



十年樹木 百年樹人

Dedication to education

10th Anniversary

1999-2009

Learn and Practice to Serve Better

White Paper on Future Orthopaedic Education and Training

**Proceedings of Forum on Orthopaedic Education and Training:
*Education and Training of Orthopaedic Surgeons –
Challenges and Changes***

Hong Kong SAR 2009



White Paper on Future Orthopaedic Education and Training

**Proceedings of Forum on Orthopaedic Education and Training:
*Education and Training of Orthopaedic Surgeons –
Challenges and Changes***

Held at the Orthopaedic Learning Centre, Prince of Wales Hospital, Shatin, Hong Kong on
April 30, 2009.

In commemoration of:
The 10th Anniversary of the Orthopaedic Learning Centre, The Chinese University of Hong Kong

*Kwok-Sui Leung
Hazel Ung
Cassia Tang
(Eds.)*

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Department of Orthopaedics and Traumatology
The Chinese University of Hong Kong

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Preface

“Changes are eternal” 变幻仍是永恒

Orthopaedic education underwent many changes in the past decades. These changes are in responses to the changes in the diseases and pathologies related to musculoskeletal system, to the changes in the demands from our patients and the society, to the changes that we practice orthopaedics and orthopaedic surgery, to the changes in advancement in the technologies and pharmacological development, to the changes in the background and needs from the younger generation colleagues, to the changes in the roles of our working partners, to the changes in doing research and development of our research team and to the changes in doing business of our industrial partners.

Education and specialty training are key programs that qualified orthopaedic surgeons are produced. The training program providers and monitoring bodies are responsible for the quality assurance of the specialists that serve the community. The training program and the curriculum of the Hong Kong College of Orthopaedic Surgeons were developed for more than 15 years basing on the UK system. In the presences of these changes in different parts of the world, we believe that it is the time to review and plan ahead for the future with the aims for a better training program that will respond to the above changes.

This forum is jointly organised with the Hong Kong College of Orthopaedic Surgeons with the aims to achieve a critical review of the current curricula in Hong Kong with respects to other parts of the world. In this forum, we will also analyse the assessment methods as well as the criteria. Feedbacks from our working partners, our trainees and trainers will be collected and reviewed. Based on these information, the future plan and program will also be discussed and hopefully the forum will help to identify the direction where the changes can be made and modified. An updated and better curriculum will be developed.

People

Chief Editor

Professor Kwok-Sui Leung Director, Orthopaedic Learning Centre
Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

Program Organisers

1. Orthopaedic Learning Centre, Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong
2. Orthopaedics Hyperguide: Regional Advisory Board - Asia-Pacific (RAB-AP)

Program Co-organiser

Hong Kong College of Orthopaedic Surgeons (HKCOS)

Program Panelists

Dr. Wai-Kit Ngai	Consultant Orthopaedic Surgeon Chief, Court of Examiners, Hong Kong College of Orthopaedic Surgeons, Hong Kong
Professor Wei Tian	President, Beijing JiShuiTan Hospital, China Member, Orthopaedics Hyperguide RAB-AP
Professor Bing-Fang Zeng	Chairman, Department of Orthopaedic Surgery Shanghai 6 th People's Hospital, China Member, Orthopaedics Hyperguide RAB-AP
Professor James Hutchison	Sir Harry Platt Chair of Orthopaedics University of Aberdeen, Scotland Chairman, Intercollegiate Specialty Board in Trauma and Orthopaedic Surgery
Professor Enrique Guerado	Director, Department of Orthopaedic Surgery & Traumatology University of Malaga, Spain Member, Orthopaedics Hyperguide RAB-Europe
Professor Mellick Chehade	Senior Lecturer and Consultant Trauma Surgeon Department of Orthopaedics and Trauma, Royal Adelaide Hospital, University of Adelaide, Australia Director, National Muscular Skeletal Curriculum
Professor Rajesh Malhotra	Consultant Orthopedic Surgeon All India Institute of Medical Sciences, New Delhi, India
Mr. Stephen Sargeant	Director of International Healthcare and Innovations Stryker Inc. USA
Ms. Jessica Chan	Orthopaedic Nurse Specialist Department of Orthopaedics and Traumatology Prince of Wales Hospital, Hong Kong
Dr. Lung-Fung Tse	Resident Specialist Department of Orthopaedics and Traumatology Prince of Wales Hospital, Hong Kong
Dr. Sally Cheng	Resident Specialist Department of Orthopaedics and Traumatology Prince of Wales Hospital, Hong Kong
Professor Leung-Kim Hung	Chairman Department of Orthopaedics and Traumatology The Chinese University of Hong Kong President, Hong Kong College of Orthopaedic Surgeons
Professor Kwok-Sui Leung	Director, Orthopaedic Learning Centre Department of Orthopaedics and Traumatology The Chinese University of Hong Kong Chairman, Orthopaedics Hyperguide RAB-AP

With participation of Members of the Orthopaedics Hyperguide, Regional Advisory Board, Asia-Pacific.

Meeting Secretary

Miss Hazel Ung Education and Events Specialist, Stryker Pacific

Technical Support

ACAOS-ITAV team Department of Orthopaedics and Traumatology
The Chinese University of Hong Kong

Forum Program

April 30, 2009

08:00	Registration	
08:20	I. Introduction – in responses to the changes now and the future!	<i>LK Hung</i>
08:30	II. Curricula – overview and changes expected in –	<i>KS Leung</i>
08:40	1. Hong Kong	WK Ngai
09:00	2. United Kingdom	J Hutchison
09:20	3. Europe	E Guerado
09:40	4. China	W Tian / BF Zeng
10:00	5. Australia	M Chehade
10:40	Break	
11:00	III. Deliverables - specialists	<i>WK Ngai</i>
	1. Quality - feedbacks from –	
11:05	a. Industry	S Sargeant
11:20	b. Working partner	J Chan / Ken Lee
11:35	c. Trainee	LF Tse / S Cheng
11:55	2. Assessments of quality - how these can be done?	M Chehade
12:15	3. Sub-Specialists- demands and developments	E Guerado
12:35	4. Discussion	
13:00	Lunch	
14:00	IV. Formats in Training, Teaching and Assessment	<i>M Chehade</i>
14:15	1. Clinical knowledge	LK Hung
14:30	2. Clinical competence and skills	J Hutchison
14:45	3. Integrating Technology in Training – Is this the Future?	S Sargeant
15:00	4. Discussion	
15:20	Break	
15:40	V. Round table discussion – Setting of new standards and ethical issue in training	<i>LK Hung</i> <i>WK Ngai</i>
	BF Zeng	
	M Chehade	
	E Guerado	
	J Hutchison	
	R Malhotra	
	KS Leung	
16:40	VI. Summary and conclusion	<i>KS Leung</i>
17:00	End of program	

Table of Contents

Preface	P. iii
People	P. iv
Program	P. v
I. Introduction – in responses to the changes now and the future!	P.1
II. Curricula – overview and changes expected in –	P.3-24
1. Hong Kong	P.3
2. United Kingdom	P.6
3. Europe	P.13
4. China	P.19
5. Australia	P.22
6. Discussion Summary	P.24
III. Deliverables - specialists	P.25-34
1. Quality - feedbacks from –	P.25-26
a. Industry	P.25
b. Working partner	P.26
c. Trainee	P.26
2. Assessments of quality - how these can be done?	P.28
3. Sub-Specialists- demands and developments	P.31
4. Discussion Summary	P.34
IV. Formats in Training, Teaching and Assessment:	P.35-40
1. Clinical knowledge	P.35
2. Clinical competence and skills	P.35
3. Integrating technology in training – Is this the Future?	P.38
4. Discussion Summary	P.40
V. Round table discussion –	P.41
Setting of new standards and ethical issue in training	P.41
VI. Epilogue	P.43-44
Acknowledgement	P.45

I. Introduction – in responses to the changes now and the future!

By Professor LK Hung

Professor Hung's opening message gave a brief introduction of the stages in achieving a career in Orthopaedic Surgery, as well as gave reference to the observations obtained during the recent American Orthopedics Association (AOA) Symposium on Orthopaedic Residency Training – Are we meeting expectations?

How do we keep up with the advancing technologies in information and medical devices, in the different medical disciplines? How do we acquire the best out of aspiring, young surgeons with the expected decreasing hours of work? What are the goals of these young surgeons: title status, financial achievement or simply compassion to care for the sick and needy?

With special mention that The Orthopaedic Learning Centre has had ten successful years in achieving its continual medical training and education in the Asia Pacific region and recognition of Professor Leung's dedication as being the pioneer in this discipline.

II. Curricula

Moderator: Professor KS Leung

Professor Leung's emphasis on Curriculum, being the main "ingredient" in producing an Orthopaedic specialist, with the proper nurturing and instructions, the likes of a manufacturing plant ensuring that the entire process from the stages of planning and analysis, to executing and producing the final product, meets the market demand and vies for continuous usage in the industry. Quality control in the training process is essential for maintaining the surgeons at high quality, not only to meet the market demand, but also to uphold their public image and increase customer satisfaction. Continuous maintenance and update are also required to sustain their quality services to the community.

We will see that clinical knowledge and surgical competencies of surgeons, communication skills towards patients and fellow colleagues, possession of leadership qualities, encouraging teamwork and adopting the right aptitude, are of absolute relevance. Then questions are posted for why changes in orthopaedic training and education are needed in view of the changes in pathologies, working hours, demands and expectation, invasion or defending orthopaedic surgery, technological advancement or quantitative orthopaedics, and CPD (Continuous Professional Development). All these will be highlighted on and discussed by the following distinguished academicians in the fraternity.

Overview and changes expected in –

1. Hong Kong

Dr. Wai-Kit Ngai began with an overview of the current scene in Hong Kong, where the British system is adopted. A resident will undergo a two-year basic training, an intermediate examination and then a higher Orthopaedics training with an eighteen-month rotation in Trauma and twenty-one months in Orthopaedics. Residents are also expected to complete a research project and get it published in the Medical Journal. With the acquired knowledge and skills set, residents are ready to sit for the exit examination. In addition, in order to fulfill the criteria, ninety training points per year and six monthly log book summary of assessments and endorsements by the relevant hospital authorities are required.

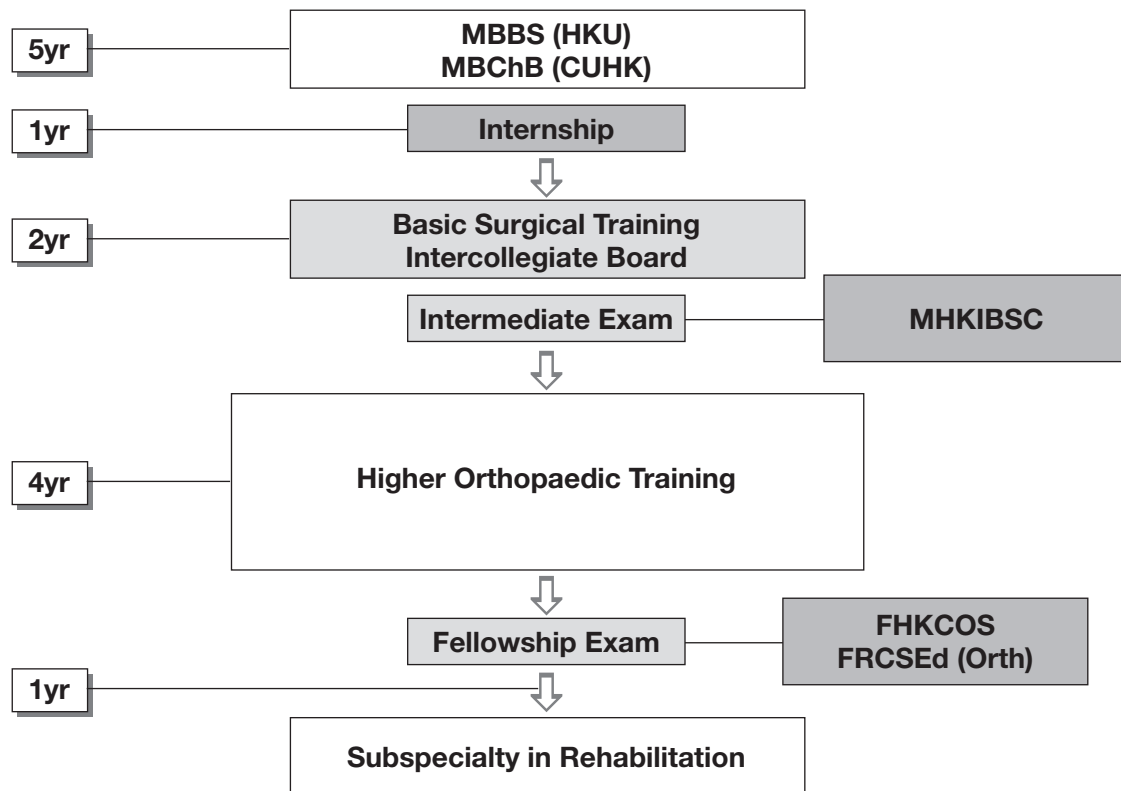


Figure 2-1.1 Career path of an Orthopaedic specialist

Basic Surgical Training (2 years)

- General Surgery with emergency work (6 months)
- Orthopaedics (12 months)
- Accident and Emergency Medicine / Neurosurgery (6 months)

Intermediate Examination

- Paper (MCQ)
 - Paper I (Applied Basic Science)
 - Paper II (Clinical)
- Viva (Oral Examination) (20 minutes each)
 - Applied surgical anatomy, operative surgery
 - Applied physiology, ICU
 - Applied surgical pathology, surgical principles
- Clinical (15 minutes each)
 - Head & Neck, Breast, Skin
 - Trunk, Scrotum
 - Vascular
 - Orthopaedics
 - Communication Skill

Higher Orthopaedic Trainee (HOT)

- Registration with Hong Kong College of Orthopaedic Surgeons (HKCOS)
- Training in accredited training center
- Designated rotational training
- 6 months rotation arranged by HKCOS
- 90 training points per year
- 6 monthly assessment report and log book summary

Higher Orthopaedic Trainee (HOT) (4 years)

- Trauma 18 months
- Elective 12 months
- Hand 3 months
- Paediatric 3 months
- Rehabilitation 3 months
- Others 9 months

Training in parent center

- Clinical service (under supervision)
 - Daily ward round/Consultant Grand Round
 - Specialist Out-Patient Clinic (OPD)
 - Operation session
- Academic activities
 - Pre-operation and discharge meeting
 - Mortality and morbidity meeting
 - Teaching by trainers
 - Journal club
 - X-Ray meeting
 - Surgical Audit

Moreover, residents are encouraged to take part in the training activities organized by the HKCOS, didactic lectures, clinical tutorials, and the Saturday inter-hospital meetings which are hospital or specialty based meetings covering case discussion and literature review.

There are courses that residents have to attend compulsorily:

- Basic Surgical Bio-skill Workshop
- Basic Orthopaedic Bio-skill Workshop
- Micro-vascular Course
- Fracture Course
- Advanced Trauma Life Support Course

One month before sitting the exit examination, residents have a five-day preparatory course comprising lectures, mock examination on viva and clinical competencies, conducted by tutors from the United Kingdom and local examiners.

To be eligible to be admitted as a Fellow of the HKCOS, one must complete all the training requirements and pass the Fellowship Examination.

There are many challenges that constant endeavors have to be made for accommodation or improvement:-

- Change in disease pattern
We have fewer infections like tuberculosis but more degenerative diseases like osteoporosis.
- Technology advancement (overspecialization)
Technology advancement has made a 6-year training insufficient and trainees tend to specialize in much early stage now. This over sub-specialization results in the problem for the requirement of the so-called all-round orthopaedic surgeons.
- Doctor work reform (less time for training / learning)
Trainees were used to work on average 80-85 hours per week in the past. The Hong Kong Hospital Authority (HA) started the work reform aiming to reduce the number of working hours to 65 at the end of Year 2009.
- Simulation training
Shift more training to simulation or other computer training in view of the less time available for doctors to conduct training.
- Communication skills/medical humanism
Need to enhance communication skills and have more training in medical humanism which is important in the modern medical profession.
- Selection of trainees
The problem of how to select the right trainees with the right attitudes.
- Assessment of trainees and programme
The problem of how to assess the trainees during the whole training period and the training program itself.
- Other training
Other training is required in the curriculum on top of medical knowledge.

With the above challenges ahead, Dr. Ngai suggested to review on the necessity of non-orthopaedic rotation, the relative weight of different sub-specialties, teaching time-table and media. Trainees nowadays are more interested in Sports Medicine, Total Joints rather than Hand Surgery, Paediatrics Surgery and Trauma. As for the changes in working hours, he suggested to set limits of 65 hours per week and 16 hours of continuous working. The adoption of simulation training would facilitate surgical proficiency and accelerate the pace of adoption of new procedures and devices, as well as, increase patient safety. As for the teaching media, they should not be limited to interpersonal contacts and books.

With all the said necessary training in place, Dr. Ngai also placed emphasis on humanism, which cannot be examined, but would have to be in the possession of the right candidate. A suggestion that direct observation or an objective test, which may involve professional assistance by educationists and psychologists could be one solution.

Further suggestions, for example, to lengthen the training period but which would not be welcomed by all the trainees, concentrate on core curriculum, set structural topics and learn from the internet, like the Orthopedics Hyperguide (<http://www.ortho.hyperguides.com/>) and Orthoteers Orthopaedic Resources (<http://www.orthoteers.org/>), are worth a consider. However, this would also mean additional manpower and monetary involvement.

He put forward the questions, points for consideration and discussion in the rest of the forum.

2. United Kingdom

Professor J Hutchison shared his views on the changing approaches of training and education, but maintained that the syllabus remains standard. It will take five to six years in medical school before one can go further up the career ladder and becomes a Consultant.

In the United Kingdom, identified high achievers have tailored training in the early years which demands most of their time and are encouraged to produce their own portfolios with more clinical work the better. Emphasis is on evidence-based competencies and not on the time in this case.

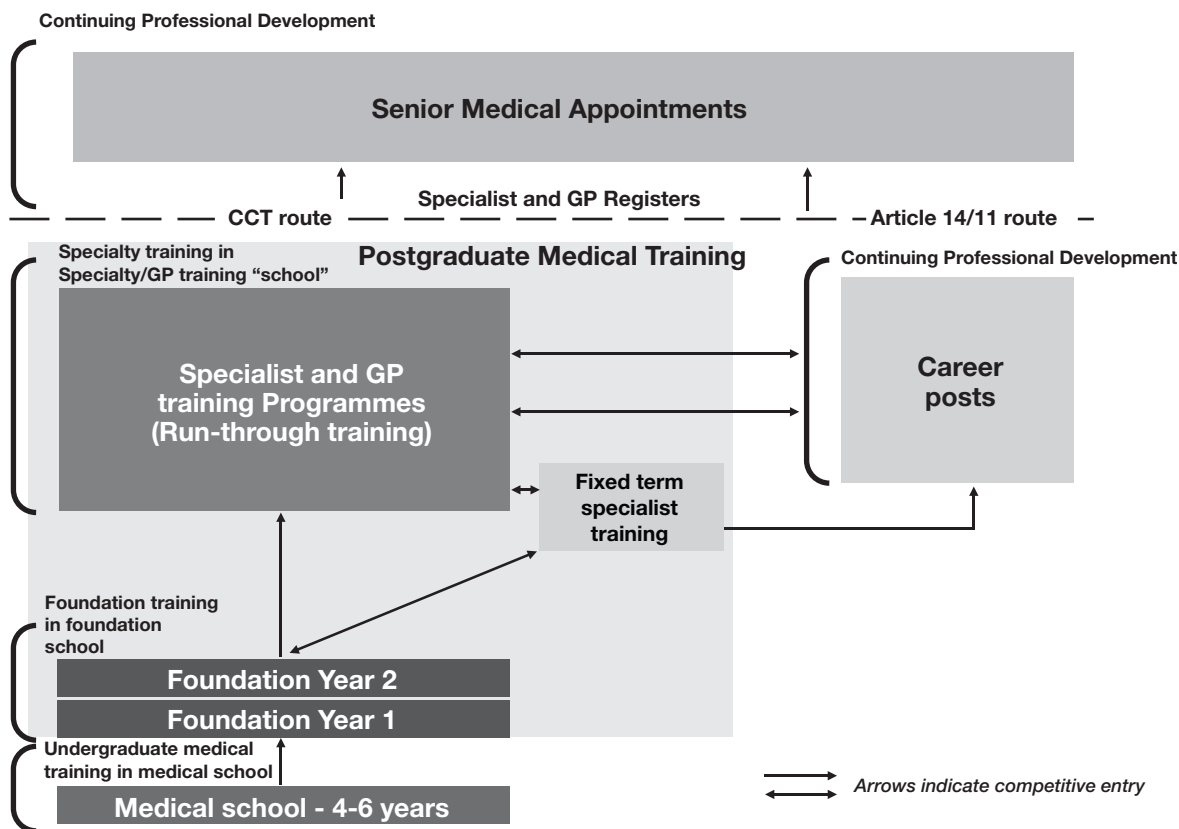


Figure 2-2.1 United Kingdom MMC (Modernizing Medical Careers) Career Framework

Career path of an Orthopaedic surgeon in the United Kingdom:-

- ⇒ Graduation from Medical School (5-6 years)
- ⇒ Foundation Years Programme (2 years – 6 x 4 months posts)
- ⇒ Selection into Specialist Training (ST) programme – variations: some Run-through (ST 1-8), some Core (ST 1-2/3) then compete for Specialist (ST 3-8)
- ⇒ Early years Specialist Training (ST 3-6) – general orthopaedics with emphasis on Trauma
- ⇒ Later years Specialist Training (ST 7-8) – development of sub-specialty interest, often with Fellowship posts
- ⇒ CCT (Certificate of Completion of Training), plus entry onto General Medical Council (GMC) Specialist Register
- ⇒ Consultant post

Foundation year 1 (F1) and 2 (F2) make up the two-year Foundation Programme which all UK medical graduates are required to undertake before progressing to specialty or GP training. Foundation doctors are trained and assessed against specific competences set out in the Curriculum for the Foundation Years in Postgraduate Education and Training. This curriculum was agreed by the General Medical Council (GMC) and the Postgraduate Medical Education and Training Board (PMETB).

Specialist and GP training programmes (run-through training) are specialist and GP training programmes which successful candidates can start directly after the F2 year. Once a doctor is in specialist or GP training, he will have the opportunity to gain a Certificate of Completion of Training (CCT) subject to satisfactory performance. Each programme has a curriculum, agreed by PMETB, against which doctors will be assessed. The number of years that a trainee spends in training varies from programme to programme. After a doctor receives a CCT, he will be legally eligible for entry to the Specialist or GP Register and can then apply for an appropriate senior medical appointment.

A doctor who has not completed a specialist/GP training programme may apply for entry to the Specialist or GP Register via PMETB. If PMETB is satisfied, he may be entered onto the appropriate register. [This route is defined by Articles 11 and 14 of the General and Specialist Medical Practice (Education Training and Qualifications) Order 2003].

Career posts are service delivery positions with no formal specialty training elements. Employer appraisal and relevant continuing professional development will be an essential part of these doctors' careers. These posts will only be available in secondary care.

Professor Hutchison quoted the meaning of "Curriculum" from the Chambers 20th Century Dictionary:

- a set of courses and content; a learning programme
- with clearly defined course objectives (learning outcomes)
- includes assessment strategy

And, the meaning of "Syllabus":

- outline (and summary) of topics to be covered in a course
- fair and transparent understanding between student and instructor, with clear & consistent expectation of material to be covered and learnt
- examinations can only be based on what is included in syllabus

Curriculum in the United Kingdom:

Trauma & Orthopaedics Curriculum 2009

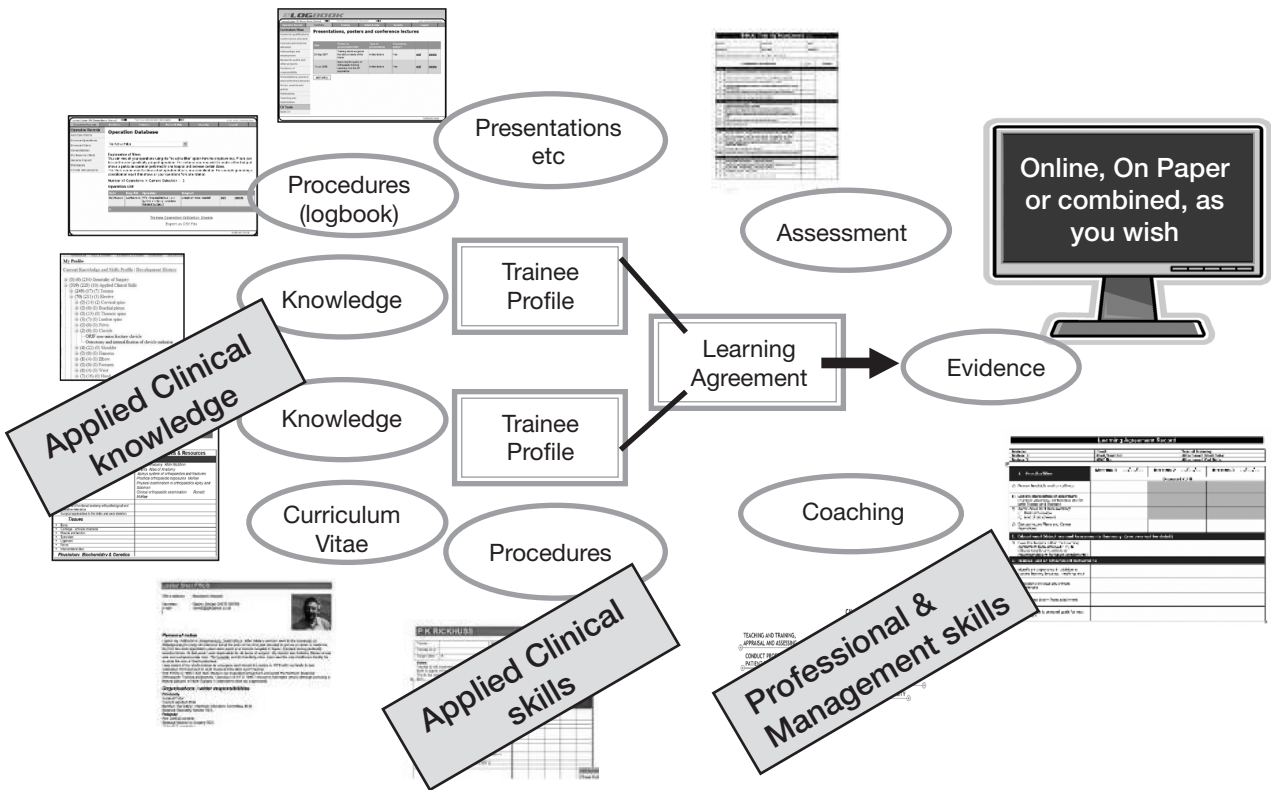


Figure 2-2.2 Trauma and Orthopaedics Curriculum 2009

Syllabus in the United Kingdom:

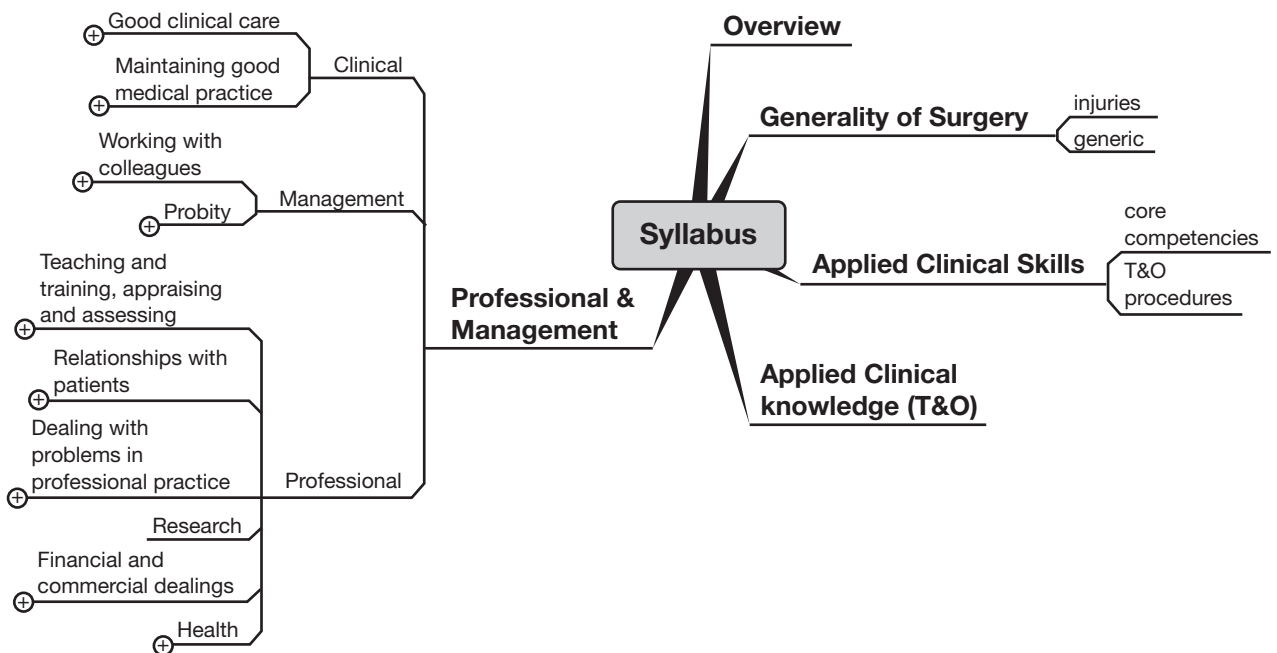


Figure 2-2.3 Syllabus

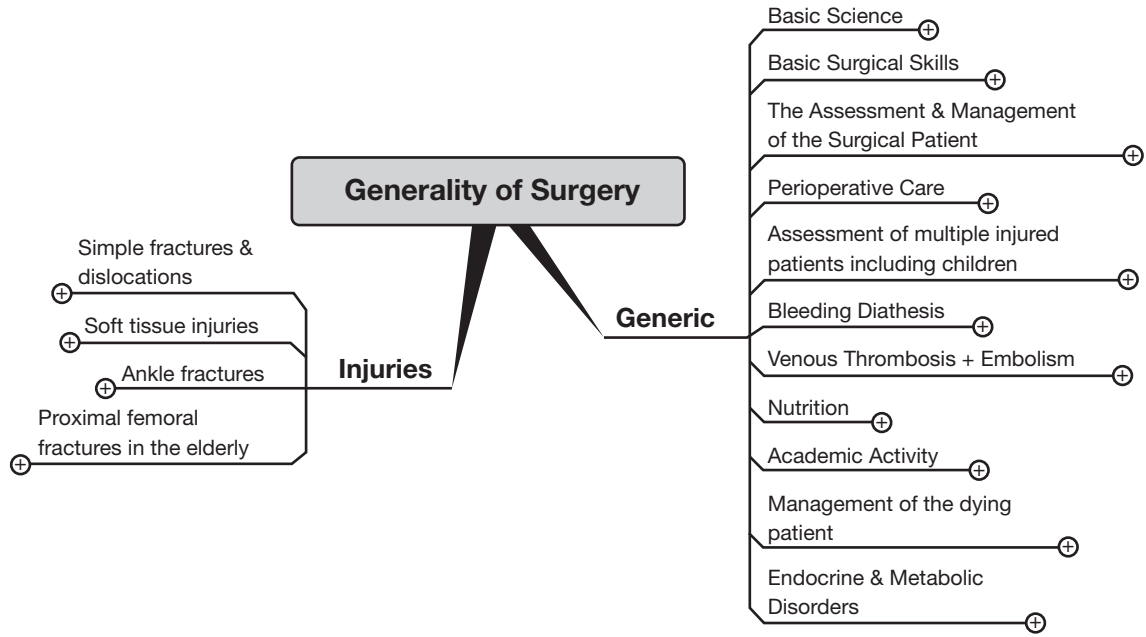


Figure 2-2.3.1 Generality of Surgery

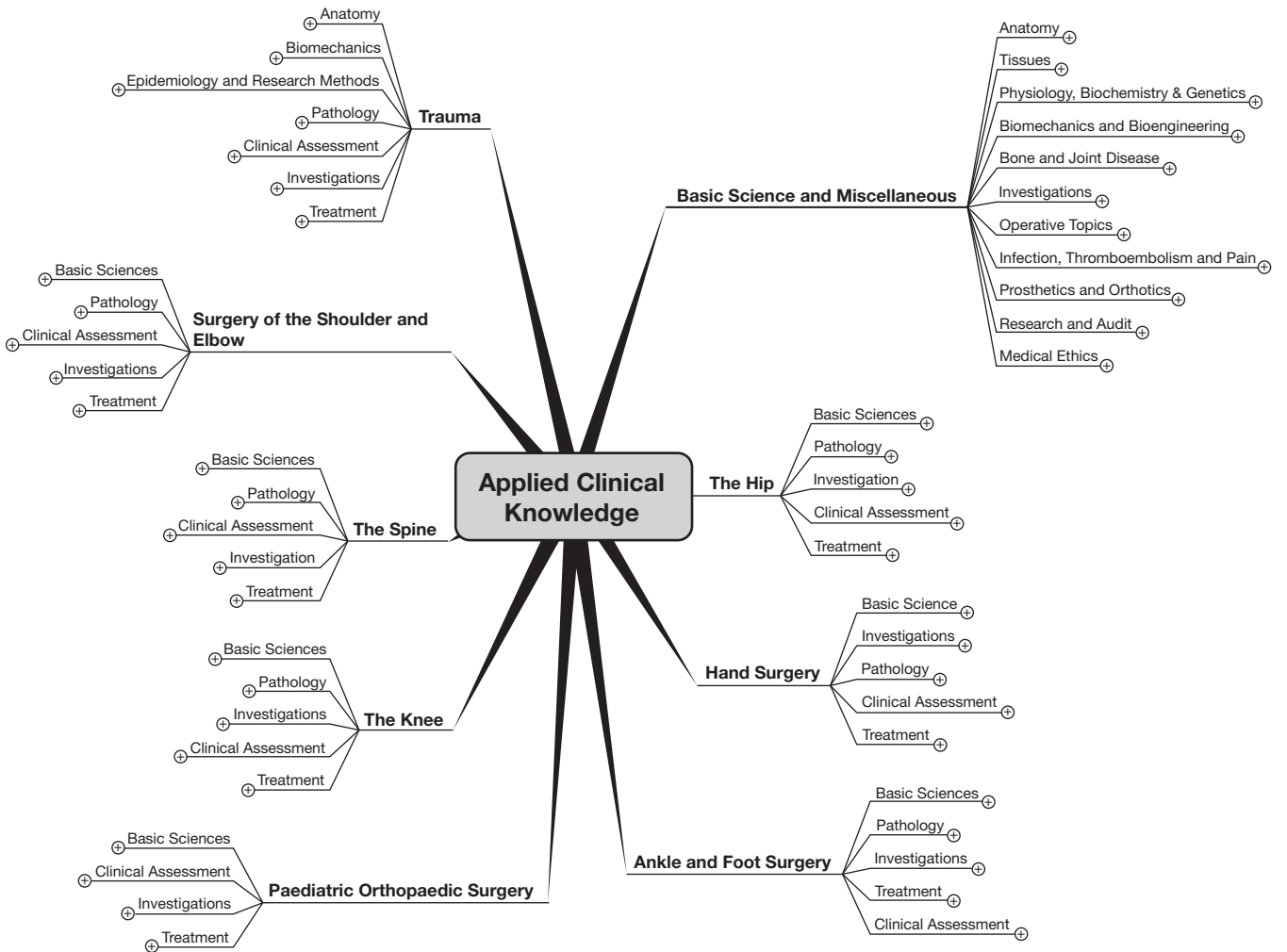


Figure 2-2.3.2 Applied Clinical Knowledge

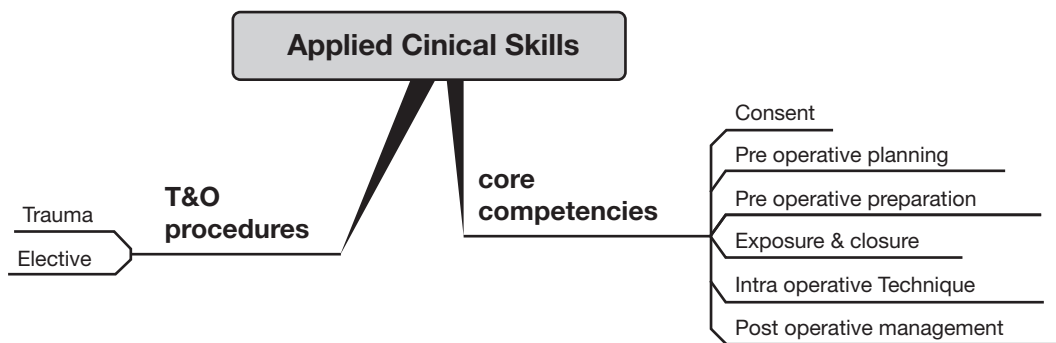


Figure 2-2.3.3 Applied Clinical Skills

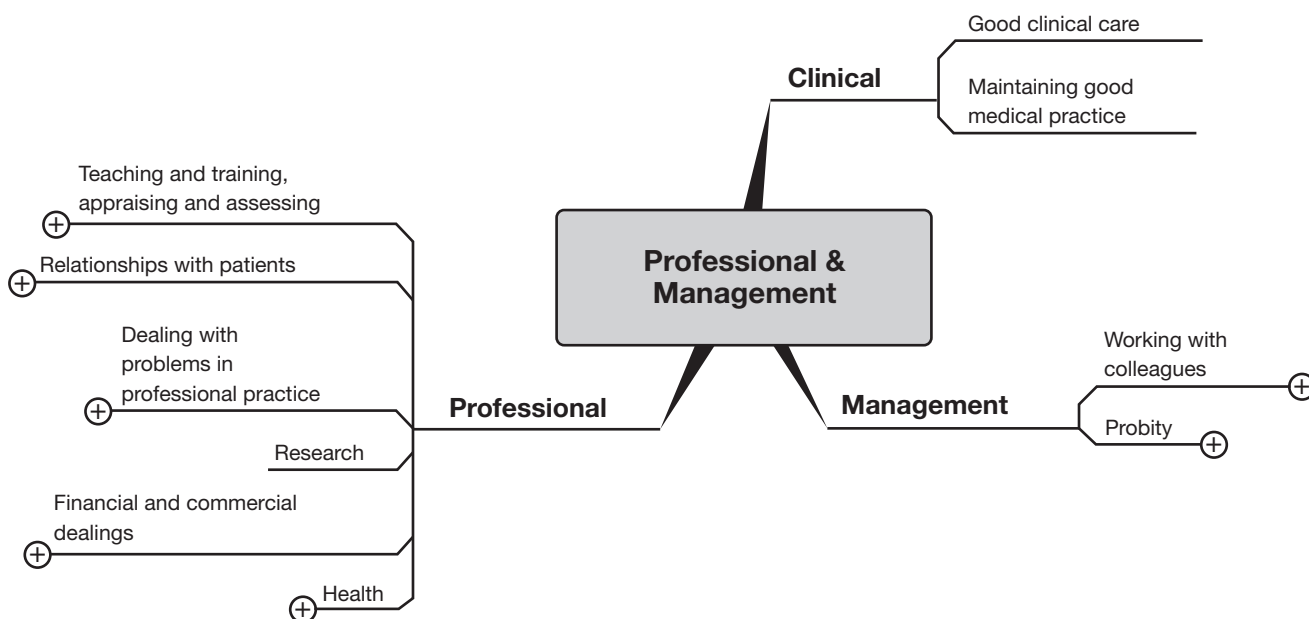


Figure 2-2.3.4 Professional and Management

Hospital attachment:

1. Trainer creates Profile using the templates provided. Trainee will have own profile, generated from OCAP (Orthopaedic Curriculum & Assessment Project) Online as necessary
2. Trainer establishes a Learning Agreement with the trainee using the Training Profiles and the Learning Agreement record
3. Provide structured feedback through Procedure Based Assessments
4. Review Progress mid attachment using the Learning Agreement record
5. Coach the trainee as necessary using the Professional & Management syllabus tools
6. Trainee to reflect on progress at the end of the attachment (in preparation for the next) using the Learning Agreement record and the completed PBA (Procedure Based Assessment) Summary Sheet
7. Summarise progress at the end of the attachment using the Learning Agreement record and the PBA Summary Sheet
8. Trainee collates all signed forms and records in readiness for annual appraisal / assessment (Annual Review of Competence Progression, formerly Record of In-Training Assessment)

Annual Review of Competence Progression:

- Portfolio
 - eLogbook (with national peer comparison)
 - Procedure Based Assessments (PBAs)
 - presentations, publications + current audit / research
 - courses – local Post-Graduate Teaching, national, international
 - plans
- Intercollegiate Specialty Boards Examination in Trauma & Orthopaedics
- Fellowship(s)
- Expected date of CCT (Certificate of Completion of Training)
- Presentation
- Reports
 - from trainer about trainee
 - from trainee about post
- Attendance by representatives from Post-Graduate Deanery (local) and Specialty Advisory Committee (national)

Intercollegiate Specialty Examination in Trauma and Orthopaedic Surgery [FRCS (Trauma and Orthopaedics)]:

- Touchstone criterion for whole examination
 - entry (referees)
 - writing questions (examiners)
 - standard setting
 - examining (clinical & orals)
 - passing
- Application – regulations
 - The applicant must hold a medical qualification recognised for registration by the General Medical Council of the United Kingdom or the Medical Council of Ireland. The applicant must have been qualified for at least six years.
 - The applicant must provide evidence of having reached the standard of clinical competence defined in the Intercollegiate Surgical Curriculum either for the award of the Certificate of Completion of Training (CCT) by the Postgraduate Medical Education and Training Board or for the award of Certificate of Completion of Specialist Training (CCST) by the Irish Surgical Postgraduate Training Committee. The required standard may have been achieved through training or qualifications, and experience considered together. The passing of the Intercollegiate Specialty Examination alone does not imply that the CCT, CCST (Ireland) or placement on the Specialist Register will be automatic; the Examination will form only part of the evidence required.
 - This evidence must consist of three structured references in the format prescribed by the Joint Committee on Intercollegiate Examinations. These references must be completed by the appropriate senior colleagues with direct experience of the applicant's current clinical practice in the appropriate specialty as defined in the Guidance Notes for Referees.
- Examination: Section 1 (Written)
 - 2 written papers, each 2 hours [no negative marking in either paper]
 - (a) MCQ Single Best Answer n=110 – to include critical appraisal of published paper (extra time to read before examination; n=c.12 MCQs = 5% total written paper mark)
 - (b) MCQ Extended Matching Item n=135
 - Images not yet included
- Examination: Section 2 (Clinicals & Orals)
 - “Clinicals with and without patients” – emphasis
 - (a) Clinicals x 3
 - Long Case (30 min) + 2 Short Cases (15min each)
 - (b) Orals x 4
 - Trauma + Adult Elective Orthopaedics + Children & Hands + Basic Science (30 min each)

Basic Sciences Oral Examination

- Pure knowledge can be tested very well in the written paper, but still a strong feeling that oral examination of applied basic sciences would test clinical reasoning, surgical experience and ability to justify.
- Emphasis on surgical approaches and anatomy (50% of oral), and practical aspects of basic sciences, such as the merits of various bearing surfaces and implants in different patients (and possibly bone tumours).

Professor Hutchison emphasized on the “touchstone” criterion¹ by which the candidates would meet the essential general requirements and that referees would have assessed whether these candidates are ready to take the examinations or not. This will also ensure that trainers *cover the entire curriculum and not just the syllabus*.

The passing rate for multiple-choice questions paper remains high as candidates are often well prepared, though there are grouses of the number of questions set. An annual mock written paper examination is also incorporated and it is the liability of the examiners to provide feedback and evaluation after, to determine the statistics of the quality of the candidates.

Markings are descriptor-based, in order to accurately rate the score of the trainees. Orals are based on clinical contents.

Do we hence select a Consultant by increasing the training hours currently capped at 48 hours? Will service be compromised? Are there quality assurances of being fit, fair and consistent?

The future of the FRCS (Trauma & Orthopaedics)

- Standards will NOT change – whatever happens to training structures and duration
- Feedback to referees
- Section 1 (MCQs – Single Best Answers & Extended Matching Items)
 - Computer-based examination with illustrations (more anatomy)
 - Future of published paper section?
 - MCQ numbers?
 - Link with overseas partners
- North-East England initiative for annual mock examination
 - many Training Programmes already using NIH Office of Intramural Training & Education
 - computer based assessment
 - December (available for one week)
 - run through eelogbook site, and security
 - instant marking and peer comparison
 - entry fee = submit new questions x2 on set part of curriculum
 - test of knowledge, incl. recent literature
 - separate from Intercollegiate Specialty Boards; run by British Orthopaedic Association Education Committee?
 - driver for knowledge, but part of Annual Review of Competency Progression?
- Section 2 (Clinicals & Orals)
 - Clinical examinations (long and short) evolving further
 - long case – too long and sometimes a lottery
 - short cases – important but possibly too rushed
 - Combine for a series of “intermediate cases” (c.f. Out-Patient Clinic)
 - Orals
 - all questions to be set within clinical scenarios
 - Calibration session - strong commonality of topics/questions within areas (for example, Trauma, Children’s, etc.), but variable quality / presentation of images
 - prepare series of high quality classic images on A4 laminated pages
- Assessment of assessments by Postgraduate Medical Education and Training Board (PMETB)
 - Quality Assurance
 - “fit for purpose”
 - fairness – promotion of equality
 - consistency of standards
 - need to :
 - ensure reproducibility and validity in the examination
 - identify, discuss and resolve issues of concern
 - identify changes that need to be made and a timetable for their introduction
 - monitor effect of these changes

¹ Touchstone criterion: A measure to test the excellence or quality of others

Other challenges and changes:

- Integration with ISCP (Intercollegiate Surgical Curriculum Project) - fraught relationship (General Surgeons!) – damning recent report (Eraut, 2009)
- Enhanced OCAP (Orthopaedic Curriculum & Assessment Project) tools – on-line PBAs (Procedure Based Assessments)
- Target of 100% Trauma & Orthopaedics use
- Longitudinal analysis of training
- Increased international use
 - customised logbook for other countries
- Modernising Medical Careers selection
- Specialist Training Programme – variations (“mixed economy”) in early years
 - Run-through (ST 1-8)
 - Core (ST 1-2/3) then compete for Specialist (ST 3-8)
 - Themed Core
- Hours of work (EWTD – European Working Time Directive)
 - 48 hours per week and other restrictions
 - shift working – loss of team structure and consultant trainer contact
 - reduced experience (esp. trauma) & confidence
 - examination pass rate!

For further information of the UK curriculum and syllabus, go to the OCAP (Orthopaedic Curriculum & Assessment Project) website (www.ocap.org.uk) or contact admin@ocap.org.uk.

3. Europe

Professor E Guerado introduced the different curricula along the European countries. Most of the countries have their own training programs and facilities except Cyprus and Luxemburg where no university or specialist training is available. Surgeons are therefore trained in other European countries like United Kingdom, Greece, Turkey, France and Germany.

Orthopaedic specialist training in Europe

3.1 Candidate selection

Selection by	Countries
National / regional examination	Croatia, Czech Republic, Denmark, France, Netherlands, Portugal, Romania, Spain, Turkey
Local examination	Italy
Interview	Austria, Belgium, Finland, Germany, Norway

Country	Number of trainees (per year)
Belgium	28
Croatia	45
Czech Republic	40
Denmark	34
Finland	20
Greece	80
Norway	21
Portugal	45
Spain	175

Table 2-3.1 Number of trainees each year

3.2 Control of training

3.2.1 Controlling authority

Controlling authority	Countries
Government	Austria, Belgium, Czech Republic, Denmark, Greece, Portugal, Romania, Spain, Sweden, Turkey
University	Finland, France, Italy
Scientific / Professional Society	Croatia, Germany, Ireland, Netherlands, Norway, Switzerland, United Kingdom

3.2.2 Control of trainers

Control of trainers	Countries
Government	Belgium, Romania
University	Italy
Head of department	Croatia, Czech Republic, Greece, Spain, Turkey
Scientific Body	Denmark, Holanda, Ireland, Netherlands, Norway, Sweden, United Kingdom

3.2.3 Control and requirements of training centres

Control of training centres	Countries
Unlimited licensing	France
Regular audit / Limited licensing	Belgium, Czech Republic, Finland, Germany, Ireland, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom
Clinical, surgical and educational activities	Belgium, Finland, Germany, Italy, Ireland, Netherlands, Norway, Portugal, Spain ² , Switzerland, United Kingdom
Personal interviews	Ireland, Netherlands, Spain, Sweden, Switzerland, United Kingdom

3.3 Curriculum in Europe

3.3.1 Duration (Years)

- 3.6: Austria
- 4.5: Croatia
- 5: Denmark, Spain, Sweden
- 6: Belgium, Finland, Germany, Portugal, Romania, Switzerland
- 6.5: Norway
- 8: Ireland
- Variable (5-8): Czech Republic, United Kingdom

3.3.2 List of operations

- Austria, Croatia, Denmark, Germany, Greece, Romania, Switzerland

3.3.3 List of content of training

- Croatia, Denmark, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom

² For example, if there are 150 hip fracture cases, the country has to train up 1 resident per year. If there are 200 hip fracture cases, the country has to train up 2 residents per year.

3.3.4 Curriculum standardization

Curriculum standardization	Countries
State	Portugal, Spain
Local	Ireland, Italy, Turkey, United Kingdom
Individual	Ireland, Norway, Sweden, Turkey, United Kingdom

Some countries in Europe adopt the curriculum of the United Kingdom, for instance, Spain uses it since 1985.

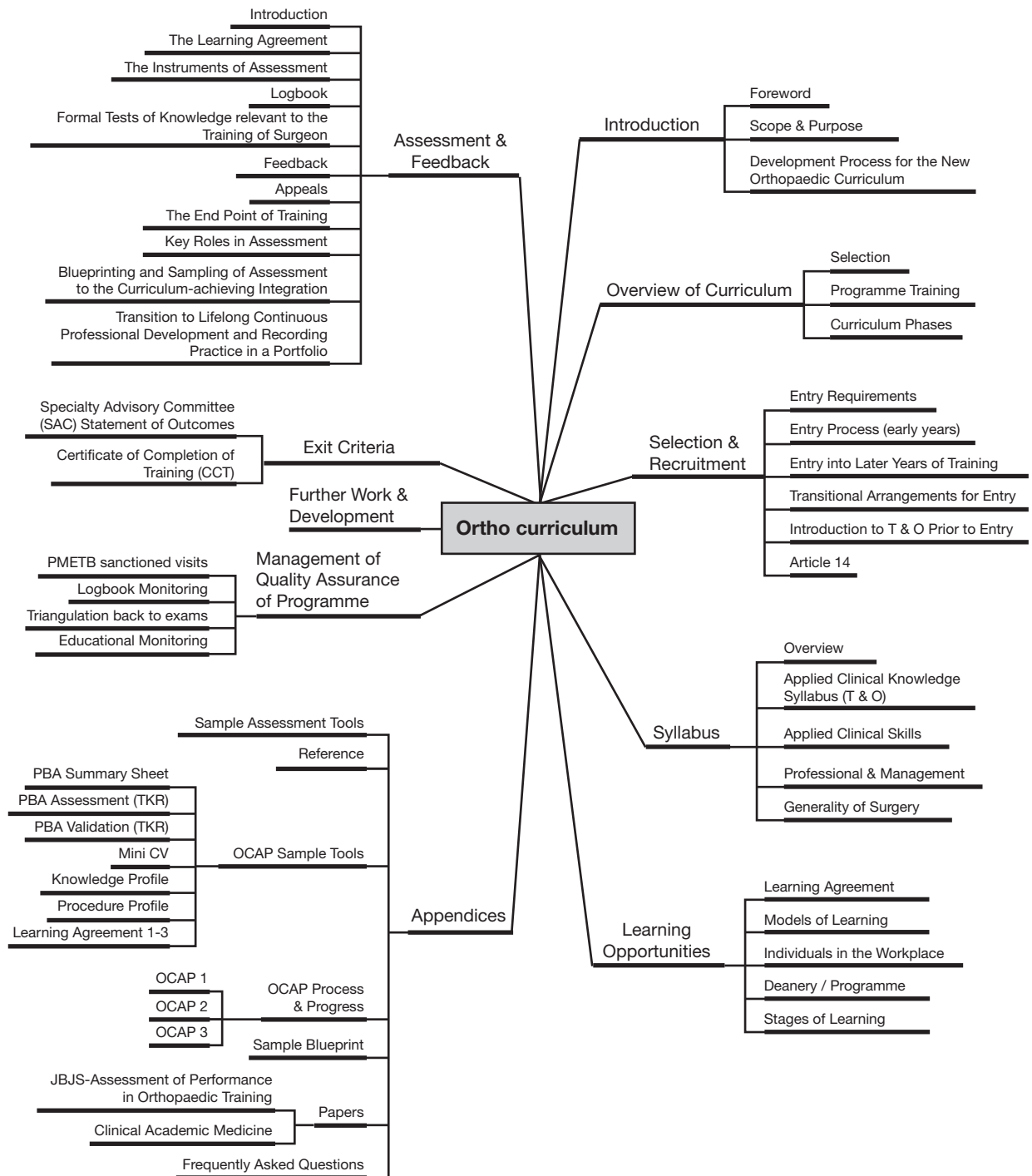


Figure 2-3.2 A competency based curriculum for Specialist training in Trauma and Orthopaedics (British Orthopaedic Association 2006)

3.4 Head and tutor of training

3.4.1 Head of training

Head of training	Countries
Head of department	Austria, Croatia, Czech Republic, Finland, Germany, Greece, Netherlands, Norway, Portugal, Spain, Sweden, Turkey
Other surgeon responsible for training	Denmark, Sweden
Regional director	Belgium, Ireland, Romania, United Kingdom

3.4.2 Tutor

Tutor	Countries
Other surgeon than Head of training	Spain ³ , Turkey
Head of training	Switzerland
Head of department	Belgium, Croatia, Czech Republic, Germany, Netherlands
Personal	Romania
Personal + Group + Superspecialization	Italy

3.5 Rotations

3.5.1 Other Departments

Specialty	Countries														
	Austria	Belgium	Croatia	Czech	Finland	France	Germany	Ireland	Norway	Portugal	Romania	Spain	Sweden	Switzerland	Turkey
General Surgery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Anaesthesia			✓	✓					✓			✓	✓	✓	✓
Radiology			✓												
Thoracic											✓				
Vascular				✓					✓	✓	✓	✓			
Plastic				✓					✓	✓	✓	✓	✓		
Neuro	✓			✓					✓	✓	✓	✓	✓		
Rheumatology			✓	✓					✓			✓			✓

3.5.2 Orthopaedic Special Units

Specialty	Countries																
	Austria	Belgium	Croatia	Czech	Finland	France	Greece	Germany	Ireland	Norway	Portugal	Romania	Spain	Sweden	Switzer-Land	Turkey	United Kingdom
Trauma			✓	✓	✓			✓	✓						✓	✓	
Paediatrics							✓		✓		✓		✓	✓		✓	✓
Spine												✓				✓	
Hand							✓									✓	
Sports / Arthroscopy							✓					✓					
Oncologic Orthopaedics												✓				✓	

³ 1 tutor to 5 residents

3.6 Clinical activity

Clinical activity		Countries
Surgical	Type of operations	Spain, Sweden
	Number & Type of operations	Austria, Czech Republic, Denmark, Norway, Portugal, Romania, Switzerland
	Surgical hours / week	Ireland, United Kingdom
Out-patient clinic	Hours / week	Greece, Ireland, Norway, Portugal, Romania, Turkey, United Kingdom
	Emergency trauma	Hours / week-month
	Months along training	Croatia, Czech Republic, Denmark, Norway

3.7 Educational Teaching

Educational teaching	Countries
Special courses are compulsory	Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, Ireland, Netherlands, Norway, Spain, Switzerland
Special courses are recommended	Germany, Greece, Romania, Sweden
Examination after special course	Croatia, Czech Republic, Netherlands, Norway, Romania
Teaching in Training Department	
• Compulsory hours / month	Belgium, Croatia, Czech Republic, Denmark, Finland, Greece, Italy, Ireland, Norway, Romania, Spain ⁵ , Switzerland, Turkey, United Kingdom
• Recommended	Austria, Sweden

3.8 Research

Research	Countries
Compulsory	Denmark, Ireland, United Kingdom
Recommended	Austria, Belgium, Czech Republic, Finland, Greece, Norway, Romania, Spain, Turkey
Communications / Papers compulsory	Belgium, Czech Republic, Switzerland

3.9 Logbook (Resident's book)

Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Spain⁶, Sweden, Turkey, United Kingdom

- Final control:
 - Netherlands
- Annual control:
 - Belgium, Italy, United Kingdom
- Detailed (list of operations, clinical activities, educational, research, etc):
 - Italy, Norway, Spain, United Kingdom

⁴ Requirement of 5 calls each month

⁵ Daily early morning clinical meeting, two radiological meetings per week, one General Special cases discussion per week

⁶ must be recorded day by day and inspection of the logbook will not be notified in advance

3.10 Intermediate evaluations

3.10.1 Intermediate examinations

	Countries
Annual	Belgium, Ireland, Italy, Netherlands, Portugal, United Kingdom
End of stage	Croatia, Czech Republic, France, Romania, Turkey
MCQ	Belgium, Holanda, Ireland, Italy
Practical / clinical	Irlanda, Ireland, Italy, United Kingdom

3.10.2 Intermediate qualifications

	Countries
According to examination	Belgium, Czech Republic, Ireland, Portugal, United Kingdom
Continuous / Formative evaluation	Denmark, Spain
According to assessment forms	Ireland, Switzerland, United Kingdom
By Tutor / Head of Department	Norway, Spain

3.11 Final evaluations

3.11.1 Final examination

	Countries
Voluntary	Spain ⁷ (first year: 2005), Sweden (15-20%)
Compulsory	Austria, Belgium, Croatia, Czech Republic, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal, Romania, Switzerland, Turkey, United Kingdom
MCQ	Austria, Switzerland
Oral	Austria, Croatia, France, Greece, Romania, Turkey
Clinical	Belgium, Croatia, Ireland, Romania, Switzerland, Turkey, United Kingdom
Interview	Germany, Italy
Written	Greece, Romania, Switzerland

3.11.2 Final qualifications

	Countries
Final examination	Austria, Croatia, Czech Republic, Finland, Ireland, Italy, Romania, Switzerland, Turkey, United Kingdom
Logbook	Italy, Norway, Spain, Switzerland
Continuous / Formative evaluation	Denmark, Italy, Spain, Turkey

⁷Will be compulsory in 2012

3.11.3 Failed candidates

	Countries
May re-examine	Austria, Croatia, Czech Republic, Finland, Germany, Greece, (Ireland), Romania, Turkey
Must repeat stage	Belgium, Denmark, Greece, (Ireland), Italy, Norway, Portugal, Spain

Professor E Guerado talked about women liberation in Europe, where there would be a decrease in the number of female surgeons for a few years, should they be impregnated, as they are encouraged to stay home to care for their infants.

In Spain, Orthopaedic surgeons are high in demand and there are about 2,500 positions currently available in all specialties. The National Government of Madrid has full control over the five years of medical training and the Head of Department has full control over the candidate selection. The ratio of tutor and resident is 1:5. General surgery is compulsory and Trauma surgery is important in order to attract residents, which is also a requirement. Examinations are competency-based and developed by the British Orthopaedic Association which has been adopted in Spain from 1985.

Residents are being rated during their medical training years, and not the final examination which is voluntary, but will be made compulsory in year 2012. Candidates who fail will be required to repeat. Professor Guerado recognized that the final examinations/evaluation is important in the selection of competent candidates.

The future of the European Union remains uncertain in Professor Guerado's opinion due to a few reasons: **Retirement**, which will happen in the next decade of which constitutes about 45% from Spain. **Incompetence of advancing**, though conscientious surgeons, due to the lack of exposure in their respective countries of practice, cannot keep up with the advanced technologies. The **political situation** whereby the various countries in the Union have different opinions altogether will remain a trying experience. Concern on the many **languages** used; French remains the language of diplomacy, English being the language of Science and spoken almost universally, German is still widely used and accepted in the Eastern countries, and Spanish, still a good percentage used in South America and many countries. **National feeling**, which is another big problem especially when establishing a task force in which people from different countries have their own national feelings and even among the Spanish themselves. Changes are on the hands of the European Federation of National Associations of Orthopaedic and Traumatology but it found itself having no power within the European community.

4. China

By Professor W Tian / Professor BF Zeng

4.1 Basic curriculum pattern 3+2 (based on the Beijing system)

- First stage: Basic surgery training: 3 years
 - Intermediate examination
- 2nd stage: Higher orthopaedic training: 2 years
 - Exit examination

- 4.2 Basic surgery training: 3 years
- | | |
|-----------------------------|-----------|
| General surgery | 12 months |
| Urology | 2 months |
| Thorax-cardiology | 3 months |
| Neurosurgery | 3 months |
| Anaesthesia | 3 months |
| Surgery Intensive Care Unit | 2 months |
| Emergency Room surgery | 2 months |
| Orthopaedic Trauma | 3 months |
| Hand surgery | 3 months |
| Paediatric orthopaedics | 3 months |
- 4.3 Intermediate examination
- Written examination: Medicine and English
 - Clinical examination: Case analysis (vivas):
 - General surgery, thorax-cardiology, orthopaedics, neurosurgery
 - Operation practice
- 4.4 Higher orthopaedic training: 2 years
- | | |
|--------------------------------|-----------|
| Plastic surgery | 3 months |
| Hand surgery | 3 months |
| Spine | 3 months |
| Orthopaedic Oncology | 3 months |
| Chief resident of orthopaedics | 12 months |
- 4.5 Exit examination
- Written examination: Medicine and English
 - Clinical examination: Case analysis (vivas)
 - Operation practice

Professor BF Zeng (曾炳芳) gave us an insight of the training and education in China, in that it takes five years of medical training in a university, with no sub-specialties. After graduation, a resident can choose to work as doctors or continue to pursue his or her Masters or PhD.

The Ministry of Public Health in China controls the rankings in four categories: residents, attending physicians, Deputy Chief doctor and Chief doctor.

Postgraduates seek for job opportunities on their own, unlike the situation in the past where the government would assign jobs for them in hospitals, which no longer happens. It is advisable to seek jobs in hospitals that are affiliated to universities in the larger cities in China as there would be guaranteed quality training outcome from these institutions.

There is a current situation where hospitals are reluctant to accept trainees, as they would need to cater to their lodgings and pay them an allowance, hence the Ministry of Public Health would need to address this issue for the future.

After a year of practice, doctors can sit for the National examinations, which consist of 2 parts: clinical skills and written examination. The passing rate is usually high and standards vary from year to year. Medical licenses are granted to graduates and they are then registered as medical doctors.

The current issue of disparity existing is that, with a Bachelors degree one can practice medicine and get promoted in five years, as compared to one who possesses a Masters degree can get promoted within three to four years and with a PhD, promotion is within three months. These doctors with Masters and PhDs usually between the ages of 29-30, though are equipped with the necessary qualifications, are lacking the experience needed. In addition, 20 training points a year is also required to gain promotion.

There are no restrictions on the standards involved in the professional training years and their standards very much depend on the hospital that the trainee is attached to. However, the main aim is for every graduate to work in a renowned hospital with well-equipped facilities for at least three years and then move to other hospitals to assume the rank of Deputy Chief or Chief.

An exchange program still takes place whereby doctors are sent to various hospitals for six months of fellowships, within the Mainland, which is held twice yearly. These fellowship programs can go up to six years and the hospitals will pay for expenses incurred by the fellows. The Ministry of Public Health sets a mandate of 1,000 projects and 100 Orthopaedic surgeries for such post graduate programs.

Competency skills are also on the compromise should the trainees be attached to a renowned hospital in the larger cities as compared to the hospital in the countryside. The surgeons are hence ranked very differently as well.

The Chinese Medical Association boasts 76 branches in China and oversees the professional training and education held all over China with the support of large commercial medical healthcare and manufacturing companies. This allows exposure to new technologies, new products and also the opportunities for overseas fellowships and training, and hence the advantage of bringing back the expertise to teach within the country. The significance of training and education is greatly emphasized now in China.

Professor Zeng proposed to invite both academicians, Professor KS Leung and Dr. WK Ngai to visit during the yearly Shanghai Orthopaedic Association meeting, to introduce the Hong Kong curriculum and the examination system. However, he did highlight that language may be a concern, as the main medium of communication in China is still Chinese. The government is hence looking into reforming medical care and improving professional education.

Professor W Tian (田伟) underlined the complicated graduate education system due to continuous educational reform. The duration of undergraduate education has been extending from 5 to 6 and then to 7 years. A graduate needs to take a further 3 years of training to be a Medical Master, and a further 3 years to be a MD or PhD. There is no general training pattern for doctors with higher educational background. Specialist training for doctors with experience of graduate education is modified from the basic pattern, because various levels of clinical training are involved in the period of graduate education.

The current promotion path is a 4-grade system:

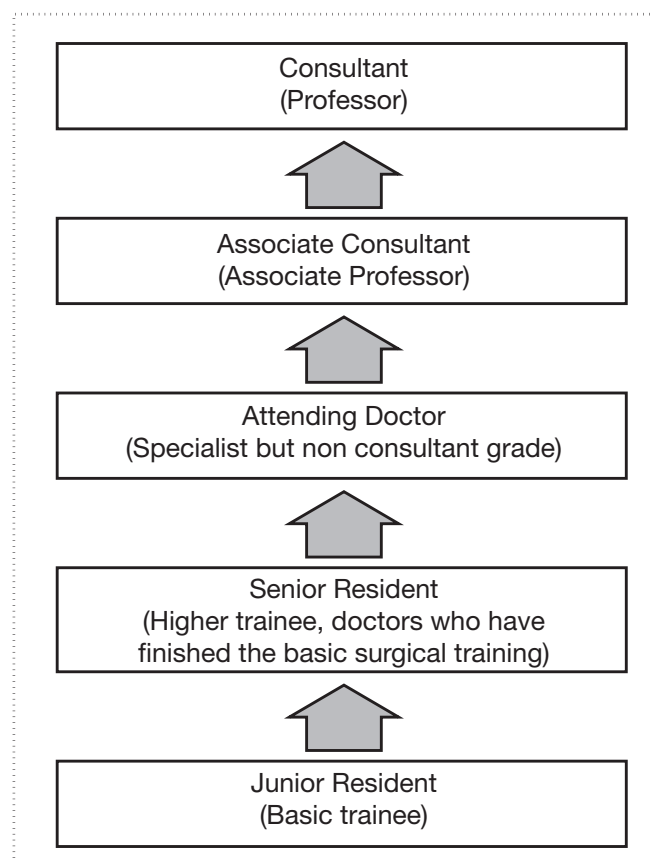


Figure 2-4.1 Promotion ladder of a resident in China

Professor Tian raised the problem of the diploma of graduate education and publishing articles being more important than the experience of specialist training with respect to promotion. He also commented that a doctor with bachelor's degree takes at least 10 years to be promoted to associate consultant, but a doctor with MD's degree takes only 5 years. Furthermore, the content and standard of training vary in different areas or even in different hospitals in the Mainland.

The importance of specialist training to improve the quality of medical service is gradually appreciated. The Beijing Jishuitan (JST) Hospital has pioneered the orthopaedic specialist training program in the Mainland with reference to the experience of HKCOS. The first batch of 6 doctors from JST Hospital went to Hong Kong to sit for the MRCS (Membership of the Royal College of Surgeons) examination on September 11, 2006.

JST Hospital was assigned to explore the orthopaedic specialist training in the Mainland. Doctors are selected to sit for HKICBSC examination on a yearly basis in JST Hospital. Six HOTs have taken this examination so far. Specialist training was initiated in JST according to the requirement set by HKCOS. JST College of Orthopaedic Surgeons was found in September 2008 and a pilot program of specialist training was initiated by Ministry of Health in April 2008.

For the prospect of the medical education in China, efforts must be made to simplify and standardize the system, to clarify the goal of training: research or clinical work, to establish a national wide standard of the content and requirement of specialist training, to heighten the importance of specialist training, to establish a specialist registration system and recognize the present orthopaedic specialists step by step, to establish a closer relationship with HKCOS.

5. Australia

Professor M Chehade briefly introduced the Royal College of Surgeons in Australia (RACS) which is the principal accredited body for training in Australia and New Zealand set up in 1927. To-date it has 9 separate surgical sub-specialties and also adopts the British system. Traditionally, basic training takes at least 2 years after which a general surgical primary examination is taken. Afterwards, advanced specialty training takes another 4 years before sitting for the National examination.

A current SET (surgical education and training) program expedites from basic training to specialty surgical training and in all requires 5 years to fulfill.

There is no gender preference, like all the other countries, both male and female are welcome to assume the position of an Orthopaedic surgeon should they meet the criteria. The male to female ratio in orthopaedics is 16 to 1, the highest among the different specialties, whilst the average is 3 to 1.

Specialty	No. of trainees		
	Total	Men	Women
Cardiothoracic surgery	45 (3.4%)	41 (91.1%)	4 (8.9%)
General surgery	549 (42.0%)	383 (69.8%)	166 (30.2%)
Neurosurgery	66 (5.0%)	55 (83.3%)	11 (16.7%)
Orthopaedics	265 (20.2%)	249 (94.0%)	16 (6.0%)
Otolaryngology/head and neck surgery	99 (7.6%)	63 (63.6%)	36 (36.4%)
Paediatric surgery	23 (1.8%)	10 (43.5%)	13 (56.5%)
Plastic and reconstructive surgery	97 (7.4%)	69 (71.1%)	28 (28.9%)
Urology	119 (9.1%)	95 (79.8%)	24 (20.1%)
Vascular surgery	46 (3.5%)	38 (82.6%)	8 (17.4%)
Total	1310	1004 (76.6%)	306 (23.4%)

Table 2-5.1 Number of trainees and their gender in each specialty

Similarly, the male to female ratio among the active orthopaedic fellows is the highest.

Specialty	No. of fellows		
	Total	Men	Women
Cardiothoracic surgery	184 (4.0%)	174 (94.6%)	10 (5.4%)
General surgery	1603 (34.7%)	1461 (91.1%)	142 (8.9%)
Neurosurgery	206 (4.5%)	191 (92.7%)	15 (7.3%)
Orthopaedics	1201 (26.0%)	1167 (97.2%)	34 (2.8%)
Otolaryngology/head and neck surgery	422 (9.1%)	398 (94.3%)	24 (5.7%)
Paediatric surgery	118 (2.6%)	97 (82.2%)	21 (17.8%)
Plastic and reconstructive surgery	382 (8.3%)	347 (90.8%)	35 (9.2%)
Urology	349 (7.6%)	334 (95.7%)	15 (4.3%)
Vascular surgery	148 (3.2%)	141 (95.3%)	7 (4.7%)
Total	4613	4310 (93.4%)	303 (6.6%)

Table 2-5.2 Number of active fellows in each surgical specialty

Selection of residents is based on merits, competency skills and whether the candidates are possessing the right aptitude, similar to the criteria of most of the countries mentioned above.

There is however, no standardized curriculum which very much depends on the syllabus, mode of delivery and timing.

Surgical training encompasses nine competences:

- Technical Expertise
- Medical Expertise
- Judgment – Clinical Decision Making
- Communication
- Collaboration
- Management and Leadership
- Health Advocacy
- Scholar and Teacher
- Professionalism and Ethics

Trainees are required to demonstrate across all the nine areas, and assessment is based on their competencies and performance. However, there are issues of how to define competencies, the forms of assessment, competency against performance, standards of hospitals, hours, efficiency and technical changes.

By the end of the **first** year of training, a trainee must:

- Demonstrate the aptitude necessary to proceed to the rest of SET
- Acquire knowledge of conservative and operative management of common traumatic and orthopaedic conditions
- Receive supervision in decision-making in the clinic, at the bedside and in the operating theatre
- Demonstrate an attitude that is compatible with the philosophical aims of the Australian Orthopaedic Association training program.

By the end of the **second** year of training, a trainee must:

- Acquire operative skills of basic trauma management, including the performance, with supervision as necessary, of operations of proximal femoral fractures, long bone fractures and juxta-articular fractures
- Receive supervised experience of primary replacement of the knee and hip joint
- Develop confidence through graduated supervision of the management and operative treatment of common hand and upper limb injuries and orthopaedic conditions not covered in the first year
- Demonstrate the ability to undertake clinical research
- Supplement training with appropriate courses outside the training program.

By the end of the **third** year of training, a trainee must:

- Continue to perform the common orthopaedic and trauma procedures with supervision according to expertise and competence
- Widen his/her management and operative experience of more complex surgical cases across orthopaedic subspecialties
- Demonstrate an ability to practice with an increasing and appropriate degree of independence.

By the end of the **fourth and fifth** year of training, a trainee must:

- Independently perform (with supervision according to experience) all common trauma and elective procedures
- Have an understanding of research skills that enable them to undertake a literature search, of basic statistical methods and of the skills required for the writing of research reports
- Show sound clinical judgment in all common orthopaedic scenarios
- Demonstrate an ability to think creatively in difficult clinical situations.

Framework and principles of the new surgical education and training program:

- i. Education and training competence-based
- ii. Generic and specialty-specific eligibility criteria for application
- iii. Single merit-based national selection directly into specialty of choice
- iv. Responsibility for trainees to reside with respective specialty for entirety of training
- v. Clear processes and criteria for accreditation of hospitals
- vi. Clinical rotations aligned to trainees' career goals
- vii. Basic sciences curricula/assessment: generic and specialty-specific components
- viii. Integrated progression subject to achievement of clinical and educational standards
- ix. Duration of training 5-6 years depending on the specialty
- x. Formal exit examination

6. Discussion Summary

From Professor R Malhotra to Professor M Chehade, on Patient's treatment which relates to role modeling, more objectives/criteria should be defined to assist to the success of residency program. What then makes a good training program? Do we reduce teaching hours? In reply, Professor M Chehade referred to self aptitude, honesty, integrity and care and compassion for their patients.

Professor Hutchison advised that the competencies standards in the United Kingdom are set by a group of professional medical experts and that MCQs are more difficult to set.

Professor Chehade further mentioned that the group of practicing surgeons should be evolving the standards rather than reinventing them.

III. Deliverables - specialists

Moderator: Dr. WK Ngai

1. Quality - feedbacks from –

a. Industry

Mr. S Sargeant talked about the characteristics in evaluating a partnership. How do the industry and surgeons interact? With the last 2-3 years of significant regulation changes, transparency in the partnerships/relationships is important. The industry is now being assessed on whether it is or not allowed to sponsor an activity and pages after pages of compliance documents would have to be completed.

This, however, does not halt the collaboration which is still an essential need and recognition of patient outcomes and quality of life, whereby a patient is fully informed of his personal liability, as well as the caring for him from the authority of the hospital and surgeons.

What is the definition of Research? Stryker has always been very transparent as to what is considered proper research. Commitment is assured for continuing medical education and is the reason for the set-up of the Homer Stryker Center (HSC) in the US, with the mission statement of being a physical hub for education outreach, that sets the standards for all Stryker training.

What are the keys to quality partnerships? It begins right from the early design phase, to obtaining good clinical input on the product, well-designed clinical trials and reporting of results efficiently. It is absolutely imperative that there is sharing of the results with colleagues and partners, through clinical publications, and subsequently receiving constructive criticisms in order to improve. It is important to possess the ability and desire to demonstrate and teach the techniques, and very importantly, to have an overriding goal of improving patient outcome and quality of life.

What are the future drivers in Research? They are continuous evolution of products, evaluation of the intangibles/output, evidence-based clinical outcome and product registry. Steve cited the Exeter hip with 30 years of outstanding clinical history. The optimization of surgical efficiencies and balancing the cost factor are considerable issues.

Steve highlighted the gaps between clinicians who are practicing and clinical researchers who are not practicing, but have switched their interests to the academic side. The industry's point of view, as it sees critical, in developing partnerships, still stands that surgeons should be active clinically.

Infection control and treatment, materials sensitivity and consistent device placement are factors in consideration as technology advances. Surgeons need to be well-trained and well-informed of the safe and effective use of the devices and products. Patients, especially the younger ones, are getting more educated through the internet. They are kept abreast of surgery and implants in the market, hence would require surgeons extra time and effort to clarify and explain to them that they may be part of a clinical trial.

With all these in the pipeline, is the new crop of surgeons still willing to get involved in time consuming research work and developing new products? What is the motivation? Are current trainees adapted to good trial protocols, and more importantly adept at getting them published?

With the prevalent restrictions adopted and especially in the US, surgeons are reluctant to approach the industry to collaborate.

Does that mean the medical industries have so reached the plateau on which medical devices and their development stop?

In summary, Orthopaedic companies can more effectively design, study and teach when in partnership with surgeons. Research goals have to be well-defined, meet the drivers in healthcare and include clinical input. It is pointless dealing with scientists and engineers. Clear and transparent partnership on both sides and clinical trial design, education and publication are extremely essential.

b. Working partner

Ms. Jessica Chan shared her nursing perspectives of the Orthopaedic specialist. She focused on the challenges that the junior Orthopaedic surgeons would meet.

Heavy workload, caring for the countless number of patients, attending to the extreme number of cases in the outpatient department and the increasing patients' expectations are daily demands in addition to their regular duties like providing both nurses and patients the summary outcome post operation, learning and acquiring surgical skills from the operating theatre and reporting statistics.

Communication skills are vital from the explanation of the surgical procedures to ensuring a satisfied patient by meeting his or her expectations.

Trainees have better guidance by their seniors and practice guidelines in these times as compared to the past. There are also more training opportunities for them to gain exposure and acquire knowledge.

Ms Chan further elaborated that in the past, junior trainees need to attend to patients at the Accident & Emergency departments, jot case notes on treatment plans then work with the nurses to carry out the appropriate procedures for the patients. The advantage of these early stages of good practice in their internship years, is that prompt and effective measures are taken more often than not. However, this becomes unfamiliar in the present time when the juniors are too caught up with their increased duties and calls.

Junior trainees are also hesitant to make prompt decisions but choose to rely on their seniors to, hence their competence and confidence levels need to be assessed.

There are surely the positive sides of the trainees in that they are more willing to adopt the holistic approach and address the psychosocial aspects of the patients.

In summary, nurses would like to see trainees adopting a clearer and definitive plan for the patients from the stages of admission, operation to being discharged.

Mr. Ken Lee further elaborated that nurses in the operating theatres share close relationships with surgeons due to the long working hours together. A common goal that both would like to achieve is more than a satisfactory patient outcome. Nurses sometimes act as trainers to the new trainees to advise of the rules and regulations of the operating theatre.

Competency skills follow as these trainees become specialist in time and as such are role models to their juniors.

There are surely expectations of the trainees, in that they should possess the right aptitude, have good communication and competency skills, know the guidelines and get familiarized with the workflow in the operating theatres, and more importantly, be nice people in order to achieve a harmonious working environment.

c. Trainee

Both **Dr. Sally Cheng** and **Dr. LF Tse** (Resident Specialists) shared their views as trainees and how they will embrace the challenges ahead of them.

A brief introduction was given on their training years, embarking on the exit examinations and finally graduates as medical doctors.

They shared statistics obtained from their peers on the exit examinations on whether the HKCOS training programs benefited them throughout their training years and positive feedback were received. This would mean that they have achieved their goals in terms of the professional status, after many years of conscientious work. However, still lacking is the status of being autonomous. Trainees still lack the confidence to carry out elective surgeries, especially on Joints Replacement, Sports and Spine. Therefore, further post-exit training and sub-specialization are necessary.

The trainees are convinced that literature is the main source of learning and acquiring knowledge and participation in study groups allowed them to apply what they have learnt from the manual, hence the competencies in managing emergency situations and make prompt and appropriate decisions during diagnosis and reduce the reliance on their seniors.

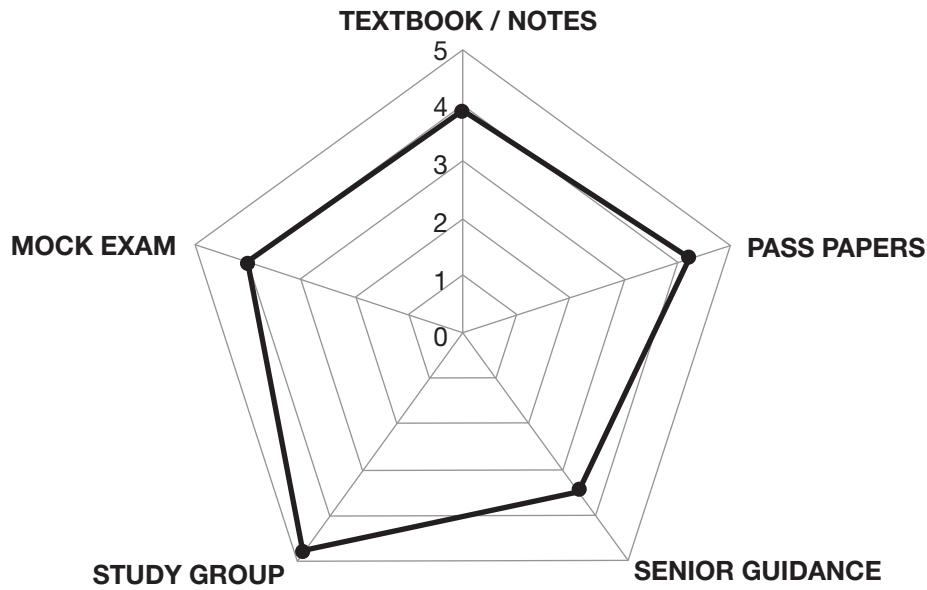


Figure 3-1.1 Sources of knowledge for a trainee to pass the exit examination

However, during the course of training, the trainees realized that the active learning model built as most respondents rated journal articles' importance higher. On the contrary, peer group review and senior personal guidance became more of an assistance role.

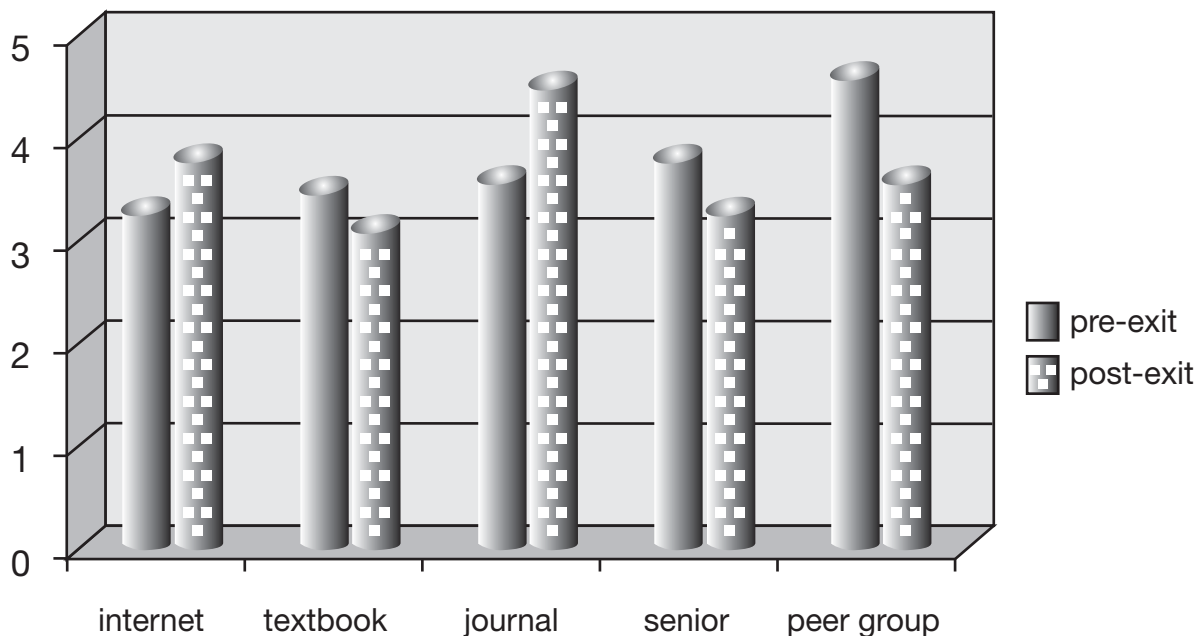


Figure 3-1.2 Sources of knowledge before and after passing exit examination

To conclude, a trainee after passing the exit examination should be able to perform as a safe surgeon and to provide basic orthopaedic care. Nevertheless, sub-specialty exposure is required for further development.

2. Assessments of quality - how these can be done?

Professor M Chehade talked about defining quality, which is the first step in the assessment of quality, and what determines the quality of a surgeon. He quoted the original Blooms taxonomy that provides a useful structure in which assessments are categorised into knowledge, understanding, application, analysis, synthesis and evaluation. Besides, technical skills and non-technical skills which are of different demands have to be taken into consideration.

2.1 Concepts vs Principles

When talking about concepts against principles, concept is an abstract idea or an element of knowledge but principle is a recurring pattern of things. A series of concepts come together to form a particular pattern or commonalities.

2.2 Who should do the assessment?

Assessment can be done by experienced surgeons, experienced teacher or assessor. Since residents deal with non-surgeons like nurse, allied health staff, ancillary workers and patients, we should also consider to include them to evaluate the performance of residents.

2.3 When should assessment be done?

Should assessment be done during the course of training or at the Exit examination? This depends on whether we are looking for recognition after residents have learnt something or looking for their ability to recall important information. We should also consider the anxiety level of residents that would influence their performance.

2.4 Why do we assess people?

We assess because people learnt from being tested and from mistakes, which is a formative approach. We also need to test the level of achievement and progress, for safety and accreditation purposes.

2.5 How assessment should be done?

There are some tests that have been adopted:

DOPS	Direct Observation of Procedures
PBA	Procedure Based Assessment
CBD	Case Base Discussion
CEX	Clinical Evaluation Exercise
360°	360 Degree Survey
ITA	In-training Assessment Form
FE	Fellowship Examination
LB	Logbook

The Procedure Based Assessment is much like the Direct Observation of Procedures but specific procedures are determined specifically to test the candidates. The Clinical Discussion becomes very popular. The 360 Degree Survey puts people from different disciplines, like allied health and ancillary workers, together to give an overall assessment of the candidates. The Fellowship Examination includes both viva and written test.

2.6 Competencies

Various tests can be used for assessing different competencies such as the following:

Competencies	Assessment Tools	
	Primary	Other
Medical Expertise		
✧ Access and apply relevant knowledge to clinical practice		
• Maintain currency of knowledge	FE	ITA
• Apply scientific knowledge in practice	CBD	FE
• Recognise and solve real-life problems	CEX/CBD	FE

Technical Expertise		
◇ Safely and effectively perform appropriate open surgical procedures		
• Consistently demonstrate sound surgical skills	DOPS/PBA	LB
• Demonstrate procedural knowledge and technical skill at a level appropriate to their level of experience	DOPS/PBA	LB
• Demonstrate manual dexterity required to carry out procedures	DOPS/PBA	LB
• Adapt their skills in the context of each patient - each procedure	DOPS/PBA	LB/ITA
• Maintain skills and learn new skills	DOPS/PBA	LB
• Approach and carry out procedures with due attention to safety of patient, self, and others	DOPS/PBA 360°	LB
• Analyse their own clinical performance for continuous improvement	CBD (AUDIT)	ITA
Judgement - Clinical Decision Making		
◇ Design and carry out effective management plans	CEX	ITA/FE
• Recognize the symptoms of, accurately diagnose, and manage common problems	CEX/CBD	ITA/FE
• Take a history, perform an examination and arrive at a well reasoned diagnosis	CEX/CBD	ITA/FE
• Efficiently and effectively examine the patient	CEX	ITA/FE
• Formulate a differential diagnosis based on investigative findings	CBD	ITA/FE
• Manage patients in ways that demonstrate sensitivity to their physical, social, cultural, and psychological needs	CBD	ITA/FE
• Recognize the most common disorders and differentiate those amenable to operative and non-operative treatment	CBD	ITA/FE
• Effectively manage the care of patients with trauma including multiple system trauma	CBD	ITA/FE
• Effectively manage complications of operative procedures and the underlying disease process	CBD	ITA/FE
• Accurately identify the risks, benefits, and mechanisms of action of currently used drugs	CBD	ITA/FE
• Indicate alternatives in the process of interpreting investigations and in decision making	CBD	ITA/FE
• Manage complexity and uncertainty with sound judgement	PBA	ITA/FE
• Consider all issues relevant to the patient	CBD	ITA/FE
• Advocate patient health	CBD	ITA/FE
• Identify and manage risk	PBA/CBD	ITA/FE
• Plan, and where necessary implement, a risk management plan	CBD	ITA/FE
◇ Organize diagnostic testing, imaging and consultation as needed	CBD/ITA	FE
• Select medically appropriate investigative tools and monitoring techniques in a cost-effective, and useful manner	CBD/ITA	FE
• Appraise and interpret results of investigations against patients' needs in the planning of treatment	CBD/ITA	FE
• Critically evaluate the advantages and disadvantages of different investigative modalities	CBD/ITA	FE
• Evaluate the significance of data	FE	Research
Communication		
◇ Communicate effectively		
• Communicate information to patients (and their families) about procedures, potentialities, and risks associated with surgery in ways that encourage their participation in informed decision making	CEX	ITA/FE

<ul style="list-style-type: none"> Communicate with the patient (and their families) the treatment options, potentials, complications, and risks associated with all treatment modalities 	CEX	ITA/FE
<ul style="list-style-type: none"> Communicate with and co-ordinate surgical teams to achieve an optimal surgical environment 	360°	ITA
<ul style="list-style-type: none"> Initiate the resolution of misunderstandings or disputes 	360°	ITA
<ul style="list-style-type: none"> Appropriately adjust the way they communicate with patients to accommodate cultural and linguistic differences and emotional status 	CEX	ITA/FE
<ul style="list-style-type: none"> Recognise what constitutes 'bad news' for patients (and their families) and communicate accordingly 	CEX	ITA/FE
Collaboration		
<ul style="list-style-type: none"> Work in collaboration with members of an interdisciplinary team where appropriate 	360°	ITA
<ul style="list-style-type: none"> Develop a care plan for a patient in collaboration with members of an interdisciplinary team 	360°	ITA
<ul style="list-style-type: none"> Collaborate with other professionals in the selection and use of various treatment modalities assessing the effectiveness of each management option 	360°	ITA
<ul style="list-style-type: none"> Employ a consultative approach with colleagues and other professionals 	360°	ITA
<ul style="list-style-type: none"> Recognise the need to refer patients to other professionals 	360°	ITA/FE
Management and Leadership		
<ul style="list-style-type: none"> Balanced decision making - see also judgement - clinical decision making 		
<ul style="list-style-type: none"> Promote patient advocacy - see also Health Advocacy 		
<ul style="list-style-type: none"> Effectively use of resources to balance patient care and systemic demands 		
<ul style="list-style-type: none"> Identify and differentiate between resources of the health care delivery system and individual patient needs 	CBD	ITA/FE
<ul style="list-style-type: none"> Apply a wide range of information to prioritise needs and demands 	CBD	ITA/FE
<ul style="list-style-type: none"> Effectively assess and manage systemic risk factors 	CBD	ITA/FE
<ul style="list-style-type: none"> Manage and lead clinical teams - see also Collaboration 		
<ul style="list-style-type: none"> Is respectful of the different kinds of knowledge and expertise which contribute to the effective functioning of a clinical team 	360°	ITA
<ul style="list-style-type: none"> Direct and supervise junior medical staff effectively 	360°	ITA
<ul style="list-style-type: none"> Maintain accurate records 		
<ul style="list-style-type: none"> Contemporaneously maintain accurate and complete clinical records 	CBD	ITA/LB
Health Advocacy		
<ul style="list-style-type: none"> Promote health maintenance of patients 	360°	ITA
<ul style="list-style-type: none"> Promote health maintenance of colleagues 	360°	ITA
<ul style="list-style-type: none"> Look after their own health 	360°	ITA
Scholar and Teacher		
<ul style="list-style-type: none"> Recognize the value of knowledge and research and its application to clinical practice 		
<ul style="list-style-type: none"> Assume responsibility for own on-going learning 	CBD	ITA/Research
<ul style="list-style-type: none"> Draw on different kinds of knowledge in order to weigh up patient's problems in terms of context, issues, needs and consequences 	CBD	ITA/FE
<ul style="list-style-type: none"> Critically appraise new trends 	Research	FE
<ul style="list-style-type: none"> Facilitate the learning of others 	360°	ITA
Professionalism		
<ul style="list-style-type: none"> Appreciate the ethical issues 	360°	ITA
<ul style="list-style-type: none"> Consistently apply ethical principles 	360°	ITA
<ul style="list-style-type: none"> Regularly participates in audit 	ITA	??
<ul style="list-style-type: none"> Identify ethical expectations that impinge on the most common medico-legal issues 	CBD	ITA/FE
<ul style="list-style-type: none"> Is accountable for their decisions and actions 	CBD	ITA

• Acknowledge their own limitations	360°	ITA
• Acknowledge and learns from mistakes	360°	ITA
• Act responsibly	360°	ITA
• Employ a critically reflective approach	360°	ITA/LB

Table 3-2.1 Assessment Tools for different competencies

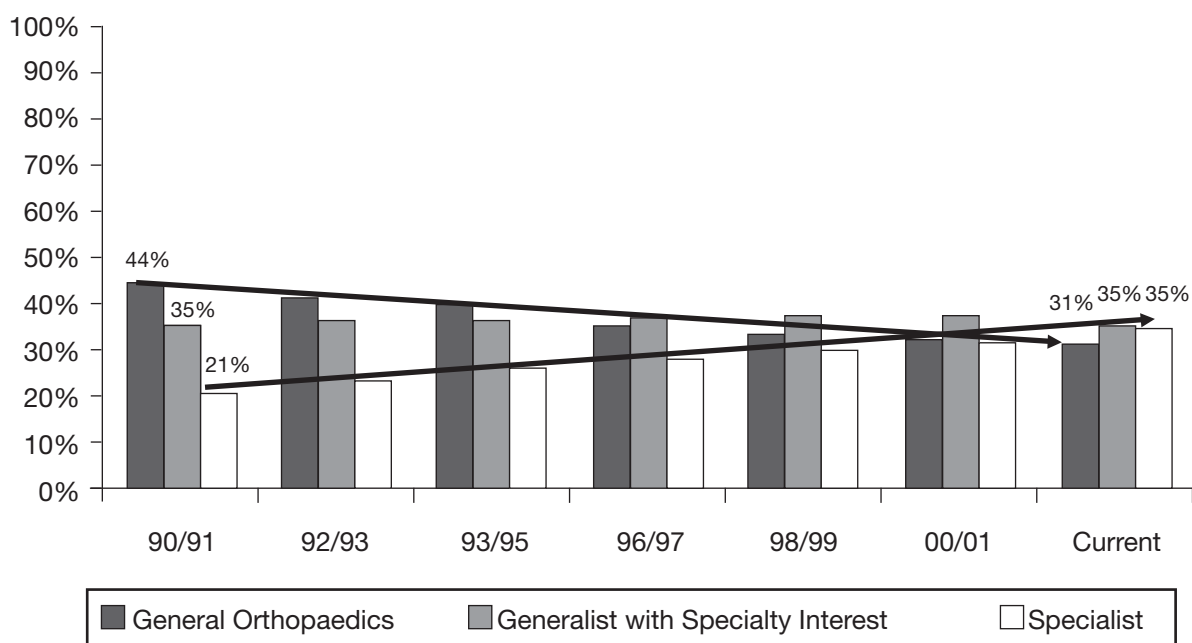
There is a new assessment tool, namely Script Concordance (SC) test which is designed to check whether knowledge of examinees is efficiently organized for clinical actions. That kind of organization of knowledge is named a script. The purpose of the SC test is to measure the degree of consistency that exists between examinees' scripts and scripts of a panel of experts. However, not all specialists agree to this.

3. Sub-Specialists - demands and developments

Professor E Guerado shared about the current trend in Europe where Orthopaedic surgeons are increasingly becoming interested in sub-specialties especially in Hand and Sports Medicine that would yield a growth in income.

What is a subspecialty? It is “a body of knowledge within a field with the aim of improving the quality of medicine being practiced within that subspecialty”⁸

Nowadays, more orthopaedic surgeons view themselves as specialists than they were in the past.

Figure 3-3.1 How Orthopaedic Surgeons view themselves⁹

⁸ Bridwell KH, Harner CD, Polly DW Jr., Stern PJ, Subspecialty Certification: Current Status of Orthopaedic, J Bone Jt Surg 2006;88-A:2081-90

⁹ American Academy of Orthopaedic Surgeons. Orthopaedic practice in the US 2002-2003, www.aaos.org/wordhtml/opus2002/opus30.htm.

The mean age of all kinds of orthopaedic surgeons decreased a little bit along the years and that of subspecialists is among the lowest.

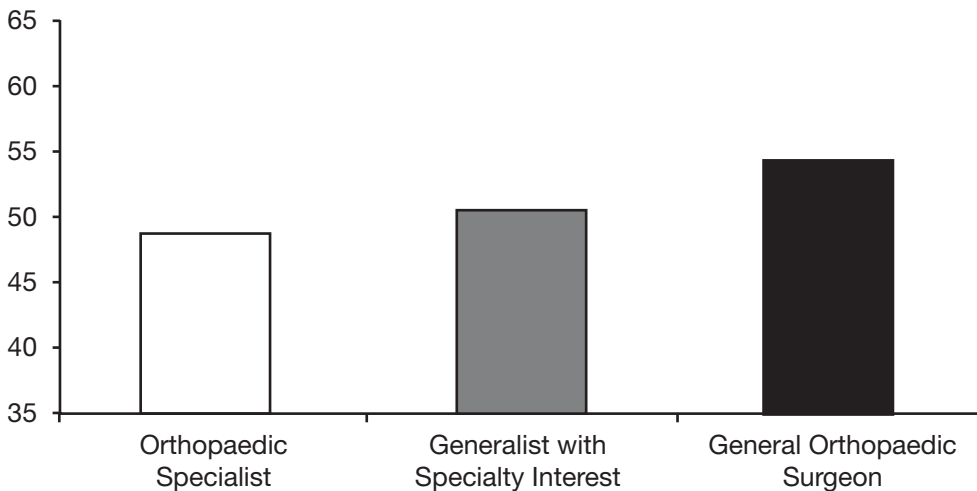


Figure 3-3.2 Mean Age of Orthopaedic Surgeons by Service Types in 2006¹⁰

3.1 Subspecialty in Hand Surgery

3.1.1 Why Hand Surgery is a subspecialty:¹¹

- Prevalence in Upper Extremity Disorders
- Fragmentation of the Parents Boards
- A Distinct Body of Knowledge
- Exclusivity and/or Better Care
- De facto certification

3.1.2 Highlights of the requirements for hand subspecialty:¹²

- A “primary” diploma
- Full unrestricted license and privileges at his/her hospital
- Ethical standing
- Actively engaged in hand surgery – Accredited by JCAHO
- More than 125 cases from 6 out of 9 categories (1-year)
- The success of a Hand Specialist correlates with his fulfillment of 300 cases operated per year and more than 75% of time devoted to hand surgery.

3.2 Subspecialty in Sports Medicine

3.2.1 Why Sports Medicine is a subspecialty:¹³

- Unique Body of Knowledge
- Becoming more complex, and difficult in 5-year residency
- 1/3 of residents have pursued a Sports Medicine fellowship

3.2.2 Highlights of the requirements for hand subspecialty:¹⁴

- A “primary” diploma
- Continuing Medical Education (CME)
- License requirements (State)
- Board Certification
- Practice requirements of 115 sport-medicine-related surgical cases and 10 non-operative cases document as a practice in orthopaedic Sports Medicine

¹⁰ American Academy of Orthopaedic Surgeons. *Orthopaedic Practice in the US 2006*. <http://www.aaos.org/research/orthocensus/AverageAge.pdf>.

¹¹ Kelsey JL, Pastides H, Kreiger N, Harris C, Chermow RA. *Upper extremity disorders: a survey of their frequency and cost in United States*. St. Louis, Mosby. 1980;1-2:39-65.

¹² Burton RI. *Certificate of added qualifications in hand surgery: history, status, and future*. *Tech Hand Up Extrem Surg*. 1999;3:151-3.

¹³ American Board of Medical Specialties. *2004 ABMS. Annual Report and Reference Handbook*. www.abms.org/Downloads/Publications/AnnualReports2004.pdf.

¹⁴ American Orthopaedic Society for Sports Medicine. *Educational Curricula*. www.aossm.org.

3.3 Subspecialty in Major Trauma

3.3.1 Why Major Trauma is a subspecialty:

- Complexity in pathology
- Multidisciplinary collaboration
- Common and yet difficult management
- Technological advancement

3.4 Subspecialty in Spinal Surgery

3.4.1 Why Spinal Surgery is a subspecialty:¹⁵

PRO (ABSS-American Board of Spine Surgery)

- A Distinct Organ System
- A Distinct Body of Knowledge
- A significant number of physicians
- National Specialty societies
- Appropriate specialty training programs
- Requirements of a “primary diploma”

Against (AAOS-American Academy of Orthopaedic Surgeons & AANS-American Association of Neurological Surgeons)

- Current board certification
- Recertification every 10 years
- Difficulty in defining the scope of Spinal Surgery
- ABSS examination does not assess competency
- Encourages legal issues
- Negative effect on patient care

3.5 Subspecialty in Joint Replacement

3.5.1 Protocol for TKR (Total Knee Replacement) indication

- Over 70 years
- Severe symptoms
- Unsuitable for alternative treatment
- Normal weight or unable to lose weight after a 6 month-period diet
- X-ray with affection
- Patient Compliance

3.5.2 Protocol for Hospital discharge

- Normal temperature
- Normal surgical wound
- Haemodynamic stability
- Hb >7,5 g
- Satisfactory x-rays
- Patient compliance

In a survey with patients who had joint replacement, many of them responded that they did not obtain the results they expected, some of them were satisfied, but still nearly a half of them were really frustrated.

Professor Guerado emphasized that doctors need good communication skills to respond to patients expectations and for cost effectiveness, will The National Health Services (NHSs) provide the expected inn-keeping/hospital lodgings like rooms, meals and more?

He further emphasized that accreditation by Competences are based on 3 important points: Knowledge through books and clinical cases, Skill through clinical practice, and Attitude through commitment to patients and their institutions. The downside, however, is that it is time-consuming and expensive.

In conclusion, Professor Guerado made 2 quotes – thumbs up on quote by Professor Rene Leriche “one is a specialist in what he/she dominates” and the thumbs down on quote from The Merck Manual (<http://www.merck.com>), an online medical library, “a specialist is one who knows more and more about less and less... ultimately knowing everything... about nothing!”.

¹⁵ Dwyer AP, Herkowitz HN, Benzel EC. Controversies in Spine. Should There be Subspecialty Certification in Spine Surgery. Spine 2002;27:1478-83.

4. Discussion Summary

Professor Hutchison concurred that examination is the driver for knowledge as learning comes from literature. The emphasis of teamwork is important during training and the questionnaires from trainees are useful feedback. To recognize that it takes 12 months of hard work to prepare for the examinations, hence there is a need to identify the drivers to keep the trainees intellectually active in the early years of training.

The perception about what training does and how much of it is geared towards passing the examinations remains a challenge as these have to be clinically relevant.

Surgeons with good communication and management skills and possess the competency in making decisions, attributes to having taken examinations which have these intangible benefits.

In order to have quality teachers for the training programmes, Professor Malhotra suggested that the selection process and exit examination should also be applied to the training of teachers.

The competency of a teacher/instructor can be identified during the training years and with the many years of teaching experience throughout, it somehow becomes a part of them, whether for the sake of teaching or a duty already. Would this then be fair to the department heads who would usually assume this multi-task role? Should there be a driver to motivate them rather than perceiving it as a duty?

'Or should they possess the correct attitude to assume as role models to their juniors, reiterate on patient care and communication skills?', commented by Professor Leung.

Professor Leung also noticed a trend that trainees would hibernate at home for the 12 months to prepare for the final examinations, in order to ensure that they pass. However, this would not mean that they are surgically competent.

Professor Hutchison further commented that trainees who are tested and apply from their own clinical experiences are the outstanding ones. These trainees can be identified by the examiners early. He reiterated that written examinations remain beneficial and can stimulate critical analysis and hence should not be abolished.

IV. Formats in Training, Teaching and Assessment

Moderator: Professor M Chehade

Professor M Chehade shared the legacy of self-directed learning as opposed to directed self-learning. A lot of actual training are self-directed. Many resources are available from text-books and journals, and increasingly available on-line such as the Hyperguide where orthopaedics and anatomies are underlined. Moreover, there are many things that cannot be learnt from text-books but are critical in the course of training. Hospital-based training at out-patient clinics and operation theaters with proper supervision are probably the best places to learn. However, the traditional way of teaching – see one, do one and teach one, is already out-dated. This notion of learning by mistake on real patients is found very distasteful and not allowed to happen again. Nowadays, there are a lot of formalized training opportunities including lectures, tutorials and workshops organized by academies. With the assistance of the industry, the use of sawbones and simulation are great valuables in training up practical skills of the trainees. The major advantage of simulation is more working through reproducing actual processes rather than real hands-on operations.

Assessments drive learning. As for formative assessment versus summative assessment, formative assessment is more valuable as it does direct further learning.

1. Clinical knowledge (by Professor LK Hung)

Clinical knowledge includes facts, information, structures like bones and joints, causes and how problems develop, etiology, pathogenesis, complications and treatments, etc. Of course we need to be supported by clinical sciences of the musculoskeletal system and surgical anatomy. We also have to think about how to deliver care to patients, avoid problems and ensure patients' satisfaction. Nevertheless, content of a training program is the most imperative.

The North Wales training program, which is very conventional, tries to cover all the aspects, and the British system, which has been discussed earlier, is really comprehensive. The Hong Kong curriculum is actually built basing on this framework.

There are two ways of conferring clinical knowledge, didactive and dialogue. The dialogue form is preferred as knowledge is constantly evolving and therefore there is no fixed number of topics or pages to remember or recite. Dialogue learning is important for the sharing of experiences apart from information. While information is feeding in, training in critical thinking is also important for the trainees to analyze the situation and decide what is the most appropriate action to take or treatment to offer. Trainees are encouraged to search for answers and unconventional concerns but not just to swallow things as they are. Furthermore, the content of a training programme should take the trainees' point of view into account. It cannot be in a solely instructive way to convince what the instructors are believing, but rather be packaged after listening to what the trainees require.

2. Clinical competence and skills (by Professor J Hutchison)

Overview:

- OCAP (Orthopaedic Curriculum & Assessment Project)
 - PBAs (Procedure Based Assessments)
 - eLogbook
- ARCPs (Annual Review of Competency Progression)
- MRCS (examination for Membership of the Royal College of Surgeons)
- FRCS (Trauma & Orthopaedics) (examination for Fellowship of the Royal College of Surgeons, in the speciality of Trauma & Orthopaedic Surgery)
- Fellowship (clinical training)
- CCT (Certificate of Completion of Training)

2.1 OCAP (Orthopaedic Curriculum & Assessment Project)

2.1.1 PBAs (Procedure Based Assessments)

Procedure Based Assessment is a combination of judgement on knowledge, skills and attitudes/values. It is a tool to give structured, high quality and formative feedback to a trainee, which can then be used as evidence to annual review of learning, progress and achievement. It aims to put trainees on the mark by testing how well they understand.

A collection of PBA's, assembled over several years, would be a summative assessment of trainee's competence in learning to perform operative procedures using the correct protocol to the correct standards, and a key part of evidence on which Higher Specialty Training Committee will base its decision to recommend CCT (Certificate of Completion of Training). PBA is not a checklist of how to perform the procedures or a trainee's only chance to succeed.

PBA is not a standalone assessment and is an element of the Trauma & Orthopaedics Curriculum.

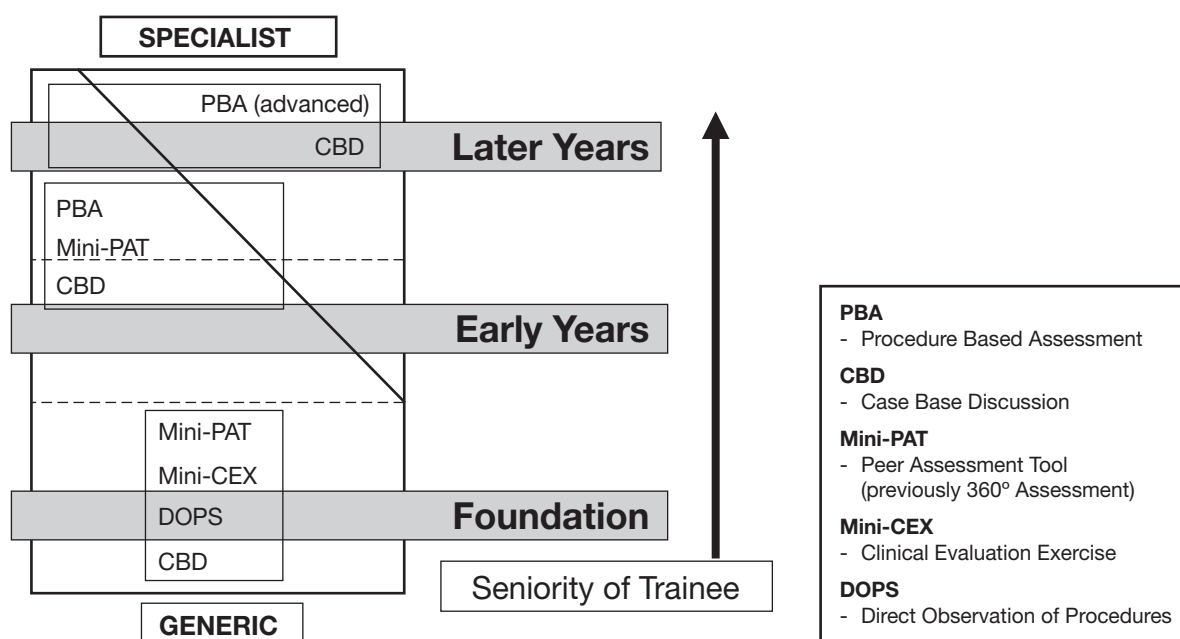


Figure 4-2.1 Where do PBAs fit in with other assessment tools?

PBAs are currently applied on the following procedures:

- Hand
 - Carpal tunnel decompression
 - Digital and palmar fasciectomy
- Knee
 - Diagnostic arthroscopy & simple arthroscopic procedures
 - Total knee replacement
- Foot
 - 1st ray surgery
- Hip
 - Total hip replacement
- Spine
 - Lumbar discectomy
- Trauma
 - Compression hip screw / Hemiarthroplasty
 - Application of limb external fixator
 - Operative fixation Weber B ankle fracture
 - Fixation by tension band wiring, olecranon & patella
 - Intramedullary nailing femoral or tibial shaft fracture
 - Tendon repair

- Generic
 - template
- In development
 - Upper limb
 - Paediatric

However, PBAs do have their shortcomings:

- Fail to discuss or identify target procedures
 - no learning agreement
- No assessments triggered
 - too busy?
 - inappropriately fearful
- Trainer not scrubbed
 - inadequate view of procedures
 - put patients at risk
- Inadequate observation
 - judge on basis of evidence on the day, not personal view of what trainee could have done
- Inappropriate prompting
 - guidance by retractor
- Over-use of “not assessed”
 - evidence for intervention
- Delaying recording to later date
 - memory test; paperwork will take longer
- Delaying feedback to later date
 - less effective
 - argument pantomime
- Turning feedback into teaching session
 - laudable, but will take longer
- Fail to transfer scores to PBA summary sheet
 - Training Committee cannot see progression

A PBA is conducted in the real world, in real time. The trainer directs the PBA and must never compromise the quality of patient care for the sake of the assessment.

2.1.2 eLogbook

ELogbook is a reference guide for trainers and trainees for validating the trainee's operations. Once validated, a copy of the operation is entered into the trainer's eLogbook automatically.

An individual must register with the Information Commissioner if he or she keeps patient-identifiable data for the purposes of research, private practice or as part of a logbook (the Data Protection Act 1998).¹⁶ It is MANDATORY for eLogbook users to register as a 'data controller'. The user will then 'own' their own data and can do with it as they choose.

For more information and registration, visit: www.ico.gov.uk. To access the eLogbook website for further information and registration, visit: www.elogbook.org.

2.2 FRCS (Trauma & Orthopaedics) (Intercollegiate Specialty Examination in Trauma and Orthopaedic Surgery)

FRCS (Trauma & Orthopaedics) is an examination for Fellowship of the Royal College of Surgeons, in the specialty of Trauma & Orthopaedic Surgery, on clinical examination. More practice on clinical work would be the best preparation for the examination.

¹⁶ Information Commissioner's Office. Notification handbook – a complete guide

2.3 CCT (Certificate of Completion of Training)

Conditions for getting the Certificate of Completion of Training:

- Successful ARCPs (Annual Review of Competency Progression), including final sign-off
- Satisfactory PBAs + eLogbook
- Passed Intercollegiate Specialty Board Examination in Trauma & Orthopaedics [(FRCS Trauma & Orthopaedics) awarded by one of the Royal Colleges of Surgeons]
- Letter of approval by Training Programme Director
- Approval of SAC (Specialty Accreditation Committee)
- Entry onto General Medical Council (GMC) Specialty Register

3. Integrating technology in training – Is this the Future?

On “**Integrating Technology in Training – Is this the Future?**”, Mr. Sargeant shared his concerns about the current status of variety in clinical scenarios and complications and factors effecting change. Changes are induced from financial impacts of the cost of travel and, specimen costs and availability; Regulatory requirements on the safe and effective use of products; Training facility criteria and licensing; Integration of technology in the operation room; And, the learning paradigm shift as a result of changing expectation of the young people who like to learn by trial, such as when they are playing electronic games, rather than by listening to the people in front of them telling them what to do.

The acceptance of this new paradigm, matching the mix right, the ways to do assessments, balancing the use of new technology with its effectiveness, the necessity of environment immersion and sensory feedback at real situations are all challenges to institutions. Orthopaedic learning is not different from others.

Whether institutions can meet these challenges relies on their initiatives to collaborate with others, accept new technology such as digital X-ray and e-records, define and develop open standards, best practices, platforms and communities of support. A study at the Beth Israel Medical Center found that computer gamers were 27 percent faster at advanced endoscopic surgical procedures and made 37 percent less errors than those who were not. Furthermore, exercises for tuning hand-eye coordination and developing fine motor neural pathways, and repetitive skills training for proficiency were benefiting. As for collaboration and employment of new technology, the websites ‘<http://immersiveeducation.org>’ (The Immersive Education Initiatives¹⁷) and ‘<http://www.nmc.org>’ (The New Media Consortium¹⁸) are worth a look for references as suggested by Mr. Sargeant.

Surgical simulation training has been benefited a lot by modern technology, simply by quoting the use of Sawbone. The old Sawbone, basically with two pieces of wood with a hinge in the middle, did nothing about patient positioning, ligament, tension on a joint or soft-tissue, whereas the newly developing model with simulation of soft-tissue, ligament and induced tension by attaching to a bench, can better simulate the clinical effects. However, the new Sawbone model does not allow us to provide the same clinical presentation for every single Sawbone in a much more realistic environment.

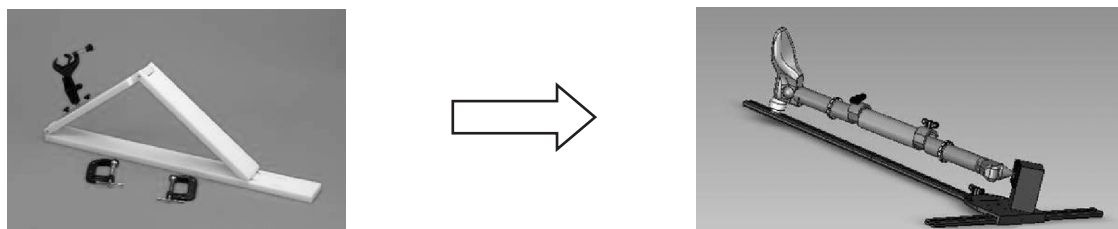


Figure 4-3.1 The evolution of Sawbone

¹⁷ The Immersive Education Initiative is an international collaboration of universities, colleges, research institutes, consortia and companies that are working together to define and develop open standards, best practices, platforms, and communities of support for virtual reality and game-based learning and training systems.

¹⁸ The New Media Consortium is an international not-for-profit consortium of learning-focused organizations dedicated to the exploration and use of new media and new technologies.

Setting objective assessment of people who are using technology in the learning process is the hardest criteria to meet. However, with the use of technology and decrease in digital capture costs, for example, we can compare own result against 20 world renowned experts in doing a surgical technique.

Visual, Tactile and Physiological realism - "Being There" is important in training. The use of haptics technology, such as simulators in endoscopy, which adds tactile realism to increase clinical proficiency and decrease medical errors and costs, has revolutionized the medical education. Haptics is in infancy stage but is a new area of research funding. (Reference: <http://immersion.com/markets/medical/>). Besides, simulation clinical training is already existed in a university. It is developed for the Medical school to create training for comprehensive clinical pathway management.

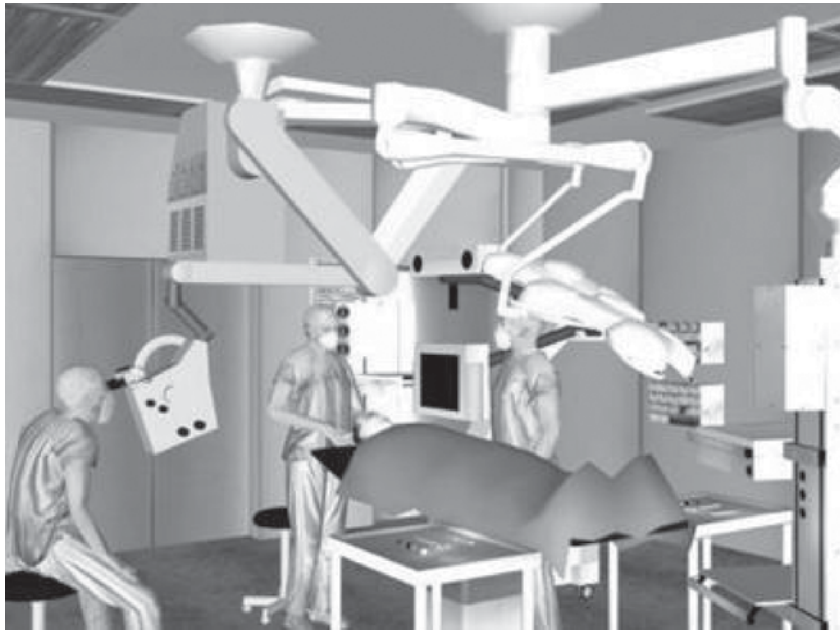


Figure 4-3.2 Simulation training in clinical management

The availability and fragility of bandwidth is considered to be a threat in the future as its demand is exploding, for example, media players, media downloads and uploads and Internet phones, but we are mostly using pre-existing cables.

In conclusion, we are now experiencing the Future and trainees have indeed changed their expectations. Technology is rapidly developing in the field of immersion and haptics that are major industry drivers and collaboration with academia. Reality check – will this ultimately improve patient outcome?

4. Discussion Summary

Dr. Bajet Nour shared the possibility of combining technology, forum and text messaging, which has been implemented in his University, in that fellows can attend the forum and still be able to gain access to information wherever they are and whilst on the go. The accessibility to download application and communicate through iPod/phone has already been implemented in his institution. This encourages studying together and if the trainees have any questions, they can send directly to their mentor and get response almost immediately.

He further emphasized the importance of “point of care” assessment, which is assessing pre- and post-operation to compare the results.

Professor Leung shared that with the advancement of technology and the new generation of trainees, who prefer to stay home to study and acquire information from the internet, voluntary attendances to non-structured training are on the decrease. Then how do we stimulate the residents to learn?

Professor Hutchison queried on the **Clinical competence and skills** in the new generation and reiterated that examination is still the driver to assess them. There has to be a driver for knowledge whether factual or skill based. He emphasized that it is important for people who make up the curriculum are actively practicing surgeons and perhaps people making up the structure on how things are taught should be nearer the age of the trainees who are being taught. There are issues about this learning mode that he cannot perceive as a way of learning.

Professor Zeng reiterated that China still lacks professional training and a regular programme, and that the government is looking into reforming medical care and improving professional education.

Broad-based training is always preferred as seconded by Professor Hung.

V. Round table discussion –

Setting of new standards and ethical issue in training

Moderator: Professor LK Hung

Dr. Nour touched on the ethical issue and quoted “the captain of the ship” whereby it is the ultimate responsibility of the trainee to steer on to improve patients’ outcome.

Professor Chehade strongly felt that a trainee should take his experience to an academic level as opposed to being a service provider.

Professor Thanainit Chotanaphuti shared that he became specialized in Joint Replacement 5 years ago and have done 400 cases per year thereafter.

Professor Leung was interested to hear the views from the panel on what it takes for female trainees to stay on, as they tend to quit after 1-2 years after training. He shared that Hong Kong has between 60-65% of female trainee to-date.

Professor Hutchison continues to be a vocal advocate for female trainees.

Professor Guerado shared that though there may be more female trainees, which reflects the general society where women go into training before the male trainees, they tend to quit after one year to look after their children. This is quite the norm in Spain, in particular as it deems the women’s responsibility to take care of children.

Professor Chehade suggested that the profession should not be altered to attract female trainees but should be based on personal interests, citing example that the number of female specializing in Paediatric Orthopaedics are high.

Dr. Ngai reiterated that trainers and centres are also critical for the assessment programmes.

Dr. Nour suggested exchanging assessment programmes between different institutions to evaluate and exchange ideas. Patients and fellows should also be involved to evaluate the entire system and exchange ideas.

Professor Malhotra referred to the presentation on the feedback from fellow trainees of both Dr. Cheng and Dr. Tse, which somewhat failed to explain what was lacking in the programme, the reasons attributed to the statistics and any criticisms as well.

Professor Chehade encouraged upholding the tradition of teaching as part of learning right from day one at medical school through retirement of career.

VI. Epilogue

“Vision is seeing more than is present”

This is not a summary or a conclusion from the workshop symposium.

Orthopaedic training is still evolving and changing. In this workshop symposium, we had the chances to share the experience from different parts of the world and different opinions. It opened up so many discussions and thoughts of how we can help to train good orthopaedic surgeons with core competency and prepare them to take up a lifelong learning as dedicated clinicians for betterment of their patients.

1. Curriculum: It is common to see changes are being done and planned in many countries in the world with respect to the training needs for good quality orthopaedic surgeons. These changes are in responses to:
 - a. Changes in diseases patterns where degenerative conditions in musculoskeletal system with aging. We are also facing the same problems where osteoporosis, osteoarthritis and degenerative spinal conditions dominate daily clinical practice. As subsequences, there are clinical problems associated with these pathologies and the training and curriculum have to be re-adjusted with different emphases accordingly. The training materials may also be severely affected if the old curriculum is used.
 - b. The shortening of working hours for surgeons and trainees also affected significantly the quality of training and the essential clinical exposure and learning. The practical experience of surgical procedures and decision-making are also directly affected. These were reflected in the presentation from the resident specialist where most trainees regarded passing an exit examination only open the door for further surgical technical training and practice where supervision is still required even with common orthopaedic operations. The clinical competency of a surgeon is not completely achieved with the current training program.
 - c. Syllabus:
 - i. The generality of orthopaedic surgery should be emphasized throughout the training period.
 - ii. Common conditions like trauma and degenerative diseases need to be focused and stressed despite there is a lack of interest in many specialists and trainees.
 - d. The differences in the curricula in different parts of the world should reflect the local needs while the principles are similar.
 - e. The recognition of the continuous changes in clinical knowledge and the exponential increase in the complexities and amount of knowledge, there is a need for an integrated technology to facilitate learning and teaching.
 - i. Cost
 - ii. Regulatory measures
 - iii. Ethical consideration
 - iv. Electronic and online
 - v. Being there is enough?
2. Trainees:
 - a. There are discrepancies in the expectations from the trainees and on the trainees. The trainees regard passing the examination and getting quality training are different. In passing the exit examination, self study and the peer group study is the most important while the teaching and guidance from their trainers only become more important after passing the examination. This truly reflects the drawback from our training program that does not always help our trainees in becoming competent orthopaedic surgeons.
 - b. The different study patterns and methods of acquiring knowledge are also different significantly in the younger generation of our trainees. The vast amount of readily available and unaccredited knowledge on the Internet, the IT efficiency of the younger generation and the different modalities of teaching and learning tools with computer support also need our reconsideration when designing curriculum and learning requirement. More interactive and self-paced learning programs will play a more critical role in our training program.

- c. The concern of more female trainees and surgeons also needs to be addressed. It has been a very sensitive issue since the awareness of the increase in percentages of female medical students all over the world. Although we are seeing more female colleagues joining our surgical specialty, should there be any changes of training and curriculum? Should there be a less physical demanding orthopaedic specialty? Should there be a modification of surgical instruments and equipment to facilitate our female colleagues?
3. Assessments:
- a. With the changes proposed, there should also be corresponding adjustment in our assessment methods: should we focus more in degenerative conditions while the paediatric and hand conditions may be respectively trimmed down?
 - b. Work place assessment: while many countries advocated Work Place assessment with its merits. How this should be done needs careful consideration. It also means a shift of the continuous assessment in a more structured manner.
 - c. Procedure based assessment: This is another important assessment for clinical competency. It may be easier to be carried out with simple procedures and be objectively done. In more complicated procedures, especially involve patients directly, it will be difficult and perhaps the assessment on decision making is more important and the issue of ethics will complicate this assessment further.
 - d. A list of indicator procedures should have been included in the training program.
 - e. 360° assessments of the other characters, e.g. attitude, empathy.
 - f. Whatever the assessments are, it is important to have structured feedback to the trainees. The use of formative assessment is preferred to summative assessment in this aspect, but the practicality needs consideration.
 - g. The eLogbook system has been implemented in many countries and proven to be useful to assess training.
 - h. Assessment on surgical skill is another difficult area for considerations. Ideally, this is one form of procedure-based assessment and the objective assessment, and the methods need further consideration.
4. Feedbacks from our partners:
- a. Our trainees are not competent enough in making decision and there is grossly lacking of the focused training in this aspect.
 - b. They are less well prepared in the operating room where our nursing staff became the instructors in many occasions.
 - c. The research activities that our trainees participated are very few nor their research programs are applied and practical.
 - d. Our trainees do not have enough extended knowledge and the spectrum is just too narrow.
 - e. All these may be a result of too heavy clinical duties and lacking protected time for focused training and learning.
5. Subspecialty development:
- a. Subspecialty development is driven by the market and sometimes driven by the idea to defend orthopaedics when other surgical specialties tried to practice certain subgroups of orthopaedic operations.
 - b. It was difficult to define a subspecialty sometimes and boundary may be blurred.
 - c. A unique subspecialty is definitely beneficial to specific patient care. It also helps the maturation of surgeons in that specialty. With the concept training in generality of orthopaedic surgery in the trainees, there may perhaps two tracks of training:
 - i. Leading to subspecialty development: early years of general orthopaedics then move into subspecialty training with an extended training.
 - ii. Leading to general orthopaedic training that follows the current program with modification and emphasis on common conditions.
 - iii. There should be tracks that our trainees can change and adopt during their training period.
 - d. The list of subspecialties should also specific to a region and country.
 - e. The risk of super-specialisation is always under consideration.

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Stryker Pacific Limited



Orthopaedic Learning Centre
Department of Orthopaedics and Traumatology
The Chinese University of Hong Kong
1/F Li Ka Shing Specialist Clinics, North Wing
Prince of Wales Hospital, Shatin
Hong Kong

Email: dept@ort.cuhk.edu.hk / olc@ort.cuhk.edu.hk
<http://www.ort.cuhk.edu.hk> / <http://www.olc-cuhk.org>