



Medicine as a science

Medicine is based on scientific principles and for clinical research it requires competent academic specialists and adequate professional structures.

Position paper of the Swiss Academy of Medical Sciences (SAMS)

Contents

1. Baseline situation	3
1.1. The success of medicine is based on its scientific principles	3
1.2. Is academic medicine in a state of crisis?	4
1.3. Favourable conditions for the strengthening of scientific medicine	4
a) The Swiss population and the politicians are in favour of research	4
b) The new curriculum for medical studies allows new profiles	5
c) The SWTR (Swiss Board of Science and Technology) -report on the demography of the medical profession which appeared in 2007 calls for reform in the field of professional medical training [11]	5
d) The number of senior professional positions, especially in our university hospitals, is high	5
e) The Swiss National Foundation (SNF) supports clinical research	5
2.1 Scientifically-based university training for all medical doctors	6
a) "Physician Track" and "Dr. med." – the direct route to clinical practice	6
b) The " Medical Sciences Track" – a route for those interested in research	7
c) MD-PhD training - a recommendable route to academic medicine	8
a) Further training / Specialisation	9
b) Compatibility between work and family	10
2.3 More efficient research platforms and clear management structures in the university hospitals	11
a) Creation of stronger research structures	11
b) Establishing of "dual leadership", with the introduction of research professorships, i.e. competent departmental management, separated from the general staff and with clearly defined responsibility, for clinical practice/services on the one hand and research on the other	12
c) Strengthening of coordination and responsibility in management	13
3. Outlook	14
4. Literature	15

Executive Summary

The major advances in medicine over the past 100 years came about as the result of new scientific knowledge. However, there is today a widespread ambivalent attitude towards scientific medicine – both within the various medical disciplines and among the general public. Research, as a full-time or part-time activity or as a career option, has become unattractive and unpopular with the majority of medical doctors. A certain mistrust of an all too technologically based medicine has led to the justified desire for a more “human“ form of medicine which is oriented towards an “integral approach“. This is however also associated with the potential risk that medical doctors would lose their traditional closeness to the basic principles of science, i.e. they would not apply the results of the research in their practical clinical work, in the sense of evidence-based medicine.

Medical doctors must be in the position to follow up the advances in research and to realistically appraise them with regard to their potential significance for medicine. Also, clinicians who are primarily involved in the treatment of patients “at the bedside“ must understand the language of the different sciences and must contribute, as practically and as efficiently as possible, to the flow of information “from the bench to the bedside and back again“.

This position paper describes the possible reasons for the calling into question of present-day medicine. At the same time it provides concrete models and proposals for a reorientation. In this connection it is based on existing and recently introduced elements, which already go in the necessary direction; these include, for example, the MD-PhD programme and the possible options provided with the Swiss Bologna model.

The position paper envisages the need for action in three specific areas:

1. The basic scientific principles that are involved in medical training and further training must be strengthened.
2. The next scientific-academic generation must be increasingly motivated and promoted, namely through the corresponding obligations and options contained in the Bologna study for “Master in Medicine“, the new “Medical Sciences Track“, through the MD-PhD programme and through the creation of new research-oriented posts, e.g. professorships promoted by the Swiss National Foundation (SNF). The setting-up of flexible and family-friendly scientific management functions in the university hospitals opens up longer-term career options, as a continuation of the existing programmes for promotion of the next scientific-academic generation.
3. The structures within clinical research must be improved with regard to both their organisation and the personnel involved, and the management of the university hospitals and the large cantonal hospitals must be adapted in order to ensure better distribution of work between clinical practice/service on the one hand and research on the other.

With this document the SAMS wishes to encourage discussion, which in its view is necessary, of the subject “Medicine as a Science“. The various recommendations are not likely to be implemented in the short term, but on the other hand it would seem to be realistic and desirable that clear changes, in the sense of the visions outlined, will become evident within five years.

1. Baseline situation

1.1. The success of medicine is based on its scientific principles

The major advances in medicine over the past 100 years came about as the result of new scientific knowledge: thanks to basic scientific research it became possible to treat diseases such as cancer, diabetes or schizophrenia directly; epidemiological research has contributed towards the recognition of risk factors and the development of prevention strategies; and the importance of patient compliance and adherence for effective therapy was revealed on the basis of social-scientific research. Against this background, the report “Aims and tasks of medicine at the beginning of the 21st century“, which was published by the SAMS in 2004, also puts forward the following requirement: “Both the scientific-biological knowledge and the knowledge obtained in the psychosocial and humanistic fields will be appropriately applied, fostered and extended in teaching, in research and in patient care.“ [1]

Research, particularly in the natural sciences, remains an important pacemaker for advances in the field of medicine. In recent years, on the one hand genetics and epigenetics have opened the doors for the development of an individualistic medicine, while on the other the correlations between congenital and acquired pathological factors and environmental influences have been demonstrated. With the genetic reprogramming of differentiated skin cells and the stimulation of organ-specific endogenous stem-cell pools, stem-cell research has taken on new dimensions. With a degree of accuracy which until recently was unthinkable, modern graphic procedures are able to identify areas of cerebral activation and functional neuronal networks in the most varied emotional disorders and mental diseases, but also in somatic disorders. A closer networking of various different disciplines (e.g. biology, chemistry, mathematics, informatics, engineering sciences) in systemic biology allows a better understanding of complex life processes. Social-scientific research, especially behavioural research, has made possible important insights into early-childhood development and the disorders associated with this, as well as the detection of relevant problems in the elderly, and has thus also contributed towards better patient-care and quality of life. And already on the horizon there is the so-called clinical nanomedicine, which promises completely new possibilities in diagnostic and therapeutic medical technology.

Medical doctors must be in the position to follow up the advances in research and to realistically appraise them with regard to their potential significance for medicine. Also, clinicians who are primarily involved in the treatment of patients at the bedside must understand the language of the different sciences and must contribute, as practically and as efficiently as possible, to the flow of information “from the bench to the bedside and back again“¹.

¹ The so-called translational research lists as many research results as possible, from basic research, through the corresponding animal models, to their therapeutic application, whereby questions and concepts frequently arise which are then in turn processed in the relevant fields of research.

1.2. Is academic medicine in a state of crisis?

There is however no lack of criticism: in fact, there is today a widespread ambivalent attitude towards scientific medicine – both within the various medical disciplines and among the general public. Research, as a full-time or part-time activity or as a career option, has become unattractive and unpopular with the majority of medical doctors. A certain mistrust of an all too technologically based medicine has led to the justified desire for a more “human“ form of medicine, which is oriented towards an “integral approach“. This is however also associated with the potential risk that medical doctors would lose their traditional closeness to the basic principles of science, i.e. they would not apply the results of the research for their practical clinical work, in the sense of evidence-based medicine [2].

Science-based “academic“ medicine is today frequently put into question, both in Switzerland and elsewhere. Various prominent medical organisations are in agreement with regard to this diagnosis. The reasons for the state of crisis are various complex deficits [2-6] such as, for example:

- lack of interest in research on the part of medical doctors,
- too great a gap between “academic“ (i.e. university-based) and practical medicine,
- the impossibility that one individual medical doctor is equally competent in the fields of medical practice, teaching and research,
- lack of recognition, cooperation and trust between different researcher profiles (basic principles, clinical practice, public health, social sciences, general-practice medicine etc.),
- neglect of urgent health problems in research,
- lack of capacity for translational research, which provides the patient with fundamental innovations,
- priority of medical service (including basic health care) over teaching and research in the university hospitals, and
- great differences in salary, between research and health-care activities.

1.3. Favourable conditions for the strengthening of scientific medicine

Besides the above-mentioned widespread ambivalent attitude towards “scientific“ medicine, there is however a large number of arguments, which speak for the fact that today favourable conditions exist for “more science in medicine“, as follow:

a) The Swiss population and the politicians are in favour of research

In 5 of the 6 national referenda of recent years on questions, which were directly related to research activities, the people clearly voted in favour of these activities; there was rejection only with regard to the question of genetically engineered plants. This positive attitude towards science and research in medicine is confirmed in various polls and inquiries: primarily it is competent action, based on scientific knowledge, that is expected of the medical doctor [7, 8]. As in other countries, the demand on the part of the general public for always better therapeutic possibilities is perceptible [9].

The Swiss Federal Parliament has clearly increased the credits in favour of the universities, for training and research over the next few years. These increased investments are intended

to ensure and increase the quality of these activities, and thus to emphasise the attractiveness and the competitiveness of Switzerland as a centre of science.

b) The new curriculum for medical studies allows new profiles

The innovative Bologna model introduced by the Swiss Faculties of Medicine provides new possibilities, firstly for placing the accent on the scientific aspects of medicine and secondly for early sensitisation for research [10]. Options, e.g. basic principles of scientific working procedures, can promote the motivation for various academically oriented professions and university careers.

c) The SWTR (Swiss Board of Science and Technology) -report on the demography of the medical profession which appeared in 2007 calls for reform in the field of professional medical training [11]

This reform should and can be used in order to increase the involvement of the sciences in professional further training: firstly through more detailed orientation of medical doctors who will later be active in the hospital or in general medical practice, including a more academically oriented curriculum for the former, and secondly for the recognition of prolonged research activity for the further training of specialist physicians – in both the biomedical and the humanistic fields that are relevant for medicine.

d) The number of senior professional positions, especially in our university hospitals, is high

In the last 15 years in the large hospitals not only assistant-physician posts but also new management posts have been created, in order to improve the professional clinical care provided, to meet the increased demands of medical training and further training, and also to meet the conditions of the new Labour Law (reduction of the working hours for assistant physicians and senior physicians). Thanks to the attractive living conditions and salary structure it has been possible to recruit medical doctors both from Switzerland and from abroad, who are interested in the possibility of fulfilling dual functions, in the medical service area and in the academic field. The demand for a competent new generation of medical doctors remains high.

e) The Swiss National Foundation (SNF) supports clinical research

In the last two promotional periods the Federal Government has made a total of more than 100 million Swiss Francs available to the Swiss National Foundation (SNF) for the promotion of clinical research. Deriving particular benefit from this have been interdisciplinary programmes (e.g. so-called “tandem projects“, in which the basic sciences and their clinical partners, in particular, are jointly interested), and translational research (as in the framework of the Special Programme for University Medicine, “SPUM“). Specific project contributions for cohort studies in the fields of person-oriented and patient-oriented clinical research, and the financing of the infrastructure for the creation of a Swiss Clinical Trial Organisation (Swiss CTO) and for the support of so-called Clinical Trial Units (CTUs) have also been made available.

2. Visions and solutions

To use scientific knowledge for the good of the patient is one aspect of the ethos of the medical profession [12]. However, the following questions arise: how are medical specialists to be able to use new results, when they themselves have not learned, through direct contact, how the results of research are obtained, how can/must they be interpreted and what is their value in the framework of concrete problems in clinical practice? Medical doctors must be trained in such a way that they can efficiently create the bridge between research and clinical practice and can thus apply relevant new knowledge, according to evidence-based medicine, for the improvement of patient care.

The medical doctor has the responsibility for facilitating the use of those research results which are not simply something new, but which also represent a marked improvement for patient care. On the other hand, he should also pass on to the appropriate laboratories and working-group questions from clinical practice, which are of concern to research. In the final analysis he has to ensure that both new and old therapeutic methods are regularly studied for their long-term effects (so-called outcome research). This research should be carried out with the cooperation of both the hospitals and basic-care and specialist practices.

Certainly not all medical doctors can or should be won over for many years' research activity – they will always only be a small percentage. But in view of the enormously rapid advances in biological-somatic and psychosocial research (especially also on the part of non-medical scientists), it is not easy for medical doctors to fully understand these developments, but it is important that they do so. Otherwise there is a real danger that the doctor treating his patient at the bedside has less and less scientific understanding to enable him to apply new knowledge in clinical practice. In order to counter this development, on the one hand it is necessary to increase the scientific competence of medical doctors and on the other to improve the structures for the support of research in the large hospitals. The undeniably necessary “art of healing“ must be coupled with critical scientific understanding, in order to be able to counter pseudoscientific or irrational concepts with well-founded arguments. A revitalisation of academic medicine is necessary [2].

2.1 Scientifically-based university training for all medical doctors

Medical studies according to the Bologna system consist of three years' basic training (Bachelor of Medicine), followed by two or three years' master studies (Master in Medicine or Master in Medical Sciences). The whole study period is divided into core studies (obligatory subjects) and mantle studies (chosen subjects). This allows the students, already during their studies, either to prepare specifically for their specialist further training, to study other possible fields in depth, or to choose a more scientifically oriented training.

a) *"Physician Track" and "Dr. med." – the direct route to clinical practice*

Students who are aiming for a clinical career choose the so-called “Physician Track“ – a training pathway in which primarily clinical knowledge and skills are imparted [6, 13]. This 6-year training period consists of three years' basic training (Bachelor in Medicine) and three years' master training, including a clinical-practice year (“Master in Medicine“). According to the Law on Medical Professions, as justification for further training for the Dr. med. qualification it is also necessary to have successfully passed the relevant Federal Examination.

In order to acquire the scientific knowledge necessary for evidence-based medical activity, during their training for “Master in Medicine“ all future medical doctors must gain minimal research experience in a field of science that is relevant for modern medicine, specifically in the form of an obligatory period of practical research of at least 3 months’, but ideally of 6 months’ duration, in the context of their medical studies.

Naturally, Swiss medical doctors should not be under any disadvantage compared with their European colleagues. The increased emphasis on science in the medical studies that is promoted in this position paper, including a period of practical research, should therefore not mean any additional expenditure of time, but should be integrated in an appropriate manner in the curriculum of the studies for “Master in Medicine“ or “Dr. med.“. The additional efforts required for this on the part of the students and their teachers should not be underestimated, and are comparable to those in our neighbouring countries.

Because of the Bologna reform of the medical studies, the conditions for granting of the “Dr. med.“ title will in future be redefined. In contrast to other sciences, up till now “Dr. med.“ played a special role, in that this title was rather more a part of the professional designation than the first step towards an academic career. According to the Bologna system, a doctorate is however associated with a 3-year period of research after completion of the studies for “Master in Medicine“, which in the context of the medical studies corresponds more to the MD-PhD programme.

The report on the period of practical research could in future form the basis for the “Dr. med.“ title. However, for the granting of this title the candidate must have completed a research period of 1 year.

Recommendation:

- ***A period of practical research and the work that is based on it, under competent direction, form an integral part of the training for “Master in Medicine“ and are the basis for granting of the “Dr. med.“ title.***

Responsible authorities: Swiss Medical Interfaculty Commission (SMIFC), medical faculties, universities, Federal Office of Health

b) The “Medical Sciences Track“ – a route for those interested in research²

The two-year Master studies of the “Medical Sciences Track“, which are also based on the Bachelor in Medicine studies, make a more scientifically oriented training possible for those medical students who are interested in research. This also includes a 6-month period of practical research activity. For this, each Medical Faculty can offer specific training modules and research activities in different areas, such as the neurological sciences, genetics, ethics, public health, social sciences, psychology etc. The “Medical Sciences Track“ can lead to a non-university professional career or to concentration on scientific work, in the form of PhD training. These studies last for 3 years, on average, and can be completed in those medical faculties, which provide the appropriate PhD programmes (besides the basic scientific subjects, for example also in public health, clinical research, ethics or other humanities). The possibility also exists of returning to clinical studies, either immediately after the “Master in

² The authors of this position paper are naturally aware that the introduction of new “tracks“ also requires a reassessment of the present number of university places that are available for studies in human medicine. This is also necessary for completely different reasons, for example because of the increasing shortage of doctors, especially in the field of basic health care.

Medical Sciences“ studies or after completion of the PhD training. For this, however, it is necessary to catch up on possibly missing specialities (and credits), the clinical-practice year and the Federal Examination. With this additional training, the conditions for granting of the combined MD-PhD title (see below) can be met.

Recommendations:

- ***Those medical students who are interested in research should be identified as early as possible (for example in the second year of their studies) and motivated to take the Medical Sciences Track.***
- ***In addition to the medical-clinical obligations of the “core studies“, this curriculum contains the special possibility of theoretical and practical training in research.***
- ***Depending on the particular medical faculty, the training that is covered by the “Medical Sciences Track“ can be coordinated with the PhD programmes.***

Responsible authorities: Swiss Medical Interfaculty Commission (SMIFC), deans of studies, medical faculties.

c) MD-PhD training - a recommendable route to academic medicine

For the effective promotion of the scientific nature of medicine, what are required in research and clinical practice are more medical doctors who are scientifically well trained and who have experience in research. Already in the context of the Master in Medicine studies, basic theoretical and practical skills in a specific field of research (mantle studies) should be acquired in preparation for possible MD-PhD training. On meeting the necessary qualification criteria the candidate may apply for a local or a national MD-PhD scholarship. The 3-year MD-PhD studies should be completed both in the basic biomedical sciences (e.g. biochemistry, physiology, pharmacology) and also in clinical research or in other fields that are important for medicine. The Bologna reform opens up extended possibilities for training in research in the course of the medical studies and thus a corresponding shortening of the duration of the MD-PhD programmes. Both the “Medical Sciences Track“ and the MD-PhD training are suitable procedures for strengthening the scientific competences in medicine and for training the next generation of research scientists in the basic biomedical specialties and in clinical practice.

The Swiss MD-PhD programme was created in 1992, as the first combined *Physician Scientists* training programme in Europe, on the initiative of the Swiss Academy of Medical Sciences (SAMS) and the Swiss National Foundation (SNF). Since then, several hundred physicians in Switzerland have completed such a second period of studies, more than 150 of whom were supported by a scholarship of the national scholarship programme³. In 2003, former and present MD-PhD students founded an alumni organisation⁴, the main purpose of which is “to promote the medical sciences and the exchange between clinical medicine and basic research in Switzerland“.

In spite of the good career opportunities for those who have completed the programme, too little advantage is being taken of the actual potential of combined MD-PhD training in Switzerland. On the one hand the reasons for this may on the one hand be financial (the amount of the scholarship is about 30-40% less than the salary of an assistant clinical physician, but on the other it may be due to lack of scientific interest on the part of the medical students.

³ Full information on the MD-PhD programme may be downloaded under www.samw.ch

⁴ Swiss MD-PhD-Association (SMPA); www.smpa.org

Doctors who have completed the MD-PhD training programme also often complain of the great difficulty in finding suitable clinical positions for their further specialist training. Also, in a recent inquiry various specialist societies belonging to the Swiss Medical Association (FMH) in some cases showed an amazing degree of reserve with regard to the recognition of scientific MD-PhD training for further training in specialist fields of medicine. The flexibility of MD-PhD training that is possible with the Bologna study reform (see above) must help to overcome these difficulties. Doctors who have completed the MD-PhD training can create ideal bridges between basic research and patient-oriented medical research [14]. More advantage must be taken of this potential for strengthening the next scientific generation in medicine.

Recommendations:

- ***The present MD-PhD training must be adapted to the new opportunities opened up by the Bologna study reform (this applies for the “Master in Medicine“ and “Medical Sciences Track“ programmes).***
- ***Talented medical students who are interested in research should be motivated, in good time, for possible MD-PhD training.***
- ***The dovetailing of the MD-PhD programme with the further clinical training must be optimised, for example in that***
 - ***the university place for the further training is guaranteed before the start of the MD-PhD studies;***
 - ***the student takes part in the subject-specific theoretical further training already during his/her MD-PhD studies.***
- ***In the further-training programmes of the Swiss Medical Association (FMH) at least 12 months' research activity should be recognised – and 18-24 months for the hospital-physician oriented specialist title.***

Responsible authorities: University managements, medical faculties, hospital managements, specialist associations, Committee for Further Training (KWFB) of the Swiss Medical Association (FMH).

2.2 Contact with science during specialist medical training

a) Further training / Specialisation

The scientific basis of medicine should be maintained not only in the context of the basic training, but also during the further specialist medical training (and later in practice). For further-training places in the hospitals this means, for example, that “journal clubs“ take place regularly, that evidence-based medicine is discussed and that there is free access to the scientific literature. Persons who have experience in research and who are motivated for scientific work should have the possibility either of being involved in research during their normal working time or be released from their normal clinical obligations so that they are available for specific research projects for a certain period of time (e.g. 6 months to 1 year). For this, the Medical Faculty should provide specific promotional scholarships, on a competitive basis. Early planning (and adaptation) of the professional career is important, in order to maintain the motivation and not to miss the most favourable moments for current national and international promotional possibilities. Accordingly, the career consultants must identify talented young future scientists already during their student years and should inform them, individu-

ally, of the existing possibilities for training and further training (e.g. the MD-PhD programme, further clinical training, post-doc training abroad and promotional programmes of the Swiss National Foundation (SNF), including SNF promotional professorships).

Recommendations:

- ***Besides adequate clinical conditions, scientifically-based patient care and research experience on the part of the departmental head are important qualifying factors for further-training centres in university hospitals and large cantonal hospitals; an important task on the part of the teacher is also regular critical consideration of the student's practical work.***
- ***Qualified and motivated assistant physicians and senior physicians should be released from their normal responsibilities at regular intervals, for specific research projects.***
- ***Promotional scholarships for clinical research should be established during the further training.***
- ***For all students there should be early and flexible career planning – including possible options.***
- ***The promotion of research in practice is also one of the aims of the strengthening of science in the further training.***

Responsible authorities: Medical faculties, hospital managers, academic and clinical heads of hospitals and hospital departments

b) Compatibility between work and family

Experienced researchers are continually expressing their amazement and their regret that present-day medical doctors are no longer prepared – as they used to be – to completely subordinate their family and their everyday life to research (or to clinical practice).

There are two developments in particular that may well be responsible for this:

- The career of researcher has lost some of its social flair: on the one hand it has to compete with other equally respected and sometimes better-paid professions, and on the other the responsibility within the family is considered more important no longer only for women, but now also for men.
- Today many women claim the right to also strive for a successful clinical and/or academic career [15]. However, what is lacking (for both sexes!) is the private support, which in many cases is what makes unusual performance possible. But it can no longer be expected that the necessary extra work, especially in research, has to be carried out in the evening and at the week-end, which puts considerable strain on the individual's family life [16].

Many firms in the private sector have already reacted to these developments. In order to attract top-rate staff (men and women) they are prepared to create part-time positions, they set up day nurseries and if necessary they try to ensure that the partner of a newly appointed top-rate employee also finds an attractive post. Similar incentives must also be created for research scientists of both sexes.

Recommendation:

- ***The promotion of a career in research (and clinical practice) requires good conditions for compatibility between work and family; these include employment of the individual's partner, the availability of places in a day nursery, adaptable working times, flexible age limits, e.g. for appointment to a post, scholarships etc.***

Responsible authorities: University managements, professorship commissions, managements of medical faculties and hospitals

2.3 More efficient research platforms and clear management structures in the university hospitals

a) Creation of stronger research structures

For many years clinical research in the Swiss university hospitals has been criticised as being of poor quality [17]. Different reasons have been given for this deficiency, including the inadequate infrastructures for research in the university hospitals. In order to improve this situation, over the past few years clinical research centres and/or departments for have been set up by some university hospitals. Their principal objectives are:

- to provide a professional research infrastructure for clinical research in humans (patients),
- to promote high-quality clinical research, carried out according to international standards,
- to observe and to further develop the special rules and ethical principles for research in humans,
- to promote the training and further training of the next generation of scientists in clinical research,
- to ensure close exchange between basic research and person(patient)-oriented research (translational research; from bench to bedside and vice versa).

These platforms contribute to the creation of specific centres of competence and excellence for research in humans and to medical advances in patient care. In order to promote the interdisciplinary nature of this research, the persons responsible in the most important specialist disciplines and the heads of the clinical trial units (CTUs) should be represented on the management committees of these centres.

The CTUs have the infrastructures and the competences that are necessary in order to be able to support professional and competitive clinical research in different medical disciplines. The Swiss National Foundation supports 6 CTUs in five Swiss University hospitals (Basel, Berne, Geneva, Lausanne, Zurich) and in the Cantonal Hospital in St. Gallen. These CTUs are networked together through the CTU network, which is also supported by the Swiss National Foundation and are included in a national "Swiss Clinical Trial Organisation" (Swiss CTO). Like the network of coordination centres for clinical studies (KKS) in Germany⁵, the CTUs and the Swiss CTO should contribute to improvement of the study culture, the coordi-

⁵ www.kks-netzwerk.de

nation of local and country-wide multicentre studies, further medical training and constant promotion of the next generation of scientists in clinical research in Switzerland.

Recommendation:

- ***The visibility, the quality and the attractiveness of clinical research must be strengthened, particularly through improvement of the infrastructures and the positions that are available in this area.***

Responsible authorities: University managements, medical faculties, hospitals

b) Establishing of “dual leadership“, with the introduction of research professorships, i.e. competent departmental management, separated from the general staff and with clearly defined responsibility, for clinical practice/services on the one hand and research on the other

The traditional model of the university physician is based on outstanding achievements and performance in research, teaching and patient care by one and the same person. However, this profile of requirements is today simply unrealistic. In leading positions in the university hospitals the sum of the requirements in clinical excellence, internationally competitive research, teaching, further training, leadership and management increasingly represents a “squaring of the circle“. Here there is a risk that research is forced into the background. This problem can be mitigated by the setting-up of research professorships, such as already exist in certain university hospitals. These allow increased integration of research into clinical practice and thus to improved fulfilment of the academic mission of a university hospital.

For the successful implementation of this concept clear basic conditions, at different levels, are recommended:

- The management committees (management of education, health, the hospital, the university and the medical faculty) provide a common description of the functions of the research professorship, for which attractive salary conditions must be envisaged.
- In observance of his responsibility for research, the hospital manager supports the setting-up of a research professorship or a similar departmental managership, which is granted an adequate degree of autonomy.
- The competence and the career planning for the holder of a research professorship require the agreement of the more clinically active colleagues. In this respect, the principle of the “Attending Physician“, in particular, has proved its value in the USA.
- The changeover from a research professorship to a clinical professorship and vice-versa (or from one similar management function to another) must be possible. This is especially important for the promotion of the next generation of scientists, whereby it should be possible to increasingly release clinically active assistant physicians and senior physicians for work in the field of research.
- The setting-up of part-time professorships and/or combined job models in research and clinical practice facilitates new, family-friendly work patterns.

The next generation of scientists with competence in medical research is thus promoted on three levels: through the “medical sciences track“ in the Masters part of the medical studies, through the MD-PhD programme and through the advertising of promotional SNF professorships. The setting-up of research professorships in the university hospitals opens up more definitive and longer-term career options for persons who successfully complete these promotional programmes for the next generation of research scientists.

Recommendation:

- ***In the university hospitals “dual leadership“ should be introduced, i.e. specific management and responsibility, separate from the general staff, on the one hand for the clinical sector and on the other for the research sector. This dual leadership must be flexible, not organised according to uniform and strictly hierarchical principles, and possibilities for job rotation should be envisaged; mutual support between clinical management and research management, complementarity and good collaboration must be constantly promoted.***

Responsible authorities: Universities, medical faculties, hospitals, hospital managements

c) Strengthening of coordination and responsibility in management

The Swiss university hospitals have developed almost exclusively from cantonal hospitals, which are service-oriented and which primarily guarantee a high level of patient care.

University hospitals should, however, be committed to promoting scientific advances in health care (supported by active research), professional training (teaching) and further medical training. Although this includes a qualitatively high level of medical performance, university medicine always operates at the limits of present scientific knowledge. It is committed to innovation, and has to find and evaluate new diagnostic and therapeutic methods and introduce these into medical practice. In order to be able to guarantee and be involved in the development of new advances in medicine, the university hospitals must have competent academic management and must pursue a clear scientific strategy. Patient care can only benefit directly from good, principle-oriented clinical research. Examples of a corresponding organisational model are the Dutch “Academic Medical Centres”⁶ and the “Academic Health Centres” in the USA [18, 19], where the university hospital and the faculty of medicine (university) are integrated into one organisation. The aim of a stronger academic management is also the improved coordination between basic, health-care and patient-oriented research, and thus an efficient implementation of the “translational medicine” principal, i.e. efficient interaction between research and patient care.

Such a structure requires common strategies and well-coordinated management committees for the university hospital and the medical faculty (3). Increased coordination however always involves the risk of preferential consideration and financing of the clinical tasks and services. This has to be achieved through a clear allocation of responsibility for the “academic” budget to medical-faculty and university instances with the obligation for teaching and research. Similarly, the responsibilities for nominations (including evaluations and possibly also dismissals) of senior management personnel rest, in the final instance, with the university/faculty (for the academic field) or with hospital management (for the field of patient care). Accordingly, for persons active in both these fields a dual system regarding appointment and direction is applicable. The salary structure must take account of these reciprocal obligations.

University medicine that is primarily oriented towards scientific research does not exclude comprehensive professional training that is in turn oriented towards general medical practice. For the development of skills in clinical practice the cantonal hospitals and the larger city hospitals can be involved in the medical training to a greater extent than they have been up

⁶ www.amc.nl

till now. However, this also means increased recognition and inclusion in the medical faculties of medical doctors almost all of who have qualified in medicine at these so-called “peripheral” teaching hospitals.

Recommendations:

- ***In the management committees of the university hospitals and clinics, greater coordination of clinical practice, research and the training of medical students is needed – while maintaining broad autonomy and specific responsibility for each of these areas, including the financial resources. The means for research and for teaching for the Bachelor and Master in Medicine qualifications are to be fully managed and justified by the faculty and the university.***
- ***An agreement on objectives and performance, defining the rights and obligations of the partners.***

Responsible authorities: political instances, universities, faculties, hospitals

3. Outlook

With this present document the SAMS wishes to encourage debate, which in its view is necessary, on the subject “Medicine as a Science“. The recommendations are intended to serve for an in-depth discussion and for the development of implementation strategies and financing options. The SAMS is not under any illusion that the proposals outlined in this position paper will be realised tomorrow. Some of them are obvious and will be subject to little criticism, while others require major changes, both in the structures and in the mentality of those involved, and will therefore not remain unchallenged. On the other hand, it seems to be realistic and desirable that within five years clear changes, in the sense of the visions outlined here, will become evident.

At the present time medicine is confronted by many different challenges: questions of cost and financing, the demography of the medical profession, new requirement profiles and implementation of the Bologna reform, to name but a few. It may seem surprising that with this position paper the SAMS opens up additional fields of action. The Board of Administration, in the sphere of which this document was produced, carefully studied the pros and cons of such a publication and first discussed it with many experts. It came to the conclusion that with the proposals formulated in this paper no new (or, mainly, unnecessary) “building site“ is opened up. The proposals on the one hand fit in with a window of opportunity, which with the present Bologna process stands wide open, and on the other they form the basis for the fact that in future medicine will be able to cope with the tasks expected of it by society. Or in other words: Medicine is also a science – or it is nothing at all.

4. Literature

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