missense mutation on COL1A1. The pregnancies were carried to term. Among the 38 COL1A1 mutations, there were 16 missense point mutations, 6 nonsense mutations, 8 deletions, 3 insertions and 5 intron mutations; and 8 familial mutations were identified: 6 point mutations, one deletion and one intron mutation. In 21 with COL1A2 mutations, there were all missense mutations and 4 were from familial inheritance. Genotype-phenotype correlation study was undertaken.

In one of our retrospective studies, 26 patients with type I, III, or IV OI (8 males and 18 females; age range at last follow-up, 2.9-39.2 years) who received (or were currently receiving) intravenous pamidronate treatment (30mg/m2/dose, every month) were retrospectively analyzed. Patients were followed for 1.0-7.3 years over the study period from February 2000 to October 2007. The mean standard deviation score (SDS) for bone mineral density (BMD) had increased significantly from -4.72 to -3.37 ($p < 0.005$) after 1 year of treatment. In 16 patients evaluated after 4 years and eight after 6 years, the mean SDS continued to improve, to -2.69 ($p < 0.001$) and -1.54 ($p < 0.005$), respectively. The fracture rate decreased significantly (from 2.8 +/- 1.1 to 0.6 +/- 0.6, $p < 0.001$), and nine patients (35%) had no fractures while receiving treatment. The response to pamidronate was significantly better in patients with poorer initial BMD SDS (1 year: $r = -0.71$, $p < 0.01$; 4 years: $r = -0.81$, $p < 0.01$) (Reference: Pediatr Neonatol 2008 Oct; 49: 161-5).

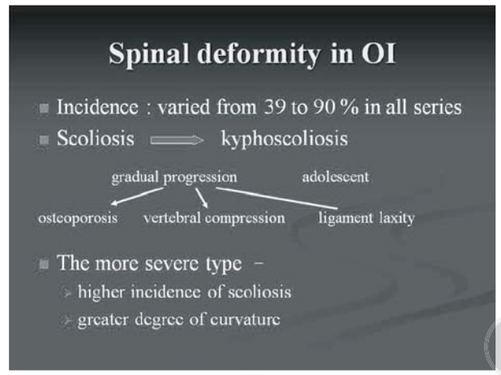
In conclusion, the evidence of Genotype-phenotype correlation was not strong and 9 of the 11 clinical features examined were significantly different among the 3 types of OI patients. These findings may be of help in evaluating patients and establishing their prognosis. As of the bisphosponate therapy for OI patients, the retrospective study suggests that Taiwanese patients with OI can benefit from pamidronate treatment, leading to a reduced incidence of fractures and increased BMD, especially in patients with poor baseline BMD.

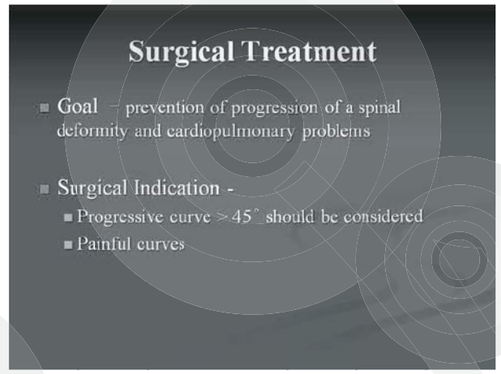
11:10 - 11:35, Sunday, May 22, 2011
Invited Speaker: Dr. Kuan-Wen Wu (Taiwan)
B1 Level, Metro Suite

OI Scoliosis Treatments - Taiwan Experience

Scoliosis in osteogenesis imperfecta (OI) is a common problem that is often difficult to manage. Scoliosis usually progresses until severe kyphoscoliosis is present in adulthood. Severe scoliosis and concomitant chest deformity will interfere with self-care, mobility and pulmonary functions. The curves tend to advance relentlessly, and bracing is ineffective in controlling the progression of deformity. Surgical stabilization of the spine appears more effective than bracing in controlling severe scoliosis in OI. However, such surgery is technically difficult. The OI spine is osteopenic and prone to fracture during instrumentation. Some surgeons have proposed different surgical strategies to overcome these difficulties, including preliminary halo-traction, adjuvant use of methymethacrylate to augment bone purchase, and in situ fusion with instrumentation without correction. However, the optimal treatment method in OI is not well-established.

It is the purpose of this presentation to investigate the problems of spine deformity in a series of osteogenesis imperfecta patients and to review the experiences of operative treatment on these patients in Taiwan.





Treatment of spinal deformity in OI

- Brace was shown to be ineffective in stopping the curve progression
- Spinal fusion with instrumentation is the treatment of choice
- In situ fusion or fusion + correction (?)
- Spine stabilization > curve correction

Difficulties in treating spinal deformity in OI

- Poor bone stock
- Dislodgement of implants
- Late loss of correction
- Lack of established treatment protocol
- Variable post-operative results

Special Difficulties of Taiwan in treating spinal deformity in OI

- Poor bone stock
  - Delay in diagnosis and medical treatment
- No pediatric spinal implants in Taiwan
  - Even Luque rod and wire system
- Denied spinal surgeries until large and decompensate curve
- Lack of double VS system in Taiwan

Specialties of surgery in OI

- Early intervention (Benson et al. suggest – spinal fusion at a young age)
- Norimatsu et al. – against correction of spinal curvature in severe scoliosis, because poor holding power in OI
- Halo-traction before operation
  - Bone quality of skull bone ?

Specialties of surgery in OI

- Prolonged immobilization in brace after operation (6-12 months)
- Cyclic intravenous biphosphonates before and after operation

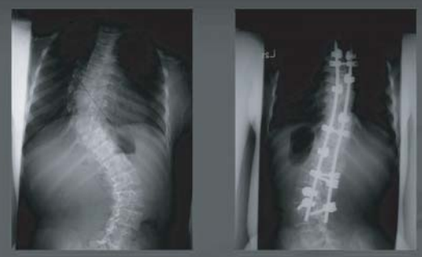
Instruments use in OI

- Harrington rod with sublaminar wire
- Hybrid hooks with supplementary wiring
- All pedicle screws method

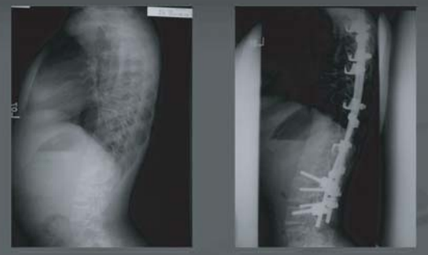
Complications of spinal surgery in OI

- Excessive blood loss (1.5 ~ 2.5 liters)
- Late loss of correction
- Late pseudarthrosis
- Higher complication rates with more severe types

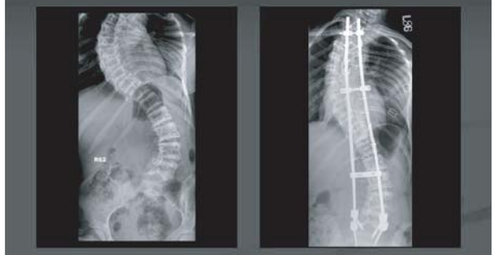
Case 1



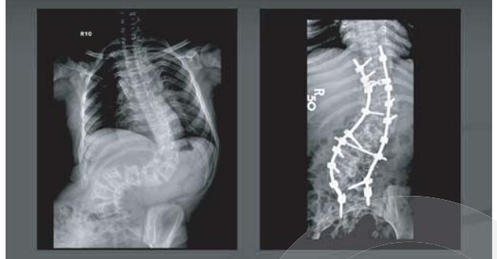
Case 1



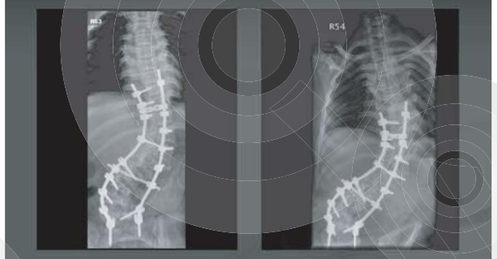
Case 2

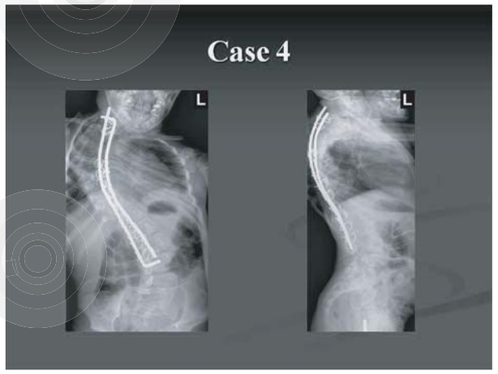


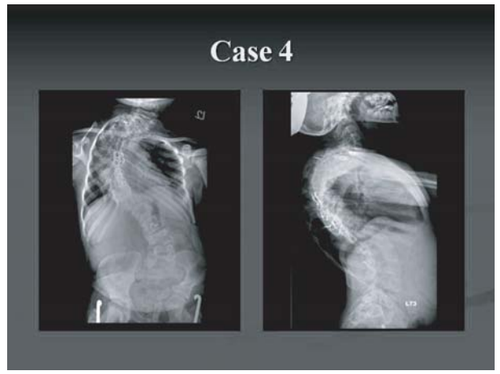
Case 3

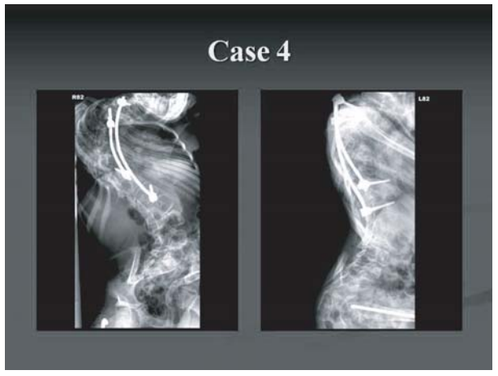


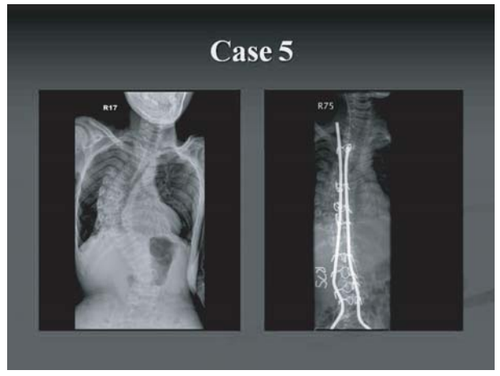
Case 3 (PO 1 and 2 y)

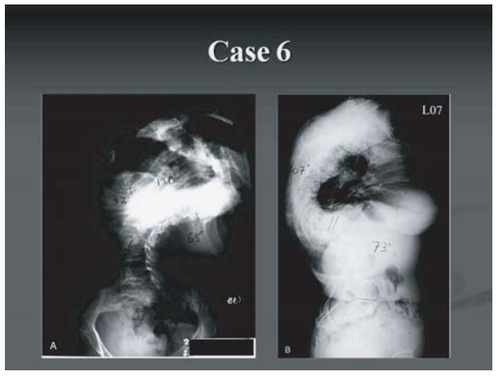


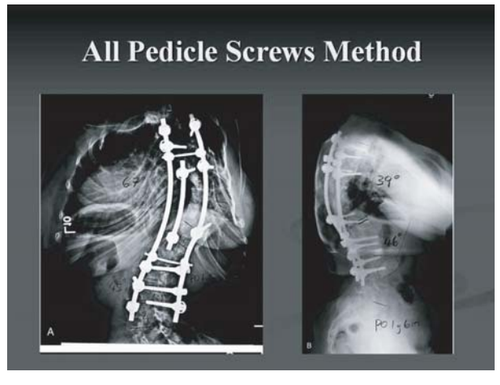












Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

邀請主持人及講員

May 21st - 22nd, 2011

Taipei, Taiwan

邀請主持人及講員

主持人─陳冠如

● 個人基本資料

姓名：陳冠如
性別：女
出生日期：1974.10.30
學歷：
美國杜克大學醫學中心遺傳諮詢短期訓練
國立陽明大學遺傳所碩士
國立台灣大學植物學系學士

● 工作經驗

財團法人罕見疾病基金會	副執行長	2005.2～迄今
財團法人罕見疾病基金會	醫療服務組 組長	2001.9～2005.2
中央研究院分子生物	所研究助理	1999.11～2000.10

● 專業證照

2009年中華民國人類遺傳學會 遺傳諮詢師甄審及認證合格證書

主持人─郭耿南

台北醫學大學醫學系
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● 學歷

1959 - 1966 台大醫學院醫學士
1967 - 1968 Internship, Wayne County General, Eloise, Michigan
1968 - 1969 Surgical Residency, William Beaumont Hospital oyal Oak, Michigan
1969 - 1973 Orthopedic Residency, University of Illinois Hospital, Chicago, IL
1973 - 1974 Fellowship, Pediatric Orthopedic Surgery
The Hospital for Sick Children, London, England

● 現職與經歷

2011-迄今	台北醫學大學醫學系實證醫學講座教授
2011-迄今	國家衛生研究院群體健康科學研究所客座教授
2007-2010	台灣實證醫學學會 理事長
2006-2010	國家衛生研究院群體健康科學研究所代理副所長 衛生政策研發中心主任
2004-2006	國家衛生研究院衛生政策研發中心副主任
2003-迄今	台大醫院骨科兼任主治醫師
1996-2007	台大醫學院院務諮詢委員
1989-迄今	Professor of Orthopedic Surgery Rush Medical College, Rush University, Chicago, Illinois

● 研究興趣

Graduate Medical Education
Evidence Based Medicine and Clinical Practice guidelines
Medical specialty manpower study
Health Policy
Medical school education
Public Health issues

● Pediatric Orthopaedic Surgery Publications

Selected Recent Scientific Journal Publications

◆ Aik, S., Smith, P.A., Kuo, K.N (corresponding author): Rectus Femoris Transfer for Children with Cerebral Palsy-A Long Term Outcome. J. of Pediatr. Orthop, 23:672, 2003.
◆ Verma, N.N., Kuo, K.N., Gitelis, S. (corresponding author): Acetabular osteoarticular allograft reconstruction following pelvic resection for Ewing's sarcoma. Clin Orthop and Rel Res, 419:149, 2004
◆ Huang, SC, Kuo, KN: Relationship of anatomic classifications to degenerative change in untreated developmental dysplasia of the hip, J. Formosa Med. Assoc. 104:349, 2005
◆ Yong, SM, Smith, PA, Kuo, KN (corresponding author): Dorsal bunion following clubfoot surgery: outcome of reverse Jones procedure, J. of Pediatr. Orthop 27:7:1-7, 2007
◆ Smith, PA, Hassani, S, Graf, A, Flanagan, A, Reiners, K, Kuo, KN, Roh, JY, Harris, G: Brace Evaluation in Children with Diplegic Cerebral Palsy with a Jump Gait Pattern, Journal of Bone and Joint Surgery, 91:356-365, February 2009
◆ Wu, KW, Huang, SC, Kuo, KN, Wang, TM: The use of the Bio-absorbable screw in a split anterior tibial tendon transfer: A preliminary result, J of Pediatr. Orthop-B 18:69-72, March 2009
◆ Kuo, KN, Smith, PA: Correcting Residual Deformity Following Clubfoot Releases: Clinical Orthopaedics and Related Research, 467:1326-1333, May 2009

- Graf A, Hassani S, Krzak J, Long J, Caudill A, Flanagan A, Eastwood D, Kuo KN, Harris G, Smith P: Long-term outcome evaluation in young adults following clubfoot surgical release, Journal of Pediatric Orthopaedics, 30(4):379-85, June 2010
- Chang, CH, Chen, YY, Wang, CJ, Lee, ZL. Kuo, KN (corresponding author): Dynamic displacement of femoral head by Hamstring stretching in children with cerebral palsy, JPO 30(5): 475-478, July 2010
- Chen, WH, Chang, CH, Chen, YY, Liu, WJ, Chua, C, Tsai, ST, Kuo, KN (corresponding author): Natural progression of hip dysplasia in newborns: A reflection of hip ultrasonographic screenings in newborn nursery. Journal of Pediatric Orthopaedics-B, 19(5):418-423 September 2010
- Wu, KW, Wang, TM, Huang, SC, Kuo, KN (Corresponding author), Chen, CW: Analysis of Osteonecrosis following Pemberton Acetabuloplasty in Developmental Dysplasia of the Hip: A Long-Term Result. Journal of Bone and Joint Surgery, 92:2083-2094, September 2010
- Chang, CH, Yang, WY, Kao, HK, Shih, CH, Kuo, KN (corresponding author): Predictive value for femoral head sphericity from early radiographic signs in surgery for developmental dysplasia of the hip, Journal of Pediatric Orthopaedics, 31(3) 240-245 April-May 2011

• Selected Recent Book Chapters

- Khazzam, M, Smith, PA, Hassani, S, Harris, GF, Kuo, KN; Functional gait analysis in Children following clubfoot releases. Foot and Ankle Motion Analysis: Biomedical Engineering, Ed: Harris JF and Smith, PA, CRC Press, October 27 2006
- Kuo, K.N.: Joint aspiration, Pediatric Orthopedic Secrets, 3rd Edition, Staheli L. and Song, K. (Ed), Publisher Lippincott, Williams and Wilkins, October 2006
- Kuo, K.N.: Anterior Tibial Tendon Transfer, in Master Techniques in Orthopaedic Surgery, Pediatric, Ed. Tolos, VT. and Skaggs, DL. Publisher: Lippincott, Williams and Wilkins, Philadelphia, 2007

• Health Policy Related Publications

• Selected Scientific Journal Publications

- Chang, CI, Chan, DC. Kuo, KN, Hsiung, CA, Chen, CY: Vitamin D insufficiency and frailty syndrome in older adults living in a Northern Taiwan Community: Archives of Gerontology and Geriatrics, 50 Suppl. S17-S21, 2010
- Wu, CY, Wu,, MS, Kuo, KN. Chen, YJ, Lin, JT: Effective reduction of gastric cancer risk with regular use of NSAIDs in Helicobacter pylori-infected subjects, Journal of Clinical Oncology, 28(18):2952-2957, June 2010
- Chen. LK, Lu, HM, Shih, SF, Kuo, KN, Chen, CL, Huang, LC: Poverty related risk for potentially preventable hospitalisations among children in Taiwan: BMC Health Services Research 10:196, July 2010
- Lee YC, Huang YT, Tsai, YW, Huang SH, Kuo, KN (corresponding author), McKee, M, Nolte, E.: The impact of National Health Insurance on Population Health, The Experience of Taiwan, BMC Health Service Research, 10:225, August 2010
- Chiu YW, Weng YH, Lo HL Shih YH, Hsu CC, Kuo KN (corresponding author): Impact of a nationwide outreach program on the diffusion of evidence-based practice in Taiwan, International Journal for Quality in Health Care, 22(5): 430-436 October 2010
- Lee, SY, Tsai, TI, Tsai, YW, Kuo, KN: Health Literacy, Health Status, and Healthcare Utilization of Taiwanese Adults: Results from a National Survey: BMC Public Health, 10:614 October 2010
- Wu CY, Chan FK, Wu MS, Kuo KN, Wang CB, Tsao CR, Lin JT. Histamine-2-receptor antagonist as an alternative to proton pump inhibitor in patients receiving clopidogrel, Gastroenterology 139:1165-1171 October 2010
- Tsai, TI, Lee, SY, Tsai, YW, Kuo, KN (corresponding author): Methodology and validation of Health Literacy Scale Development in Taiwan. Journal of Health Communication, 16(1): 50-61, January 2011
- Tsai YW, Wen YW, Huang WF, Chen PF, Kuo KN, Hsiao FY: Cardiovascular and gastrointestinal events of three antiplatelet therapies: clopidogrel, clopidogrel plus proton-pump inhibitors, and aspirin plus proton-pump inhibitors in patients with previous gastrointestinal bleeding, J Gastroenterology, 46(1) 39-45, Jan 2011
- Hsu CC, Lee, CH, Hwang SJ, Huang SW, Yang WC, Chang YK, Tsai DFC, Kuo KN: Outcome of overseas kidney transplantation in chronic hemodialysis patients in Taiwan, Nephrology, 16(3) 341-348, March 2011
- Hsu CC, Chang SY, Huang MC, Hwang SJ, Yang YC, Tai TY, Yang HJ, Chang CT, Chang CJ, Loh CH, Shih YT, Li YS, Shin, SJ, Kuo, KN: Association between Insulin Resistance and Development of Albuminuria in Type 2 Diabetes: A Prospective Cohort Study, Diabetes Care, 34(4) 982-987 April 2011

• Selected Book Publications and Reports

- Graduate Medical Education for Medical Specialties; July, 2003
  專科及次專科醫師培育建議報告書
- Evidence Based Medicine and Epidemiological Application, May 2004
  實証醫學-臨床流行病學方法之應用
- Guide for Writing Evidence Based Clinical Practice Guidelines, June 2004
  臨床診療指引發展手冊
- A Study of Taiwan Medical Specialty Manpower Distribution, Part I, December 2004, and Part II, December 2005
  台灣（專科和次專科）醫師人力評估研究報告
- Institutional Review Board Accreditation Standard, December, 2004
  醫療機構人體試驗委員會評鑑作業基準
- Taiwan Tobacco Control Forum, A white paper, June 2005
  全國菸害防制策略總結報告書
- Taiwan Physician Scientist Education and Development, December, 2005
  國內醫師研究人才之培育【政策建議報告書】
- Kuo, K.N., Editor: Evidence-Based Decision Making in Health Care, in Chinese, December, 2006 in Taiwan
  實證醫學：醫療照護決策
- Taxation of Betel Nut -A project on Betel Nut Control. 2007.10
  檳榔健康捐研議報告
- Physician training, practice environment and public education, 2008.03
  醫師培育暨執業環境、民眾教育、國家醫療支出研議
- Healthy People 2020, Taiwan, 2008.05
  2020國民健康白皮書
- Healthy People 2020-Technical Report, Taiwan, 2008.09
  2020國民健康白皮書技術報告
- How to write a guideline: From start to finish, 2009. 05
  如何撰寫臨床指引-從開始到完成
- Health People 2020-White paper- second edition (revised) 2009, 08
  2020國民健康白皮書再版
- Physician Education and Training in Taiwan-present and future 2009. 12
  醫師培育-現況與展望
- Dental Workforce 2020: Education, Supply and Demand 2010. 12
  2020牙醫醫事人力培育和供需規劃
- Nurse Workforce and Nurse Practitioner System: Vision and Challenge 2010.12
  護理人力及專科護理制度-願景與挑戰
- Public Health Education & Workforce: Current Status & Perspective 2010.12
  公共衛生教育與人力-現況與展望

邀請講員─張鳳書

● 學歷

醫學生物管理研究所碩士　　畢業日期：2009年5月
美國約翰霍普金斯大學 (巴爾的摩，馬里蘭州)
醫學生物技術研究所碩士　　畢業日期：2005年6月
長庚大學
G.P.A = 3.63
生命科學學士　　畢業日期：2003年6月
慈濟大學
G.P.A= 3.7 (排名：4th/41)

● 研究與工作經歷

臨床研究員/先天性成骨不全症資料庫管理員　2009年7月~現在
甘迺迪克瑞格研究機構，先天性成骨不全症及骨科研究中心
-負責有關先天性成骨不全症臨床研究計畫的進行。
-管理先天性成骨不全症資料庫，包括會員註冊、推廣、臨床研究者使用、醫學研究倫理委員會(IRB)程序。

臨床研究助理　2009年1月~2009年7月
約翰霍普金斯大學醫學院，生殖泌尿腫瘤研究中心
-協助臨床研究資料管理者有關攝護腺癌研究。
-負責整合研究參與者資料及病歷報告表格，確保有效的收集資料、協助分析及驗證患者資料、血液採集，並參與研究會議。

實習
美國食品藥物管理局(FDA)，儀器暨放射安全中心　2008年1月~2008年12月
-計畫：醫療器材軟體IEC 62304標準之可追蹤性及相容性分析，及醫療器材軟體上市前申請之FDA準則。
-指導教師：John F. Murray Jr.　FDA儀器暨放射安全中心，法規管制室，軟體管制專家

實驗室研究助理　2005年7月~2006年7月
台大醫院，眼科
-研究老年性黃斑部病變(ARMD)MAPK訊息傳導路徑的作用。
-老年性黃斑部病變患者細胞培養中，找到一個不正常啟動之MAPK訊息傳導路徑。

碩士生　2003年9月~2005年7月
長庚大學，醫學生物技術研究所
-Disabled-2在plakoglobin調控的Wnt訊號傳遞路徑中所扮演的角色。
-了解plakoglobin與Dab2在白血病發生的過程中可能扮演的角色。

教學助理　2004年6月~2004年9月
長庚大學，醫學生物技術研究所
-研究所進階生物科技課程教學助理。
-教導研究生生物科技實驗原則與實驗、作業之問題解決。

學士生
慈濟大學，生命科學學院　1999年9月~2003年7月
幹細胞學生研究計畫
-研究專題：幹細胞標記基因表現之量化分析。
-使用定量PCR表現不同之幹細胞標記基因。

● 學術及專業榮譽

長庚大學第二屆碩士論文競賽，第三名　2005年
慈濟大學校長獎及全額獎學金　1999~2003年

邀請講員─程健智

姓名：程健智──台灣最矮的計程車司機
年齡：38歲

● 學歷

雲林縣三崙國小
雲林縣文生國中
嘉義縣東石高中肄業
高中同等學歷考試及格
國立嘉義大學獸醫學系

● 經歷

農委會家畜衛生試驗所 研究助理
先天性成骨不全症關懷協會 秘書長

● 簡介

因為疾病讓他國中讀了5年、高中只讀1年，最後居然以32歲高齡從大學畢業；身高只有123公分的他，從沒想到可以交女朋友、結婚、生子，最後居然也戀愛結婚、有了二個可愛的子女。一位從小到大骨折二十多次的玻璃娃娃(成骨不全症患者) --健智在過去的38年歷史中，經歷許多奇異的經驗，他感謝老天爺的安排，讓他有了先天性成骨不全症，感恩疾病帶給他異於常人的學習歷程、生活經歷，讓他的生活因此而多彩豐富，只有123公分身高的健智，努力樂觀地尋求現實社會的立足之地，學習如何支撐一個家庭、扮演一個稱職的丈夫、父親角色。

邀請講員—詹姆斯·甘柏

● 任職

教授 骨科
史丹佛大學醫學院
爾帕卡德兒童醫院
史丹佛大學醫學中心
美國加州史丹佛

學術辦公室：
Stanford University Medical Center (史丹佛大學醫學中心)
300 Pasteur Drive, Edwards R105
Stanford, California 94304-5341
Telephone: 650-723-5286
Fax: 650-723 9370

臨床地址：
Packard Children's Hospital at Stanford (史丹佛爾帕卡德兒童醫院)
Johnson Pediatric Outpatient Clinic
750 Welch Road
Stanford, California 94305
Telephone: 650 497 8201
Fax: 650 497 8891

● 學歷

學士B.A. 文學士
俄亥俄州立大學
美國俄亥俄州哥倫布市 1966年6月
博士Ph.D. 博士
俄亥俄州立大學
美國俄亥俄州哥倫布市 1969年12月
論文：心臟粒線體的RNA和蛋白質合成

醫師M.D. 醫學士
優等成績 (Magna Cum Laude)
馬里蘭大學醫學院
美國馬里蘭州巴爾的摩 1975年6月

碩士M.L.A. 文理碩士
史丹佛大學
美國加州史丹佛 1997年6月
論文：肢體障礙者的社會史

● 獎學金

博士前：俄亥俄州立大學
贊助者：美國國家衛生研究院
領域： 生理化學
1966 - 1969

博士後：美國約翰霍普金斯大學醫學院
贊助者： 美國公共衛生服務
領域： 分子生物學與生物化學
1969 - 1971

博士後：史丹佛大學
贊助者：美國國家兒童健康和人類發育研究院
領域：分子與細胞老人學
1970

● 住院醫師訓練

住院醫師： 精神科
PGY 1 馬里蘭大學醫學院
1974年11月 - 1975年6月
住院醫師： 一般外科
PGY 1 馬里蘭大學醫學院
1975年7月- 1976年6月
住院醫師： 骨外科
PGY 2 馬里蘭大學醫學院
1976年7月- 1977年6月
低年住院醫師： 骨外科
PGY 3 馬里蘭大學醫學院
1977年7月- 1978年6月
高年住院醫師： 骨外科
PGY 4 馬里蘭大學醫學院
1978年7月- 1979年6月
住院總醫師： 骨外科
PGY 5 馬里蘭大學醫學院
1979年7月- 1980年6月

● 醫療執照

California(加州) G-48452

● 專業認證

美國國家家醫學考試委員會 1975
美國骨科醫師委員會 1981

● 學術職務

教師
外科，骨外科部門
馬里蘭大學醫學院
1979年7月 - 1980年6月
助理教授
外科，骨外科部門
馬里蘭大學醫學院
1980年7月 - 1982年6月
住院醫師教育主任
馬里蘭州巴爾的摩克南兒童醫院
1981年1月 - 1982年6月
助理教授
外科，骨外科部門
史丹佛大學醫學院
史丹佛兒童醫院
1982年7月 - 1989年3月
副教授
外科，骨外科部門
史丹佛大學醫學院
史丹佛兒童醫院
1989年4月 - 1994年8月
教授
骨外科部門
史丹佛大學醫學院
史丹佛爾帕卡德兒童醫院
1994年8月 - 現在

● 服務活動

骨科諮詢
馬里蘭啟明學校，1980 - 1982
馬里蘭公共衛生部，1980 - 1982
馬林縣加州兒童服務，1983 - 2009
考威爾(Cowell)學生健康中心，1989 - 2001
Vadn學生健康中心，2001 - 2003
自願醫療諮詢
加州囊狀纖維化基金會，1984 - 1990
Camp Trinity Mainstream Program, 1985 - 1995
北京國際援助中國孤兒委員會，2001 -現在
愛無界限醫療顧問(Love Without Borders)，2010 - 現在
AYSO足球教練，1993 - 1998
YMCA籃球教練 ，1994 - 1996

● 醫院職務

馬里蘭大學醫院
馬里蘭州巴爾的摩 1980 - 1982
詹姆士勞倫斯克南兒童醫院
馬里蘭州巴爾的摩 1980 - 1982
帕羅奧多市退伍軍人行政醫院
加州帕羅奧多市 1982 - 2009
史丹佛大學醫院
加州帕羅奧多市 1982 - 現在
史丹佛爾帕卡德兒童醫院
加州帕羅奧多市 1982 - 現在
聖塔克拉拉醫學中心
加州聖荷西 2010 - 現在

● 獲獎與榮譽

馬里蘭醫學獎學金，1973
Alpha Omega Alpha醫學會榮譽，1974
馬里蘭大學成績優等，1975
西部骨醫科協會員工榮譽獎，1980
傑出科學展獎
馬里蘭醫學及手術學會，1992
哈本(Halpern)傑出教學獎，1994
馬里蘭巴爾的摩RC Abrams Memorial Lecturer講師，2000

● 會員與專業社群

美國骨科學會
美國骨科醫師學院
美國科學促進聯會
美國腦性麻痺和發展協會
美國化學學會
美國運動醫學院
美國醫學會
加州醫學會
馬里蘭醫學及手術學會
骨科研究學會
北美兒童骨科學會
美國聖塔克拉拉醫學會
馬里蘭大學醫學會
西部骨科學會

● 期刊審查委員

成人醫學期刊 (Adolescent Medicine)
美國人類生物期刊 (American Journal of Human Biology)
臨床骨科暨相關研究期刊 (Clinical Orthopaedics and Related Research)
發展醫學暨兒童神經醫學期刊 (Developmental Medicine and Child Neurology)
成人醫學期刊 (Journal of Adolescent Health)
骨骼暨關節手術期刊 (Journal of Bone and Joint Surgery)
知覺與動作技能期刊 (Perception and Motor Skills)
兒科醫學期刊 (Pediatrics)
兒科研究期刊 (Pediatric Research)
心理學報導 (Psychological Reports)

● 編輯委員會

The Pharos

● 國際臨床經驗

尼加拉瓜埃斯特利：
Operation Rainbow: 1999, 2000, 2001, 2002, 2003, 2010
(非營利組織)　領隊：2001, 2002, 2003
瓜地馬拉薇薇特南果：
Operation Rainbow(非營利組織): 2001
中國大陸：
天津市天津骨科醫院：
2001, 2002, 2003, 2004, 2005, 2006, 2007
蘭州醫學院第二附屬醫院：2002
敦煌骨科醫院：2003
煙台台骨科醫院：2003, 2004, 2009, 2010
寧波市第6醫院：2005
重慶兒童醫院：2006
臨沂兒童醫院： 2007
廊坊市紅十字骨傷科醫院：2010
哥倫比亞：
La Universidad del Valle, Cali: 2011
Fundication Hospitall San Jose Buga: 2011

● 休假研究

1989
商學院研究所
美國加州史丹佛大學

1996
西班牙巴塞隆納自治大學Universitat Autonomia de Barcelona
瓦爾德希伯倫醫院Vall d'Hebron Hospital

邀請講員─林炫沛

● 現任職稱

馬偕紀念醫院小兒遺傳科
資深主治醫師及一般兒科
主任醫學研究部生化遺傳
組組長

● 學歷

高雄醫學大學醫學系

● 專長項目

先天性代謝疾病及罕見疾病（如黏多醣症、有機酸血症、成骨不全症、Prader-Willi氏症等）；
先天性畸形與智能發展遲緩之診斷和療育、遺傳諮詢、一般兒科（身體評估與預防保健）

● 經歷

1.馬偕紀念醫院台東分院小兒科主任 (1988-1989)
2.馬偕紀念醫院院小兒遺傳科主任 (1997-2009)
3.馬偕紀念醫院一般兒科主任 (2009~)
4.馬偕醫護管理專科學校幼保科暨國立台北護理健康大學幼保系副教授
5.罕見疾病基金會常務董事、唐氏症基金會董事、台灣黏多醣症協會榮譽理事長、小胖　威利協會理事，結節硬化症協會、成骨不全症協會、白化症者關懷協會、肌肉萎縮症協會、兒童福利聯盟文教基金會及喜願協會醫療顧問
6.高雄生命線第九期志工 (1976~1979)
7.台灣兒科醫學會理事 (2005~2008)
8.台北市政府早期療育推動委員會委員 (2003~2007)
9.台北市政府衛生局婦幼健康諮詢委員會委員 (2008~)
10.Medical Consultant and Immediate Past President, International PWS Organisation (IPWSO)

● 其他卓越成就表現

行政院衛生署第一屆罕見疾病藥物供應製造及研究發展貢獻獎(2001)
行政院衛生署罕見疾病個案通報第一名(2002、2003及2005)
台北市醫師公會杏林獎(2005)
台灣黏多醣症協會第一屆周艾獎(2007)
馬偕紀念醫院優良教師(1992及2002)、優良員工(1992)
台灣兒科醫學會優秀論文獎(1993及2001)
論文：1985~2010年共發表188篇論文，其中152篇為SCI論文。
著作：1.0~6歲嬰幼兒的養護與照顧(允晨文化，1996年);
2.寶貝生病了(美夢成真文化公司，1998年);
3.一眼看出孩子生病了嗎？(文經社，2002年);
4.認識小兒先天性疾病 (華成圖書，2002年); 5.其他七本專業書籍的章節作者

邀請講員—傑伊．傑匹羅

● 職位

甘迺迪克瑞格研究機構，先天性成骨不全症及骨科研究中心主任

● 學歷

美國富蘭克林馬紹爾學院 學士 1953年 生物學 (優等)
美國波士頓大學醫學院 醫師 1957年 醫學(優異學業成績)

● 個人背景

傑匹羅醫師為甘迺迪克瑞格研究機構先天性成骨不全症及骨科研究中心主任，此研究中心位在美國馬里蘭州，巴爾地摩市，為全美國聞名的先天性成骨不全症患者診斷與治療中心，每年約治療250位患者，此外，此中心發展並且負責維護達含有1760位患者的先天性成骨不全症資料庫。

● 職位與獲獎

2004年~現在 美國約翰霍普金斯大學，復健醫學系所，教授(兼任)
1997年~現在 甘迺迪克瑞格研究機構，先天性成骨不全症及骨科研究中心主任
1999年~現在 美國軍隊衛生服務大學，教授(合聘)
2003年~2004年 馬里蘭州洛克維爾醫學會，內分泌醫師(兼職)
2000年~2003年 美國軍隊衛生服務大學，航太醫學跨部門中心，主任
1997年~2004年 美國貝勒醫學院院，國家太空生物醫學研究研究所，主管(骨質流失)
1998年~2000年 美國華特里德陸軍醫學中心，臨床評估計畫，主任
1993年~1998年 美國約翰霍普金斯大學，老年醫學暨老年學部門，教授
1997年~1998年 美國牙科研究國家研究院，顱顏骨骼發育異常與骨骼疾病，特別諮詢
1993年~現在 美國先天性成骨不全症基金會，醫療顧問委員會
1990年~1997年 美國約翰霍普金斯灣景醫學中心，臨床研究中心，計畫主任
1991年~1998年 美國約翰霍普金斯灣景醫學中心，骨質疏鬆症專科，共同主任

● 獲獎

1956 Alpha Omega Alpha Honor Society
1987 Sustaining Membership Award, Association of Military Surgeons of the United States
1982 DHHS, U.S. Public Health Service Outstanding Service Award
1982 Founder's Medal, Association of Military Surgeons of the United States
1981 DHHS, U.S. Public Health Service Commendation Medal
1980 Equal Employment Opportunity Award, Clinical Center, National Institutes of Health, Uniformed Services Public Health Service, Department of Health and Human Services

● 期刊論文出版 (2000年起依年代排列)

1. Engel Jr CC, Liu X, Clymer R, Miller RF, Sjoberg T, Shapiro FR. Rehabilitative care of war-related health concerns. J Occup Environ Med. 42:4, 2000
2. Shapiro JR, Schneider V. Coutermeasure development: Future research targets. J Gravit Physio. 17:P1-P4, 2000.
3. Schultheis L, Ruff CB, Rastogi S, Bloomfield SA, Hogan HA, Fedarko N, Thierry-Palmer J, Ruiz F, Bauss F, Shapiro JR. Disuse Bone Loss in the Hindquarter Suspended Rat: Partial Weightbearing Exercise and Ibandronate Treatment as countermeasures. J Gravit Physiol 7: P13-P15, 2000
4. Shapiro JR, Sponsellor P, Hickman C, McCarthy E, Rossiter K, Santiago H, Bober M. Treatment of Osteogenesis Imperfecta, Type IA with Intravenous Pamidronate. Calcif Tissue Int'l. 2002
5. Yu-Yahiro JA, Michael RH, Dubin NH, Fox, KM Sachs, M, Hawkes WG, Hebel R, Zimmerman SI, Shapiro FR, Magaziner, J Serum and urine markers of bone metabolism during the year after hip fracture. J Am Geriatr Soc, 49:1-7, 2001
6. Shapiro JR, Schneider V. Countermeasure development: future research targets J Gravit. Physiol 7:1-4, 2000
7. Shapiro JR, McCarthy EF, Rossiter K, Ernst K, Gelman R, Fedarko N, Santiago HT, Bober M.. Effect of intravenous Pamidronate on Bone Mineral Density, Bone Histomorphometry and Parameters of Bone Turnover in Adults with type 1A Osteogenesis Imperfecta. Calcified Tissue International, 72:103-12, 2003
8. Grzeski, Wj, Chester R. Frazier Jay R. Shapiro, Paul D. Sponsellor, Pamela Gehron Robey, Neal S. Fedarko. Age-related Changes in Human Bone Proteoglycan Structure: Impact of Osteogenesis Imperfecta. J Biological Chem. 277:43638-47, 2002
9. Shapiro, JR, Beck TJ, LeBlanc, A, Schneider V, Mustapha B, Shakelford L, Oreskovic T, Ballard P, Ruff C, Toerge J, Caminis J. Patterns of Femoral Bone Loss in Spinal Cord Injury and Spaceflight, ASBMR, San Antonio, TX, September, 2002.
10. Wojciech JG, CR Frazier, JR Shapiro, PD. Sponsellor, P. Gehron Robey, NS. Fedarko.. Age-related Changes In Human Proteoglycan Structure: Impact of Osteogenesis Imperfecta. J Biological Chem. 277:43638-47, 2002.
11. E A. Streeten, DF. McBride, A Lodge, T. Pollin, WC Hsueh, JR Shapiro, AR. Shuldiner, BD. Mitchell, Reduced incidence of hip fracture in the Old Order Amish. J Bone Miner Res. 2004; 19:308-313.
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13. Shapiro, JR. Microgravity and Drug Effects on Bone. J Musculoskeletal Neuronal Interact. 6:322-333, 2006.
14. Shapiro JR, Beck TJ, Musthapha B, Ballard P, Caminis J. Zoledronic Ameriorates the Effets of Acute Bed Rest in Patients with Acute Spinal Cord Injury. Calcified Tissue Int. 2007 80(5):316-22.
15. Martin EN, Shapiro JR. Osteogenesis Imperfecta: Epidemiology and Pathophysiology. Current Osteoporosis Reports 5: 91-97, 2007;
16. Pillion JR, Shapiro JR. Audiological findings in osteogenesis imperfecta, J Am Acad Audiol 19:595-601,2008. Shapiro JR, Sponseller PD. Osteogenesis Imperfecta: questions and answers. Curr Opin Pediatri. 2009; 21:709-716
17. Shapiro JR, Inherited and Related Disorders of Bone Matrix Synthesis in Men. In Orwoll, E. Beleziakan, Jl, VanderScheuren D. Osteoporosis in Men, Ed 2, Academic Press, 505-522, 2010.
18. Shapiro JR, Bibat G, Hiremath G, Blue ME, Hundalini S, Yablonski T, Kantipuly A, Rohde C, Johnston M, Naidu S. Bone Mass in Rett Syndrome: Association with Clinical Parameters and MECP2 Mutations. Pediatr Res. 2010 Jul 23. PMID: 20661168
19. Shapiro JR, Thompson CB, Wu Y, Nunes M, Gillen C. Bone mineral density and fracture rate in response to intravenous and oral bisphosphonates in adult osteogenesis imperfecta. Calcif Tissue Int. 87:120-129. 2010
21. Shapiro, JR; Kantipuly, A; Rowe, D. Osteogenesis Imperfecta: Current and Future treatment. Drugs of the Future 35: 529-604, 2010.

● 進行中研究與贊助

主題：使用Forteo(骨穩)治療成人先天性成骨不全症患者 9/1/05-8/31-10
共同研究者
研究目的為以雙磷酸鹽類藥物治療成效不佳之成人先天性成骨不全症患者，評估其以teriparatide治療骨質疏鬆症。

主題：美國馬里蘭州洛克維爾慈善暨研究基金會 6/1/2000-5/31/2009
PI: 建立甘迺迪克瑞格研究機構先天性成骨不全症專科之管理職位及臨床研究之推行
此基金支援先天性成骨不全症資料庫的發展，包含鼓勵全美國研究者投入先天性成骨不全症的研究、協助研究者取得患者相關資料。

主題：以雙磷酸鹽類藥物作為太空飛行骨質流失的對策。美國太空總署: (USRA Subcontract 04490.072-Bisphosphonate)
共同研究者
本研究測試在國際太空站6個月的太空飛行中，口服及靜脈注射雙磷酸鹽類藥物減少骨質流失的效果。

Edward and Stella Van Houten基金會 2006-2007 $50,000
PI: JR Shapiro: 營養對先天性成骨不全症小朋友骨質成長的影響(The Impact of Nutrition on Bone Growth in Osteogenesis Imperfecta)

慈善暨研究基金會(Charitable and Research Foundation) 2006-2010 $200,000
PI: JR Shapiro: 先天性成骨不全症資料庫(The Osteogenesis Imperfecta Registry)

邀請講員－吳冠彣

Birth: April 18th, 1978
Email: wukuanwen@gmail.com

- **學歷**

台灣大學醫學系畢業
Medical school: National Taiwan University School of Medicine, MD Degree 1996-2003

- **任職**

1. 台大醫院骨科部住院醫師
Residency, Department of Orthopedic Surgery of National Taiwan University Hospital. July, 2003 ~ June, 2008.

2. 台大醫院雲林分院主治醫師
Attending Physician, Department of Orthopedic Surgery of National Taiwan University Hospital, Yun-Lin Branch. July 2008~ now (current position)

3. 台大醫學院骨科部兼任講師
Lecturer, Department of Orthopedic Surgery of National Taiwan University Hospital, January 2011 ~

Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

2011年5月21日

May 21st - 22nd, 2011

Taipei, Taiwan

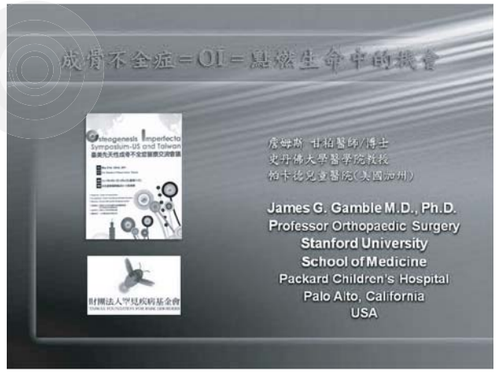
2011 臺美先天性成骨不全症醫療交流會議
每日議程

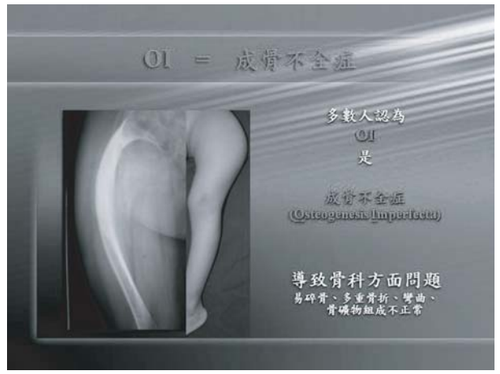
第一天 ── 2011年5月21日 星期六
主持人：陳冠如 (臺灣)

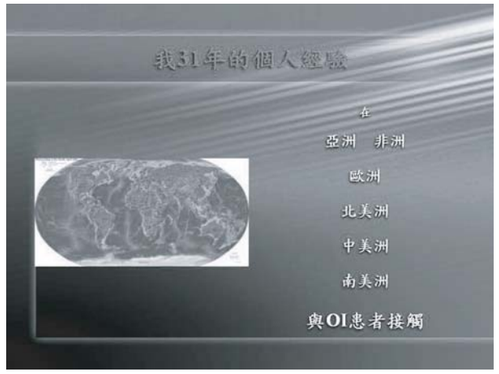
09:10 - 10:00, 2011/05/21 星期六
邀請講員： 詹姆斯 · 甘柏 (美國)

B1, 大都會廳

成骨不全即是機會的點燃







已知的研究

1972 美國精神醫學期刊 (*Amer. J Psychiatry*)

Osteogenesis Imperfecta: Psychological Function

- 12位兒童OI
  - 年齡6－17歲
- 平均50次骨折
  - 多次長期住院
  - 長時間不動
  - 多次手術治療
- 情緒與認知
  - "非常地開朗快樂"
  - 沒有任何精神方面的問題
- 平均學校表現較佳

已知的研究

2003 兒科醫學期刊 (*Pediatrics*)

Temperament and Physical Performance in Children With Osteogenesis Imperfecta

- 35位OI兒童
  - 年齡1－12歲
    - 平均年齡7.5歲
  - 20位女生，15位男生
  - 多重心理量表
- 性格
  - "行為方式"
  - 活動性、心情、注意力、持久性、規律性、可預測性
- 從小開始就有社會適應能力

已知的研究

2005 美國遺傳醫學期刊 *Am J (Medical Genetics)*

Personality and Stereotype in Osteogenesis Imperfecta: Behavioral Phenotype or Response to Life's Hard Challenges?

- 55位成人OI
  - 年齡19－67歲
  - 30位女生，25位男性
- 對話表達
  - 愉快的、健談的、情緒佳
- 學校表現極優
  - 多數大學上過大學

已知的研究

2010 美國生物醫學工程期刊 (*Disability & Rehabilitation*)

A population-based study of demographical variables and ability to perform activities of daily living in adults with osteogenesis imperfecta.

- 97位成人OI
  - 平均年齡41歲
  - 56位女生，41位男性
  - 挪威中部中心
- 教育水準高
  - 50%學院或大學
    - 一般挪威人為36%
  - 75%就業率
- "社會性的、能適應的"
- 78% 第一型，12% 第四型，10% 第三型

已知的研究

1980 骨與關節外科期刊 (*J Bone Joint Surgery*)

Aftermath of Osteogenesis Imperfecta: The Disease in Adulthood

- 31位成人OI
  - 95人骨折
    - 93%下肢
  - 8位女性，23位男性
  - 年齡17－51歲
    - 平均27歲
  - 北卡羅萊納州骨科醫院
- 教育狀況
  - 33%上大學
  - 65%就業
  - 25%學生
- "有智慧的、社會互動豐富、能適應方位"

骨科的角色

尼古拉安德烈
Nicholas Andre (1658－1759)

OI患者
很早就有看骨科醫師的經驗

Orthopaedics (骨科)
(*orthos* 變直; *paedia* 兒童)

Andre，1741年

骨科的角色

治療目標

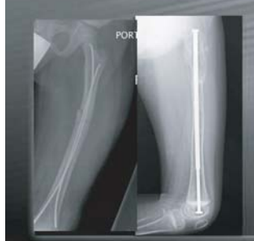
- 維持舒適
  - 治療與預防骨折
- 降低變形的發生
  - 長骨骨釘治療
- 增加功能
  - 配合物理治療與職能治療
- 增進與社會融合
  - 行動力
  - 日常生活功能獨立
  - 教育與就業

骨科的角色

治療方式

- 早期使用行動輔助裝置或輔具 (orthosis)
- 減少以石膏固定的時間，以降低骨質疏鬆發生

骨科的角色



治療方式

- 長骨骨釘治療
  - 伸縮性骨髓內骨釘
- Bailey-Dubow
- Fassier Duval
- Williams Rod
- Flexible rods (有彈性的)
- Rush rods

骨科的角色

治療方式

- 長骨骨釘治療
- 1963 Bailey-Dubow: 第一個可伸縮"生長"的骨髓內骨釘

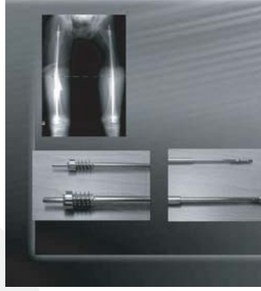
骨科的角色

治療方式

- 長骨骨釘
- 1963 Bailey-Dubow: 第一個可伸縮"生長"的骨髓內骨釘

Complications of Intramedullary Rods in Osteogenesis Imperfecta: Bailey-Dubow Rods Versus Nonelongating Rods

骨科的角色



治療方式

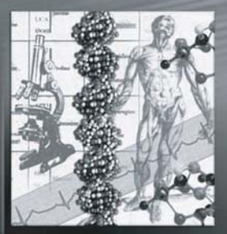
- 長骨骨釘
- Fassier-Duval 伸縮性骨釘

骨科的角色

治療方式

- 長骨骨釘
- Peter Williams骨釘：最少的侵入性骨釘放置手術

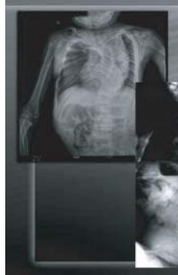
骨科的角色



治療方式

- 長骨骨釘
- 為減少手術的侵入性、改進植入物，需要做更多研究

骨科的角色



治療方式

- 脊椎側彎之治療
- 非手術治療
- 手術治療
  - 多階段固定
  - 骨線、骨鈎、骨螺絲

雙磷酸基藥物的角色

治療方式

- 藥物治療
  - 1992年，帕米迪巴內(Pamidronate)
  - 增加骨密度
  - 在美國為仿單核准適應症外(Off Lable)使用
- 傑伊傑匹羅醫師(Dr Shapiro)的專長

OI = 點燃機會

提供

- 法律的保護
  - 機會平等
- 骨科及醫療照護
- 能達成什麼目標？

研究與方法

- 史丹佛帕卡德醫院做的縱貫性(長期性)研究
- 31位成人OI
  - 20位女性；11位男性
  - 平均年齡40歲
  - 年齡從26歲-69歲

OI = 點燃機會

31位成人OI

- 平均年齡40歲(26－69歲)
- Sillence類型
  - 第三型 22 (71%)
  - 第四型 3 (10%)
  - 第一型 6 (19%)
- 行走
  - 獨立 13 (42%)
  - 電動輪椅 18 (58%)

31位成人OI

- 教育成就
- 大學畢業 29 (93%)
- 學士 93%
- 碩士 10%
- 專業 13%
  - 博士Ph.D 3
  - 法學學士LLB 1

相較之下？

31位成人OI

- 大學畢業 93%
- 學士 93%
- 碩士 10%
- 博士 13%
- 未就業者 6% (2)
  - 僅高中

普通美國人口

- 大學畢業 27%
  - p <.001 (有顯著差異)
- 學士 27%
- 碩士 9%
- 博士 3%
  - p <.05 (有顯著差異)
- 未就業者 9%

他們現在是？

31位成人OI

31位成人OI

教師、生物物理學家、企業主、資訊科技、會計師、房仲業者、律師、藥師、網站設計者、生化學家、通訊專家、新聞記者、軟體設計師、人類學家、政治學家

結果為何可以如此？

學術成就

學術成就

- 學習動機
- 語文能力
- 專注力

是成功的要件

他們是怎麼做到的呢？

解答：團隊合作！

如果我能看得更遠...
那是因為
我站在巨人的肩膀上。

牛頓(Sir Isaac Newton) 1675

OI = 點燃機會

如果我能看得更遠...
那是因為
我站在巨人的肩膀上。
牛頓 1675

- OI兒童是站在巨人團隊的肩上
- 團隊合作才有可能發生...感謝生命中貴人

Xie Xie

10:00 - 10:50, 2011/05/21 星期六
邀請講員： 傑伊傑．匹羅 (美國)
B1, 大都會廳

OI研究近況與治療

成骨不全症是因數個調節第一型膠原蛋白(type I collagen)的基因突變，造成易碎性骨質。第一型膠原蛋白是骨骼及結締組織，如：肌腱與韌帶中主要的結構蛋白。基因突變改變骨骼中第一型膠原蛋白的量（製造較少）或骨骼中有不正常的膠原蛋白存在，讓骨骼強度降低。本篇將討論基因型（基因突變）與表現型（突變造成的臨床表現）之間的關係，亦討論不同種類的雙磷酸基(bisphosphonate)藥物對兒童與成人增加骨質強度效果，它對於兒童OI有效，但對成人OI預防骨折的效果較少。

OI研究近況與治療

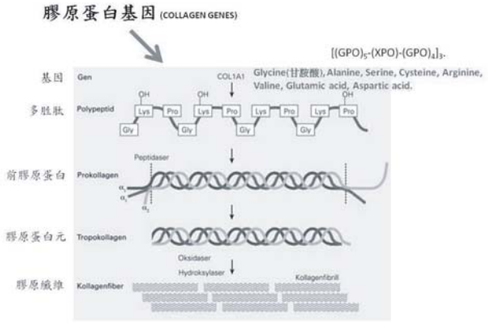
傑伊 傑匹羅 醫師
甘迺迪克瑞格研究機構、約翰霍普金斯大學
骨科與成骨不全症部門主任

Jay R. Shapiro, MD
Director, Bone and Osteogenesis Imperfecta Dept.
Kennedy Krieger Institute and Johns Hopkins School of Medicine
Baltimore, MD, USA

主題

- OI膠原蛋白的突變
- 基因型與表現型的關係
- 兒童與成人治療相關的問題
- 未來的對策

膠原蛋白基因 (COLLAGEN GENES)



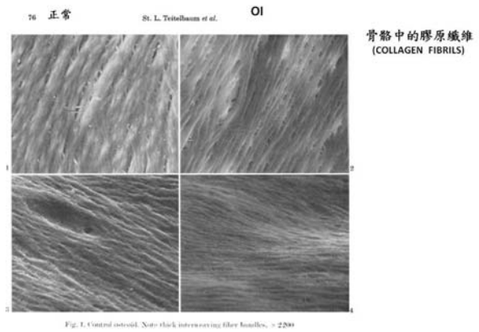


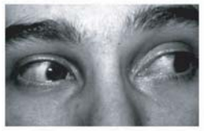
Fig. 1. Control osteoid. Note thick interweaving fiber bundles. × 220

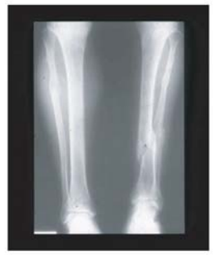
OI臨床類型與遺傳

第一至四型OI

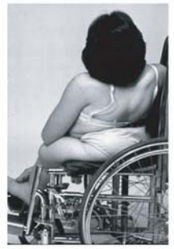
I, II, III IV, V　　顯性遺傳

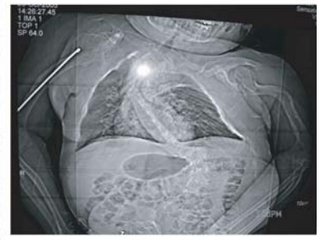
第六、七、八型OI　　隱性遺傳





第三型OI





膠原蛋白突變與基質(Matrix)組成

OI第一型：無效等位基因(Null allele)(量的缺陷)

無義突變或缺失、插入造成的提早形成終止密碼(premature termination codon)

正常數量的一半

OI第二三四型：(質的缺陷)

被巨大胺基酸取代

(Glycine, Alanine, Serine, Cysteine, Arginine, Valine, Glutamic acid, Aspartic acid.

(胺基酸取代、缺失、插入或重複：RNA剪接突變(Splice mutations)、轉譯框位移(Frameshifts))

突變的α鏈合成基質
顯性負面效應
(DOMINANT/NEGATIVE EFFECT)

OI第五六型：沒發現膠原蛋白突變

第七型OI：隱性
(Glorieux: Northern Nation, Canada)

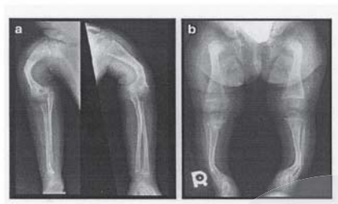


Figure 2. (a) Patient V-3, age 3 years 5 months, showing selective shortening of the humeri (rhizomelia). (b) Patient V-6, age 4 months, showing bilateral coxa vara. Bowing deformity of the lower extremities is also evident.

OI症候群的基因突變

COL1A1
collagen, type I, alpha 1 (第一型膠原蛋白α1)
COL1A2
collagen, type I, alpha 2 (第一型膠原蛋白α2)
CRTAP
cartilage associated protein
LEPRE1
leucine proline-enriched proteoglycan (leprecan) 1
PPIB
peptidylprolyl isomerase B (cyclophilin B)

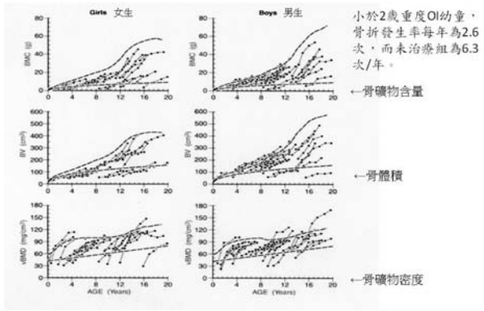
SERPINH1 (HSP 47) serpin peptidase inhibitor, clade H (heat shock protein 47), member 1, (collagen binding protein 1)
FKBP65 (FKBP 10)
FK506 birding protein 10, 65 kDa
PLOD2 and FKBP 10 (Bruck Syncrome Type 2)
procollagen-lysine, 2-oxoglutarate 5-dioxygenase

突變發生於**CRTAP/LEPRE1**複合體干擾第一型膠原蛋白的**proline 3 hydroxylation OF Pro986**

CRTAP + Lepre1 (P3H1)
+
PPIB gene encodes CyPB cyclophylin B
↓
3-OH-Proline 986

基因與表現型

帕米德諾內治療OI : Glorieux and Rauch



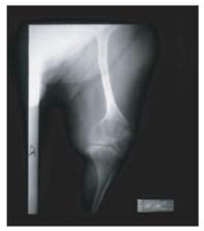
小於2歲重度OI幼童，骨折發生率每年為2.6次，而未治療組為6.3次/年。

帕米德諾內與骨折發生率

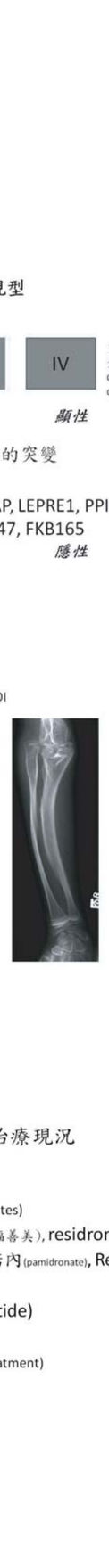
骨質密度與骨折風險並不相同。

帕米德諾內(pamidronate)治療能增加骨質密度，最多能減少一半的骨折發生率，但並非針對所有OI兒童。

基因型與表現型的關係



第五型OI



兒童之治療建議 (KKI)

- 在甘迺迪克瑞格研究機構中，建議以雙磷酸基藥物治療出生時多重骨折、長骨變形、及X光顯示去礦化的嬰孩。
- 雖然治療年紀較大兒童沒有標準。一年內發生3處或超過2處骨折，包括椎骨骨折，及雙光子骨密度檢測(DXA)骨質密度Z分數(與同年齡層比較)小於-2.0，則考慮治療。
- 接近青春期的孩童通常不治療，因青春期的因素減少了骨折的風險。

帕米德諾內治療：需治療多久？
Rauch F. et al Histomorphometry

- 在研究觀察前半段，平均骨密度增加72%；但在後半段僅增加24%。在治療後的第一次檢測，平均皮質骨寬度與海綿骨體積分別增加87%與38%。其後，皮質骨寬度無顯著變化，但海綿骨體積有增加的趨勢(P = 0.06)。
- 帕米德諾內(pamidronate)治療開始後，骨小梁表面的骨形成率減少70%，並在後期顯示有繼續下降的趨勢。
- **結論**：帕米德諾內在治療開始2-4年內能達到效果。

基因型與表現型關係

- **COL1A1 及 COL1A2 突變**
- **最常出現的突變是甘胺酸(glycine)被絲氨酸(serine)置換：**
- **Alpha-1 突變比 alpha-2 嚴重**
  - **身材較小**
  - **短小身材與alpha 2的*位置*有關，非alpha 1鏈**
- **突變發生在氨基末端前120胺基酸，與藍鞏膜有關**
- **Alpha-1單套缺失(haploinsufficiency)：身高較高、體重較重並腰椎骨質密度較高**

不同組別的腰椎骨質密度或組織形態沒有相關。被影響的α(I)鏈與被置換胺基酸種類則會產生作用。

Rauch, F. Eur J Hum Genet. 2010

兒童與成人OI治療現況

- 鈣質與維他命D
- 雙磷酸基藥物 (Bisphosphonates)
  - 口服：alendronate(福善美), residronate
  - 靜脈注射：帕米德諾內(pamidronate), Reclast
- 研究中
  - Forteo骨穩 (teriparatide)
  - 生長荷爾蒙
  - 振動治療 (vibration treatment)

以口服雙磷酸基藥物治療

- Phillipi (Cochrane, 2008)：證據顯示口服或注射雙磷酸基藥物能增加兒童或成人OI的骨密度。**二者對於增加骨質密度並無不同，這二種的治療是否減少骨折風險也不明確。**
- Ward L等人：結論—小兒OI病患以口服**ALN**治療二年，明顯減少骨代謝(turnover)，**增加椎骨密度，但與骨折是否改善沒有關連。**
- Rauch F等人：相反地，**Residronate (Peds)**對於橈骨骨骺端與骨幹、股骨、及全身的骨量及密度沒有顯著治療效果。髂骨間骨活組織檢查(transiliac bone biopsies)的組織形態測量分析，在皮質骨寬度、海綿骨體積、或骨代謝沒有顯著治療效果，**而在椎骨形態測量、第二掌骨皮質骨寬度…或骨折發生的次數，也沒有治療的效果。**

雙磷酸基藥物對成人OI骨折發生率的影響
Shapiro J. 等人 2010

評估治療前與治療後5年

51位治療：22位無治療成人OI

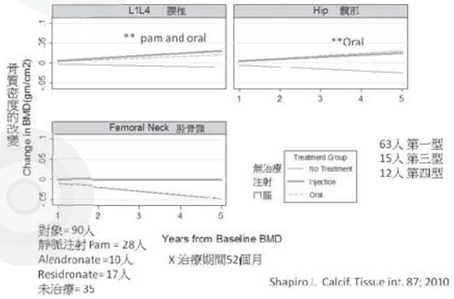
OI第一型患者，對於減少骨折發生率沒有治療效果

OI第三型，在靜脈注射之帕米德諾內(pamidronate)治療之後，骨折發生率降低 (p=0.054)，但並非使用口服雙磷酸基藥物後。

Shapiro J. et al. Calcif. Tissue int. 87; 2010

第一型OI患者五年間不同部位骨質密度的改變

Projected Levels of BMD Change for Type I OI Patients
by Treatment Group and Site Across 5-year Span



63人 第一型
15人 第三型
12人 第四型

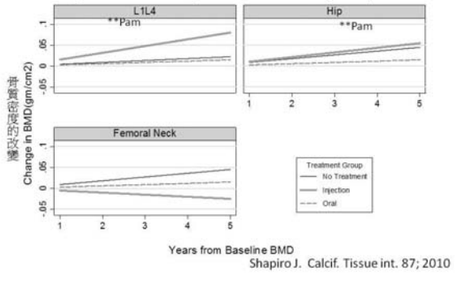
對象= 90人
靜脈注射 Pam = 28人
Alendronate =10人
Residronate= 17人
未治療= 35

X 治療期間52個月

Shapiro J. Calcif Tissue int. 87; 2010

第三、四型OI患者五年間不同部位骨質密度的改變

Projected Levels of BMD Change for Type III/IV OI Patients
by Treatment Group and Site Across 5-year Span

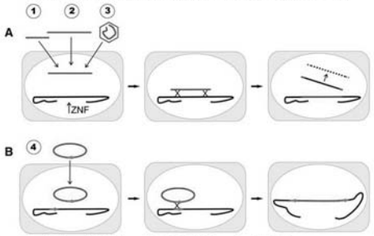


Shapiro J. Calcif. Tissue int. 87; 2010

基因重組途徑及人類胚胎幹細胞基因組修飾的應用

Genetic recombination pathways and their application for genome modification of human embryonic stem cells

Mikko Nieminena. EXPERIMENTALCELLRESEARCH316(2010)2578

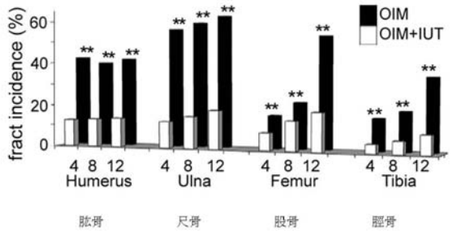


1. Linearized plasmid delivery for HR. 2. Linearized BAC delivery for HR. 3. Viral delivery for HR.

總結

- OI共有8類型7(+) 基因型
- 診斷需以DNA分析（非皮膚切片）
- 靜脈注射雙磷酸基藥物對大多數兒童有效
- 口服雙磷酸基藥物無顯著效果
- 除了一些第三、四型OI患者，雙磷酸基藥物對成人無顯著效果。

第一孕期血液之人類胚胎間葉系幹細胞子宮內移植
修補骨骼與減少OI老鼠的骨折
Intrauterine transplantation of human fetal mesenchymal stem cells from first-trimester blood repairs bone and reduces fractures in osteogenesis imperfecta mice
Pascale V. Guillot[1], Blood. 2007



新的治療對策：未來的方向！

對重度OI分子治療(Molecular approach)
(Dominant/Negative disease)

1. 異體骨髓移植(Allogeneic bone marrow transplant)
2. 減少突變的等位基因(allele)的活動
   hammerhead核糖體(ribosomes)
   小干擾RNA (siRNA)
   micro-RNA
   alpha-2(I) cDNA嵌入腺病毒(Adenoviral)間葉幹細胞 (mesenchymal cells)
3. 間葉幹細胞過度表現正常的COL1A1等位基因

基因治療(Genetc approach)數量的缺陷：
無效等位基因(Null allele)

1. 減少突變等位基因的活動，將有功能的等位基因增加到患者的間葉細胞並移植。
2. 藉由同源重組(homologous recombination)，移除突變的基因片斷

鋅指核酸胸(Zinc finger nucleases) to excise and insert (也可用於顯性抑制(dominant negative) OI)

11:00 - 11:30, 2011/05/21 星期六
邀請講員： 張鳳書 (美國)

B1, 大都會廳

成骨不全症資料登錄 (The OI Registry)

進行罕見疾病（例如：成骨不全症）的研究時，困難之一是能找到足夠可參與研究的對象。在「成骨不全症登錄」資料量逐漸增加下，成為促進成骨不全症臨床研究當中重要的一環，並讓成骨不全症患者有機會能參與研究。

成骨不全症資料登錄
The Osteogenesis Imperfecta (OI) Registry

凱登布倫南女士
甘迺迪克瑞格研究機構：成骨不全症登錄管理者
Caden Feng-Shu Brennen(Chang), MS
OI Registry Manager
Kennedy Krieger Institute,
Baltimore, MD

議題

- 什麼是成骨不全症資料登錄？
- 包括哪些資訊？
- 如何運作？
- 重要性是什麼？

成骨不全症（資料）登錄是什麼？

- 成骨不全症登錄是與甘迺迪克瑞格研究機構及美國成骨不全症協會(OI Foundation)合作下，第一個網路上保密OI資料庫，於2006年5月成立。
- 是病患自行建立的資料庫，包括兒童及成人OI人口統計資料。
- 目的是建立一個容易聯絡到的OI患者最新名單，藉以鼓勵OI相關臨床研究的建立。

成骨不全症登錄成員
（截至2011年2月）

- 超過1740位成員。
- 包括各年齡層及各類型的OI患者，亦包括已故者的資料。
- 來自40個國家
  －9% 的成員住在美國以外的地區。
- 2位成員在台灣（台北）。

成骨不全症登錄網站：
http://www.osteogenesisimperfecta.org/oir/

成骨不全症登錄同意表

成骨不全症登錄包含哪些資料？

- 成員聯絡資料
- OI 病史，例如：
  - 家庭史
  - 骨折病史
  - 兒童受虐議題
  - 懷孕相關問題
  - 心臟問題病史
- 醫療疾病狀況
- 先前治療狀況，包括手術史
- 教育與工作狀況

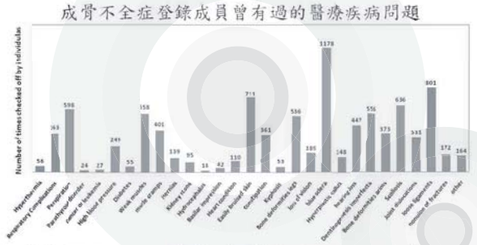
成骨不全症登錄成員資料

- 性別
  – 女性佔64%；男性佔36%
- 年齡
  – 30歲以下佔48%
  – 30－49歲佔34%
  – 50歲以上佔17%
  – 已故OI患者佔1%
- OI類型
  – 輕度佔44%
  – 中度佔12%
  – 重度佔26%
  – 其他未填寫或不知道自己的類型

...接續前頁

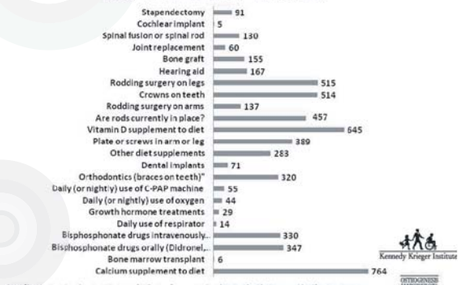
- 活動度行動力
  – 61% 能獨立行走
  – 17% 需電動或手動輪椅
  – 7% 使用拐杖或助行器
  – 2% 表示不能獨立活動
- 骨折
  – 61% 表示一生經歷1-30次的骨折
- 兒童受虐議題
  – 31% 表示遇過兒童受虐議題

成骨不全症登錄成員曾有過的醫療疾病問題



較常出現的是：藍眼珠（鞏膜）、韌帶鬆弛、皮膚易出現傷痕、骨椎側彎、牙本質形成不全、上下肢變形、聽力喪失、呼吸方面併發症、肌肉無力、肌肉痙攣。

成員曾經歷過的手術及治療



較常見治療為：手術（骨釘）、雙磷酸基藥物、營養補充品（維他命D、鈣）、齒科或矯正治療。

成骨不全症登錄如何運作？

- 當有通過的臨床研究時，會以電子郵件通知OI登錄成員，並告知如何與研究者聯絡。
- 研究參與者是完全的自願性的，並且資料隱私被安全處理。
- 登錄不允許調查者直接存取資料庫或研究對象。

已完成及進行中的研究協定

已完成的研究

1. **副甲狀腺素活性片段(teriparatide)(FORTEO骨穩)對成人OI增加骨質量與改善骨質結構的效果。**(Jay Shapiro, Kennedy Krieger Institute; Eric Orwall, Oregon Health Sciences University; Brendan Lee, Baylor Medical Center)
2. **OI個人生活經驗的衝擊：對生育的決定。**(Marta Szybowska, Hospital for Sick Children-University of Toronto)
3. **成人OI對著床前基因診斷的態度。**(Elizabeth S. Janoski, Case Western University)
4. **兒童當中雙磷酸基藥物引起的下頜骨骨頭壞死症(BON)。**(Tarak Srivastata, University of Toronto)
5. **OI登錄成員的流行病學研究。**(Elizabeth Martin, Oregon Health Science University)

已完成及進行中的研究協定

進行中

1. **OI患者脊椎側彎的自然進程與治療成果。**(Paul Sponseller, Johns Hopkins Medical Institutes)
2. **OI個體的營養對骨質成長的影響。**(Jay Shapiro, Kennedy Krieger Institute)
3. **OI個體患閉角型青光眼(Open-Angle Glaucoma)的發生率。**(Rand Allingham, Duke University)
4. **牙本質形成不全的基因型與表現型。**(John Timothy Wright, University of North Carolina)
5. **OI的縱貫（長期）研究。**(Jay Shapiro, Kennedy Krieger Institute; Jessica Adsit, Oregon Health Sciences University; Mary Mullins, Baylor Medical Center)

OI登錄的重要性

從病患與家庭角度來看：

- 成員們提供與OI經驗相關資料，鼓勵了臨床研究，使各年齡層及各類型OI更多的被了解。
- 成員有機會參與研究。

從OI研究者角度：

- 已建立的資料庫推動研究的進行。
- 登錄促進潛在研究對象的聯繫。
- 登錄讓研究者考慮到未曾想到的研究計劃。

OI登錄讓研究者與潛在研究對象在一起合作。

OI病患的心血管疾病

- OI登錄包含下述問題：
  - 你曾有過主動脈瓣或僧帽瓣的手術嗎？
- 1485人中有110人(7.4%)回答是。
- 這樣的結果，讓一項研究被提出：“OI患者心血管疾病醫療與手術評估”。（與紐當普金斯醫院心臟科合作）

依登錄成員與醫學研究者的建議，新的問題持續被加入登錄

例如：

- 2010年四月，加入女性專有的問題。
- 2010年五月，加入教育與工作相關問題。
- 眼睛與皮膚相關問題也通過人體試驗委員會(IRB)，並日前納入OI登錄。

下一步？

- OI登錄的規模需要持續成長。
- OI患者平均表示有2-3個家庭成員也有OI。已註冊的成員請鼓勵其他患有OI的家庭成員也註冊。OI家長也請幫他們的小孩註冊。對於已故的OI患者，其資料對於回顧性研究亦有其價值。
- 當OI登錄的成員增加，對於社群團體與研究者的價值也會跟著增加。

如果你已經是OI Registry的一員，請再核對並更新您的資料，以保持最新資訊。

謝謝

11:30 - 11:55, 2011/05/21 星期六
邀請講員： 陳冠如 (臺灣)
B1, 大都會廳

罕見疾病防治及藥物法對OI的重要與影響

罕見疾病防治及藥物法對ＯＩ的重要與影響

財團法人罕見疾病基金會
副執行長 陳冠如
100/05

罕見疾病基金會簡介

- 1999年6月點亮了黑色的歷史
- 起始於兩位患者的家長
  - 我們不可能照顧孩子一輩子 但是制度可以

Background of TFRD

- The Story of Founders
  - Serena Wu - an ordinary mother who chooses an unusual way for her son and others.
    - Serena's boy-Terry Wu
      - Urea Cycle Disorders→Primary Carnitine Deficiency
      - Transferring specimen abroad
      - Importing Orphan Drug-Ucephan and Carnitine

Background of TFRD

- The Story of Founders
  - Min-Chieh Tseng
  - Professor Tseng's son - Zi-Fun Tseng
    - Leucine metabolism disease
    - Born and treated in US
    - Being introduced by Dr. Lin, the father borrowed the drug from Serena.
    - as a sociologist, he knows he can't take care of his son forever but a well-established system can

By the assistant of patients' families, physicians, government officers, and press media, TFRD was established in 1999.

罕見疾病防治及藥物法 立法推動

- **1999.06** 罕見疾病基金會成立
- 1999.07 罕病基金會第一屆第三次董事會決議籌組「罕見疾病立法小組」
- 1999.11 罕見疾病基金會版之「罕見疾病法草案」正式出爐
- 1999.11 立法院第1140號，委員提案第2711號由立法院江綺雯等34位委員草擬之「罕見疾病法草案」提出表決
- 1999.11 立法院第1140號，委員提案第2716號由立法院余政道等34位委員草擬之「罕見疾病法草案」提出表決
- 2000.01 立法院第四屆第二會期第十七次會議正式三讀通過「罕見疾病防治及藥物法」
- **2000.02** 總統明令公告「罕見疾病防治及藥物法」，罕病病友不再是求助無門的醫藥孤兒
- 2010.05 力促罕病疾病防治及藥物法修法

世界第**5**個制訂與孤兒藥或罕病相關法律的國家。
全世界獨一無二的將防治及藥物放在一起

Rare Disease Prevention and Orphan Drug Act

- 1999.06 Department of Health held a "Rare Disease Drugs Act (Draft) "
- 1999.11 TFRD proposed the draft for " Rare disease Prevention and Orphan Drug Act ", including all levels towards the prevention and treatment of rare diseases
- 2000.01 The Taiwan Legislative Yuan passed "Rare disease Prevention and Drug Act"
- 2000.02 President promulgated the Act
- Now, the health system for rare disease is more completed

Catastrophic Illness Certificate covered under National Health Insurance

- 2002.09 NIH announced that all rare diseases are under the category of catastrophic illness, patients with rare diseases are covered for most of their medical needs and no longer need to renew their NHI cards.

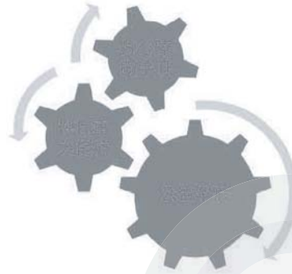
National Health Insurance Fund

- Starting in July 1, 2004, the system of "Global budget of the National Health Insurance" was implemented.
- the Bureau of National Health Insurance gave a positive response that starting in 2005, there will be a fund of several billion NT dollars allocated specifically to provide medication and access to drugs for rare disease patients.

Physically and Mentally Disabled Citizens Protection Act

- 2001.10 Taiwan government listing of rare diseases under the disabled classification.
  - Before the 5th amendment of the Physical and Mental Disabled Citizens Protection Act, rare disease patients weren't protected by the law.
  - Therefore, TFRD lobbied the government to include rare disease patients into the Physical and Mental Disable Citizens Protection Act, and furthermore, to establish a new category as "rare diseases"
- 2007.06 "Physically and Mentally Disabled Citizens Protection Act" formally changed its name to "Disability Rights Protection Act "
- 2009~2010 TFRD will pay close attention to "Disability Rights Protection Act" for rare disease patient's right

罕病法中罕病認定連動身障手冊與重大傷病資格



罕見疾病=身心障礙者??

■中央衛生主管機關所定之身心障礙手冊者為範圍：

- 1.視覺障礙者
- 2.聽覺機能障礙者
- 3.平衡機能障礙者
- 4.聲音機能或語言機能障礙者
- 5.肢體障礙者
- 6.智能障礙者
- 7.重要器官失去功能者
- 8.顏面損傷者
- 9. 植物人
- 10.失智症者
- 11.自閉症者
- 12.慢性精神病患者
- 13.多重障礙者
- 14.頑性（難治型）癲癇症者
- 15.經中央衛生主管機關認定，因罕見疾病而致身心功能障礙者
- 16.其他經中央衛生主管機關認定之障礙者。

2011年5月21日立法院通過「身心障礙者保護法」第三條修正案

財團法人罕見疾病基金會

全民健保之病患權益倡導

- **2002.09** 行政院衛生署公告，經署公告之罕見疾病，**列屬重大傷病**
- 2004.09 匡醫健保總額，罕見疾病用藥單獨專款專用
- 2010.05 爭取不限縮重大傷病範圍罕病類核發條件之資格限制
  - 歷年罕病用藥專款專用保障金額

年度	2005	2006	2007	2008	2009	2010
罕病及血友病預算（億）	22.34	26.59	30.00	36.00	47.82	47.82
罕病實際藥費（億）	5.12	10.84	11.12	13.47	15.15	16.61

備註：註：2005-2009年為實際數，2010年為推估數

13

財團法人罕見疾病基金會

罕見疾病防治及藥物法

- 內容大綱
  - 明訂國內罕見疾病的範圍
  - 獎勵藥商及醫界重視罕見疾病
  - 明訂罕見疾病藥物許可證有效期間為十年
  - 建立未查驗登記之罕見疾病藥物專案申請辦法
  - 辦理罕見疾病防治系列宣導計畫
  - 辦理罕見疾病防治研究及工作計畫
  - 取得困難藥物之準用規定（第22條）
    非罕見疾病藥物依藥事法規定製造或輸入我國確有困難，且經委員會審議 認定有助於特定疾病之醫療者，準用本法有關查驗登記及專案申請之規定 。

14

財團法人罕見疾病基金會

罕見疾病防治及藥物法之醫療補助

- **補助範圍：**
- 罕見疾病病人，因罕見疾病所產生之下列自行負擔之醫療有關費用，除已申請其他補助者外，得依本辦法申請補助：
  一、對罕見疾病治療方式或遺傳諮詢建議，有重大影響之診斷費用。
  二、國內、外研究證實，具相當療效及安全性之治療、藥物及維持生命所需之特殊營養品費用。
  三、疑似罕見疾病確認診斷之檢驗費用。
  四、代謝性罕見疾病營養諮詢費。
  五、維持生命所需之居家醫療照護器材費用。
  前項第三款及第五款規定，自中華民國一百年一月一日施行。
- **補助額度：**
  - 以實際發生數之**百分之八十**為限。但下列費用得全額補助：
    - 低收入戶病患之醫療費用。
    - 罕見遺傳疾病病患使用之藥物及維持生命所需之特殊營養食品費用。

財團法人罕見疾病基金會

Aredia雙磷化合物注射劑治療成骨不全症臨床試驗計畫

- 2000~2001年 計畫主持人:林如立及林炫沛醫師
- 罕見疾病基金會補助經費：**NT$500,000**
  補助人數：50人(諾華買一送一)
- 長庚醫院林如立醫師於罕見疾病審議委員會及健保局會議說明研究成果
- 健保局於**2003**年專案通過給付成骨不全症**Aredia**用藥

罕見疾病防治及藥物法

- **歷經四次修法，最近的修法（2010年12月8日）**
  - 第六條　中央主管機關應辦理罕見疾病之防治與研究。
  - 第三十三條
    中央主管機關應編列預算，補助罕見疾病預防、篩檢、研究之相關經費及依全民健康保險法依法未能給付之罕見疾病診斷、治療、藥物與維持生命所需之特殊營養品、居家醫療照護器材費用。其補助方式、內容及其他相關事項之辦法，由中央主管機關定之。
    前項補助經費，得由菸品健康福利捐之分配收入支應或接受機構、團體之捐助。

15

財團法人罕見疾病基金會

罕病、罕藥及特殊營養食品之審議成果

項目	種類	說明
罕見疾病審議 罕見疾病之認定，除以疾病盛行率萬分之一以下為參考基準外，需經罕見疾病及藥物審議委員會之審議認定，並以是否為「遺傳性」及「診療之困難性」為考量基礎。	公告185種	•納入健保重大傷病範圍，免健保部分負擔。 •截至100年2月台灣罕病通報人數共3,102人
罕見疾病藥物審議	公告74項	罕見疾病藥物 (48項) 困難取得藥物(26項)

- 罕見疾病通報告案中成骨不全症為排行第**6**名
- 健保局重大傷病成骨不全症領證數為**205**名 **(2010.12止)**

21

22

財團法人罕見疾病基金會

罕病法下設兩服務中心

項目	種類	說明
罕病特殊營養食品品目及適應症	公告40種	•台北榮總成立特殊營養食品暨藥品物流中心 •全額補助31項特殊營養品（99年使用者共289人）。 •儲備10項緊急用藥（99年使用者共有8人）
國際醫療合作代行檢驗服務方案		•罕病基金會成立國際代檢服務中心 •截至2010.12止協助399人次送檢

17

財團法人罕見疾病基金會

罕見疾病防治的法規制度

母法	子法規(行政法)
罕見疾病防治及藥物法	罕見疾病防治及藥物法施行細則
	罕見疾病醫療補助辦法
	罕見疾病藥物專案申請辦法
	罕見疾病藥物查驗登記審查準則
	罕見疾病藥物供應製造及研究發展獎勵辦法

18

11:55 - 12:20, 2011/05/21 星期六
邀請講員： 程健智 (臺灣)

B1, 大都會廳

先天性成骨不全症關懷協會背景及現況
一段由脆弱前進堅強的故事

歷史背景：
--1998年 成立病友會
由台灣最矮男人(林煜智)及最矮的姐妹花(蔡美玲、蔡淑惠)，和前理事長鄭 淑勻女士在因緣際會下，成立病友會。
--1999年 成立中華玻璃娃娃社會關懷協會
為提供病友更多的服務及讓社會提昇對成骨不全症的了解而成立。
--2008年更名為先天性成骨不全症關懷協會
為讓社會更正確了解成骨不全症而更名。

宗旨：
--協助病友自立、自強，並融入社會成為一股新的力量
病友們並非是社會的負擔，經過協助後亦可以是社會的清新的力量。
--結合社會資源，協助病友就學、就業、就養的人生歷程驅向完善
期待病友們和正常人一樣有完善的人生歷程。

服務項目：
--提供病友諮詢及協助，並結合公益團體及社會大眾增進病友之權益。
--彙整OI相關資料，並經由舉辦演講、定期聯誼活動、出版刊物及有關書籍的宣導活動，喚起社會大眾對OI的認識及關心。
--結合醫學界，加強對OI之診斷、醫療、預防相關之學術研究。
--與世界各國相關OI(玻璃娃娃)團體資訊交流，以提昇協會對病友之服務品質。
--結合有才藝的病友成立玻璃娃娃天使合唱團，從事宣導及關懷演出。
--爭取家族孕婦篩檢。
--提供會員急難救助。
--提供會員獎助學金。

遭遇問題：
--會員人數無突破，服務計劃困難行。
--社會偏見根深固，環境處處現障礙。
--骨鬆問題待改善，骨折不斷換釘難。

解決困難：
--會員個個好宣導、互助扶持解困難。
--攜手共促好權益、改善環境自由行。
--Aredia新藥來相助、伸縮骨釘待推行。

結論：
即使是身障者仍期待大同世界的來臨
那就是--幼有所養，少有所學，壯有所用，老有所終

Osteogenesis Imperfecta
Symposium-US and Taiwan
臺美先天性成骨不全症醫療交流會議

2011年5月22日

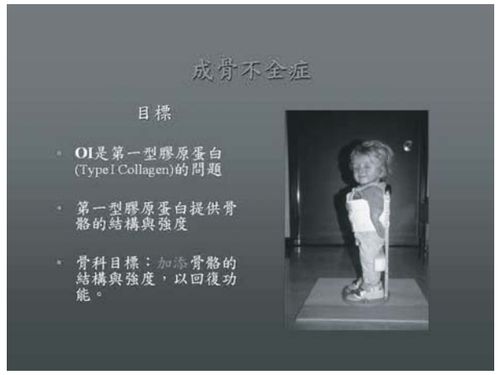
May 21st - 22nd, 2011
Taipei, Taiwan

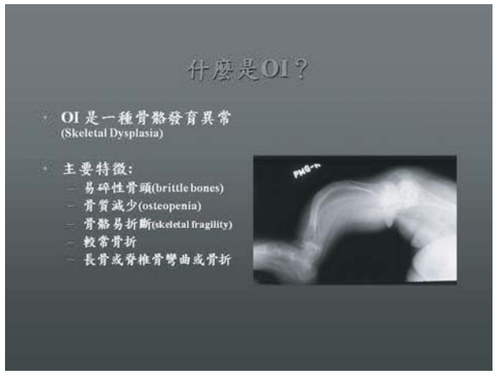
2011 臺美先天性成骨不全症醫療交流會議
每日議程

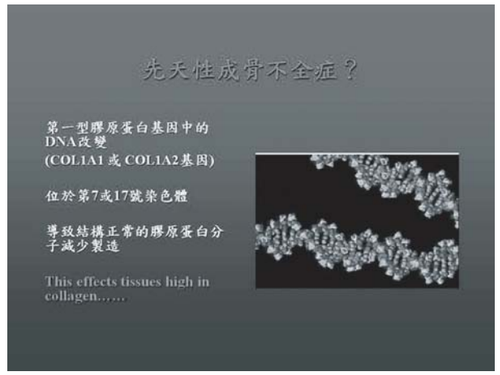
第二天 — 2011年5月22日 星期日
主持人：郭耿南 (臺灣)

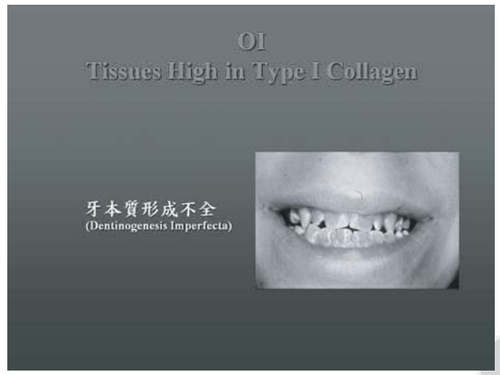
09:15 - 09:55, 2011/05/22 星期日
邀請講員： 詹姆斯 · 甘柏 (美國)
B1, 大都會廳

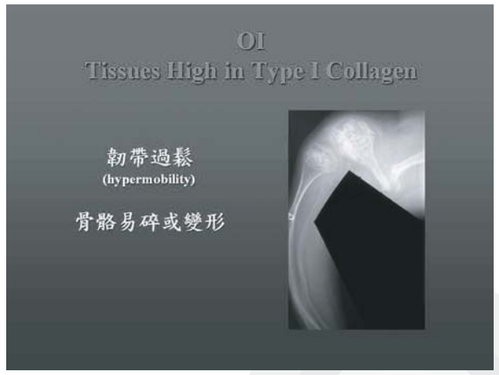
先天性成骨不全症：骨科觀點

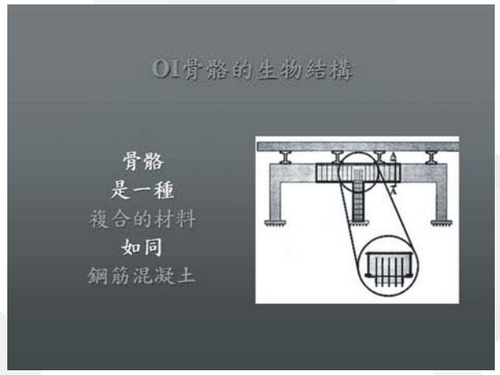








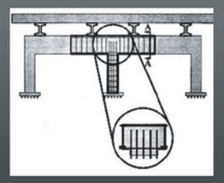




OI骨骼的生物結構

水泥＝鈣質

鋼筋＝膠原蛋白



OI：第一型膠原蛋白引起的問題

OI
是
骨頭裡的
鋼筋
不足

OI
第一型膠原蛋白

正常的鈣化
(calcification)
需要
正常的鋼筋

OI
第一型膠原蛋白

膠原蛋白的排列方向
(orientation)
讓
骨骼能生成

OI
第一型膠原蛋白

正常的膠原蛋白
正常的排列(packing)
正常的骨骼

OI
第一型膠原蛋白

不正常的膠原
不正常的排列
骨骼強度不足

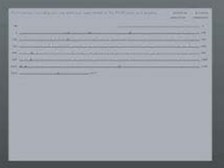
OI的臨床表現型(Phenotype)

表現型
(可被觀察的特徵)
嚴重程度
在於
DNA中
發生改變的位置

OI基因型(genotypes)
異質的情況

突變篩檢
>130基因型順序
(genotypes sequenced)

插入(Insertions)
缺失(Deletions)
錯義突變(Missense)
無義突變(Nonsense)



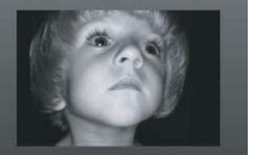
臨床表現型：分類
Sillence, 遺傳醫學期刊。1979;16:101

- 第一型
  - 輕度骨質脆弱
  - 體染色體顯性遺傳(AD)
- 第二型
  - 極重度骨質脆弱
- 第三型
  - 嚴重程度有不同差異
  - 體染色體隱性遺傳(AR),
  - 體染色體顯性遺傳(AD)
- 第四型
  - 中度
  - 體染色體顯性遺傳(AD)

臨床表現型
Sillence, J Med Genet 1979; 16:101

第一型

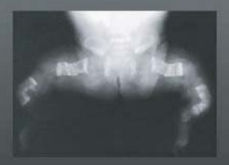
- 最常見、最輕度
- 正常身高
- 藍鞏膜
- 牙本質形成不全
- 晚期聽力喪失
- 正常之第一型膠原蛋白減少
  (一個等位基因(allele))



臨床表現型
Sillence, J Med Genet 1979; 16:101

第二型

- 最嚴重
- 通常肺功能不全致死
- 產前發生多重處骨折
- 頭部、軀幹、四肢變形
- 膠原蛋白嚴重缺乏



臨床表現型
Sillence, J Med Genet 1979; 16:101

第三型

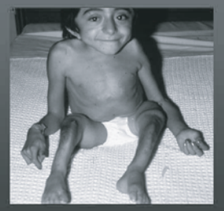
- 嚴重程度差異最大
- 身材矮小
- 藍鞏膜
- 桶狀胸
- 脊椎側彎
- 不正常之膠原蛋白分子

臨床表現型

Sillence, J Med Genet 1979; 16:101

第三型

- 嚴重程度差異最大
- 身材矮小
- 藍鞏膜
- 桶狀胸
- 脊椎側彎
- 不正常之膠原蛋白分子

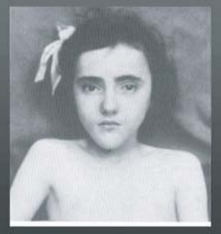


臨床表現型

Sillence, J Med Genet 1979; 16:101

第四型

- 中度
- 較第一型較易發生骨折、身材亦較小
- 三角臉
- 正常鞏膜



臨床表現型

Sillence, J Med Genet 1979; 16:101

第四型

- 中度
- 較第一型較易發生骨折、身高亦較小
- 三角臉
- 正常鞏膜

臨床表現型

Glorieux et. al. J Bone Mineral Res 2000; 15:1650

很多患者
和前述分類
表現並不完全一致

- Bruck症候群
- 骨質疏鬆性-假性神經膠質瘤症候群 (osteoporosis-pseudoglioma syndrome)

治 療

治療目標

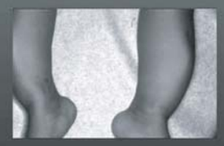
- 降低骨折發生率
- 矯正長骨之變形
- 提升行動與獨立自主能力

非手術治療

- 輔具 (bracing)
  - 外骨骼及站立支架
  - 幫助直立承重

非手術治療

- 輔具
  - 長腿支架(KAFOs)
    與踝足輔具(AFOs)
- 物理治療
  與職能治療



非手術治療

- 行動能力 (mobility)
  - 輪椅
  - 電動輪椅
  - 電動車

非手術治療

- 護具
- 行動能力
- 獨立自主(independence)

非手術治療：雙磷酸基藥物

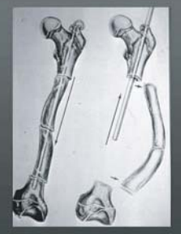
Devogelaer, Skeletal Radiol 1987; 16:360

- Alendronate (Fosamax福善美)
  Pamidronate (Aredia)
  - 與焦磷酸鹽(pyrophosphate)相似
    - P-O-P挑圍
    - P-C-P挑圍
  - 沉積於骨骼表面
  - 減少骨頭的再吸收

手術治療

Sofield & Millar, 骨骼與關節手術期刊 - 1959; 41A: 1371

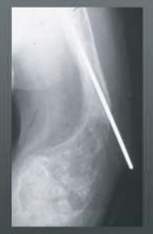
- 多重截骨矯正術(osteotomy)
- 骨髓內釘(Intramedullary Rodding)



手術治療
固定式骨釘(Rigid Rods)的問題

Sofield & Millar, JBJS 1959; 41A: 1371

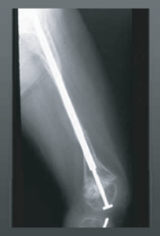
- 骨骼會長過骨釘
- 骨折部位會超過骨釘
- 遠端的變形讓骨釘容易退出



手術治療

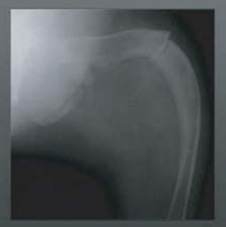
Bailey, Dubow. Surgical Forum 1963; 14: 455

- 使用二端呈T字型、可伸縮的骨釘(telescoping rods)。
- 一端置於近端骨骺(epiphysis)
- 另一端在遠端骨骺
- 當骨骼生長變長時，骨釘也跟著“生長”



手術治療

- 13歲OI男孩
- 在社區裡使用輪椅五年
- 在家裡藉由scooting移動
- 四肢較短，腿部動作時會痛



手術治療

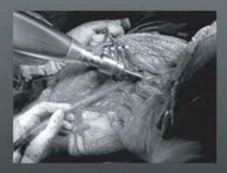
- 從股骨轉子處讓骨頭露出，伸直遠端部分
- 截骨和移除變形的骨頭
- 通常較細並缺少骨髓管道(medullary canal)

手術治療

- 保留“最佳”部分骨頭
- 切成相對較直的骨段
- 小心地增大孔隙(over-ream)，讓骨釘能穿過所有骨段

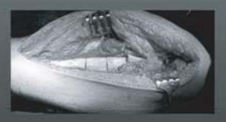
手術治療

- 擴大近端股骨到轉子處
- 擴大遠端股骨
- 骨釘經過生長板(Cross Physis with the Rods)
  - 無生長問題



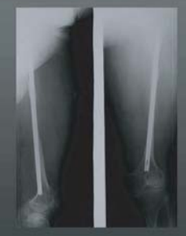
手術治療

- 從一端穿入骨髓內釘，經分別的骨段到遠端股骨
- 不要嘗試恢復到全長(full length)
- 通常多餘的骨頭用做骨骼移植



手術治療

- 4年後追踪
- 截骨部分癒合
- 無痛的髖、膝關節活動
- 使用助行器在社區活動



手術治療

- 患部長短腿(LLD)
- 3公分鞋墊

手術治療

Gamble, Stradwick, Rinsky, Bleck. JPO 1988; 8: 645

- 骨髓內釘保護骨頭
- 骨髓內釘有較高的併發症
- 固定式的骨釘併發症較可伸縮的B-D骨釘為複雜

TABLE 3. *Complications following the insertion of 42 Bailey-Dubow rods and 66 nonelongating rods*

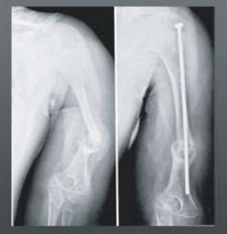
	Bailey-Dubow	Nonelongating	
Complications	29 (69%)	36 (55%)	p = 0.16
Reoperations	8 (19%)	19 (29%)	p = 0.36
Replacements	5 (12%)	16 (24%)	p = 0.14
Migrations	11 (26%)	28 (42%)	p = 0.064
Proximal	9	14	
Distal	2	14	
Bent rod	2	2	
Fracture	5	4	
Shaft	2	2	
Beyond rod	3	2	
Nonunion	0	2	
T piece	10	—	
Unscrewed	9	—	
Broken	1	—	
No elongation	1	—	

OI的問題

Gamble, Rinsky, Stradwick, Bleck. JBJS 1988; 70A: 439

骨折不癒合

- 調查對象：52個病人
- 10位OI病患有12處不癒合
- 20%有不癒合的問題
  - 5股骨
  - 4肱骨
  - 1橈骨
  - 1尺骨
  - 1下頜枝

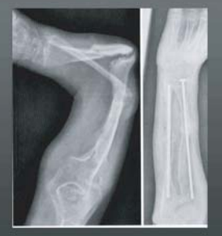


OI的問題

Gamble, Rinsky, Stradwick, Bleck. JBJS 1988; 70A: 439

骨折不癒合

- 9位病患
  - 切除不癒合
  - 骨頭縮短
  - 骨髓內釘
  - 骨移植
- 9處骨折中有8處經手術癒合
- 1處截肢

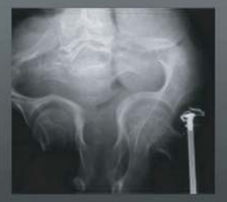


OI的問題

Lee, Gamble, Moore, Rinsky. JBJS 1995; 77A: 1352

腸胃道系統

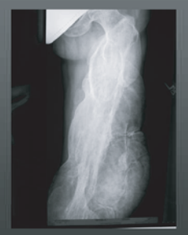
- 瘺白突出造成骨盆入口及出口不足



OI的問題：增生性骨痂

Battle & Shattock. Proc Roy Soc Med 1908; 1: 83

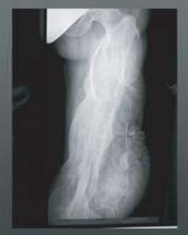
- 很少見約1.5%於OI患者
- 自發性、手術後、受傷後
- 放射檢查：大範圍的鈣化骨痂



OI的問題：增生性骨痂

Fairbank & Baker. Brit J Surg 1948; 36: 1-16

- 易與骨肉瘤 (Osteosarcoma)混淆
- 關節活動度減少

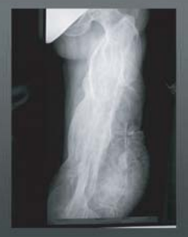


OI的問題：增生性骨痂

Fairbank & Baker. Brit J Surg 1948; 36: 1-16

與骨肉瘤的鑑別診斷

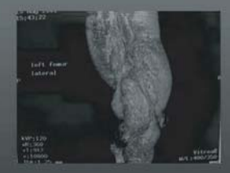
- 不會滲入軟組織或髓骨部分
- 沒有骨皮質破壞
- 核磁共振顯示骨痂中心呈均質、沒有壞死



OI的問題
病例報告
史丹佛大學

增生性骨痂
(Hyperplastic Callus)

- 39歲男性
- 生物物理博士
- 專業音樂家
- 約9年增生性骨痂病史
- 髖關節活動度0-119度
- 膝關節活動度10－35度
- 踝關節20度外翻
- 使用訂製長腿支架KAFO



OI的問題

增生性骨痂

- 股四頭肌薄層蓋在大範圍骨痂之上
- 關節活動度減少

OI的問題

增生性骨痂

- 骨膜切削相對容易

OI的問題

增生性骨痂

- 移除骨頭直到原先骨皮質邊緣出現些微的改變

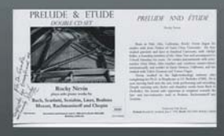
OI的問題

增生性骨痂

OI的問題

增生性骨痂

- 4年後追追蹤
- 髖關節活動度0-110度
- 膝關節活動度5-85度
- 踝關節：抬起背屈15度
  踩下屈曲25度
- 不用支架



最終目標

完滿的生活
A Full Life

Xie Xie

09:55 - 10:35, 2011/05/22 星期日
邀請講員： 傑伊 · 傑匹羅 (美國)

B1, 大都會廳

兒童與成人OI的保健及照護

成骨不全症不止影響到骨骼，還影響分佈全身的結締組織。成骨不全症患者健康的維持需要醫療團隊的合作，包括內科、骨外科、復健科醫師、物理治療、社會工作者，去協助其家庭、就學與工作等問題。除骨折照護之外，兒童OI還包括還營養、牙齒問題、關節活動過度與肌力訓練等健康議題。成人OI漸增的脊椎側彎、心肺問題也可能出現，聽力評估亦相當重要。很多成年病患未定期進行身體檢查。此外，治療成年人骨質密度降低的方法依然未能確定。

兒童與成人OI的保健及照護

傑伊 傑匹羅 醫師
甘迺迪克瑞格研究機構、約翰霍普金斯大學：成骨不全症部門主任

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兒童OI之照顧

- ☐ 日常兒童的處置
- ☐ 骨折的處理
- ☐ 骨折的預防
- ☐ 手術後處置：復健與物理治療
- ☐ 營養：吞嚥障礙 (swallowing defect)
- ☐ 腦水腫：發展問題
- ☐ 肌肉力量與協調能力
- ☐ 脊椎側彎 (scoliosis)
- ☐ 牙齒護理
- ☐ 聽力

兒童至成人照顧的轉換期

- ☐ 年齡：18-21歲
- ☐ 需小兒科與成人醫師之間協同合作。
- ☐ 包括責任的轉變：從父母到青少年。
- ☐ 需醫療團隊的合作：內科、骨科、復健科醫師（物理治療師）、社會服務等。

成人OI第一型：骨骼方面疾病

- ☐ 持續骨質流失：治療議題
- ☐ 脊椎側彎評估：遲發性(late onset)改變
- ☐ 脊椎骨折
- ☐ 椎間盤疾病
- ☐ 成人復發性骨折
- ☐ 骨折不癒合(non-union)：治療？
- ☐ 手術處理的時機？
- ☐ 骨關節炎(osteoarthritic)之關節疼痛
- ☐ 疼痛診斷與處理

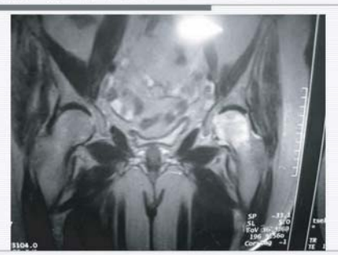
OI患者可能出現的問題

- ☐ 聽力喪失
- ☐ 高血壓
- ☐ 心臟瓣膜及血管疾病
- ☐ 膽固醇、血脂問題
- ☐ 全身性的肌肉無力、不適、痙攣
- ☐ 維他命D缺乏
- ☐ 眼睛問題：圓錐狀角膜(keratoconus)、鞏膜軟化(scleromalacia)
- ☐ 腎結石
- ☐ 膽結石
- ☐ 糖尿病：身體質量指數(BMI) > 25
- ☐ 增生性骨痂(hyperplastic callus)：第四型OI
- ☐ 骨肉瘤(osteosarcoma)：非常罕見

關節炎與OI

- ☐ 學者McKiernan (2005)：花6星期於美國成骨不全症基金會網站做調查。
- ☐ 111 成人回應者（78位女性），平均年齡=40.8歲
  - ■ 近半數表示有關節炎
  - ■ 關節痛、僵硬、不穩定多數集中於下肢承重（大）關節（骨性關節炎）
  - ■ 三分之二表示關節活動過度，其中三分之一曾經肌腱斷裂

OI的暫時性骨水腫 (Transient Bone Edema)



OI的肺功能

- ☐ 限制性(restrictive)肺疾病較常見
- ☐ 與脊椎側彎相關
- ☐ Superimposed氣喘或支氣管炎
- ☐ 測量肺功能
- ☐ 進行睡眠測試以評估睡眠呼吸中止症(sleep apnea)
- ☐ 需要時給予氧氣
- ☐ 當醫師指示，使用連續正壓呼吸器(CPAP)或雙向正壓呼吸器(BIPAP)
- ☐ 使用吸入性支氣管擴張劑、類固醇
- ☐ 感染時使用抗生素

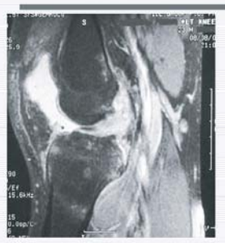
OI的神經方面疾病

- ☐ 神經根疼痛症候群 (nerve root pain syndrome)
  - ■ 脊椎側彎
  - ■ 椎間盤疾病
  - ■ 脊椎骨折及椎間盤壓迫
- ☐ 神經壓迫症候群：手肘、手腕通道、脊椎狹窄(stenosis)
- ☐ 顱底凹陷 (basilar invagination)
  - ■ 頭痛
  - ■ 顱神經異常：眼球震顫 (nystagmus)
  - ■ 反射增強
  - ■ 四肢無力
  - ■ 手腳麻刺感、感覺改變

OI的肌肉功能

- ☐ 原理：肌肉中膠原蛋白減少 <機械性的應變 (strain)，使肌肉體積減少、韌帶與肌腱強度減弱 → 骨質流失
- ☐ 測試時多數患者肌肉無力
- ☐ 肌腱斷裂：阿基里斯腱（跟腱）、肩部韌帶
- ☐ 上下肢的肌力訓練很重要

OI患者韌帶受傷



美國運動醫學期刊：OI病例報告－前十字韌帶重建
Cortes ZE, Maloney MD Anterior cruciate ligament reconstruction in osteogenesis imperfecta:a case report. Am J Sports Med. 2004 32:1317.

手術考量

- ☐ 手術：患需要“增進功能”時
- ☐ Gimics 通常無作用
  - ■ BMPs
  - ■ 骨髓細胞(marrow cell)準備
  - ■ 超音波對骨折癒合不確定有效果

鈣質攝取

- ☐ 每天1000-1500 毫克(mg)
- ☐ 鈣片種類不限
- ☐ 定期監控尿鈣排泄量

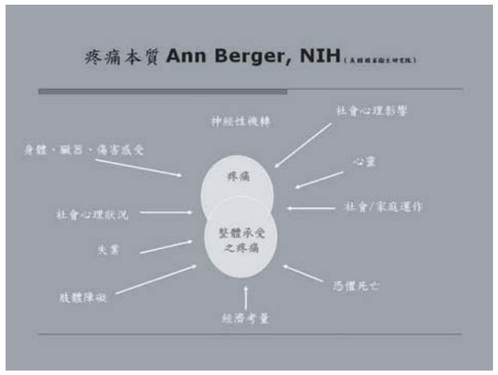
維他命D缺乏病患：依血清中25-Hydroxy維他命D之比例

Serum 25-hydroxy 維他命D濃度	第一型 OI	第三型 OI	第四型 OI	健康加拿大成人	健康美國人 18-29歲及 49-83歲	住院美國成人
<10 奈克/毫升 (ng/mL)	7%	4%	17%	6%	N/a	22%
<20 奈克/毫升 (ng/mL)	56%	40%	50%	34%	36% 與 41%	57%
<32 奈克/毫升 (ng/mL)	79%	84%	100%	N/a	N/a	N/a

維他命D建議

- ☐ 多數人每日需1000-2000 國際單位 (international units)
- ☐ 維他命D2或D3均可
- ☐ 依指示監控血清中25-HYDROXY維他命D濃度

疼痛本質 Ann Berger, NIH



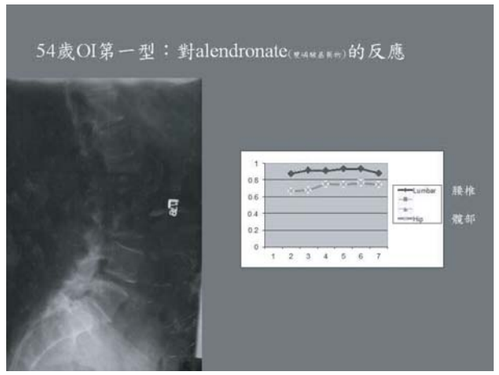
下顎骨骨頭壞死症(osteonecrosis)

- ☐ 發生於5-10%注射高劑量雙磷酸基藥物(bisphosphonates)之老年人
  - 患有癌症
  - 進行化學治療
  - 牙科手術之後
- ☐ 非於OI患者

雙磷酸基藥物與股骨幹骨折

- ☐ Park Wilie等人發現使用超過五年雙磷酸基藥物者，罹患股骨轉子骨下骨折或非典型股骨幹骨折的風險比值(OR)，是短期使用小於100天女性的2.74倍。(95%信賴區間1.25-6.02)
- ☐ 此一結果得到結論：雙磷酸基藥物減少大多數骨質疏鬆性髖部骨折的發生，但與使用藥物超過五年之極少數股骨轉子骨下和股骨幹骨折的增加有關。

54歲OI第一型：對alendronate(雙磷酸鹽藥物)的反應



總結

- ☐ 兒童與成人OI的治療需要團隊
- ☐ 兒童OI的骨折預防及復健同樣重要
- ☐ 成人OI不應被忽視：他們需要被告知、教導和接受全面性醫療及手術照護

10:45 - 11:10, 2011/05/22 星期日
邀請講員： 林炫沛 (臺灣)
B1, 大都會廳

成骨不全症（OI）之臨床及遺傳學觀-台灣經驗

林炫沛 [1,2,3]、林翔宇 [1,2,4]、邱慧菁 [1]、蘇怡寧 [5]
[1]馬偕紀念醫院 小兒遺傳科； [2]馬偕醫護管理專校 幼保科； [3]國立台北護理健康大學 幼保系； [4]國立陽明大學臨床醫學研究所； [5]國立台灣大學附設醫院基因醫學部

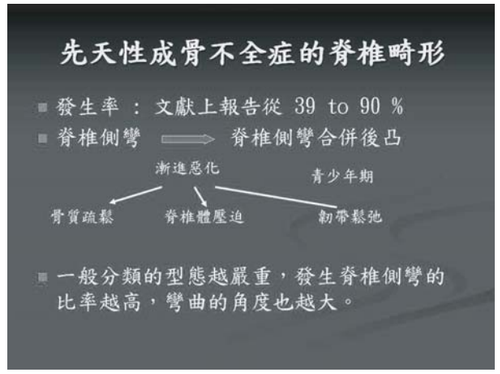
成骨不全症(Osteogenesis imperfecta, OI) (MIM 166200, 166210, 259420 and 166220)，是一種先天性單基因遺傳疾病，出現在男女的比例大約相同，這種疾病會造成第一型膠原纖維缺陷，使骨骼忍受外力衝擊的能力較正常人差，即使是輕微的碰撞，也可能會造成嚴重的骨折。在台灣，有關成骨不全症的文獻記載並不齊全，大多數為零星的個案報告，截至目前為止僅有三篇探討有關OI病患顱顏特徵、臨床表現及接受雙磷酸鹽化合物治療療效的報導。本篇論文將針對馬偕紀念醫院小兒遺傳科過去7年以來62例OI病人臨床狀況及基因分析的特徵提出報告，並分享馬偕紀念醫院小兒遺傳科OI治療團隊分別在2008及2009年所發表，57例OI病人臨床表現的觀察結果，以及26例OI病人接受雙磷酸鹽化合物治療的療效分析。

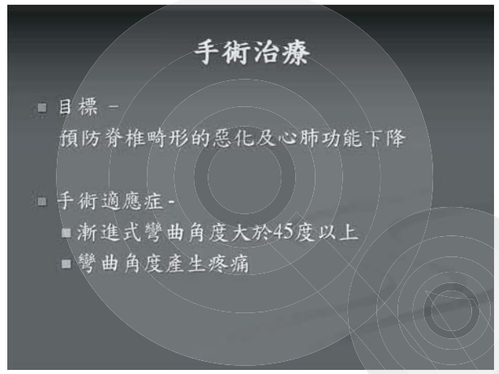
11:10 - 11:35, 2011/05/22 星期日
邀請講員： 吳冠彣 (臺灣)
B1, 大都會廳

先天性成骨不全症的脊椎側彎治療──臺灣經驗

成骨不全症候群的脊椎側彎是個常見且困難處理的問題。側彎通常在青春期時期變得明顯，且會合併側彎駝背畸形。嚴重的側彎或胸廓畸形會影響生活照顧、活動能力及肺功能狀況。側彎彎曲的狀況會無止盡地進展，且過去的經驗，背架對於這類的脊椎病症控制是完全沒有效果的。手術治療對於這類的脊椎病灶，相較於背架是較有效果的。然而，成骨不全的脊椎手術技術上是十分困難的，因為骨質較為疏鬆，故在手術植入物的同時，容易造成骨折或固定物脫落。過去有一些醫師曾經運用不同的治療策略，嘗試克服這樣的困難，包括：術前使用頭部牽引，輔助使用骨水泥增加固定能力，或者僅作原位融合植入物固定，不做矯正。然而，確切的成骨不全脊椎側彎的手術治療方式至今仍未完全建立。

這次報告主要的目的，即在探討成骨不全症脊椎側彎手術治療過程會遭遇到的困難點，及過去在台灣的治療經驗成果回顧。





成骨不全脊椎側彎的治療

- 背架治療在防止角度惡化是沒有效果的,一般只用在手術後的固定
- 脊椎融合合併植入物是治療的首選
- 原位融合　or　融合 + 矯正 (?)
- 脊椎穩定 ＞ 彎曲矯正

脊椎手術的困境

- 骨質疏鬆
- 植入物脫位
- 側彎畸形復發
- 缺乏完整的治療準則
- 術後結果不確定性高

台灣治療成骨不全症脊椎側彎的困境

- 骨質疏鬆
  - 耽擱診斷及藥物治療
- 缺乏小兒專用的脊椎植入物
  - 連桿或專用金屬絲(Luque rod and wire)
- 家屬不願意在角度明顯惡化前提早手術治療
- 缺少團隊主治醫師手術制度

成骨不全症脊椎手術的特點

- 早期治療(Benson et al. 建議 - 早期接受脊椎融合固定)
- Norimatsu et al. - 在嚴重脊椎側彎的病人身上不建議作過度的彎曲矯正
- 手術前牽引
  - 需考量頭骨的骨質是否可承受?

成骨不全症脊椎手術的特點

- 術後需長時間使用背架固定(6-12 個月)
- 術前術後週期性使用雙磷酸鹽注射治療

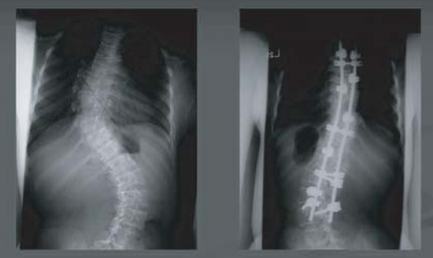
常用的脊椎植入物

- 脊椎固定桿(Harrington rod)及脊椎板下的金屬絲固定(sublaminar wire)
- 迷你鉤(hooks)
- 椎弓根螺釘(all pedicle screws method)

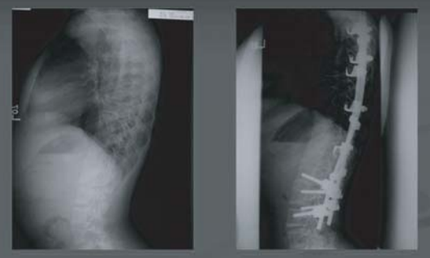
脊椎手術的併發症

- 大量失血 (1.5 ~ 2.5 升)
- 彎曲角度復發
- 脊椎融合術後癒合不良
- 一般而言越嚴重的分類型態，併發症發生率越高

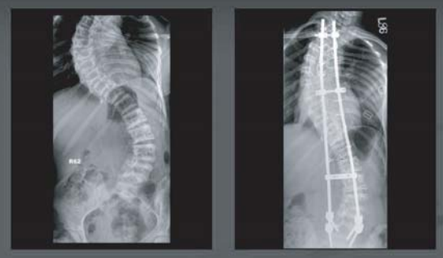
Case 1



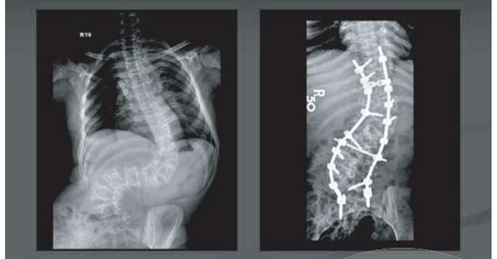
Case 1



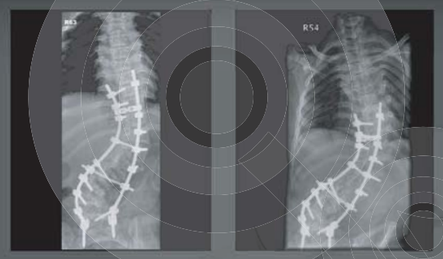
Case 2

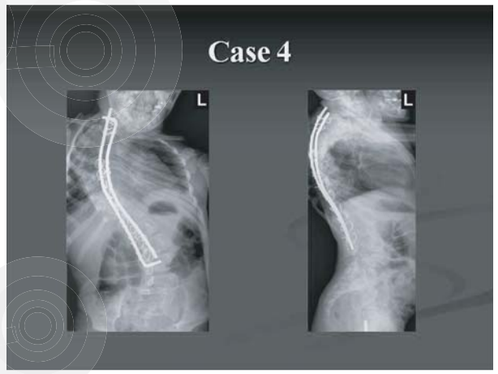


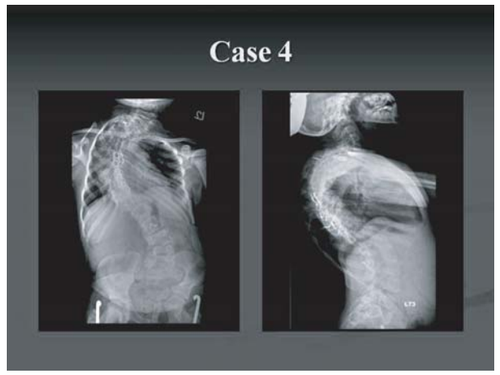
Case 3

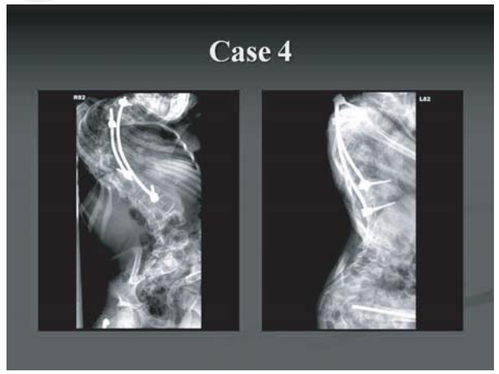


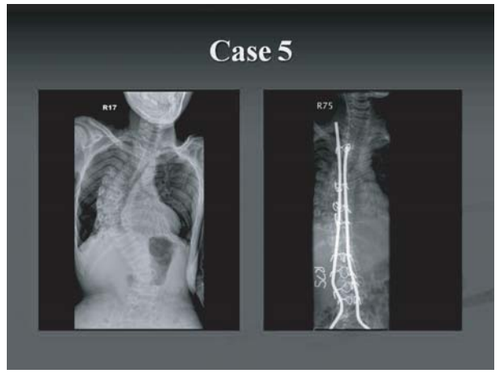
Case 3 (PO 1 and 2 y)

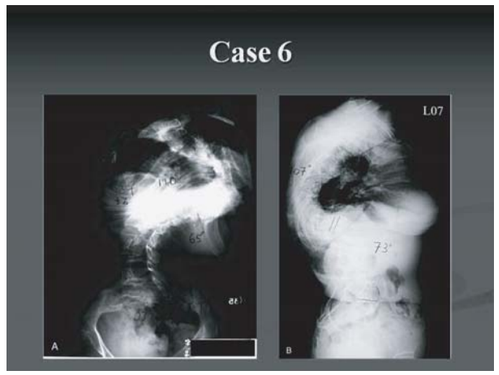


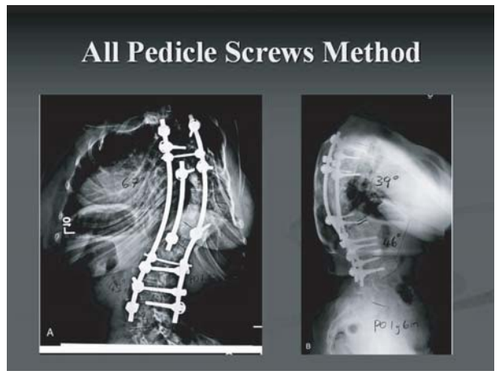












Osteogenesis Imperfecta Symposium-US and Taiwan

臺美先天性成骨不全症醫療交流會議

Taiwan Osteogenesis Imperfecta Association

社團法人先天性成骨不全症關懷協會

May 21st - 22nd, 2011

Taipei, Taiwan

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1. 1999協會成立大會
2. 2000協會成立週慶
3. 2000爭取友善安全教育環境
4. 2001天使合唱團成立
5. 2001訓練病友~廣播人員培訓
6. 2001開辦繪畫課
7. 2001辦理尋找隱藏性玻璃娃娃，讓更多病友能走出家門
8. 2002與振興醫院舉辦水療活動
9. 2002雙林化合物治療成果報告
10. 2003病友至日本體驗無障礙環境
11. 2004天使合唱團公益演唱關懷社區
12. 2004病友走秀活動
13. 2005喜萊登表演口琴
14. 2006建國中學學生利用假日課輔病友
15. 2006假日英語課
16. 2007玻璃娃娃『67.5公分的天空』舞台劇
17. 2007校園宣導
18. 2008 LOHAS 天使-讓愛飛揚 感恩音樂會
19. 2008傾聽玻璃娃娃聲音研討會
20. 2009OI關懷老人

21. 2009病友表演相聲
22. 2009尋訪陶藝之旅
23. 2010北區病友宣導種子訓練
24. 2010天使合唱團至醫院演唱關懷病童
25. 2010自我挑戰~病友向行人介紹先天性成骨不全症
26. 2010草莓姐姐關懷病友
27. 2010病友走出戶外迎向陽光增加參與社會之機會
28. 2010愛的抱抱感恩活動關懷社區居民
29. 2011/03/26在地耕耘南部病友交流聯誼會
30. 病友每個周日齊聚一堂練唱改善身體不適之情況
31. 病友拜訪美國史丹福醫院小兒骨科醫生詹姆斯 甘柏
32. 病友清新高昂的聲音為社會帶來清新氣象
33. 病友擔任圖書館志工~關懷學童
34. 堅強的OI媽媽經營公益彩券扶養兩位OI
35. 理監事百忙中出席會議
36. 輪椅國際標準舞~病友克服障礙展現力與美
37. 蕭副總統關懷病友2008 LOHAS 天使-讓愛飛揚　感恩音樂會
38. 關懷訪視大陸病友