

CURRICULUM VITAE

of

KHALID MAHMUD SHAH

MBBS (Punjab) Ph.D. Ortho (Glasgow)

Cert. Ortho (Singapore) Cert. Arthroscopy (Tokyo) Dip. Biomech

(Strathclyde) Cert. Ed. Med. (Glasgow)

CONSULTANT ARTHROSCOPIC AND ORTHOPAEDIC SURGEON



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CURRICULUM VITAE

NAME:

PIR KHALID MAHMUD SHAH

ADDRESS:

Flat #: 204, Abeeda Towers
Fatima Jinnah Road
Clifton, Karachi, Pakistan
Mobile : +92 333 215 8347

DATE OF BIRTH:

20.10.1957

MARITAL STATUS:

Married

QUALIFICATIONS:

1982	Bachelor of Medicine and Bachelor of Surgery M.B.B.S. (Punjab Univ., Pakistan)
1986	Postgraduate Certificate in Orthopedics (Tokyo Univ., Japan)
1986	Postgraduate Certificate in Arthroscopy (Tokyo Univ., Japan)
1988	Dip., Biomechanics (Strathclyde Univ., UK)
1989	Postgraduate Certificate in Education and Medicine (Glasgow Univ., UK)
1990	Doctor of Philosophy (Ph.D.) in Orthopedic Surgery (Glasgow Univ., UK)
1994	Postgraduate Certificate in Orthopedics (Singapore Univ., Singapore)

UNDERGRADUATE EDUCATION:

1963 – 1973	First Class, Secondary Certificate, May 1973 - Cadet College Hasanabdal (Pakistan)
1973 – 1975	First Class, Intermediate Certificate, F.Sc. (Pre-Medical), May 1975 - Cadet College Hasanabdal (Pakistan)
1975 – 1980	First Class, M.B.B.S. Quaid-i-Azam Medical College Bahawalpur, University of Punjab (Pakistan)

Merit Certificates Obtained:

Forensic Medicine: 2nd in the class.
3rd Professional Examination: Stood overall 3rd in the class.

ACADEMIC APPOINTMENT IN PAKISTAN:

6 Feb 1996-Aug 2001	Assistant Professor Orthopaedic Surgery Baqai Medical College Karachi
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CONSULTANT ORTHOPAEDIC SURGEON TO ORGANISATIONS:

1996	Pakistan International Airlines
1996	Pakistan Steel Mills Karachi
1997	Attock Cement Limited Hub Chowki
1998	National Refinery Limited Karachi
1999	Pakistan Insurance Corporation
2000	National Insurance Corporation
2001	Karachi Port Trust Karachi
2001 – till date	Hill Park General Hospital, Karachi
2001 – till date	Zubaida Medical Center, Karachi
2015 – till date	Orthopaedic & Medical Institute, Karachi

MEMBERSHIP OF SOCIETIES / COUNCILS / COMMITTEES:

1982	Pakistan Medical and Dental Council (Reg. No. 5383-P)
1989	European Society of Biomechanics.
1991 – 1994	Singapore Medical Council (Reg. No. 0543 7B)
1991	Biomedical Engineering Society (Singapore)
1991	The Medical Defense Union Ltd. (Memb. No. – 11/280857X)
1992	Singapore Orthopedic Association.
1992	Member Editorial Committee, Biomedical Engineering Society (Singapore).
1993	Scientific Chairman, Prevention of Osteoporosis Symposium, 8th - 9th April 1993, Singapore.
1993	Member Organizing Committee, Hands on Course: Total Joint Replacement. 1St - 4th December 1993, Singapore.
1993	Coordinator: The Knee Workshop - Arthroscopy and Replacement, 15-17 December 1993, Karachi, Pakistan.
1996— 2004	Treasurer, Pakistan Orthopaedic Association
1999— 2004	Associate Editor, Journal of Pakistan Orthopaedic Association
2014— Till Date	Chairman, POA Arthroscopy Forum
2017	Member, ISAKOS: 150158

POSTGRADUATE EDUCATION / TRAINING - PAKISTAN:

May 1982- Nov. 1982	Resident House Surgeon (General Surgery), Surgical Unit III Bahawal Victoria Hospital, Bahawalpur, Pakistan, with Professor A H Rathore FRCS, FTC S.
Nov. 1982- May 1983	Resident House Surgeon (General Medicine) Medical Unit 11, Jinnah Post-Graduate Medical Center, Karachi, Pakistan, with Professor A L Minhas, FCPS, FRCP, FCCP, TDD.
Aug., 1983 – Jan 1984	Resident House Surgeon (Orthopedic Surgery), Orthopedic Unit II, Jinnah Post-Graduate Medical Center, Karachi Pakistan, with Professor S A Khan, FRCS.
Feb. 1984- Jun. 1985	Orthopedic Registrar, Department of Orthopedic Surgery, Jinnah Post-Graduate Medical Center, Karachi, Pakistan, with Professor S A Khan, FRCS.

My responsibilities included care of patients as well as running of the outpatients clinics and theater lists.

DECISION TO PROCEED TO JAPAN:

During my training at Jinnah Post-Graduate Medical Center Karachi, I was offered an opportunity to proceed to Department of Orthopedic Surgery, University of Tokyo as a Research Scholar. I accepted because I wanted to expand the horizons of my knowledge in the chosen field of Orthopedic Surgery. The opportunity was also attractive to me because it promised work in a Research orientated environment which was the kind of experience I was looking for at that stage of my training. I believed that a sound basis of Research training at an early stage would help me understand my subject better. It would also give me an opportunity to work with surgeons from many countries and benefit from their experience.

POSTGRADUATE EDUCATION OVERSEAS - JAPAN:

July 1985 - Dec. 1986

Postgraduate Research Scholar, Department of Orthopedic Surgery, Faculty of Medicine, University of Tokyo, Hongo, Tokyo Japan. My training was supervised by Professor Takahide Kurokawa, Director and Head of Department of Orthopedic Surgery.

My training involved work with different consultants in rotation with special interests in different fields of Orthopedics. I assisted them in operating theaters as well as in the outpatient clinics. My time was specially devoted to learning the skills of Arthroscopy and involvement in the basic animal experiments with the “Knee Group” of the department. I was also able to attend the various courses and

symposia organized by the Japanese Orthopedic Association giving me an opportunity to exchange views and increase my understanding of the subject.

POSTGRADUATE EDUCATION OVERSEAS: - UNITED KINGDOM

POSITION

I was working as a Postgraduate Student with the University Department of Orthopedic Surgery. My research work was on: "Tibial Shaft Fractures: A Biomechanical and Clinical Approach" for the degree of Ph.D. It involved laboratory work as well as clinical series with the patients.

Feb. 1987- Dec. 1990

I was reading for a Ph.D. degree in Orthopedic Surgery from the faculty of Medicine, University of Glasgow. During the course of my research activities, I was awarded a number of research awards to assist in my work.

I decided to use my 3 years period of stay in Glasgow to expand my education and experience in other areas, which would be of value to me on my return to Pakistan. My collaborative research work with the Bioengineering Unit, Strathclyde University led to my decision to enroll in the Diploma course offered by Strathclyde University.

June 1987 - June 1988

Postgraduate Diploma in Biomechanics, Department of Bioengineering, University of Strathclyde, Glasgow (United Kingdom).

This part time diploma course is designed as an introduction to biomechanics and lasts one year. Its curricula include the understanding and measurement of joint forces and their orthotic and prosthetic applications. Assessment included written examinations at the end of residential periods, and a dissertation on a short research project.

On completion of my diploma, I decided to further my knowledge of medical education.

Oct. 1988 - Sept. 1989

Postgraduate Certificate course in "Education and Medicine". Department of Postgraduate Medical Education, University of Glasgow.

This postgraduate certificate course is run for Doctors, Dentists, Nurses and other health professionals wishing to extend their skills in communication and education. Topics include an historical perspective, the aims of medical education, curriculum planning, education methods and assessment. The course is of one year duration with continual assessment and an education based research project. My subject was titled "Assessment Methods in Medicine - A study of student attitudes to Orthopedic examinations".

POSTGRADUATE TRAINING / EMPLOYMENT OVERSEAS - SINGAPORE:

POSITION

23 Feb 1991 - 22 Feb 1994

I was employed as a Fellow in the Department of Orthopedic Surgery, National University of Singapore. My duties included clinical, research and training commitments. I conducted outpatients clinics, operating sessions and supervised junior doctors in their work in the wards. My research work consisted of guiding junior doctors and other scientists with their research projects as a resource person and also conducted independent research of my own. I undertook research into diverse orthopedic problems, for which grants were awarded by various national bodies of Singapore. During my stay in Singapore I actively pursued my special interest in adult reconstructive surgery, especially Total Knee Replacement and Arthroscopic surgery.

SCHOLARSHIPS / AWARDS:

July 1985 - Dec. 1986	<u>The Mitsuki - Tsuyama Award for Overseas Fellows</u> , Department of Orthopedic Surgery, Faculty of Medicine, University of Tokyo, Japan (Total Award: 700,000/- Japanese Yen).
Feb. 1987- Feb. 1989	Awarded Pakistan Government sponsored, <u>Oarz-e-Hasna Scheme for Educational Studies Abroad</u> . This is a study loan awarded on merit through a scheme which works on Islamic principles of banking.
Oct. 1987- Dec. 1990	<u>Overseas Research Students (ORS') Award</u> , by the committee of Vice Chancellors and Principals of the Universities of the United Kingdom (Total Award: 23,630/- Pound Sterling).
August 1988	<u>Scottish Home and Health Department</u> , research award (RINMD/2/2/C373) for project titled "The Development of a Mechanical Non-Invasive Measurement of Fracture Healing" (Total Award: 4,441/- Pound Sterling).
January 1989	<u>Cohn C MacPherson's Bequest Trust</u> , research award (CDD/JDSIIMS/8862889-4) for project titled "The Biomechanical Analysis of Functional Bracing" (Total Award: 900/- Pound Sterling).
September 1989	<u>Cohn C MacPherson's Bequest Trust</u> , research award (CDD/JDS/IMS/8862889-4) for project studentship - Load Analysis of Fracture Bracing Systems (Total Award: 1,800/- Pound Sterling).

SHORT COURSES ATTENDED:

30th Mar - 3rd April 1987	Course on Fracture Bracing at National Center of Orthotics and Prosthetics, University of Strathclyde, Glasgow, Scotland, UK.
27th - 29 th Aug 1987	Accident and Emergency Medicine and Surgery Course organized at Glasgow Royal Infirmary by West of Scotland Committee for Postgraduate Medical Education, University of Glasgow, UK.
2nd - 4 th Sep 1987	Instructional Course "Recent Advances in Functional Bracing and External Fixation" organized by Royal Postgraduate Medical School, Hammersmith Hospital, at London, UK.
9 th - 10 th January 1988	British Orthopedic Association Instructional Course, St. Bartholomew's Hospital, London, UK.
11 th September 1988	Sixth Meeting of European Society of Biomechanics University of Bristol, Short Course, England, UK.
19 th Oct - 2 nd Nov 1988	Computer course on Disk Operating System (MSDOS/PC-DOS) organized by the Strathclyde University, Microlabs, Computer Center, Glasgow, UK.
October - November 1988	Short course on Statistics, organized by Bioengineering Department, Strathclyde University, Glasgow, UK.
5 th September 1989	"Marketing and Design of Short Courses", organized by Staff Development Center, University of Glasgow, UK.
12 th September 1989	"Teaching and Learning in Small Groups", organized by Staff Development Center, University of Glasgow, UK.
18 th October 1989	"Preparing Research Proposals", organized by Staff Development Center, University of Glasgow, UK.

26 th Oct - 14 th Dec 1989	“Medical Statistics”, organized by Staff Development Center, University of Glasgow, UK.
16 th Nov 1989	“Sports Injuries . Is Fitness good for you?” symposium organized by the Royal College of Physicians and Surgeons of Glasgow, UK.
28 th .29 th Nov 1989	“Orthopedic Footwear”, held at the National Center for Training and Education in Prosthetics and Orthotics, University of Strathclyde, Glasgow, UK.
17 th - 19 th Jan 1990	“Clinical Gait Analysis”, held at the National Center for Training and Education in Prosthetics and Orthotics, University of Strathclyde, Glasgow, UK.
18 th - 20 th April 1990	“Instructional Lectures”, held at the British Orthopedic Association spring meeting at Glasgow, UK.
21 st February 1992	“Management of the Infected Total Joint Arthroplasty”, held at the American Academy of Orthopedic Surgeons, 59th Annual Meeting in Washington DC. USA.
22 nd February 1992	“Advances in Thromboembolic Disease Prophylaxis after Elective Lower Extremity Surgery”, held at the American Academy of Orthopedic Surgeons, 59th Annual Meeting in Washington DC, USA.
24 th February 1992	“Avascular Necrosis: Pathogenesis, Diagnosis and Treatment”, held at the American Academy of Orthopedic Surgeons, 59th Annual Meeting in Washington DC, USA.

PUBLICATIONS:

- 1 Shah K M (1988): "Fracture Stiffness Measurement: A non-invasive mechanical method using electro-goniometer". Dissertation for Postgraduate Diploma in Biomechanics, University of Strathclyde, Glasgow (UK).
- 2 Shah K M and Ewart J (1989): "A new functional brace that saves time and money".
Fracture Magazine 16 (November): 14-15.
- 3 Shah K M Nicol A C and Richardson J B (1989): "A method of non-invasive fracture stiffness measurement" (Chapter 31: 174-178). Published in Progress in Bioengineering, edited by Paul I P, Barbenal J C, Courtney I M and Kenedi R M. Adam Hilger, Bristol and New York.
- 4 Shah K M (1989): "Assessment methods in medicine: A study of student attitudes to medical examinations". Dissertation for Postgraduate Certificate in Education and Medicine, University of Glasgow, Scotland (UK).
- 5 Shah K M, Nicol A C and Richardson I B (1990): "A method of non-invasive fracture stiffness measurement" (Abstract). Journal of Biomechanics vol. 23, No. 4: 370.
- 6 Shah K M and Semple I C (1990): "Grip assessment system". New British Patent application vide reference number P8024/55/1GM/CS.
- 7 Shah K M, MacDonald D A, Hamblen D L and Denholm W S (1990): "A non- invasive method of fracture stiffness measurement" (Abstract). I Bone Joint Surg [Br] 72-B: 1084.
- 8 Shah K M (1992): "Tibial shaft fractures: A biomechanical and clinical approach .
Thesis Summary". Clin. Biomech. 7: 247-248.
- 9 Shah K M, Das De S, Goh J C H and Bose K (1994): "Morphological cortical index of the proximal femur in Asians requiring total hip replacement". Journal of Orthopaedic Surgery 2 (1):9-13.
- 10 Shah K M, Goh J C H, Karunanithy R, Low S L, Das De S and Bose K (1995): "Effect of decalcification on bone mineral content and bending strength of Feline femur". Calcified Tissue International 56: 78-82.
- 11 Shah K M, Nicol A C and Hamblen D L (1995): "Fracture stiffness measurement in tibial shaft fractures: A non-invasive method". Clinical Biomechanics vol 10, No 8.pp 395-400.
- 12 Goh J C H, Shah K M, Low S L and Bose K (1993): "Predictive role of bone density measurement in Orthopaedics". Abstracts of 2nd Far Eastern conference on medical and Biological Engineering, Beijing, China:7

- 13 Khoo B C C, Shah K M, Gob J C H, Low S L, Bose K and Chang D (1993): "Investigations on BMD values from various skeletal sites". In the book of abstracts, Prevention of Osteoporosis Symposium, April 8-9, Singapore: 34.
- 14 Shah K M, Goh J C H, Low S L, Karunanithy R, Gob D C L, DasDe S and Bose K (1993): "A model for osteomalacic bones - Correlation of bone mineral content measurements to bone calcium and bone strength". In the book of abstracts, Prevention of Osteoporosis Symposium, April 8-9, Singapore: 35
- 15 Goh J C H, Shah K M, Low S L and Bose K (1993): "An in-vitro study of the femoral neck strength, bone mineral content and fracture fixation strength". In the book of abstracts, Prevention of Osteoporosis Symposium, April 8-9, Singapore: 60
- 16 Shah K M, DasDe S, Goh J C H, Low S L, Komala P and Bose K (1993): "Total hip replacement - Serial evaluation of femoral bone implant interface using DXA". In the book of abstracts, Prevention of Osteoporosis Symposium, April 8-9, Singapore: 61
- 17 Shah K M, Goh J C H, Karunanithy R, Low S L, Das De S and Bose K (1995): "Effect of decalcification on bone mineral content and bending strength of Feline femur". Calcified Tissue International 56: 78-82.
- 18 Shah K M, Nicol A C and Hamblen D L(1995): "Fracture stiffness measurement in a tibial shaft fractures: A non-invasive method". Clinical Biomechanics vol 10, No 8.pp 395-400.
- 19 Shah K M, Nicol A C and Hamblen D L(1995): "Fracture stiffness measurement in tibial shaft fractures: A non-invasive method". Clinical Biomechanics vol 10, No 8.pp 395-400.
- 20 Richardson J B, Shah K M and Andrew R (1988): "System for measuring fracture stiffness". European patent application number 883123887.

PROCEEDINGS:

1. Shah K M: “2 in 1 functional brace . A new method of tibial functional bracing”. Presented at the Scottish Orthopedic Club meeting, 4th June 1988, at Glasgow Royal Infirmary, Glasgow (Scotland).
2. Shah K M: “Functional bracing of the lower limb”. Presented at Functional Bracing study seminar, and workshop, Hospitality Inn, Glasgow, organized by Incare Medical Products (UK) cii 1St July 1988.
3. Shah K M, Nicol A C and Richardson I B (1988): “A method of non-invasive fracture stiffness measurement”. Presented at 6th meeting of the European Society of Biomechanics (September 11 . 15) at University of Bristol, UK. Abstract in the “Proceedings of the 6th Meeting of the European Society of Biomechanics” published by Butterworths, London.
4. Shah K M, MacDonald D A and Hamblen D L: - A method of non-invasive fracture stiffness measurement”. Poster presentation at “Progress in Bioengineering . An International Seminar” on the occasion of the 25th Anniversary of the Strathclyde Bioengineering Unit (September 20th . 22nd, 1988) at the Bioengineering Unit, Wolfson Center, University of Strathclyde, Glasgow, Scotland (UK).
5. Shah K M: “Fracture healing monitoring . A non-invasive method”. Presented at the First Convocation and National Scientific Conference, Quaid-i-Azam Medical College Bahawalpur, 22nd December 1989, Bahawalpur.
6. Shah K M: “2 in 1 functional brace . A new method of tibial functional bracing”. Poster presentation at the visit of ABC Traveling Fellows to Glasgow on 18th April 1989, Glasgow.
7. Shah K M: “Fracture stiffness measurement”. Poster presentation at the visit of ABC Traveling Fellows to Glasgow on 18th April 1989, Glasgow.
8. Shah K M and Hamblen D L: “2 in 1 functional brace: A new method of tibial functional bracing”. Poster presentation at the British Orthopedic Association Meeting, April 1990 at Glasgow.
9. Shah K M and MacDonald D A, Hamblen D L and Denholm W 5: “A non-invasive method of fracture stiffness measurement”. Presentation to British Orthopedic Association meeting, April 1990 at Glasgow.
10. Kwong K S C, Solomonidis S E and Shah K M (1990): “Biomechanical function of cast bracing system for femoral shaft fractures . A pilot study”. Abstract in the Proceedings of Sixth International Conference on Biomedical Engineering held at Singapore: 309-312.

11. Shah K M and Bose K: "Back problems in sports". Presented to Orthopedic/Traumatology meeting, October 26-27, 1991, Hong Kong.
12. Shah K M, Goh J and Bose K: "The relationship between femoral neck strength, bone mineral content and fracture fixation strength . An in-vitro study". Presented to International Conference on Osteoporosis, November 5-7, 1991, Kobe, Japan.
13. Goh J C H, Low S L, Shah K M and Bose K: "Bone density measurements of the femoral neck using DXA . A correlation and repeatability study". Presented to the methodologies of bone mineral assessment, 8-9 November, 1991, Nara, Japan.
14. Goh J C H, Shah K M, Low S L and Bose K: "An in-vitro study of the femoral neck strength, bone mineral content and fracture fixation strength". Presentation to the 14th Singapore Orthopedic Association meeting, November 6-8, 1991, Singapore.
15. Shah K M, MacDonald D A and Hamblen D L: "A non-invasive method of fracture stiffness measurement". Presentation to the 14th Singapore Orthopedic Association meeting, November 6-8, 1991, Singapore.
16. Shah KM, DasDe 5, Goh 1, Low S L and Bose K: "Serial assessment of bone mineral density (BMD) at the bone implant interface". Presentation to the First International Symposium on Osteoporosis and Metabolic Bone Diseases, May 7-11, 1992, Beijing, China.
17. Low S L, Shah K M, DasDe 5, Goh J C H and Bose K: "Methodology of serial measurement of bone mineral density (BMD) in femoral hip scans". Presented as a Poster to the First International Symposium on Osteoporosis and Metabolic Bone Diseases, May 7-11, 1992, Beijing, China.
18. Shah K M, Goh J and Bose K (1992): "Problems of fracture fixation in osteoporosis". Presented to the First International Symposium on Osteoporosis and Metabolic Bone Diseases, May 7-11, Beijing, China.
19. Bose K and Shah K M "Biomechanics of OA knee and its treatment". Presented as a breakfast lecture to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
20. Goh J C H, Chow S L, Shah K M and Bose K: "Total knee replacement . A morphometrical study of the Asian knee joint". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
21. Bose K, Shah K M and Goh J C H: "Problems of fracture fixation in osteoporosis". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.

22. Shah K M, DasDe S, Goh I C H, Low S L, Komala P and Bose K: "Total hip replacement . Serial assessment of bone mineral density (BMD) at the bone implant interface". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
23. DasDe S, Shah K M and Win K K: "Recent trends and our experience of total hip replacement". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
24. Verhoeven W, Shah K M, Dharmadi, Wong H K, DasDe S, Lee S M and Mariappan K: "Calcaneal fractures . A multiple modality review". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
25. Shah K M, DasDe S, Goh J C H, Mistry S and Mariappan K: "Morphological cortical index (MCI) of the upper femur in Asians and total hip replacement". Presented to the 10th Western Pacific Orthopedic Association meeting, November 2-7, 1992, Jakarta, Indonesia.
26. Shah K M: "A non-invasive method of fracture stiffness measurement". Presented to the Seventh National Orthopedic Conference, November 21-22, 1992, Lahore, Pakistan.
27. Shah K M, DasDe S, Goh J, Low S L and Bose K: "Total hip replacement . Serial assessment of bone mineral density (BMD) at the bone implant interface". Presented to the Seventh National Orthopedic Conference, November 21-22, 1992, Lahore, Pakistan.
28. Shah K M: "Correlation of bone mineral content measurements to bone strength . An experimental study". Presented to the Seventh International Conference on Biomedical Engineering, December 2-4, 1992, Singapore.
29. Shah K M, DasDe S, Goh I C H, Low S L, Komala P and Bose K: "Serial assessment of bone mineral density (BMD) at the bone-implant interface in total hip replacement". Presented to the Seventh International Conference on Biomedical Engineering, December 2-4, 1992, Singapore.
30. Goh J C H, Shah K M, Low S L and Bose K: "Biomechanical study of femoral neck fracture fixation in relation to bone mass". Presented to the Seventh International Conference on Biomedical Engineering, December 2-4, 1992, Singapore.
31. Low S L, Shah K M, Goh I C H, DasDe S and Bose K: "Serial assessment of bone mineral density in femoral scans". Presented to the Seventh International Conference on Biomedical Engineering, December 2-4, 1992, Singapore.

32. Khoo B C C, Shah K M, Goh I C H, Low S L and Bose K: "Bone mineral density values at various skeletal sites of young male volunteers". Presented to the Seventh International Conference on Biomedical Engineering . December 2-4, 1992, Singapore:538.
33. Khoo B C C, Shah K M, Goh 3 C H, Low S L, Bose K and Chang D: "Investigations on BMD values from various skeletal sites". Presented to the Prevention of Osteoporosis symposium, April 8-9, 1993, Singapore:34
34. Shah K M, Goh 3 C H, Low S L, Karunanithy R, Goh D C L, DasDe S and Bose K: "A model for osteomalacic bones .Correlation of bone mineral content measurements to bone calcium and bone strength". Presented to the Prevention of Osteoporosis symposium, April 8-9, 1993, Singapore:35
35. Goh J C H, Shah K M, Low S L and Bose K: "An in-vitro study of the femoral neck strength, bone mineral content and fracture fixation strength". Presented to the Prevention of Osteoporosis symposium, April 8-9, 1993, Singapore:60.
36. Shah K M, DasDe 5, Goh J C H, Low S L, Komala P and Bose K: "Total hip replacement . Serial evaluation of femoral bone implant interface using DXA". Presented to the Prevention of Osteoporosis symposium, April 8-9, 1993, Singapore:61
37. Shah K M: "Effect of bone calcium in bone mineral content measurement and bone strength . A model for osteomalacic bones". Presented to the combined meeting of Singapore Orthopedic Association and Sports Medicine Association (Singapore), June 11-13, 1993, Singapore.
38. Shah K M, DasDe 5, Gob J C H, Low S L, Komala P and Bose K: "Total hip replacement . Serial evaluation of femoral bone implant interface using DXA". Presented to the combined meeting of Singapore Orthopedic Association and Sports Medicine Association (Singapore), June 11-13, 1993, Singapore.
39. Goh J C H, Shah K M, Low S L and Bose K (1993): "Predictive role of bone density measurement in Orthopaedics". Abstracts of 2nd Far Eastern conference on medical and Biological Engineering, Beijing, China:7

TEACHING:

My interest in teaching was developed during my training as a registrar at Jinnah Postgraduate Medical Center Karachi (Pakistan). Where part of my duties included clinical demonstrations to the Medical student. While in Britain, I decided to increase my skills in communication and also to learn the principles of curriculum planning and educational methods by taking up the Postgraduate Certificate course in “Education and Medicine” offered by the Department of Postgraduate Medical Education, Faculty of Medicine, University of Glasgow. To fulfill the above aim I also attended a number of short courses organized by the Staff Development center, University of Glasgow.

During my stay in Glasgow, I have used some of my spare time to assist in the teaching of the student nurses (College of Nursing, University of Glasgow) and Undergraduate Medical Students, University of Glasgow. This allowed me the opportunity of retaining a broader clinical interest in Orthopedics. I have also acted as clinical adviser to MSc. students of Bioengineering Unit, University of Strathclyde, Glasgow with regard to their projects for the said degree.

My duties as a Fellow in the Department of Orthopedic Surgery, University of Singapore (23 February 1991 - 22 February 1994), included teaching commitments in addition to clinical and research responsibilities. I was involved in medical undergraduate teaching and supervised students in writing up and conducting their research projects. I also supervised university students from the faculty of Science and Engineering in their projects related to the Medical field.

Ph. D. THESIS
TIBIAL SHAFT FRACTURES: A BIOMECHANICAL
AND CLINICAL APPROACH

My research for the degree of Ph.D. involved the following areas of study:

- A** The development of a mechanical non-invasive measure of fracture healing: Fracture healing remains unpredictable. The development of methods of treating fractures is hindered by a lack of an objective measurement of bone union. I worked on a non-invasive method of assessing union in tibial fractures by measuring fracture stiffness utilizing Electric Goniometers. A pilot study was followed by computerization of the above method with the aim to make it portable. A trial was conducted to assess its efficacy in the clinical environment. I was awarded a research grant by the Scottish Home and Health Department, for the above purpose.
- B** Determination of the differential load actions transmitted across fractures and by functional braces for the lower limb: Knowledge of the biomechanics of the functional fracture brace for the lower limb is insufficient to permit rational optimization of this type of conservative treatment. For instance, questions on whether the brace off-loads or prevents angulation occurring at the fracture must be addressed. I studied volunteers/patients with braces. Total forces and moments in three dimensions externally applied to the limb/brace complex and those carried by the brace alone were analyzed and compared. It was also planned to investigate muscular activity in order to estimate its effect on fracture loading. I was closely working with the Bioengineering Unit, Strathclyde University, Glasgow in this regard. We completed a preliminary study and were awarded grants by the Cohn C MacPherson Bequest to continue the work.
- C** 2 in I Functional Brace: Contemporary tibial braces fall into two main groups; those which encase the foot like the "Sarmiento Cast" and those which allow the movement of ankle and subtaloid joints called "Gaiters". Both types of braces are applied secondarily after the limb has been kept in a long leg cast. Because of its design the Sarmiento cast provides good rotational and angulatory control allowing it to be applied at an earlier stage of fracture healing than the gaiter. However if it is retained until fracture union, it may lead to problems with ankle/subtaloid joint stiffness. Gaiters leave the foot free and so avoid the complications of joint stiffness, but for the same reason they cannot be applied at an early stage because they lack rotational control.

2 in I functional brace is a new method of tibial functional bracing which encompasses the advantages of both "Sarmiento casts" and "Gaiters". It is simple, inexpensive and also cuts down on the application time. I have completed a series of 80 patients with an average follow up of 16 months, treated with this method. I was awarded research grants by the Cohn C MacPherson Bequest Trust to undertake the biomechanical aspects of functional bracing