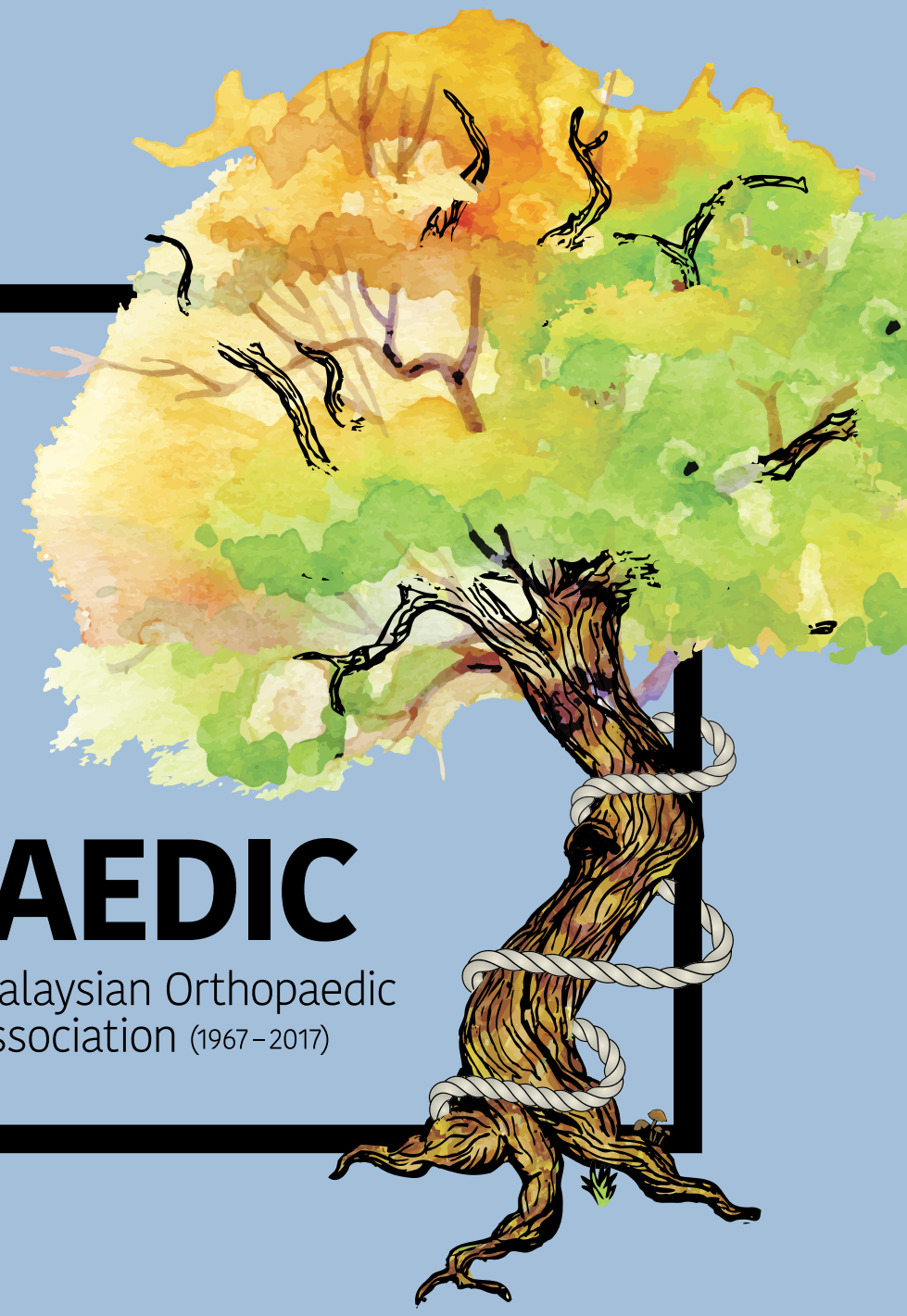
50 YEARS OF ORTHOPAEDIC SURGERY

Malaysian Orthopaedic Association (1967–2017)



Editors
Badrul Shah Badaruddin
Wan Faisham Nu'man Wan Ismail
Chye Ping Ching
Abdul Jamal Mohd Thalha

Published by

Malaysian Orthopaedic Association©

First Print – 2017

ISBN 978-967-15030-0-3

Design & Produced by

PAUL & MARIGOLD (DeCalais Sdn Bhd)
G-1-1, Plaza Damas, Jalan Sri Hartamas 1,
50480 Kuala Lumpur, Malaysia.
T: (603) 6206 3497/6201 0725
F: (603) 6201 8850
W: www.paulandmarigold.com

The first meeting of the Malaysian Orthopaedic Association, covered in the *Utusan Malaysia* newspaper, 1968.

Editors' Note

Dear Reader,

We are honoured to have been given the privilege to act as editors of this Golden Jubilee commemorative book for the Malaysian Orthopaedic Association, titled 50 Years of Orthopaedic Surgery. This milestone is one that the association aims to use to celebrate achievements and the progress made over the past 50 years. As the editors, we strived to ensure that the contents of this book highlights that.

Through this endeavor, we learnt a great lesson. Through actions we make an impact with our daily work. However, it is the written word that carries the legacy on for generations. Documentation is an essential element to ensure that the true details prevail in every history book. Lack of such documentation made the establishment of the details in this book a challenging task. As such, we apologise if any individuals or events were left out of this book. Any omission in content was never intentional.

As you go through the pages of this book, you will be going through the memories of key individuals in the association's history who have experienced them. Each chapter has different contributors who wanted to tell their story right. It truly is his-story, and we would like to extend our deepest appreciation of these individuals for taking the time to get the details down in black and white. We hope that the contents of these pages will inspire more individuals with a promise in the field of surgery to take on this noble profession and join our fraternity.

We wish all of us a bright future for our association and the practice of Orthopaedics.

Yours Sincerely,

Editors

50 Years of Orthopaedic Surgery

Dato' Dr Badrul Shah Badaruddin

Prof Dr Wan Faisham Nu'man Wan Ismail

Dr Chye Ping Ching

Dr Abdul Jamal Mohd Thalha

Preface

For 50 years, the Malaysian Orthopaedic Association (MOA) has worked tirelessly in bringing up the standards and practice of Orthopaedic Surgery in Malaysia. Beginning with a team of nine, the year 1967 brought about a realisation among a few colleagues in Orthopaedic Surgery of the need to provide a platform to spread and promote education and support the budding Orthopaedic fraternity in Malaysia.

This year, we celebrate and appreciate the efforts of those founding members and the following councils in maintaining integrity and nobility in the profession of Orthopaedic Surgery. With 50 years of Orthopaedics under its belt, it is MOA's goal to continue inspiring excellence in the profession.

MOA has developed the Orthopaedic field in Malaysia into much more than just an all-encompassing trade. The field currently comprises of a total of eleven subspecialties, while six institutions of higher learning have developed National Masters Programmes in Orthopaedics.

These achievements, along with reflections of the early days of MOA and the people instrumental in the rise of the association are documented in this Commemorative Book.

Each contributor to this book has played an integral role in the field they have written on and provide insights into the very foundation of the various subspecialties and elements that make up the Orthopaedic fraternity. I hope you, the reader, are able to gain a perspective on our profession that goes beyond that of a patient and dives into the very humanity of the work we do. As Orthopaedic Surgeons, we help people regain movement and mobility, and thus their quality of life.

This book reflects an important fact, that we are ordinary people who have been given the opportunity to do something extraordinary. This truly is our history, and we hope that it will stand the test of time, inspiring generations ahead of us to uphold the profession and keep the dream alive.

Dato' Dr Azmi Baharudin

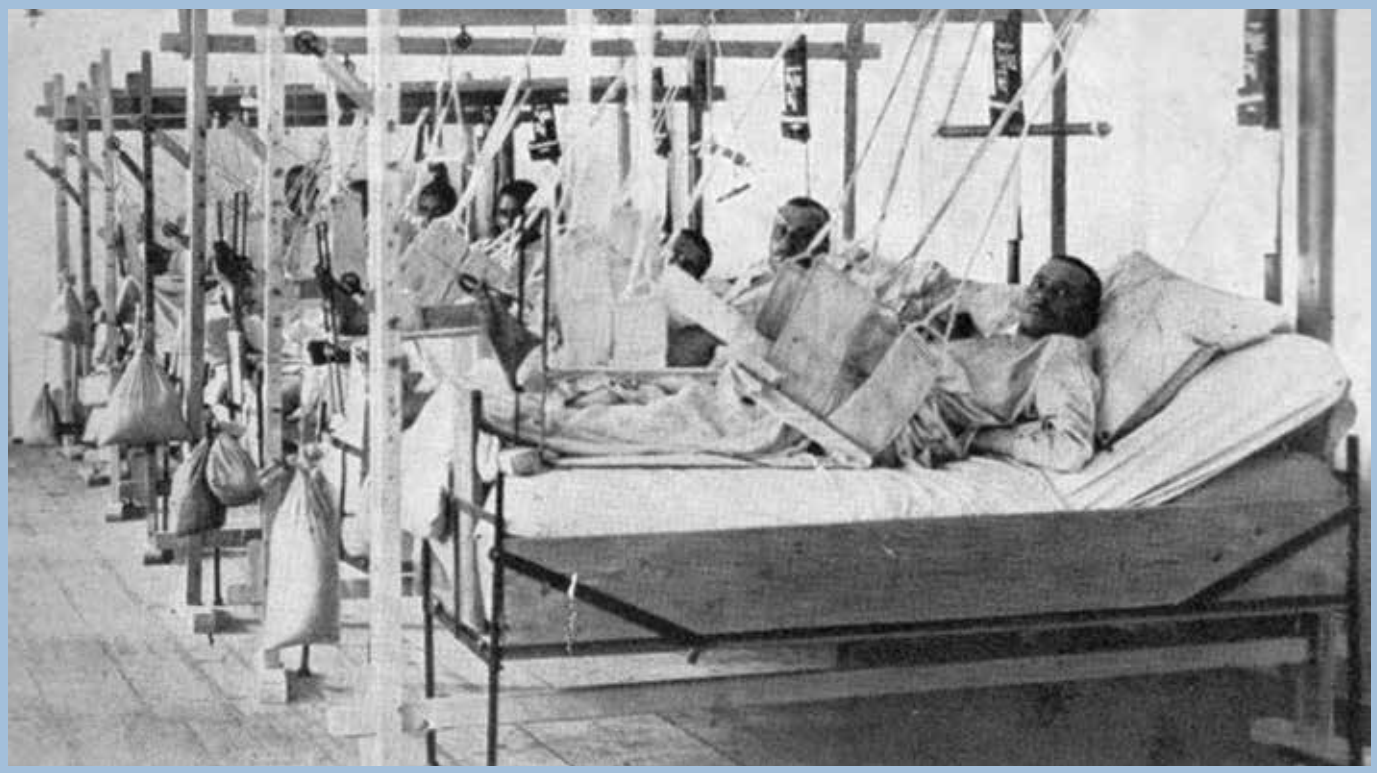
President
Malaysian Orthopaedic Association
2016 – 2017

Contents

CHAPTER 2.0

History of Orthopaedics

Dr Chye Ping Ching



History of Orthopaedics

Orthopaedics, like many specialties, has developed through necessity to correct deformity, restore function and alleviate pain. It is important that a surgeon has sound knowledge of the history of his art. He must be aware of the way surgeons in the past have contributed and more importantly, of the mistakes they have made in the process. The past is our foundation for future developments, we must build upon it so that we too can act as a stable foundation for our future generations.

Ancient Orthopaedics

ANCIENT EGYPT

Mummified bodies, wall paintings and hieroglyphics have shown that the ancient Egyptians suffered from the same problems that we suffer today. Splints padded with linen have been found on mummies and they were made of bamboo, reeds, wood or bark. The earliest evidence of the use of crutches came from a carving made in 2830 BC on the entrance of Hirkouf's tomb.

The Edwin Smith papyrus is the oldest known surgical treatise on trauma and was written in 1600 B.C. based on text 1000 years before that. It revealed understanding of the action of the heart and peripheral circulation. Injuries were classified according to their prognosis and management of dislocated mandible, fractured clavicle, spinal injuries and treatment of various fractures and wounds including osteomyelitis were described.

ANCIENT GREECE

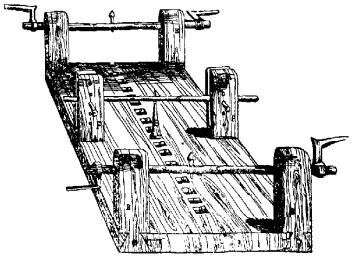
The ancient Greeks were the first to document in detail the history and development of various diseases. Homer, in his account of the Trojan War, provided insight to the understanding and treatment of injuries. The Iliad also contains references to various deformities.

Herophilus (330-260 B.C), known mostly for his anatomical works, was the first to divide nerves into sensory and motor components and also the first to distinguish arteries from veins.

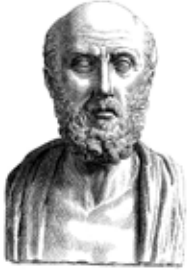
Hegetor in 100 BC, described in detail the anatomical relations of the hip joint, and was the first to record a description of the ligamentum teres.

Edwin Smith Papyrus

Herophilus



Scamnum for correction of scoliosis



Hippocrates

Between 430 and 330 BC, the Corpus Hippocrates was collated. Correction of club foot, reduction methods for dislocation of various joints were described. Management of infection after compound fractures was described in details. Hippocrates introduced the principles of traction and counter-traction for fracture management. He developed special splints for fractures of the tibia, similar to external fixation and a special bench or "scamnum" for correction of scoliosis.

THE ROMAN ERA

Galen (129-199 BC) who was a Greek from Pergamon, became an army surgeon in Rome. Galen gave a good account of the skeleton and the muscles that move it and described signals from the brain through the nerves to the muscles. He first recorded a case of cervical rib. He described bone destruction, sequestration and regeneration in osteomyelitis. He is believed to be the first to have used the words, kyphosis, lordosis and scoliosis for the deformities described in the Hippocratic texts.

During the Graeco-Roman period, there were accounts on the use of wooden legs, iron hands and artificial feet. Soranus of Ephesus first described rickets. Ruphus of Ephesus described tendon ganglia and their treatment by compression. Antyllus of the 3rd century practised subcutaneous tenotomy to relieve contracture around a joint by using both linen and catgut sutures. Various primitive surgical tools like drills, saws and chisels were also developed during this period.

THE MIDDLE AGES

There was little progress in the study of medicine for a thousand years after the fall of the Roman Empire. The first medical school in Europe was established in Salerno, Italy during the ninth century. However it provided primarily pedantic teaching and perpetuated the theories of elements and humours. Later on, the University of Bologna became one of the first academic institutions to offer hands-on surgical training.

Corpus Hippocrates

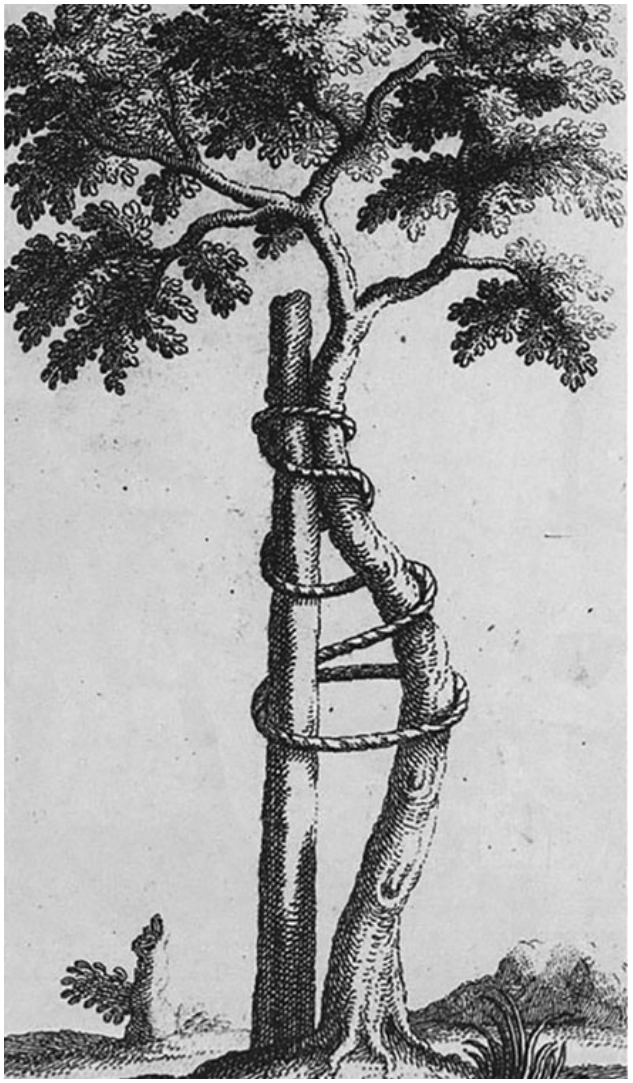
Galen

Guy de Chuauliac

One of the most famous surgeons in the Middle Ages was Guy de Chuauliac (1290-1368). He was the leader in ethical principles and practice of surgery. In 1363 he wrote the textbook Chirurgia Magna which remains as one of the greatest medical-surgical monuments to this day. The high moral standards advocated by Guy de Chuauliac became the standard of medical practice .

Study of Anatomy from Churirgia Magna

It was not until the l2th century that Europe began to awake gradually from its Dark Ages. Human dissection resumed and the great Greek texts were being translated from Arabic to Latin. However, until the l6th century, all developments remained within the shadow cast by Hippocrates.



The Tree of Andry

The Foundations of Modern Orthopaedics

AMBROISE PARÉ (1510-1590)

Ambroise Paré is widely regarded as Father of Surgery. In 1564, he published the Dix Livres de la Chirurgie. The first part contained anatomy and physiology and the second, surgery. Many surgical techniques were described. One of the most significant being the use of tourniquet and ligature to achieve haemostasis during amputations. He also designed a wide variety of forceps, instruments and braces. With the help of armourers, he made a variety of artificial limbs from iron and he designed corsets for scoliosis boots for clubfoot correction.

Ambroise Paré's Iron Hand

Dix Livres de la Chirurgie

Paré's Artificial Limbs

NICOLAS ANDRY (1658-1759)

Nicolas Andry was the professor of Medicine at the University of Paris. His book, De la génération des vers dans les corps de l'homme, published in 1700 as "An Account of the Breeding of Worms in Human Bodies" was the results of his experiments with the microscope. He believed that microorganisms he called "worms" were responsible for smallpox and other diseases. In 1741, at the age of 81, he published a book called L'Orthopaedie or "The Art of Correcting and Preventing Deformities in Children", a two volume set which was translated in Brussels in 1742, London in 1743 and Berlin in 1744. In this book, Andry presented the word Orthopaedic which was derived from two Greek Words, "Orthos", which signifies straight, free from deformity, and Pais, a Child. Andry was interested in postural defects and this has been reflected by his famous illustration, "The Tree of Andry" that soon became the symbol of Orthopaedics worldwide till today.

PERCIVAL POTT (1714-1788)

Pott was from London and worked in St. Bartholomew's Hospital. His most famous work is on the paraplegia of spinal tuberculosis, known as Pott's paraplegia.

JOHN HUNTER (1728-1793)

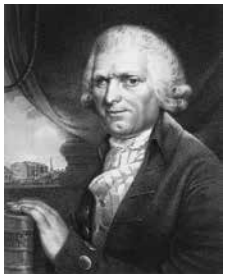
All surgeons have studied Hunter's Canal without much thought about whom this anatomic structure was named after. This is unfortunate as John Hunter was arguably one of the most influential surgeons ever to practice medicine. He put the practice of surgery on a scientific foundation and inspired generations of modern day surgeons. Hunter's contribution was immense and even stemmed through his pupils such as Edward Jenner, Astley Cooper, John Abernethy, Robert Chessher, and American surgeon Philip Syng Physick.

Hunter was a pupil of eminent surgeons Percival Potts and William Cheselden and later became house surgeon at St. George's Hospital in London. His interests were broad and wide encompassing anatomy, physiology and pathology in human and animals. In subjects related to orthopaedic, he studied loose bodies in joints, pseudoarthroses and fracture healing, where he described the transformation from fracture haematoma to fibrocartilagenous callus to the deposition of new bone, trabeculation, reestablishment of the medullary canal and the resorption of excess bony tissue. Hunter wrote "A Treatise on the Blood, Inflammation and Gunshot Wounds" in 1794, and made attempts at tissue grafting. His collection of specimens (initially over 14,000; half destroyed in the bombing of London) is currently in the College of Surgeons, London. It is a humbling and inspiring experience to visit the museum and see one man's monumental contribution to medicine and surgery.

Hunterian Museum, Royal College Of Surgeons, London

JEAN-ANDRE VENEL (1740-1791)

Jean-Andre Venel was a Swiss from Geneva. In 1780, he established the first orthopaedic institute in the world in Orbe, Switzerland. This was the first true hospital that dealt specifically with the treatment for crippled children's skeletal deformities. Venel recorded and published all his methods and for this he became known as the father of orthopaedics and his institute acted as a model for hospitals throughout Europe.



WILLIAM HEY (1736-1819)

William Hey was the founder of Surgery at Leeds and trained at St. George's Hospital. Hey wrote a book on Surgery which contained several chapters on Orthopaedics. Subacute Osteomyelitis of the tibia was described and he advocated deroofing of the lesion. In 1773, Hey banged his knee getting out of the bath, and many attribute his subsequent interest in the knee to this. He coined the phrase "internal derangement of the knee" and described meniscal injuries. Hey described intra-articular loose bodies and tarso-metatarsal amputation (Hey's Amputation).

GIOVANNI BATTISTA MONTEGGIA (1762-1815)

Monteggia was a Milanese surgeon and in 1795 he was appointed professor of anatomy and surgery, holding a chair of Istituzioni Chirurgiche at University of Pavia. He is particularly remembered for his description in 1814 of the fracture that bears his name, Monteggia's fracture.

ABRAHAM COLLES (1773-1843)

Born in Kilkenny, Ireland, Colles was a professor of anatomy, surgery and physiology at the Royal College of Surgeons in Ireland. He is remembered as a skillful surgeon and for his 1814 paper "On the Fracture of the Carpal Extremity of the Radius" which continues to be known as Colles' Fracture. This paper, describing distal radial fractures, was far ahead of its time, being published decades before x-rays came into use. He was also the first to successfully tie the subclavian artery.

GUILLAUME DUPUYTREN (1777-1835)

Dupuytren was a brilliant teacher, astute diagnostician and gifted surgeon. In 1803 he was appointed assistant surgeon at the Hotel-Dieu in Paris and in 1811, professor of surgery. Though famous as the surgeon who treated Napolean Bonaparte's haemorrhoids, Dupuytren's name is most associated with the contracture of palmar fascia and the bimalleolar ankle fracture that he described. He wrote on subjects including congenital dislocation of the hip, callus formation, subungual exostosis, Trendelenburg sign, tenotomy in torticollis and various musculoskeletal tumours.

BENJAMIN BRODIE (1786-1862)

Brodie was a surgeon at St. George's Hospital and Royal Surgeon to King George IV, William IV and Queen Victoria. His most important work is the 1818 treatise Pathological and Surgical Observations on the Diseases of the Joints, in which he attempted to trace the beginnings of disease in the different tissues of a joint. This led to reduction in the number of amputations and the saving of many limbs and lives. In 1832, he described the chronic bone abscess that has since been named after him. He recognised the association of arthritis with gonorrhoea. In 1843, he introduced the Fellowship examination of the Royal College of Surgeons to improve the education and standing of surgeons.

JOHN RHEA BARTON (1794-1871)

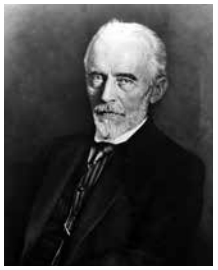
Born in Lancaster, Pennsylvania, U.S.A., Barton studied at the Pennsylvania Hospital and later worked for Physick (the father of American Surgery). Barton was ambidextrous and once he had positioned himself for an operation, he did not move about. In 1826, he performed a subtrochanteric osteotomy of the femur for a severe flexion-adduction deformity of the hip. Barton is best known for his innovative corrective osteotomies for ankylosed joints. In 1834, he wired a fractured patella and in 1835, described Barton's fracture of the wrist.

ROBERT WILLIAM SMITH (1807-1873)

A Professor of Surgery at Trinity College in Dublin, Smith founded the Dublin Pathological Society with Colles, Graves, Corrigan and Stokes. In 1847, Smith wrote a book "A Treatise on Fractures in the Vicinity of Joints", and on certain forms of accidents and congenital dislocationse described the eponymous Smith's fracture, and Madelung's deformity of the wrist before Madelung described it. In 1849, he published a treatise on the Pathology, Diagnosis and Treatment of Neuroma. Smith wrote on neurofibromatosis in great detail, much before von Recklinghausen did.

ANTONIUS MATHYSEN (1805-1878)

Mathysen was a Dutch military surgeon who in 1851, invented the plaster of Paris (POP) bandage which was to become so important to orthopaedic practice and remains the mainstay of fracture immobilisation.



EMIL THEODOR KOCHER (1841-1917)

Born in Bern Switzerland, Kocher became Professor of Surgery in University of Bern in 1872. For nearly 100 semesters he taught about 10 000 students in the university. Kocher first attained international recognition in 1870 with his method the Kocher Manouvre to reduce a dislocated shoulder joint. He also published multiple works on antisepsis, aseptic treatment and surgery, haemostasis, surgical infections, gunshot wounds, osteomyelitis, hernia and abdominal surgery. He invented the Kocher's Surgical Clamp in 1882, which is still widely used to this day. One of his main works, "Chirurgische Operationslehre" (Text-Book of Operative Surgery), was published through six editions and translated into many languages. In the book he detailed many useful surgical incisions such as his posterolateral exposure of the hip (Kocher Incision). Kocher recognized the importance of aseptic techniques and ordered strict adherence to the antiseptic method in surgery. He made it compulsory to investigate the cause of every wound infection and remove every potential source of infection. However it was for his work on the thyroid gland that Kocher was awarded the Nobel Prize in Medicine in 1909.

Kocher at work

WILLIAM MACEWEN (1848-1924)

William Macewen was born in Scotland and studied in Glasgow. By adopting systematically the use of scrubbing, sterilisation of surgical instruments, use of surgical gowns, and with the availability of anaesthesia, Macewen became one of the most innovative surgeons of his time and was able to greatly advance modern surgical technique and improve the recovery of patients. In terms of his Orthopaedic contributions, he performed many osteotomies and developed a one-piece osteotome. Macewen's main research interest was in bone growth and in 1879 he performed the first of his pioneering bone grafts. In 1916 Macewen helped to found the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers in Erskine near Glasgow to treat the thousands of soldiers that lost their limbs in the First World War. Macewen was its first chief surgeon and designed the Erskine prosthesis and trained a team of technicians to manufacture them for the patients.

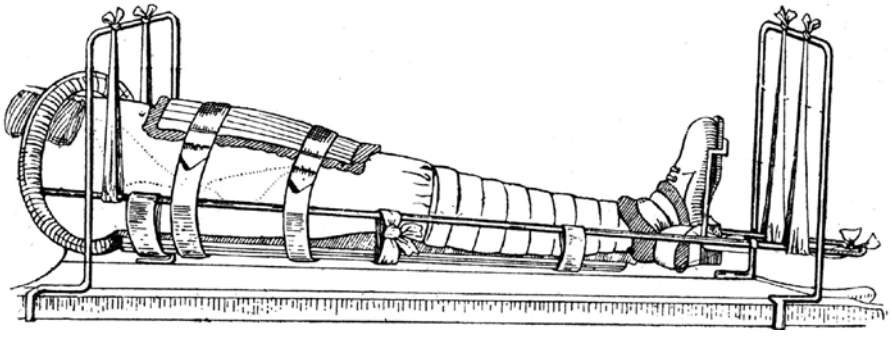
Macewen fitting an Erskine leg

Macewen's research, leading to the development of the Erskine prosthesis

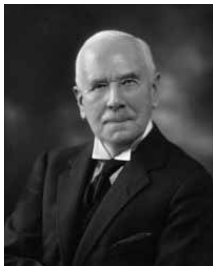
HUGH OWEN THOMAS (1834-1891)

Born in Liverpool, Hugh Owen Thomas is regarded as the father of British Orthopaedics. He treated all his patients at his home. Hundreds of patients from the country would surround his house in order to be treated by him. Despite his busy schedule, Thomas wrote prolifically and developed many new techniques and surgical instruments such as cervical collar, metatarsal bar, heel wedge and splints, the most famous being the Thomas' splint. He was the first to demonstrate concealed flexion of the hip joint and a way of unmasking this by performing the Thomas Test.

Thomas test



Thomas splint



WILLIAM ARBUTHNOT LANE (1856-1938)

Lane was from Inverness and was trained and later worked at Guy's Hospital in London. He is known for his use of internal fixation to improve alignment of fractures. In 1892, he started off using silver wire, then steel screws and later, plates and screws. Some of the surgical instruments he designed are still in used today. In the 1890s, for his open reductions and plating of fractured bones, Lane introduced the "no-touch technique" which permitted aseptic surgery which is perhaps his greatest contribution to surgery. In 1905 he published "The Operative Treatment of Fractures". The introduction of x-rays vindicated Lane's assertion of frequent malunion from nonsurgical intervention. The conservative medical community vehemently opposed, as nearly 50% of patients whose closed fractures were opened died of ensuing infections. Yet with aseptic surgical techniques previously unheard of, Lane was able to produce better outcomes.

Lane Bone Holder

Lane's Dissecting Forceps

Lane's Tissue Forceps

WILHELM CONRAD RONTGEN (1845-1923)

Although Rontgen was a professor of Physics at Wurzburg, his discovery of X-rays and their use has provided an enormous contribution to Orthopaedics and is still of great value to Orthopaedic practice. Rontgen received the Nobel Prize for his discovery in 1901.

Rontgen's discovery of X-rays

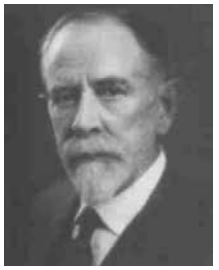
The Modern Era (20TH Century Orthopaedics)

THE TURN OF THE CENTURY

The early 1900's was a great turning point for orthopaedics. With the discovery of X-ray, orthopaedics was now being seen as a true specialty of its own. The British still dominated orthopaedic developments, but the new world had now reached maturity and there were increasing contributions by the Americans.

One area where there was an evident surge of new information with the introduction of the X-ray was that of osteochondritis and osteonecrosis. Although the German George Clemens Perthes took the first X-rays of Perthes' disease in 1898, Perthes' assistant did not publish it until 1914. In 1903, Robert Osgood (1873-1956) of Boston described a lesion of the tibial tubercle occurring during adolescence. This is now known as Osgood-Schlatter's disease. Another German by the name of Georg Axhausen (1877-1960), was the first to use the word aseptic necrosis. It was not until the 1950's that the term aseptic necrosis was replaced by avascular necrosis.

Jacques Calve (1975-1954) of France, Arthur T. Legg (1874-1939) of Boston and George Perthes jointly described Perthes' disease in 1910. Hence this disease is sometimes referred to as Calve-Legg-Perthes disease. The early 1900's was also a time of advancement for spinal surgery.



RUSSELL AUBRA HIBBS (1869-1932)
From New York Orthopaedic Hospital, Hibbs published a report on a technique of spinal fusion that he had developed in 1911. Hibbs performed the first spinal fusion for tuberculosis and later performed a similar procedure for scoliosis.

JOEL GOLDTHWAIT (1867-1961)
From Boston, Goldthwait had a great interest in posture and in 1911, published a case of laminectomy from L1 to S3 performed on a man who developed bilateral sciatica followed by paraplegia.

ROBERT JONES (1855-1933)
Probably the most important figure at the turn of the century was Robert Jones (1855-1933). Jones was a nephew of Hugh Owen Thomas and became one of his apprentices in Liverpool.

In 1896, Jones published the first report of the clinical use of an X-ray to locate a bullet in a wrist. He founded several associations and Orthopaedic hospitals. Jones wrote several important books such as Injuries of Joints in 1915 and Notes on Military Orthopaedics in 1917. His textbook Orthopaedic Surgery is said to be the first to have dealt systematically with the diagnosis and treatment of fresh fractures. In World War I, Jones headed the orthopaedic section of the British Forces. Jones was an advocate of tendon transplantation, bone grafting, and other conservative, restorative procedures.

WORLD WAR ONE

War has played an important part in Orthopaedic history. Many of the great Orthopaedic Surgeons were military surgeons. Orthopaedics was established as a separate specialty after World War I where aseptic techniques were saving many more lives than in the past wars.

JULES TINEL (1879-1952)

Of Rouen and Paris, Tinel was a neurologist in the First World War and first described Tinel's sign in 1917.

THOMAS PORTER MCMURRAY (1888-1949)

In the chain of great surgeons that followed Hugh Owen Thomas, came Thomas Porter McMurray.

McMurray was born in Belfast, but worked for Robert Jones in Liverpool. In 1928, McMurray published a paper on internal derangements of the knee where he described the sign for a torn meniscus, McMurray's sign. He was the first to perform a displacement osteotomy for non-union fracture of the femoral neck and arthrosis of the hip.

WINTHROP MORGAN PHELPS (1894-1971)

In 1932, Phelps a professor of orthopaedic surgery at Yale University and director of the Children's Rehabilitation Centre at Baltimore, made immense contributions to the management of cerebral palsy.

RICARDO GALEAZZI (1866-1952)

Of Milan, he had great experience in congenital dislocation of the hip and structural scoliosis, but is best known for the Galeazzi forearm fracture that he described in 1934.

WORLD WAR TWO

In the Second World War, there were less amputations performed, less gangrene, better fixation of fractures and the widespread use of penicillin greatly reduced the morbidity and mortality of wound sepsis. The Germans needed quick measures to restore their fighters to optimal fighting potential and developed a number of nailing procedures during this period. At the same, the Americans were now making more contributions than ever before.

WILLIS C. CAMPBELL (1880-1941)

One of these Americans was Willis C. Campbell (1880-1941) of Memphis, Tennessee. In 1924, Campbell established the orthopaedic residency program in University of Tennessee, which has since trained hundreds of the America's finest orthopaedic surgeons. In 1931, with six other surgeons, Campbell founded The American Academy of Orthopaedic Surgeons (AAOS).

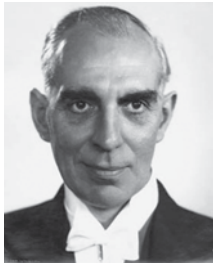
GERHARD KÜNTSCHER (1900-1972)

Born in Germany, Küntscher served as a surgeon on the Eastern Front during World War II. He invented what is now famously known as the K-Nail or Küntscher nail, At the meeting of the German Surgical Society in 1940, he presented his report, "Medullary Nailing of Fractures," which has been regarded as an important milestone in the operative treatment of fractures. The Küntscher nail must be among the most ingenious inventions that German surgery brought forth in the last century. Küntscher went on to develop various femoral and tibial nails, an intramedullary bone saw for endosteal osteotomy, distractor to align fractures, expandable nail for the tibia, a nail for trochanteric fractures, cannulated flexible powered intramedullary reamers and locking intramedullary nails.

Küntscher in action

MARTIN KIRSCHNER (1879-1942)

German in nationality, Kirschner was from Breslau (now Wroclaw in Poland), and was also known for his methods of fracture fixation, in particular in the use of the Kirschner or K-wire which is still in use today.



REGINALD WATSON-JONES (1902-1972)

Reginald Watson-Jones was a protégé of Robert Jones. During World War II, he served the RAF and was among the leading teachers in fracture management. He established an orthopaedic rehabilitation service for the RAF and designed programmes for rehabilitation of the injured soldiers. Watson-Jones published Fractures and Joint Injuries in 1940, which remained a standard reference for several decades and was translated into many languages. He was the main driving force behind the formation of the orthopaedic journal JBJS and was its first editor and held this position until his death. All orthopaedic surgeons across the world know him for his anterolateral approach to the hip joint, Watson-Jones bone levers and tenodesis for ATFL injury.

AUSTIN T. MOORE (1899-1963)

In 1942, another American, Austin T. Moore reported and performed the first metallic hip replacement where for the first time, the entire upper portion of the femur was replaced with a vitallium prosthesis. Over the years, the design of the prosthesis and the procedure has greatly improved. The famous Austin-Moore prosthesis is still widely available and used today.

Austin-Moore prosthesis

AFTER THE WARS

In the years following the war, thanks to improved sterilisation, aseptic surgical techniques, invention of antibiotics and modern anaesthesia, surgical management became the mainstay of orthopaedic practice. Management of fractures was further improved with the use of metallic pins, screws, plates, nails, cables and wires for fixation. There was also a wave of new prostheses, implants, surgical tools and devices which paved the way for the most amazing period of advancement in the history of orthopaedic surgery.

JOHN CHARNLEY (1911-1982)

One surgeon that made the most significant contribution in this period is John Charnley from Manchester . In 1950, Charnley wrote the book "The Closed Treatment of Common Fractures". He is however renowned as the father of total hip replacement. He borrowed a new type of acrylic cement from his dentist colleagues to secure the first effective hip replacement in June 1958, an operation which has given millions of people back their mobility over the last half century and has probably had more human impact than any other medical development in the last 50 years. In November 1962, after in-depth research in cemented implant fixation and bearing surfaces, and following the unhappy experience with Teflon cups, Charnley implanted his first low friction arthroplasty (LFA) using a cemented high density polyethylene cup, which articulated with a stainless steel femoral head. For over two decades, it was the most-used system in the world. This formed the basis for all modern hip implants. Many of the total hip replacements that he performed in the 1960's are still sound and serving their patients effectively.

The Exeter hip replacement system was developed at the same time. Since Charnley, there have been continuous improvements in the design and technique of joint replacement with many contributors, including W. H. Harris whose team at Harvard pioneered uncemented arthroplasty techniques.

Knee replacements using similar technology were started by McIntosh for rheumatoid arthritis patients and later by Gunston and Marmor for osteoarthritis in the 1970s. John Insall in New York started using a fixed bearing system, while Frederick Buechel and Michael Pappas, a mobile bearing system.

External fixation of fractures was refined by American surgeons during the Vietnam War but a major contribution was made by Gavril Abramovich Ilizarov who was sent to look after injured Russian soldiers in Siberia in the 1950s. He was confronted with crippling conditions of unhealed, infected, and malaligned fractures. With the help of the local bicycle shop he devised a ring external fixator system tensioned like the spokes of a bicycle and achieved healing, realignment and lengthening to a degree unheard of elsewhere. His Ilizarov System is still widely used today.

Pioneering work in the field of arthroscopy began as early as 1920s with the work of Eugen Bircher. It was the Japanese surgeon Masaki Watanabe who was inspired by the work of Richard O'Connor that began using the arthroscope for interventional surgery.

John Charnley in the operating theatre

Charnley's low friction arthroplasty implant

In the early 1900s, the Rizzoli Institute in Bologna, Italy was the cradle for orthopaedic oncology. The work of Vittorio Putti, Scaglietti and Domenico Campanacci laid the foundation for extensive development of orthopaedic oncology both in Europe and America in the last century.

In 1958, a group of Swiss general and orthopedic surgeons established the AO (Arbeitsgemeinschaft für Osteosynthese-fragen). Their mission was to transform fracture treatment in Switzerland, which at that point in time included prolonged bed rest in traction and subsequent application of a cast or splint, often resulting in poor functional results and lifelong disability. The "core group" of founders consisted of Maurice E. Müller, Hans Willenegger, Martin Allgöwer, and two other early members, Robert Schneider and Walter Bandi. The AO pioneers also realized that immobilization resulted in atrophy of the soft tissues, osteoporosis, thinning of articular cartilage, severe joint stiffness, and, at times, causalgic pain. To prevent these complications and improve the results of fracture treatment, they introduced "functional after-treatment." This concept

was based on the observation that when stable fixation of a fracture was achieved surgically, most of the pain was effectively eliminated, which made immediate and full mobilization of the extremity possible.

In November 1994, AO East Asia (AOEA) was founded under the leadership of Dr Suthorn Bavonratanavech, who also became the first chairman of AOEA and Malaysia AO is part of AOEA.

SUMMARY

Orthopaedic surgery has a long history and is a diverse field that have seen the most rapid advances in the last thirty years thanks to computerisation, information technology, engineering and biomaterial technology and improved research at various basic sciences and clinical aspects. It currently have some of the highest ratings for success and patient satisfaction and long lasting results among all surgical specialties. Orthopaedic surgery today is a specialization driven by increasing technical wizardry and multidisciplinary collaborations. On one hand, virtually gone are the diseases and conditions upon which modern surgery was founded and on the other hand stands revolutionary innovations hardly dreamed of fifty years ago. Its transformation has been such as to make it largely unrecognizable to its practitioners of scarcely a generation ago. An evolution of orthopaedic surgeon education is also clearly underway. A new paradigm will soon be needed to address the many core issues. The demand and challenges faced by the orthopaedic surgeons and institutions worldwide, will continue to rise dramatically in the coming decades and with a growing emphasis placed on outcomes and healthcare cost by today's society, it will be interesting to see how this field continues to evolve in the future.

CHAPTER 3.0

History of Orthopaedics in Malaysia

Dato' Dr Abdul Hamid Abdul Kadir

General Hospital Kuala Lumpur circa 1920

The Early Years of Medical Services

The medical services for British army personnel during the Colonial era was established in the Straits Settlements of Penang in the late 1820s and in Malacca in 1827.

However, medical services for the public in Malaya began with the establishment of Chinese Pauper Hospitals, to provide healthcare for Chinese immigrant labourers. The first such facility, Yeng Wah (Anglo-Chinese) Hospital, was opened in Taiping in 1880 primarily to provide healthcare for coolies and tin-mine workers in the north of Malaya. This hospital in Taiping was taken over by the British government the following year in 1881 and run entirely on Western lines. In 1894, it was converted into a general hospital, open to all in the Larut district, Perak.

A few years later, a similar Chinese Pauper Hospital was established in Selangor, by Yap Kwan Seng, a Chinese immigrant, with similar objectives, and was the forerunner of Tung Shin Hospital.

Injuries to limbs were rare in those days. The main diseases were cholera, smallpox, malaria and tuberculosis.

The recorded history of medical services, open to the public in the late 1880s, gradually developed through the Malay states, but suffered a setback in 1941 with the outbreak of the war and the subsequent occupation by the Japanese forces, which lasted till August 1945.

The British forces and the administration returned in September 1945 (after the atomic bombing of Hiroshima and Nagasaki in August 1945), with the defeat of the Japanese. British doctors as well as a handful of Malaysian doctors provided medical services in the post-war period.

Another setback to the development of medical services was the period referred to as the Malayan Emergency (1948 to 1960). This was a critical transition period in the history of Malaya and the British Commonwealth forces were involved in fighting the communist guerrillas while securing the safety of the people.

The Malaysian Armed Forces casualties during the Emergency, mainly with orthopaedic problems, were admitted in the north to government hospitals in Penang, Ipoh and Sungai Petani. These were mainly lower limb injuries sustained in booby traps in “hot areas” in Perak, and many of them were managed with lower limb amputations. Besides the infantry, Army Engineer corps personnel who were working to disarm these land-mines also sustained hand and upper limb injuries, as well as facial and eye injuries.

The early British military hospitals (BMH) in Kamunting (Taiping, Perak), Kinrara (Puchong, Kuala Lumpur), Kluang (Johore) and the rehabilitation hospital in Tanah Rata, Cameron Highlands, and later Terendak Hospital (Malacca), were mainly staffed by Commonwealth doctors and nurses and provided medical services during the Emergency. These hospitals were taken over by the Malaysian medical corps in late 1960s.

On a note regarding the development of orthopaedics in the Malaysian Armed Forces, the first orthopaedic surgeon with Masters in Orthopaedics University of Liverpool in 1979 was Dr Abdul Hamid Abdul Kadir, with the rank of Lt Col. He introduced knee arthroscopy in 1981 with Storz arthroscopy after briefly training under David Dandy in Cambridge, England, and Henche in Rhinefelden, Germany.

On a national level, with the Independence of Malaya from Britain in 1957, and the handing over of the general and district hospitals, the health services in the country began to progress significantly. Increasing number of Malaysian doctors in various disciplines returned with specialist qualifications from the United Kingdom.

The Beginning of Orthopaedic Services in Malaya

The main centre for Orthopaedics in Malaya, as well as for other disciplines, was the General Hospital in Kuala Lumpur (GHKL).

There were interesting historical links between the Orthopaedic Service developments in General Hospital Kuala Lumpur and the Orthopaedic Department of the Faculty of Medicine of University of Malaya (in Singapore).

Dr J.A.P. Cameron was in the pre-war period, the first Selangor State Surgeon in the Malayan Medical Services and just before the outbreak of WWII. In 1938, he left for the University of Liverpool to pursue the degree of Masters in Orthopaedics.

Dr C.P. Allen was a general surgeon in the immediate post-war period in GHKL and as was norm in those early years, had pioneered the treatment of orthopaedic patients, while also treating general surgical, neuro-surgical, obstetric and gynaecological patients.

Dr J.A.P. Cameron on returning to Malaya after the War in 1949 continued as the surgical chief and also set up the first Orthopaedic Unit in the country in GHKL in 1949. The Orthopaedic Unit consisted of one male and female Orthopaedic wards, comprising 50 beds each. In addition, there were two children's wards of twenty-five beds each, one for general orthopaedic cases and the other for bone and joint tuberculosis, the latter being very prevalent among children at that time.

Cameron was appointed Professor of Orthopaedic Surgery in University of Malaya (in Singapore) in 1952, and was succeeded by Dr O'Malley in GHKL, who was subsequently succeeded by Dr Donald Gunn in 1955. Dr Donald Gunn was appointed to the chair in the Orthopaedic Department in the Singapore University in 1957 upon the retirement of Cameron. The Orthopaedic Department of GHKL again came under the headship of Dr O'Malley.

J.A.P. Cameron

Donald Gunn

Tan Sri Dr Abdul Majid Ismail

Tan Sri Dr Abdul Majid Ismail had entered the King Edward VII College of Medicine in Singapore in 1940 (just before the Japanese invaded Malaya and Singapore) and his studies were interrupted by the Occupation. After the war, he re-entered the College, graduating in 1950. A long 10-year medical course, indeed, punctuated nevertheless by many interesting and exciting escapades of young Abdul Majid during the Japanese occupation years in Kuala Lumpur.

It is of historical interest that his degree was conferred by Rt Hon Malcolm MacDonald who was the Commissioner-General of South-east Asia and was also the first Chancellor of the University of Malaya (in Singapore).

Rt Hon Malcolm McDonald conferring my MBBS at the first convocation ceremony of the University of Malaya in 1950.

Tan Sri Dr Abdul Majid Ismail did his houseman training under Dr J.A.P. Cameron after graduating from University of Malaya (Singapore) in July 1950.

Tan Sri Dr Abdul Majid Ismail was the first Malayan to obtain the degree of Masters in Orthopaedic Surgery from the University of Liverpool in 1957. This started the trend of sending those with Fellowships in Surgery to Liverpool for the Masters degree. Upon his return Tan Sri Dr Abdul Majid Ismail became the first Malayan Chief Orthopaedic Surgeon. He was appointed as the Head of Department of Orthopaedics in GHKL in 1958. In the years that followed, he encouraged and arranged for many surgeons to Liverpool for the Master Ch. Orth. degree.

The first Orthopaedic Trainee under Tan Sri Dr Abdul Majid Ismail was Dr Pretam Singh who in 1964 obtained his postgraduate specialisation in Orthopaedics from Liverpool. After working as Tan Sri Dr Abdul Majid Ismail's Registrar for three years, he was transferred to Ipoh GH in 1967 as the head of orthopaedic department and to set up orthopaedic services there.

Dato' Dr Mahmood Merican, obtained his Master Ch. Orth. Liverpool in 1963 and was Tan Sri Dr Abdul Majid Ismail's senior assistant. He was appointed Head of the Orthopaedic Department GHKL in 1969 when Tan Sri Dr Abdul Majid Ismail was promoted to the newly created position as Director of Planning and Research in Ministry of Health. Tan Sri Dr Abdul Majid Ismail was appointed the second Malaysian Director General of Health later in 1971.

Dato' Dr Mahmood Merican

Datuk Dr M. Sivanantham

Dato' Dr Mahmood Merican left GHKL in 1971 for University of Malaya as Associate Professor in the orthopaedic department, and after two years, resigned and left for private practice.

Dato' Dr Mahmood Merican took over the GHKL Orthopaedic Department from Tan Sri Dr Abdul Majid Ismail in 1969.

Dr Khaw Joo Hua went to Liverpool to pursue his MChOrth in 1968 after obtaining his FRCS. Upon his return in 1969, he was posted to Johor Bahru GH but transferred back to GHKL as the head of the second orthopaedic unit there. In 1973, Dr Khaw became the first private orthopaedic surgeon in Malaysia.

Dr S. Ratnasingam started the Department of Orthopaedics in Malacca GH in 1966. He was transferred to Ipoh GH in 1972. Dr R. Balakrishnan took over from Dr S. Ratnasingam in Malacca in Jan 1972 and again from Dr S. Ratnasingam in Ipoh in 1975. Dato' Dr K.S. Sivananthan filled the post left by Dr S. Ratnasingam in Malacca till 1981 when he was transferred to Ipoh to fill the vacancy caused by the resignation of Dr R. Balakrishnan. Dr David Sam Willie was posted to Penang GH in 1968 and remained there till his retirement in the mid 1980s.

The Institute of Orthopaedics in GHKL was opened in 1976 with Datuk Dr M. Sivanantham as the first head. He was succeeded by Dr Easaw Thomas and in 1995 by Dato' Dr Muhammad Borhan Tan.

The Orthopaedic services grew from strength to strength and expanded throughout the country. After 1969, most of the General Hospitals in the country, from Penang, Ipoh, Malacca and had at least one Malaysian Orthopaedic Surgeon. In other state capitals, from Alor Setar, Kota Bharu, Kuala Terengganu, Seremban and Johor Bahru, to Kuching in Sarawak and Kota Kinabalu in Sabah, there were expatriate Orthopaedic Surgeons from India, Pakistan and Egypt.

Rehabilitation services for Orthopaedic and Trauma patients were established by Tan Sri Dr Abdul Majid Ismail when he was head of Orthopaedics, as well as the National Artificial Limb and Prosthetic Centre and the Spinal Ward in GHKL. Ikram Ullah Malik, a rehabilitation physician, was in charge of these departments. The School of Nursing was also established during this period. Rehabilitation services were also set up in University Hospital in University of Malaya and the first head was Zaleha Omar, who also started a postgraduate training programme in rehabilitation medicine.

With the commencement of Orthopaedic Postgraduate Training in the National University Malaysia in 1981, University Of Malaya in 1989, University Of Science in 1991 and International Islamic University in 2008, the number of Orthopaedic Surgeons in the country increased remarkedbly. In 2015 University Malaysia Sarawak and University Putra Malaysia took in their first batch of orthopaedic postgraduate candidates. When Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya returned from her fellowship in Singapore to University of Malaya as an Orthopaedic Surgeon in 1991, it marked the beginning of female participation in Orthopaedics in Malaysia. To date, there are around 750 Orthopaedic Surgeons in the country, slightly more than half are in the private hospitals while the rest are in the government hospitals and universities. Orthopaedic services in the country is currently widely available and in many of the major state hospitals and university hospitals, subspecialist services such as arthroplasty, hand and microsurgery, paediatric orthopaedic, orthopaedic oncology, sports and arthroscopy, advanced trauma, foot and ankle are firmly established and rapidly expanding.

The Orthopaedic Services grew from strength to strength and expanded throughout the country. After 1969, most of the General Hospitals in the country, from Penang, Ipoh, Malacca and had at least one Malaysian Orthopaedic Surgeon.

References

1. Abdul Majid bin Ismail. (2006). An old man remembers: the memoirs of Tan Sri Dato' Seri Dr Haji 'Coco' Abdul Majid bin Ismail, Dato' Seri Maharaja di Raja Selangor. Kuala Lumpur: The Written Word.

CHAPTER 4.0

History of the Malaysian Orthopaedic Association

Dato' Dr Abdul Hamid Abdul Kadir and Dato' Dr Badrul Shah Badaruddin

The first meeting of Malaysian Orthopaedic Association in 1968. The President seated and flanked by the ladies of the founding members.

History bears testimony to major events being usually developed by just a few highly-motivated individuals powered by lofty passions. The formation of an Orthopaedic association was first mooted by Prof Dr Joseph Francis Silva in the Department of Orthopaedics University of Malaya, which at that time had the most number of Orthopaedic Surgeons in one location. Following this proposal, a meeting was called and with the participation of all the Orthopaedic Surgeons in the country, the Malaysian Orthopaedic Association (MOA) was born in 1967. The founding members were Tan Sri Dr Abdul Majid Ismail, Prof Dr Joseph Francis Silva, Prof Dr P. Balasubramaniam, Dr Pretam Singh, Dato' Dr Mahmood Merican, Prof Dr Subir Sengupta, Prof Dr Quazi Mohammed Iqbal, Dr K. Thambyrajah, Dr Arumugam Selvaratnam, Dr Balasingam and pathologist, Dr Methil Kannan Kutty. The objective of this association was and remains to this day, to promote the advancement of the science, arts and practice of Orthopaedic Surgery and Allied Science in the country, and is immortalized in the constitution.

The MOA Crest

The original emblem of the MOA was designed circa 1968 as a heraldic coat of arms, with an escutcheon (shield), a ladder with a missing rung, and two hibiscus florals an inverted V separating the two symbols, and on top the traditional Orthopaedic symbol of crooked tree, pole and rope. The words "Lurus Tulus" (straight and honest) and Roman numeral MCMLXVII (in Arabic, 1967) were inscribed in the bottom banner beneath the paws of two tigers supporting the shield.

This design was rejected by the Registrar of Societies (ROS) in 1983, on the basis that the hibiscus flowers and tigers represent national symbols and therefore should not be part of the emblem of a "private" organization.

The original coat of arms of the Association

The floral design banner at the bottom highlighted to show the year MCMLXVII in Roman numerals (1967).

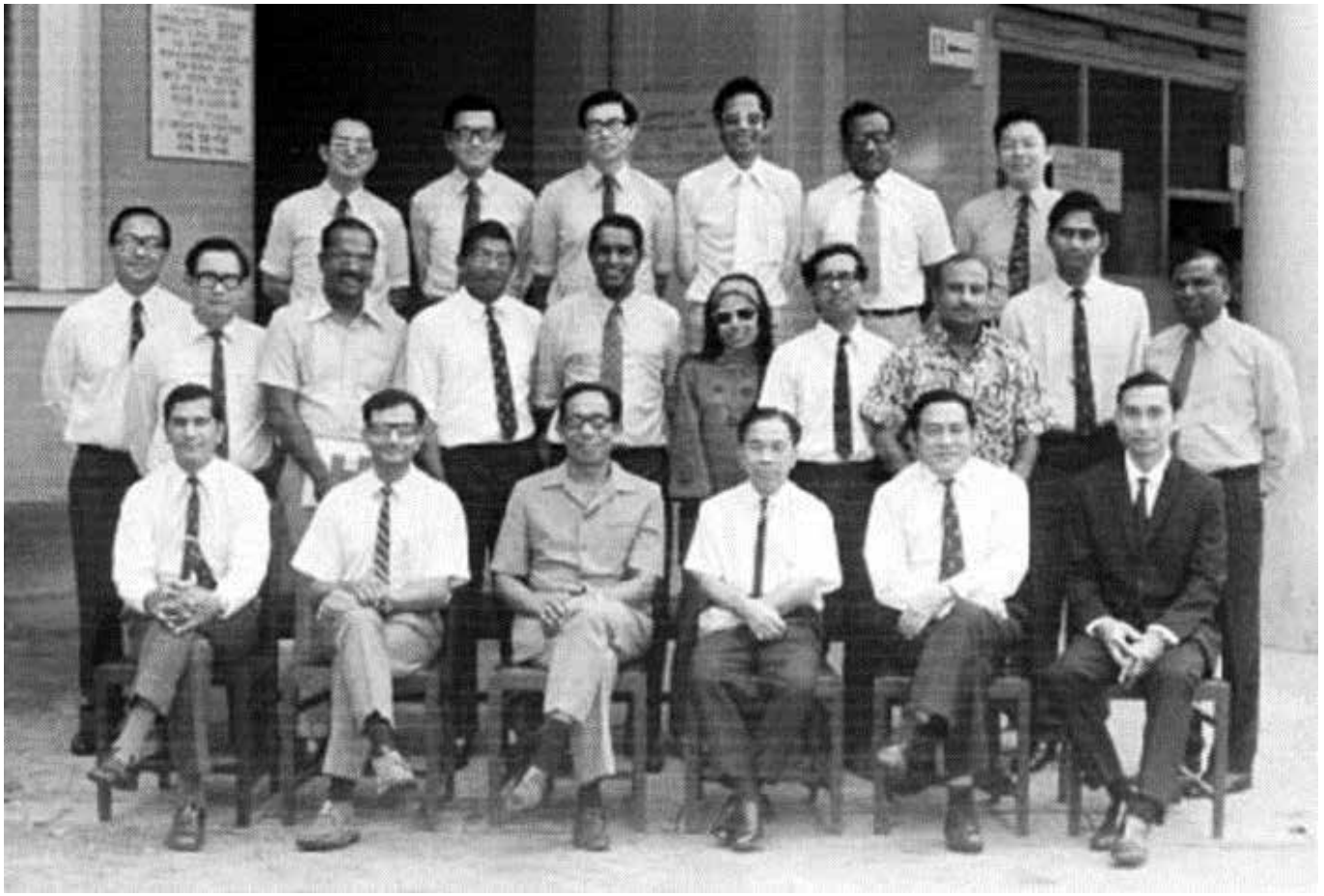
The coat of arms was then redesigned as an emblem in 1984. This was a vertical oval plaque with the words Malaysian Orthopaedic Association inscribed in the upper two-third, and the words “Lurus Tulus” at the lower third of the oval. It depicted the traditional Orthopaedic symbol of the Tree of Andry, held by a rope held on the right by a pelandok (mousedeer), and balanced on the left by another. The pelandok or mousedeer is a fauna depicting courage, skill and intelligence. The motto “Lurus Tulus” (in translation “Straight Honest”) has been on the emblem right from the founding in 1967 and is a meaningful phrase signifying the traditional Orthopaedic theme of treatment of deformities in children and the need for infusing honesty in the professional practice of the art and science of Orthopaedics.

The resubmitted emblem had a 14-pointed star embellished in yellow and in the middle was the year of the founding of the Association, “1967” in Arabic numeral.

The MOA had another encounter with the Registrar of Societies (ROS) in 1984 when it was deregistered for non-submission of annual reports and statements of account for previous three years. The incoming Council in 1984 (President Dato’ Dr Mahmood Merican, Honorary Secretary Dato’ Dr Abdul Hamid Abdul Kadir) had to resubmit a new constitution which the ROS accepted and re-registered the Association on condition that the figure “1967” be removed. Thus the centre of this multi-pointed star remains empty since that time. It is hoped that this historical and meaningful numeral indicating the very birth of the Association can be reinstated with the approval of the ROS.

The current emblem of the Association with the empty multi-pointed star.

The Tree of Andry, as originally featured in Nicolas Andry’s book, *Orthopædia*.



First MOA-SOA combined meeting in Singapore in 1969. From Malaysia: Tan Sri Dr Abdul Majid Ismail, Dato' Dr Mahmood Merican, Dr S. Ratnasingam, Dr R. Balakrishnan, Prof Dr Quazi Mohammed Iqbal. From Singapore: Dr Pesi Chacha, Dr Kandasamy Pillay, Dr Kamal Bose, Dr Balachandran Marar, Dr Kanwaljit Soin, Dr Balachandran, Dr Ling Chaw Ming, Dr Khong Ban Zee and Dr William Fung.

The Presidents

Tan Sri Dr Abdul Majid Ismail was elected to be the founding President when MOA was registered in 1967. He remained in that position till 1982 when Dr Khaw Joo Hua was elected as President, From then on, the President in office served a two year term (Dato' Dr Mahmood Merican 1983-85, Datuk Dr M. Sivanantham 1985-87, Dr Eddie Soo 1987-89, Dato' Dr Abdul Hamid Abdul Kadir 1989-91, Dato' Dr K.S. Sivananthan 1991-93). Beginning with Prof Dr Subir Sengupta in 1994, Presidents held office for a one year term, and as the "old guards" finished their rounds, the younger Orthopaedic Surgeons took over the stewardship. Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya has the distinction being the first lady President of the MOA in 2006. The current President is Dato' Dr Azmi Baharudin.

Milestones of the Association

MOA has seen many collaborations with other international societies over the years. In 1968, the first MOA Congress was held in Kuala Lumpur, with some 60 participants.

In 1969, the first Malaysia-Singapore joint meeting was inaugurated and held in Singapore. This provided a forum for Orthopaedic Surgeons from both sides of the Causeway to meet and establish academic and social ties, alternating between Singapore and Malaysia. This went on for a few years, but unfortunately came to an end in the mid-1980s as the initial enthusiasm from across the Causeway began to fade.

In 1973, the MOA took up the responsibility to host the 4th Congress of Western Pacific Orthopaedic Association (WPOA) in Kuala Lumpur. WPOA became known as the Asia Pacific Orthopaedic Association (APOA) in 2000 and in 2016, MOA joined APOA as a federation member.

After the establishment of the ASEAN Orthopaedic Association (AOA) in 1984, the MOA hosted the 4th AOA Congress in 1987 and many more in the following years.

In 1983 an instructional course in hand surgery, organised by chairman Dato' Dr Abdul Hamid Abdul Kadir, was held by MOA in conjunction with the College of Surgeons of Malaysia, and declared open by Tan Sri Dr Khalid Sahan, the Director-General of Health. The distinguished faculty included Dr Campbell Semple (Glasgow), Dr S.P. Chow and Dr P.C. Leung (Hong Kong), Dr Venkataswami (India), Dr Robert Pho (Singapore), Dr Chehab Hilmi (Indonesia), and Dr Teo Wee Sin. The course was attended by about 30 Orthopaedic and Plastic Surgeons and was held in the Merlin Hotel (now the Concorde Hotel). The first toe-to-thumb transfer was performed by Dr P.C. Leung for radial club hand in GHKL and another in UH in 1985.

In 1985, the first course on Knee Surgery was organised by MOA. The distinguished faculty included Dr George Bentley

4th Congress of Western Pacific Orthopaedic Association in Kuala Lumpur, 1973. Seated in the front row middle are Tan Sri Dr Abdul Majid Ismail and Prof Dr Joseph Francis Silva, along with Dr Thamrongrat Keokarn, along with many local and foreign delegates.

(London), Dr Russell F. Warren (New York), Dr Robert Wilson Jackson (Toronto), Dr Kamal Bose and Dr K. Satku (Singapore) with Malaysian participation by Dr N. Subramaniam and Dato' Dr Abdul Hamid Abdul Kadir. The participants included, besides Malaysians, Orthopaedic Surgeons from Indonesia, Singapore, and Thailand. Dr Russell Warren was working with Dr John Insall in Hospital for Special Surgery (HSS) in New York and was nominated to attend by Insall who was unable to come in spite of earlier acceptance. The first total knee replacement was performed in GHKL in 1985 by Dr Russell Warren using the Insall-Burstein system.

Since then numerous conferences have been organised by the Association, with many foreign delegates and participation of internationally acclaimed Orthopaedic Surgeons. In the earlier years, most of the annual scientific meetings were held in Kuala Lumpur. In the 1990s, attempts were made to have the meetings out of the capital and they were received with positive response from the widely expanding fraternity of Orthopaedic Surgeons. Among the venues are Malacca, Pangkor Island, Penang, Kota Kinabalu, Damai Laut in Sarawak, Kuching, Kota Bharu, Kuantan and twice in Johor Bahru. In 2015, MOA incorporated an Allied Health Session into the scientific meetings, allowing paramedics and nurses to join in. Since then, the annual scientific meeting has become one of the largest in the region, with more than 1000 attendees every year.

Besides organizing scientific meetings, MOA plays many roles in the Orthopaedic community of Malaysia. The MOA has close relations with the College of Surgeon (COS), one of the main bodies of Academy of Medicine, Malaysia. Many members of MOA are also members of the COS. Any issues regarding Orthopaedics that are discussed in the COS are often referred to the MOA.

With the increasing number of Orthopaedic Surgeons over the years, the association recognises

MOA Instructional Course in Hand Surgery- the Faculty.
L-R: Dr S.P. Chow, Dr Venkataswami, Dr P.C. Leung, Dr Campbell Semple, Dr Chehab Hilmi, Dr Robert Pho, Dr Khaw Joo Hua, Dato' Dr Abdul Hamid Abdul Kadir

Cover of Hand Course Programme in 1983 with the original coat of arms of MOA

> **The objective of this association was and remains to this day, to promote the advancement of the science, arts and practice of Orthopaedic Surgery and Allied Science in the country.**

the need to ensure the overall development of our members in various aspects of practice. Many measures have been taken in the past to provide opportunities to achieve this aim.

MOA Awards

The Malaysian Orthopaedic Association (MOA) has 4 annual awards to recognise the best clinical and non-clinical efforts in the preceding year by members of the association. The aim of these awards is to promote original research, presentation and publication culture among MOA members and to recognise their contributions in the field of orthopaedics and traumatology.

Mahmood Merican Award was established in 1997 through a generous donation by Dato' Dr Mahmood Merican and is awarded annually for the best thesis produced by a trainee in the 4 years Orthopaedic Masters Programme.

Subir Sengupta Award is for the best published clinical paper in the Orthopaedic journal and is in recognition of Prof Dr Subir Sengupta who was a long-serving Paediatric Orthopaedic Surgeon and senior academic staff and teacher in the Department of Orthopaedics, Faculty of Medicine, University of Malaya.

P. Balasubramaniam Award is for the best published translational medicine paper (non-clinical) by a member of the Association in the Orthopaedic journal. It is to recognise Prof Dr P. Balasubramaniam an eminent orthopaedic academician and teacher of the ASEAN region, originally from the Department of Orthopaedics, Faculty of Medicine, University Malaya.

The cash prizes for Subir Sengupta Award and P. Balasubramaniam Award are donated by *Yayasan Ortopedik*, Department of Orthopaedic Surgery, Faculty of Medicine, University of Malaya.

Basic Science Poster Award is presented annually to the participant of MOA Annual Scientific Meeting with the best Basic Science Poster and is donated by Dato' Dr K.S. Sivananthan.

Subspecialty Interest Groups

To encourage continuing medical education among its members, the MOA appointed regional representatives for the five geographical regions (North, East Coast, South, Central and East Malaysia) of the country and provides financial assistance for them to organise local scientific meetings. Beginning in the year 2010, in line with rapid development of Orthopaedic subspecialties around the world, various subspecialty interest groups were formed under the umbrella of the MOA. There are currently 11 sections under MOA which are Hand, Trauma, Paediatrics, Oncology, Sports, Arthroplasty, Foot & Ankle, Spine, LLRS, Humanitarian, and Research.

These groups serve to coordinate regular teaching, training, research and humanitarian activities for Orthopaedic Surgeons and trainees in the country, as well as to support the regional CME programs by providing speakers and teaching materials.

The Malaysian Orthopaedic Journal

With the increasing number of Orthopaedic related basic science and clinical research, the MOA published the first Orthopaedic supplement of the Medical Journal of Malaysia (MJM) from 1998 until 2006. The Malaysian Orthopaedic Journal was born in 2007 with Prof Dr Saw Aik from University of Malaya as the Editor-In-Chief till today. It was published twice a year in 2007 till 2009. From 2010, it has been published three times a year in the months of March, July and November; both in printed and electronic versions. The journal is currently indexed in EMcare, Index Copernicus, MyCite, WIPRIM, APAMED Central, Google Scholar, PubMed and PubMed Central which is indeed a commendable achievement for MOA.

To encourage more Orthopaedic Surgeons to take up research activities, the MOA has recently formed a research committee that looks into the possibilities of providing technical and financial support for research projects, especially for members not attached to any teaching institutions.

With just less than 20 members in the 1960s and a slow increment to 40 in the 1970s, the membership of MOA grew to 300 in 2003. Currently, it has a total of over 739 members of which 327 are life members. In line with the association's vision and mission, the MOA is planning ahead for the next decade. In 2016, the first Leadership Congress was organized in Colmar Tropicale, Bukit Tinggi, Pahang. Many past presidents, senior and junior members of the association participated in congress. It was a great platform for the members to network, exchange thoughts and build a relationship that strengthens the MOA fraternity, identity and the future of our field. One of the main matters that were discussed in the congress was MOA's role and involvement in orthopaedic education in the country.

For 50 years, MOA has evolved from a society that organize social and scientific gatherings to a society that has become the voice of Orthopaedic fraternity in Malaysia and the region.

With increasing number of Orthopaedic Surgeons, expansion and advancement of Orthopaedic services in the country, MOA will need to strengthen and grow in accordance with our peers in the rest of the world in order to face challenges in years to come.

For 50 years, MOA has evolved from a society that organize social and scientific gatherings to a society that has become the voice of Orthopaedic fraternity in Malaysia and the region.

First home of MOA in the old Academy Medicine Building, Jalan Foley Barat, Kuala Lumpur

Second home of MOA in Academy of Medicine Building, Jalan Tun Razak, Kuala Lumpur

Council Members 2004-2005

Council Members 2005-2006

Council Members 2007-2008

Council Members 2015-2016

Council Members 2001- 2002

Council Members 2016 - 2017


MASTERS OF
PROGRAM IN PRIV


42nd Malaysian Orthopaedic Association
Annual General Meeting /
Annual Scientific Meeting


45th
MALAYSIAN ORTHOPAEDIC ASSOCIATION
ANNUAL SCIENTIFIC MEETING
2015

MOA Leadership Congress held in February 2016. Many of the past presidents attended the meeting and are seated in the front.

MOA Past Presidents in Colmar Bukit Tinggi, February 2016

MOA in Golden Jubilee Night of Academy of Medicine Malaysia
August 2016

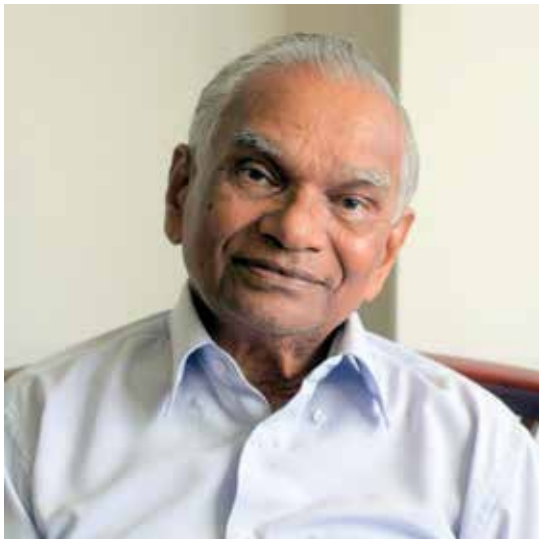
CHAPTER 5.0

The Founding Members

Tan Sri Dr Abdul Majid Ismail

Prof Dr Joseph Francis Silva

Dr Pretam Singh



Prof Dr P. Balasubramaniam

Prof Dr Subir Sengupta

Prof Dr Quazi Mohammed Iqbal

Dr K. Thambyrajah

Dr Arumugam Selvaratnam

Dato' Dr Mahmood Merican

I came back at the end of 1966 to Kuala Lumpur, and at that time, there were only Tan Sri Dr [Abdul Majid] Ismail, Dr Pretam Singh and myself who were qualified Orthopaedic Surgeons in the government service. But the university had just been started, and they had actually about 5 Orthopaedic Surgeons including Professor J. F. Silva. You might say with the handful of Orthopaedic Surgeons, we were very active... form[ing] the Orthopaedic association and we even held quite large international meetings where Orthopaedic Surgeons came from the region. It built up very quickly.

Dato' Dr Mahmood Merican, Founding Member of the MOA, on the beginnings of the association.

CHAPTER 6.0

MOA Past Presidents and Office Bearers

1967 - 1982
Tan Sri Dr Abdul Majid Ismail

1982 - 1983
Dr Khaw Joo Hua

1983 - 1985
Dato' Dr Mahmood Merican

1985 - 1987
Datuk Dr M. Sivanantham

1987 - 1989
Dr Eddie Soo

1989 - 1991
Dato' Dr Abdul Hamid Abdul Kadir

1991 - 1993
Dato' Dr K.S. Sivananthan

1993 - 1994
Prof Dr Subir Sengupta

1994 - 1995
Datuk Dr Yeoh Poh Hong

1995 - 1996
Dr N. Subramaniam

1996 - 1997
Dr Easaw Thomas

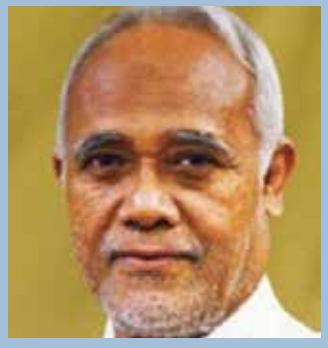
1997 - 1998
Prof Dato' Dr Mohammad Abdul Razak

1998 - 1999
Dato' Dr Shong Hing Kock

1999 - 2000
Dato' Dr Muhammad Borhan Tan

2000 - 2001
Dr David Choon Siew Kit

2001 - 2002
Prof Dr Sharaf Ibrahim



2002 - 2003
Prof Dr Zulmi Wan

2003 - 2004
Dato' Dr Syed Abdul Latiff Alsagoff

2004 - 2005
Prof Dr Saw Aik

2005 - 2006
Dr G. Ruslan Nazaruddin Simanjuntak

2006 - 2007
Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

2006 - 2007
Dr Jamal Azmi Mohamad

2008 - 2009
Dr Robert Penafort

2009 - 2010
Dr Abdul Malek Hussein

2010 - 2011
Dato' Sri Dr Zulkharnain Ismail

2011 - 2012
Prof Dr Mohammad Hassan Shukur

2012 - 2013
Dr Faris Kamaruddin

2013 - 2014
Dr Gobinder Singh

2014 - 2015
Prof Dr Azlina Amir Abbas

2015 - 2016
Dato' Dr Badrul Shah Badaruddin

Past Presidents and Office Bearers

YEAR	PRESIDENT
1967 - 1982	Tan Sri Dr Abdul Majid Ismail
1982 - 1983	Dr Khaw Joo Hua
1983 - 1985	Dato' Dr Mahmood Merican
1985/1986 & 1986/1987	Datuk Dr M. Sivanantham
1987/1988 & 1988/1989	Dr Eddie Soo
1989/1990 & 1990/1991	Dato' Dr Abdul Hamid Abdul Kadir
1991/1992 & 1992/1993	Dato' Dr K.S. Sivananthan
1993/1994	Prof Dr Subir Sengupta
1994/1995	Datuk Dr Yeoh Poh Hong
1995/1996	Dr N. Subramaniam
1996/1997	Dr Easaw Thomas
1997/1998	Prof Dato' Dr Mohammad Abdul Razak
1998/1999	Dato' Dr Shong Hing Kock
1999/2000	Dato' Dr Muhammad Borhan Tan
2000/2001	Dr David Choon Siew Kit
2001/2002	Prof Dr Sharaf Ibrahim
2002/2003	Prof Dr Zulmi Wan
2003/2004	Dato' Dr Syed Abdul Latiff Alsagoff
2004/2005	Prof Dr Saw Aik
2005/2006	Dr G. Ruslan Nazaruddin Simanjuntak
2006/2007	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya
2007/2008	Dr Jamal Azmi Mohamad
2008/2009	Dr Robert Penafort
2009/2010	Dr Abdul Malik Hussein
2010/2011	Dato' Sri Dr Zulkharnain Ismail
2011/2012	Prof Dr Mohammad Hassan Shukur
2012/2013	Dr Faris Kamaruddin
2013/2014	Dr Gobinder Singh
2014/2015	Prof Dr Azlina Amir Abbas
2015/2016	Dato' Dr Badrul Shah Badaruddin
2016/2017	Dato' Dr Azmi Baharudin

YEAR	PRESIDENT ELECT
2001/2002	Prof Dr Zulmi Wan
2002/2003	Dato' Dr Syed Abdul Latiff Alsagoff
2003/2004	Prof Dr Saw Aik
2004/2005	Dr G. Ruslan Nazaruddin Simanjuntak
2005/2006	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya
2006/2007	Dr Jamal Azmi Mohamad
2007/2008	Dr Robert Penafort
2008/2009	Dr Abdul Malik Hussein
2009/2010	Dato' Sri Dr Zulkharnain Ismail
2010/2011	Prof Dr Mohammad Hassan Shukur
2011/2012	Dr Faris Kamaruddin
2012/2013	Dr Gobinder Singh
2013/2014	Prof Dr Azlina Amir Abbas
2014/2015	Dato' Dr Badrul Shah Badaruddin
2015/2016	Dato' Dr Azmi Baharudin
2016/2017	Prof Dr Wan Faisham Nu'man Wan Ismail

YEAR	IMMEDIATE PAST PRESIDENT
2001/2002	Dr David Choon Siew Kit
2002/2003	Prof Dr Sharaf Ibrahim
2003/2004	Prof Dr Zulmi Wan
2004/2005	Dato' Dr Syed Abdul Latiff Alsagoff
2005/2006	Prof Dr Saw Aik
2006/2007	Dr G. Ruslan Nazaruddin Simanjuntak

2007/2008	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya
2008/2009	Dr Jamal Azmi Mohamad
2009/2010	Dr Robert Penafort
2010/2011	Dr Abdul Malik Hussein
2011/2012	Dato' Sri Dr Zulkharnain Ismail
2012/2013	Prof Dr Mohammad Hassan Shukur
2013/2014	Dr Faris Kamaruddin
2014/2015	Dr Gobinder Singh
2015/2016	Prof Dr Azlina Amir Abbas
2016/2017	Dato' Dr Badrul Shah Badaruddin

YEAR	HONORARY SECRETARY
2001/2002	Prof Dr Saw Aik
2002/2003	Dato' Dr R. Ramanathan
2003/2004	Dr G. Ruslan Nazaruddin Simanjuntak
2004/2005	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya
2005/2006	Dr Jamal Azmi Mohamad
2006/2007	Dr Wong Chung Chek
2007/2008	Dato' Sri Dr Zulkharnain Ismail
2008/2009	Dato' Sri Dr Zulkharnain Ismail
2009/2010	Prof Dr Sharifah Roohi Syed Waseem Ahmad
2010/2011	Prof Dr Azhar Merican
2011/2012	Dr Ewe Teong Wan
2012/2013	Prof Dr Azlina Amir Abbas
2013/2014	Dato' Dr Badrul Shah Badaruddin
2014/2015	Dato' Dr Azmi Baharudin
2015/2016	Prof Dr Wan Faisham Nu'man Wan Ismail
2016/2017	Dr Azhar Merican

YEAR	HONORARY TREASURER
2001/2002	Dato' Dr Syed Abdul Latiff Alsagoff
2002/2003	Dr Mohd Ezlan Sidique
2003/2004	Dr Shahril Mohd Yusof
2004/2005	Dr Jamal Azmi Mohamad
2005/2006	Dr Wong Chung Chek
2006/2007	Dr Robert Penafort
2007/2008	Dr Mohd Iskandar Mohd Amin
2008/2009	Dr Shahril Mohd Yusof
2009/2010	Prof Dr Azhar Merican
2010/2011	Dato' Dr Badrul Shah Badaruddin
2011/2012	Dr Gobinder Singh
2012/2013	Dato' Dr Zamyn Zuki
2013/2014	Dato' Dr Azmi Baharudin
2014/2015	Prof Dr Wan Faisham Nu'man Wan Ismail
2015/2016	Dr Saadon Ibrahim
2016/2017	Dr Mohamad Yazid Din

YEAR	HONORARY EDITORIAL SECRETARY
2001/2002	Dr Harwant Singh
2002/2003	Prof Dr Subir Sengupta
2003/2004	Prof Dr Subir Sengupta
2004/2005	Prof Dr Mohammad Hassan Shukur
2005/2006	Prof Dr Mohammad Hassan Shukur
2006/2007	Prof Dr Saw Aik
2007/2008	Prof Dr Saw Aik
2008/2009	Prof Dr Saw Aik
2009/2010	Prof Dr Saw Aik
2010/2011	Prof Dr Saw Aik
2011/2012	Prof Dr Saw Aik
2012/2013	Prof Dr Saw Aik
2013/2014	Prof Dr Saw Aik
2014/2015	Prof Dr Sharifah Roohi Syed Waseem Ahmad
2015/2016	Dr Chye Ping Ching
2016/2017	Dr Chye Ping Ching

YEAR	COMMITTEE MEMBER 1
2001/2002	Dr Mohd Ezlan Sidique
2002/2003	Prof Dr Saw Aik
2003/2004	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya
2004/2005	Dr Lim Heng Hing
2005/2006	Dr Robert Penafort
2006/2007	Prof Dr Sharifah Roohi Syed Waseem Ahmad
2007/2008	Prof Dr Kwan Mun Keong
2008/2009	Dr Faris Kamaruddin
2009/2010	Prof Dr Azlina Amir Abbas
2010/2011	Prof Dr Azlina Amir Abbas
2011/2012	Dato' Dr Zamyn Zuki
2012/2013	Assoc Prof Dr Mohamed Razif Mohamed Ali
2013/2014	Datuk Dr Mohd Asri Abd Ghapar
2014/2015	Dr Chan Chee Ken
2015/2016	Dr Chan Chee Ken
2016/2017	Datuk Dr Mohd Asri Abd Ghapar

YEAR	COMMITTEE MEMBER 2
2001/2002	Dato' Dr Ramli Baba
2002/2003	Dr Robert Penafort
2003/2004	Dr Chan Kin Yuen
2004/2005	Dr Wong Chung Chek
2005/2006	Dr Tan Kok Keong
2006/2007	Dato' Sri Dr Zulkharnain Ismail
2007/2008	Dr Rosman Md Idrus
2008/2009	Prof Dr Wan Faisham Nu'man Wan Ismail
2009/2010	Prof Dr Ahmad Hafiz Zulkifly
2010/2011	Dr Gobinder Singh
2011/2012	Dato' Dr Azmi Baharudin
2012/2013	Dato' Dr Azmi Baharudin
2013/2014	Assoc Prof Dr Ng Wuey Min
2014/2015	Dr Saadon Ibrahim
2015/2016	Dr Mohd Fairuz Suhaimi
2016/2017	Assoc Prof Dr Abdul Halim Abd Rashid

YEAR	POSITION - NOT AVAILABLE
1985/1986 & 1986/1987	Dr Eddie Soo
	Dato' Dr Mahmood Merican
	Dr Vaikunthan Rajaratnam
	Dr Low En Huat
	Dr N Subramaniam
	Dr Thambiraj
	Dr Zulraini Dato' Shaari
1987/1988 & 1988/1989	Dr Lau Chun Cheung
	Dr Low En Huat
	Dr Zulraini Dato' Shaari
	Dato' Dr Charles Vijayan David
	Dato' Dr K.S. Sivananthan
	Prof Dr Subir Sengupta
	Dato' Dr Ali Noor Ghani
1989/1990 & 1990/1991	Dr Eddie Soo
	Dr N. Subramaniam
	Dato' Dr K.S. Sivananthan
	Dr Jamaluddin Mohd
	Dato' Dr Ali Noor Ghani
	Dr Sarwan Singh
	Dato' Dr Shong Hing Kock
1991/1992 & 1992/1993	Prof Dr Subir Sengupta
	Dr Sunthralingam
	Prof Dr Sharaf Ibrahim
	Dr K. Raveendran
	Dr Jamaluddin Mohd

	Dato' Dr Ali Noor Ghani
	Dato' Dr Abdul Hamid Abdul Kadir
1993/1994	Datuk Dr Yeoh Poh Hong
	Prof Dr Sharaf Ibrahim
	Dato' Dr Syed Abdul Latiff Alsagoff
	Dr David Choon Siew Kit
	Dato' Dr Abdul Wahab Ghani
	Dato' Dr K.S. Sivananthan
	Dr Easaw Thomas
1994/1995	Prof Dr Subir Sengupta
	Dr N. Subramaniam
	Prof Dato' Dr Mohammad Abdul Razak
	Dato' Dr Syed Abdul Latiff Alsagoff
	Dr David Choon Siew Kit
	Dr John Leong Yew Hong
	Dato' Dr Shong Hing Kock
1995/1996	Datuk Dr Yeoh Poh Hong
	Dr Easaw Thomas
	Prof Dato' Dr Mohammad Abdul Razak
	Dr David Choon Siew Kit
	Dr Aaron Lim
	Dato' Dr Abdul Wahab Ghani
	Dr R. Balakrishnan
1996/1997	Prof Dato' Dr Mohammad Abdul Razak
	Datuk Dr Yeoh Poh Hong
	Dato' Dr Syed Abdul Latiff Alsagoff
	Dr Palasena Chidambar Anand
	Dato' Dr K.S. Sivananthan
	Dr Ramanathan Rasiah
	Prof Dr Zulmi Wan
1997/1998	Datuk Dr Yeoh Poh Hong
	Dato' Dr Shong Hing Kock
	Dr Palasena Chidambar Anand
	Dato' Dr K.S. Sivananthan
	Dr Ramanathan Rasiah
	Dr Hyzan Mohd Yusof
	Dato' Dr Syed Abdul Latiff Alsagoff
1998/1999	Dato' Dr Muhammad Borhan Tan
	Prof Dato' Dr Mohammad Abdul Razak
	Dr Hyzan Mohd Yusof
	Prof Dr Saw Aik
	Dr Palasena Chidambar Anand
	Dr Jamal Azmi Mohamad
	Dato' Dr K.S. Sivananthan
1999/2000	Prof Dr Sharaf Ibrahim
	Prof Dr Saw Aik
	Dato' Dr Shong Hing Kock
	Dr Eddie Soo
	Dato' Dr K.S. Sivananthan
	Dr G. Ruslan Nazaruddin Simanjuntak
2000/2001	Dato' Dr Muhammad Borhan Tan
	Dr Ramanathan Rasiah
	Prof Dr Sharaf Ibrahim
	Dr G. Ruslan Nazaruddin Simanjuntak
	Dato' Dr K.S. Sivananthan
	Prof Dr Pan Kok Long
	Dr Eddie Soo

CHAPTER 7.0

History of Orthopaedics in Ministry of Health (MOH) Malaysia

Dr Mohammad Anwar Hau Abdullah

The Orthopaedic services in Malaysia began shortly after the Second World War (1939-1945). The service was started by JAP Cameron of British Colonial Service in GHKL. Subsequently, in 1958, our very first local Malaysian Orthopaedic Surgeon; Tan Sri Dr Abdul Majid Ismail was appointed to the post of Chief Orthopaedic Surgeon of the Federation of Malaysia. Since then, the Orthopaedic services in our country has changed, developed and evolved rapidly with tremendous achievements in many aspects.

Development and achievement:

(i) Strength

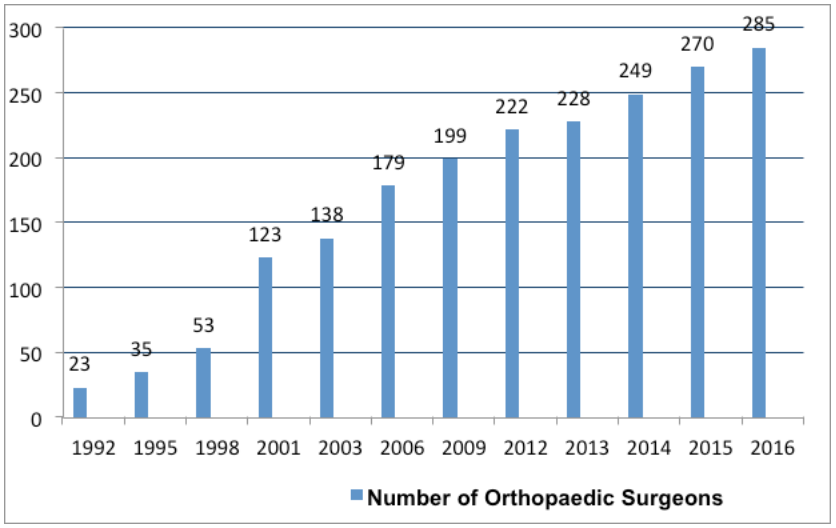
(a) Number of Orthopaedic Surgeons serving MOH hospitals:

The number of Orthopaedic Surgeons in MOH has increased rapidly in the past 3 decades since the beginning of the local Masters in Orthopaedics program in 1981. The increment is more obvious in 2001 with the implementation of the Open System in the Master program (distant learning; PJJ) since 1996. Currently, there are around 300 Orthopaedic Surgeons serving the MOH hospitals throughout the country.

(b) Number of MOH hospitals with resident Orthopaedic Surgeons:

In its reach-out policy to provide better and higher quality of care, the Orthopaedic services have also been rapidly expanded. Currently, there are 52 hospitals throughout the country providing 24- hour Orthopaedic services.

Through the implementation of the networking concept nationwide; the coverage of Orthopaedic services has expanded greatly. Surgeons regularly visit and even perform surgeries in remote hospitals; such as Kota Belud, Tenom, Kunak and Semporna in Sabah, M'salam, Lundu, Kapit, Marudi, Betong, Mukah in Sarawak.



MOH Hospitals With Resident Orthopaedic Surgeons

STATE	HOSPITAL
Perlis	Tuanku Fauziah, Kangar
Kedah	Sultanah Bahiyah, Alor Setar Langkawi Sultan Abdul Halim, Sg Petani, Kulim
Pulau Pinang	Pulau Pinang Seberang Jaya
Perak	Raja Permaisuri Bainun, Ipoh Taiping Sri Manjung Teluk Intan Slim River
Selangor	Selayang Sg. Buloh Tengku Ampuan Rahimah Klang Serdang Kajang Banting Shah Alam Ampang
Negeri Sembilan	Tuanku Ja'afar Seremban Kuala Pilah Port Dickson
Melaka	Melaka
Wilayah Persekutuan	Kuala Lumpur Putrajaya Labuan

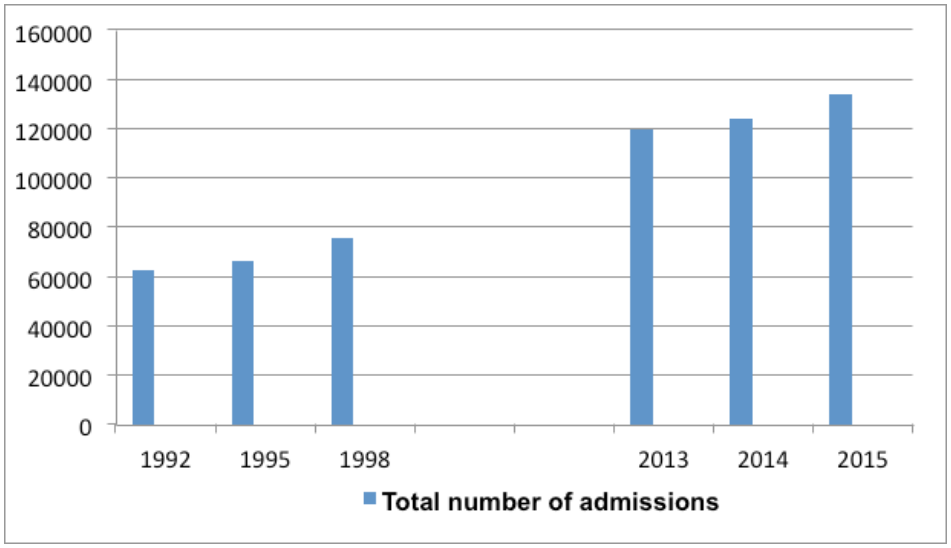
STATE	HOSPITAL
Johor	Sultanah Aminah Johor Bharu Sultan Ismail, Pandan Johor Bharu Sultanah Fatimah Muar Enche' Besar Hajjah Khalsom, Kluang Sultanah Nora, Batu Pahat Segamat
Pahang	Tengku Ampuan Afzan, Kuantan Sultan Hj Ahmad Shah, Temerloh Kuala Lipis
Terengganu	Sultanah Nur Zahirah, Kuala Trengganu Kemaman
Kelantan	Raja Perempuan Zainab II, Kota Bharu Kuala Krai Tanah Merah
Sarawak	Umum Kuching Sarawak Bintulu Sibu Miri Sarikei
Sabah	Queen Elizabeth Likas Tawau Keningau Sandakan Lahat Datu

(ii) Workload:

Our population has almost doubled between 1992 and 2015 (18 million in 1990; 21 million in 2000; 25 million in 2006; 30 million in 2015). This is in addition to the increase in foreign workers (more than 1 million) which has increased the patient load significantly.

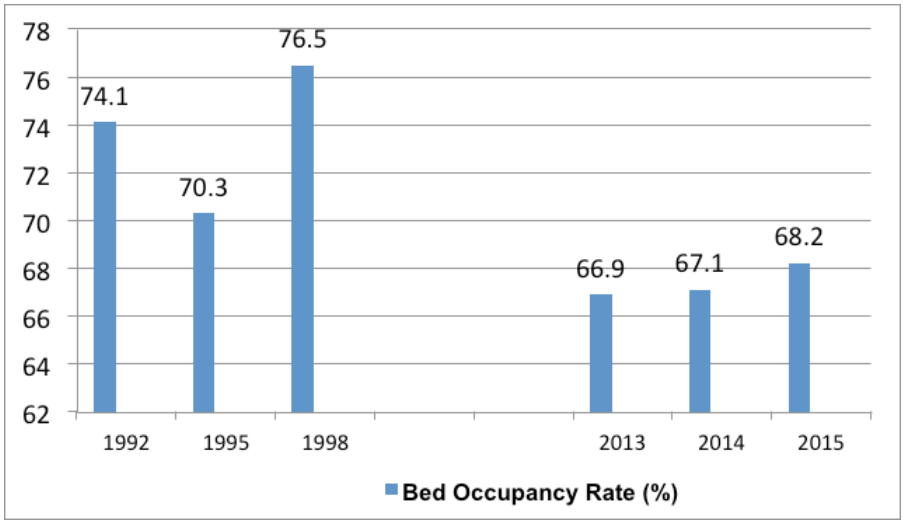
(a) Total number of admission into Orthopaedic Wards:

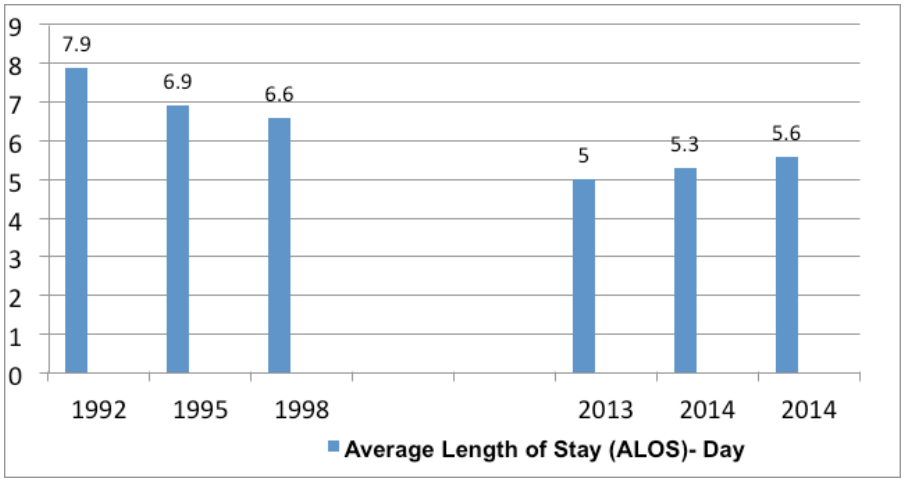
The total no of admission has almost doubled between 1995 and 2015.



(b) Bed Occupancy Rate (BOR) and Average Length Of Stay (ALOS):

The BOR in 2013, 2014 and 2015 were all below 70%, lower than in the 1990s. Likewise, ALOS was also shorter in 2013, 2014 and 2015 when compared with ALOS in the 90s. This could be due to increase in the number of hospitals providing Orthopaedic services, improved Operating Theatre operating times, advancement in surgical technologies and techniques, expansion of medical and health services (numbers of doctors/ specialists in all disciplines). Furthermore, the practice of net-working in all states has also reduced the overall BOR as well as the ALOS.


78
76
74
72
70
68
66
64
62
74.1
70.3
76.5
66.9
67.1
68.2
1992
1995
1998
2013
2014
2015
Bed Occupancy Rate (%)


9
8
7
6
5
4
3
2
1
0
7.9
6.9
6.6
5
5.3
5.6
1992
1995
1998
2013
2014
2014
Average Length of Stay (ALOS)- Day

(c) Number of patients seen in Orthopaedic out-patient clinic:

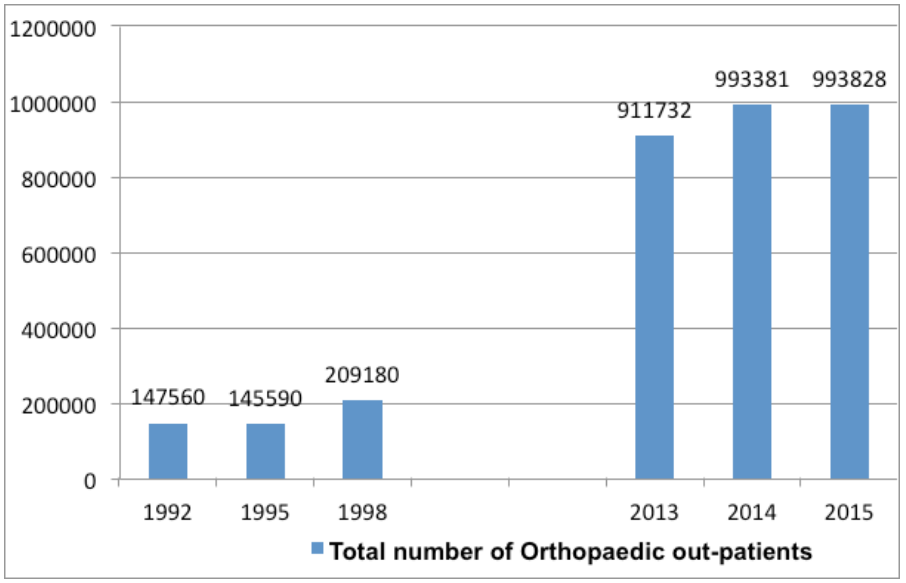
The total number of patients seen in Orthopaedic out-patient clinics throughout the country has increased many fold between 1992 and 2015.

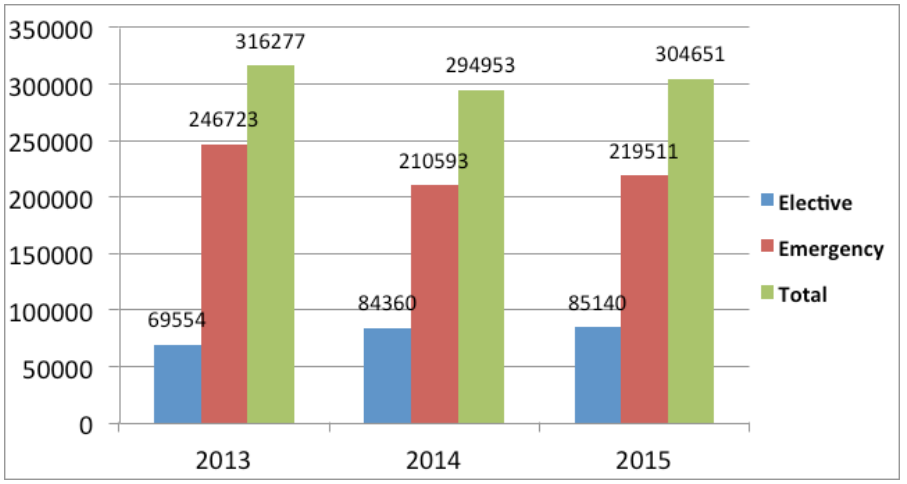
(d) Number of Orthopaedic operation:

In the year 2013 – 2015, there were around 300,000 to 310,000 Orthopaedic surgeries performed annually.

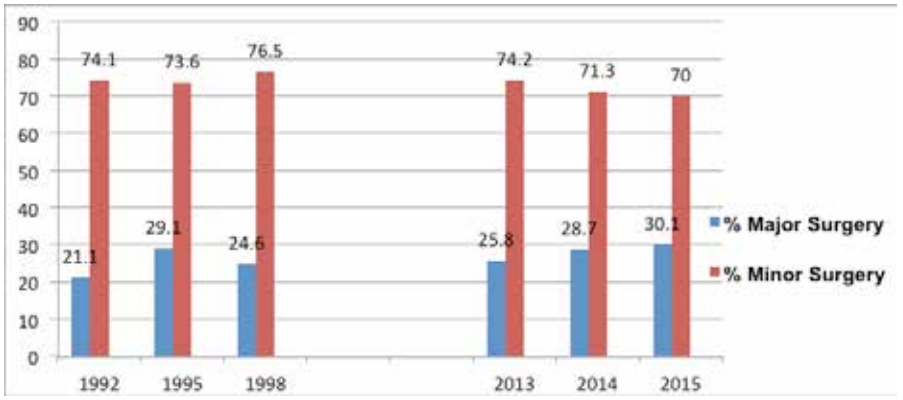
The "Fee Ordinance 195: Akta : Fees Act 1951 - Fees (Medical) (Amendment) Order 1994 [PU(A)5/1994], classifies all surgical procedures under six groups (A to F) depending on the complexity of the surgeries.

Overall, there were slightly higher percentages of major surgeries being performed in 2013 – 2015 as compared to 1990s. This is partly due to the present of more Orthopaedic Surgeons and also subspecialists in various fields.





Orthopaedic Surgeries performed annually in Malaysia



Breakdown of major and minor Orthopaedic Surgeries being performed in Malaysia

(iii) Orthopaedic subspecialty programme and service:

The objectives of the Orthopaedic Subspecialty Fellowship Programme are:

a. To produce competent and safe Orthopaedic and Traumatology Subspecialists capable of independent practice.

b. To further improve the quality and standards of Orthopaedics and Traumatology in the country.

c. To enhance the accessibility of care to the public.

d. To provide additional career pathways for the Orthopaedic Surgeons.

The program kick-started in 2005 involving 8 subspecialty areas; namely Advanced Trauma, Spine, Arthroplasty, Upper Limb and Microsurgery, Arthroscopy and Sport Injury, Pediatrics Orthopaedic, Orthopaedic Oncology and Foot and Ankle.

Besides the accredited trainers from various MOH hospitals, the program also involved trainers from local public universities as well as Military hospitals. The candidates are also encouraged to undergo a one year overseas training Fellowship in their respective fields.

From 2005 till 30th June 2017 the program has managed to produce around 55 subspecialists in various fields.

Number of Subspecialists produced

	SUBSPECIALTY	NO.
1	Arthroplasty	**10**
2	Paediatric Orthopaedic	**5**
3	Arthroscopy and Sports Surgery	**8**
4	Spine	**14**
5	Upper Limb and Microsurgery	**3**
6	Advanced Trauma	**5**
7	Foot and Ankle	**4**
8	Orthopaedic Oncology	**4**
Total	**Total**	**53**

Future of Orthopaedic service in the Ministry of Health Malaysia.

(a) **Parallel Program:**

There are currently 18 MOH accredited training hospitals. Likewise, many MOH senior Orthopaedic Surgeons are appointed as candidate supervisors or program coordinators.

To achieve the status of a developed nation, Malaysia requires 1500 specialists. The MOH is working on a Parallel Program to further leverage on its large patient base and expertise towards this goal.

(b) **Subspecialty Service:**

The Subspecialty Fellowship Program was started in 2005 to enhance the quality and expertise of care given. These subspecialists are placed strategically throughout the country every year according to the MOH National Orthopaedic Strategic Planning.

(c) **Evidence Based Practice:**

The practice of evidence based medicine and a reliable standard of care will improve the outcomes for all patients.

Thus, it is time we look into National Orthopaedic registries in various areas, Consensus Guidelines as well as Clinical Practice Guidelines.

(d) **Future Challenges:**

As our country achieves developed nation status, the health services in Ministry of Health generally and Orthopaedic services specifically, need to be ready to face the following challenges:

(i) Aging population with increasing number of osteoporotic fractures and Orthopaedic related geriatric illnesses/conditions such as cancer and bone metastasis.

(ii) Rapid increase in the prevalence of diabetes (17.5% in 2015), which could lead to prolonged care for diabetic related complications.

(iii) Re-emergence of tuberculosis with increasing musculoskeletal and spine tuberculosis.

(iv) Increasing number of motor vehicle accidents as well as industrial accidents with more complex musculoskeletal injuries.

(v) Worrying trend of emerging antibiotic resistant bacterial infections.

Words of thanks:

We must thank all levels of the Ministry of Health whether they be from the past, present or future for their dedication and commitment in ensuring the quality and standard of Orthopaedic services in Ministry of Health Malaysia are of a high, trustable and respectable level.

References

1. Abdullah, R. (1992). Background paper on demographic trends and implications for a sustainable population and environment in Malaysia. Malaysian National Conservation Strategy, Economic Planning Unit, Prime Minister's Department.
2. Department of Statistics Malaysia. (2016). Synopsis on population and demography.
3. Tan, M. B. (2000). Orthopaedic services in government hospitals in Malaysia.

Acknowledgements

Dato' Sri Dr N. Premchandran, Dato Dr Zulkiflee Osman, Dato' Dr Fazir Mohamad, Dr Aliza Idris (Bahagian Perkembangan Perubatan, Kementerian Kesihatan Malaysia).

Dato' Dr Muhammad Borhan Tan, the Head of the Institute of Orthopaedic & Traumatology, Hospital Kuala Lumpur with his specialists in 1998.

CHAPTER 8.0

Orthopaedic Subspecialties

CHAPTER 8.01

Trauma

Dato' Dr Abdul Rauf Ahmad

The Orthopaedic services in Malaysia started at Kuala Lumpur General Hospital around 1949 and the first head of the orthopaedic service was Dr J.A.P. Cameron, a general surgeon with Master Ch. Orth. (Liverpool), England and he was later succeeded by Dr O'Malley in 1952. In 1955 Dr Donald Gunn became the next head of department. In 1957 a new era began whereby a Malaysian became the first head of Orthopaedic Department. He was Tan Sri Dr Abdul Majid Ismail who was the first local to obtain the Master Ch. Orth. from Liverpool, England. He was fondly known as 'Coco Majid'. The Orthopaedic service started off as part of the General Surgery service mainly to manage trauma cases and some deformity cases such as shortening of the lower limbs, CTEV and other some congenital abnormalities where treatment mainly was non-operative.

The services progressed and expanded after independence in 1957. As development progressed, motorvehicle accident cases also increased. It created huge challenges to fracture management for the General Orthopaedic Surgeon. With the increasing number of hospitals in Malaysia, there is a need for Orthopaedic Surgeons to master the treatment of the complex fracture cases.

AO foundation was formed in 1958 in Biel, Switzerland. This foundation has set the standard care of fracture management internationally. It has expanded all over the world including Malaysia. The first AO course in Malaysia was in 1988. It was organized at Kuala Lumpur General Hospital. Until 2016, there were 18 principle courses has organised in Malaysia. The participants were mainly postgraduate candidates from Malaysia and neighbouring

countries. The AO Trauma had also conducted courses for operating room personnels (ORP) so that they are familiar with the AO concept of trauma management.

All AO courses were jointly conducted by MOA and AO organization. The AO and MOA had also conducted specialty courses like Pelvic Acetabulum, Minimally Invasive Osteosynthesis (MIO) and Foot and Ankle Trauma in keeping with the subspecialty advances.

In early 1990's Prof Dr Catagni from Lecco, Italy first came to Malaysia to conduct Illizarov courses and received tremendous response from the Orthopaedic Surgeons especially the young surgeons who faced big number of trauma cases which developed complications of non-unions and mal-unions. Among the local surgeons that were committed to use Ilizarov principles were Prof Dr Saw Aik, Dato' Dr Thirumal Manickam, Dr Mohd Basir Towil and Dr Chua Yeok Pin.

The first Association for the Study and Application of the Methods of Ilizarov (ASAMI) course was conducted at Hospital Tengku Ampuan Rahimah Klang in 2006 and the

Prof Dr Maurizio Catagni

Taylor Spatial Frame

Illizarov Frame

Illizarov Course in Miri, Sarawak, April 2015 with Dato' Dr Thirumal Manickam

Illizarov Course with Live Surgery, Kuala Terengganu, December 2015 with Dr Mohd Basir Towil

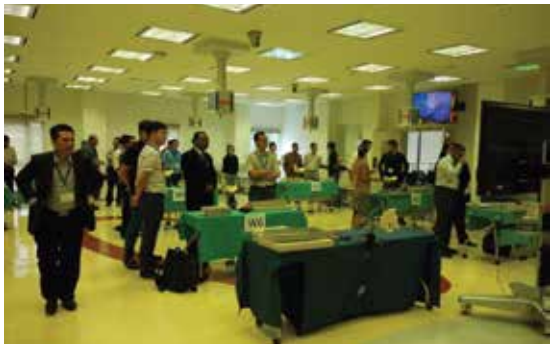
first deformity course was held at the University of Malaya by Prof Dr Saw Aik, also in 2006. It provided a platform for the young Orthopaedic Surgeons to gain knowledge related to treatment of limb deformity providing basic science, principle and technique of treatment using Illizarov apparatus and Illizarov-like apparatus, such as Taylor Spatial Frame. The discipline of deformity correction has now been named Limb Lengthening Reconstruction Surgery (LLRS).

In 2004, Dr Seto Boon Chong ,the head of National Orthopaedic Service then, established Orthopaedic Subspecialties, comprising of Spine, Arthroplasty, Sports Surgery, Paediaric Orthopaedics, Orthopaedic Oncology, Hand and Upper Limb Microsurgery and Advanced Trauma. In 2009, Foot and Ankle subspecialty was included.

The Advanced Trauma subspecialty was established by Dato' Dr Thirumal Manickam, Dato' Dr Abdul Rauf Ahmad, Dr Mohd Basir Towil, Dr Sivapathasundaram and Dr Thevarajan. The first intake for Advanced Trauma trainees was in 2006.

The first course in Pelvic Trauma was held at HUKM in 2004 with speakers from the Chinese University of Hong Kong (Prof Dr John Leong) and from University of Hamburg, Germany (Prof Dr Rueger). The second Pelvic Trauma Course was held in USM (2012), followed by the first National Basic Pelvic Trauma Course at Hospital Sultanah Bahayah Alor Star in 2014. The first AO Pelvic Cadaveric Workshop was held in August 2015 at UKM. Currently only one centre in Malaysia is accredited for pelvic trauma training by the MOH that is the Hospital Tuanku Jaafar Seremban, Negeri Sembilan with Dato' Dr Abdul Rauf Ahmad as the only trainer for Pelvic Trauma Injury in MOH.

The Advanced Musculoskeletal Trauma subspecialty of MOH is unique because it combines two unrelated subspecialties of LLRS and Pelvic Trauma. It is unknown up to date whether there is such subspecialty discipline elsewhere in the world. It is also our ambition that one day we will become the regional training centres for this unique Advance Musculoskeletal Trauma subspecialty.



First Malaysia AO Pelvic Trauma Course with Anatomical Specimen at HUKM, 10 August 2015

Cadaveric session

AO Pelvic Teaching Faculty Members; from front left:
Dr Khong Kok Sun,
Prof Dr Ramesh Sen,
Dr Mark Riley,
Dr Rodrigo Persantez,
Dato' Dr Abdul Rauf Ahmad,
Dr Hyzan Mohd Yusof.

Back from behind left:
Dr Avtar Singh,
Dr Mahendran Subramaniam,
Dr Ahmad Salehuddin,
Dr Ramesh Naidu,
Prof Dr Wan Faisham Nu'man Wan Ismail,
Dr Ashraf Hakim and
Assoc Prof Dr Abdul Halim Abd Rashid.

First Malaysian AO Pelvic Trauma Symposium Participants, 2015 at HUKM

CHAPTER 8.02

Joint Replacement Surgery (Arthroplasty)

Dr G. Ruslan Nazaruddin Simanjuntak and Dr Jamal Azmi Mohamad

The field of modern arthroplasty began in the 1960's. In United Kingdom, Sir Dr John Charnley introduced the low friction Total Hip Replacement (THR) while Dr John Insall and Dr A.H. Burstein developed Total Knee Replacement (TKR) in the United States of America. Since then, there have been many developments in these arthroplasty implants by various surgeons. These developments evolved throughout the world and finally developed in Malaysia in the early 80's.

It started with the hospitals in Klang Valley, the General Hospital Kuala Lumpur and University Malaya Hospital. The first THR was done by Dr Thomas Verghese in GHKL. It was Howse (mono block) Hip Replacement. It was a catastrophic THR, whereby it has survival rate of 42% in 10 years.

Among the earlier surgeons who performed THR in the country were Prof Dr P. Balasubramaniam, Dr Lopez Jaya Mohan, Dato' Dr K.S. Sivananthan and Prof Dr K.S. Dhillon. In the early 80's different types of THR were introduced, such as the Charnley Low Friction Arthroplasty system and the Isoelastic stem THR. Later on, uncemented THR of various designs has been introduced to the country and been used successfully by many local surgeons.

There were 109 THR implanted in 89 patients in General Hospital Kuala Lumpur (GHKL) between 1987 to1996 by various surgeons. 60.5% were Charnley hip. There were many complications, with 13.8% requiring revision, with 5 years' survival rate of 87.5%. This is the first outcome study about THR in Malaysia.

The first TKR in Malaysia was done in 1982 by Prof Dr P. Balasubramaniam in University Hospital Kuala Lumpur using Rotaglide knee. In 1984, Dr Lopez J. Mohan conducted 3 Rotaglide TKR. In 1985, Total Condylar Knee (IB1) was first implanted in Malaysia by Prof Dr K.S. Dhillon and more

surgeries had been done since then. Mid-term results of the series was reviewed and published in 1993. It was the first outcome study in TKR. There were 100 knee replacements performed between 1986 till 1992 in 69 patients with 78% good to excellent result.

The mid-80's was the early learning period for senior surgeons. There were varieties of implants for THR and TKR. There were major implant failures especially isoelastic stem THR, Rotaglide TKR, Whiteside Ortholoc.

In the beginning, TKR and THR were done mainly in Klang Valley hospitals. The first Joint Replacement Unit was set up in 1995 in HKL by Dr Lee Chong Meng. Subsequently, almost all state hospitals and private hospitals are performing these procedures. Many world-renowned arthroplasty surgeons, such as Dr C. Ranawat, Dr Hugh Cameroon and Dr Robin Link have come to Malaysia to share their knowledge and experience. In 2003, IIUM and Kuantan Hospital started to organise the Basic Arthroplasty Course, which is held annually till today. This course is for aspiring junior surgeons and also helps prepare them for their Postgraduate examinations.

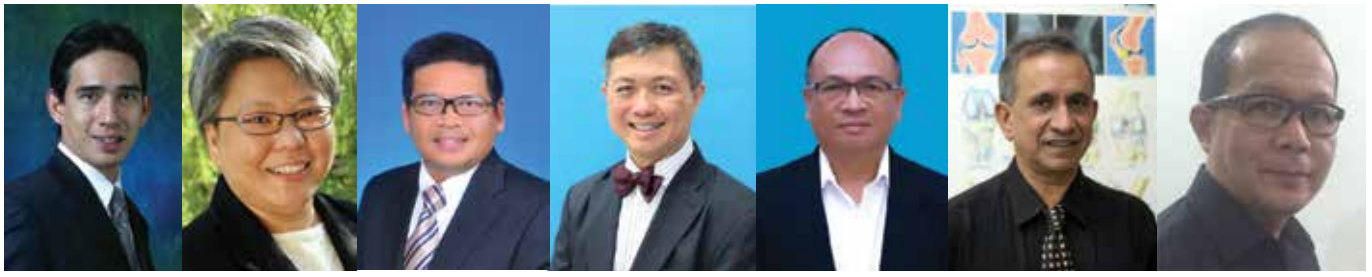
On 18th April 2004, the Arthroplasty Interest Group (AIG) was founded by Dr G. Ruslan Nazaruddin Simanjuntak and Dr Jamal Azmi Mohamad and the 1st meeting was held in Langkawi. The following year, it was recognised as one of the subspecialty interest group in MOA. Various courses have been held by MOA and AIG to further improve Joint Replacement surgeries in Malaysia.

Since the 2000s, there have been many papers published by Malaysian surgeons in both local and international journals. Arthroplasty training has since become more structured, with fellowship programmes being set up in the universities and Ministry of Health hospitals.

Arthroplasty surgeries have progressed tremendously in the last 20 years, with improved clinical results and outcomes. It is estimated that around 8000 to 9000 arthroplasty surgeries are currently done yearly in Malaysia. Advancements in Orthopaedics around the world such as Computer Aided Surgery, Patient Specific Instrumentation, Robotic Joint Replacement Surgeries and Direct Anterior Approach for Total Hip replacement surgeries are now being practiced in various institutions in Malaysia.

References

1. Tay, B. H., Masbah, O., Razak, M., & Ruslan, N. (2000). Total hip arthroplasty in Malaysia--the Universiti Kebangsaan Malaysia and Hospital Kuala Lumpur experience. Med J Malaysia; Sept2000;55 Suppl C, 74-85.
2. Dhillon, K. S., & Jamal M. A. (1993). Early result of total knee replacement. Clinical and radiological outcome. Med J Malaysia, vol. 48.



Important individuals in the field of Joint Replacement Surgery: (from left) Prof Dr Azhar Merican, Prof Dr Azlina Amir Abbas, Dato' Dr Badrul Shah Badaruddin, Dr David Choon Siew Kit, Dr G. Ruslan Nazaruddin Simanjuntak, Prof Dr K.S. Dhillon, Dr Jamal Azmi Mohamad

The first Arthroplasty Interest Group meeting in 2004.

The second Arthroscopy Interest Group Meeting held in Putrajaya.

CHAPTER 8.03

Spine

Dato' Dr K.S. Sivananthan

During the 70s, to be an Orthopaedic Surgeon in Malaysia, one must first be qualified as a General Surgeon by obtaining the FRCS. Then he has to do the MCh. in Liverpool. In 1975 the following doctors were served the Government Service in order of seniority:-

1) Tan Sri Dr Abdul Majid Ismail
2) Dr Pretam Singh
3) Dr S. Ratnasingam
4) Dr David Sam Willie
5) Dato' Dr Mahmood Marican
6) Dr R. Balakrishnan
7) Dr Khaw Joo Hua
8) Datuk Dr M. Sivanantham
9) Dato' Dr K.S. Sivananthan

The Orthopaedic unit was started in Kuala Lumpur General Hospital in 1949.

> **"I am fortunate to witness and be instrumental in a small way to the progress of spinal surgery from infancy to the present state in Malaysia."**
>
> **- Dato' Dr K. S. Sivananthan**

In 1975, there was only 15 Orthopaedic Surgeons serving the country. All these surgeons were General Orthopaedic Surgeons. None of them subspecialised except Dr K. Thambyrajah was more interested in hand surgery and Prof Dr P. Balasubramaniam and Dr N. Subramaniam had special interest in spine surgery.

The spinal surgeries done at that time in the 70's were the following:-

1) Laminectomy and discectomy
2) Decompressive laminectomy
3) Laminectomy and lateral mass fusion
4) Cervical discectomy and fusion using iliac bone graft
5) Scoliosis correction using POP cast and later in-situ fusion
6) Harrington instrumentation for scoliosis cases
7) Most vertebral fractures were immobilized in POP jacket or Meurig Williams plates were used to hold the thoracolumbar spinal fractures

Scoliosis surgery in the early 70s was done in the University Hospital mostly by Prof Dr P. Balasubramaniam and Dr N. Subramaniam.

The Spinal injury unit started in General Hospital, Kuala Lumpur in the late 70's on the advice of Prof Dr Guttman and headed by Rehab Physician Dr Malik from Pakistan.

In the 70's and 80's, the following spine surgeons visited General Hospital Kuala Lumpur, University Hospital Kuala Lumpur and demonstrated their expertise and techniques:-

General Hospital of Kuala Lumpur 1949

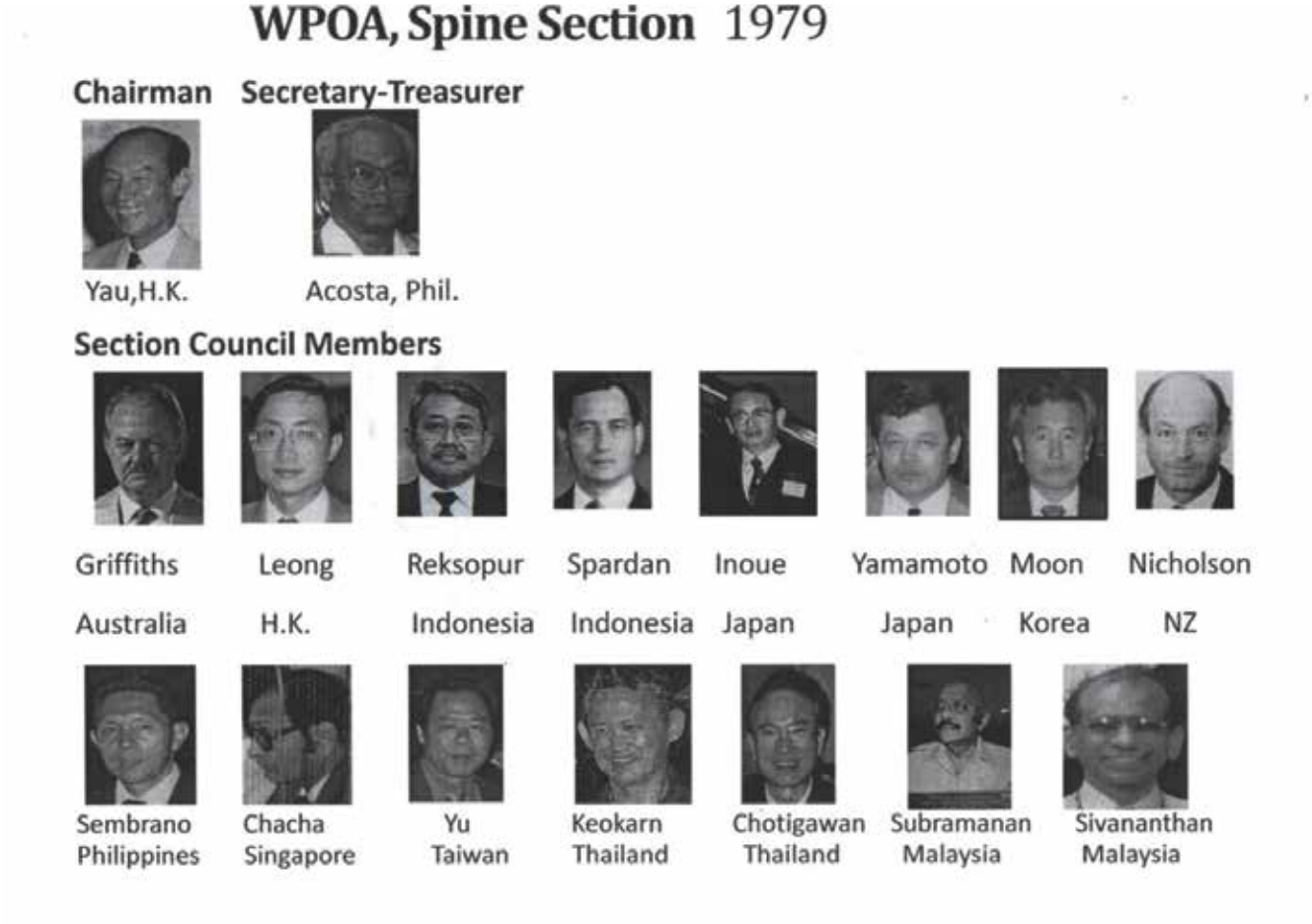
1) Prof Dr Robert Roaf
2) Prof Dr Paul R. Harrington
3) Prof Dr Hodgson
4) Prof Dr Arthur Yeow
5) Prof Dr Risser
6) Prof Dr Guttman

Prof Dr Paul R. Harrington

Regional cooperation and exchange of faculty in the Asia Pacific region started with the formation of the Western Pacific Orthopaedic Association (WPOA). WPOA was formed in 1962. Tan Sri Dr Abdul Majid Ismail was the founding member of WPOA.

The Spine Section of WPOA was started in 1979.

The mission of WPOA Spine Section was as follows:-



3rd Practical Spine Operative Course, Ciba, Tokyo, 1983

- To advance spine care in Asia Pacific
- To education spine surgeons by going around the Asia Pacific countries

Spine Operative Courses were conducted in various countries in the Asia Pacific region. MOA invited international Spine Surgeons to conduct courses in Malaysia. Orthopaedic Surgeons went overseas for training.

Spine fellowship training in the Ministry of Health started about 8 years ago and the fellows are trained for 4 years, 3 years locally and a year overseas.

The Malaysia Spine Society (MSS) was formed in 2006 and successfully held their first conference in Marriott Putrajaya. The first President of the society was Dr Abdul Malik Hussein, followed by Prof Dato' Dr Mohammad Abdul Razak, Prof Dato' Dr Abdul Halim Yusof and currently the presidentship is held by Dato' Dr K.S. Sivananthan.

WPOA changed to Asia Pacific Orthopaedic Association (APOA) in 2001 – now it includes most countries in the Asia Pacific region.

The Malaysia Spine Society and the Malaysian Orthopaedic Association activities involves conducting annual scientific meetings and funding courses to educate spinal surgeons.

Spine surgeries in Malaysia have evolved by leaps and bounds in the last decade. Minimally-invasive surgery, deformity surgery, and pain intervention have been successfully performed all over Malaysia. Malaysian spine surgeons have been appointed as Key Opinion Leaders in many organisations, locally and internationally.

Spine Operative Course: Live surgery

Spine Operative Course: Post op. discussion between faculties and attendants

10th APOA Operative Spine Course, Kuala Lumpur 2001

First batch of locally trained Orthopaedic Surgeons was started in Universiti Kebangsaan Malaysia in 1981 and one of them, Prof Dato' Dr Mohammad Abdul Razak has become a prominent spine surgeon in Malaysia.

Formation of APOA in Gold Coast - 2001

CHAPTER 8.04

Sports and Arthroscopy

Datuk Dr Mohd Asri Abd Ghapar

Orthopaedic Surgeons have always been treating sport injury cases from the early days of competitive sports in this country. However, as the injuries became more complex and diagnostic tools improved including CT and MRI scans, there was a need to also improve the techniques and modalities of treatment of these injuries and conditions. Developments in the field of arthroscopy worldwide were adopted and embraced by us beginning in the late 1970s and early 1980s. A few surgeons were sent for training in Germany and United Kingdom, and returned with the knowledge and drive to start arthroscopy services in the Ministry of Health hospitals. Arthroscopy systems started being supplied to Hospital Kuala Lumpur and other major hospitals in the country.

Throughout the 90s the services started flourishing amidst interest and development in the field, including in Universiti Kebangsaan Malaysia (UKM) and the University of Malaya (UM), with surgeons like Dr Mohd Ismail Maulut, Dato' Dr Abdul Wahab Ghani, Dr Aaron Lim, Dr Gan Eng Cheng, Dr Hyzan Mohd Yusof, Dr Saw Khay Yong and Dr Tay Yong Guan. The military hospitals also were very active in introducing

Participants watching a live beam of a Cadaveric Demonstration from NOCERAL, University of Malaya during the 3rd Malaysian Arthroscopy Society Annual Scientific Meeting in 2015

and developing the services under the leadership of Col Dr Azmi Abdul Latif, Col Dr Vejayan Rajoo, Col Dr Kok Choong Seng and others. The first arthroscopy workshop was done in UKM, Jalan Raja Muda, Kuala Lumpur in 1995 and attracted numerous surgeons to start learning and eventually adopting arthroscopy in their daily practice.

Later on, Arthroscopy gradually became regular feature and service provided by major hospitals throughout Malaysia.

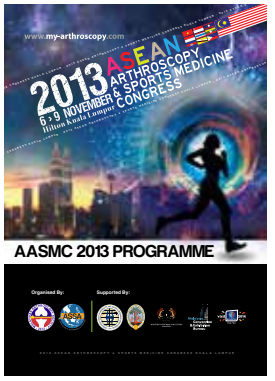
Under the Malaysian Orthopaedic Association, a group of Orthopaedic Surgeons started the Malaysian Arthroscopy Interest Group (MAIG) in the early 2000s. Led by the senior surgeon Dato' Dr Abdul Wahab Ghani, the former USM Orthopaedic Head of Department, meetings were held in his residence as well as GHKL & UKM Orthopaedic Departments to discuss academic topics and plans to further improve and strengthen the subspecialty. Numerous arthroscopy and sports surgery workshops and meetings were held locally, organized by GHKL, UKM and UM as well as private hospitals. Prominent surgeons in the field from abroad were invited to share their knowledge and experiences like Dr David McGuire, Dr Freddy Fu, Dr John Bartlett, Dr Andreas Imhoff, Dr Kim Seung Ho and others. Industry players like Smith & Nephew, Conmed Linvatec, Arthrex, Stryker and others played major role in supporting the development of this field in Malaysia. MOA members also regularly attend and participate in major meetings, conferences and workshops around the world like ISAKOS, ESSKA, APKASS and others.

In 2012, MOA members active in the field of sports and arthroscopy were invited to attend the formation meeting of ASSA (ASEAN Society for Sports Medicine & Arthroscopy) in Jakarta, Indonesia. The representatives returned to Malaysia and formed the Malaysian Arthroscopy Society (MAS), an affiliate society under the umbrella of MOA. With the Protem Committee led by Datuk Dr Mohd Asri Abd Ghapar, the 1st Annual General Meeting held in November 2013 elected Dr Hishamudin Masdar as the 1st President of MAS. Along with the AGM, the 1st MAS Annual Scientific Meeting which doubled as the 1st ASSA Annual Scientific Meeting was held in Hilton Kuala Lumpur from 6th to 9th November 2013.

MAS acts as a parallel body to assist MOA in developing the subspecialty of Sports & Arthroscopy in Malaysia. Together with MAIG, numerous courses and workshops were held to help train doctors and paramedics in areas and topics relevant to the field.

Current Concepts In Knee Arthroscopy Course 1994

Local and international arthroscopy talent converged in Kuala Lumpur for the AASMC 2013



ASEAN Arthroscopy & Sports Medicine Congress (AASMC) 2013 Souvenir Programme Cover

Malaysian Arthroscopy Society Logo

CHAPTER 8.05

Hand and Microsurgery

Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

Sungai Buloh Leprosarium Ward.

Hand surgery in Malaysia began as management for leprosy. A leprosarium was set up in Sungai Buloh, a 15 minutes drive from Kuala Lumpur. The set up included inpatient facilities and residences for patients requiring long term management. Many patients decided to reside around the hospital to escape social stigma and group together economically to grow and sell flowers and potted plants. The area became known for selling plants and flowers, admittedly is not an ideal occupation for those with insensate hands, but nevertheless helped them to make a good living and in some cases, to prosper.

The late Dr K. Thambyrajah was a pioneer in Malaysian hand surgery. He worked in Sungai Buloh Hospital in the 1960s. He remembers Dr Dakshiamoorthy and himself performing 20 to 30 procedures a month on hands and feet. The main problem they encountered was the high ulnar nerve lesion. Today, Leprosy is still the world's main cause of high ulnar nerve palsies. They performed Brand's many tailed transfer, as an anti-claw procedure. They also performed opponensplasties for median nerve lesions at the wrist. Sadly, they were not able to restore the debilitating loss of sensation. We are little better at that even today.

There was also help available from overseas. The legendary leprosy surgeon Dr Grace Warren and others visited, from Australia. They examined and operated on patients and guided young surgeons. "The Leprosy Mission of England" also helped by sending physiotherapists to rehabilitate these unfortunate patients. Dr Thambyrajah did two fellowships with Mr Pulvertaft at the Derbyshire Royal Infirmary and on returning joined the Orthopaedic Department of the University of Malaya. With encouragement from Prof Dr P. Balasubramaniam, the head of the Orthopaedic Department and advice from Prof Dr Pesi Chacha, a visiting examiner from Singapore, microsurgical practice laboratory was setup using the rat carotid artery model. Today, the Department of Orthopaedic Surgery runs a continuous Basic Microsurgery Course, which has been successfully continued for the past 14 years.

Dato' Dr Abdul Hamid Abdul Kadir did a fellowship with Dr Campbell Semple in UK. He joined the second medical school in UKM, the Universiti Kebangsaan Malaysia and set up a microsurgery practice laboratory there. In 1983, he organized a Hand Surgery Course under the banner of the MOA and the College of Surgeons of Malaysia.

The distinguished faculty included Dr S.P. Chow and Dr P.C. Leung from Hong Kong, Dr Venkataswami from India, Dr Campbell Semple from UK, Dr Chehab Helmi from Indonesia and Dr Robert W.H. Pho from Singapore. Dato' Dr Abdul Hamid Abdul Kadir and Dr Khaw Joo Hua represented Malaysia. Over the years, there has been much cooperation and transfer of skills from nearby and distant countries. Dr P.C. Leung performed the first two toe-to-thumb transfers (one in each of the two medical faculties) in 1985.

Over the years, many more young surgeons developed an interest in Hand and Microsurgery and several did training abroad. Dr V. Pathmanathan and Dr R. A. Vaikunthan were the first to do fellowships at the Christine Kleinert Instituite of Hand Surgery, Louisville. Kentucky, USA. After their return, enthusiasm was high and the Malaysian Society for Surgery of the Hand (MSSH) was formed. It was registered on the 3rd of March 1993. Dato' Dr Abdul Hamid Abdul Kadir became the protem President and Dr V. Pathmanathan was secretary. The motto of our society is "Excellence through Hand Surgery".

Two emeritus members have been appointed; Dato' Dr Abdul Hamid Abdul Kadir (2011) and Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya (2012).

The current committee:

President	Prof Dr Manohar Arumugam
Vice President	Dr Ranjit Singh Gill
Honorary Secretary	Dr Rashdeen Fawzi
Honorary Treasurer	Dr Ravindran Thuraisingam
Committee Member 1	Dr Ruban Sivanoli
Committee Member 2	Assoc Prof Dr Shalimar Abdullah
Committee Member 3	Dr Teh Kok Kheng
Committee Member 4	Dr Chuah Chee Kheng

Malaysian Orthopaedic Surgery Association / College of Surgeons of Malaysia National Course on Hand Surgery – left to right: Dr S.P. Chow, Dr Venkataswami, Dr P.C. Leung, Dr Campbell Semple, Dr Chehab Helmi, Dr Robert W.H. Pho, Dr Khaw Joo Hua, Dato' Dr Abdul Hamid Abdul Kadir

Auditor 1	Prof Dr Sharifah Roohi Syed Waseem Ahmad
Auditor 2	Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

The surgeons worked closely with therapists and decided to make therapists full members of the society, a very unique cooperation not seen in any other country. Several therapists, especially Mr Nathan Vytialingam, were active in the committees in the early days. However, later on it was decided to revert to an association membership similar to those overseas, with surgeons as full members and therapists as associate members. We ran joint "Roadshows" with therapists, in most of the states of Malaysia, where surgeons would talk about various topics covering mainly hand trauma and therapists would hold splinting and therapy workshops.

In 1993 the Malaysian Society for Surgery of the Hand (MSSH) organized the 1st Malaysian Conference on Surgery and Rehabilitation of the Hand. This was a successful international course. The guest speakers included internationally renowned therapists such as Judy Colditz,

Logo reflecting different cultures and discipline interwoven and working towards excellence in hand surgery.

1st Malaysian Conference on Surgery and Rehabilitation of the Hand - 1993.

and top surgeons including Dr Robert W.H. Pho, Dr Tsu Min Tsai, Dr David Green, Dr Teoh Lam Chuan and Dr James Hunter. The next conference was entitled "The 2nd Malaysian Conference on Surgery and Rehabilitation of the Hand" but quickly become known as the "2nd Hand Meeting". We invited in addition to the previous regional guests, Dr Jean Pillet, the famous prosthetist from France, and other famous hand surgeons such as Dr Venkataswami and Dr B. B. Joshi from India. It was again very successful, although on a visit to the Tropical Jungle Learning Centre (Rimba Ilmu) in University of Malaya, a thunderstorm broke out and a bolt of lightning struck a few feet from Prof Dr Robert Pho!

Since those two big international conferences, the specialty of hand surgery has been slowly and quietly gaining strength. There have been circle meetings at least three times a year. These meetings are loosely based on the circle meetings held in Liverpool, UK and the concept was brought back by Master Ch. Orth. (Liverpool) candidates. The meetings are held traditionally in homes of surgeons, and are casual meetings where exchanges of ideas occur and discussions on difficult problems are held. These casual and warm meetings are in line with Malaysian culture and have been readily accepted and proved to be an invaluable source of learning and camaraderie. Yearly annual scientific meetings are held in conjunction with the MSSH annual general meeting and have been well attended. In addition, other courses that have been held are the Universiti Malaya (UM) cadaveric flap course 2007, the Universiti Putra comprehensive course 2008, UM Basic Microsurgery Course for the past 14 years and the Kuantan National Course on Hand Trauma for 4 years.

I designed a logo which was adopted by the MSSH in 2007 which is meant to reflect many different cultures and disciplines that are interwoven and working towards excellence in hand surgery.

The Department of Hand Surgery in the Ministry of Health was setup in the Kuala Lumpur Hospital in 1986. It moved to Selayang Hospital in 1999. It was headed by Dr V. Pathmanathan, a pioneer who has been involved tirelessly in the training of Hand Surgeons since the department was established. This department was transferred back to Orthopaedics in June 2016.

On the 18th of May 2000, a team led by Dr V. Pathmanathan the Department of Hand Surgery, Selayang, performed the world's first arm and hand transplant on a one-month-old baby girl from her twin. Since the twins were identical, there was no need for anti rejection drugs. It was also the worlds 9th successful hand transplant. The child is doing well until today.

When the Ministry of Health began four year subspecialty courses for postgraduate, Hand and Microsurgery was included. The four years include a one year fellowship abroad. The programme was reduced to 3 years. So far graduates from this programme are Dr Chuah Chee Kheng (2011), Dr Rashdeen Fazwi (2012), Dr Ruban Sivanoli (2014), Dr Jeremy Prakash (2016) and several others are enrolled to meet our future needs.

The trauma seen in our country has attracted fellows in Hand and Microsurgery from abroad such as: Dr Tracey Horton (U.K. 2006), now Consultant Hand Surgeon in Derby, UK; Dr Simon Tan (U.K. 2007), now a consultant hand surgeon in Birmingham, UK.This exchange of ideas and also culture is excellent for our local surgeons. We need to benchmark our standards with international standards.

When FESSH (Federation of European Societies for Surgery of the Hand) began their Hand and Microsurgery examination to foreigners, Dr Vaikunthan Rajaratnam sat and won the Churchill Livingstone prize. Prof Dr Sharifah Roohi Syed Waseem Ahmad topped the class. Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya passed it in 2009 and Assoc Prof Dr Shalimar Abdullah in 2010. Malaysian hand surgeons will continue to seek international benchmarking and this may be one venue.

The congress of the Asian Pacific Society for Surgery of the Hand was held in Kuala Lumpur from 2nd to 4th October 2014. It was held at KL Hilton and Meridian Hotel and was hailed by all as highly successful including the hand therapy section.

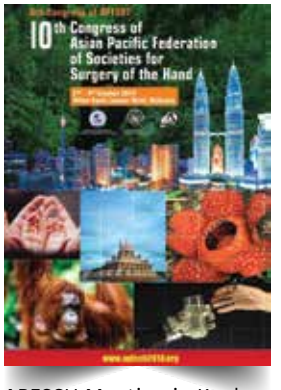
What the MSSH aim for in the future is

- to have a uniformly high standard of care for hand conditions and injuries throughout the country.
- to have a high standard of local postgraduate training in hand and microsurgery.
- to aid, catalyze and foster formation of a hand therapists group for training and learning.
- to form and maintain closer international links.
- to carry out more research.
- to look into prevention and treatment of hand injuries in the local context.
- to be a presence at all international conferences.
- to publish in all major hand surgery journals.

With a dynamic group, a critical mass of members and god's grace, we hope these goals can be achieved.

Malaysian Hand surgeons and friends at the APFSSH Hong Kong (2008) posing at the hand print of Jackie Chan.

APFSSH Council Meeting 2014.



APFSSH Meeting in Kuala Lumpur.

CHAPTER 8.06

Foot and Ankle

Dr Low Tze Choong

As Orthopaedic and Trauma surgery services grew in importance during the 1980s and 1990s, a number of senior Orthopaedic Surgeons began to take a deeper interest in the treatment of Foot and Ankle Trauma. The AO (Arbeitsgemeinschaft für Osteosynthesefragen) group from Switzerland started to run fracture fixation courses in Malaysia and ankle fractures was among the key topics featured in the AO Basic Course.

Dato' Dr Muhammad Borhan Tan, as Head of Orthopaedic services in Ministry of Health Malaysia, was among the lecturers and instructors running the AO Basic Course and he lectured on fixation of ankle fractures. In 2000, the first AO Advanced Course in Foot and Ankle Trauma was conducted in Singapore. Dato' Dr Muhammad Borhan Tan and a number of junior specialists participated in this course to further their understanding in Foot and Ankle Surgery.

Through the AO Education Funding, Dr Low Tze Choong was able to go for the AO Foot and Ankle Fellowship in Harborview Medical Centre in Seattle in 2001. Inspired by Dr Sigvard Hansen's work, Dr Low returned to organise courses in Foot and Ankle Surgery in University Malaya and during the MOA Annual Scientific Meeting before embarking on another Foot and Ankle Surgery fellowship in the United Kingdom in 2004.

Dato' Dr Muhammad Borhan Tan at the AO Advanced Foot Course in Singapore, 2000.

Between 2005 to 2010, more doctors travelled for Foot and Ankle Surgery training before returning to form the core group of the Foot and Ankle Special Interest Group of the MOA. Thanks to the close rapport between Malaysian and Singaporean doctors, about half a dozen Malaysian doctors had the opportunity to train in Foot and Ankle surgery in Singapore General Hospital and Tan Tock Seng Hospital. Other doctors went further to gain valuable experience in Foot and Ankle surgery in Taiwan, Germany, Switzerland, Australia and the United States. With the advanced training, our Foot and Ankle surgeons have brought many improvements in treatment. This includes better outcomes of treatment for complex injuries such as Pilon, calcaneal and Lisfranc fractures. We now have better techniques for correcting flat feet, Charcot foot and Rheumatoid foot deformities, just to name a few.

In 2010, Malaysia hosted the Triennial Scientific Meeting of the Asian Federation of Foot and Ankle Societies in Johor Bahru. The meeting was met with unprecedented support by participants from Singapore, Philippines, Taiwan, Japan, South Korea and China. The same year, Dr Yeap Ewe Juan organised the first National Foot and Ankle Trauma Symposium in Perlis which continues to be held annually. In 2011, Dr Khairul Fauzi Mohamed organised the AO Advanced Foot and Ankle Course for the first time in Malaysia. Around the region, our doctors continued to participate in meetings in India, Japan, Korea and China. At the Asian Federation of Foot and Ankle Societies Meeting in Hong Kong in 2013, the paper from Malaysia presented by Dr Yeap won the Takakura prize.

Among the many international Foot and Ankle personalities, the one who is most well-known to Foot Surgeons in Malaysia is Dr Sigvard Hansen who has taught doctors from Malaysia and Singapore. He has also mentored other senior doctors who have trained our Malaysian Foot surgeons. As a young surgeon in the late 1960s, Dr Hansen himself had been taught by Prof Dr Donald Gunn in Seattle. Interestingly, prior to his re-location there, Prof Dr Donald Gunn who was formerly from the United Kingdom, oversaw Orthopaedic Services in Malaya and Singapore in the early 1960s.

1st National Foot and Ankle Trauma Symposium in Kangar, 2010.

Asian Federation of Foot and Ankle Societies Meeting in Johor Bahru, 2010.

The AO Advanced Foot Course is held in Malaysia for the 1st time, 2011.

Malaysian surgeons with Dr Sigvard Hansen, Chicago, 2014.

CHAPTER 8.07

Orthopaedic Oncology

Prof Dr Wan Faisham Nu'man Wan Ismail, Dr Chye Ping Ching, Prof Dr Zulmi Wan, Prof Dr Vivek Ajit Singh

From the turn of the twentieth century until 1970s, tumours of the musculoskeletal system were managed mostly by Orthopaedic or General Surgeons with excision or amputation. The overall survival was poor due to lack of effective treatment options, poor understanding of the diseases, low awareness and late presentation and the intent of treatment then was mainly ablative or palliative. Limb-sparing surgery for patients with both primary and secondary malignant tumour of the extremities was made possible beginning in 1970s by incorporating chemotherapy and radiotherapy in various multimodal treatment regimes and protocols and this was associated with markedly improved survival and clinical outcome. Over the past 40 years, with vigorous research and training, Orthopaedic Oncology has undergone a rapid growth and development and has firmly established itself as a subspecialty in Orthopaedic Surgery both internationally and in Malaysia.

In the 1980s, under the supervision of Prof Dr Subir Sengupta and with the support of clinical oncologists, the Paediatric Orthopaedic team in University of Malaya started implementing multimodal treatment for various musculoskeletal tumours. The limb salvage surgeries were mainly combined with biological reconstruction using autograft and sliding split cortical osteotomy technique, which was well accepted back then.

4th Asia Pacific Musculoskeletal Tumour Society Meeting in Chennai, India 2002

In the mid-1990s, led by Prof Dr Zulmi Wan from the University of Science Malaysia who was trained in the prestigious Rizzoli Institute, Bologna Italy under Prof Dr Rodolfo Capanna; the service and training of Orthopaedic Oncology in Malaysia began to take shape and get organized. Prof Dr Pan Kok Long, Dr Anwar Hau Abdullah, Dato' Sri Dr Zulkharnain Ismail, Dr Chye Ping Ching, Dr Sa'adon Ibrahim, Prof Dr Vivek Ajit Singh, Prof Dr Wan Faisham and Dr Nor Azman Mat Zain were the earliest surgeons in the country to undergo fellowship trainings in overseas. Upon their return to Malaysia, they started Orthopaedic Oncology services and training in their respective Ministry of Health and university hospitals and the oncology group gradually grew in numbers and strength. It was during this period that the practice of limb sparing surgery went through a revolution with the use of cutting-edge instrumentations, devices and biomaterials such as modular and custom-made endoprosthesis, allograft and vascularized tissue and flaps. The management of soft tissue sarcomas using wide margin surgery, postoperative radiotherapy to achieve local control, and chemotherapy for high-risk groups resulted in a better survival of the patients.

6th APMSTS Meeting in Chiang Mai 2006

Over the years, Orthopaedic Oncology service in Malaysia has expanded steadily and is available in 10 hospitals nationwide. There are currently 16 Orthopaedic Oncology Surgeons in the country with 7 fellows in training. The first postgraduate national Orthopaedic Oncology course was held in 2002 and is now held annually.

The Orthopaedic Oncology Interest Group was established under the umbrella of MOA and its members are actively involved in international tumour groups such as Asia Pacific Musculoskeletal Tumour Society (APMSTS) and the

Combined Trauma and Oncology Meeting HUSM 2008

International Society for Limb Salvage Surgery (ISOLS). The group successfully organised The Asia Pacific Musculoskeletal Tumour Society Meeting in Kuala Lumpur in September 2012 and various International Limb Salvage and Pelvic Tumour Courses and cadaveric workshops annually with great success.

Patients with various musculoskeletal tumours in Malaysia are now able to enjoy excellent treatment and care thanks to the relentless effort and hard work of this small group of dedicated tumour surgeons. Training of more talented and committed junior surgeons as well as strengthening of the existing tumour teams is necessary to ensure a continuous high standard of practice in the years to come.

1st National Orthopaedic Oncology Course Johor Bahru 2009.

International Metastatic Bone Disease Course UMMC May 2011.

Tumour Reconstruction Course UMMC May 2010.


WELCOME


MALAYSIA
Malaysia
Truly Asia


Organised By:


skeletal Oncology
And Future
Supported By:

9th Asia Pacific Musculoskeletal Tumour Society Meeting, Kuala Lumpur, September 2012.

National Postgraduate Orthopaedic Oncology Course Johor Bahru, 2013.

International Limb Salvage Course UMMC, 2013.

International Pelvic Tumour Course UMMC, 2014.




National Orthopaedic Oncology Course Hospital Kuala Lumpur, 2015.

45th MOA Annual Scientific Meeting, Kuala Lumpur, 2015.

Northern Orthopaedic Oncology Course, Penang General Hospital, 2016.

International Pelvic Tumour Course UMMC, December 2016.

Orthopaedic Oncology Course USM, February 2017.

CHAPTER 8.08

Paediatric Orthopaedics

Prof Dr Saw Aik

Paediatric Orthopaedics was one of the earliest subspecialisation in Orthopaedic Surgery in Malaysia. Before this, clinics and wards for children with orthopaedic problems had been available in many hospitals and most of the Orthopaedic Surgeons were assigned to be in charge of these problems in rotation. In 1978, Prof Dr Subir Sengupta was assigned to head Paediatric Orthopaedic unit in Faculty of Medicine, University of Malaya. It took some time before others started to subspecialise in this field of Orthopaedic Surgery. Courses in Paediatric Orthopaedic surgery were started to be organised especially by the teaching hospitals.

Prof Dr Subir Sengupta with other academic staffs and Master Orthopaedic students of Orthopaedic Department of University of Malaya.

Paediatric Orthopaedic review course with Prof Dr Lee Eng Hin and Prof Dr Ken N. Kuo as our foreign faculties (2002).

First Ponseti workshop in this country with Dr Jose Morquende from Iowa as the instructor.

First POSNA ASEAN Paediatric Orthopaedic Course. Social tour for visiting faculty to Malacca.

External fixator workshop sponsored by Malaysian Orthopaedic Association in Angkor Children Hospital in 2008.

AOA outreach in Surabaya on Neglected Paediatric conditions.

In the early part of this millennium, Malaysian Orthopaedic Association (MOA) members started to organize subspecialty meetings to provide regular updates and organise training courses for those interested in managing Orthopaedic problems in children. In 2004, Paediatric Orthopaedics Interest Group was formed with Prof Dr Sharaf Ibrahim as the first coordinator. In 2005, Prof Dr Saw Aik and Dr Ken N. Kuo initiated a collaboration between MOA and POSNA to organise a Paediatric Orthopaedic course and Ponseti workshop in Kuala Lumpur. This course eventually evolved into two yearly ASEAN POSNA courses to be hosted in various ASEAN cities up till today. The Paediatric Orthopaedic Interest Group had also been actively involved in humanitarian efforts in this region. Many Paediatric Orthopaedic Surgeons have travelled to neighbouring countries to provide voluntary consultation and therapeutic services. From time to time, the Paediatric Orthopaedic Interest Group also offers complimentary registration to participants from neighbouring countries for some of the Paediatric Orthopaedic courses organised in this country. The group also collaborated with Asia Pacific Paediatric Orthopaedic Society (APPOS) to host their travelling fellows for many occasions.

In 2012, the first Subir Sengupta memorial lecture was organized by MOA. World experts in Paediatric Orthopaedics and Limb Deformity Correction Surgery would be invited to deliver a plenary lecture during the annual scientific meeting of MOA. Prof Dr Lee Eng Hin, Dr Benjamin Joseph, Dr Ken N. Kuo and Dr Kamegaya were among the invited experts who have served as speakers for this memorial lecture.

Paediatric Orthopaedic interest group of MOA has progressed from a group that organises meetings for its members to discuss interesting cases. With increasing number of Paediatric Orthopaedic surgeons in the country and higher expectation for the treatment outcomes, the interest group has to provide basic instructional courses for its junior members, and at the same time organises advanced trainings for the management of more complicated clinical conditions. Similar to most other developing nations, a large proportion of the population in this country falls under paediatric category. The Paediatric Orthopaedic interest group will continue to play an important role to promote advances in science and art of Paediatric Orthopaedic in this region.

AO Trauma Paediatric Orthopaedic course with Prof Dr Theddy Slongo and Prof Dr Mamoun Kremli as international faculties (2016).

Four Asia Pacific Paediatric Orthopaedic Society (APPOS) travelling fellows attending Paediatric Orthopaedic case discussion session in Kuala Lumpur (2013).

CHAPTER 8.09

Research in Orthopaedics

Prof Dr Tunku Kamarul Zaman Tunku Zainol Abidin

The underlying problem in research is "the way in which the production of evidence is organized institutionally with highly centralized mechanisms, whereas the application of that science is highly decentralized. This social distance prevails because scientists are more oriented to the international audiences of other scientists for which they publish than to the needs of practitioners, policy makers, or the local public"- *Public Health Annual Review of Public Health. 2009.*

In the beginning

Records relating to research in orthopaedics Malaysia for the past 5 decade were sparse. We can only assume that Orthopaedic Research was championed at that time by the pioneers of Orthopaedic Departments in universities, being the guardian of the forefront in knowledge.

An analysis of records from Medline and Web Of Science (WOS) publication databases provides us with some interesting facts. Using Medline, it appears that there were 793 published articles from Malaysia related to Orthopaedics, whilst the WOS search produced 584 titles. In WOS, the first published article appeared to have come from Prof Dr Joseph Francis Silva of University of Malaya with his article entitled "A dynamic approach to the training of orthopaedic surgeon in 3rd world countries", published in the Journal International Orthopaedics in 1980. However, the publication list in Pubmed indicates the first publication being authored by Assoc Prof Dr K.S. Dhillon, Prof Dr Subir Sengupta and Prof Dr B.J. Singh with their article entitled "Delayed management of fracture of the lateral humeral condyle in children" in the journal Acta Ortohpaedica Scandinavia in 1988.

Prof Dr Joseph Francis Silva was the first head of Department of Orthopaedics in University of Malaya, and on record, the first to author a WOS indexed scientific orthopaedic publication in Malaysia.

According to Medline database, Prof Dr K.S. Dhillon (left), Prof Dr Subir Sengupta (middle) and Prof Dr B.J. Singh (right) were the first to author on a subject relevant to Orthopaedics.

Using WOS database, a deeper analysis further demonstrated that the top three contributors of publications came from the institutions of higher learning, which coincidentally were of the three oldest universities in Malaysia (UM, UKM and USM); It was apparent that surgeons over the years preferred to published in five most preferred journals; the Singapore Journal of Medicine (29), Spine (19), Injury (16), Journal of Paediatrics Orthopaedics Part B (11) and, The Journal of Hand Surgery European Edition (10).

Orthopaedic Research In the Modern Era

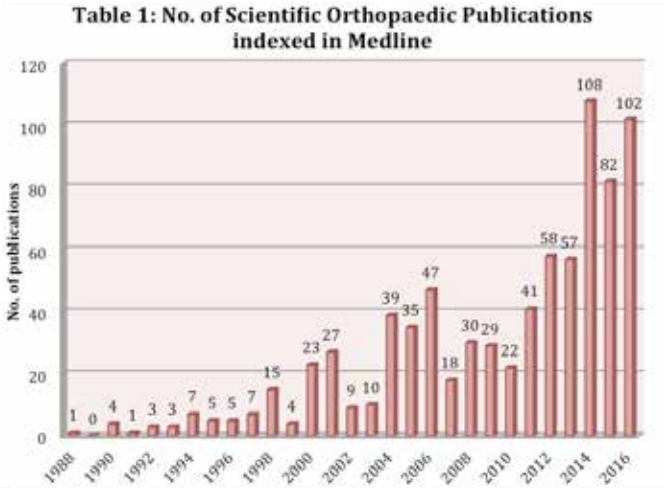
In the 1980s and 1990s, the research undertaken of that time appears to be mainly related to subjects which were either relevant to training or, purely clinical in nature. There were very few publications outside of these realms, as surgeons tend to discuss more superficial clinical discoveries. An area that is somewhat beyond the norm of that period was on the subject of biomaterials & Orthopaedic implants. The first known publication of this kind was by Dato' Dr Ali Noor Ghani of UKM entitled "A simple and inexpensive external fixator", published in the journal Injury in 1988.

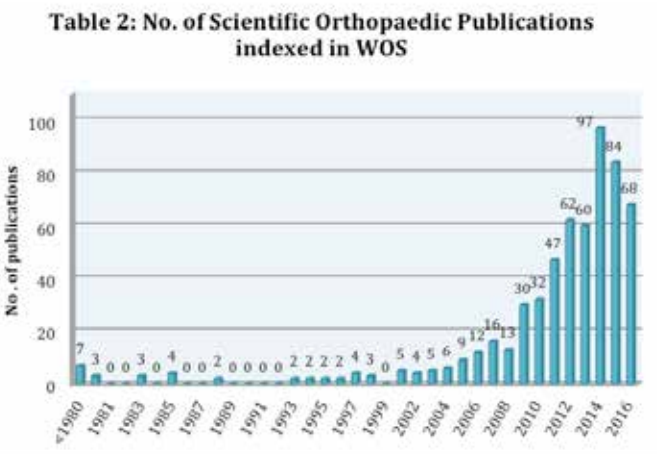
ßThe external fixator designed and produced by Dato' Dr Ali Noor Ghani published as a novel implant that is cheaper and easier to apply than of equivalent commercial implants of that time. Pictures (as shown on right) are extracted from The Malaysia Journal of Medicine; 47(2), 1992.

It was not until 2002 that publications mirroring more basic science began to emerge. The pharmacological study using high-performance liquid chromatography (HPLC) to measure Tramadol levels in patients published by the USM group (Gan, SH; Ismail, R, Adnan, Waw; Wan, Z) in the Journal of Chromatography B-analytical Technologies in the Biomedical and Life Science marked the beginning for more advanced orthopaedic research in Malaysia. Since then, orthopaedic research became more competitive, with many more publications that encompasses latest state-of-the-art technologies being published in orthopaedic scientific journals.

Moving ahead into the future

For the past 10 to 15 years, orthopaedic research has taken a different form from the usual clinical research type of studies. The orthopaedic research in presently a serious endeavour and for some it has become a full time occupation. Several institutions have now embarked in areas of research that incorporates other fields of sciences into orthopaedic research; ranging from applied engineering, biochemistry to molecular and cellular medicine, and high-tech stem cell technologies. Even clinical research is now

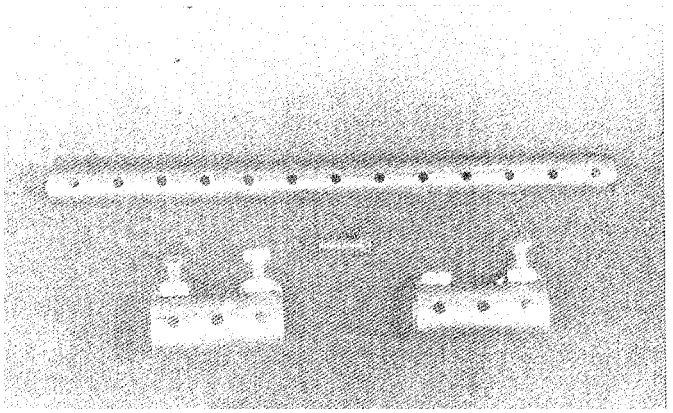




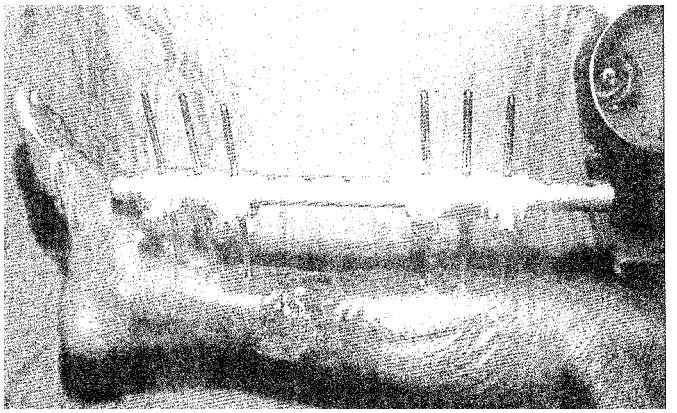
Summary of published scientific articles in the field of Orthopaedics in Malaysia. Source from Pubmed and WOS extracted on the 4th of October 2016.

likely to be a "hypothesis driven type of research" with control trials being favoured over the antiquated case report type of studies. As the country becomes more affluent, many parties including private and government agencies are now able to heavily fund these research activities.

Among the most active in orthopaedic research are the institutions of higher learning, such as UM and UKM. Using specifically allocated government grants, these institutions have embarked into developing specific orthopaedic research niche areas that are super-specialised and of world class.



Components of the local external fixator.



Local external fixator applied on a compound fracture of the tibia.

In UM, the National Orthopaedic Centre of Excellence for Research and Learning (NOCERAL) was developed in 2010 as a centre of excellence that would drive orthopaedic research of the nation forward. The formation of this centre has allowed major state-of-the-art research to be conducted, which includes areas such as stem cell and regenerative medicine. In UKM, through strong cooperation with the tissue-engineering centre of the same hospital, the Department of Orthopaedics is now strongly supported in terms of their research activities, thus increasing the numbers of research publications.

The National Orthopaedic Centre of Excellence for Research and Learning (NOCERAL) in UM houses a number of high-tech laboratories and research groups that produces the highest number of scientific publications in the country.

From available databases, it has also become apparent that research output from private hospitals such as Prince Court Medical Centre, KL Sports Medicine Centre, Ampang Puteri Medical Centre and many others are also on the rise. This is a new phenomenon that has not been observed previously, and has contributed to the growth of the national research output.

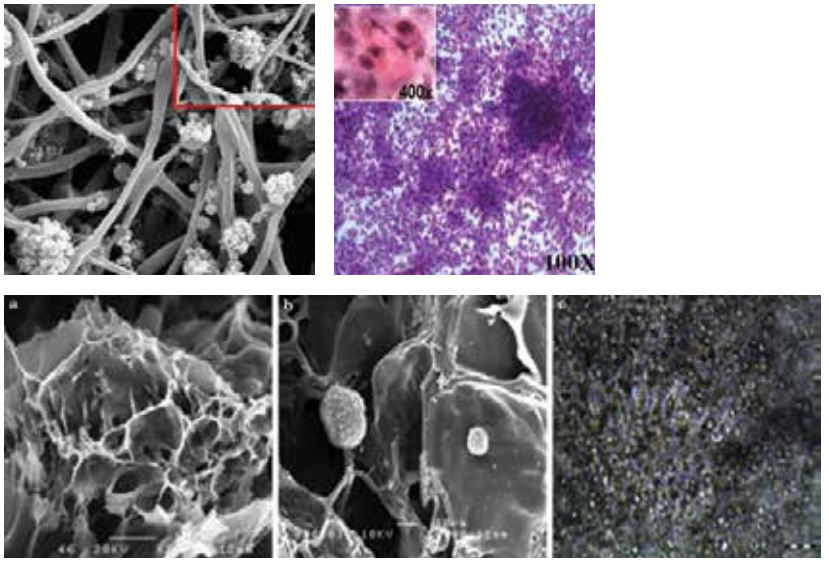
The Sciences of Orthopaedics and the Future

It is difficult to envisage what the future will hold in the field of Orthopaedics but one thing is for certain; at the rate this area is developing in this country, Orthopaedic Research will continue to strive to greater heights. Orthopaedic research output will no longer be limited to mere case reports and technical sheets, but rather of new products and innovations, and that of fundamental research; which focuses on the mechanisms leading to observed outcomes. With technology advancing at a remarkable speed, advanced therapeutics would no

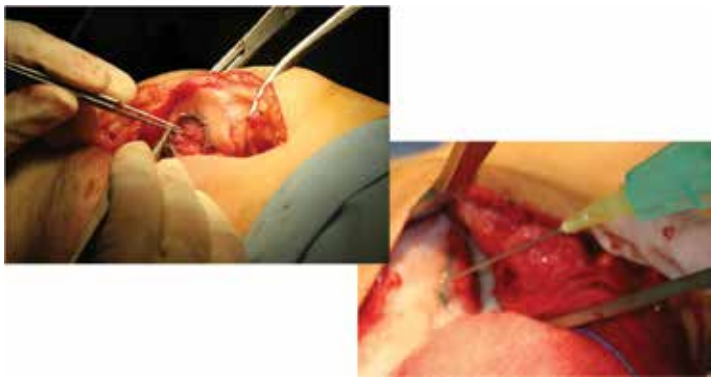
longer be a stranger to the common Orthopaedic Surgeon. However, it is worth noting that with new technologies comes the need for more stringent regulations and controls.

It is possible that cell therapy will be commonly used in patients in the not too distant future. The image (bottom right) illustrates a case of damaged cartilage that is repaired through the regeneration of new tissues using cell sheets and injectable sealable biomaterials. Image courtesy of the Tissue Engineering Group (TEG), NOCERAL.

In the future, it is vital that research in orthopaedics must take into account the regulations that govern the local use of developed technologies into patients. This has become necessary with the advent of spurious research and products introduced into the market by unscrupulous parties. Such regulations are already slowly being introduced in Malaysia; for example the Cell and Gene Therapy Products (CGTP) guidelines and of the Medical Device Act (MDA). It is also possible that in the future, training and sub-specializations of non-clinician scientists may be necessary in view of the expected projected growth of this area of interest. Nevertheless, despite the pressing need for scientific advancement, it is clear that the Orthopaedic community would continue to place the interest of patients as their top priority.



In the near future, the applications of Nano-scaffoldings with drug delivery systems (top left), advanced cellular integrative biomaterials (bottom 3 images) and highly potent stem cells (top right) into patients will be a reality thanks to the on-going research efforts. Images courtesy of the Tissue Engineering Group (TEG), NOCERAL.



A case of damaged cartilage that is repaired through the regeneration of new tissues using cell sheets and injectable sealable biomaterials.

CHAPTER 8.10

Humanitarian Group of the Malaysian Orthopaedic Association

Assoc Prof Dr Shalimar Abdullah, Prof Dr Saw Aik, Prof Dr Sharaf Ibrahim

The Beginning

The humanitarian group of the Malaysian Orthopaedic Association (MOA) was proposed by Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya during the June 2004 MOA Annual General Meeting in Penang in an effort to coordinate and encourage members of MOA to volunteer their services within the country and abroad.

The massive Acheh tsunami of 24th December 2004 prompted the group into action. Prof Dr Sharaf Ibrahim was appointed as the coordinator with Dr Hyzan Mohd Yusof, Dr Suryasmi Duski, Prof Dr Saw Aik, Dr Kamariah Nor Mohd Daud and Dr Nor Azlin Zainal Abidin heading to Banda Aceh. Dato' Dr K.S. Sivananthan, Dr T. Kumar and Dato' Dr Vasan Sinnadurai went to Sri Lanka to treat and operate on tsunami victims in Poonambalam Memorial Hospital project. The team was in collaboration with the NGO Global Peace Mission and MERCY Malaysia. China Orthopaedic Association (COA), Philippines Orthopaedic Association (POA), and Chiba Children Hospital donated the Orthopaedic equipment with an estimated cost of about MYR 1.2 million flown by Malaysian Airlines and Royal Malaysian Air Force. Subsequently in April of 2005, Prof Dr Saw Aik and Dr Yong Su-Mei participated in the Tzu Chi Medical Association (TIMA) medical camp to provide free medical and dental treatment to 3000 patients from Batam and the surrounding islands.

Through collaboration with international Orthopaedic

societies, a group of MOA experts was established to help various Orthopaedic problems abroad.

Prof Dr Sharaf Ibrahim with Dr Abdul Malik Hussein and Dr Hyzan Mohd Yusof visited Al Mujtahid Hospital, Damascus, Syria in April 2006. The team performed various surgeries for spine deformities, sports injuries and complex trauma. In August 2006, Dr Hyzan Mohd Yusof joined another medical relief organization to Tyre, South Lebanon to as a volunteer to provide free treatment for war victims in the region. In April 2007, Dr Abdul Malik Hussein and Datuk Dr Mohd Asri Abd Ghapar visited Damascus General Hospital in Syria to treat and operate on patients. Datuk Dr Ahmad Ridzwan Arshad (Plastics), Dato' Dr Ali Noor Ghani and Dr Kamil Mohd Kassim visited Al-Mujtahid Hospital, Damascus, Syria in April 2007 to perform various surgeries and attend a Health Care Conference organized by the Syrian Ministry of Health.

In September 2006, Prof Dr Saw Aik visited Angkor Children Hospital to arrange Orthopaedic training for the local doctors. In April of 2008, the MOA Humanitarian Group headed by Dr Yong Su-Mei organised an external fixator workshop in Angkor Children Hospital in Siem Reap, Cambodia.

In 2011, the Asean Orthoapedic Association (AOA) Outreach Programme was initiated to provide a platform for further interaction and cooperation amongst Orthopaedic Surgeons in ASEAN. The AOA outreach organizes groups of volunteers from ASEAN to visit provincial communities and interact with the local surgeons through education and provision of treatment services. Dr Peter Lee Y.C. of Singapore headed the first team to Klaten, Java.

MOA members of AOA Outreach Programme, Prof Dr Sharaf Ibrahim, Prof Dr Saw Aik, Prof Dato' Dr Mohammad Abdul Razak and Assoc Prof Dr Abdul Halim Abd Rashid went to Surabaya, Indonesia with

The Indonesian Red Cresent Field Hospital.

MOA Humantarian Group in Batam Island.

Dr Abdul Malik Hussein Scoliosis Surgery in Damascus.

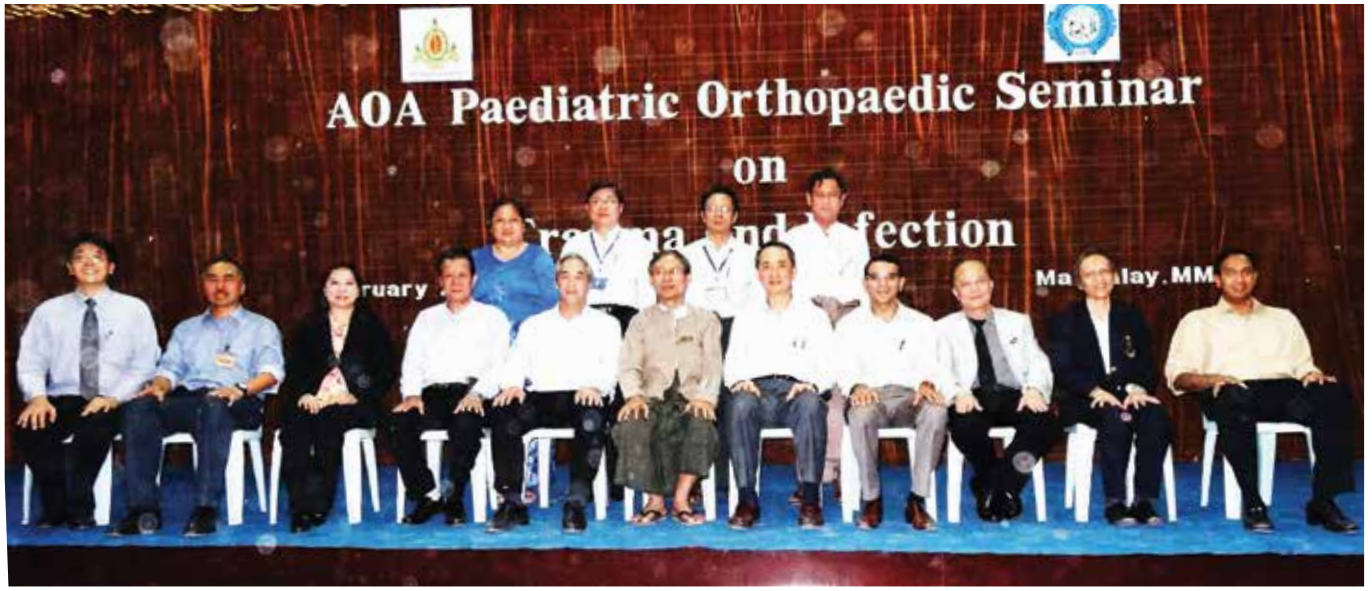
Orthopaedic Clinic, Damascus Hospital.

other ASEAN members and they organized a symposia, case discussions and Ponseti workshop on clubfoot models. The ASEAN pediatric group also held a workshop from February 22-24th, 2013 in Mandalay, Myanmar.

Since 2013, MOA has allocated a fund of RM20,000 annually for Humanitarian projects. The fund was used for AOA Outreach Programme in Banjarmasin, Kalimantan, Indonesia. MOA in collaboration with MERCY Malaysia sent two teams to Ormoc, Leyte Island to support the orthopaedic service after Typhoon Haiyan struck the Philippines in November 2013. MOA also contributed RM 10,000 to the POA. The MOA Humanitarian team went to Dhaka Community Hospital (DCH), Bangladesh in 2014 to organize an Orthopaedic Workshop with 50 participants.

In conjunction with the AOA Outreach Programme, a team was sent in 2015 to Jayapura, Papua, Indonesia. The team ran a 2 days workshop titled “Advance Treatment Modalities for Neglected Cases in Orthopaedics” attended

Hand Surgery, Haifa Hospital.



Dr Ferdhany Effendi with operating staff of Rumah Sakit Martapura, Banjarmasin. Kalimantan Mission, 2013.

Entrance of Dhaka Community Hospital (Dr Ikraam Ibrahim, Dr Ferdhany Effendi, Assoc Prof Dr Shalimar Abdullah, Prof Dr Sharaf Ibrahim). Dhaka Mission, 2014.

Dr Mohd Ikraam Ibrahim, Assoc Prof Dr Shalimar Abdullah and Dr Monirul Alam operating on a hand case. Dhaka Mission, 2014.

Participants trying out Ponseti clubfoot casting as Prof Dr Sharaf Ibrahim watches. Papua Mission, 2015.

by 250 participants. In 2016 "Principles of Musculoskeletal Trauma Management" seminar was held in RSUD Dr Zainal Abidin Banda Acheh. Assoc Prof Dr Shalimar Abdullah also visited Sitagu Ayudana Charity Hospital in Mandalay Myanmar for paramedic training workshop in June 2016.

The Future

Over the recent years, there have been some changes in the approach towards medical humanitarian services in less developed countries, and the role of professional organisations in organizing these activities. During massive natural disasters and wars, there are a large number of patients overwhelming the local and national resources and the needs of medical relief and support are important to minimized casualties. The elective medical humanitarian is also important to provide training for local medical staff to allow them to be the first line medical providers to their patients instead of relying on foreign / visiting doctors who are available for a short duration only.

Over the years, MOA has provided a support for medical humanitarian services in less developed countries. This includes complimentary registrations to attend courses and workshops held in Malaysia. However, MOA is now providing support for members to educate local medical staff in other countries. The 2016 MOA Scientific Meeting was the first meeting where the humanitarian section had its own plenary and lecture sessions. This definitely augurs well for the subsection and we hope to see the subsection continue to grow and expand.

References

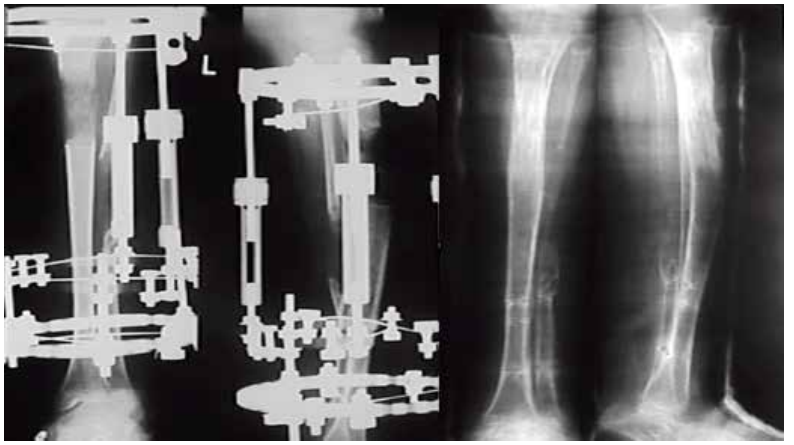
1. Lee, Y. (2013). ASEAN Orthopaedic Association Outreach Programmes. Malaysian Orthopaedic Journal 7(1), 88-92.
2. Sharaf, I., Saw, A., Hyzan, Y., & Sivananthan, K. (2005). The Malaysian Orthopaedic Association humanitarian mission to Indonesia and Sri Lanka. Med J Malaysia; Jul2005;60 Suppl C, 3-7.

CHAPTER 8.11

Limb Lengthening and Reconstruction Surgery

Prof Dr Saw Aik

Distraction osteogenesis is an innovative procedure developed by G. Ilizarov in the middle of last century for the management of recalcitrant non-union and severe deformities. The procedure was introduced to Italy in early 80's before subsequently disseminated to the rest of the world. Distraction osteogenesis was first performed on Malaysia in 1988 when Dato' Dr K.S. Sivananthan lengthened two tibias and one femur with Ilizarov external fixator. In 1991, the first Ilizarov workshop was organised by in Kuala Lumpur were a few experts including Dr R. Cattaneo and Dr D. Paley were invited to train our local surgeons on the procedure. Subsequently, a group of academic staffs from University

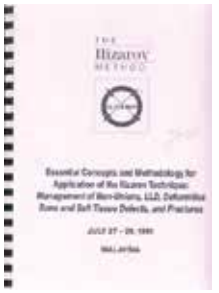


Radiograph of showing left tibia lengthening (during and after the procedure) for an 11-year-old boy using Ilizarov external fixator (with permission of Dato' Dr K.S. Sivananthan).

Malaya visited Lecco, Italy and initiated the Ilizarov service in the institution headed by the late Prof Dr Subir Sengupta. Throughout the 90's and early this century, Dr M. Catagni has been invited to visit many hospitals in this country to provide guidance and surgical assistance for many local surgeons.

In 2000, the first basic Ilizarov course was organised by University Malaya Medical Centre with Dr Juanito Xavier from Philippines as the invited guest speaker. On the second year, additional training session was added for the operating theatre nurses. Both basic and advanced Ilizarov courses were organised in University hospitals and major public hospitals in Seremban and Kuala Lumpur and Klang. Primary indications for surgery included congenital or acquired deformities and post-traumatic non-union with or without bone loss. In order to coordinate training programs among various ASEAN nations and improve communications between the regional experts, ASEAN ASAMI was formed by a group of Ilizarov surgeons from Malaysia, Philippines, Singapore and Thailand.

With time, indications for Ilizrov surgery expanded to include correction of soft tissue contracture and symptomatic / unstable joints. Advanced forms of unilateral external fixator were used for limb lengthening especially for the femur bone. In addition, acute correction of long bone deformity either in isolation or in combination with Ilizarov surgery was also being performed for more selected limb deformities. In 2004, the Limb Lengthening and Reconstruction Surgery (LLRS) interest group was formed under the Malaysian Orthopaedic Association (MOA). Since then, MOA has been



Cover of handbook for the first Ilizarov workshop in Malaysia (1991).

Dr R. Cattaneo demonstrating construction of a frame during the first Ilizarov workshop organised in Kuala Lumpur (with permission of Dato' Dr K.S. Sivananthan).

Practical saw bone workshop during the first basic Ilizarov surgery organised in University of Malaya (2000).

Second Basic Ilizarov Course and Workshop (2001).

Basic Ilizarov course organised in Klang Hospital (2003).

supporting many types of training program in severe trauma, complications of trauma and limb deformity correction.

With increasing number of patients being treated with Ilizarov external fixator, complications of treatment started to surface. Subjects on rehabilitation and prevention of complications were introduced into the training courses. Advances in the designs of internal fixation allowed selected deformities to be treated with acute correction. In order to provide a more comprehensive treatment for the patients, University Malaya Medical Centre organised the first Limb Deformity Correction Course in 2009.

In developing nations, it is not uncommon to come across severe or neglected limb deformities. The LLRS interest group of MOA is playing an important role to provide adequate training for surgeons in this region. The interest group may also provide a platform for clinicians to meet and organise both clinical and basic research on new methods of bone regeneration or reconstruction. Over the last few years, we have observed increasing number of course participants and fellowship trainings coming from other parts of Asia Pacific region, Middle East and Africa. It is hoped that LLRS interest group of MOA can continue to play a role in the promotion and development of advanced trauma management and limb deformity correction surgery for the benefit of our patients.

Dr M. Catagni and Dr J. Xavier with local faculty during Ilizarov course and workshop 2003.

First Limb Deformity Correction Course in Malaysia in computer lab of University of Malaya (2009).

CHAPTER 9.0

Orthopaedic Education In Malaysia

CHAPTER 9.01

History of Masters Programme: Universiti Kebangsaan Malaysia

Prof Dr Sharaf Ibrahim

The First And Second Decades In The General Hospital Kuala Lumpur: 1976-1996

The Department of Orthopaedics and Traumatology in Universiti Kebangsaan Malaysia (UKM) was established in 1976 with Prof Dr Quazi Mohammed Iqbal as the inaugural professor and head of department.

The other Orthopaedic lecturers in the late 1970s were Datuk Dr Yeoh Poh Hong, Dato' Dr Shong Hing Kock and Dr Tassim Mahamooth. In 1981, the UKM Orthopaedic Training Programme commenced with three trainees: Dr Mohammad Abdul Razak, Dr Mohamed Noor Manukaran and Dr Masbah Omar. The UKM medical faculty was based in the General Hospital Kuala Lumpur (GHKL).

In 1984, Dato' Dr Abdul Hamid Abdul Kadir was appointed the second head of department. The academic staff then were Dato' Dr Ali Noor Ghani, Dr Lau Chun Cheung, Dr Joshua Thambiraj and Dr U Myint Han. Dr U Myint Han was the first rehabilitation physician in our department.

Dato' Dr Ali Noor Ghani was appointed the third head of department in 1989 and Prof Dato' Dr Mohammad Abdul Razak became the fourth head of department in 1993.

The Third And Fourth Decades In Hospital Universiti Kebangsaan Malaysia: 1997-2016

In 1997, our department moved to the newly-built Hospital UKM. The move resulted in further strengthening of the department with the establishment of the specialty units in spine, trauma, arthroplasty, paediatric orthopaedics and sports injury.

Prof Dr Masbah Omar became the fifth head of department in 2003, Prof Dr Mohammad Hassan Shukur as the sixth head of department in 2006 and Prof Dr Sharaf Ibrahim, the seventh head of department in 2009.

Our adjunct professor, Prof Dr P. Balasubramaniam was awarded an honorary doctorate in medical science by UKM during the 40th convocation ceremony in 2012. This was in recognition of his contribution to more than 4 decades of orthopaedic training in Malaysia, Singapore and Indonesia.

Our 2nd Head Of Department, Assoc Prof Dr Abdul Hamid Abdul Kadir and the UKM Orthopaedic Department office staff in the mid-1980s

UKM Department circa the late 1980s.

To further strengthen research in the department, Prof Dr Sabarul Afian Mokhtar became the first lecturer in our department to obtain a PhD from Macquarie University in 2012. Prof Dr Muhammad Kamal Muhammad Abdul Jamil was the second lecturer to pursue a PhD in 2015 at the University of Sydney.

A public-private hospital partnership for orthopaedic training commenced with three trainees from Kumpulan Perubatan Johor (KPJ) University College in 2015. They are Dr Abdul Hafiz Abdul Wahab, Dr Rajvinder Singh and Dr Sheriman Mohammad. Their first 2 years will be in KPJ Hospitals while their final 2 years of training will be in UKM.

The department currently has 8 specialty teams consisting of 21 academic staff:

Spine Surgery: Dato' Dr Azmi Baharudin, Prof Dr Sabarul Afian Mokhtar, Dr Mohd Hisam Muhamad Ariffin, Dr Shaharuddin Abdul Rhani, Dr Kamalnizat Ibrahim

Paediatric Orthopaedics: Assoc Prof Dr Abdul Halim Abd Rashid, Prof Dr Sharaf Ibrahim, Prof Dr Muhammad Kamal Muhammadd Abdul Jamil

Arthroplasty: Assoc Prof Dr Nor Hamdan Mohd Yahaya, Dr Rizal Abd Rani, Dr Mohamed Ashraff Mohd Ariff

Rehabilitation Medicine: Prof Dr Amaramalar Selvi Naicker, Assoc Prof Dr Rashidah Ismail@Ohnmar Htwe, Dr Brenda Saria Yuliawiratman

Hand & Microsurgery: Prof Dr Jamari Sapuan, Assoc Prof Dr Shalimar Abdullah

Orthopaedic Oncology: Assoc Prof Dr Nor Hazla Mohamed Haflah, Dr Abdul Yazid Mohd Kassim

Sports & Arthroscopy: Dato' Dr Badrul Akmal Hisham Md Yusoff, Dr Ahmad Farihan Mohd Don

Trauma, Foot & Ankle: Assoc Prof Dr Mohd Yazid Bajuri

National And International Collaborations

Besides participating in examinations, conferences and workshops, our surgeons have operated with Malaysian and international colleagues. Surgery abroad was performed in Afghanistan, Pakistan, Syria, Lebanon, Brazil, South Africa, Brunei, Philippines, Bangladesh and Indonesia. Surgeries with our Malaysian colleagues were done in Ampang, Sg. Buloh, Telok Intan, Seremban, Kulim, Alor Star, Kuching, Segamat, Malacca, Putrajaya, Ipoh and Kubang Kerian.

To further promote academic collaboration, our department has memorandum of understandings with University College London, Northern University of Sumatra in Medan, Hasanuddin University in Makassar and Prince of Songkla University in Hat Yai. Combined orthopaedic symposiums were held in Hat Yai and Medan in 2015 and 2016 respectively.

Conclusion

The department has contributed to the development of orthopaedic surgery by training 353 orthopaedic surgeons from May 1986 to May 2016. Thirty-four (almost 10%) are women orthopaedic surgeons. Twenty-one (6%) are international surgeons from 7 countries: Sudan, Iran, India, Libya, Timor Leste, Indonesia and Yemen.

We acknowledge and thank the contribution of all our trainees, administrative and academic staff who have contributed to the progress of the department over the past 40 years.

We will continue to provide the best treatment for our patients, teach our students with passion and contribute to new knowledge with our research and publications.

HEADS OF ORTHOPAEDIC DEPARTMENT UKM: 1976-2016

Prof Dr Quazi Mohammed Iqbal
1 March 1976 –
7 January 1984

Assoc Prof Dr Abdul Hamid Abdul Kadir
8 January 1984 –
10 August 1989

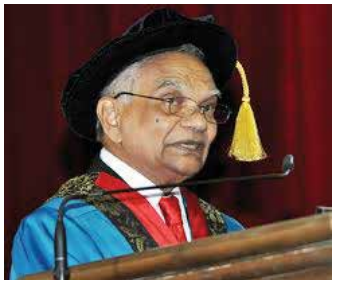
Prof Dr Ali Noor Ghani
11 August 1989 –
31 December 1992

Prof Dr Mohammad Abdul Razak
1 January 1993 –
31 December 2002

Prof Dr Masbah Omar
1 January 2003 –
31 December 2005

Assoc Prof Dr Mohammad Hassan Shukur
1 January 2006 –
31 December 2008

Prof Dr Sharaf Ibrahim
1 January 2009 - now



P. Balasubramaniam, Adjunct Professor of Orthopaedics UKM

Prof Dr P. Balasubramaniam received an honorary doctorate in medical science from UKM in 2012 for his more than 40 years of teaching Orthopaedics.

CHAPTER 9.02

History of Masters Programme: University of Malaya

Prof Dr Azlina Amir Abbas

The first medical faculty of this country was established in University of Malaya (UM) in 1962 and became functional in 1963. The Orthopaedic Department of this medical school was established in 1965 and in 1966 the University appointed Prof Dr Joseph Francis Silva as its first Professor and head of department. The department also counted Prof Dr P. Balasubramaniam and Prof Dr Subir Sengupta as its first staff. At that time there were only four Orthopaedic Surgeons in Malaysia, so the consultants and specialists of the department performed general Orthopaedic procedures without the assistance of house or medical officers for a number of years.

Following the formation of the Malaysian Orthopaedic Association in 1967, a special committee was formed under its auspices whose task was to prepare a proposal and syllabus for the formation of a postgraduate course in Orthopaedic Surgery in Malaysia. The members of this committee consisted of Prof Dr P. Balasubramaniam, Prof Dr Quazi Mohammed Iqbal and Dr Pretam Singh. Their proposal described a training course and examinations that were modelled after the UK-based FRCS examinations.

In UM, the postgraduate course in orthopaedic surgery, M.S. (Orth), commenced in 1989 under the leadership of Prof Dr N. Subramaniam. It had an initial intake of 4, though 2 subsequently left the programme to pursue overseas training. The need for the Masters Training Programme was to address the difficulties in training and producing specialists for the Malaysian healthcare system. Prior to the start of the programme, budding orthopaedic surgeons had to attempt the FRCS examinations, with some also qualifying with Master Ch. Orth. in Liverpool, United Kingdom before they were recognised as Orthopaedic Surgeons. Although the first part of the professional examinations was held in Malaysia 2 to 3 times a year, the second part had to be attempted in UK or Australia. Therefore, to create more training opportunities and specialists, the decision was made to start the Masters Training Programme in Malaysia.

The department was considered small when the Masters Programme began, with staff of 4 to 6 professors and lecturers and 2 to 3 medical officers. All performed Orthopaedic Trauma and General Orthopaedic procedures, but specialists and consultants were also free to practice in any of the 4 subspecialty units in the department. These units

Prof Dr Joseph Francis Silva

Prof Dr P. Balasubramaniam

Prof Dr N. Subramaniam

Prof Dr Subir Sengupta

Assoc Prof Dr K.S. Dhillon

Dr Marwan Hassan Mohd Mustafa (L) and Dr Jamal Azmi Mohamad (R) at their convocation in 1993.

were formalised by Prof Dr P. Balasubramaniam in 1979 and consisted of the Hand unit (under Prof Dr K. Thambyrajah), Spine unit (Prof Dr P. Balasubramaniam and Prof Dr N. Subramaniam), and Paediatric Orthopaedics and Orthopaedic Oncology unit (Prof Dr Subir Sengupta).

Assoc Prof Dr K.S. Dhillon, who was an attending specialist in the department at that time, recalled that the start of the postgraduate training programme was not difficult. For one, the FRCS and FRACS Part I examinations used to be conducted in the University Hospital (currently known as University of Malaya Medical Centre). Therefore, the experience and facilities for conducting professional examinations were readily available. There also existed a lot of didactic teaching sessions such as case conferences, Grand Ward Rounds (GWR), Morbidity and Mortality (M&M) meetings, journal club and interdepartmental meetings (between Radiology, Accident & Emergency and Orthopaedic Departments), all of which took place throughout the week. These sessions were described as intensive, and junior members were encouraged to give their views on cases and not merely agree with their consultants. This led to many healthy discussions between the members of the department.

Concurring with Assoc Prof Dr K.S. Dhillon is Dr Jamal Azmi Mohamad, one of the first 2 graduate specialists in 1993. In particular, he recollected that the twice weekly Grand Ward Rounds was a rich source of knowledge. The GWR would always start with the house-officer presenting the patient history, followed by physical examination by the medical officers. Then the questions regarding theory and practical matters

Dr Jamal Azmi Mohamad, pioneer graduate of the UM Masters of Orthopaedic Surgery training programme.

Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

Prof Dr Saw Aik

Prof Dr Vivek Ajit Singh, Head of Department 2014-2016

Prof Dr Azlina Amir Abbas, Head of Department 2016-present

Medical officers undergo training in microsurgery, a compulsory component before starting their posting in the Upper Limb and Reconstructive Microsurgery Unit.

would begin, and everyone from the MO to the specialist were not spared. Every case concluded with a summary of what was the best way of managing the respective cases. Morbidity & Mortality conferences was also a valuable time for teaching as everyone could learn from the mistakes of others, and it was not for blame games.

The small size of the department did not hinder training in any way. Everyone worked hard and learnt while they worked, reinforcing the point that service and teaching went hand in hand. Dr Jamal recalled that from the start, they were instructed by Prof Dr N. Subramaniam that with respect to surgical training, there were no limits and that they had to know everything. They were informed that the aim of the programme was to produce a general orthopaedic surgeon who could safely and independently serve in the general hospital setting. They were not allowed to operate on any patient unless they knew every detail of that patient and the surgery to be performed. This was adhered to strictly as they understood that the more they saw and did, the better they would be. With the high ratio of staff to trainee, a trainee had a lot of one to one time with their consultants resulting in an excellent and enriching learning experience.

Trainees had to be proficient in the basic sciences of anatomy, physiology and pathology. In terms of clinical training, for 1 year out of the 4, trainees had to be posted to another department relevant to their practice, for example, to anaesthesia or surgical departments.

Since the mid-1990's, the department has grown in many ways. The number of academic staff increased from 4 to 6 consultants and specialists initially to 26 currently. Many of the staff in attendance now are graduates of the UM Masters Programme. The increase in staff was attributed to a few factors. Firstly, it was in line with the growth of the Masters Programme, currently averaging an intake of 25 candidates per year for the past 3 years. Increased staff numbers assured a 1:1 ratio of trainee to trainer so as not to compromise practical training and supervision. The clinical subspecialty services provided by the department were also increased from five (orthopaedic trauma, hand, orthopaedic oncology, paediatric orthopaedics and spine surgery) in the 1970's to nine with the addition of four more subspecialties (arthroplasty, sports surgery, lower limb reconstructive services and foot and ankle surgery). This meant that UM was and is able to train medical officers in the full complement of orthopaedic subspecialties. As the clinical services expanded, the number of patients seen annually by the department also increased. Increased clinical services however did not equate to reduced learning opportunities. In reality the opposite is true, and our trainees are exposed to a wide variety of patient conditions and management methods. The increased numbers of patients also ensured the trainees were given ample opportunities to perform the expected core procedures.

At the time of commencement of the Masters training programme, much of the department experience in research was focused on case reports. Therefore, the main challenge for the trainee and their supervisors was conducting research to fulfil the thesis or dissertation requirement of the programme. To this day, preparation of the thesis can be described as painful for many trainees, and perhaps torturous for the ill-prepared. In the 1990's, the rationale behind the thesis or write-up was not to get new ideas, but more for teaching research methods, ethics, statistics and to obtain reasonable results. Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya recalled that although research activities were few in the beginning, the Masters Programme helped a lot in encouraging research. As the programme developed, the department's research activities evolved from producing case reports, to conducting clinical, preclinical and translational research. In order to assist the trainee and their supervisors with their projects, Prof Dato' Dr Tunku Sara oversaw the formation of a Thesis Review Committee (TRC) in 2010. The TRC helps

to monitor the feasibility of a project and its progress. It also advises on ways to improve them. Research has now become an integral part in the everyday life of the academic staff and trainee. The findings of many research projects conducted by trainees and their supervisors have been published in national and international journals and books, presented in national and international conferences, and have also earned their investigators awards in the national and international arena.

The first international trainee enrolled into the MS (Orth) programme was Dr Marwan Hassan Mohd Mustafa (Palestine) in the pioneer batch in 1989. Since then, the department has hosted and trained many international trainees from near and far. In some instances, the trainees were selected from their respective government bodies and sent to UM for further training. In others, the candidates themselves applied directly to the department. Dr Suhaeb Abdulrazzaq Mahmod came from Iraq to enrol in the Masters Programme in UM in 2007 after having learnt about UM from the Malaysian cultural attaché in Egypt, as well as from his friend who was already in Malaysia. He found the whole experience of orthopaedic training in UM a new and rewarding one. As any international trainee would attest to, having to adjust to new social and working environments, learning a new language and understanding and appreciating the different cultures was initially difficult. But Dr Suhaeb and many of his peers coped well thanks to the overwhelmingly friendly and helpful attitudes of the head of department, staff and fellow colleagues.

To streamline teaching, clinical services and research activities in the department, Prof Dato' Dr Tunku Sara initiated the establishment of the National Orthopaedic Centre of Excellence for Research and Learning (NOCERAL) in 2003 with the objective of combining current research, clinical services and education activities into an integrated inter-disciplinary world-class premier national research centre in Orthopaedic surgery and other related fields. NOCERAL currently offers a complete and wide range of orthopaedic sub-specialty clinical services and courses, and has research groups in tissue engineering, biomechanics, bio-products and biological aids and clinical orthopaedics.

Casting it right. Prof Dr Subir Sengupta's workshop on the proper techniques of applying casts.

Putting orthopaedic skills to use building NOCERAL

Sawbone workshops to familiarise trainees to various instruments and steps for surgery.

Housed in its own building, NOCERAL has many research laboratories and resource rooms to aid staff and trainees carry out their day to day tasks.

Since 2003, the Department of Orthopaedic Surgery of University of Malaya conducts the Part II exit examinations together with orthopaedic departments of the other universities in Malaysia, under the umbrella of the Conjoint Board of Orthopaedics (CBO). Working in partnership with the CBO, the curriculum and syllabus of the Masters Training Programme continues to be adapted to current knowledge, needs and technology.

Over the 28 years since it was initiated, the UM Masters Training Programme has naturally seen some changes in how the course is conducted. The various teaching sessions are still held, albeit adapted to be more relevant to current needs. Aside from focusing on academic pursuits, trainees are encouraged to volunteer and contribute to community services or causes. Over the years, trainees and staff have volunteered to see patients in the Kajang Women's Prison clinic and have also participated in activities organised by Mercy Malaysia, Tzu Chi Foundation and Lions Club.

The experience of being a UM Orthopaedic Masters trainee has been described as "a hard life" and "like a roller coaster ride" for many and there were times when they

Prof Dr Azlina and Prof Dr Tunku Kamarul Zaman from UM with Dr Mats Brittberg.

The 2016 Mahmood Merican Award finalists from UM.

At UM, we work hard and play hard too.

Trainees of the Department of Orthopaedic Surgery, UM 2016

felt like quitting. However, many graduates of the UM Masters of Orthopaedic Surgery programme look back on their training in UM with satisfaction, and felt that the end result was worth the “hardship”. They credit the structure and method of the programme in training them to think on their feet, and help them build strong clinical skills and personal confidence. In fact, it is the culture of teaching, mentoring and nurturing that was inculcated over 50 years ago and still practiced now that the Department of Orthopaedic Surgery in University of Malaya is known for when it comes to orthopaedic training.

Acknowledgements

I would like to thank the following who were instrumental in helping me write this chapter:

Prof Dr P. Balasubramaniam
Prof Dato’ Dr Tunku Sara Tunku Ahmad Yahaya
Dr K.S. Dhillon
Dr Jamal Azmi Mohamad
Assoc Prof Dr Azura Mansor
Dr Suhaeb Abdulrazzaq Mahmod
Dr Chan Chee Ken
Dr Rifa Aquidah Subhan
Dr Choo Qi Qi

References

1 History - About Us. (n.d.). Retrieved from Faculty of Medicine, University Malaya: http://medicine.um.edu.my/about-us/history/

2. History - Orthopaedic Surgery. (n.d.). Retrieved from Faculty of Medicine, University Malaya: http://medicine.um.edu.my/departments/clinicaldepartments/orthopaedic-surgery/history/

3. Home. (n.d.). Retrieved from NOCERAL: http://noceral.um.edu.my/

4. Thesis Review Committee (TRC). (n.d.). Retrieved from NOCERAL: http://noceral.um.edu.my/trc/

Photo Credits

Department of Orthopaedic Surgery, Universiti Malaya

Prof Dr Azlina Amir Abbas

Ms Vicky Wong

Associ Prof Dr Azura Mansor

Prof Dr Vivek Ajit Singh

CHAPTER 9.03

History of Masters Programme: Universiti Sains Malaysia

Prof Dr Wan Faisham Nu'man Wan Ismail, Prof Dr Zulmi Wan, Prof Dr Nordin Simbak, Prof Dr A.S. Devnani, Prof Dr Imran Yussof

The Master of Orthopaedics Programme in Universiti Sains Malaysia (USM) was introduced in 1991. The duration of the programme was four academic years. The programme was divided in two parts.

Part I was of one year duration in which anatomy, physiology, pathology and bio-mechanics were covered. At the end of first year candidates were required to sit for the Part I exams. Only successful candidates progressed to Part II, which was of three years duration. Candidates were required to sit for the final exams at the end of three years and successful candidates were awarded Masters of Medicine, M.Med (Ortho) degree by the university.

The pioneer faculty were Assoc Prof Dr A.S. Devnani, Dr Abdul Wahab Ghani, Dr Roslan Razak, Dr Rasheed and Dr B.A. Kareem. The first batch had four candidates who enrolled in 1991 and successfully completed the exit exam in 1995. Prof Dr Graham Apley from UK, was the external examiner.

The objective of the programme was to train general Orthopaedic Surgeons. They were subsequently encouraged to further their training in a various orthopaedic sub-specialties.

Since 2003, the 3 universities – UM ,UKM, USM, later joined by other universities and academic institutions, got together and pioneered the formation of CBO which presently conducts final exit exam. All the trainees are exposed to all major specialties before they are allowed to sit for the Conjoint Board of Orthopaedic (CBO) exit examination.

USM is recognized for their quality of Orthopaedic training. Ten international trainees from Yemen, Sudan, Iran, Mauritius and Iraq have enrolled in our programme and qualified as Orthopaedic Surgeons. USM also receives national and international fellows for subspecialty training.

To date USM had produced over 168 Orthopaedic Surgeons who are now practicing in various sectors including public, academic and private institutions throughout Malaysia.

USM Orthopaedic lecturers 1993 from left to right: Dr B.A. Kareem, Dr Abdul Wahab Ghani, Assoc Prof Dr A.S. Devnani, Dr Rasheed and Dr Roslan Razak.

Trainee and lecturer of USM Orthopaedic Department in 1995.

Prof Dr Graham Appley during Master Orthopaedics Final Exam, 1995.

Prof Dato' Dr Roslani and Prof Dr Graham Apley during the 1st Masters Orthopaedics Final Exam, 1995.

Department members with external examiner Prof Dr Lee Eng Hin during the Masters Final Exams, 1998.

Alumni USM Orthopedic gathering 2003 in Grand River View Hotel, Kota Bharu.

CHAPTER 9.04

History of Masters Programme: International Islamic University of Malaysia (IIUM)

Prof Dr Ahmad Hafiz Zulkifly

The Department of Orthopaedics, Traumatology and Rehabilitation, Kulliyyah of Medicine, IIUM started Masters of Orthopaedic Surgery in the Semester 2008/2009. The first batch of this programme enrolled by three students; Dr Goh Kiang Liang, Dr Mohd Shahidan Noor Rahin and Dr Ardilla Hanim Abdul Razak. Dr Goh Kiang Liang created history in IIUM to become the first non-Muslim student to graduate from the Clinical Masters Programme.

This programme is a four-year programme to train doctors to become Orthopaedic Surgeons. The students are taught the basic science and principles of surgery in year one and they will continue their

subspecialty and elective rotation until they sit for the final professional exam organized by the Conjoint Board of Othopaedics. During this period the students will continue to work in the Department of Orthopaedics in the hospital. The minimum duration of study is four years. The maximum duration of study shall be seven years.

The Department of Orthopaedics, Traumatology and Rehabilitation took the initiative to offer the Masters of Orthopaedic Surgery programme in view that Malaysia still has an inadequate number of Orthopaedic Surgeons to serve the public. The Orthopaedic Surgeons are in high demand because Orthopaedics is very much involved in treating trauma injury victims which is the third highest cause of death in Malaysia.

Objectives of Masters of Orthopaedic Surgery

1. To prepare trainees for the Basic Clinical Examination and National Conjoint Board of Orthopaedics Examination;
2. To provide training programmes that will produce compassionate, knowledgeable and technically competent orthopaedic surgeons;
3. To offer an Islamic perspective at the same time produce well-rounded and competent professionals with a good background in the art and science of medicine;
4. To prepare new specialists with comprehensive in-house education and training in traumatology and orthopaedic surgery to make them able to better serve in the health services; not just equipped with good education but also with great attitude.

The uniqueness of the Master Programme offered by the Department of Orthopaedics, IIUM is the inclusion of the “Islamic Input in Orthopaedic” programme. The programme aims to produce orthopaedic surgeons who will serve their patients and community with care and integrity. They will be equipped with not only scientific and clinical knowledge, but also skillful to function effectively as an orthopaedic surgeon within the Islamic concept of the unity of knowledge and the spirit of tawhid. They will have a healthy critical faculty and possess the desire and skills to continue self-directed learning to keep up with future advances in medicine. The quest of knowledge is a trust from ALLAH. This component is part of integrating Islamic knowledge into the medical science curriculum.

Number of Master of Orthopaedic Surgery Students over the Years

NO.	BATCH	NO. OF STUDENTS
1	Batch 2008	3
2	Batch 2009	4
3	Batch 2010	5
4	Batch 2011	6
5	Batch 2012	7
6	Batch 2013	7
7	Batch 2014	8
8	Batch 2015	15
9	Batch 2016	18
	TOTAL	**73**

Postgraduate Activities

Basic Arthroscopy Course.

Diabetic Limb Conference.

Islamic Medical Ethics Workshop.

Arthroplasty Course.

Stress Management and Communication Workshop.

CITRA promotional video making.

Orthopaedic Research Laboratory Award

MS/ISO 17025 Certificate of Appreciation

Bionexus Partners Status Award

CHAPTER 9.05

History of Masters Programme: Universiti Malaysia Sarawak

Assoc Prof Dr Chan Wai Hoong

Sarawak is a large state with its population spread throughout the region. Many patients from rural areas faced transportation difficulties and financial constraints, resulting in delay in them to getting or receiving treatment. Furthermore, some conditions that have become rare in West Malaysia are still relatively common in Sarawak, , for example tuberculosis of the musculoskeletal system.

Not many Orthopaedic Surgeons are keen to be posted to Sarawak due to its landscape and difficult accessibility to many areas. At present only four hospitals provide full time Orthopaedic services. The closest distance between two of these hospitals is more than 200km and is linked for most of the way via winding single lane roads passing through hills

and valleys. From the rural hospital to the main hospital, at times ambulances have no other option but to make use of river transport, logging camp roads or reach inaccessible areas via an emergency response helicopter. Therefore, there is dire need to train more local Orthopaedic Surgeons with the hope that they would stay in their homeland and serve Sarawak after being equipped with the knowledge and the experience of the limitations faced here.

Thanks to the hard work of Prof Dr Pan Kok Long and Prof Dr Ahmad Hata Rasit and after many series of meetings at various levels, UNIMAS finally received its first candidate for the Masters in Orthopaedics programme in the year 2015. Together with Consultant Orthopaedic Surgeons from Sarawak General Hospital, we look forward to producing more Orthopaedic Surgeons to better serve the Sarawakian people and add to the Orthopaedic Surgeons fraternity in Malaysia.

Prof Dr Ahmad Hata Rasit

Prof Dr Pan Kok Long

Faculty Of Medicine and Health Sciences UNIMAS

CHAPTER 9.06

History of Masters Programme: Universiti Putra Malaysia

Prof Dr Sharifah Roohi Syed Waseem Ahmad and Dr Zanariah Othman

Historical Background

The Orthopaedics Masters Programme offered by Universiti Putra Malaysia (UPM) is the 'youngest' on the plate amongst the public Universities. A veteran in the field of agriculture of 85 years, UPM was first founded as the School of Agriculture in 1931. In 1997, former Prime Minister Tun Dr Mahathir Mohamad renamed it Universiti Putra Malaysia, reflecting its capability as a centre for higher education in providing an increasing portfolio especially in science and information technology. The Faculty of Medicine and Health Sciences was pioneered by then Vice Chancellor, Prof Emeritus Tan Sri Dato' Sri Dr Syed Jalaludin Syed Salim in August of 1996 with the first batch of medical students given MMC full recognition in 2001.

From left: ProfEmeritus Tan Sri Dato' Sri Dr Syed Jalaludin Syed Salim, Prof Dr Azhar Md Zain, Prof Dr Norlijah Othman, Prof Dato' Dr Abdul Jalil Nordin and the late Prof Dato' Ir Dr Radin Umar Radin Sohadi

The idea of starting a Masters Programme in Medicine was mooted 10 years ago by the then Dean Prof Dr Azhar Md Zain and brought fast forward by the next Dean Prof Dr Norlijah Othman. Orthopaedics was the first surgical specialty to start off with the 2015/2016 batch of four candidates taken in as trainee lecturers, and the third clinical department after Psychiatry and Paediatrics.

Development

A Unique programme with various strengths

With four public Universities offering the programme, we had to convince the powers that be that we had something with an added value. One of the key features was the unique 'Blue Ocean" strategic agreement between UPM (the upcoming Hospital Pengajar Universiti Putra Malaysia or HPUPM), and the Ministry of Health (Serdang Hospital) to work together combining the strengths in two different working environment and styles. With this, a rare and lasting combination of both MOH and MOE hospital settings would be made available for both undergraduates and postgraduates reaching a combined capacity of approximately 1200 beds. The two hospitals would not duplicate but complement each other in terms of emergency versus elective, specialty-based versus sub-specialty based and the division of sub-specialties and services. For example, the cardiothoracic unit would encourage collaboration with microsurgeons for vascular cases as well as spine surgeons for anterior spinal cases.

The historical strength of the University in animal husbandry and veterinary science would tremendously boost basic science small and large

The building of Universiti Putra Malaysia teaching hospital.

animal research which the postgraduate students can avail themselves of easily. Research into zoonotic diseases would also be facilitated.

The Centre for Diagnostic Nuclear Imaging in the Faculty of Medicine and Health Sciences (FMHS) complex, led by our current Dean: Prof Dato' Dr Abdul Jalil Nordin, has amongst the other usual imaging modalities, a PET-CT machine to facilitate investigations of oncology cases – it is especially sensitive for detection of metastases, and we are keen to expand our musculoskeletal oncology services in time to come.

The Department of Orthopaedics, although young (that is an asset), has a total of 18 academic members, 5 of whom are trainees. Ten members however have more than seven years of postgraduate qualifications and experiences having completed their sub-specialty training, two of whom are Full Professors and two are Associate Professors. We have all the sub-specialties represented including a young surgeon in oncology waiting in the wings. Collaboration with Serdang hospital increases strength in terms of surgical staff with seniority and experience (for example in advanced trauma, sports medicine and rehabilitation), augmenting the programme in areas where we (university) may be deficient.

With the establishment of the Sports Injury and Arthroscopic Surgery Centre of Excellence (SIASCOE), we aim not only to provide the best (practice) services for shoulder, elbow, knee, foot and ankle cases but ultimately to lead in research, teaching and training.

Points Deliberated

There were a number of significant points brought up during the deliberation of the programme in the department which may prove relevant to future Universities aiming to set up this course.

Whilst the duration of the programme was not negotiable, there were a number of factors within, which altered the fluidity of the programme. These included the number of years a candidate spent 'in' and 'out' of 'campus' (we settled for 2 plus 2); the duration of each posting in years three and four (we finally decided on three months each); the duration of the elective posting in the second year (resulting in six months) and finally which ones the candidates would get to choose from (general surgery, vascular surgery, plastic surgery, neurosurgery, urology and anaesthesia). Although timing of the Part I exam was an issue: some advocating it being taken a year later whilst others were in favour of six months after commencement of the programme, this may become irrelevant with the implementation of the Basic Science Examination or BSE as an intake requirement in the near future.

Taking the Best of All

With advancing technology and ease of availability of documents, our task was made less intimidating for we had access to all the syllabi from the various Universities. However, simultaneously it became challenging with the enormous amount of information at our disposal. We (Dr Zanariah and Prof Dr Roohi) spent countless evenings and nights at the Faculty gleaning through tonnes of information (and plates of Kajang satay) trying to take what we thought would be the best of all the programmes. We realised too much information is not always a good thing, but we were guided by good mentors and perseverance paid off in the form of a final document.

Challenges

Justification of the Programme

At various steps along the way we had to justify the introduction of the programme, both within the University and outside. This was an eye-opener for us as we had to tackle the financial impact (with MAMPU), the long-

Hospital Serdang in relation to our Faculty and the proposed HPUPM site.

The final document of 137 pages outlining the UPM Orthopaedic Master programme.

term projection of the number of Orthopaedic Surgeons and the country's expected requirements based on WHO criteria (with Ministries of Health and Higher Education), providing evidence of sufficient academic staff, cases and facilities (to the Conjoint Board of Orthopaedics) and finally mastering LOKI (with the Senate and Board of Directors of the University). We are thankful for the great support we received from our then Dean - Prof Dr Norlijah and ex-Vice-Chancellor – the late Dato' Ir Dr Radin Umar Radin Sohadi who kindly explained to us the formulation of LOKI (Learning Objectives and Key Indices) in his office!

Feedback Form and Market Survey

The market survey led us to realise the deficit (of Orthopaedic Surgeons) we would potentially face in 2020 at the present rate of production: a very essential exercise to conduct. It also gives an insight into the thoughts of prominent surgeons in the country. Although the feedback was not complete, it helped us decide part of the formation of our programme. We strongly suggest this to be carried out in the future and potential respondents reading this to please reply!

JPA

Always a challenge to extract posts from the Public Service Department, crunching the numbers in as many possible ways is certainly helpful when faced with a torrent of questions. Respect for their obligations in difficult financial times helped us tweak our requirements too.

Lessons Learned

There is a flow chart of the process of application of a new Masters Programme for our local public (and private) Universities. This chart is constantly changing and there are little tweaks that takes one off guard. It is difficult to keep tabs on these changes but necessary for one's peace of mind and sanity.

Perseverance is the key. Issues of contention must be addressed and taken as a lesson – they ultimately make one's programme better. Constructive criticism is welcome

Estimated Projection of Orthopaedic Surgeon Population in Malaysia

TAHUN	POPULASI	NISBAH DOKTOR POPULASI	KEPERLUAN NEGARA	UNJURAN BEKALAN	UNJURAN STOK	DEFISIT/ LEBIHAN
2010	28,250,000	30,000	942	30	458	-484
2012	29,000,000	30,000	967	40	498	-469
2015	30,716,000	30,000	1024	55	553	-471
2018	32,000,000	30,000	1067	70	623	-444
2020	34,075,060	30,000	1136	80	703	-433

– we found the review by the Evaluation Committee most useful and were well-advised by them. These were senior members of the Academy of Medicine, CBO, MOA and MOH.

Be prepared for long nights and have a good secretarial team – we certainly did! They were instrumental in compiling data, performing analyses and editing as well as going through the enormous amount of paperwork – thank you Aida and Ida.

A department that works well together and bonds during crises is the best – we had them helping at every corner and compiling information upon extremely short notice – kudos to you guys!

Suggestions

We would like to suggest definite guidelines and procedures to follow when trying to establish a Master Programme in Orthopaedic Surgery, specifically transparency, objectivity and reduction of bias in the evaluation of such a programme. The rules and regulations should not be loosened: just the criteria for certification and selection should be highlighted and written.

After submission of the said programme, a timeline should be adhered to whereby the programme is evaluated and either accepted or rejected (with reasons given).

Future Directions

Establishing a Masters Programme is just the beginning. Planning the future direction in terms of expansion and direction is the key to keep it running. The senior members have to lead the way by example, just talking the walk is not enough. Ensuring an equal distribution of staff is also paramount: 20% senior consultants, 40% consultants and

Faculty of Medicine and Health Sciences, UPM set in lush greenery in Serdang

40% specialists we feel is a good tincture – but it also depends on the University policy and academic make-up.

Planning of the National Orthopaedic Curriculum is well underway and this will, the hope is, pave the way for a more streamlined postgraduate programme and in time uniformity and some standardisation of specialist calibre.

The country is young and promising, with an excellent health service, we need to maintain and upgrade it.

References

1. Cadangan Penawaran Program Master Surgeri Ortopedik UPM. (n.d.).
2. UPM. (n.d.). The Story Behind UPM. Retrieved from Universiti Putra Malaysia: http://www.upm.edu.my/about_us/history/the_story_behind_upm-8203

CHAPTER 10.0

Award Winners Over The Years

The graduates from the Masters in Orthopaedic Surgery courses for the year 2016 on stage at the ASM Conference Dinner as the N. Subramaniam Award recipient is about to be announced.

MOA Annual Scientific Meeting 2016 - Finalists of the Mahmood Merican Award on stage with the Dato' Dr Mahmood Merican and MOA President, Dato' Dr Badrul Shah Badaruddin.

It's to promote, to encourage good research by the young Orthopaedic surgeons. This is meant for those taking the course in Orthopaedic surgery... It's now something that is keenly competed for and I see [the] standard of the research and the papers presented for this award is very high [from the] very good remarks of those judges who mostly are from abroad.

Dato' Dr Mahmood Merican, Founding Member of the MOA, on his motivation behind creating the Mahmood Merican Best Masters Thesis Award.

Award Winners Over The Years

YEAR	N. SUBRAMANIAM	MAHMOOD MERICAN
1998	Robert Penafort, Ahmad Tajuddin Abdullah, Wan Hazmy Che Hon	Selva Kumar
1999	Wong Chung Chek, Md Ros Che Ali, Fazir Mohamad	Md Ros Che Ali
2000	Ozlan Izma Muhamed Kamil, Abang Kilat Abang Yak, Chong Chee Seang	Kamarul Ariffin Khalid
2001	Vivek Ajit Singh, Wan Faisham Nu'man Wan Ismail, Zairul Nizam Zainol Fitri	Abdul Nawfar Sadagatullah
2002	Kwan Mun Keong, Nazri Mohd Yusof, Ariff Sukimin Mohammad Shukri	Kwan Mun Keong
2003	Khoo Shaw Ming, Abdul Nawfar Sadagatullah, Felix Loong Yew Seng	Khoo Shaw Ming
2004	Ivan Randal Ranatunga	Sureshan Sivananthan
2005	Lim Phaik Gan	Shalimar Abdullah
2006	Sri Subanesh Narayanan	Avthar Singh Jaswant Singh
2007	Rajesh Singh	Suryasmi Duski
2008	Chris Chan Yin Wei	Chris Chan Yin Wei
2009	Yohan Khirusman	Low Tze Hau
2010	Ang Hock Leong	Terence Tay Khai Wei
2011	Fong Tuck Shin	Tan Chen Wee
2012	Mohd Zakhiri Mohd Rashid	Ng Thong Pin
2013	Ong Theng Khiam	Ong Theng Khiam
2014	Lim Chiao Yee	Rifa Aquidah
2015	Chan Sook Kwan	Shams Amir Shamsul Bahar
2016	Inderjeet Singh	Mohamed Faizal B Abdul Manan

Award Winners Over The Years

YEAR	P. BALASUBRAMANIAM	BASIC SCIENCE	SUBIR SENGUPTA
2010	No Award	Hawa Dashtdar	No Award
2011	No Award	Recipient unavailable	No Award
2012	No Award	Kamarul Ariffin Khalid, Nam Hui Yin, Tan Sik Loo	No Award
2013	No Award	Tan Sik Loo	No Award
2014	Kwan Mun Keong	Nam Hui Yin	Chua Yeok Pin
2015	Rifa Aquidah	Nam Hui Yin	Wan Faisham Nu'man Wan Ismail
2016	Kwan Mun Keong	Nam Hui Yin	Chris Chan Yin Wei

CHAPTER 11.0

Malaysian Orthopaedic Journal

Prof Dr Saw Aik

Editorial board meeting during a conjoined Board of Orthopaedics session in UKM Medical Centre, in 2016

Progress in science and arts of medicine relies heavily on research and publication. In order to encourage its members to share their clinical experiences, Malaysian Orthopaedic Association (MOA) made special arrangement with Medical Journal of Malaysia (MJM) to organise a regular Orthopaedic supplement where full text articles in the field of musculoskeletal conditions can be published. From 1998 to 2006, six supplement issues were published.

Due to the change in policy by MJM where full text articles are no longer allowed to be published in supplement issues, MOA decided to publish a new journal under the name Malaysian Orthopaedic Journal (MOJ) in the year 2007. Prof Dr Saw Aik was appointed to undertake the challenge and a team of senior orthopaedic surgeons was enrolled as the editorial board member. MOJ was initially published twice yearly, but in 2010, the issue was increased to three times a year (March, July and November issues). We subsequently engaged CrossRef to provide digital object identifier (d.o.i.) coding for all published articles, and later included CrossCheck to perform duplication check. Since MOJ allowed free access of all published material on our journal homepage without subscription, we observed increasing online viewing of our published articles over the years. Submissions started to come in from various continents of the world.

In 2010, MOA proposed to ASEAN Orthopaedic Association (AOA) to adopt the March issue of MOJ as the continuation of "Journal of Asean Orthopaedic Association" or "ASEAN Orthopaedic Journal". A new group of regional Editors was formed and all the March issue of MOJ in the subsequent years will carry the heading of "ASEAN Orthopaedic Journal" with a subheading of "ASEAN edition of MOJ" to ensure the continuation in the indexing and citation of the publication.

In 2012, Academy of Medicine of Malaysia (AMM) hosted the annual Asia Pacific Association of Medical Editors (APAME) congress in University of Malaya, Kuala Lumpur. MOJ actively

MOJ webpage providing links to all published supplement issues of MJM from 1998 to 2006.

Discussion between a few senior Orthopaedic surgeons on publishing a new journal under Malaysian Orthopaedic Association (Nov 2006).

participated in the organising of the event. Incidentally, the guest of honour for the opening ceremony was the deputy vice chancellor of University Malaya Dr Awang B, who happened to be a member of MOJ editorial board. Our Board members were also actively involved in activities of the Association of Malaysian Medical Journal Editor (AMMJE) that was formed shortly after the APAME congress.

Starting from 2014 November issue, MOJ adopted open access module using Creative Commons license where all published materials can be downloaded, duplicated, modified and used for commercial and non-commercial purposes as long as the contributors are acknowledged. In other words, there is no need to ask for permission from authors or publishers. MOJ does not request for Article Processing Charges (APC) for authors to submit articles. MOA supported the secretariat services, editorial programs, and printing of the journal. Contributions by members of the editorial board and peer reviewers are all on voluntary basis. In order to handle the increasing volume of submissions, and to more effectively organise the peer reviewer process, we subscribed to Editorial Manager (Aries Systems Corporation) program that is used by most of the top ranked scientific journal in the world.

2017 marks the 10th anniversary for the publishing of MOJ. With this special landmark, we are happy that many scientific papers and case reports from Malaysia and ASEAN region have been published and made available to the medical community around the world. MOJ has also provided a platform for many authors / clinicians to share their clinical experience and innovations. In order to further expand and improve the role of MOJ, we are working to enrol more peer reviewers from various orthopaedic subspecialties, and also increasing the number of editorial board members. We are also trying to improve the visibility of the journal by getting the journal indexed by more internationally acclaimed indexing bodies. With the combined effort of the contributing authors, peer reviewers and editorial team, we hope that MOJ will develop into an established journal that contributes toward progress of medicine especially in the field of Orthopaedic Surgery.

References

1. DOI Guidelines. (n.d.). Retrieved from Crossref: https://www.crossref.org/02publishers/doiguidelines.pdf
2. Editorial Manager. (n.d.). Retrieved from Aries Systems: http://www.ariessys.com/software/editorialmanager/
3. Similarity Check. (n.d.). Retrieved from Crossref: http://www.crossref.org/crosscheck/index.html
4. Supplementary Issues. (n.d.). Retrieved from Malaysian Orthopaedic Journal: http://www.morthoj.org/supplements/
5. What we do. (n.d.). Retrieved from creative commons: https://creativcommons.org/about/

Cover page for Malaysian Orthopaedic Journal (Nov 2016 issue)

Cover page of ASEAN Orthopaedic Journal / ASEAN edition of Malaysian Orthopaedic Journal (March 2016 issue)

CHAPTER 12.0

Women in Orthopaedics in Malaysia

Dr Chye Ping Ching

Men have always dominated Orthopaedic Surgery. In fact, Orthopaedics has the lowest percentage of women in a surgical specialty. Although women now account for almost half if not more of the medical school graduates, only 4.3 percent of board-certified Orthopaedic Surgeons and 14 percent of Orthopaedic residents in America are female.

People used to attribute the field's gender disparity to the physical force required to manoeuver fractured or dislocated bones and joints back into place. While the need for physical strength may have played a role decades ago, advances in modern-day medical equipment have shifted the demands in surgery from brute strength to manual dexterity, mechanical ability and an aptitude in three-dimensional visualisation.

Until the last 20 years, there is a relatively low numbers of practicing female Orthopaedic Surgeons who are able to serve as mentors and role models. When women see other successful women in the specialty, they are more likely to be inspired, believe that "they can do what the boys can do" and follow in the footsteps.

The journey of women in Orthopaedics in Malaysia started in 1991 with Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya who was the only lady Orthopaedic Surgeon in the country for 8 years. Following in her footstep were Dr Razana Amran and Dr Zanariah Othman who successfully completed their orthopaedic training in 1999. The turn of the millennium saw four female Orthopaedic Surgeons Dr Chye Ping Ching, Dr Sharifah Roohi, Dr Atikah Amirah and Dr Yong Su-Mei joining the orthopaedic family. The number of female Orthopaedic Surgeons has since increased steadily over the years and we now see a total of 71 female Orthopaedic Surgeons practicing in various corners of the country, comprising just slightly short of 10% of the total number of Orthopaedic Surgeons in Malaysia. Among them there are 4 Orthopaedic Oncology Surgeons, 3 Paediatric Orthopaedic Surgeons, 3 Hand and Microsurgery Surgeons, 2 Arthroplasty Surgeons, 2 Spine Surgeons and 1 Sports Surgeon, many of whom are among the best in their fields.

Women Orthopaedic Surgeons have always been treated as equal with their male colleagues in Malaysia. Besides shouldering similar responsibilities at work, they enjoy equal recognition and opportunities and are just as effective if not better as teachers and leaders locally and internationally. Narrowing the gender gap in orthopaedic surgery is crucial for the advancement of orthopaedics and patient care. In order to continue to attract the best and the brightest, Orthopaedics needs to become more attractive to women students. By demystifying stereotypes, breaking down barriers and fostering career development of young female Orthopaedic Surgeons we can truly make this field the best it can be.

> **Do not go where the path may lead, go instead where there is no path, and leave a trial.**
>
> **Ralph Waldo Emerson**

Universiti Kebangsaan Malaysia (UKM) Women Orthopaedic Graduates

UKM 1999
Dr Razana Amran

UKM 1999
Dr Zanariah Othman
HOSP PUSRAWI KUALA LUMPUR

UKM 2000
Dr Atikah Amirah
HOSP KUALA TERENGGANU

UKM 2000
Dr Chye Ping Ching
HOSP KUALA LUMPUR
Orthopaedic Oncology

UKM 2000
Dr Sharifah Roohi
UPM
Hand & Microsurgery

UKM 2001
Dr Kamariah Nor
HOSP KUANTAN
Paediatric Orthopaedics

UKM 2001
Dr Lee Keat Hwa
HOSP PULAU PINANG
Arthroplasty

UKM 2001
Dr Nor Azlin Zainal Abidin
HOSP KUALA LUMPUR
Spine

UKM 2001
Dr Siti Hawa Tahir
HOSP KUALA LUMPUR
Arthroscopy & Sports

UKM 2004
Dr Norashikin Johari
HOSP KUALA LUMPUR
Paediatric Orthopaedics

UKM 2004
Dr T. Jayamalar
HOSP SULTAN ISMAIL JOHOR
Spine

UKM 2005
Dr Mashayati Muhammad
HOSP KAJANG

UKM 2005
Dr Shalimar Abdullah
UKM
Hand & Microsurgery

UKM 2006
Datin Dr Vasanthie Balakrishnan
PENANG MEDICAL COLLEGE

UKM 2007
Dr Isnoni Ismail
HOSP KUALA TERENGGANU

UKM 2007
Dr Suryasmi Duski
HOSP KUALA LUMPUR
Orthopaedic Oncology

UKM 2008
Dr Haryati M. Yusof
HOSP ALOR SETAR

UKM 2008
Dr Hazla Haflah
UKM
Orthopaedic Oncology

Universiti Kebangsaan Malaysia (UKM) Women Orthopaedic Graduates

UKM 2008
Dr Nur Rahimawati
HOSP TEMERLOH

UKM 2009
Dr Kartinawati Mohamad
HOSP KUALA TERENGGANU

UKM 2010
Dr Roslida Awang
HOSP TANAH MERAH KELANTAN

UKM 2012
Dr Siti Khadijah Shunup
HOSP BATU PAHAT (HSNI)

UKM 2013
Dr Fazrina Ayu Abdul Sani
HOSP SEREMBAN

UKM 2013
Dr Noreen Fazlina Nor
HOSP SULTAN ISMAIL JOHOR

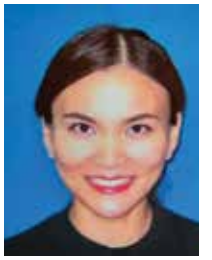
UKM 2013
Dr Norhaslinda Bahaudin
HOSP SEREMBAN

UKM 2014
Dr Sharizan Yusoff
HOSP KLUANG JOHOR

UKM 2015
Dr Arneemarlina Wahab
HOSP BATU PAHAT JOHOR

UKM 2015
Dr Chan Sook Kwan
HOSP QUEEN ELIZABETH SABAH

UKM 2015
Dr Imma Isniza Ismail
HOSP KENINGAU SABAH



UKM 2015
Dr Maria Shelynn Wong
HOSP QUEEN ELIZABETH SABAH

UKM 2016
Dr Nurhanani Abu Bakar
HOSP SHAH ALAM

UKM 2016
Dr Nurul Aishah
HOSP SULTANAH AMINAH JOHOR BAHRU

Universiti Sains Malaysia (USM) Women Orthopaedic Graduates

USM 2001
Dr Mazlina Bt Awang
KOTA BAHRU
KELANTAN HRPZ II

USM 2001
Dr Suzanah Kamaludin
HOSP KUALA
TERENGGANU HSNZ

USM 2009
Dr Norazira M. Yacob
UNIMAS KUCHING
SARAWAK

USM 2013
Dr Norzakiah Abu Mansor
HOSP PULAU PINANG

USM 2013
Dr Surianty Shafei
HOSP KUALA KRAI
KELANTAN

USM 2014
Dr Noor Mahazrinna Hayadin
HOSP ALOR SETAR
KEDAH

USM 2014
Dr Nor Zarini Yusoff Ibrahim
HOSP KANGAR PERLIS

USM 2015
Dr Aidilyana Shalan
HOSP SLIM RIVER
PERAK

USM 2015
Dr Normawathy Amir Osman
HOSP KUALA
TERENGGANU HSNZ

USM 2015
Dr Nur Sabrina Abdul Ghani
USM KELANTAN

USM 2015
Dr Nurul Shakirah Abdul Halim
HOSP LIKAS SABAH

USM 2016
Dr Choo Chin Yin
HOSP SEBERANG JAYA
PENANG

USM 2016
Dr Khoh Phaik Shan
HOSP ALOR SETAR
KEDAH

USM 2016
Dr Liau Chai Jiun
HOSP SIBU SARAWAK

USM 2016
Dr Noor Hidayah Abdullah Abd Wahab
HOSP KUALA
TERENGGANU (HSNZ)

USM 2016
Dr Prema Sivalingarajah
HOSP AMPANG
SELANGOR

Universiti Malaya (UM) Women Orthopaedic Graduates

UM 2000
Dr Yong Su-Mei
HOSP TUNG SHIN KL
Paediatric Orthopaedic

UM 2005
Dr Azlina Amir Abbas
UNIVERSITY MALAYA
Arthroplasty

UM 2005
Dr Azura Mansor
UNIVERSITY MALAYA
Orthopaedic Oncology

UM 2005
Dr Lim Phaik Gan
HOSP PANTAI SUNGAI PETANI KEDAH

UM 2007
Dr Lynn Azura
HOSP AMPANG

UM 2010
Dr Norzatulsyima Nasirudin
HOSP MIRI SARAWAK

UM 2010
Dr Nur Aida Faruk Senan
HOSP KUCHING SARAWAK

UM 2010
Dr Nur Rahimah Abdul Rahim
HOSP AMPANG

UM 2011
Dr Haniza Sahdi
UNIMAS

UM 2012
Dr Loke Yean Hwe
HOSP ARA DAMANSARA

UM 2012
Dr Norazian Kamisan
HOSP KUALA LUMPUR

UM 2013
Dr Gooi Siew Ghim
HOSP PULAU PINANG

UM 2014
Dr Jayaletchumi Gunasagaran
UNIVERSITY MALAYA

UM 2014
Dr Lim Chiao Yee
HOSP KUALA LUMPUR

UM 2014
Dr Melissa Mohd Nor
HOSP KUALA PILAH NEGERI SEMBILAN

UM 2014
Dr Rifa Aquidah Subhan
HOSP KLANG

UM 2014
Dr Teo Seow Hui
UNIVERSITY MALAYA

UM 2015
Dr Liew Siew Khei
HOSP SERDANG

Universiti Malaya (UM) Women Orthopaedic Graduates

UM 2015
Dr Sia Ung
HOSP KUCHING
SARAWAK

UM 2016
Dr Joanne Ngim Hui Ling
HOSP PULAU PINANG

UM 2016
Dr Khoo Saw Sien
HOSP SUNGAI BULOH

UM 2016
Dr Noor Sa'adah Kasim
HOSP ALOR SETAR
KEDAH

International Islamic University of Malaysia (IIUM) Women Orthopaedic Graduates

IIUM 2012
Dr Ardila Hanim Abdul Razak
IIUM
Paediatric
Orthopaedics

IIUM 2016
Dr Nur Akmal Binti Ismail Mansor
HOSP MUAR JOHOR

My Journey as a Woman in Orthopaedic & Hand Surgery

Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

I graduated in 1982 from the Royal Free School of Medicine in London, the first women's medical school in England with a tradition of training women. In my year the intake was strictly 50% women.

I returned home to do housemanship and joined University of Malaya in 1985 as a trainee lecturer. Most Orthopaedic Surgeons including the late Prof Dr Subra and Prof Dr Subir Sengupta were very chivalrous and encouraging and it has been a great place to work and I consider the department my second home and the staff my family.

University Malaya Orthopaedic Department 1991

I was the first lady Orthopaedic doctor in the department and, it seems, in the country. Hand and Microsurgery was a new and exciting field and it was decided that, as a lady, there is less force and more precision required and that I should take this up. Despite being the last team called to theatre, for long and tiring hours at the microscope, I was happy and enjoyed the challenges and the successes of the subspecialty. I learned very fast that therapists were key to the successful treatment.

I was fortunate to have the opportunity to do a one year general surgical training in National University of Singapore under Prof Dr Abu Rauf in 1989 and 1990 and obtained my FRCS (Glasgow) during that period of time. I later did a year fellowship with Prof Dr Robert W.H. Pho in Hand Surgery from 1990 to 1991. Prof Dr Robert Pho was a sensation and had performed a highly publicised live fibula graft on a child from the UK. He was and still is an amazing mentor, a great thinker and surgeon. I returned in 1991 as a member of the academic staff to the Orthopaedic Department University Malaya.

When I returned, we were required to manage other orthopaedic cases. Among others, I did spine surgery, knee replacements, knee scopes and the general orthopaedic trauma that came in when I was on call. Interlocking nails were just beginning to be used. Power instruments were not always available and we used a lot of energy drilling holes in the bone with a hand drill.

As the number of Orthopaedic Surgeon increased, we were able to focus more on our chosen subspecialties. After the Malaysian Society for Surgery of the Hand (MSSH) was founded, there was an enthusiastic burst of activities, like the 1st and 2nd International Hand Conferences. Smaller events were carried out until many more specialists joined in culminating in the successful APFSSH organised in KL by the MSSH in 2014. The future

Tennis with Prof Dr Pho, staff and fellows.

With a favourite Matron in OT 1994.

In OT with Dr Teh Kok Kheng.

of hand surgery looks bright with more talented young people coming into the field.

The MOA has always been a huge part of all aspects of most Orthopaedic Surgeon's career and life in Malaysia. Through MOA, we made many friends and enjoyed many hours of learning and socialising together. I served in the Committee and finally as president, in 2006 with a group of great colleagues and the help of the legendary, super-efficient Ms Molly Kong. I have watched it grow from a small club to a successful organization capable of running multiple big conferences and representing the hundreds of Orthopaedic Surgeons we have now.

I love teaching and a very rewarding part of my life is spent teaching and guiding medical students and especially Masters students in Orthopaedic Surgery, a nice bunch of clever youngsters. The Conjoined Board of Orthopaedics (CBO) is another unifying factor where the universities and Ministry of Health come together to ensure a common standard in training examination and certification of young orthopaedic surgeons. We argue and discuss heatedly on many topics and issues but remain friends nontheless.

I have always enjoyed the easy camaraderie between Orthopaedic Surgeons and with other subspecialties and allied health personnel. The students always say that Ortho UM are the nicest teachers and it is great that the Orthopaedic community has seamlessly expanded to include us girls to be "one of the boys".

Representing the Malaysian hand Society at the APFSSH in Chennai.

With department collegues.

CHAPTER 13.0

Innovations by Orthopaedic Surgeons

1. Ali Noor External Fixator

2. Implants and instruments designed and manufactured in Malaysia

(a) **OSA Technology.** The founder of OSA Technology, Dr Hyzan Yusof has been actively involved in humanitarian works and he observed an acute scarcity of quality and affordable medical devices for surgical operations and treatment. There was a pressing need and concerns for health and safety issues. Thus, OSA Technology Sdn Bhd (OSA) was incorporation in February 2004 to introduce quality Malaysian-made orthopedics and medical devices to the ASEAN, Southeast Asia and Middle East markets to provide niche orthopedics products especially implants which are safe and high quality, affordable and accessible to patients.

(b) **Leonix.** Variable Angle Locking System.

a

b

3. Winner of the Gold Award and Pharma Innovation of the Year at the BioInnovation Awards 2016.

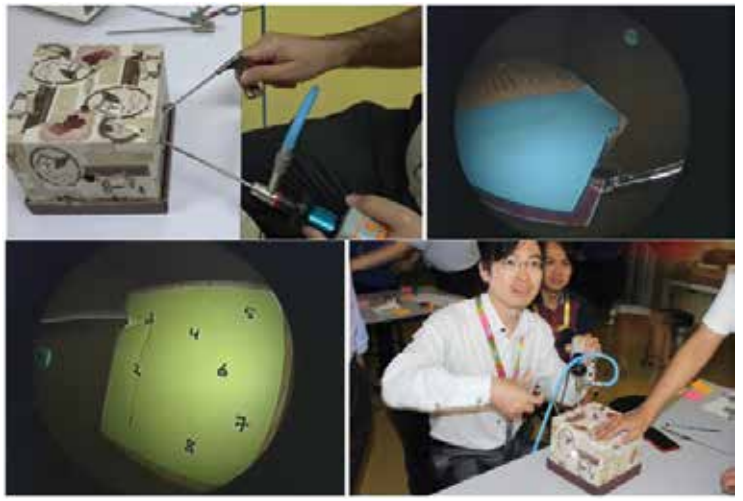
Development of Total Ankle Replacement Digital Templating Software is a software developed to accurately determine the size of implants needed in patients who will be undergoing total ankle arthroplasty, using precise image scaling, of which the template image library was created based on Hintegra conventional total ankle replacement acetate template.

4. **GranuMaS®** is a synthetic calcium phosphate bioceramic-based substitute bone graft. It is a bio-technological product developed through a collaborative R&D effort of Malaysian researchers from Advanced Material Research Centre (AMREC)-SIRIM Berhad, International Islamic University Malaysia (IIUM), Science University of Malaysia (USM), National University of Malaysia (UKM) & Malaysian Institute of Nuclear Technology (MINT). This product is widely used in Malaysian hospitals.

5. **UKM innovations:** (left) **Spinal instrumentation**. It was exhibited at the 33rd International Exhibition of Inventions of New Techniques and Products 2005, held in Geneva, Switzerland; (right) **Pinless Halovest.**

6. **Arthroscopy Box For beginners in arthroscopic surgery training -** by Dr Mohamed Zubair Mohamed Al-Fayyadh

The Arthroscopy box is used for seven exercises which are learning triangulation, 8 points connection, Arthroscopic measurements, debridement, removal of loose bodies, sliding knots and making a dice tower to enhance the 3D proprioception of the trainees.

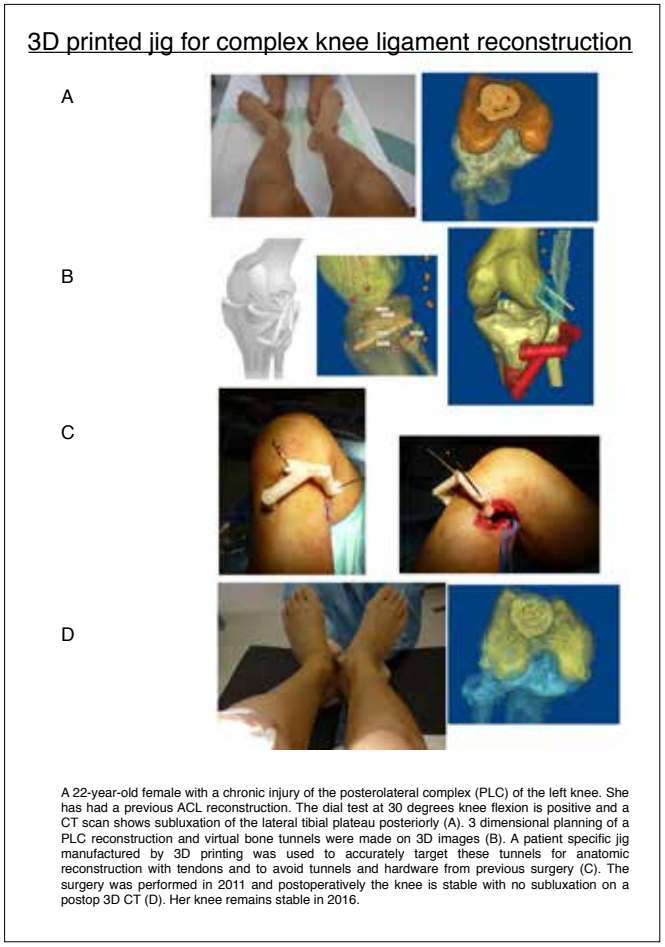


7. **Custom made Proximal humerus replacement –** by Prof Dr Zulmi Wan

8. **Custom made digital phalanx thumb –** by Dr Mohd Iskandar M Amin

9. Prof Dr Azhar Merican was one of the four developing surgeons for the **Sirius stem**. The project began in 2011 and it is manufactured by one of the top 5 global orthopaedic device companies. The double tapered cemented stem follows the proven taper-slip philosophy. It has been specifically designed with multiple sizes and offset to fit a broader range of proximal femoral morphology, with the Asian hip in mind. The hip prosthesis was designed to allow for direct exchange with existing stems and cement in cement revision and focussed on surgeon-friendly instrumentation.

10. **3-D Printed Jig for Complex Knee Ligament Reconstruction -** by Prof Dr Azhar Merican



A 22-year-old female with a chronic injury of the posterolateral complex (PLC) of the left knee. She has had a previous ACL reconstruction. The dial test at 30 degrees knee flexion is positive and a CT scan shows subluxation of the lateral tibial plateau posteriorly (A). 3 dimensional planning of a PLC reconstruction and virtual bone tunnels were made on 3D images (B). A patient specific jig manufactured by 3D printing was used to accurately target these tunnels for anatomic reconstruction with tendons and to avoid tunnels and hardware from previous surgery (C). The surgery was performed in 2011 and postoperatively the knee is stable with no subluxation on a postop 3D CT (D). Her knee remains stable in 2016.

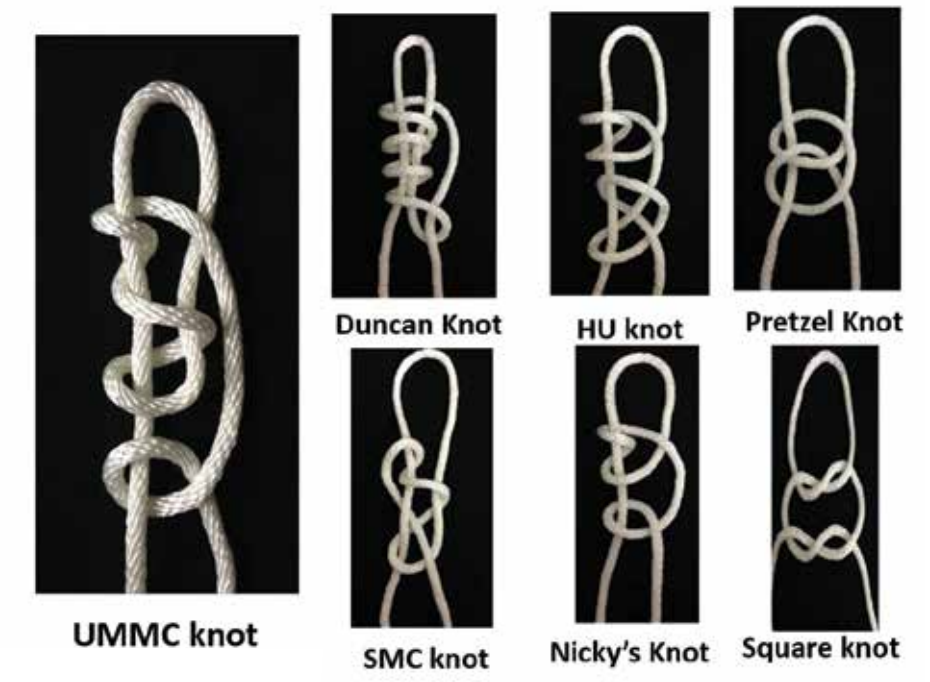
11. Portable Expandable Lower Limb Emergency Splint

12. Allofibular Composite (AFC) An ideal reconstruction for bone tumours

13. Universiti Sains Malaysia Hip Spica Brace

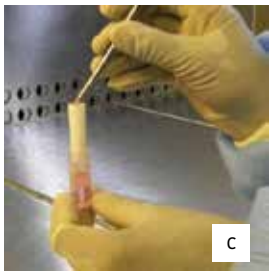
14. Universiti Sains Malaysia Functional Load Sharing Patella Tendon Bearing Brace

15. **UMMC knot** was compared with 5 other arthroscopic sliding knots and a square knot - by Dr Teow Seow Hui, Dr Mohamed Zubair Mohamed Al-Fayyadh, Assoc Prof Dr Mohamed Razif Mohd Ali, Assoc Prof Dr Ng Wuey Min



16. **Universiti Kebangsaan Malaysia tissue engineering innovations.**

17. Bone Banking in Hospital Universiti Sains Malaysia



Amnion membrane: a) air dried, b) glycerol preserved and c) glycerol cryopreserved

Bone allograft: a) deep frozen and b) freeze dried

Deep frozen tendon/ligament allograft

Freeze dried bovine bone

USM Tissue Bank with clean room facilities

Freeze dried bovine pericardium

18. A new finger fixation for rigid flexion deformities - by Prof Dato' Dr Tunku Sara Tunku Ahmad Yahaya

CHAPTER 14.0

Collaboration of MOA with Other Associations

Dr David Choon Siew Kit

4th Congress of the Western Pacific Orthopaedic Association in Kuala Lumpur

The MOA has developed excellent relations with several regional and international societies over the years. These ties have yielded lasting bonds of friendship and understanding between office bearers and participants.

Western Pacific Orthopaedic Association / Asia Pacific Orthopaedic Association (APOA)

Our founder Tan Sri Dr Abdul Majid (Koko) Ismail was a founder member of the Western Pacific Orthopaedic Association which was mooted during the 1962 Second Meeting of the Pan-Pacific Rehabilitation Conference of Rehabilitation International.

The original idea belonged to Dr Catalino T. Jocson of the Philippines who felt that there was a great need for a "local" Asia Pacific meeting where the handful of surgeons in the region could discuss common problems and work out solutions. Other founding member countries were Hong Kong, Philippines, South Vietnam and South Korea. Over the years Malaysia has provided three Presidents of the Association, namely Tan Sri Dr Abdul Majid Ismail, Dato' Dr K.S. Sivananthan and Prof Dr David Choon Siew Kit. Two Congresses had been held in Malaysia in 1973 and 2004. Malaysia has also been chosen to be the host of the 2020 meeting.

By the time Malaysia held the 2004 Triennial meeting the attendance had grown to more than 1500 participants and the Sections of the renamed Asia Pacific Orthopaedic Association included Spine, Paediatrics, Knee, Hip, Trauma and Sports. The Association has since added Infection, and Foot and Ankle as subspecialty sections. Dato' Dr K.S. Sivananthan was the president during this period and he was instrumental in the 1990's for the name change that allowed India, Bangladesh, Pakistan, Sri Lanka, China and Turkey to join as members.

Under the presidency of Dr Ted Mah, an Australian surgeon who was born in Ipoh, the Federation system of membership was created. The Malaysian Orthopaedic Association became a Federation member in 2016.

MOA-SOA Combined Meeting in Singapore 1969

ASEAN Orthopaedic Association (AOA)

The first Malaysia-Singapore Orthopaedic Meeting took place in 1968 and combined meetings have been held yearly since then. This was the precursor of the ASEAN Orthopaedic Association which was founded in the 1970's. There were only a handful of Malaysian orthopaedic surgeons then and a similar number of their Singaporean counterparts. It was decided that an annual meeting of this small band of surgeons would provide an excellent platform for scientific discourse and a "friendly" round of golf. The Malaysians who started this meeting included Tan Sri Dr Abdul Majid Ismail and Prof Dr P. Balasubramaniam of University of Malaya.

The ASEAN Orthopaedic Association South East Asia was a very exciting place to be in the 1960's and 1970's for a chronicler of the birth and development of nations and regional blocs. Malaya achieved independence in 1957 and forged ahead to a union with Singapore and North Borneo only to have Singapore achieving independence in 1965. On 8 August 1967, five leaders – the Foreign Ministers of Indonesia, Malaysia, Philippines, Singapore and Thailand

became signatories to the ASEAN Declaration that bound the five nations to the notion of cooperation within the framework of the Association of South East Asian Nations.

In tandem with this the government of Singapore instructed Dr Ong Leong Boon to initiate steps to create an Orthopaedic association that would similarly bind the ASEAN Orthopaedic Surgeons. This was a great success. Dr Ong went on to become the Secretary General of the ASEAN orthopaedic Association for twenty three years and single-handedly ran the Association during this time.

Dr Ong was a regular at all meetings of the AOA and his jovial cigarette smoking personality helped to foster great bonds of friendship not just between his peers but also to junior orthopaedic surgeons as well. Eventually the Association has now grown to encompass all the current ASEAN nations. Dr Ong has been replaced by an equally friendly Secretary General, Dr Ellewelyn Pasion of the Philippines.

The ASEAN Junior Travelling Fellowship was a master stroke that was inaugurated soon after formation of the AOA. This was initially funded by Biomet and then Johnson and Johnson Orthopaedics. It is now funded from individual member societies. The idea was to get five mid-level Orthopaedic Surgeons under the age of forty to travel together for five weeks to each other's countries with the final destination being the AOA meeting grafted onto a member organisation's national meeting to be held in rotation. Many friends were made during these travels and young and upcoming surgeons were introduced to the regional bosses. I was one such fortunate participant. I truly enjoyed sharing ideas and presenting my thoughts to surgeons in other countries. Our little band of five became firm friends.

There is also a Senior Travelling Fellowship and I must confess to being too young for this as yet. I certainly remember Dr Pedro Sembrano turning up in Malaysia in his 80's with a twinkle in his eyes and a spring in his step.

In addition the Association arranged for Travelling Fellowships to EFORT and the American Orthopaedic Association meeting. These were also excellent events that introduced us to the world at large. It goes without saying that the Presidents of all ASEAN orthopaedic societies are automatic invites at each other's national meetings. Dr Pasion usually manages to entertain us all with his rendition of Elvis Presley's "You ain't nothing but a hound dog"!

The bonds of ASEAN are set to become even stronger soon with the possibility of removal of barriers to flow of manpower between nations. In anticipation of this, the ASEAN Orthopaedic Association has initiated a working group to develop minimal standards of training throughout the region. This project is headed by Prof Dr Lee Eng Hin of Singapore.

Other international links

In addition to ASEAN, Presidents of the Malaysian Orthopaedic Association have in the past and present received invitations to attend the national meetings of the Australian Orthopaedic Association, Indian Orthopaedic Association, Hong Kong Orthopaedic Association, Korean Orthopaedic Association, Bangladesh Orthopaedic Society, the Academy of American Orthopaedic Surgeons (AAOS). In some cases such as the Hong Kong Orthopaedic Association, the invitation is also extended to a junior member of the MOA as a junior ambassador.

All in all, the MOA has benefitted from its links to many international societies and bodies. In return, it has been a powerhouse in some of these regional societies and contributes much to the success of the region.

ASEAN Orthopaedic Association Secretary General Dr Ellewelyn Pasion in conversation with the Representative of the Indian Orthopaedic Association Dr Jamal Ashraf at the 2016 MOA President's Dinner.

Incoming APOA President Dr David Choon Siew Kit with MOA President Dato' Dr Badrul Shah Badaruddin during 2016 MOA's President Dinner.

CHAPTER 15.0

Orthopaedics In The News

Disc implant that saved a knee

HKL performs successful synthetic meniscus procedure on FRU officer

By LOH FOON FONG
foonfong@thestar.com.my

KUALA LUMPUR: Malaysia achieved another notch in sports science when Hospital Kuala Lumpur (HKL) successfully implanted a synthetic meniscus with the hope of repairing a man's badly damaged knee, a feat the hospital said was second in Asia after Hong Kong.

Orthopaedic specialist Dr Siti Hawa Tahir said the synthetic meniscus served as a temporary scaffold to stimulate the knee to grow a new meniscus, while the implant itself would disintegrate after four years.

The meniscus is a rubbery disc that cushions the knee as it moves under load, such as when lifting heavy objects or running, making meniscus tear a common knee injury.

Doctors say most types of tears are not repairable since only the peripheral third of the meniscus receives blood supply, which is essential for tissue repair.

According to HKL Orthopaedic and Traumatology department head Datuk Dr Fazir Mohamad, when it comes to severe meniscus tear, the damaged part is usually removed, but this leads to early osteoarthritis in young people.

The new approach could offer a better option to those who suffered a severe tear, he said.

The man on the receiving end of this new way of repairing meniscus is an officer with the Federal Reserve Unit, Kpl Adisura Syafriee Abdullah, 36.

Kpl Adisura fell on his left knee during a football game in 2010 but continued with playing and running. Last year, he heard a popping sound from his knee before it started to swell.

Dr Siti Hawa said Kpl Adisura's treatment was extensive because his injury had been left untreated for far too long and his left knee looked like it belonged to a 60-year-old man.

A team of four specialists and eight other medical personnel took six hours on Sept 26 to complete the alignment procedure, implant the synthetic meniscus, as well as to reconstruct the damaged cartilage and ligament on Kpl Adisura.

Dr Siti Hawa said the next stage for him now was to undergo proper rehabilitation.

Kpl Adisura should be able to walk six weeks after the surgery and run in four to six months, as well as engage in all forms of sports a year later.

"As the country moves towards a developed nation status and has athletes competing at the highest levels, knee injuries tend to be more complex and require highly skilled treatment," Dr Fazir said.

"We will continue to lead in this area and provide training for those who want to specialise in this area," he said.

Extensive treatment: Dr Fazir (right), Dr Siti Hawa and HKL sports medicine specialist Dr Arshad Puji examining Kpl Adisura's knee after the surgery. (Inset) A model of the human knee.


Sci-Tech 45

Fixated on straightening fingers

HANDS-ON APPROACH: Prof Tunku Sara and Prof Goh examining the external fixator which has been fitted onto the finger of a model skeleton.


Rawat segera kecederaan buku lali

DOKTOR AKAN MEMBERI RAWATAN KONSERVATIF MENGGUNAKAN UBAT-UBATAN DAN PESAKIT DINASIHATKAN MENJALANI PROGRAM FISIOTERAPI. PEMBEDAHAN SEPERTI PENUKARAN SENDI BUKU LALI HANYA DISARANKAN JIKA ARTHRITIS BUKU LALI SEMAKIN TERUK DAN BUKU LALI MASIH TIDAK STABIL, HINGGA SUKAR BERJALAN"


Gerak tubuh yang mudah sudah cukup mengembirakan


4.3 PERATUS

40-70


骨癌患者的生活素質

Guang Ming Daily (PG3)
15th October 2012

From a service-oriented medical practice, doctors are now playing active roles in seeking solutions to problems in the operating theatre.

Bone and joint

IF you think a doctor's life revolves around the operating theatre and consultation room, think again.

For some doctors, work also includes endeavours in research laboratories, where they lead investigations to seek practical solutions for problems they encounter when they treat their patients.

"I think the keyword is evidence-based (medicine). So, whatever (methods) gives us the best results, we will do it that way," says Prof Dr Tunku Sara Tunku Ahmad Yahya.

Risiko DVT selepas pembedahan

Oleh RABIATUL ADAWIYAH KOH ABDULLAH
adawiyah.koh@utusan.com.my
Foto JEFFRI IRAN

RAMAI yang beranggapan selepas pembedahan pemulihan fungsi sistem rangka serta sendi kaki dapat membantu pergerakan menjadi lebih sempurna. Namun, bagaimana jika anda mendapati tiba-tiba kaki anda membengkak? Keadaan itu cenderung kepada masalah sistem vena trombosis (VTE) di mana darah berubah daripada cecair menjadi pepejal dan membentuk bekuan darah (trombus).

Mungkin ramai yang tidak menyedari antara komplikasi bahaya selepas pembedahan ialah pembentukan darah beku di bahagian kaki (deyvein thrombosis) atau DVT.

Lebih parah lagi, jika darah beku itu pecah ia akan menyekat salur darah ke paru-paru (pulmonary embolism-PE).

Sekiranya masalah ini tidak diatasi pada peringkat awal, ia boleh menyebabkan kematian.

Penyakit ini adalah disebabkan darah beku yang menyebabkan salur pembuluh darah terutamanya di bahagian peha dan betis tersumbat. Keadaan ini berlaku kerana aliran darah yang tidak baik hasil daripada aktiviti yang pasif dan rehat berbaring. Terdapat beberapa faktor yang mempengaruhi pesakit mengalami DVT seperti lebih

PROF. DR. AZHAR

DR. JAMAL AZMI MOHAMAD

"Secara umum, dalam kajian tidak rasmi DVT di Malaysia, 62.5 peratus pesakit yang menjalani pembedahan gantian sendi lutut, gantian sendi pinggul dan patah tulang paha mengalami DVT
– Dr Jamal

S28 PENDIDIKAN selangor&kl Sinar

UM cemerlang dalam penyelidikan ortopedik

Menawarkan pembelajaran dan penyelidikan lanjutan dalam bidang pembedahan ortopedik

"**MATLAMAT** kami ialah untuk menjalin kaedah meringankan penderitaan manusia dan pengagan pesakit dalam bidang pembedahan ortopedik," kata Prof Datuk Tunku Sara Tunku Ahmad, Pengarah Pusat Ortopedik Nasional untuk Kecemerlangan Penyelidikan dan Pembelajaran, Universiti Malaya (UM) atau dikenali juga sebagai 'NOCERAL'.

Dr Ahmad Mahyuddin Mohamed

» Pemakaian terlalu lama boleh sebabkan sakit belakang, rosakkan saraf

CHAPTER 16.0

Bone Men and Women

Prof Dr Wan Faisham Nu'man Wan Ismail,
Dr Shahrulazua Ahmad,
Dr Ismail Munajat,
Prof Dr Zulmi Wan

We the bone men and women...

Thee may wonder who we are
And what excitement we share
We drill, we tap, and ream and screw
So that things are fixed, firm and good
As straight as we are
And no hiding behind bush

Our first exposure was an X ray
Our games are tractions and splints
We use our mind to pull
We hold with gypsum
We share the same place "Paris"
We are the bone men and women

Chisels, hammers, reamers
Are our favourite tools
We play with all kind of
nails, screws and pins
Our playground is
Littered with flesh and blood
Though we are no fools
As we despise courts and
only love theatres
Thus we are careful with
vessels and nerves

We are no robots nor mechanics
But we know biomechanics
very well
We calculate and study
Strength, load, tensile
& Young modulus
So our construct stays
superb and faithful

We lot love heavy-metal
As we use stainless steel,
titanium, cobalt and chromium
We make plastic so
useful to people
And so we strengthen new
joint with bone cement
We just help people
not make bionic men
As we are no god but only
the bone men and women

Sometimes we love water
Scuba with key-hole vision
Repairing thing while watching TV
To make loose joint
stronger and tighten

We don't like to make enemy
We respect our rival "bone setters"
Despite fixing their mistake
With difficulties
We still do
As we are the
bone men and women

Our playmates
Love to play with gases
Once they touch people
People fall in love
They put them into deep
comfortable sleep
With sweetest dream
People won't feel the pain
Because our playmates
Are the gas-men and women

People labels us as carpenters
We are not
We are the artists in our own world
We are experts in science and biology
Perhaps others don't
understand our language
As they are not
bone men and women
And only we the
bone men and women can

Photo Gallery

Molly Kong, affectionally known as Ms Kong, was the Executive Secretary of MOA for many years. She organised many of MOA Annual Scientific Meetings (ASM).

The MOA staff and 46th ASM Secretariat (Medical Conference Partners) worked hand in hand during the meeting.

Every ASM, a golf competition is held and the champion trophy is always presented during the Conference Dinner.

Industry participation is always appreciated. The number of exhibition booths during the ASM increases every year.



Past Presidents have always participated in MOA activities and give advice and guidance to junior members of the association.

The Conference dinner is always a highlight during the ASM. We always have local performers, professional singers and even Prof Dr Ellewelyn Pasion from Philippines bringing cheer to the occasion.

The Keynote speaker for the 2011 Annual Scientific Meeting, Dato' Sri Che Khalib Mohamad Noh walking with the MOA Council Members.

Acknowledgements

In addition to the individual chapter contributors, we would like to acknowledge and show our deepest appreciation to the following parties for the additional content:

Dato' Dr Mahmood Merican
Prof Dr P. Balasubramaniam
Prof Dr Azhar Merican
Dr Mohd Yazid Bajuri
Dr Ahmad Mahyuddin Mohamed
NOCERAL
Zimmer Medical (M) Sdn Bhd
Leonix Sdn Bhd
Pravitra Jeyaratnam
Medical Conference Partners