

Bologna and the Tuning Project in Medicine

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Graz Conference, Austria



Overview

Background - Bologna Process and Tuning Project

MEDINE ❖ Tuning (Medicine) = Second Cycle

❖ Euro Specs WFME Global Standards

MEDINE2 ❖ Bologna First Cycle

❖ Tuning Research Competences

❖ Tuning Process in Medicine

Related projects and future directions

Background



Medicine is an EU 'regulated profession'

http://europa.eu/legislation_summaries/index_en.htm

Cross-recognition of EU medical degrees

Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005

Wide variation in medical training in EU

Admissions, length (4-7yrs), LO, qualifications (MBCbB, MMed, MD), licence to practise



Background

Bologna Process (www.ehea.info)

Easily readable & transferable degrees

3 'Cycles' - Bachelor, Master & Doctor



'Dublin Descriptors' of 3 Cycles

www.uni-due.de/imperia/md/content/bologna/dublin_descriptors.pdf



The Tuning Project (www.unideusto.org/tuning)

Started in 2000 with 9 HE disciplines, defined Tuning process

Generic & Subject-Specific LO / competences for 3 Cycles

Ongoing EU support & new developments



Education and Culture DG



Tuning
Educational Structures
in Europe



Tuning for
'harmonisation'
not
standardisation
or enforced

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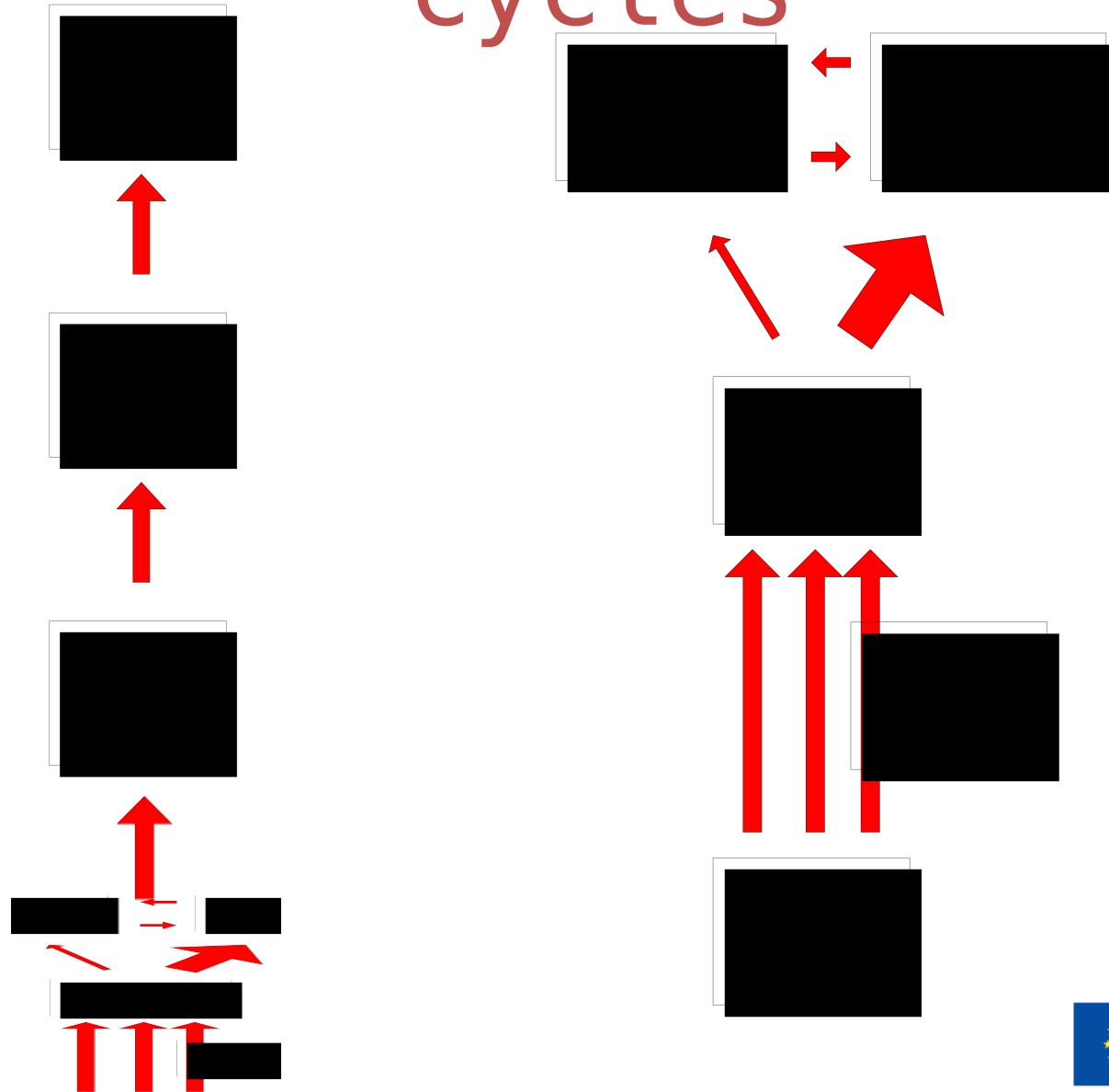
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MEDINE – identifying 3 cycles



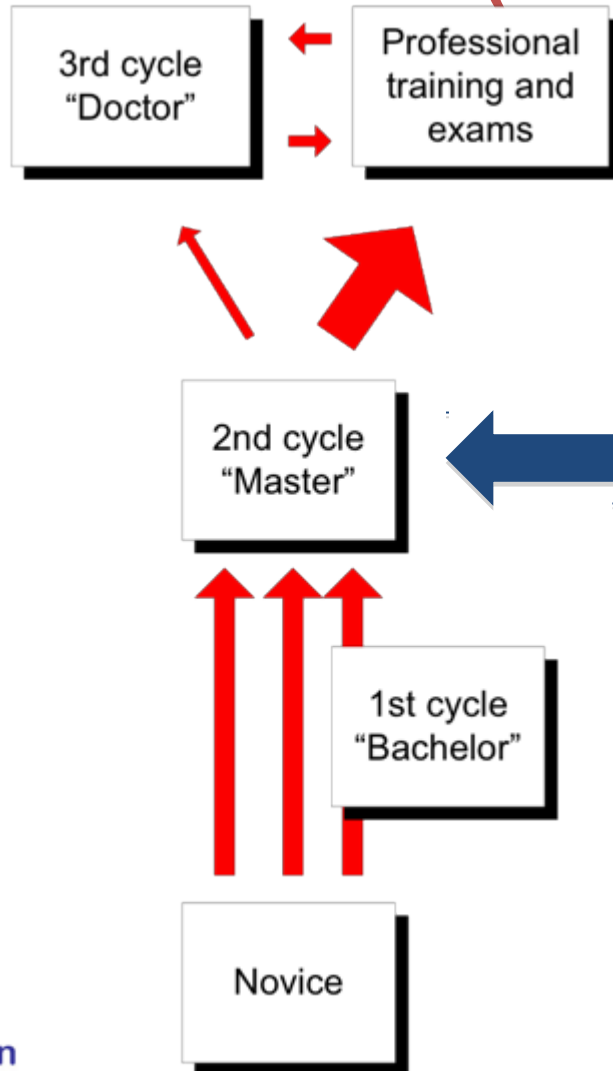
Definition of Learning Outcomes

Learning Outcomes are

“Statements – made by the academic staff – of what a learner is expected to know, understand and / or be able to demonstrate after completion of a process of learning”

González J, Wagenaar R (2008) Universities' contribution to the Bologna Process: an introduction, 2nd Edition. Bilbao, Universidad de Deusto

MEDINE - Tuning (Medicine)



MEDINE Network (2004-7)

L0 for primary medical degree

(Bachelor and 2nd Cycle)



Tuning 2nd Cycle



Review existing L0 frameworks

Draft set of L0 for Medicine 2nd Cycle

Level 1, Level 2 & Professionalism (\approx Generic) L0

SurveyMonkey in 3 languages

1,302 responses. All EU countries, except Luxemburg, Cyprus and Estonia

Quantitative and Qualitative analysis

Consensus Conference, Validation,



Booklet



THE UNIVERSITY of EDINBURGH



Learning Outcomes/
Competences for
Undergraduate Medical
Education in Europe



The Tuning Project (Medicine)

The Tuning Learning Outcomes/ competences for Primary Medical Degrees in Europe

LEVEL 1

Graduates in medicine will have the ability to:

- carry out a consultation with a patient
- assess clinical presentations, order investigations, make differential diagnoses, and negotiate a management plan
- provide immediate care of medical emergencies, including First Aid and resuscitation
- prescribe drugs
- carry out practical procedures
- communicate effectively in a medical context
- apply ethical and legal principles in medical practice
- assess psychological and social aspects of a patient's illness
- apply the principles, skills and knowledge of evidence-based medicine
- use information and information technology effectively in a medical context
- apply scientific principles, method and knowledge to medical practice and research
- promote health, engage with population health issues and work effectively in a health care system

LEVEL 2 (the relevant Level 1 outcomes are shown in bold parenthesis)

Graduates in medicine will have the ability to:

'Carry out a consultation with a patient'

- take a history
- carry out physical examination
- make clinical judgements and decisions
- provide explanation and advice
- provide reassurance and support
- assess the patient's mental state

'Assess clinical presentations, order investigations, make differential diagnoses, and negotiate a management plan'

- recognise and assess the severity of clinical presentations
- order appropriate investigations and interpret the results
- make differential diagnoses
- negotiate an appropriate management plan with patients and carers
- provide care of the dying and their families
- manage chronic illness

'Provide immediate care of medical emergencies, including First Aid and resuscitation'

- recognise and assess acute medical emergencies
- treat acute medical emergencies
- provide basic First Aid
- provide basic life support and cardio-pulmonary resuscitation according to current European guidelines
- provide advanced life support according to current European guidelines
- provide trauma care according to current European guidelines

'Prescribe drugs'

- prescribe clearly and accurately
- match appropriate drugs and other therapies to the clinical context
- review the appropriateness of drug and other therapies and evaluate potential benefits and risks
- treat pain and distress

'Carry out practical procedures'

- measure blood pressure
- venepuncture
- cannulation of veins
- administer IV therapy and use infusion devices
- subcutaneous and intramuscular injection
- administer oxygen
- move and handle patients
- suturing
- blood transfusion
- bladder catheterisation
- urinalysis
- electrocardiography
- basic respiratory function tests

'Communicate effectively in a medical context'

- communicate with patients
- communicate with colleagues
- communicate in breaking bad news
- communicate with relatives
- communicate with disabled people
- communicate in seeking informed consent
- communicate in writing (including medical records)
- communicate in dealing with aggression
- communicate by telephone
- communicate with those who require an interpreter

'Apply ethical and legal principles in medical practice'

- maintain confidentiality
- apply ethical principles and analysis to clinical care
- obtain and record informed consent
- certify death
- request autopsy
- apply national and European law to clinical care

'Assess psychological and social aspects of a patient's illness'

- assess psychological factors in presentations and impact of illness
- assess social factors in presentations and impact of illness
- detect stress in relation to illness
- detect alcohol and substance abuse, dependency

'Apply the principles, skills and knowledge of evidence-based medicine'

- apply evidence to practice
- define and carry out an appropriate literature search
- critically appraise published medical literature

'Use information and information technology effectively in a medical context'

- keep accurate and complete clinical records
- use computers
- access information sources
- store and retrieve information

'Ability to apply scientific principles, method and knowledge to medical practice and research'

- no specified level 2 outcomes

'Promote health, engage with population health issues and work effectively in a health care system'

- provide patient care which minimises the risk of harm to patients
- apply measures to prevent the spread of infection
- recognise own health needs and ensure own health does not interfere with professional responsibilities
- conform with professional regulation and certification to practise
- receive and provide professional appraisal
- make informed career choices
- engage in health promotion at individual and population levels

Outcomes for Medical Professionalism

Professional attributes

- probity, honesty, ethical commitment
- commitment to maintaining good practice, concern for quality
- critical and self-critical abilities, reflective practice
- empathy
- creativity
- initiative, will to succeed
- interpersonal skills

Professional working

- ability to recognise limits and ask for help
- capacity to deal with uncertainty and adapt to new situations
- ability to lead others
- ability to work autonomously when necessary
- ability to solve problems
- ability to make decisions
- ability to work in a multidisciplinary team
- ability to communicate with experts in other disciplines
- capacity for organisation and planning (including time management)

The doctor as expert

- capacity for analysis and synthesis
- capacity to learn (including lifelong self-directed learning)
- capacity for applying knowledge in practice
- ability to teach others
- research skills

The global doctor

- appreciation of diversity and multiculturality
- understanding of cultures and customs of other countries
- ability to work in an international context
- knowledge of a second language
- general knowledge outside medicine

MEDINE
The Thematic Network on Medical Education in Europe

WFME GLOBAL STANDARDS FOR QUALITY
IMPROVEMENT IN MEDICAL EDUCATION
EUROPEAN SPECIFICATIONS



Quality Assurance Task Force · WFME Office · University of Copenhagen · Denmark · 2007



WFME Global Standards: European Specifications

Global Standards
for Quality
Improvement
in UG, PG & CPD
Medical Education,
explicitly
tailored
to the European
context

Reflections on MEDINE



Defined Primary Medical Degree as 2nd Cycle

Gained consensus on L0 for 2nd Cycle...

... EXCEPT Level-2 L0 in research

Identified ++ diversity across Europe in research

European Specifications of WFME Global Standards



Additional References



Cumming AD, Ross MT (2008) The Tuning Project (medicine) – learning outcomes / competences for undergraduate medical education in Europe. The University of Edinburgh, Edinburgh. Online: www.tuning-medicine.com

Cumming AD, Ross MT (2007) The Tuning Project for medicine – learning outcomes for undergraduate medical education in Europe. *Medical Teacher* 29(7):636-641

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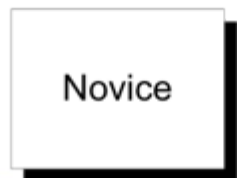
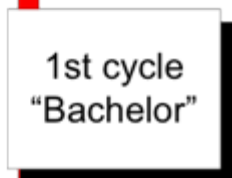
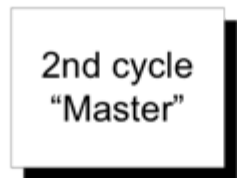
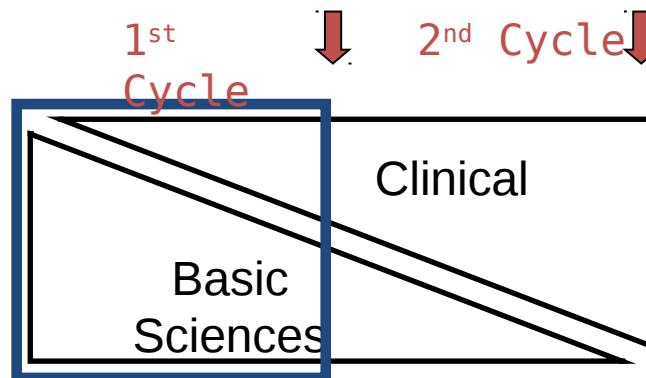
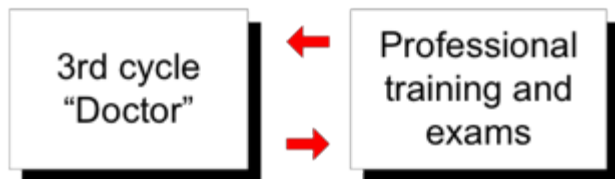
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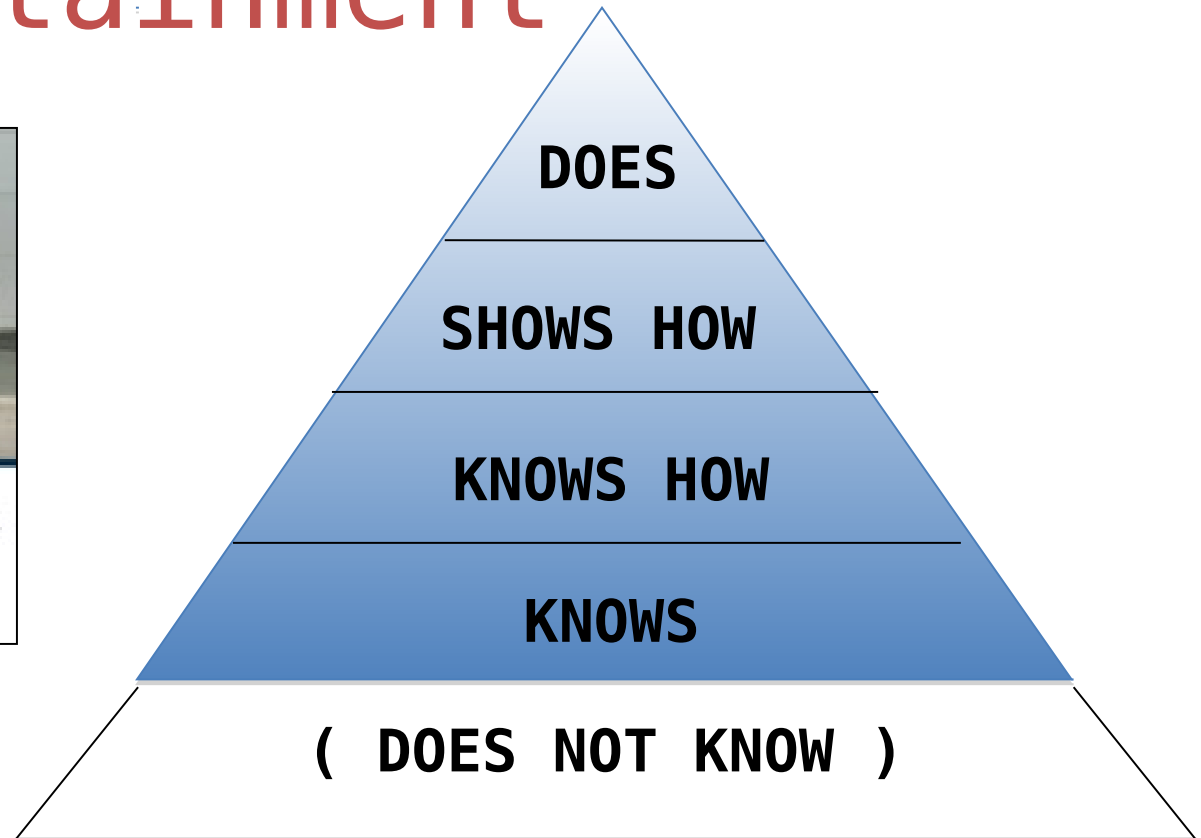
MEDINE2 – Bologna 1st Cycle



To what extent should 2nd Cycle L0 be achieved by the end of 3 years of university education in medicine (180 ECTS)?



L0 attainment



Miller (1990) The assessment of clinical skills /
performance. Acad Med (Suppl) 65:S63-67

MEDINE2: Bologna First Cycle

2. Level 1 Learning Outcomes / Competences

Please rate the following learning outcomes / competences on the extent to which you think they should have been achieved by a student who has successfully completed the first three years of university education in medicine.

Each can be rated as 'not learned' (students need not achieve this by the end of their third year); 'knows' (students will know about it and be able to demonstrate their understanding of the appropriate basic sciences); 'knows how' (students will be able to explain how and why they would do this); 'shows how' (students will be able to demonstrate their competence in this in a simulated situation); or 'does' (students will be able to demonstrate mastery of this in a real clinical situation).

1. The student who has successfully completed the first 3 years of university education in medicine will be able to:

	Not learned	Knows (about it)	Knows how (to do it)	Shows how (in simulation)	Does (in real practice)
Carry out a consultation with a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assess clinical presentations, order investigations, make differential diagnoses, and negotiate a management plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide immediate care of medical emergencies, including First Aid and resuscitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prescribe drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carry out practical procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

MEDINE2: Bologna First Cycle

6. MEDICAL PROFESSIONALISM

Please rate the following learning outcomes / competences relating to medical professionalism on the extent to which you think they should have been achieved by a student who has successfully completed the first three years of university education in medicine. Note these have been grouped under the headings of 'Professional attributes', 'Professional working', 'The doctor as expert' and 'The global doctor'.

Each can be rated as 'not learned' (students need not achieve this by the end of their third year); 'knows' (students will know about it and be aware of the issues); 'knows how' (students will be able to explain the underlying principles); 'shows how' (students will be able to demonstrate their competence in this in a simulated situation or artificial scenario); or 'does' (students will be able to do this consistently in real practice).

15. Please rate these learning outcomes / competences relating to medical professionalism under the heading "Professional attributes"

	Not learned	Knows (aware of issues)	Knows how (understands principles)	Shows how (in artificial scenarios)	Does (consistently in real practice)
Probity, honesty, ethical commitment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commitment to maintaining good practice, concern for quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critical and self-critical abilities, reflective practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empathy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Initiative, will to succeed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Summary Tuning 1st Cycle

Use existing L0 from 2nd Cycle

Likert scale of attainment based on Miller

SurveyMonkey in 3 languages

560 responses. All EU countries except Cyprus, Luxemburg and Bulgaria

Students (51%), Academics (38%),

Graduates (7%) Patients (2%) and

Employers (2%)

Statistical Analysis

Intra-class correlation coefficient...

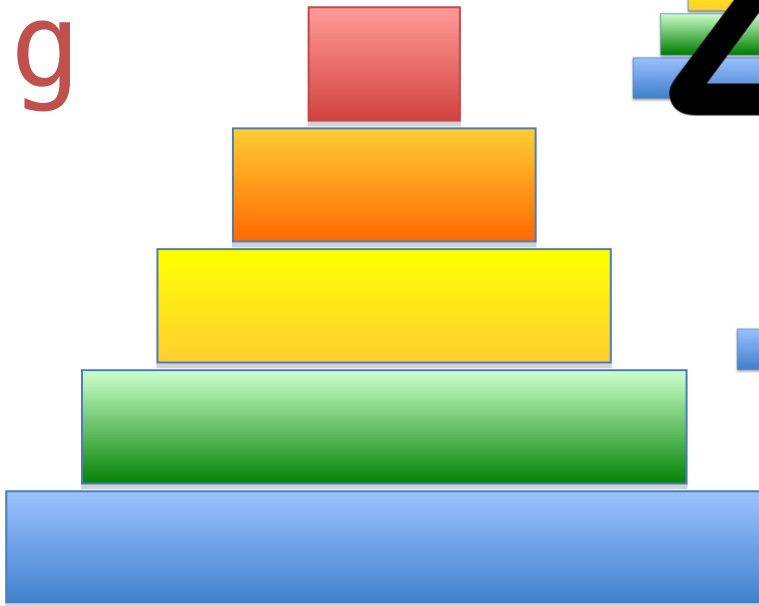
Acceptable consensus from

participants (slightly lower on average than 2nd Cycle)

Comparison of sub-group scores...

No subgroup has undue impact on results

Median
rating



Does

5



Shows How

4



Knows How

3



Knows

2



Not
Learned

1

L0 median rating summary



Does (7 x L2)



Shows How (3 x L1, 14 x L2, 17 x P)



Knows How (7 x L1, 36 x L2, 9 x P)



Knows (2 x L1, 12 x L2)



Not Learned (none)

L1 = Level 1 L0
L2 = Level 2 L0
P = Professionalis

1. Carry out a consultation with a patient	3.38	 3
2. Assess clinical presentations, order investigations, make differential diagnoses, and negotiate a management plan	2.62	 2
3. Provide immediate care of medical emergencies, including First Aid and resuscitation	3.50	 4
4. Prescribe drugs	2.18	 2
5. Carry out practical procedures	3.01	 3
6. Communicate effectively in a medical context	3.68	 4
7. Apply ethical and legal principles in medical practice	3.14	 3
8. Assess psychological and social aspects of a patient's illness	3.23	 3
9. Apply the principles, skills and knowledge of evidence-based medicine	3.18	 3
10. Use information and information technology effectively in a medical context	3.60	 4
11. Apply scientific principles, method and knowledge to medical practice and research	3.30	 3
12. Promote health, engage with population health issues and work effectively in a health care system	3.17	 3

Level 1 L0

7 x L2 median 5 (Does)

Communicate with patients

Communicate with
colleagues

Maintain confidentiality

Measure blood pressure

Use computers

Access information sources

Store and retrieve
information



Conclusions

It is possible to gain broad consensus on broad (L1) L0 for the Bachelor of Medicine

Still range of opinions on detailed (L2, P) L0, but now common framework & terminology

Broad consensus all 2nd Cycle L0 should be achieved to some extent by end of 1st Cycle

Potential impact

It is possible to gain broad consensus on broad (L1) L0 for the Bachelor of Medicine. Still range of principles detailed (L2, P) L0, but now common framework & terminology

HARMONISATION
Sharing practice
& Mobility

integration

Patient safety & employability

Broad consensus all 2nd Cycle L0 should be achieved to some extent by end of 1st Cycle

Tuning Research Competences

Review existing LO / competences in
Research

Draft framework of LO for 3rd (Doctorate)
Cycle

Generic, Using & Doing research
competences

Survey how important for each to be
achieved by the end of 1st, 2nd and 3rd
Bologna Cycle

MEDINE2 - Tuning of Research Competencies in Europe

Again, please focus on which outcomes you think should be achieved by graduates at the END of each of the 3 cycles of study.

SINCE IT IS EXPECTED THAT GRADUATES WILL ACCUMULATE COMPETENCES PROGRESSIVELY AS THEY MOVE THROUGH THE CYCLES OF STUDY, IT IS LOGICAL THAT FOR EACH OF THE OUTCOMES, THE RATING FOR SECOND CYCLE SHOULD BE EQUAL TO, OR GREATER THAN, THAT FOR FIRST CYCLE - NOT LESS.

SIMILARLY, FOR EACH OUTCOME, THE RESPONSE FOR THIRD CYCLE SHOULD BE EQUAL TO OR GREATER THAN THAT FOR SECOND CYCLE.

1. Ability to formulate a research question as a hypothesis and design experiments to test it

	Not important	Important	Very important	Essential
First Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Third Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Ability to define and carry out an appropriate literature search

	Not important	Important	Very important	Essential
First Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Third Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Ability to keep track of the pertinent scientific literature

	Not important	Important	Very important	Essential
First Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tuning Research Competences

Item I.D.	Rank	Graduates will have the ability to ...	Generic	Using	Doing	% Rated 'not important' by ...		
						End of 1st cycle	End of 2nd cycle	End of 3rd cycle
C31	1	Use computers effectively	X			1.9	0.8	0.5
C2	2	Define and carry out an appropriate literature search		X		8.4	1.0	0.5
C16	3	Synthesize findings and draw conclusions	X			21.1	3.1	0.8
C9	4	Recognize, discuss and prevent scientific misconduct	X			21.1	3.3	0.5
C11	5	Maintain confidentiality and protect data	X			11.8	3.3	0.5
C30	6	Write and speak in English	X			10.3	3.5	1.1
C4	7	Critically appraise published medical literature including observational, interventional, and meta analysis using established critical appraisal guidelines		X		34.2	4.2	0.3
C14	8	Analyze research findings (qualitative or quantitative data)			X	23.6	4.4	1.0
C8	9	Apply ethical principles and analysis to research, seeking ethical approval where appropriate			X	21.8	4.6	1.3
C3	10	Keep track of the pertinent scientific literature		X		33.1	4.8	0.8
C15	11	Select and carry out appropriate statistical tests and interpret the results			X	31.0	5.9	2.1
C1	12	Formulate a research question as a hypothesis and design experiments to test it			X	37.7	6.6	0.8
C21	13	Present research results obtained by others, e.g. in a journal club		X		28.9	6.9	0.8
C19	14	Present research results to peers, e.g. in scientific meetings			X	36.6	8.1	1.0
C26	15	Contribute effectively to a research team			X	35.2	8.6	1.3
C10	16	Obtain and record informed consent for participation in research	X			31.9	8.7	1.0
C7	17	Choose the appropriate qualitative or quantitative research method			X	47.4	9.9	1.2

Tuning Research Competences (cont)

Item I.D.	Rank	Graduates will have the ability to ...	Generic	Using	Doing	% Rated 'not important' by ...		
						End of 1st cycle	End of 2nd cycle	End of 3rd cycle
C28	18	Communicate scientific findings to lay people	X			37.1	12.2	2.4
C13	19	Carry out research on medical practice			X	52.3	12.2	2.3
C18	20	Disseminate research findings		X		50.8	15.6	2.6
C17	21	Propose and carry out the next step in a research project			X	56.2	15.7	1.8
C12	22	Apply national and European law to research			X	41.5	16.1	3.1
C20	23	Write a scientific paper suitable for publication			X	59.7	17.8	1.8
C6	24	Carry out laboratory procedures			X	40.5	19.9	9.7
C5	25	Design a research project, including project planning and allocation of resources			X	63.6	22.4	2.7
C22	26	Contribute to research-funding proposals			X	68.7	26.5	3.5
C29	27	Critically evaluate research proposals		X		67.3	31.5	3.8
C23	28	Write research-funding proposals			X	77.9	36.5	4.0
C25	29	Supervise laboratory technicians			X	83.8	48.7	11.9
C24	30	Supervise research students			X	87.4	54.7	6.6
C27	31	Lead a research team			X	86.0	59.4	14.0

Tuning Process (WP3)

Aimed to take Tuning L0 off the shelf and put them into practice for real in European curricula

Developed self-assessment questionnaire aimed at Deans of medical schools

Piloted and refined questionnaire

Collected examples of how each of the Tuning L0 can be taught, learned and assessed

Tuning guide including background, definitions, detail on 10 questions (above), and examples

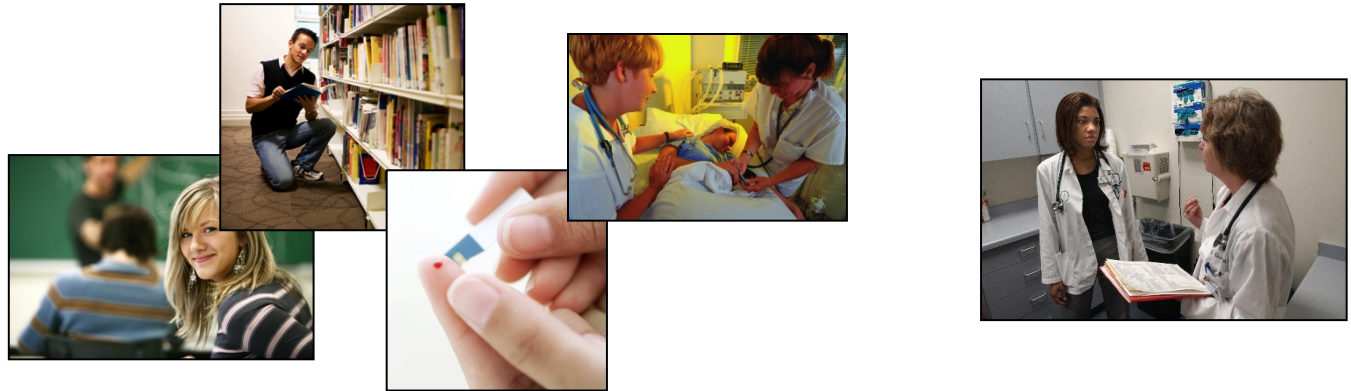
Tuning's 10 steps for programme design and development

Lockhoff J, Wegewijs B, Durkin K, Wagenaar R, González J, Isaacs AK, dalle Rose LFD, Gobbi M (2010) A Tuning guide to formulating degree programme profiles. Nuffic, The Hague; Universities of Deusto, Bilbao & Groningen

Cameron HS, Ross MT, Cumming AD (2013) A Tuning guide to designing and delivering an outcomes-based undergraduate medical curriculum.

Edinburgh, The University of Edinburgh

Constructive alignment



**Define
LO**

**Student-centred
Teaching & Learning**

**Appropriate
assessment**

Evaluation

Biggs J (1996) Enhancing teaching through constructive alignment. HE 32:347

Courses and Credits

Sub-divide programme into manageable courses or equal credit-bearing 'modules'

Allocate ECTS credits to each course



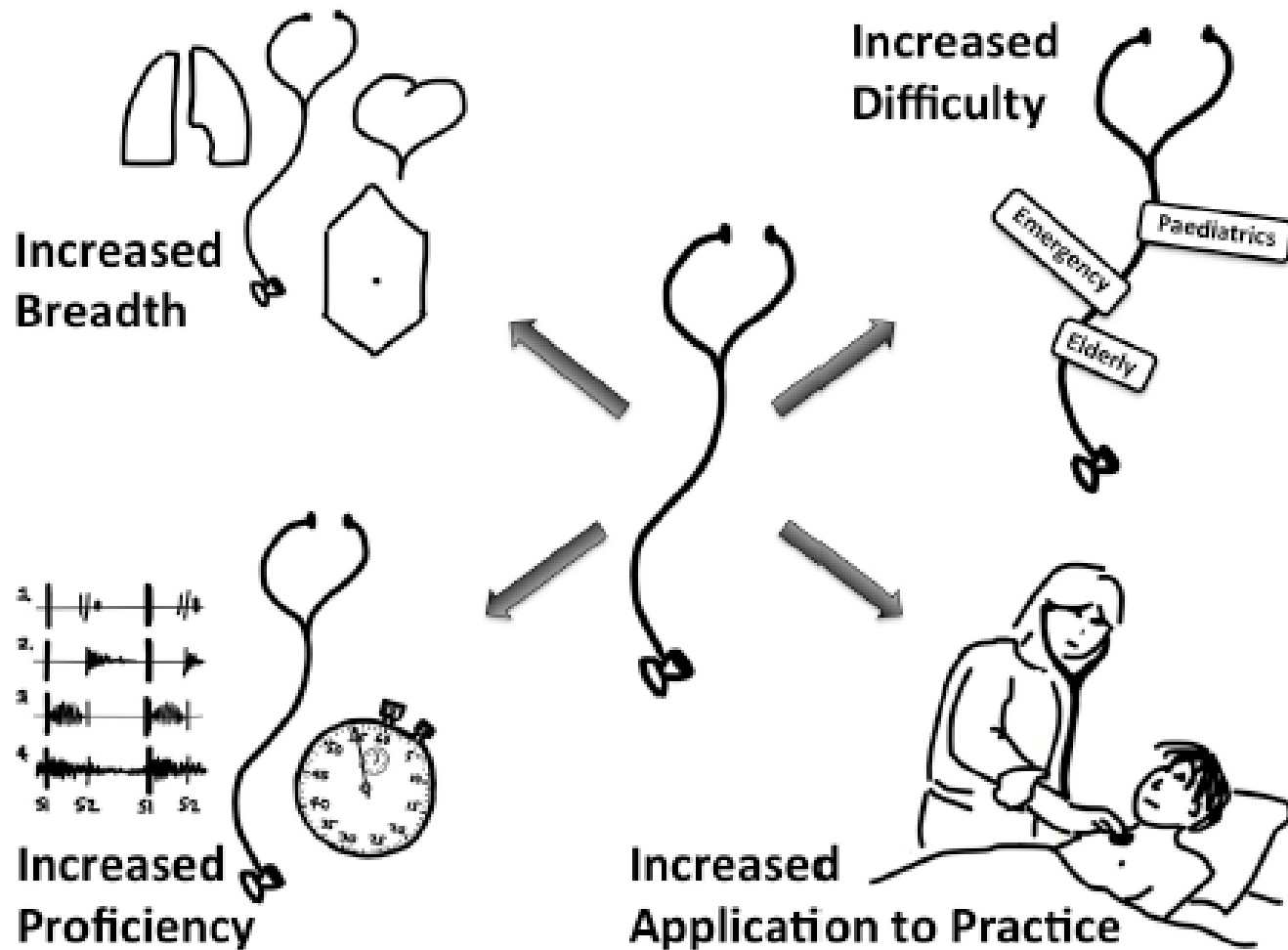
25-30 hours student work = 1 ECTS

1 year full-time = 60 ECTS

BSc = 180-240 ECTS, MSc = additional 90-120 ECTS

Primary medical degree = 5,500 hours or 6 years

LO Progression



Ross and Cameron

Adapted from: Harden, R.M., 2007 *Learning outcomes as a tool to assess progression*. *Medical Teacher* 29:678-682



Additional References

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Related projects & future directions

EUROPET Thematic Network (Paediatrics)

Med-MOTION Project (European mobility)

Core competencies in teaching and training for doctors in Scotland

International Society for Thrombosis and Haemostasis Core Curriculum

Thank you!

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