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Recommendations on the
**development of medical
education in Germany**
based on a review of
model medical degree
programmes

– Executive Summary –

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Preliminary remarks

In January 2012, the German Council of Science and Humanities (Wissenschaftsrat) added the topic “Status and Perspectives of Model Medical Degree Programmes” to its agenda, to analyse the existing model degree programmes and clarify which reform elements have tested successfully and identify resulting conclusions for the development of medical degree programmes. As such, it builds on the recommendations passed in July 2012 for higher education qualifications for the healthcare system. |¹

The working group commissioned by the Council started its work July 2012. It was based on written surveys and consultations of medical faculties and student bodies with model degree programmes, as well as (reformed) regular degree programmes. Moreover, meetings were held with associations, societies, student representatives and other experts from Germany and other countries. Some societies also sent reports which were incorporated in the consultation process. The review focused on the model medical degree programmes established in Aachen, Berlin, Bochum, Hanover, Cologne, Mannheim and Witten/Herdecke before the consultation process started. Information on the model degree programmes set up in the 2012/2013 winter semester or later in Hamburg, Oldenburg and Düsseldorf was included based on the respective course regulations.

The model medical degree programmes were reviewed as a cross-sectional analysis. The Council did not evaluate the model degree programmes by analysing the locations individually. Accordingly, it is not tantamount to a supplementary and conclusive evaluation of the respective model degree programmes as required per Section 41, Para. 2 Clause 1 No. 4 of the Licensing Regulations for Medical Doctors, and does not replace such an evaluation.

The Council’s recommendations on the future design of medical degree programmes in Germany are not based solely on analyses of the model and re-

|¹ Wissenschaftsrat: Recommendations on higher education qualifications for the healthcare system - Executive Summary, Cologne 2012.

formed regular degree programmes. In addition to this, the Council's experience from its analyses of medical faculties in recent years and current national and international discussions, international standards and experience in other countries were incorporated.

The Council thanks the surveyed medical faculties and student bodies as well as all respondents for their participation in the development of the present recommendations. Participants in this working group also primarily include experts who are not members of the Council. The Council owes them a particular debt of thanks.

The Council adopted these recommendations on 11 July 2014.

Summary

Based on analyses of curriculum reforms in education of medical personnel, the present recommendations deal with how academic education of physicians should be structured and designed in future to meet the growing requirements of the medical profession in an increasingly complex healthcare situation. The healthcare sector and thus the healthcare system faces great challenges due to demographic change, epidemiological changes and medical advances, which medical training must take into consideration.

Development of medical degree programmes

Against the background of these challenges, the Council considers the following principles key for the development of medical degree programmes.

Focus on competencies: In future, education of doctors will still require a solid foundation of fundamental medical, psychosocial and scientific knowledge. The traditional subject focus should be replaced with education focused on medical roles and competencies. The subjects remain responsible for the adequate scope and integration of course contents. Overall, medical degree programmes must teach knowledge, specific skills and capabilities as well as ethical standards.

Integrated, patient-focused curricula: The course content is primarily to be taught in interdisciplinary, organ and topic-based modules. Pre-clinical and clinical content must be integrated bidirectionally. This highlights the importance and application of fundamental theory for medical practice from the start of the degree programme. Of course, a comprehensive practical focus includes early patient contact, as well as psychosocial and communicative skills.

Scientific competencies: Doctors must be in a position to evaluate the evidence basis for their own actions in increasingly complex healthcare situations, and against the background of new medical findings, to reach a decision specific to the individual patient. Scientific thinking and action therefore form the basis for appropriate patient-oriented selection of diagnostic and therapeutic measures. Therefore, obligatory development of scientific competencies in a degree programme is essential for a responsible professional work as a medical doctor.

Interprofessional education: In future, healthcare processes will increasingly be organised in multiprofessional teams, and thus based on division of labour. This makes cooperation with paramedical professions, and, as a result, interprofessional education more important, as well as development of corresponding skills.

Concentration of course content: The interdisciplinary design of the curricula is an approach to incorporating the constant increase in knowledge, including new methods and technologies. In addition to this, the mandatory parts of the degree course must be concentrated on a core curriculum, reducing the examination content in medical examinations, which require agreement on an underlying, unified catalogue of learning objectives. In addition to this, the option of selecting individual areas of specialisation must be provided more consistently than before, making the students more responsible for their own progress in their degree programme.

On this basis, the Council submitted a series of specific recommendations for the future structure and design of medical degree programmes:

- _ For reasons of quality assurance and comparability, as well as to promote mobility, a **standardised national M1 examination** should be held after the 6th semester. It must be supplemented by a structured practical clinical examination to evaluate practical skills. They can be held by the faculties.
- _ Overall, the state examinations must be adapted to the requirements of competency-based, integrated curricula. The practical oral parts of the medical examinations absolutely must be **more standardised**.
- _ In future, the practical year should be broken down into four training periods of 12 weeks (**quarterly structure**) to increase the students' freedom of choice. In addition to periods spent in internal medicine and surgery, which will remain compulsory, the other two quarters can be chosen freely from all medical specialisations. An individual specialisation for two quarters is to be permitted for one subject only (elective or compulsory subject).

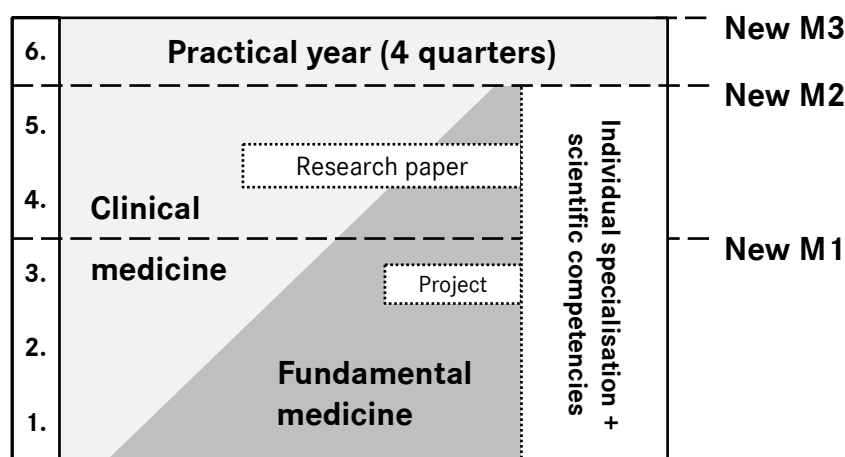
A key element of the future medical degree programmes is **enhancing the scientific competencies** of the doctors in spe, to allow them to make evidence-based decisions based on the state of the art in medical science, including a comprehensive understanding of health and illness, as part of their increasingly complex job:

- _ The curricula should include corresponding specific classes to enhance the scientific competencies. These classes must last multiple semesters, which build on one another (longitudinal strand).
- _ After the M1 examination, the completion of an obligatory research paper chosen from the entire field of medical subjects over a period of at least

twelve weeks is recommended. In order to practice the fundamentals required for scientific work, a four-week project is to be completed before the M1 examination. The fundamental subjects should play an important part in this.

Figure 1 shows the model proposed by the Council for the future structure of medical degree programmes.

Figure 1: Structure model for future medical degree programmes



M1/M2/M3: First/second/third section of the medical examination.

Source: German Council of Science and Humanities (Wissenschaftsrat)

The implementation of the proposed structure model for medical degree programmes must be fundamentally neutral in its curricular work load (*Curricularnormwert*). In concentrating the education on a core curriculum, **primary medical care** must be prioritised appropriately. Accordingly, **general medicine** must be incorporated adequately when revising the course and examination content. The Council believes students must be allowed to study specific problems of primary medical care at the faculties in other classes, in addition to a nationwide institutionalisation of general medicine at the faculties. This also includes integration of medical university out-patient care, which must be better structured for a stronger integration of teaching.

The Council believes further research is needed into the questions of how teaching and examinations can be made to fit better, which effects specific teaching formats have in given contexts, and into the validity, reliability and objectivity of more practical, skill-oriented test formats. As a result, it recommends that universities and the *Länder* strengthen medical education research in Germany and network it systematically.

Overall, the use of teaching as a tool to strengthen universities' profiles must be increased. In this context, the medical faculties should also use the existing tools to focus the selection of students more on its own teaching and scientific profile.

The proposed development of medical degree programmes with their new medical examinations and promotion of scientific competencies should be evaluated as it progresses. The Council recommends that the German National Government and *Länder* Governments set up a group of experts to determine the prerequisites required for an evaluation and suitable uniform criteria and draw up an implementation proposal.

Besides a corresponding amendment of the Licensing Regulations for Medical Doctors, the Council proposes that capacity legislation be developed in accordance with the requirements of modern medical education. The development of both the Licensing Regulations for Medical Doctors and capacity legislation must be coordinated with one another due to the numerous interdependences. The Council sees a need for changes, which the *Länder* Governments and National Government should tackle in the short term.

Superordinate consideration of the model degree programmes

With these recommendations, the Council is reviewing the model medical degree programmes for the first time. Roughly 25% of all new students in Germany now start their medical degrees in one of the nine current model degree programmes. On the introduction of the model clause in the Licensing Regulations for Medical Doctors in 1999, it did not govern the transition of successfully tested innovative elements and structures of medical education into changes to the regular degree programmes. The current recommendations of the Council are an important step in this transition process. As quantifiable evaluation criteria and assessment methods for a comparative evaluation of the medical education have not been sufficiently established, either nationally or internationally, the Council's comprehensive evaluation of the model degree programmes is based on a series of criteria for structural and process quality, most of which are also part of the European specifications of international standards for medical education.

The model degree programmes, as well as the reformed regular degree programmes, implement the transition to a competency-based education with the fundamental teaching of knowledge, skills and attitudes in higher education courses. The Council welcomes this transition from an education focused on the course content in individual subjects to one based on the doctors' roles and their required competencies, which is manifested nationally in the development of the National Competency-Based Learning Objectives Catalogue in Medicine (NKLM).

Most model degree programmes are characterised by horizontal and vertical integration of course content and, accordingly, the organ and topic-based modularisation of the curriculum. Besides the horizontal, the Council welcomes the implementation of a largely vertical integration of pre-clinical and clinical

course content. However, the associated decision not to participate in the first section of the medical examination (M1 examination) is also a disadvantage. The comparability with the other degree programmes is reduced, and a benchmark available for all faculties is lost. It also makes student mobility more difficult.

The model degree programmes use various new teaching and examination formats. However, there is a fundamental need for further coordination and research into the systematic description of the implementation of teaching and examination formats and the controlled evaluation of their effects for the objectively measured student learning outcomes. The Council appreciates the early patient contact in all model degree programmes. The fact that all model degree programmes considered allow the students to choose individual specialisations in their degree programmes is also welcomed.

In particular, more recent model degree programmes now emphasise the independent research skills, for example through compulsory projects and research papers, as well as practical evidence-based medical work. In an international context, the acquisition of scientific competencies is considered increasingly important in medical degree programmes.

With the exception of a deep vertical integration, the reformed regular degree programmes have implemented many of the criteria investigated. The transitions are smooth. Classically-organised regular degree programmes have also implemented various reform elements, or aim to do so. The Council recognises the particular commitment of the medical faculties in the development of medical degree programmes and welcomes the increasing status of teaching which this expresses.

Overall, the model degree programmes, with their integrated curricula and flexibility and willingness to facilitate required adaptations, make a major contribution to developing medical education in Germany. The introduction of the model clause has initiated a continuous change process. It inspired creativity and a willingness to make changes in the faculties – including reforming regular degree programmes – and combined the pre-clinical and clinical programme phase in the model degree programmes in accordance with the intention of the legislator. Accordingly, it can be deemed a success in terms of the expectations made of it.

Appendix

Medical education in Germany

MEDICAL DEGREE PROGRAMMES TODAY

The structure and content of the degree programmes and the examinations to be completed by medical students are defined for Germany as a whole in the **Licensing Regulations for Medical Doctors** (ÄApprO). According to Section 1 Para. 1 of ÄApprO, medical education is intended to produce doctors educated scientifically and practically in medicine who are capable of working in the medical profession independently and under their own responsibility, participating in continuing professional development and advancing their education at all times.

Per the valid ÄApprO, the **regular medical degree programmes** comprise (1) a six year university programme, whereby the last year is a full, consecutive year-long period of practical training (practical year) of forty-eight weeks, (2) first aid training, (3) three months of nursing work, (4) clinical traineeship of four months and (5) a medical examination to be completed in three sections. The first section of the medical examination, consisting of a standardised national written part, as well as a practical oral part, is completed after two years of studying medicine (M1 examination). This pre-clinical section of the programme primarily focuses on teaching the scientific and theoretical fundamentals of medicine. The subsequent three-year clinical section mainly teaches practical and theoretical clinical medicine, and concludes with the second section of the medical examination, which comprises a standardised national written examination (M2 examination). After the practical year, which consists of three 16 week sections (internal medicine, surgery, elective), the degree programme is completed with the third section of the medical examination, which is a practical oral examination (M3 examination). Figure 2 shows the structure of the current regular medical degree programmes.

Figure 2: Structure of current regular medical degree programmes

6.	Practical year (3 terms)	M3
5.	Clinic	M2
4.		
3.		
2.	Pre-clinic	M1
1.		

M1/M2/M3: First/second/third section of the medical examination.

Source: German Council of Science and Humanities (Wissenschaftsrat)

In order to trial innovative degree programme designs, a model clause was included in ÄApprO in February 1999 (Section 41). It allows the competent body under state law to set up **model medical degree programmes** which can deviate from the defined regular education in prescribed areas. The model clause is intended to create the basis for future improvements of the regular degree programme. The particular aim of the legislator was to improve the distribution and integration of the practical programme contents over the entire course period, and thus to integrate the pre-clinical and clinical phases better. As a result, most model degree programmes avail of the option to omit the first section of the medical examination (M1). The practical year can also be implemented in a deviating form to regular degree programmes.

PROGRAMMES AND PLACES

According to the preliminary report of the German Federal Statistical Office, there were a total of 86,026 medicine students at the 37 medical faculties in Germany in the 2013 academic year (2013 summer semester and 2013/2014 winter semester). That is equivalent to almost 3.3% of all 2,613,168 students. There were a total of 10,827 places for new students of medicine in the 2013 academic year, including 2,682 at the nine current locations with model degree programmes (Aachen, Berlin, Düsseldorf, Hamburg, Hanover, Cologne, Mannheim, Oldenburg, Witten/Herdecke). |² Thus, since the 2013/2014 winter semester, roughly 25% of all new medicine students in Germany start studying medicine in one of the nine model degree programmes.

|² Number of places for new students according to the *Stiftung für Hochschulzulassung* (University Admissions Foundation), plus places at Witten/Herdecke University.

The Wissenschaftsrat

The German Council of Science and Humanities (Wissenschaftsrat) is one of the leading science policy advisory bodies in Germany. It advises the Federal Government and the governments of the *Länder* (Federal States). It produces recommendations on the development of science, research and higher education, thus helping to ensure that German science and humanities remain competitive at national, European and international levels. The recommendations of the Council incorporate quantitative and financial effects and the implementation of such measures, taking into account the requirements of societal, cultural and economic life at all times.

The Council issues recommendations and prepares reports primarily relevant to two fields of science policy:

- _ Scientific institutions (universities, universities of applied sciences and non-university research institutions), especially their structure and performance, development and financing,
- _ General issues regarding the system of science and higher education, selected structural aspects of research and teaching, and the strategic planning, appraisal and governance of specific fields and disciplines.

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