10th Anniversary Program on Community Fall and Fracture Prevention

Department of Orthopaedics and Traumatology
The Chinese University of Hong Kong

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1. Organisers

Organiser:

Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Co-organisers:

Asian Association for Dynamic Osteosynthesis

Caritas Hong Kong

The Chinese University of Hong Kong Jockey Club Centre for Osteoporosis Care and Control

Department of Orthopaedics and Traumatology, Caritas Medical Centre

Department of Orthopaedics and Traumatology, Pamela Youde Nethersole Eastern Hospital

Division of Geriatrics, Department of Medicine & Therapeutics, Prince of Wales Hospital

ELCHK, Shatin Integrated Elderly Service

The Family Planning Association of Hong Kong

The Hong Kong Council of Social Service

Hong Kong Housing Society

Hong Kong Occupational Therapy Association

Hong Kong Sheng Kung Hui Welfare Council

HOPE *worldwide*

The Neighborhood Advice-Action Council

Physiotherapy Department, Prince of Wales Hospital

Town Health International Holdings Co. Ltd.

Tung Wah Group of Hospitals

2. Organizing Committee

Prof. Kwok-Sui Leung, Director of Community Fall and Fracture Prevention Program; Chair Professor, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Dr Tsz-Ping Lam, Research Assistant Professor, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Prof. Wing-Hoi Cheung, Research Associate Professor, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Dr. David Dai, Consultant, Division of Geriatrics, Department of Medicine and Therapeutics, Prince of Wales Hospital

Ms. Jessica Chan, Deputy Department Operations Manager, Department of Orthopaedics and Traumatology, Prince of Wales Hospital; Vice-Director of Community Fall and Fracture Prevention Program, The Chinese University of Hong Kong

Ms. Yuen-Yee Wong, Trauma Team Nurse Leader, Coordinator of Fall and Fracture Prevention Program, The Chinese University of Hong Kong

Ms. Mandy Tsang, Trauma Team Nurse Leader, Coordinator of Fall and Fracture Prevention Program, The Chinese University of Hong Kong

Ms. Susan Chan, Regional Supervisor, ELCHK, Shatin Integrated Elderly Service

Ms. Katherine Wong, District Director, Hong Kong Sheng Kung Hui Welfare Council

Mrs. Amy Tsui, Assistant Community Services Secretary, Elderly Services, Tung Wah Group of Hospitals

Ms. Selina Lo, Social Worker Supervisor, Caritas Hong Kong

Mr. Francis Li, Service Supervisor, The Neighborhood Advice-Action Council, Shumshuipo District Elderly Community Centre

Ms. Grace Chan, Chief Officer (Elderly Service), Service Development, The Hong Kong Council of Social Service

Ms. Jenny Kwok-Fai Chan, Information and Communication Officer-in-charge, The Family Planning Association of Hong Kong

Mr. Anthony Kwok, Centre Manager, Jockey Club Center for Osteoporosis Care and Control, The Chinese University of Hong Kong

Mr. Ernest Yu, Publication Secretary, Hong Kong Occupational Therapy Association

Ms. Barbara Chan, Occupational Therapist, Occupational Therapy Department, Prince of Wales Hospital

Ms. Jamie Lau, Senior Physiotherapist, Physiotherapy Department, Prince of Wales Hospital

Ms. Loanna Wong, Department Operations Manager, Department of Orthopaedics & Traumatology, Caritas Medical Centre

Mr. Kenneth Au Yeung, Manager, Hong Kong Housing Society

Mr. Dick Ng, Assistant Program Manager, HOPE *worldwide*

Dr. Bennet Fung, Director, Town Health International Holding Co. Ltd.

Dr. Peter TK Lau, Consultant, Town Health International Holding Co. Ltd.

Mr. Anthony Cheng, Nurse Specialist, Department of Orthopaedics & Traumatology, Pamela Youde Nethersole Eastern Hospital

Ms. Joyce Lai, Chairperson (Nursing), Asian Association for Dynamic Osteosynthesis

Ms. Claudia Chan, Project coordinator, Fall and Fracture Prevention Program, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Ms. Candy Chan, Project Coordinator, Orthopaedics Learning Centre, The Chinese University of Hong Kong

Ms. Cassia Tang, Project Coordinator, Orthopaedics Learning Centre, The Chinese University of Hong Kong

3. Introduction

Falls and fall related injuries in elderly are an epidemic and serious public health issue. With the aging population in Hong Kong and worldwide, we have been managing ever increasing number of elderly with fragility fractures and very soon, it was realised that fall is the most immediate cause of these fractures among our elderly with poor bone quality. It became a vey logical approach in trying to prevent fall in addition to the popular anti-osteoporosis campaign in the community. We shouldered this responsibility because we believe orthopaedic surgeons manage these results of falls frequently, i.e. fractures and we understand best what the impacts of fall related injuries on the patients and their families and the society. When we proposed this program in the community in 2000, we were supported enthusiastically by many frontline workers in the elderly centres which shared our concern. With much support from the donors, charity organisations and NGOs, we organised programs targeting different age groups in the community in the past ten years. The program evolved with extended care to patients who are returning to the community after fractures.

In the past ten years, this program has been gradually popularised in many communities and become one of the most welcome programs. Although we may not have the solid figures how effective it is, through our research programs: we organised studies, from laboratory to bedside, from prototypes to domestic and community applications. Throughout these year we, who participated and involved, felt the importance of the program for our elderly, felt the appreciation and encouragement from the elderly and their family members, and the program is so much endorsed by the people we are working with. It is very timely to organise this one-week program to review, to share and to plan ahead for the continuous care we all would like to offer.
It really takes a lot of dedication, compassion and passion to keep the program running and evolved into a more comprehensive and effective prevention program.

“上工治未病” <<黃帝內經，公元前200－750>>

“Prevention is the most superior accomplishment”, Huangdi Neijing, B.C. 200-750.

We would also like to show our heartfelt gratitude to all those who have shared our vision and supported our mission and taken part in the action in this program.

“Love never dies
Love never falters
Love never fades
Love never alters”
From the Musical: “Love Never Dies”
by Andrew Lloyd Webber, 2010.

“愛，永不枯萎
愛，永不躊躇
愛，永不褪減
愛，永不變樣”
（譯自：*Andrew Lloyd Webber* 的音樂劇
“Love Never Dies”, 2010）

Kwok-Sui LEUNG
September 2010

4. Guest Speakers

Overseas Speakers:

Prof. Jean-Marc G Féron, Professor of Orthopaedic Surgery, Head of the Department of Orthopaedic and Trauma Surgery, Saint Antoine Hospital, France

Prof. JM Rueger, Chairman and Head, Department of Trauma, Hand and Reconstructive Surgery, University Hospital Hamburg Eppendorf, Germany

Dr. Takeshi Sawaguchi, Chief Surgeon, Department of Orthopaedic Surgery and Reconstruction, Toyama City Hospital, Japan

Dr. Boon Chong Se To, Consultant Orthopaedic Surgeon, KPJ Penang Specialist Hospital, Malaysia

Local Guest Speakers:

Ms. Barbara Chan, Occupational Therapist, Occupational Therapy Department, Prince of Wales Hospital, HKSAR

Ms. Susan Chan, Regional Supervisor, ELCHK, Shatin Integrated Elderly Service, HKSAR

Dr. Erh-Heng Chen, Consultant, Department of Orthopaedics and Traumatology, Caritas Medical Centre, HKSAR

Ms. Yin-Ping Cheung, Registered Nurse, Department of Orthopaedics and Traumatology, Prince of Wales Hospital, HKSAR

Dr. Ping-Hong Chin, Consultant, Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital, HKSAR

Ms. Kah-Leng Choi, Advanced Practice Nurse, Department of Orthopaedics & Traumatology, Prince of Wales Hospital, HKSAR

Mr. Yiu-Chung Chow, Team Leader of Counselling and Carer Service Team, Tung Wah Group of Hospitals Wilson T.S. Wang District Elderly Community Centre, HKSAR

Dr. David Dai, Consultant, Division of Geriatrics, Department of Medicine and Therapeutics, Prince of Wales Hospital, HKSAR

Dr. Wency Ho, Associate Consultant, Division of Geriatrics, Department of Medicine and Therapeutics, Prince of Wales Hospital, HKSAR

Prof. Timothy Kwok, Division of Geriatrics, Department of Medicine and Therapeutics, Faculty of Medicine, The Chinese University of Hong Kong, HKSAR

Ms. Kam-Lee Lam, Service Supervisor, Ma On Shan District Elderly Centre, Evangelical Lutheran Church of Hong Kong

Ms. Jamie Lau, Senior Physiotherapist, Physiotherapy Department, Prince of Wales Hospital, HKSAR

Dr. Peter TK Lau, Honorary Clinical Assistant Professor in Family Medicine, The Chinese University of Hong Kong.

Prof. Diana Lee, Chair Professor of Nursing and Director, The Nethersole School of Nursing, The Chinese University of Hong Kong, HKSAR

Dr. Chi-Hung Leong, Chairman, Elderly Commission, HKSAR

Dr. Man-Fai Leung, Associate Consultant, Department of Orthopaedics and Traumatology, Pamela Youde Nethersole Eastern Hospital, HKSAR

Prof. Wen Li, Professor, Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong, HKSAR

Dr. Kan-Hing Mak, Consultant, Department of Orthopaedics and Traumatology, Kwong Wah Hospital, HKSAR

Dr. Wan-Yiu Shen, Director, Orthopaedic Trauma Service, Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital, HKSAR

Mr. Patrick Sze, Service Coordinator, Hong Kong Housing Society, HKSAR

Ms. Jamie KM Wan, Medical Social Worker, Medical Social Work Department, Alice Ho Miu Ling Nethersole Hospital, HKSAR

Mr. Tabris Wong, Orthotist, Pedorthic Technology Ltd., HKSAR

5. Program Rundowns

10th Anniversary Program on Community Fall and Fracture Prevention
Sept. 6 to Sept. 13, 2010

Themes:
Partnership through Multidisciplinary Collaborations
From Community to Laboratory and
An Introduction to Geriatric-orthopaedics

Program at a glance

	Program 1	Program 2	Program 3	Program 4/5	Program 6	Program 7
Date	Sept 6 / Sept 13 (Mon)	Sept 7 (Tue)	Sept 8 (Wed)	Sept 9 (Thur)	Sept10 (Fri)	Sept 11 (Sat)
AM	Staff Training for Community Fall and Fracture Prevention Program			Research Forum on Osteoporosis and Fragility Fracture		International Symposium on Geri-orthopaedic Fracture Management
PM		Train-the-trainer Workshop for Caregivers	Lunch Seminar on "Is Long Term Use of Bisphosphonates Safe?"	Seminar on Fragility Fracture: the Psychosocial Issues	Public Event: Talk on Fall and Fracture Prevention	

Program 1

Staff Training for Community Fall and Fracture Prevention Program

Date: September 6, 2010 (Monday)
Time: 9:30am – 5:00pm
Venue: Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin
Objectives: To train staff working on Community Fall and Fracture Prevention Programs with delivery of a panoramic view on the various facets for caring for the elderly with Geri-orthopaedic problems
Target participants: Staff at elderly community centers, paramedical professionals with special interest in Geri-orthopaedic care

Time	Content	Speaker
9:30 – 9:40	Course introduction	Claudia Chan
9:40 – 10:00	Epidemiology of fall and fracture in elderly	Leung Kwok-Sui (Professor)
10:00 – 10:20	Risk factors and consequences of fall and osteoporosis	Choi Kah-Leng (Nurse)
10:20 – 11:20	First aid management of fall and fracture	Choi Kah-Leng (Nurse)
11:20 – 11:30	Break	
11:30 – 11:50	Demonstration: Bone mineral density measurement	Anna Mok (Research Assistant)
11:50 – 12:10	Demonstration: Simplified fall risk assessment	Winnie Mak (Physiotherapist)
12:10 – 12:30	Exercise for osteoporosis and fall prevention	Winnie Mak (Physiotherapist)
12:30 – 14:00	Lunch	
14:00 – 14:20	Fall and fracture prevention aids: Introduction of vibration therapy	Poey Li (Research Assistant)
14:20 – 14:40	Fall and fracture prevention aids: Hip protectors and footwear education	Claudia Chan (Prosthetist & Orthotist)
14:40 – 15:00	Introduction of fragility fracture program	Claudia Chan (Prosthetist & Orthotist)
15:00 – 15:30	Environmental hazard identification and modification	Patrick Sze (Occupational Therapist)
15:30 – 16:00	Skills on home visitation	Patrick Sze (Occupational Therapist)
16:00 – 16:15	Break	
16:15 – 17:00	Examination and certificate distribution	

Accreditations:
Physiotherapist: 5 CPD pts
Occupational Therapist: 3 CPD pts
Nurse: 5.5 CNE pts

Program 2

Train-the-trainer Workshop for Caregivers

Date: September 7, 2010 (Tuesday)
Time: 2:20pm – 4:30pm
Venue: Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin
Objectives: To train the trainers for domestic helpers and other caregivers on the knowledge and skills in providing care for Geri-orthopaedic elderly for their daily living activities
Target participants: Trainers for domestic helpers and other interested candidates

Time	Content	Speaker
2:20 – 2:30	Course introduction	Winnie Mak
2:30 – 2:40	Epidemiology of fall and fracture in elderly	Flora Tam
2:40 – 2:50	Risk factors and consequences of fall and osteoporosis	Flora Tam
2:50 – 3:00	Break	
3:00 – 3:10	Diet for osteoporosis prevention	Mandy Tsang (Nurse)
3:10 – 3:20	Self-care session for caregivers: - Infection control	Mandy Tsang (Nurse)
3:20 – 3:40	Self-care session for caregivers: - Lifting and transfer	Winnie Mak (Physiotherapist)
3:40 – 3:55	Environmental hazard identification and modification	Claudia Chan (Prosthetist & Orthotist)
3:55 - 4:10	Stress management for caregivers	Yiu-Chung Chow (Social Worker)
4:10 – 4:20	Break	
4:20 – 4:30	Revision and certificate distribution	

Accreditations:
Nurse: 1.5 CNE pts

Program 3

Lunch Seminar on "Is Long Term Use of Bisphosphonates Safe?"

Date: September 8, 2010
Time: 1:45pm – 3:15pm
Venue: Royal Park Hotel, Shatin
Objectives: To discuss the safety issue of long-term taking of bisphosphonate
Target participants: Family Physicians and General Practitioners

Time	Content	Speaker
1:45pm - 2:05pm	Atypical Sub-trochanteric Fracture: a City-wide Survey in Hong Kong	Dr. KH Mak
2:05pm - 2:25pm	Atypical Sub-trochanteric Fracture: a Biomechanical Analysis Analysis and the Preventive Measures	Prof. KS Leung
2:25pm - 2:45pm	Safety Issues of Bisphosphonate – an Updated Guideline	Prof. Timothy Kwok
2:45pm - 3:15pm	Discussion	All

Lunch will be provided

Accreditations:
Orthopaedic Surgery: 1.5 CME pts, 1.5 training pts
Family Physician: 2 CME pts
MCHK CUHK: 1.5 CME pts

Program 4

Research Forum on Osteoporosis and Fragility Fracture

Date: September 9, 2010 (Thursday)
Time: 9:30am – 12:30pm
Venue: Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin
Objectives: A forum with research workers sharing research ideas and scientific projects on osteoporosis and fragility fracture
Target participants: Research workers in the field and interested candidates

Time	Content	Speaker
	Introduction	Prof. Louis Cheung
9:30 – 10:00	Can we improve the bone quality in osteoporotic fracture repair?	Prof. JM Féron
10:00 – 10:20	Advanced Bio-imaging in Osteoporosis Diagnosis and Prediction of Osteoporotic Fracture	Prof. Ling Qin
10:20 – 10:40	Biophysical Interventions to Enhance Osteoporotic Fracture Healing – Preclinical Evidences	Prof. Louis Cheung
10:40 – 11:00	Angiogenesis in Osteoporotic Fracture Healing: An Interventional Study with Vibration Treatment	Dr. MH Sun
11:00 – 11:20	Break	
11:20 – 11:35	Effects of Low-Magnitude High-Frequency Vibration Treatment on Intertrochanteric Fracture Healing	Claudia Chan
11:35 – 11:50	Efficacy of Low-Magnitude High-Frequency Vibration Treatment on Prevention of Fracture in Community Elderly – A Prospective Randomized Controlled Trial	Poey Li
11:50 – 12:05	Comprehensive Management of Fragility Fractures	Winnie Mak
12:05 – 12:20	Medico-social Impact of a Comprehensive Multi-disciplinary Program for the Care of Fragility Fracture of the Elderly – A Proposal	Winnie Lee
12:20 - 12:30	Concluding Remarks	Prof. KS Leung

Accreditations:
Orthopaedic Surgery: 2 CME pts, 2 training pts
Nurse: 2.5 CNE pts

Program 5

Seminar on Fragility Fracture: the Psychosocial Issues

Date: September 9, 2010 (Thursday)
Time: 2:00pm – 5:00pm
Venue: Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin
Objectives: A seminar catered for the psychosocial aspects of the Geri-orthopaedic subspecialty.
Target participants: Staff working with the elderly suffering from Geri-orthopaedic problems, including trainers for caregivers, health care professionals working in hospitals, staff in old age homes and community centers

Time	Content	Speaker
2:00 – 2:30	Cognitive impairment and falls	Dr David Dai Consultant, Division of Geriatrics, Dept of Medicine & Therapeutics, PWH
2:30 – 3:00	The effects of antipsychotic drugs on elderly	Dr Wency Ho Associate Consultant, Division of Geriatrics. Dept of Medicine & Therapeutics, PWH
3:00 – 3:30	The psychological impacts of hip fracture on elderly	Professor Diana Lee Chair Professor of Nursing and Director, The Nethersole School of Nursing, CUHK
3:30 – 3:45	Break	
3:45 – 4:15	Institutionalization of elderly after fracture	Ms Susan Chan Regional Supervisor, ELCHK, Shatin Integrated Elderly Service
4:15 – 4:45	Suffering fracture – the psychological response of caregivers	Ms Jamie Wan Medical Social Worker, Medical Social Work Department, AHNH
4:45 – 5:00	Presenting souvenirs	

Accreditations:
Physiotherapist: 3 CPD pts
Occupational Therapist: 1.5 CPD pts
Nurse: 2.5 CNE pts

Program 6

Public Event: Talk on Fall and Fracture Prevention
Date: September 10, 2010 (Friday)
Time: 2:15pm – 5:00pm
Venue: Postgraduate Education Center, Prince of Wales Hospital, Shatin
Objectives: A program opens to the public. Elderly is most welcome to participate. Educational talks on musculoskeletal health and fall and fracture prevention will be delivered to the participants. There will also be on-site health and bone density measurement.
Target participants: Elderly in the community

Time	Content	Speaker
2:15 – 2:30	Introduction	
2:30 – 3:00	Drama on bone health	Volunteers from Women's Club, The Family Planning Association of Hong Kong
3:00 – 3:20	Elderly fracture care: how can we do better?	Prof JM Féron
3:20 – 4:30	Fall Prevention Talk: - Epidemiology of fall and fracture in elderly - Causes and Consequences of osteoporosis - Exercise for osteoporosis prevention - Home environmental hazard and modification - Fall and fracture prevention aids	 Prof KS Leung YY Wong Winnie Mak Claudia Chan
4:30 – 4:45	Q&A	
4:45 – 5:00	Demonstration on Tai Chi exercise	Volunteers from Women's Club, The Family Planning Association of Hong Kong

Program 7

International Symposium on Geri-orthopaedic Fracture Management

Date: September 11, 2010 (Saturday)
Time: 8:00am – 5:30pm
Venue: Postgraduate Education Center, Prince of Wales Hospital, Shatin
Objectives: To give a general account of multi-disciplinary care for geri-orthopaedic patients; recent advances and frontier research in Geri-orthopaedics Discipline
Target participants: Any personnel working in the Geri-orthopaedics including doctors, nurses, rehabilitation specialists, nutritionists, social workers and community center personnel

Time	Topic	Proposed Speakers
0800 – 0855	Registration	
0900 – 0910	Welcome speech	Prof KS Leung
0910 – 0925	Opening address by Chairman of Elderly Commission, HKSAR Dean, Faculty of Medicine, The Chinese University of Hong Kong	 Dr CH Leong Prof TF Fok
Session 1	Geri-orthopaedic Discipline – the International Scene	***Moderator: Dr MF Leung & Dr TP Lam***
0925 – 0940	Elderly care – the Hong Kong scenario	Dr CH Leong
0940 – 1000	Elderly fracture care: how can we do better?	Prof Jean-Marc G Féron
1000 – 1020	Management and prevention of fragility fractures in Germany	Prof JM Rueger
1020 – 1040	Subsequent fracture after first hip fractures and prevention of second hip fractures in Japanese women	Prof Takeshi Sawaguchi
1040 – 1100	Management and prevention of fragility fractures in Malaysia	Dr BC Se To
1100 – 1120	A model on management of fragility fracture – experience from Hong Kong	Prof KS Leung
1110 – 1125	Discussion	
1125 – 1140	Break	
Session 2	Geri-orthopaedic Discipline: the Multi-disciplinary Approach	***Moderator: Katherine Wong & Prof LK Hung***
1140 – 1150	Acute management of geriatric hip fractures	Dr WY Shen
1150 – 1200	Medical optimization of acute hip fracture patients	Dr David Dai
1200 – 1210	Evolving role of O&T nurse – from hospital to community	Jessica Chan
1210 – 1220	Role of rehabilitation specialist – the road back to the community	Jamie Lau
1220 - 1230	Rehabilitation - the occupational therapists' perspectives	Barbara Chan
1230 – 1240	Extended program for frail elderly in the community	KL Lam
1240 – 1250	Discussion	
1250 – 1400	Lunch	
Session 3	From Community back to the Bench – The Frontier in Geri-orthopaedic Research	***Moderator: Dr EH Chen & J Chan***
1400 – 1415	Geriatric fracture: recent advances and what are we missing?	Dr N Tang
1415 – 1430	Fall prevention: the shoe innovation	Tabris Wong
1430 – 1445	Vibration for stronger bone and muscle: the theory behind	Prof Louis Cheung
1445 – 1500	Hip protector: the air bag design	Prof Wen Li
1500 – 1515	Numeric modeling in the management of hip fracture – the future approach	Prof KS Leung
1515 – 1530	Discussion	
1530 – 1545	Break	

Program 7

Time	Topic	Proposed Speakers
Session 4	Experience Sharing : Hospital Experience	***Moderator: Dr David Dai & Prof KS Leung***
1545 – 1600	Experiences from KWH	Dr KH Mak
1600 – 1615	Experience from QEH	Dr PH Chin
1615 – 1630	Experience from CMC	Dr EH Chen
1630 – 1645	Experience from PYNEH	Dr MF Leung
Session 5	Experience Sharing : Summary Report from the Community-based Week Program	***Moderator: Anthony Kwok & Poey Li***
1645 – 1655	Staff training for community fall and fracture prevention program	Claudia Chan
1655 – 1705	Train-the-trainer workshop for caregivers	Winnie Mak
1705 – 1715	Seminar on running fall and fracture prevention program in the community	Dr Peter Lau
1715 – 1725	Seminar on fragility fracture: the psychosocial issues	YY Wong
1725 – 1730	Closing speech	Prof KS Leung

Accreditations:
Orthopaedic Surgery: 5 CME pts; 5 training pts
Physiotherapist: 5 CPD pts
Occupational Therapist: 3 CPD pts
Nurse: 6.5 CNE pts
Family Physician: Pending
MCHK: 5 CME pts

Program 1 (2nd Round)

Staff Training for Community Fall and Fracture Prevention Program

Date: September 13, 2010 (Monday)
Time: 9:30am – 5:00pm
Venue: Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin
Objectives: To train staff working on Community Fall and Fracture Prevention Programs with delivery of a panoramic view on the various facets for caring for the elderly with Geri-orthopaedic problems
Target participants: Staff at elderly community centers, paramedical professionals with special interest in Geri-orthopaedic care

Time	Content	Speaker
9:30 – 9:40	Course introduction	Claudia Chan
9:40 – 10:00	Epidemiology of fall and fracture in elderly	Leung Kwok-Sui (Professor)
10:00 – 10:20	Risk factors and consequences of fall and osteoporosis	Cheung Yin-Ping (Nurse)
10:20 – 11:20	First aid management of fall and fracture	Cheung Yin-Ping (Nurse)
11:20 – 11:30	Break	
11:30 – 11:50	Demonstration: Bone mineral density measurement	Anna Mok (Research Assistant)
11:50 – 12:10	Demonstration: Simplified fall risk assessment	Winnie Mak (Physiotherapist)
12:10 – 12:30	Exercise for osteoporosis and fall prevention	Winnie Mak (Physiotherapist)
12:30 – 14:00	Lunch	
14:00 – 14:20	Fall and fracture prevention aids: Introduction of vibration therapy	Poey Li (Research Assistant)
14:20 – 14:40	Fall and fracture prevention aids: Hip protectors and footwear education	Claudia Chan (Prosthetist & Orthotist)
14:40 – 15:00	Introduction of fragility fracture program	Claudia Chan (Prosthetist & Orthotist)
15:00 – 15:30	Environmental hazard identification and modification	Patrick Sze (Occupational Therapist)
15:30 – 16:00	Skills on home visitation	Patrick Sze (Occupational Therapist)
16:00 – 16:15	Break	
16:15 – 17:00	Examination and certificate distribution	

Accreditations:
Physiotherapist: 5 CPD pts
Occupational Therapist: 3 CPD pts
Nurse: 5.5 CNE pts

Abstracts of Presentations

International Symposium on Geri-Orthopaedic Fracture Management

Sept 11, 2010

Elderly Fracture Care: How Can We Do Better?

Prof Jean-Marc G Féron, M.D., Ph.D., Professor of Orthopaedic Surgery,
Head of the Department of Orthopaedic and Trauma Surgery,
Saint Antoine Hospital, France

Hip fractures in elderly people are a common and very serious event accompanied by a high incidence of morbidity and mortality. The population over 85 years is growing faster than other segment of the population and represents the higher risk for osteoporotic fractures.

The goal of management of any hip fracture in the elderly is to restore mobility safely and efficiently while minimizing the risk of medical complications and technical failure as well as to prevent another fracture in the future.

Most of patients have co-morbidities that must be managed concomitantly with their fractures.

Co-management of elderly fractures patients by orthopaedic, anaesthesiologist and geriatrician has been developed in England in 1960's and has been shown to be successful in other countries.

The multidisciplinary care in hip fractures despite various models according to the health care system of the different countries and the differences of the patient groups seems to improve the outcomes of this frail population .A co-managed care allows to minimize the time to surgery by addressing co-morbidities and stabilizing acute medical conditions what decrease the mortality rate and improve the functional recovery when surgery is performed within 48 hours.

Studies of multidisciplinary groups have also shown improvements in level of hospital care, length of stay, better rehabilitation discharge planning, implementation of osteoporosis treatment and prevention of re-fracture.

Facing an aging population and widening indications for orthopaedic procedures the orthopaedic surgeons should be familiar with the major medical issues commonly encountered and should work closely with their medical colleagues on an individual patient basis. Such shared-responsibility units likely will become more common in clinical practice.

Management and Prevention of Fragility Fractures in Germany

Prof JM Rueger, Department of Trauma, Hand and Reconstructive Surgery,
Spine Center, University Hospital Hamburg Eppendorf, Germany

Introduction:
Osteoporosis (OPO) and osteoporosis associated fractures (OPO#) = fragility fractures are everywhere. The number of such fractures is constantly increasing and causes an ever increasing burden on the health care systems worldwide.

In Germany calculations are that by 2050 30% of the German population will be 50yo or older. The number of patients in the age group 65 and older will increase from 2010 = 17 millions to 22 millions in 2050. If in 2010 age groups 65 and above will account for approximately 8.2% of hospital admissions, it is calculated that this number will increase to 12% in 2050 with a disproportional higher increase in the age group 75 and above.
It is well understood that not all these hospital admissions will be due to OPO#s, but there is evidence that a great part of the former will be the dire consequences of fragility fractures.

Management:
We count for osteoporosis associated fractures:
Vertebral fractures
Anterior/posterior pelvic ring fractures
Certain types of acetabular fractures (anterior column, anterior wall)
Proximal humeral fractures
Distal Radius fractures
Femoral neck as well as peri - and subtrochanteric fractures
Distal femoral fractures
Tibila plateau fractures
Calcaneus fractures
Periprosthetic (nail as well as joint replacement) fractures.

Since a great number of our fracture patients is not only medically impaired but also suffers from a deteriorating intellectual capacity to fully developed dementia, diagnostics must take the latter into account. This is why, besides the investigation into the mechanism of injury, thorough clinical examination and standard plain x-ray films, in the ER we liberally set the indications for either CT scans or MR imaging. Especially in pelvic ring injuries and vertebral fractures CT scanning is highly indicated as a diagnostic tool.

Thus, whenever on clinical examination a patient complains of pain in the sacral area, he/she undergoes CT imaging to clear the posterior pelvis. If there are mono- or bilateral transsacral fractures (most often in zones Denis 1 and 2) the patients are admitted and will be stabilized the following day with 1 to 2 percutaneous transiliac-trans-SI-joint sacral screws into the body of S1. In addition to this, an anterior Ex Fix, using the inferior route will be applied for a maximum of 6 weeks. Patients are ambulated with full weight bearing on the day after surgery.

We do believe that this aggressive protocol is necessary to prevent our patients from secondary dislocation or even worse, development of bony non union - in the posterior as well as the anterior pelvic ring.

If patients with longstanding OPO present with back pain, even without adequate trauma, and plain x-ray films will not allow for the differentiation between a fresh vertebral fracture or an old collapse, patients will under go CT-imaging. In vertebral fractures, depending only slightly on the biological age of the patients, we set our indication for either Kyphoplasty or formal posterior instrumentation. This depends on the fracture type, ie we differentiate between inherently stable fractures without the danger of a later development of neurological symptoms and/or the presence/absence of neurological deficits immediately after the admission.

If a fracture is stable, prior to Kyphoplasty MR imaging is strongly recommended according to German guidelines to make sure that all involved vertebrae are surgically augmented. If there is an unstable fracture type, if there is a primary neurological deficit or if the status is deteriorating, formal instrumentation of adjacent vertebrae with sometimes PMMA augmentation of pedicle screws and (rarely) hemilaminectomy is performed. If there is no indication for hemilaminectomy, instrumentation is performed percutaneously.

For the reminder of the above listed fragility fractures, principles of treatment are:
1. Diagnostics: As extensive as for non OPO#, ie especially in proximal humeral fractures, comminuted intraarticular distal radius fractures, unclear peritrochanteric fractures and calcaneal fractures, CT scans are aquirred.
2. Treatment: We do rely as often as possible on either stabilisation of these fractures using angular stable nails, ie in the prox. humerus, peri- and subtrochanteric fractures, supracondylar, extraarticular distal femur fractures or, if nail technologies are not available we elect to use angular stable implants. Mippo techniques are standard, always trying to be as minimally invasive as possible. In intraarticular fractures anatomic reduction and stabilisation, often associated with bone substitute material applications, is carried out.
In neck fractures, above the age of 65/70, depending somewhat on the biological age of the patient and whether or not there are already signs of hip osteoarthritis, we replace the fractured hips either with cemented bipolar implants, hybrid THR (cup press fit, stem cemented) or uncemented THR.
In principal, we try to perform definitive stabilisation within 24 hours after patient admission, which sometimes, in undisplaced proximal humerus fractures, in distal radius fractures, calcaneus fractures is difficult to achieve. Neck fractures and peritrochanteric fractures are closely monitored by an external, government funded quality control system. This necessitates us to do surgery in these patients within 24 hours, a max at 48 hours. If surgery is delayed more than 48 hours after admission, the hospital is monitored within 6 month.
3. Postoperative: Patients are always mobilised as early as possible with at least 60% of our patients being transferred to a geriatric rehabilitation hospital/program.

Prevention:
In Germany - well connected with Switzerland and Austria - there is a German speaking umbrella organisation, the `Dachverband Osteologie` in which a board of delegates represent multinational societies. These societies - among them the German Trauma Society `Deutsche Gesellschaft für Unfallchirurgie`(DGU) - are all concerned with the diagnostics, prevention and treatment of osteoporosis or its sequelae. Among others, the delegates within the DVO develop guidelines for osteoporosis prophylaxis as well as therapy. Treatment guidelines that are accepted by the majority of the delegates are published, put on-line and are re-evaluated on a regular basis.

The recommendations according to the guidelines will allow for a select prevention protocol in patients who suffer from a first OPO# as well as for a prophylaxis protocol in those patients who are diagnosed osteoporotic (T-score) without prior fragility fracture.

All female patients that are older than 60 and present to my institution with one of the above fractures, especially in those circumstances when the mechanism of injury seems to be inadequate, are started on a vitamin D and Calcium 1gr/day substitution therapy. If there is a history of fragility fractures in the past, we initiate a bisphosphonate therapy after blood sampling and tests. Contraindication to this is maxillofacial surgery within the last three month before the patient was admitted. Since the average stay in German trauma departments is less than 8,0 days (including polytraumatised, multiply injured patients) formal evaluation and formal diagnostics, whether or not there is a pathological T-score, very often needs to be done in an ambulatory setting after the dismission of the patients. This procedure is also recommended for the patient group that are treated for a first OPO# and are not started on a bisphosphonate while admitted.

Even though, especially due to the work of the DVO, there is an ever increasing better knowledge and consciousness in German trauma surgeons, who primarily treat the OPO#s, that the treatment of such a fracture is just the beginning and that longterm prophylaxis is key to decrease recurrencies, there is still insufficient adherence to the published guidelines. It will be the task of all of us to train colleagues, young and old, at home and abroad, in the diagnostic procedures and adequate therapeutic strategies for this disabling disease.

Subsequent Fracture After First Hip Fractures and Prevention of Second Hip Fractures in Japanese Women

Takeshi Sawaguchi[1], Hiroshi Hagino[2], Naoto Endo[3], Tetsuo Nakano[4], Yoshinobu Watanabe[5]
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Introduction
Japan has the highest percentage of geriatric population. The percentage of the population older than 65 years old is 25 % at 2010. The numbers of hip fractures are 160,000 at present. It is estimated to be 250,000 to 300,000 in 2050. The age-standardized rates of hip fractures is still increasing
We conducted a study to elucidate the incidence of new fractures and the current status of osteoporosis treatment within one year after the first hip fracture.

Material & Methods
The survey was conduct on all female patients who were 65 years or older who had experienced hip fracture due to minor trauma for the first time and were treated at the participating hospitals in five geographic areas in Japan during the study period (January 2006 to December 2007). The data on demographics, treatments, and health outcomes were collected from medical records. A voluntary and confidential questionnaire was mailed to patients about the patients' health outcomes.

Results
The analysis was conducted in 2,330 patients (age 83.6 ± 7.1 years). During the one-year observational period 158 fractures occurred in 152 patients. The incidence for all fractures among patients with first hip fracture was 71.7 (per 1000 person-year), and that for hip fracture was 36.7. The relative risk of hip fracture was 4.4 for women aged 65 years and over with first hip fracture. During this one-year period, anti-osteoporosis pharmacotherapy was given in 437 patients (18.8%) while 1,240 patients (53.2%) received no treatment.

Discussion & Conclusion
This study demonstrated the high risk of subsequent fracture in patients with first hip fracture compared to the average incidence of fracture of the same age group. It became clear that adequate treatment for fracture prevention after first hip fracture is not given to the majority of patients. Since hip fracture patients are the most plausible candidates in the prevention of subsequent fractures, especially second hip fractures with high burden, appropriate treatment of osteoporosis is essential.
From the results of this study, we made a common clinical path which can be used throughout all the acute phase hospital to the rehabilitation hospital and also to the nursing home or the visiting care in our prefecture with one million inhabitants. This will help to provide adequate anti-osteoporosis pharmacotherapy to this high risk group of patients with subsequent fractures.

Management and Prevention of Fragility Fractures in Malaysia

Dr Boon Chong Se To, Consultant Orthopaedic Surgeon, KPJ Penang Specialist Hospital, Malaysia

Malaysia is a multi-racial country with a population of 28.25 million. The main ethnic groups are Malays 65%, Chinese 26% and Indians 8 %. About 4.7 % of the population (1.3 million) is aged 65 years and above and 63.6 % between the ages of 15 to 64 years. Life expectancy for the Malaysian male is 71 years and female is 77.1 years.

Osteoporosis affects the Chinese more than the Malays or Indians as reflected in the incidence of osteoporotic hip fractures in 63 % Chinese 20 % Malays and 13 % Indians. Females were twice more affected than males and osteoporotic hip fracture incidence was highest in Chinese females.

Malaysia has about 65 DXA machines throughout the country for bone mineral density assessment. Calcaneal ultrasound scan is also used but their number in this country is unknown. They are commonly used as a screening tool in health awareness campaigns.

Most of the conventional medications for the treatment of osteoporosis are available in Malaysia. Treatment of osteoporotic fractures is carried out using standard techniques and implants.
Malaysia is a developing country with a small health budget but with a progressively increasing ageing population. Treatment of osteoporosis and fragility fractures has been proven to be very costly. Hence, more emphasis is now put on to education and prevention.

Every main public hospital in Malaysia is envisaged to have an osteoporotic education and fragility fractures prevention programme which is to be jointly carried out by the orthopaedic and the physiotherapy or occupational therapy departments. The Malaysian Osteoporosis Society and the Osteoporosis Awareness Society of Kuala Lumpur are the two societies in Malaysia actively promoting awareness and programmes for osteoporosis.

The way forward in the treatment of osteoporosis and prevention of fragility fractures in Malaysia is to educate and increased the awareness of the general public to osteoporosis; train the caregivers in the management of osteoporosis and to increase priority of osteoporosis in the National Health Policy planning and budgeting.

A Model on Management of Fragility Fracture – Experience from Hong Kong

Prof KS Leung, Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong, HKSAR

Management of fragility fractures among elderly becomes a major challenge to orthopaedic professional to-day. The role of orthopaedic surgeon is not limited to surgical management. We are the leader in the clinical management team for these patients and we understand most the suffering of our patients and their family members, together in providing the best acute management, we need also to take part in the rehabilitation and prevention of the fractures.

Since 2000, we started our community program on the prevention of falls and fractures in Hong Kong. Through series of organised and systemic community programs, we successfully raised much attention to this medico-social problem in the society where we initiated many related projects and education programs. Although we have not yet proven the effectiveness of these Primary Prevention Programs, fall and fracture prevention program become one of the regular programs in many District Elderly Community Centre (DECC) in Hong Kong today.

Based on the experience of community fall prevention program, we also focused on patient related programs- Secondary Prevention Program for Fragility Fracture. The basic concept is: first fragility fracture may be the first presentation of osteoporosis and risk of fall and the re-fracture rate is highest within the first year after the first fracture, It is therefore the best opportunity to start the treatment of osteoporosis and secondary prevention of fractures and falls. A multi-disciplinary clinical team was formed to provide holistic care for these patients with a comprehensive management program. The advancement in treatment modalities, surgical, pharmacological as well as non-pharmacological treatments were taken into the consideration in the planning of this comprehensive management program. The results of this program after 3 years showed significant improvement in patients after the first fractures with respects to functional recovery, quality of life and also decrease in falls and fractures. Patients and their family members rated the program with high satisfaction.

Surgically, orthopaedic surgeons are to provide the best treatment with minimally invasive technique to ensure least complication, quick rehabilitation and maximal recovery. Pharmacological treatment with anti-resorption therapy and anabolic calcium treatment would be the standard treatment to maintain and improve bone mass.

The building up of the collaborative relationship helped in our many other translational research programs and applied community projects. The research and development on hip protectors, fall prevention shoes and vibration platform and treatment programs are typical examples.

High frequency low magnitude vibration therapy as a form of interactive Weight bearing Exercise (iWE), is a non-pharmacological modality to improve bone mass, enhance balance and co-ordination and improve muscle power among elderly. Many laboratory and clinical studies have confirmed benefits of this unique biophysical treatment on bone and on muscles. It will also be an important modality for bone health in general public at large. A large scale controlled trial in the community research program since 2009 shows the excellent results in improving muscle power and co-ordination in the elderly. The results of the study confirm the beneficial effects of this simple biophysical stimulation on the prevention of fall and fractures among the elderly.

Acute Management of Geriatric Hip Fractures

Dr WY Shen, Director, Orthopaedic Trauma Service, Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital, HKSAR

Acute management of geriatric hip fractures consists of a quick assessment of the premorbid condition of the patient together with immediate stabilization of co-morbidities. A decision will then be made as to the most appropriate management of the fracture. Most patients who do not have a strict contra-indication for operative management should receive early surgery. They should be optimized and operated on within 24 to 48 hours, preferably during the day-time, and performed by a team of anaesthetists, surgeons and nurses experienced with these operations.

The purpose for operative treatment is to relieve pain, facilitate nursing, and to mobilize the patient as soon as possible. The operation should provide stability good enough for immediate full weight bearing standing and walking, unless the patient was incapable of so before the fracture. In order to minimize complications, fracture fixation should preferably be approached with a minimally invasive exposure, and coupled with an implant that would share the load and allow controlled collapse and impaction at the fracture site. Femoral neck fractures pose different potential complications, and most displaced femoral neck fractures would need an arthroplasty.

The challenge of geriatric hip fractures lies in the fact that many of these patients are old and fragile with multiple co-morbidities, and whose bones are osteoporotic. To compound the problem, the workload is quite unpredictable. An efficient multi-disciplinary geri-orthopaedic management team demands seamless co-operation among the orthopaedic surgeon, the anaesthetist, the geriatrician and cardiologist, who must all share a thorough understanding of the needs of this special group of patients.

This presentation shall share the experience of the acute geriatric hip fracture management team at Queen Elizabeth Hospital.

Medical Optimization of Acute Hip Fracture Patients

Dr David Dai, Consultant Geriatrician, Prince of Wales Hospital, HKSAR

Hip fracture in elders can be perceived as a geriatric syndrome characterized by frailty, osteoporosis, sarcopenia, falls, multiple pre-morbid co-morbidities and peri-operative medical instability. The modern hip fracture programme follows a co-management model comprising orthopedic and geriatric input; all patients are seen by the geriatric team automatically 3 times a week without the need for consultation. Close attention is paid to medical problems identified in the pre-operative period. Delirium is a common occurrence with a prevalence of 36-39% in our group of patients. A cost-effectiveness analysis demonstrates 72% reduction in hospital mortality, 45.1% mortality at 1 year. Savings also amounts to $ 1 million per year for manpower.

5 yr mortality remains high at 45.6% in a cohort of 344 patients. While peri-operative geriatric input is beneficial, post discharge support and follow up need to be further developed to maintain function and reduce mortality.

Evolving Role of O&T Nurse – from Hospital to Community

Jessica Chan, Department of Orthopaedics and Traumatology,
Prince of Wales Hospital

Hip fracture is a serious consequence of fall among the elderly and constitutes a major public health problem worldwide. In the past, the role of nursing care focused on the peri-operative and early rehabilitation processes. However, secondary prevention of hip fractures by fall prevention is equally important and it becomes an essential component in holistic care nowadays.

Recently, a comprehensive management of fragility fracture has been introduced. After receiving standard peri-operative and rehabilitation program, patients at high risk of recurrent fall would be referred to a fragility fracture clinic for detailed evaluation and proper interventions would be offered to reduce fall incidence. A large scale community health care and fall prevention scheme has also been set up for both primary and secondary prevention purposes. A multidisciplinary approach involving orthopaedic surgeons, geriatricians, family physicians, social workers and rehabilitation specialists is necessary to achieve the ultimate goals of better patient care and reduce the risk of fall and fractures. In fact, the role of orthopaedic nurses should not be restricted in delivering in-patient services but should be extended actively in facilitating this novel approach to fulfill the holistic concept of patient care. In addition to being a health care provider, orthopaedic nurses should also identify the major physical, psychological and environmental risk factors of fall among the elderly admitted for fragility fracture. Moreover, nurses also play the role as an educator to provide information and preventive measures to the patients and the caregivers so as to prevent falls at home and in the community. Finally, nurses should be a liaison officer to coordinate different key members within the multidisciplinary team to provide an optimal and tailored care plan for each individual patient from the hospital back to the community.

In conclusion, the evolving nursing role together with the novel comprehensive management program for patients with fragility fractures may minimize complications, shorten acute hospital stay and rehabilitation period, reduce frequent clinic visit, facilitate the patients returning to the community safely and reduce the fall and fracture incidence in the future.

Role of Rehabilitation Specialist – The Road Back to the Community

Jamie Lau, Senior Physiotherapist, Prince of Wales Hospital, HKSAR

After sustaining a hip fracture, a patient needs to go through a pathway that rehabilitation specialists help guiding him/her through in order to restore meaningful functions to the clinicians and the patient. The rehabilitation specialists involve a team including nurses, physicians, occupational therapists, physiotherapists, prosthetists and orthotists and social workers.

At the acute post-operative phase, the roles of rehabilitation specialists are to minimize the adverse effect due to the surgery or prolonged bed rest.
Physiotherapist will:-
- check and prevent thromboemboli and pulmonary complications from happening,
- regain the active mobility of the injured leg while the surgically stabilized fracture site is being protected,
- facilitate the daily functional transfers and walking.

Occupational therapists will:-
- assess the cognition level for differentiating delirium from dementia if indicated,
- assess functioning decline and provide training.

Care should be taken to prevent subluxation and dislocation after total hip hemiarthroplasty.

Besides documenting patients' progress, measurement of their functioning outcomes assists in the subsequent planning of the treatment programme which should be targeted toward the patient's individual needs. The outcomes include:
- Mobility – Modified Functional Ambulatory Categories, Elderly Mobility Score, Timed-Up&Go-Test
- Activities of daily living – Modified Barthel Index, Functional Independence Measure, Lawton Instrumental Activities of Daily Living.

These outcomes are measured at the time points of transfer from acute setting to rehabilitation setting, before discharge back home, at out-patient clinic visits and in the community centre.

In the rehabilitation phase, rehabilitation specialists' roles are focused on intensive training of mobility and functional capacity restoration in a holistic approach.
Physiotherapists emphasize the following:
- early ambulation and ankle exercises for preventing deep vein thrombosis;
- joint mobility and muscle strength training – actively mobilizing and gradually resisted training of the involved leg; strengthening of the arm and sound leg;
- restoring function, gait and balance –
  - bed mobility
  - transfer mobility (bed to chair, wheelchair to stand, floor to stand)
  - walking mobility (weight-bearing restrictions, assistive device, distance, velocity, gait deviation, stairs)

Occupational therapists take care of the following:
- cognitive assessment
- evaluation of the functions of daily living, followed by training, and provision of any assistive device which is indicated.
- home hazard assessment and treatment – safety on functioning and home environment for return, home fall risk screening and modification

Achieved in the controlled environments of clinic beds and mats during the rehabilitation phase, the mobility skills have to be translated into higher level of functional ability, simulated in the home environment and community which the patient is going to reintegrate. Patient's functional capacity has to be thoroughly evaluated. Deficiency compared with the life style the patient led before the injury is documented. Practice of the functional tasks in a safe manner help building the patient's strength and confidence. This is an essential step to press on toward reintegration back to community. The patient will then have better quality of life, less burden both physically and financially to the caretakers.

It is the rehabilitation specialists' role to educate the caretakers, especially near to discharging the patients on how to:

- take care of the patient safely,
- carry on the rehabilitation programme back home,
- motivate the patient

In cases where financial or social support is required, the social worker can offer help.

After the patients returned home, they can participate in some activities in the nearby community centre where group exercise classes are offered. This will be shared more in detail by other speakers in the symposium.

Hence returning to the community after a hip fracture is a concerted effort from a team of rehabilitation specialists centred at the patients who may be able to lead their lives again in a more dignified manner.

Rehabilitation - The Occupational Therapists' Perspectives

Barbara CM Chan, Occupational Therapist, Occupational Therapy Department, Prince of Wales Hospital, HKSAR

The goals of occupational therapy in rehabilitation are to prevent further loss to the individual and restore functional ability to the optimum in activities of daily living. The occupational therapist has a role to play at different stages of rehabilitation.

During hospitalization, patient with hip fracture were three to six times more likely in exhibiting cognitive impairment (Schor J.D. et al, 1992). Cognitive assessment to detect delirium and dementia for pre and post hip operation is conducted. After orthopedic surgery, splintage or position devices are used for protecting the operated site and facilitating proper alignment of the injured area; for example hi-lo seat is prescribed to prevent subluxation and dislocation of hip. Post-operated complication or prolonged immobilization may result swelling and pressure sore for the fragile elderly people. Pressure garment is tailor-made pants to reduce swelling of the lower limbs. Air mattress, cushion and heel protectors are used for preventing pressure sore of the fragile elderly people.

During pre-discharge / out-patient rehabilitation, fall risk screening is conducted in order to identify fall risk factors and fall risk behaviors. Several studies have shown that 30% -70% of falls happened in or around the home, and 40% – 60% of falls were related to environmental hazards (Tinetti M.E. et al 1988; Nevitt M.C. et al, 1989). Therefore, occupational therapy home assessment aims at increasing or maintaining functional independence, safety and quality of life of elderly people both as therapeutic and prophylactic measures. At home visit, contrast testing and lighting assessment are performed especially for those having vision impairment. Home modification involves major architectural alternation, minor home adaptation, on-site arrangement and activities of daily living assistive devices prescription. Carer training is important to educate appropriate techniques in handling elderly people in daily living. Lastly, hip protector is introduced to prevent further hip fracture of the elderly people.

Various commonly used assessment tools and occupational therapy equipments will be showed and discussed in the presentation.

Extended Program for Frail Elderly in the Community - A Holistic and User-friendly Fall Prevention Program

KL Lam, Service Supervisor, Ma On Shan District Elderly Centre, Evangelical Lutheran Church of Hong Kong

Fall is not merely a physical problem for elders. It affects all aspects of the elders, ranging from social, psychological, emotional to physical wellbeing. It also devastates their quality of life and brings stress to family caregivers. Initiatives to support elders with fall risks undoubtedly bring values to the community. As a major community service provider for older adults in the district, ELCHK Integrated Elderly Service has been actively involved in community-based fall prevention initiatives for some years. Effective collaboration is built with the leading institute, Department of Orthopaedics and Traumatology, Faculty of Medicine, The Chinese University of Hong Kong, that with expertise in providing medical consultation, training and conducting research at Prince of Wales Hospital.

With its initiation and responsiveness of the agency, it has matured as an enhanced and user-friendly care program integrated with centre service. A tailor-made continuum of services is packaged as a Community Healthcare and Fall Prevention Clinic. Services rendered include: treatment with Vibration Platform; rehabilitative exercise group guided by outreach physiotherapist; regular medical consultation by visiting medical officer from private clinic; educational programs organized regularly and centre membership given to encourage better use of daily service.

It is to provide a community-based, one-stop and holistic package of services to community dwelling elders having fall history to prevent repeated falls. They are mainly orthopedic patients referred from the rehabilitative unit of hospital. It is a trans-system partnership of hospital, university, private health clinic and NGO. Data is shared and research conducted by university is built in. About one hundred elders have been benefited from the enhanced care program, with a lot more benefited from several related program packages. Encouraging feedbacks from users on its effectiveness and beneficial outcomes are received, making it a brand service at centre.

Apart from professional and technological input, success of the extended community program also lies on shared mission among collaborators, continuity of service, full support from top management, effective downstream training, user ownership, human touch, continuous improvement and adequate facilitation.

Acknowledgement: Special thanks to Professor Kwok-Sui LEUNG, Department of Orthopaedics and Traumatology, Faculty of Medicine, The Chinese University of Hong Kong, for initiation, professional support and leadership of the program.

Geriatric Fracture: Recent Advances And What Are We Missing?

Dr N Tang, Associate Consultant, Department of Orthopaedics and Traumatology, Prince of Wales Hospital, HKSAR

The population is aging with expect 10 Million people (25%) of the population will be older than 65 years old by 2050 (WHO). The associated health issue is increasing osteoporotic fractures especially proximal femoral fractures (expected reaching 6.26 Million. Among these 51.2% will be in Asia. Huge resource has been put into research for management of these fractures and a few technologies will be introduced.

The diagnosis of fractures is by history, physical examination and confirmation with XR. However, in more and more patients they presented with clinical symptoms and signs both in ambiguity and also the XR in osteoporotic bone could not review a clear diagnosis. This especially affected many cancellous bone regions like basal neck/ trochanteric region of proximal femur or posterior ring of pelvis (sacrum). Traditional CT scan and bone scan still has significant false negatives in diagnosing these occult fractures. With collaboration from the Department of Diagnostic and Imaging, we now employ a fast MRI protocol which give 100% sensitivity to occult hip fractures and also guide our treatment protocol.

Once diagnosis of the fractures has been confirmed and fracture patterns analysed, many of the patients need to undergo surgical treatment to maximize their functional recovery and at the same time avoiding complication from non-operative treatment. Concept of minimal invasive surgery (MIS) has been advocated to optimize the surgical outcome. This especially important in geriatric patients whom usually have much co-morbidity with low physical reserve so emphasis in minimizing surgical induced trauma is essential. Among the various technologies, computer aided orthopaedic surgery (CAOS) is one of the new area of development. CAOS has the advantage of detail pre-operative planning, accurate intra-operative execution with navigation system. Our experience employing navigation with Gamma nailing in the treatment of pertrochanteric fractures has shown it could decrease XR exposure, minimized surgical wound, improve implant position and with short operative time (~ 30 minutes). Arthroscopy is another commonly used method of treatment of articular fractures which direct visual restoration of joint congruity is possible with stab incision portals. Combination of the above technologies is also possible which further enhance the clinical outcome.

Osteoporosis not only affects the quantity of bone but also leads to deterioration of in bone structure and this presented a great challenge when surgeons try fixing the fractures. The development of locking plate which has biomechanical advantages being able to share the forces by few screws together and also preserving the periosteal blood supply has greatly decrease the failure rate. Another commonly associate finding in injured metaphyseal region of bone is the finding of huge bone void. Convention autogenous bone grafting may cause significant donor site morbidity and the mechanical strength of bone graft is also inferior. Many types of bone substitutes have been developed to filled and bone void and at the same time act as a bridge to allow new bone formation. At the same time the bone substitutes could be shaped and designed to meet the biomechanical properties of the local bone. Furthermore other forms of bioaborbable bone glues and implants had also been developed so removal of implant is not necessary.

Despite the various advances in technology, there still lacks an overall quantitative assessment of the diseases and patient factors which could predict the clinical outcome. A patient specific treatment protocol could then be made based on this numeric modeling. This is the challenge we are working on and hope all the patients will benefit from this.

Fall Prevention: The Shoe Innovation

Tabris Wong, Orthotist, Pedorthic Technology Ltd.

In cases of falls, one would naturally look into the interface between the human foot and the walking surface – that is the Shoes. To reduce risks of falls, researches have been done to optimize the design of the shoes. Indeed, shoes play a key role of controlling alignment of foot joints for posture stability and maintaining an optimal anti-slip micro-environment. This presentation will share the essential elements in biomechanical design for fall prevention shoes.

Vibration for Stronger Bone and Muscle: The Theory Behind

Prof Louis Cheung, Prof KS Leung
Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong, HKSAR

Low-magnitude high-frequency vibration (LMHFV) treatment at 35Hz and 0.3g (g is gravitational acceleration) is a non-invasive biophysical intervention to provide systemic vertical whole-body vibration stimulation to the musculoskeletal system. Our previous study found that muscle fiber type IIA and IIB decreased with age, leading to deterioration in muscle quality and balancing ability in elderly *[Lee et al. Clin Orthop Relat Res. 2006]*, which significantly correlated to bone mineral density *[Cheung et al. CMJ. 2010]*. LMHFV may help to provide the lost frequency range (30-50Hz) originally generated by contraction of muscle fiber types IIA/B.

We are the first group to investigate the effect of LMHFV on fracture healing in a rat model *[Leung et al. J Orthop Res. 2009]*. Results showed that LMHFV could accelerate femoral shaft fracture healing by 30%, as confirmed radiologically, densitometrically and biomechanically. Callus formation and maturation were enhanced with increased chondrogenesis and upregulation of gene expression. Application of LMHFV on osteoporotic fracture healing even indicated that osteoporotic bones were more sensitive to respond to vibration treatment, as compared with age-matched normal bones *[Shi et al. Bone. 2010]*. Callus microvasculature in terms of blood volume and intensity of blood flow was significantly enhanced *[Sun et al. ORS. 2009]*.

We have also extended the animal work to clinical trials. We have conducted a randomized controlled trial (RCT) using LMHFV on osteoporotic intertrochanteric fracture in elderly female patients *[International Congress of COA. 2009]*. Most updated results of this on-going study showed that LMHFV increased fracture impaction and intramedullary callus formation, as shown in radiographs. Vibration group showed significant improvement in quality of life and early enhancement in range of motion of hip joint after 6-month intervention. Retardation of bone loss was observed at hip areas in vibration group, without any complications. All the elderly patients can tolerate the vibration treatment well. This confirms the feasibility, efficacy and safety of LMHFV treatment on fractured patients.

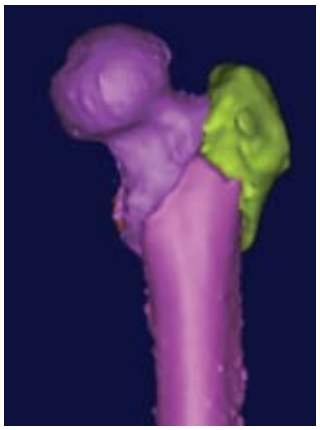
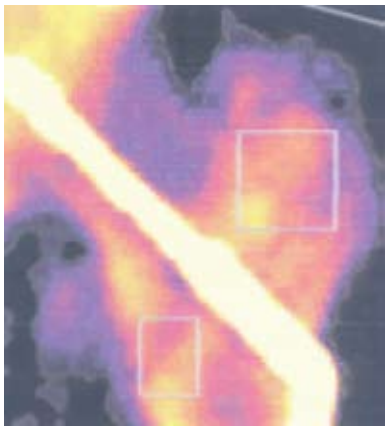
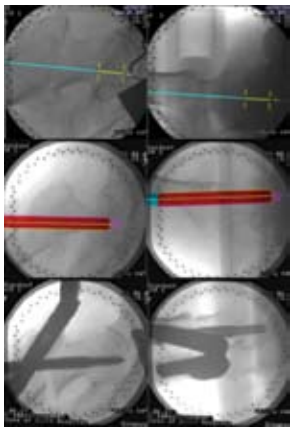
Vibration treatment was also applied on normal postmenopausal women that indicated vibration enhanced the balancing ability of postmenopausal women in movement velocity and directional control, implying the improvement of sensory perceptual functions and muscle quality *[Cheung et al. Arch Phys Med Rehabil. 2007]*. Another large-scale RCT was undergoing in our institute, involving 704 postmenopausal women, to evaluate the efficacy of LMHFV on reducing fracture rate. Interim results demonstrated a lower fracture rate (0.5% vs. 1.6%), lower fall incidences (7.88% vs. 17.29%) and significantly enhanced muscle strength and balancing ability in treatment group after 9-month intervention *[Chan et al. Combined ORS. 2010]*.

The above findings confirm the multi-factorial advantages on musculoskeletal system with regard to bone, muscle, sensory perceptual functions and circulation. As LMHFV is non-invasive and side effect-free, the feasibility of vibration application for various musculoskeletal indications is high. This can help osteoporosis, fracture healing, muscle weakness or neuromuscular deficient patients. Future development of LMHFV application for osteoarthritis, post-stroke rehabilitation or Parkinsonic disease is also of high potential.

Numeric Modeling in the Management of Hip Fracture – The Future Approach

Prof KS Leung, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong, HKSAR

Computer assisted surgery is commonly practiced. We had shown that the application of CAOS in the operative treatment of hip fractures enhances minimally invasive surgery that facilitates the recovery of our elderly patients. With the advancement in technology, the practice of CAOS is an excellent example to show the practice quantitative orthopaedics and digital medicine. One good example is application of numeric model in the management of trochanteric fractures. Digitisation can be done in pre-operative planning: demographic data, fracture characteristics with micro-architecture and bone mineral content – a *densiscan* of the proximal femur enabling our preoperative planning to define the best position for the lag screw fixation with optimal length for TAD. These data help in decision making of management, guide intra-operative execution of the surgical procedures with the help of navigation. Postoperative numeric recording and monitoring will also help to formulate postoperative rehabilitation program and thus provide prognostic information.

Management protocol for hip fracture is one example of the many protocols in the management of orthopaedic trauma. As this is one of the commonest surgeries done in any major hospital, the application of numeric modeling will generate more experience for the other applications.

To bring the CAOS to another level for wider application, there must be paradigm shift in the workflow of CAOS where quantitative diagnostic studies together with preoperative planning should form part of the CAOS. Precise operative execution can be further enhanced with technological advancement in hard wares and software. Postoperative technology specific assessment must be developed and applied for these new technologies. Our patients will then receive guided and programmed rehabilitation accordingly.

The goals of CAOS should also be redefined. The procedures are patient specific with the aim to enhance minimally invasive surgery, booster quantitative orthopaedic practice. The technological advancements will enhance visibility of surgical anatomy, improve accuracy and repeatability and quality control.

Management of Geriatric Fractures on a Joint Clinical Pathway 10 Years' Experience from Kwong Wah Hospital

LK Leung, KH Mak, Department of Orthopaedics and Traumatology,
Kwong Wah Hospital, Hong Kong SAR

The management of geriatric fractures aims at prevention of complications. It is essential to control pain, to support early ambulation and rehabilitation. A standard integrated clinical management pathway for hip fractures in patients over 65 had been in place in our hospitals extending from the acute to the extended care since 1999.

A review was done after the first year with minimal follow up of 6 months. About 25% of patients could be discharged home after an average length of stay of 16.5 days. More 60% has to be institutionalized. The mortality in hospital in the first month was 4% and was overall 11.4% in one year.

The study period was then extended to 2 years from 1 April 1999 to 31 March 2001. Length of follow up was at least two years. Number of patients involved was 673. Most of the hip fractures can be stabilized within 3 days. Mortality was 2.5 % in the first month, 8% in the first 6 month, 17.3% in the first year and in 2 years was 27.6%.

Only two third of patients used to live in family could be discharged home within 3 month, some of them had undergone a protracted period of rehabilitation in an extended care centre. Most of the other patients had to be institutionalized permanently.

The number of geriatric hip fractures admitted within the study period was around 250 to 320 annually in the years to follow. Probably, due to the improvement in the living condition, the promotion of fall prevention program in the community and the emergent prescription of anti-osteoporotic therapy, the number of geriatric fractures seemed to be on the decreasing trend. There were however, more male hip fractures. The male to female ratio increased from 1:6 to 1:2 in the recent years.

Surgical treatment of osteoporotic hip fractures had been prioritized in a dedicated surgical list in recent years. Together, with the improvement in the surgical armamentarium and peri-operative care, the morbidity and mortality and discharge pattern improved steadily in these 10 years. Early mortality was around 0.6 to 2 percent. However, only one sixth to one fourth of patients could return home within one month of the fracture.

New problems however have arisen in the recent 5 years related to prolonged prescription of anti-osteoporotic medications.

Experience of Queen Elizabeth Hospital in the Management of Fragility Hip Fractures

Dr. Ping-Hong Chin, Consultant, Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital, HKSAR

The Orthopaedic Unit of Kowloon Central Cluster takes in around 700 patients with geriatric hip fractures each year. Our study shows that the most important factors affecting outcomes of patients were post-operative physical condition represented by FIM score and their mental condition, measured by AMT. Patients can then be channeled through different rehabilitation pathways and better rehabilitation outcomes are attained. However, the ultimate goal of rehabilitation can only be the genuine satisfaction of patients after they return to their communities and their continuous care by community rehabilitation facilities. The continuously improving effort on our part on such seamless transition of care from the Hospital Authority to the Community should be our next challenge in our service for our senior citizens.

Caritas Medical Centre (CMC) Geriatric Hip Fracture Service Experience

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Milestone of Hip Fracture Service Development in Caritas Medical Centre

- Formed Cluster Rehabilitation in CMC in 2003 with rehab. clinical pathway in the same year
- Initiation of KPI monitoring in 2007
- Multidisciplinary task force, acute hip fracture care plan in 2007
- LOS monitoring in 2008
- Patient Triage system for intense training to increase return home rate 2009
- New discharge planning in end of 2009
- Fragility Fracture Clinic in 2009

CMC has the unique experience of receiving the postoperative fragility fracture patients for rehabilitation from all 4 acute orthopedics departments in the Kowloon West Cluster after we formed the Kowloon West Cluster Orthopaedics Rehabilitation Center in CMC in 2003. The immediate problem would be the resource constraints in terms of available beds and manpower. That is the reason why we focus on the efficiency of our management system.

Geriatric hip fracture has been a major service load to all orthopedic departments occupying more than half of the patient load. However, due to various reasons, it was not managed in an optimal setting in most of the hospitals in HK which was reflected by the previous multiple studies conducted. The most salient feature was the delay in pre-operative stay with subsequent complications of prolonged immobilization and deconditioning and the 1 year mortality rate was around 14%.

In view of this, there were two actions taken. In the early 2007, CMC already planned for a special task force consisted of the involved departments and tried to formulate the strategy to improve the situation without knowing that the Central Committee in HAHO was also looking into the same issue and launched the KPI for hip fracture in the Fall of 2007 aiming to raise the pre-op stay to be 70% in less than 2 days pre-op.

So the task force had decided on the listed actions:

- Establish hip fracture clinical pathway (from AED admission to discharge from rehabilitation ward)
- Multi-disciplinary team approach
- Integrated patient documentation by multi-disciplinary team: improve communication
- Daily monitoring of hip fracture waiting for operation by both Anaesthetic and Orthopaedics Department heads with information of and why patient is not ready for surgery

With Services Pledge and Outcome indicators as follows:

- Physician assessment within 1 day of consultation
- Anaesthetist assessment automatically, without referral, within 1 day from admission
- Planned emergency operation
- 70% of operation done within 2 days from admission

Planned emergency is one of the crucial factors because the protected OT time will let all the preparations and flow become smooth.

Data monitoring was done by HAHO through CMS system. While in our Kowloon West Cluster Orthopaedics Rehabilitation Unit, we have kept a more detailed database of our own capturing of the variance on each step and the reasons of any delay. These data are benchmarked with all hospitals in HK.

As for our database, we review periodically and released to all departments concerned through the half year progress report and answer any queries whenever questions and problems arouse.

As a result, operation for acute hip fracture done within 48 hours after admission improved from 47% to 87% (COC KPI requirement: 70%) and acute O&T ward length of stay decreased from 11 days to 9 days.

Another executed improvement strategy was the accelerated rehabilitation model which goes hand-in-hand with the previous one with the reinforced multidisciplinary support and triage system which differentiate those with good social support and with progressive improvement in the functional status and the vice versa. The first group will aim at maximal functional regain and return home while the second group will aim at placement management. It showed that after the new strategy of selective and prolonged training of those with good social support and rehab. potential, the discharge rate to home increased from 53% in 2007 to 55% in 2008 and 57% in 2009.

As for the patient discharged from the center, they will be followed up by the same team and start osteoporosis treatment and fall prevention training.

Experience of Pamela Youde Nethersole Eastern Hospital in the Management of Fragility Hip Fractures

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Introduction:
The incidence rate of geriatric fragility hip fracture is high, up to 500 cases per year in HKEC. The cause of fracture was mostly fall injury. About 85% of patients have co-existing medical problems. Medical conditions were one of the important causes for delay the operation and prolong of hospital stay. Besides, readmission for second fragility hip fracture is not uncommon. Repeated fall and fractures directly lower the quality of life of the elderly, lead to permanent disability and even death in the worse condition. Therefore, secondary prevention of fragility hip fracture is essential for the group who suffered from hip fracture. In order to address the problems, comprehensive fragility hip fracture program was adopted. Management protocols are standardized with respect to surgical techniques, medical treatment, anaesthetic support, rehabilitation regimen and long-term community-based post-fracture care program across the hospitalization phase and post-discharge follow up phase of the program. To streamline the treatment and rehabilitation pathway of fragility hip fracture, multidisciplinary care plan is designed for hospitalization phase. To promote secondary prevention of fragility hip fracture, osteoporosis treatment, counseling and education on fall prevention are the main components. To achieve these, a combine fragility hip fracture clinic is designed.

Purposes of the Project:
The purpose of the project is to achieve early operation, shorten the hospital stay, promote bone health and prevent second fracture of the patients.

Material & Methods:
Hospitalization phase
(Multidisciplinary care plan)
Patients aged 65 or more with fragility hip fracture who need surgery were included in this care plan since July of 2009. Multidisciplinary involvement of orthopaedics surgeons, experts of other specialties, nurses, therapists, social workers, NGO, patients and relatives .Focus on three milestones: receive operations within 48 hours after admission, transfer to rehabilitation units within 4 days after operation and discharge from hospitals before 24 days after operation

Post-discharge follow up phase
(Comprehensive fragility clinic)
Patients with fragility hip fracture who received surgery were arranged follow-up in comprehensive fragility fracture clinic after discharge since July 2009. In the clinic, O&T nurse would interview the patients and careers after doctor's assessment. Nurse would assess patients' mobility and self care ability by Elderly Mobility Scale and Modified Barthel Index respectively. Also advises on fall prevention, home safety issue, bone health education, osteoporosis and related drug education would be provided by nurse. Related pamphlets were given to patients for reference. In addition, choices of 4 local NGOs would be referring for fall prevention and muscle strengthening programs to share the caring role form hospital to community. All the information would then be input into an electronic nursing notes template at CMS.

Results:
More than 70 % of patients received operations within 48 hours after admission. The average total length stay is around 25 days. The most common problems causing the delay in operation, transfer to rehabilitation units and discharge are medical problems of patients, the shortage of availability in rehabilitation institutions and old age homes.

Within 6 months period, more than 100 patients were interviewed by nurses in comprehensive fragility hip fracture clinic. The repeated fall rate within 3 months period was below 10% among this group of patients and the readmission rate due to fall and fracture within 3 months period was below 1%.

Conclusion:
Fragility hip fracture is the most devastating complication of osteoporosis, this fracture clinic play an important role in minimizing the chance of secondary fragility fractures. As a result, this specific group of patients could go through a smooth rehabilitation process and maximize the enjoyment in their life.

Fracture Prevention Program in the Community

Dr Peter TK Lau, MBBS (HK), DFM, MFM (CUHK), Honorary Clinical Assistant Professor in Family Medicine, The Chinese University of Hong Kong.

Community care is crucial in the prevention of fragility fracture, and the primary care physician plays a pivotal role in this aspect.

The "Fall Prevention Clinic" pioneered by the CUHK Orthopedics Department is an innovative approach to fracture prevention in the community. In particular it successfully involves and integrates the participation of the University (with its team of specialist doctors, nurse specialists, physiotherapists and occupational therapists), the NGOs (with their social workers and volunteer helpers) and the private sector (with family physicians firmly rooted in the community) in providing a comprehensive service to promote bone health and prevent fracture.

One of the most important roles of the primary care physician is the initiation and maintenance of specific pharmacotherapy for osteoporosis. To this end the physician needs to:

1. Assess the indications for treatment
2. Convince the patient of the benefits of treatment
3. Choose and prescribe the right medication
4. Monitor adherence and response to treatment
5. Be vigilant for adverse effects from medications

Among the various pharmacological agents available, bisphosphonates are by far the most commonly prescribed anti-osteoporotic medications in the elderly population.

The physician also needs to promote, advise and coordinate the provision of non-pharmacological interventions in fracture care. These include dietary advice, calcium and vitamin D supplementation, use of hip protector, fall prevention exercise and vibration therapy.

The community physician is uniquely poised to provide an attentive and effective fracture prevention service on account of the good rapport with patients and the holistic approach valued by the discipline of family medicine. This is especially true in the wake of the concern raised by recent media reports of the risk of atypical fractures in long-term bisphosphonate users. Empathetic elucidation of the issue can allay the anxiety of patients, while careful documentation of the commencement date of therapy and consideration of a "drug holiday" helps to minimize the potential risks involved.

Abstracts of Paper Presentations

International Symposium on Geri-Orthopaedic Fracture Management

Sept 11, 2010

Domiciliary Environmental Inspection in a Prospective Falls Study of Community Living Elderly in Hong Kong

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Background and purpose: Falls are a common problem among the elderly. A previous study found that the incidence of falls among community-living elderly in Hong Kong was 26% and the incidence of new fallers was 198 per 1000 persons per year. The one-year prevalence of falls was 19%. Of all falls, 47% occurred indoors and 53% outdoors. Falls can be attributed to both intrinsic factors, like medical problems, and extrinsic factors, such as environmental hazards. The purpose of this paper was to examine the difference in hazards between domiciliary environments for a group of community-living elderly with and without falls over one year in Hong Kong.

Methodology: A cohort of 603 participants aged 65 years and above was recruited by convenience sampling in the Elderly Resource Centre of Hong Kong Housing Society for monthly telephone follow-up for 12 months. A home visit for environmental inspection was conducted within 3 days for those who reported falls at domiciliary environment. A convenience sample of 30 participants without falls was selected by closely matched with the falls group in terms of age, gender and geographic distribution. Home visits for this group took place within 3 months in a cross-section. Environments of these two groups were compared for analysis.

Results: Significant differences were found in domiciliary environments between both fallers and non-fallers in terms of number of safety problems in environmental hazards (e.g. clutter, trailing wires, etc.) ($p = 0.024$) and household task performance ($p = 0.023$) as measured by SAFER HOME, the number of fall risks in location of kitchen (e.g. accessibility and heights of fixtures and equipment) ($p = 0.023$), and number of hazards in areas of illumination ($p = 0.05$), steps and stair railing ($p = 0.031$), and seating ($p = 0.009$) as measured by the Westmead Home Safety Assessment. No significant difference was found in comparison of demographic and functional parameters as well as falls behavior between both groups.

Conclusion: This study supported the difference in environmental risk factors between fallers and non-fallers. Environmental modification in both new and old housing was recommended in reducing risks of falls for community-living elderly in Hong Kong.

Use of Hip Protectors in Elderly Chinese Women: A One-Year Observational Study

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Introduction:
Hip protectors have been effective in reducing hip fracture as a result of falls. However, patient non-compliance is common, owing to intrinsic factors (e.g. discomfort, being unaccustomed to their use or not fashionable) and extrinsic factors (environment being too hot or too humid, lack of assistance from caregiver). Most of the hip protectors were originally designed for Caucasians and may not be suitable for Asian in a subtropical climate.

Objectives:
(1) To investigate the compliance with hip protector use in elderly Chinese women with hip injury.
(2) To examine the factors influence compliance of hip protectors.

Methodology:
This was a one-year observational study. Between February 2006 and July 2008, a hundred and thirty elderly Chinese women who had hip injury as a result of fall were recruited in the study (n=130). Demographic, socio-economic information and compliance at 1, 3, 6 and 12 months after discharge in 33 compliant and 32 non-compliant patients were compared.

Results:
The compliance rate of hip protectors was maintained above 60% up to the 6-month follow-up but dropped to 50.8% after 1 year. Patients who were aware of the importance of wearing hip protectors were significantly more compliant (p=0.001). Education programs and close monitoring by clinical staff during hospital stay and after discharge increased patient awareness. Besides, adaptation of hip protectors for individual needs reduced discomfort and poor fits. Most non-compliance factors were related to wound pain and skin allergy (p=0.02), rather than the device design and difficulties in daily functioning. The relative risk of recurrent falls was 1.34 and none of the fallers reported hip fracture.

Conclusions:
The compliance rate of hip protector use in elderly Chinese women was moderate. The effectiveness of hip protectors as a mean of reducing hip fracture could not be justified, as the risk of falls or hip fractures was not higher in non-compliant patients.

Epidemiology of Geriatric Hip Fractures in Hong Kong

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Purpose

Hip fractures are associated with reduced mobility and increased dependency. Understanding its epidemiology and case-mix is important in hip fracture prevention and multidisciplinary patient care.

Method

This is a retrospective descriptive study. Data was collected by case note review. Operated acute hip fracture episodes, which were admitted to the United Christian hospital between 1st January 2007 and 31st December 2007 and under ortho-geriatric team care were included. Episodes involving high-energy trauma, hip prosthesis or disseminated malignancies were excluded.

Results

Total 516 hip fracture episodes were identified involving 514 patients and 470 episodes fulfilled the inclusion criteria. The mean age of the patients was 81.7 (SD 8.0) years (men 79.7 (SD 7.7) years, women 82.4 (SD 8.0) years, $p<0.001$). Females accounted for 73.6% of the cohort. 15% subjects were living alone and additional 14% were daytime alone. 18.7% elderly were living in institutions before hip fracture. Over 80% of the cohort suffered from co-morbidity with mean of Charlson Co-morbidity Index 1.94 (SD 1.92). Cerebrovascular disease and dementia were the most common co-morbidity. 42 (8.9%) patients had past history of hip fracture. Old left hip fracture was more common (54.8%, n=23, $p<0.001$). Fall usually happened at home (n=308, 66%) and toilet was a common site of fall, that was specifically recalled by the patients or informants (n=22). In-hospital mortality rate was 3.4% (n=16). All cause mortality rate was 12.3% (n=58) and 17.7% (n=83) at 6 month and 1 year post-fracture. Sepsis (33%) and Cardiovascular diseases (19%) were the most common causes of death, followed by malignancy (13%), cerebrovascular accident (10%) and gastrointestinal diseases (10%).

Conclusions

The current study highlighted recent epidemiology and case-mix profile of geriatric hip fracture in Hong Kong. It demonstrated the complexity of geriatric hip fracture management and the needs for individualised targeted proactive early multi-disciplinary patient care approach.

Pre-op and Post-op Acute Delirium in Hip Fracture Patients

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OBJECTIVES: To investigate the risk factors that are associated with preoperative and postoperative delirium in hip fracture patients.
DESIGN: Prospective study on the clinical characteristics of patients consecutively admitted to the Department of Orthopedic and Traumatology in Prince of Wales Hospital during 14/4/2010 to 14/05/2010.

METHODOLOGY: Thirty patients admitted to the hospital for treatment of hip fracture. Patients were clinically evaluated preoperatively and postoperatively; and a diagnosis of delirium and/or delirium was made by the attending geriatrician. By Confusion Mini-Mental State Evaluation (MMSE) was used to document cognitive function.

RESULTS: Eleven patients (36.7%) were delirious during the hospital stay. 4 out of 30 subjects (13.3%) were delirious before surgery while 7 patients (23.3%) developed delirium postoperatively. Multivariate logistic regression analysis showed that total co-morbidities was the only independent predictors for preoperative delirium (adjusted odds ratio = 8.4; 95% CI = 1.02-69; P = 0.048) while a history of dementia was the only independent predictors for all delirium during the hospitalization (adjusted odds ratio = 11.6; 95% CI 1.5-90; P= 0.019).

CONCLUSION: Total co-mobidities is an independent risk factor for preoperative delirium while history of dementia is an independent risk factor for delirium during hospitalization.

Empowering Self-Efficacy and Knowledge of Patient and Their Caregivers After Fall

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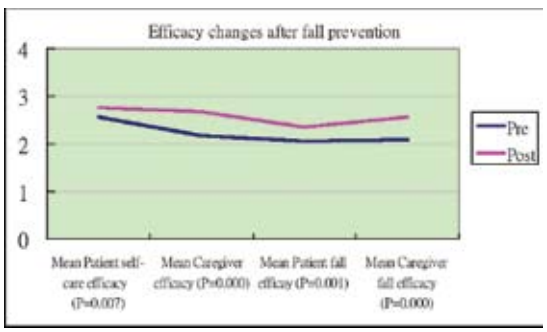
According to statistics report of Hospital Authority, accidental fall constitutes the 5th leading condition for hospital admissions and hospital stay. Fallers would experienced decreased functional independence in activities of daily living, decreased mobility, decreased quality of life, increased need for caring by others and allegedly greater burden to their caregivers as well.

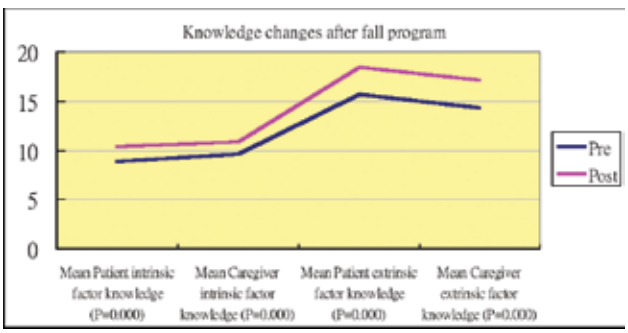
In the rehabilitation of post fallers, apart from physical training, activities of daily living training and arrangement of social support services, many researchers find that the enhancement of self efficacy are important. Strong empirical evidence suggest self-efficacy predicts behavior and functioning (Michael W 1968, Bandura A 1982, Bandura A 1987) and many literatures reported that falls and fear of falling are inter-related (Tinetti ME 1996).

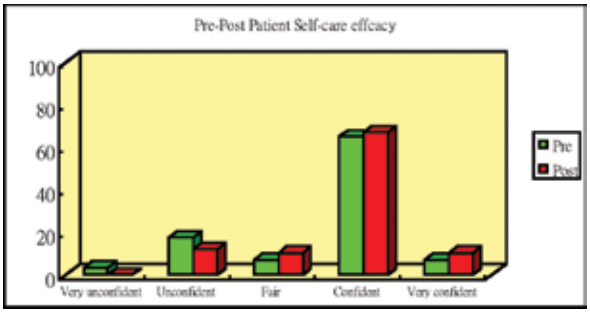
This study aimed at exploring the fall efficacy, self-care efficacy of patient after fall, caring efficacy of their caregivers, knowledge on risk factors for fall; and the clinical effectiveness of a fall prevention program conducted by occupational therapist in a rehabilitation hospital.

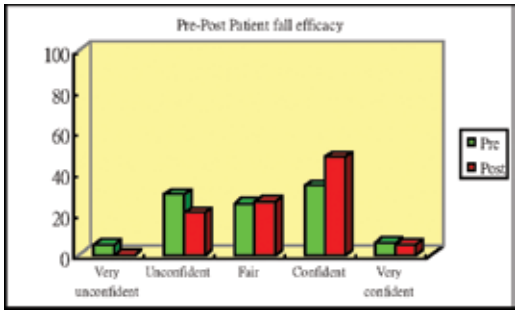
From 2008 to 2010, over sixty sessions of fall prevention program had been provided to patient after fall and their caregivers in Tung Wah Eastern Hospital. The program was held every two week regularly, contents include education on prevalence and consequence of falls, intrinsic and extrinsic risk factors for fall, introduction of assistive devices and home safety modifications, and provision of carer training as well. During the period, 115 patients and 62 caregivers attended the fall prevention program. They were asked to fill in a questionnaire before and after the session. The questionnaire was designed by a team of occupational therapist after detailed literature review on efficacy and risk factors for fall. A precise questionnaire was developed with two efficacy question asking about the self-efficacy in self-care (for patient), caring efficacy (for caregivers) and the fall efficacy with a five point scale ranging from very unconfident to very confident. The other part of the questionnaire asking about the knowledge on fall risk factors including intrinsic factors (6 questions) and extrinsic factors (10 questions) with simply a yes or no or do not know answer.

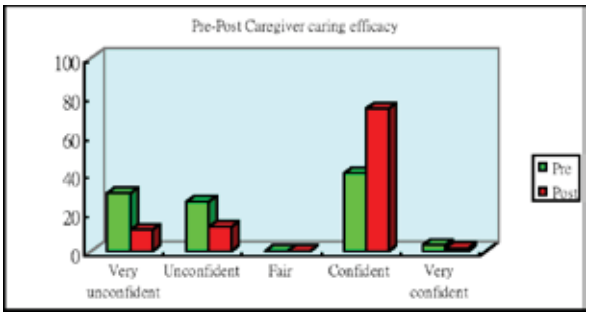
The efficacy rating and knowledge score before and after the session were collected and analyzed. Paired sample t-test was used to measure the statistical significance of changes. The results are shown as following figures and all showing statistically significant improvement.

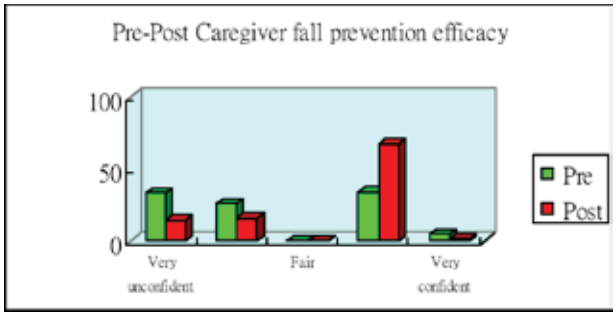












Yet, as this study merely measure the effectiveness of improving self-efficacy and knowledge of patient and their caregivers, it does not actually look at the clinical significance in fall reduction after the program and the carryover effect of the program overtime, which were both prudent to look at the impact on fall prevention program if resources allowed.

To conclude, enhancing the efficacy of patient and caregivers are important for fallers, and low self-efficacy and fear of falling are proven to lead to restriction in activity, decrease in social interactions and increased risk of falling eventually. (Tinetti ME 1990, Powell LE 1995, Yardley L 2005) Bringing awareness of risk factor for fall are beneficial to post fallers and their caregivers. Routine fall prevention program is effective and worthwhile to carry out as a core program for patients after fall.

Multidisciplinary Fall Prevention Program for Senior Persons in Rural Communities in Hong Kong

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With a goal to support needy senior citizens and promote dignified and happy aging, Tung Wah Group of Hospitals has been servicing our society with a range of quality residential care and community support services for 140 years.

The district of Tai Po and North is characterized by the presence of outlying villages where healthcare supporting network is inadequate. In response, TWGHs Shuen Wan Complex for the Elderly has initiated multidisciplinary fall prevention programs for elderly villagers since 2005 with statistically significant fall prevention efficacy. In view of the multiple factors predisposing seniors to increased fall risk and declining health, SWCE extended its fall prevention program in 2009. Purposes of this descriptive study are to overview the health status and identify the healthcare service needs of elderly villagers.

PROGRAM CONTENT: Elderly villagers from two villages were recruited and individually assessed by physiotherapists. Home modification was performed for high-risk homes with the assistance of corporate volunteers. Villagers were prescribed and taught the proper use of walking aids if indicated. In addition to educational talks on fall prevention, a series of healthy life style and social programs were also organized. Villagers' health data such as BMI, blood glucoses level and BP were analyzed.

RESULTS: Totally 108 elderly villagers (mean age = 76) were recruited. 27 high-risk households were identified and followed up with home modification. The educational talks recorded 500 attendances. Majority of the elderly villagers were over-weight (mean BMI = 27.1 kg/m^2.) 14.4% of them had high blood glucose level. 13.9% and 38% villagers presented with high blood pressure and BP on high side respectively.

CONCLUSION: Results of the descriptive study provides useful information for our service development. Elderly fall accidents are almost always multi-factorial. Adequate management goes beyond controlling the immediate causes. Situations of the elderly villagers are further compounded by adverse physical environment, heightened transportation cost to access services, social isolation and poverty. Our multidisciplinary fall prevention program aims at combating the problems from multiple levels. While immediate risk factors are targeted with environmental improvement, functional optimization and fall-related education, villagers are also educated on age-related illnesses, healthy lifestyle, active participation and early intervention for successful aging. At the same time, we also proactively strengthen the villagers' neighborhood support network and facilitate the elderly villagers to remain safely in the community.

Aggressive Peripheral Parenteral Nutrition Support for High Grade Pressure Sores

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Introduction: Pressure ulcer (PU) is a common, disruptive condition affecting frail elders, in particular to post-fracture patient. Frailty and malnutrition further influence the course of PU, leading to immunodeficiency and poor healing. Enteral Nutrition support may enhance wound healing yet nutrition requirement were difficult to achieve due to poor compliance and tolerance. Peripheral parenteral nutrition (PPN) offers another delivery route for nutrition augmentation which helps achieving the nutrition goal easier. High grade refractory pressure patients treated with PPN result in improved wound healing, serum albumin (Alb), as well as C-reactive protein (CRP).

Objective: To observe the relations among the pressure sore, nutritional status, inflammatory markers in relations with peripheral parenteral nutrition.

Methods: Ten patients with stage IV pressure sores were managed in the orthopaedic ward of a tertiary hospital in Hong Kong.Daily dressing, antibiotics use & surgical debridement were applied and nutrition status was assessed by Geriatricians and Dietitian clinically and biochemically. PPN support was commenced and the duration ranged from
10 - 40 days. Alb and CRP were collected at baseline and after PPN intervention for comparison.

Results: Wilcoxon Signed Rank Test was used to compare the baseline and post intervention Alb and CRP among this group of patient. The average age of the patients is 79.9+7.8yr. Their mean Alb significantly increased from 25-29.9 mmol/l (p=0.022). The mean CRP were decreased significantly from 126.3-39.5mg/l (p=0.017). Wound size markedly improved by 64% to 92% in some patients after 10 to 20 days of PPN use. **Conclusion** The use of PPN support is not yet considered as a regular form of nutritional management for pressure sore. Our patients given aggressive nutrition augmentation through PPN demonstrate significant improvement in wound healing, optimization of nutritional and inflammatory marker, saves costs and reduces physical sufferings in elders with refractory high grade sores.

Pilot Study for Physical and Psychological Impact of Square-Stepping Exercise (SSE) on Local Elders

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Square-stepping exercise (SSE)[1-4], which is developed in Japan, has proved to reduce the fall risk in older adults. SSE is performed on a thin felt mat with squares, participants are asked to walk from one end of the mat to the other. They are required to memorize the step patterns demonstrated by an instructor prior to each stepping exercise and walk as quickly as possible. There are more around 200 step patterns, the complexity of the step patterns is increased progressively

Purpose:
To investigate the effect of square-stepping exercise (SSE) on physical and mental aspects in local elders

Method:
164 community-dwelling older adults, aged between 58 and 96, were recruited by convenient sampling. They engaged in 60-min intervention sessions including warm up and cool down exercise twice a week for two months. Mini-Mental State Examination (MMSE) score and General Health Questionnaire (GHQ) score, for mental health, &, Time up and go test, Sit to Stand Test and Single Leg Stand Test for physical performance, were collected as the outcome measures. All outcome measures were compared by paired t-test.

Results:
A p-value <0.05 was considered to be statistically significant. Significance improvement was shown in GHQ, Time up and go test, sit to stand Test and Single Leg Stand Test while no significant change was shown in MMSE.

Conclusion:
SSE showed improvement in both physical and certain aspects of mental health. As a feasible and low cost exercise program, SSE could be well promoted for older adults. However, further researches are required to assess the effect of SSE on mental health.

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Multidisciplinary Care Plan for Geriatric Hip Fracture Patients: From Hospitalization to Rehabilitation

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Background
More than 600 hip fracture cases per year in HKEC, over 90% of them were geriatric fragility hip fractures due to fall and osteoporosis. Hip fracture is devastating, 50% of the sufferers with impaired mobility even they received hip surgery and gone through a prolonged rehabilitation phase. Prolonged hospitalization does not improve the outcomes, rather, it impede the patient re-integrate to the community. High risk of repeated fall and fractures further worsen the outcome of rehabilitation. In view of these, actions are needed to shorten their length of stay (LOS) in hospital but without jeopardize the quality. Also, services are needed to prevent further fall and fractures.

Aims
1. Shorten the waiting time for hip surgery and average LOS of geriatric hip fracture patients without jeopardize in functional status.
2. Provide a standard continuum of care to this group of patients in HKEC.
3. Reduce the repeated hip fracture rate.
4. Promote bone health concept to this group of patients.

Methods:
Since July 2009, patients admitted to PYNEH with hip fracture, aged 65 or above, and received hip operation were arranged to go through a standardized, multidisciplinary involved care plan from admission to post-discharge rehabilitation phase. Waiting time for hip surgery, LOS in hospital in acute and rehabilitation phase were focused. After discharged, patients and carers were arranged to visit doctors and nurses two times in combine fragility fracture clinic. Patient's bone healing progress and functional status would be monitored. Fall prevention education and bone health concept would be provided. Anti-osteoporotic medication would be prescribed to the suitable patients with related education provided. Suitable patients would be referred to NGO for further rehabilitation.

Results:
In compare with the period before the implementation of the care plan, the average LOS of geriatric hip fracture patients was shortened. Patients able to receive operation within 48 hours were increased. Reasons of patients unable to follow the care plan were mainly because of unavailability of rehabilitation bed, medical problems, and caring problems. Their repeated fall and fracture rates were low.

Conclusion:
Standardized care plan facilitate patient flow of geriatric hip fracture patients, it guided us to solve problems with foci. It's cost-effective and worth to adopt in all Orthopaedics & Traumatology departments in HA.

Community Fall Prevention Program

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Purpose

Community-dwelling elderly with high risks of fall are only known to medical services when they fall and require hospital attention. Therefore this program adopted a preventive approach and focus on fall risk screening in the community to identify more frail elderly for intervention and education.

Methods

HOPE *worldwide* initiated a community-based fall prevention project composed of three phases and in collaboration with the Hong Kong Housing Authority. In Phase I trained volunteers used Law's Test to screen fall risks of older adults living in public housing estates. In Phase II an occupational therapist (OT) conducted a home-based intervention to prescribe aids, make modifications to the home environment, and provide functional training and fall prevention education to the elderly. In Phase III trained volunteers made visits to follow up primarily elderly living alone (due to program and other constraints) on the recommendations given by the OT.

Results

3680 community-dwelling elders were screened. 29% (n=1082) showed high risks of fall. 318 seniors agreed to follow-ups and received an OT visit (Phase II). Of that number, trained volunteers visited 105 seniors (Phase III). The findings below are based on these 105 high-risk fallers who participated in all three phases of the program. They had a mean age of 80. The vast majority of them were single living (n=94) and receiving economic subsidy (CSSA) (n=65). For those 90 elders measured by the Timed Up and Go Test (TUG), 24% (n=22) were 30 seconds or longer, demonstrating their impaired mobility. From the detailed account of fall incidents by the OT (n=28), 25% (n=7) fell near or inside the toilet and 36% (n=10) fell after slipping. When surveyed about risky behaviors (n=98), 29% (n=28) used an umbrella instead of a walking aid and 23% (n=23) climbed up on a chair. 32% encountered a fall in the six months prior to Phase I, while only 21% encountered a fall in the six months prior to Phase III.

Conclusion

This project sheds light on the potential benefits of volunteer and professional inputs into a fall prevention program that focuses on creating a safer home environment for and providing education on risky behaviors and functional training to older adults with a high risk of falls.

Rehabilitation Outcomes Following Simultaneous Hip and Upper Limb Fracture in Older Women

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Objective:
Fractures related to osteoporosis are common in elderly women, and there is limited evidence on the analysis of functional recovery of patients presenting with combined hip and upper limb fractures. This study examined the rehabilitation outcomes of patients with simultaneous hip and upper limb fractures and compared the results with those with isolated hip fracture.

Study Design:
A cross sectional, prospective study.

Setting:
The Orthopaedic Rehabilitation unit in Tai Po Hospital

Methods
A total of 138 female in-patients with traumatic hip fracture or a combination of hip and upper limb fractures were recruited from September 2009 to April 2010. They were classified into two groups: combined hip and upper limb fractures group (group I) and isolated hip fracture group (group II). The motor part of Functional Independence Measure™ (FIM-Motor) (on admission and upon discharge) was used to assess functional change. Length of hospital stay (LOS) and discharge placement were also evaluated as rehabilitation outcomes.

Results:
Group I consisted of 20 patients (14.5%) while group II consisted of 118 patients (85.5%). The associated upper limb fractures were proximal humerus (n = 5) and distal radius (n =15). 18 patients (90%) in group I had simultaneous upper limb and hip fractures ipsilaterally. There was no significant difference detected on the mean age between two groups (p = 0.0.78) (85.9 years for group I and 82.9 years for group II). A significant lower admission and discharge FIM-Motor scores was found in group I ($p < 0.05$). Group I was also shown to have longer LOS significantly when comparing with group II ($p < 0.01$) (25.7 days for group I and 19.8 days for group II). For discharge placement, over 65% patients in both groups returned to community.

Conclusion:
In this study, patients sustaining combined hip and upper limb fractures showed significant slower in functional recovery and required longer hospital stay, independent of age factor and change of living condition. These findings have important implications on rehabilitation consideration for this specific group of patients.

Introducing Spinomed® Orthosis for Women with Osteoporotic Back

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Background
Soft corset is used to provide muscular support for persons with osteoporotic spine, hence relieves back pain. Spinomed® orthosis is an alternative treatment. It provides rigid moldable support to accommodate back curvature. The purpose of this study is to compare their effects on women with osteoporotic back pain.

Methods
Two-group experimental design was adopted. Women aged 55 or above with osteoporotic collapsed lumbar-sacral spine were recruited. They were divided into Spinomed® and soft corset group by blocked randomization. The participants applied the devices 3 hours daily for 3 consecutive weeks. Visual analogue scale (VAS) of back pain level, Functional Independence Measures (FIM) – motor scores, Lawton Instrumental Activity of Daily Living (IADL) scores, Chinese version of Fall Efficacy Scale(C-FES) and participants' feedback questionnaires on comfort, convenience and overall satisfaction were collected before and after the programme.

Results
A total number of 39 participants were recruited originally. Four participants of Spinomed® group were dropped out in the mid of the programme, as they were reluctant to try the newly-designed orthosis. Finally, a total number of 35 participants were recruited in this study with twenty-one of them were allocated to Spinomed® group and fourteen participants were allocated to soft corset group. Significant reduction on VAS of back pain level, FIM-motor scores, Lawton IADL scores and C-FES were noted on both groups ($p < 0.05$, paired t-test). However, there was no significant difference found on overall satisfaction of applying the orthosis on both groups ($p > 0.05$, paired t-test). When comparing the outcome parameters between the two groups, there was no significant back pain reduction, FIM-motor score gain, Lawton IADL scores gain and C-FES difference were found ($p > 0.05$, independent t-test). Significant higher rating on comfort and convenience aspects of applying the orthosis were noted in Spinomed® group ($p < 0.05$, independent t-test).

Conclusion
Both Spinomed® and soft corset were showed to be effective in reducing back pain and improving functional performance of women with osteoporotic collapsed spine. However, Spinomed® seems to accommodate back contour better and hence improve comfort on application. Further studies on investigating the effects of Spinomed® on different age groups with osteoporotic conditions were recommended.

The Effects of Community Fragility Fracture Clinic on Community-Dwelling Elderly

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Background:
The multi-disciplinary Community Fragility Fracture Clinic was launched at Tung Wah Group of Hospitals (TWGHs) Wilson T.S. Wang District Elderly Centre in 2008. It is the joint effort of TWGHs Wilson T.S. Wang District Elderly Community Centre, Department of Orthopaedics and Traumatology, Prince of Wales Hospitals/ The Chinese University of Hong Kong and Town Health International Holding Co. Ltd.

Community-dwelling elders discharged from Community Fragility Fracture Clinic within the catchment area of the Centre were invited to join the program. The objectives of the program are providing professional medical care and rehabilitation training, enabling patient to recover mobility, enhancing quality of life and enriching social life of patient living in the community. The intervention was a multiple component service delivered in a center-based mode of delivery which includes medical consultation, physiotherapy assessment and exercise, vibration therapy, fall prevention education talks and nurse help-desk.

Objective:
The purpose of this study was to investigate the effects of Community Fragility Fracture Clinic in improving the falls self-efficacy and life satisfaction; and in reducing depressive symptoms in community dwelling older adults.

Method:
The study population consisted of 44 community-dwelling elderly who joined the program of Community Fragility Fracture Clinic during the period of Apr 2008 to Apr 2009. Pre-test and Post test were conducted at the beginning and completion of 12-month intervention. The Falls Self-Efficacy Scale, Geriatric Depression Scale and Life Satisfaction Scale for Chinese Elders were used.

Result:
Of 44 participants, 32 completed the follow-up test, representing a 72.7% response rate. 29 (90.6%) were women and the mean age was 77.5 years. The result showed that the score of falls self-efficacy and life satisfaction were significantly ($P<.05$) increased from baseline to intervention termination. However, there is no statistically change ($P>.05$) on the depression symptoms.

Conclusion:
In conclusion, the findings of this study indicate that the Program of Community Fragility Fracture Clinic is effective in improving the life satisfaction and falls self-efficacy in older people living in the community while effect of the program on reducing depressive symptoms can be further explored.

Self-training of Fall Prevention in Parkinson's Disease Using Body Sensor Networks Techniques

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Abstract:
Parkinson's disease (PD) is a degenerative disorder of the central nervous system, which is characterized by tremor, rigidity, bradykinesia, gait disturbance, and postural instability. Clinical experience indicates that patients with PD suffer frequent falls, however little research has been done to assess quantitatively and prevent the fall risks specific to PD patients. The objective of this study was to monitor instantaneously, assess quantitatively and prevent the fall risks for PD patients through the collection of physiological, locomotory, and medical information using Body Sensor Networks (BSN) techniques during self-care and activities of daily living. First, a BSN platform was constructed with 3 base stations and 3 inertial sensors nodes, each node including a 3D accelerometer, a 3D gyroscope, and a 3D magnetometer, which can be used to calibrate and record accurately the 3D segmental position and orientation of 3 functional body regions (pelvis, left shank, and right shank) simultaneously. Then, 30 PD patients and 30 healthy adults participated in this study, who were tested by a series of customized motion plans, including static stance, TUG walking, sit to stand, stand to sit, etc., which could predispose them to falls. The results indicated that, compared to the healthy adult, the motion patterns and segmental orientation of PD patients were deficient and inadequate to the demands for keeping whole body stability. Thus, the PD patients could train and adjust their motion patterns by themselves at home base on BSN instantaneous monitoring information. The findings have also implications for reducing the fall risks through giving an effective training and warning.

Low-Magnitude, High-Frequency Vibration Enhances Fracture Healing and Rehabilitation in Elderly with Intertrochanteric Fractures

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Introduction:
Osteoporotic hip fracture is common in Hong Kong and usually takes long time to recover due to impaired healing in osteoporotic bones and slow functional recoveries.
Low-magnitude, high-frequency vibration (LMHFV) is a mechanical stimulation, which has been proven significantly accelerated normal and osteoporotic fractures healing and improves balance and muscle functions in our previous studies. The objective of this study is to study the effect of LMHFV on fracture healing and postoperative rehabilitation in elderly with trochanteric fractures.

Methods:
40 elderly with unilateral hip fracture patients aged 65 years or above, fixed with dynamic hip screw or gamma nail were recruited into this study. Vibration group was treated with LMHFV at 35Hz, 0.3g for 20min/day and 5days/week while control group remained sedentary with normal life style. The treatment was started from day 4 post operation to 6 months. Radiographic examination on fracture healing was regularly taken in hospital phase and each out-patient clinic follow up visits. The bone mineral density (BMD) of hip and spine, bone micro-architecture of distal tibia and radius were measured at baseline and end-point. Other functional outcomes such as balancing ability, range of motion, quality of life and daily activity performance were also measured.

Result:
The vibration group showed with significant improvement in quality of life and early enchantment in range of motion of hip join at 2nd month after treating vibration therapy. Bone retention and BMD increasing around the femur neck and wards triangle region of hip were found in vibration group as well. The radiographic examination showed that vibration group with earlier fracture impaction and intra-medullary callus formation. There was no complication and complaint on the use of LMHFV treatment in both groups.

Discussion and Conclusion:
LMHFV enhances post-operative rehabilitation and earlier regaining of functions and activities. It also improves fracture healing by promoting fracture impaction with earlier callus formation. The maintenance of BMD in hip areas indicated an anabolic effect on bone mineral content. These findings support LMHFV promote fracture healing by maintaining BMD content and earlier fracture impaction with appearance of intra-medullary callus. Also LMHFV is safe for clinical use in osteoporotic hip fracture patients.

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Low-Magnitude, High-Frequency Vibration Treatment Prevents Fall Incidence and Reduces Fracture Risks on Community Elderly

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Introduction: Poor muscle strength and balancing ability together with low bone mineral density among elderly are the major reasons of fragility fractures. Low-magnitude High-frequency vibration (LMHFV) treatment was previously shown to enhance spine BMD, improve balancing ability and muscle strength. This study is to investigate the effectiveness of long-term LMHFV treatment in reducing both fracture risks and the fracture rate in community elderly.

Materials and methods: 704 female subjects aged 65 or above are recruited and randomized into control or treatment group. Treatment group subjects received LMHFV treatment (35Hz, 0.3g) at 20min/day, 5days/week for 18 months, while control group remained sedentary. The occurrence of fracture and fall incidence, quality of life, compliance, BMD of hip & spine, muscle strength, balancing ability were assessed at baseline, mid-term (9-month), and end-point (18-month).

Results: 378 subjects had completed mid-term assessments, with 0.5% fracture rate in treatment group and 1.6% for control group. 7.88% of treatment group elderly had fall incidences reported, compared with 17.29% for the control group. The muscle strength of dominant and non-dominant legs of the treatment group were improved by 29.9% and 30.3% respectively, compared with -5.7%($p<0.0005$) and 0.1%($p<0.0005$) in controls. In limits of stability test for balance, treatment group showed 6.75% and 2.79% improvement in end point excursion and maximum point excursion respectively, as compared with -0.83%($p=0.009$) and -4.64%($p<0.005$) in controls.

Discussion and conclusion: Treatment group elderly showed an improvement in muscle strength and balancing ability, and a lower fall rate after 9 months LMHFV treatment. The results supported that LMHFV treatment is effective on preventing fall incidences and fall risks.

Acknowledgment: This study was supported by General Research Fund (Ref: 469508)

Development of Fall Prevention Shoes for Elderly

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INTRODUCTION

Inappropriate footwear is identified as one of the reasons of fall among elderly. This may be due to poor shoe wearing habit. Elderly prefer to wear shoes with soft material, without any support or without any fixation. They affect foot biomechanics and stability during gait, thus, affecting balance and increasing fall risk. Shoes which enhance comfort, biomechanics, stability and balance are potentially beneficial to elderly in fall prevention. The development of fall prevention shoes is one of the strategies in preventing fall among elderly.

METHODS

A large-scale study was conducted on foot anthropometry of 500 Chinese elderly. Elderly aged 60 or above were recruited and their feet were measured by using a 3D foot scanner. 3D foot shapes and data including foot length, foot breadth, foot circumference were collected. The data were computed and analysed to design a series of shoe lasts. Fall prevention footwear made from these lasts. Moreover, shoe design based on the concept of improving proprioception and maintaining gait stability. Therefore, aimed to reduce the risks of fall and fracture among elderly.

RESULTS

The result of foot data showed that there were no significant paired differences between the left and right feet in all foot parameters. Therefore, data from both left and right feet were averaged. There was a high correlation between foot width (Female: 93.87 ± 5.78, Male: 101.9 ± 5.46) and foot length (Female: 228.7 ± 10.4, Male: 246.2 ± 10.5) ($R2 = 0.866$). The foot width increased accordingly when foot length increased. This implied larger shoe width in our design. By collaborating with a footwear industrial partner, the first prototype was manufactured. Both friction test and clinical trial were done.

CONCLUSIONS

The concept of wearing appropriate footwear is already applied in the first prototype. To investigate its efficacy, a large scale of fitting trial is performed. Subject feedbacks are collected for future footwear modification and further development.

A Pioneer Multidisciplinary Post-Fracture Rehabilitation Program for Elderly Patients with Fragility Fracture in Hong Kong.

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Introduction

Elderly patient with fragility fracture is commonly re-admitted to the hospital with repeated falls. Current healthcare system in Hong Kong is insufficient in promoting fall and fracture prevention. Therefore, our department has established a pioneer multi-disciplinary post-fracture care program – **Comprehensive Healthcare and Fall Prevention Clinic** (CC) in the community to tackle this problem.

Methodology

Patient with fragility fractures admitted to the Prince of Wales Hospital (PWH) in Hong Kong, will receive surgical or non-surgical intervention, rehabilitation, and specialist follow-up. Bone mineral density is measured and specialists prescribe bisphosphonate and anabolic drugs accordingly. When the fracture confirms healed, patient is discharged to CC to receive post-fracture rehabilitative care. The program involves a close collaboration among PWH, elderly community centre and general practitioners (GP). We have established 10 CC located around the residential areas of the patients since 2008. In the program, patients will receive regular GP consultation for the maintenance of bone health. They will also receive vibration therapy, balance training and muscle strengthening exercises, fall and fracture prevention educational talk and home visitation. Patient will receive four balance assessments, including Timed-up-and-go test (TUG), Elderly Mobility Scale (EMS), Berg Balance Scale (BBS) and fall risk screening (FS), before and after the program.

Result

2628 patients aged 60 or above were introduced about the program in PWH since January 2008. 466 patients (aged 75.5±7.7) were referred to CC which are close to their residential areas. 182 patients (39.1%) completed the program, 251 patients (53.9%) were still currently participating and 33 patients (7.1%) defaulted. For the completed patients, the average attendance of exercise sessions and vibration therapy were 70% and 67% respectively. After the one year program, patients showed a significant improvement in TUG test (from 22.96±20.39 seconds to 21.51±19.37 seconds, $p=0.007$), EMS score (from 15.80±4.56 to 16.39±4.31, $p=0.001$), BBS score (from 42.60±12.20 to 45.33±11.01, $p<0.001$) and risk of fall (from 7.05±3.03 to 6.10±2.96, $p<0.001$). 21 recurrent falls (4.8%) and 3 fractures (0.7%) are reported since the program start.

Conclusion

The results showed the improvement of balancing ability of the patient and proved the effectiveness of CC in reducing fall rate and fall-related injuries through interventions in the community.

Elderly Care – The Hong Kong Scenario

Dr. C.H. Leong, Chairman, Elderly Commission, HKSAR

Like the rest of the world, Hong Kong has a rapidly ageing population. Today one in seven is 65 years old or above. By 2033, one in four will be in that category. Is ageing population therefore a burden? On the other hand, the elderly of tomorrow will be more healthy, more active, more willing to participate, perhaps more educated and even financially independent. Ageing population should really be considered as a challenge — a challenge of:

- How to keep the elders active and healthy;
- How to keep them occupied and to be in keeping with societal progress and perhaps even gainfully contributing;
- How to maintain them to enjoy their golden years at home with their families and close one;
- How to promote adequate and quality institutional care in the eventually.

Regrettably, elderly care in HK is still being considered in a rather negative way:

- It is a welfare services;
- Retirement is set at 60 years old when life experience is at its peak;
- Without considerations, elderly are institutionalized in elderly homes, most of the time against their wishes;
- Elders themselves usually take a negative attitude themselves — they consider themselves to be useless in their wrongly coined “twilight” years.

The mindset, the culture of the whole society must be radically changed all the way from the young to the old to ensure that our elderly become an asset instead of a burden for as long as possible.
Needless to say, health or healthy ageing is the most important issue. This symposium, focusing on maintaining our elders injury and fracture free is therefore most timely.

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