



**Committee for the Evaluation of Medical Study Programs**

**Technion - Israel Institute of Technology**

**Faculty of Medicine**

Evaluation Report

**June 20, 2014**

**Contents**

**Chapter 1:** Background.....3

**Chapter 2:** Committee Procedures.....4

**Chapter 3:** Evaluation of Medical Study Programs at  
The Technion.....5

**Chapter 3A:** Outline of observations and findings.....5

**Chapter 3B:** Full observations, findings, and  
                    recommendations.....13

**Chapter 4:** Collected recommendations.....49

**Appendices:** Appendix 1 – Letter of Appointment.....57

                    Appendix 2 - Schedule of the visit.....58

## **Chapter 1- Background**

The Council for Higher Education (CHE) decided to evaluate the study programs in the field of Medicine during the academic year of 2014.

Following the decision of the CHE, the Minister of Education, who serves ex officio as Chairperson of the CHE, appointed a Committee consisting of:

- Prof. Stephen Schoenbaum – The Josiah Macy Jr. Foundation, New York, USA: Committee Chair
- Prof. Raymond H Curry – Northwestern University Feinberg School of Medicine, Illinois, USA
- Prof. Shimon Glick- Professor emeritus in medicine, Faculty of Health Sciences, Ben Gurion University of the Negev, Israel
- Prof. Peter Crome- School of Medicine, Keele University, United Kingdom
- Prof. Elliot Gershon Department of Psychiatry and Behavioral Neuroscience, University of Chicago, Illinois USA
- Prof. David Katz – Professor Emeritus of Immunopathology, Faculty of Medical Sciences, University College of London, United Kingdom
- Prof. Ora Paltiel , Attending Physician, Department of Hematology- Hebrew University Hadassah Medical School, Hebrew University
- Prof. Jo Shapiro – Harvard Medical School, Harvard University, Massachusetts, USA

*Ms. Daniella Sandler- Coordinator of the Committee on behalf of the CHE.*

Within the framework of its activity, the Committee was requested to:<sup>1</sup>

1. Examine the self-evaluation reports, submitted by the institutions that provide study programs in Medicine, and to conduct on-site visits at those institutions.
2. Submit to the CHE an individual report on each of the evaluated academic units and study programs, including the Committee's findings and recommendations.
3. Submit to the CHE a general report regarding the examined field of study within the Israeli system of higher education including recommendations for standards in the evaluated field of study.

The entire process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (of October 2012).

---

<sup>1</sup> The Committee's letter of appointment is attached as **Appendix 1**.

## **Chapter 2-Committee Procedures**

The Committee held its first meetings on 23 February, 2014, during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as all medical Study programs in Israel.

During March 2014, the committee conducted multi-day visits at Ben Gurion University of the Negev and the Technion. In May and June 2014, committee members visited, Hebrew University, Tel Aviv University and the Bar Ilan University campus in Tzefat. During the visits, the Committee met with various stakeholders at the institutions, including management, faculty, staff, and students.

This report deals with the Technion -Ruth and Bruce Rappaport Faculty of Medicine. The Committee's visit to the school took place between the dates 2-4.3.2014.

The schedule of the visit is attached as **Appendix 2**.

The Committee thanks the management of the Technion and the Medical Faculty for their self-evaluation report and for their hospitality towards the committee during its visit at the institution.

The format of this report is the following: Chapter 3A outlines the Committee's observations and findings, but not its recommendations. Chapter 3B contains a full narrative of the Committee's observations, findings, and recommendations. Chapter 4 is a collection or aggregation of the Committee's recommendations. Chapters 3A, 3B, and 4 are organized in the following sections: Mission and goals; Organizational structure; Study programs; Human resources/faculty; Students; Teaching and learning outcomes; Research; Infrastructure; Self-evaluation process; and Additional comments. Readers may choose to read the entire report (highly recommended); or Chapters 3A and 4; or Chapter 3B.

## **Chapter 3: Evaluation of the Faculty of Medicine's Medical Studies**

### **Programs at the Technion**

*This Report relates to the situation current at the time of the visit to the institution, and does not take account of any subsequent changes. The Report records the conclusions reached by the Evaluation Committee based on the documentation provided by the institution, information gained through interviews, discussion and observation as well as other information available to the Committee.*

### **Chapter 3A: Outline of Observations and Findings**

The Committee evaluated the Ruth and Bruce Rappaport Faculty of Medicine at the Technion. Although focused primarily upon the traditional MD program for Israeli medical students, this review also addresses several other educational programs for which the Faculty is responsible and considers the impact these programs have on institutional resources and priorities. The Committee's major findings may be summarized as follows:

1. Mission:
  - a. Numerous items in the self-evaluation report (SER) and interviews were labelled as statements of "goals" or "mission," with significant variation in content and emphasis. After completing its review, the Committee concluded that the school pays excellent attention to the following elements of the mission and goal statements: support of excellent biomedical research; training, recruitment and support of clinician scientists; and encouragement of collaborative research.
  - b. Since the vast majority of students both enter and graduate with the intention of having a clinical medicine career, the Committee feels that there is an under-emphasis on what is needed to best educate the students who will not become physician-scientists.
2. Organizational Structure:
  - a. The Technion's organizational structure appears to be highly centralized
    - i. Many, if not most, significant decisions require some form of central approval, i.e., by central committees, central executives, or both.
    - ii. The Committee was informed that about 25% of the Faculty's recommendations on promotion or tenure had been overruled by the Technion's Faculty Senate committees, resulting in promotion or tenure being denied.
    - iii. The number of administrative and technical staff assigned to the Faculty and their rank are determined according to Technion-wide standards, affording the Faculty limited flexibility.

- b. The Committee formed several impressions about the organizational structure, including:
    - i. The Dean of the Ruth and Bruce Rappaport Faculty of Medicine is elected for two year terms (renewable up to a total of six years). The two-year terms of a dean and the lengthy centralized Technion processes make it very difficult for a dean to have a major impact, however desirable, on the Faculty's program during his/her term of office.
    - ii. The system for instituting changes in the teaching program is unduly cumbersome and not designed to address the needs of a faculty of medicine to respond to changes in the field.
    - iii. More administrative support would be desirable in several areas.
    - iv. The appointment and promotions process is also unduly cumbersome.
      - 1. There is inadequate recognition of the clinical service obligations of medical faculty.
      - 2. There is inadequate recognition that the high level of collaboration, tight regulatory environment, and relatively long time-frame required for clinical research differ from bench research and necessitate different ways of assessing the productivity and importance of the work and those who perform it.
3. Study Programs: The Committee focused on three existing study programs and one that is being proposed: The MD program for Israeli medical students, a six year program taught in Hebrew; the Technion American Medical Studies Program (TeAMS), a four year post-baccalaureate degree program taught in English; the MD/PhD program; and the proposed new Medical Sciences program.
- a. Over the past 5 years, the Israeli MD program has grown from 90 to 120-130 students per year.
    - i. Both students and faculty gave the Committee the impression that much of the basic science in this curriculum does not appear to be linked to clinical aspects of medicine. Over the past ten years this issue has been raised at and attended to by many medical schools around the world; this has generally led to significant medical education reforms that completely rework and shorten the pre-clinical teaching.
    - ii. Most of the teaching consists of frontal lectures. The Committee understands that some new techniques have been introduced, e.g., in histology where core teaching material has been computerized.
    - iii. A previous committee recommended that the third year integrative course begin in the third year. However, the Technion's course approval process led to retaining the timing

of the course so that clinical rotations continue to begin in the mid-fourth year. Shortening of the sixth year has further decreased the time available for student clinical placements and elective options.

- iv. The Committee felt positively about and was impressed by the fact that the required research thesis topics and subsequent products are subjected to external review.
  - b. The TeAMS program, operating since 1983, takes about 30 post-baccalaureate students each year, primarily from the U.S. and Canada. The Committee's impression again was that most students find much of the content of basic science curriculum irrelevant to their future clinical careers.
  - c. The MD/PhD program has increased recently from 4 students per year to 10, and the intent is to continue to attract and support 10 each year. The Committee was told that approximately 1/3 of these graduates become basic scientists, 1/3 physician-scientists, and 1/3 clinicians; but no specific data about educational outcomes or career trajectories was presented.
  - d. The proposed new format for the MD degree and medical sciences would increase the number of students in each of the first two years to 200. After two years, a total of 130 students will be accepted into the MD program. Presumably the remainder will pursue a degree in medical sciences, e.g., BSc in medical sciences or biology, MSc, or PhD. The Committee feels it is likely that the first two years will continue to be skewed toward the exact sciences and is concerned that the delay of substantive medical context and professional perspectives until the 4th year will continue, or even be exacerbated. We also are greatly concerned that the future scientists will not be those students who have the greatest potential for scientific achievement but rather be those rejected from the clinical medicine program.
4. Faculty/Human Resources:
- a. The Committee was impressed by the quality of the teaching staff - senior and junior, basic and clinical - and noted their enthusiasm, professionalism, commitment and institutional pride.
  - b. The number of pre-clinical faculty members (48) seems much too low, especially in view of the increased numbers of students presently studying in the Faculty of Medicine and particularly because of the projected further increase.
    - i. The Committee had strong concerns about the teaching burden on the small number of pre-clinical faculty. The concerns paralleled those of an external committee in 2010, namely:
      - 1. Teaching responsibilities decrease time for research
      - 2. Teaching is required in areas outside the expertise of the faculty member.

- c. The clinical teachers the Committee encountered were skilled and committed to all three classical roles: clinical care, teaching, and research. Again, the Committee had strong concerns:
  - i. It is rare that clinical teacher-researchers have protected time for research.
  - ii. There are too few academic positions: out of 700 clinical teachers, several hundred have no appointment - even one-half or one-quarter appointments.
- d. The Committee feels that the Technion has not sufficiently recognized the importance of ambulatory and community-based teaching. At no time in the site visit did the Committee meet anyone involved in primary care or community-based activities.
- e. The Committee feels that the current understaffing of the Center for Medical Education at a time when there should be wider introduction of innovative teaching methods at the Technion is a serious problem.

5. Students:

- a. The criteria for admission are high. Most admissions are based on an applicant's having a very high threshold *sechem* and then on the scores on the noncognitive admission tests (MOR).
- b. The Committee had some concern about the future for female MD/PhD students interested in research or clinician-researcher careers. An appointment in the Faculty requires a post-doctoral fellowship abroad, usually in the U.S. Many women find personal barriers to traveling abroad for an extended time.
- c. In the pre-clinical curriculum, the "To be a physician" course generally appears to be a positive experience for both students and faculty. There is, however, variation by tutor and lack of clear learning objectives for parts of the course.
- d. The integrative course appears to fill gaps in connecting the first three years' courses to clinical context. As a result it appears to be well liked and considered important. Nonetheless, the material is presented almost entirely in lectures and needs to be revised to include other learning formats such as small group teaching and self-directed learning.
- e. The Committee's impression is that overall the clinical rotations are of a high standard. This is reflected in the students' enthusiasm about many clerkships. The Committee was concerned, however, about several issues:
  - i. Students continue to be sent to some clinical departments that have a poor reputation for teaching.
  - ii. Much of the instruction even within these clinical rotations is delivered in lectures.
  - iii. Students are present for only a limited number of hours each day since they leave in order to go to jobs that help support

them during medical school. Thus, it is crucial that their time in the clinics be highly experiential and educational.

- iv. MD/PhD students are usually still working on their research in the clinical years and find it difficult to travel to assignments in remote clinical sites.
- f. The Committee also questions whether coursework for PhD students is of sufficiently high quality and relevant to their interests. This issue was also raised in 2010 by an external committee.
- g. The Committee did not hear specifically how professionalism – including respect for patients and team members, honesty, and altruism - is either taught to students or assessed.
- h. The Committee's understanding is that the lecture facilities for the TeAMs students are superior to those generally available to the Israeli students. The Israeli students seemed to accept this situation and to attribute it to the large tuition differential. Nonetheless, the Committee is concerned that resources are not allocated equitably in proportion to educational need.

#### 6. Teaching and Learning Outcomes:

- a. It is important to move away from dependence on live frontal lectures to other teaching methods. The Committee heard about and commends some examples of these strategies at the Technion including the following:
  - i. The department of surgery has developed video presentations of didactic material that are available via the internet to all rotation sites. This and other distance learning methods should result in increased standardization of material presented across sites.
  - ii. The OB/GYN clerkship, working with an external expert on medical education, has developed a detailed syllabus and efforts to ensure that students in all locations meet specific learning objectives. This shows that such innovative improvement is possible. The Committee feels it is critically important that all courses and clerkships have detailed syllabi and specific learning objectives.
- b. There is very little use of clinical simulation technologies at the Technion. The Committee feels that simulation in its many forms is an extremely important set of tools for the preparation of 21<sup>st</sup> century physicians.
- c. The Committee's impression is that faculty development efforts are recent and relatively few; and we have noted above our concern about understaffing in the Center for Medical Education, the logical locus of faculty development efforts.
- d. The Committee is concerned that most assessment of learning is by multiple choice examinations and quizzes. This method is best for assessing knowledge but not skills and attitudes. The Committee did

not learn how many Observed Standardized Clinical Examinations (OSCEs) a student takes or for which subjects. The Committee was concerned that the OSCE for sixth year students had been dropped due to shortening of the sixth year.

7. Research: Research is the great strength of the Technion and its Faculty of Medicine.
  - a. The publication record of the Faculty is outstanding; in recent years, there have been nearly 1000 publications per year in peer-reviewed journals with several each year in leading journals.
  - b. The internal funding of research, with numerous initiatives that fill in the gaps in national funding, is exceptional.
  - c. The laboratories that the Committee visited were modern and well-equipped.
  - d. One potentially positive effect of the proposed new medical sciences program could be an increased number of MD/PhD and PhD candidates.
  - e. The Committee's impression is that learning objectives for the educational aspects of the PhD and other research programs would be desirable both to evaluate the PhD students' progress and to aid in mentoring these students.
  
8. Infrastructure:
  - a. The Committee feels it is important that adequate space be available for students to study, work together, and learn together.
    - i. The Committee understands that more study space will be available when the library refurbishment is completed; but currently study space appears to be inadequate.
    - ii. The Committee saw two of the large lecture theaters that are used for frontal lectures and got the impression that the facilities available for the Israeli students are noisy due to construction sounds, windowless, and inadequately air conditioned. In addition, alarms are said to go off frequently.
  - b. The Committee's understanding is that students and clinical faculty who are outside the university complexes do not have sufficient access to library resources.
  - c. The Committee sees educating potential users of the new video-conferencing system as important and hopes that the system will improve communications greatly once more people learn how to use it.
  - d. The Committee's understanding is that IT support is available primarily for minor computer problems but not for more complicated issues.
  - e. The Committee was told on many occasions that the present arrangement for traveling between the two campuses is grossly inadequate and that this is a deterrent to establishing good working

linkages. Accordingly, the Committee believes that the frequency of the shuttle bus service needs to be increased beyond three times a day.

- f. The Committee is concerned that the animal facility located in the Faculty that serves research and commercial activity has a number of deficiencies that must be addressed to achieve accreditation.

9. Self-evaluation Process:

- a. The self-evaluation report describes most existing programs, but the main body of the report does not include an adequate description of the TeAMS program.
- b. The report does not present detailed self-criticism including the degree to which previous recommendations of external committees have not been addressed.
  - i. The Committee is aware of previous reports of external committees with recommendations for improvement.
  - ii. NOTE: The Committee has prepared an appendix to its full report, Chapter 3B, Section 9, entitled, "Observations Related to Implementation of October 2007 CHE Recommendations and to the 2010 Review by a Technion-chartered Committee Chaired by Prof. Spiegel."
- c. A formal strategic planning and review process would permit the Technion to create a self-evaluation report that details the successes of its programs and also the challenges it faces. A detailed self-evaluation should then state the approaches that have been decided upon to address the challenges. That would be consistent with CHE's intent that its quality assurance program, including periodic reviews by an external committee, lead to improvements.
- d. The self-evaluation reports should be cogent, consistent, concise, and coherent. We felt this was not the case. For example, the numerous different statements of mission that are in the current self-evaluation report are confusing.
- e. The Faculty should be able to provide evidence to back up its assertions about the quality of its programs. The assertions should be documented and quantified wherever possible.

10. Additional comments:

The Committee appreciates the Faculty's passion for application of the natural and biological sciences and technology to medicine. We also believe that there are other areas of scholarship important to the development of 21st century physicians. These include inculcation of professionalism throughout the process of a medical education and a career in medicine; interprofessional education; quality improvement and patient safety; and ambulatory and primary care. We have noted the importance of new teaching methods, e.g., interactive learning and distance learning; and we have noted the importance of newer teaching tools, e.g., simulation.

In a spirit of quality improvement, the Committee has made a large number of recommendations. These are aggregated in Chapter 4. The Committee urges that the recommendations be considered carefully and be implemented.

In conclusion, as stated at the end of the Appendix to Section 9, the Committee makes the following observation: We hope that in view of the fact that the Technion is widely and deservedly acclaimed as one of the leading universities in the world in technological and scientific innovation, it would manifest similar innovation and creativity in its medical educational efforts.

## **Chapter 3B: Full Observations, Findings, and Recommendations**

### **1. Mission and Goals**

The mission, as stated by both the President and the Dean, is cogent and compelling: to educate physicians, physician-scientists and non-physician scientists. It is known that the great majority of graduates, at least 80 percent, will be practicing clinicians.

#### **- Observation and findings**

The Committee's impression from what we read and heard is that, despite some challenges, excellent attention is paid to the following part of the mission and goals:

- Support of excellent biomedical research
- Training, recruitment and support of clinician scientists
- Encouragement of collaborative research

This part of the mission and goals directly addresses those faculty and students whose careers align with the Technion's special interest and expertise in basic science and technology. It does not, however, necessarily address the needs of the majority of graduates.

The Committee sifted through numerous items in the self-evaluation report and interviews that were labelled as "goals" and "mission" in an effort to clarify how the institution's other goals mapped to the part of the mission relating to the education of the 80 percent of graduates who will have careers as clinician physicians. The following were explicitly labeled in the report in various places as goals or missions:

- "To qualify new generations of high quality physicians and scientists"
- "To train excellent physicians, who have a comprehensive education in the basic and the life sciences"
- "The capacity to conduct clinical research and possess a diverse clinical experience that will prepare them for the profession"
- "To promote medical research, both basic and clinical, carried out at the Faculty and in the hospitals."
- "Support excellent research in biomedical science and to train excellent M.Sc, and PhD. students"
- Foster technology oriented research
- Educate physicians who will keep up with knowledge and not lose the human nature of medicine
- Combine research on the two campuses
- Provide the students "with good background in sciences and quantitative thinking thus enabling them to become leaders in Israel academic medicine."
- "Develop his/her communication skills with peers, members of team, patients and their families"

- "Develop into clinician/researchers in order to advance medical knowledge for the benefit of patients"
- "Train excellent general practitioners, who have a comprehensive education in the basic and life sciences, the capacity to conduct clinical research and possess a diverse clinical experience that will prepare them for the profession"
- "Promote medical research, both basic and clinical, carried out at the Faculty and in the hospitals."
- "Promote medical research at the Technion and in the hospitals"
- "Ensure high quality health care in Northern Israel"
- Harness the strength and branding of The Technion

□

Though there is an aspiration to prepare clinicians for the future, we found that there is relatively little explicit attention paid to several elements that would support that aspiration. There even is relatively little attention to some mentioned above as goals or missions. The elements that merit more attention include:

- Unique needs of a medical education and the important differences between educating physicians and educating basic scientists and technologists
- Training in critical thinking skills
- Self-directed learning
- Innovative medical education methods that are more integrative
- Teaching teamwork communication skills
- Teaching and assessing professionalism, including self-knowledge, ethics and cultural competence
- Supporting high quality, academic clinician educators
- Ensuring high quality of care in Northern Israel
- Commitment to educating and developing a diverse workforce. Specifically, there is little mention of how to promote gender opportunity in faculty promotions.

It is essential for everyone, including students, trainees and faculty, to be clear about what the Faculty's mission is. In its simplest form, a mission statement addresses the following: "Who we are"; "What we do"; "Whom we do it for"; and "How we do it". It can be, and ideally is, very brief so that all can grasp it readily. In addition, the components of the mission need to be coupled with specific programmatic and cultural goals and with explicit measures of performance.

The Committee understands that there are limited resources for any institution, e.g., human resources, financial resources, and space/capital equipment. Each choice of resource allocation for one area may have an unintended negative consequence on another area. Each major decision involving resources should be linked clearly and explicitly to the mission.

The Committee perceived that the Faculty members and clinician educators support the missions of educating physician-scientists and clinicians. On an institutional level, however, the stated mission and multi-faceted goals are not explicitly and consistently woven into the curriculum and may not be reflected in resource allocation.

There needs to be a rigorous, ongoing internal process for evaluating whether the mission and goals are being achieved and to make sure that there is a balance so that one portion of the mission does not come at the excessive expense of another.

- **Recommendations**

a. **Short term/immediate (~ within 1 year)**

- Write a focused, clear mission and goals statement and promulgate it widely
- List those processes and programs that support each goal
- Delineate those existing processes and programs for which there is a gap between stated and achieved goals
- Detail the means by which the Technion will determine whether it has closed the gaps and achieved the desired outcomes
- Develop processes for ongoing self-evaluation that allow for flexibility and innovation. These could be modeled, for example, on the principles of rapid cycle quality improvement such as PDSA (Plan-Do-Study-Act). See section 9, Self-evaluation process.

b. **Intermediate (~ within 2-3 year)**

- Summarize yearly achievements and achievement gaps
- Maintain/reinforce successes
- Develop alternative plans to address the largest achievement gaps

## **2. Organizational Structure**

The Technion's Ruth and Bruce Rappaport Faculty of Medicine is unique in Israel in that it is considered to be part of a "Technological Institute" rather than a "University". However, from the point of view of CHE's Quality Audit and Assessment of Israeli medical schools, the Technion's Faculty has to be considered with respect to the same core criteria as those used for the other medical schools.

The Faculty, established in 1969 and incorporated into the Technion in 1971, is one of 18 Faculties of the Technion, four of which (Biotechnology, Biology, Biomedical Engineering, Food Engineering, and Medicine) are considered to have some shared

biomedical interests. However several other faculties (e.g. Chemical Engineering and Computer Science) also have common interests with these faculties.

The Faculty of Medicine offers or participates in several undergraduate programs, including:

- MD program for Israeli medical students, a six year program taught in Hebrew.
- Technion American Medical Studies Program (TeAMS), a four year post-baccalaureate degree program taught in English, in existence since 1983.
- MD/PhD program
- MD/Biomedical Engineering program
- MD/Law program
- BSc program in Laboratory Medicine
- BA program in Occupational Therapy, a joint program with Haifa University.
- Genetic Counseling program

The Faculty also offers an MSc and a PhD in Medical Sciences for graduate students.

The Dean of the Faculty of Medicine is elected for two-year terms, renewable up to a maximum of three terms. There currently are five appointed vice deans; and there are two main faculty governance bodies, the Faculty Assembly and the Faculty Promotions Committee.

Recommendations for recruitment, promotion, and tenure made by the Faculty Promotions Committee require the approval of the Technion Senate committee. The Technion Vice President for Academic Affairs, through Senate committees, controls the decisions on promotion of persons in all academic ranks from Clinical Lecturer to Full Professor and also persons in adjunct positions. The Committee was informed that about 25 percent of the Faculty of Medicine's recommendations on these issues had been overruled by the Senate committees resulting in promotion or tenure being denied.

The reported advantage of the system for academic promotion is objectivity and maintenance of uniform scales of excellence in the Technion's faculties since the procedure allows for promotion to be reviewed by several committees composed of full professors from different disciplines. However, several disadvantages were also reported to the Committee: The process, consisting of two rounds in the Faculty Promotions Committee plus three Technion committees takes about two years - far too long for the candidate seeking promotion. The Senate committees consist of members from different faculties, while members of the Faculty of Medicine often have roles that include not only scholarship and teaching but also commitments to provide high quality clinical services. The non-medical faculty may therefore not be in the best position to assess the medical faculty's suitability for promotion. In addition, the problem can keep recurring since clinical faculty positions have to be reconfirmed every few years. Moreover, clinical teaching of medical students

appropriately relies heavily on staff who are appointed for their ability in teaching and patient care, not for excellence in research. The lengthy process of accrediting and appointing such adjuncts fails to reward academic teaching activities, prevents flexibility, and seems counter-productive for addressing the requirements of educating 21<sup>st</sup> century physicians.

The number of administrative and technical staff assigned to the Faculty and staff ranks are determined according to Technion-wide standards. Promotion of this staff is restricted by multi-year agreements made by the Technion's management and various unions that represent the employees. The Faculty has very little flexibility either to compensate excellent workers or to hold accountable those who are under-performing.. Furthermore, there has been a 44 percent cut in administrative and technical staff in recent years.

Teaching is the responsibility of the pre-clinical departments and the clinical divisions. The latter include all the clinical departments of the same specialty from all the hospitals that have been accredited as teaching departments. These departments and divisions are responsible for updating the syllabi of the courses under their responsibility and for running the courses. The Center for Medical Education supports them with advice.

The Dean and the Vice Dean for Academic Programs are responsible for planning, running, and updating the study programs through three Committees: Medical Education, Pre-clinical Curriculum, and Clinical Curriculum. The last two committees each include two student representatives.

Any change in the teaching program – including addition, deletion, and changing the time frame of a course - can be initiated by the Dean, Vice Dean for Education Affairs, Curriculum Committees, Medical Education Committee, Pre-clinical Departments and Clinical Divisions. Students can contribute through three official avenues: (a) curriculum committees; (b) end of semester evaluations of courses and rotations; and (c) the Teachers-Students Committee.

When a change has been initiated by any of the above, a discussion is opened within the appropriate curriculum committee as well as with all teachers who may be affected by this change in order to examine the likely consequences. Once the Curriculum Committee decides upon a specific change, its recommendation is brought to the Faculty Assembly for approval. If approved, the recommendation is transferred to the Technion authorities to be ratified by the Technion Senate through its standing committee.

Reported examples of changes since 2005 include:

- i. The numbers of students on clinical rotations in internal medicine in the 6th year have been reduced from 8-9 to 2-4 so that this "mini stage" provides more personalized teaching and better preparation for

internship. Reported results have been: giving more independence to a student in understanding the process of patient admission, workup, care and discharge from hospital; and encouragement of self-study.

- ii. Subspecialty teaching has been altered. There now are more mandatory subjects, e.g. orthopedics, cardiology and medical imaging, plastic surgery and endocrinology. There are shorter electives to allow more students to be exposed to them. A two week refresher course in general surgery has been introduced into the 6th year; and as in internal medicine and pediatrics, there are small groups (1-3 students) with personal guidance and teaching and more student independence in their activities.
- iii. There is a revised mandatory first-aid course for first year students. The course used to be considered by the students to be unprofessional and was not taken seriously. The revised course and two complementary elective courses in years 2 and 3 are reported to be among the most popular. A similar change in the endocrinology course has been initiated by the teachers of this course.
- iv. A mandatory pre-clinical course on nutrition has been added.

A major theme emerged regarding problems inherent in the structure between the Technion (upper campus) and the Faculty of Medicine. This was manifest at several different levels:

- The two-year term of the Dean of this Faculty, who then must be re-elected, is not compatible with the needs of the post, particularly bearing in mind that the Dean of the Faculty of Medicine has to work at the interface with the clinical service provision system as well as with the Technion itself. Since it can take a long time for changes to pass through the committee processes of the Faculty and of the main Technion system, the short tenure makes it very difficult for a Dean to make a major impact on the Faculty's program, however desirable a change might be, during his/her term of office.
- The Dean of Education has many and varied responsibilities but there is a considerable lack of administrative support for these activities.
- There are instances where the decisions of sub-committees of the Faculty of Medicine's Faculty Assembly have been over-ruled by the Technion. This is demoralizing and can stifle innovation.
- The system of change in the teaching program seems unduly cumbersome and unlikely to address the needs of a faculty of medicine to respond to

changes in the field. For example there appeared to be a minimum of six stages at which curriculum changes could be reviewed and rejected; and the attempts to change the timing of the “integrated course” from 4<sup>th</sup> to 3<sup>rd</sup> year did not move forward because of the burdens of this process. More importantly, each curriculum change within a medical school simply should not be subject to central university approval.

- Although changes have been introduced in recent years, almost all of these have been in the clinical courses, suggesting to the Committee that there may be considerable perceived or real resistance to change in the parts of the curriculum that are shared with the other Technion faculties.
- The appointment and promotion process is also unduly cumbersome and not suited to the needs of a Faculty of Medicine. There does not appear to be adequate recognition that medical faculty have clinical service obligations and that the nature, style, and timescale of clinical research differ from bench research.

### **Recommendations**

#### a. Short term/immediate (~ within 1 year)

- Revamp the process of appointment and promotion within the Faculty with clearly defined timelines and revised criteria, including ones for peer review of teaching and scholarly output that might include non-traditional measures of impact such as innovative curriculum development. Persons whose primary activities demonstrate clinical and teaching excellence and innovation should be eligible for promotion up to the level of full professor.<sup>2</sup>
- Devise a plan to improve and streamline the working relationships between the Technion, the Faculty of Medicine, and the health care providers, i.e., both Government (Rambam Hospital) and the sick funds (other hospitals and clinics). Multi-party high-level decision-making can then advance the clinical and scientific education of future medical professionals and prompt implementation of measures to improve the training of clinical physicians and the professional lives of the teaching faculty.
  - Re-evaluate, and ideally lengthen, the position of Dean of the Faculty of Medicine.

---

<sup>2</sup> Some of the most highly reputed universities in Canada, the United Kingdom, and United States have decided it is important to recognize not only traditional research excellence but scholarship in medical education and clinical care. As a first step, the Technion should investigate the criteria for academic appointments and promotion at such institutions. For example, see: Harvard Medical School and Harvard School of Dental Medicine. Criteria for Appointment and Promotion. Available at: <http://facultypromotions.hms.harvard.edu/promotions.pdf>

- Adopt pedagogically sound educational approaches, e.g., longitudinal ambulatory clinical experiences and small group problem solving activities
- Take steps to ensure that changes within the curriculum are not impeded either by institutional processes or by inflexibility within the current delivery pattern.
- At a minimum, and as has been recommended in the past, provide significantly more opportunities for medical students to learn in ambulatory and long term care settings.
- Re-evaluate the administrative support structure within the Faculty to ensure that student needs are met.
- Ensure that the Faculty of Medicine at the Technion can make changes in the medical school curriculum as it sees fit. This does not preclude the Technion's central governance from periodic review of the Faculty of Medicine's educational program and performance.

### **3. Study Programs**

Members of the Rappaport Faculty of Medicine, in addition to their responsibilities for teaching students in the various MD programs, also teach MSc and PhD students and contribute to the life sciences teaching in occupational therapy, laboratory medicine, and genetic counseling programs conducted jointly with other faculties of the Technion and, in the case of the occupational therapy program, Haifa University.

#### **The 6-Year MD Program**

The number of students who matriculate each year has risen from ~90 to 120-130 over the past five years. The pre-clinical curriculum includes both general science and medical science courses. In keeping with the culture and academic strengths of the Technion, general science courses are given great emphasis. The consensus of students and faculty who met with the Committee was that much of the basic science in this curriculum is not tailored to promote students' understanding of medicine and detracts from the time and attention that should be paid to other aspects of preparation for the profession, such as human behavior. There is little time for independent study, and frequent multiple choice testing may reward the transient learning of small details at the expense of a broader understanding and integration of the material.

Newer pedagogical methods have begun to be introduced since the last review, but the pre-clinical curriculum remains predominantly delivered through traditional frontal lectures. Moreover the courses are structured by traditional disciplines, e.g., physiology, pharmacology, rather than by the organ systems approach now favored

in many other parts of the world to facilitate students' integration of the material. The Integrative Medicine course that occupies a large part of the 4<sup>th</sup> year is intended to accomplish this, but the result is a delay of students' transition to clinical education. As noted earlier, attempts to shift the Integrative Medicine course into the latter part of the 3<sup>rd</sup> year have met with administrative barriers; and the material in this course consists almost entirely of lectures.

The newer pedagogical methods that have been incorporated into the pre-clinical curriculum include the addition of imaging technology into the anatomy lab where students can view CT images of their cadaver. All histology slides have been digitized and are available to students during interactive lectures utilizing desktop computers and available for remote study as well. A few courses such as physiology are utilizing problem-based learning (PBL); however, the description provided to the Committee did not follow the accepted PBL self-directed learning construct but was instead a simple case discussion. Some clinical perspective has been added to the first two years with the "To be a Physician" program. This course involves regular discussions with patients about their illness experience and other off-campus activities such as a visit to a domestic violence shelter.

Attendance at all exercises in the pre-clinical curriculum other than frontal lectures is mandatory. This addresses student attendance issues expressed in prior CHE reports.

The required clinical rotations begin in the middle of the 4<sup>th</sup> year, with all students starting with an internal medicine placement. Although many of the 6<sup>th</sup> year rotations are described as "elective", students reported little flexibility in choosing these rotations according to their educational needs and were instead reported being assigned to whatever is available. In addition, a recent nationwide reduction in the duration of the 6<sup>th</sup> year curriculum has limited the time available for elective clinical clerkships which in turn has led to the cancellation of a summative clinical examination that had helped ensure adequate student preparation for the responsibilities of the 7<sup>th</sup> year stage. The concomitant inability to move the Integrative Medicine course to an earlier position in the 3<sup>rd</sup> year severely limits the time available to conduct essential activities of the clinical curriculum, especially experiential learning.

Pedagogic methods are also evolving in the clinical curriculum, albeit slowly. Two disciplines in particular – OB/GYN and surgery – are making substantive efforts in this regard, e.g., surgery's video presentations of didactic material that are available via the internet to all rotation sites. This and other distance learning methods promise to "increase quality through standardization," in the words of the surgery forum director. The OB/GYN clerkship is also to be commended for its detailed syllabus and efforts to ensure that students in all locations meet specific learning objectives.

There is very little use of clinical simulation technologies to date. The Committee was told that simulation is limited to activities such as the introduction of basic laparoscopic manipulation skills in surgery and the advanced trauma life support course in the 6<sup>th</sup> year, a course disseminated world-wide by the American College of Surgeons.

Core clinical teaching is conducted at several major hospitals, and a variety of other smaller facilities are used mainly for psychiatric education. There is a question as to the quality of educational opportunities at these smaller sites. Also, since the opening of the Bar-Ilan medical school in Tzfat, three hospitals formerly used for core rotations are now unavailable to the Faculty.

There is very little opportunity for students to learn in the ambulatory setting. There is only one required ambulatory rotation, a one month rotation in family medicine in the sixth year. No other rotation contains a significant outpatient component. Attempts to affiliate with large ambulatory facilities in the area have reportedly been unsuccessful, and other infrastructural problems noted in CHE's 2011 Continuation Report have not been overcome. The proportion of the clinical curriculum delivered in the ambulatory setting is essentially unchanged.

Syllabi for both pre-clinical and clinical courses are superficial, most occupying no more than a half page in the appendix material provided to the Committee. Most courses and clerkships do not provide explicit and detailed learning objectives (see section 7, Learning Objectives - below) with a few exceptions such as the OB/GYN clerkship as noted above. Course leadership in the pre-clinical years spoke of using templates from the United States Medical Licensing Examination (USMLE) to guide course content, but the learning objectives are not further elaborated and published to guide students' learning. Some clerkships, e.g., pediatrics, offer alternative methods such as computer-based cases for students not encountering patients with a particular clinical condition. However the Committee did not see evidence that students receive guidance on the specific conditions they are expected to see or learn about during a given clerkship or within the clinical curriculum as a whole (see section 7, Learning Objectives - below).

Completion of a research thesis is a graduation requirement. An exemption is made for students who already hold academic degrees requiring a research thesis. A group of 50 faculty members from all fields serves as referees approving both the initial proposal and the final product. A commendable feature of the thesis requirement at the Technion is that each student's product must pass muster of two external reviewers. The individual thesis supervisor assumes responsibility for shepherding the project through approval by the Helsinki Committee. Service as a review committee member and/or thesis supervisor is recognized as a factor in academic promotion. Students must conduct the work on an *ad hoc* basis as no dedicated curricular time is provided. Current students and faculty who also had been Technion students, i.e., are alumni, generally reported finding the thesis a productive and educational exercise. There are administrative issues in the thesis

program, e.g., a lack of sufficient clerical support for moving proposals along and delays in approval by the Helsinki Committee.

### **The Medical Sciences Program (Proposed)**

A new format for the MD degree program would include active integration with graduate degree programs of the Faculty of Medicine. This plan would increase the number of students in the first two years to 200. As they enter the first year, 60 students will already have been accepted into a medical degree program subject to acceptable academic performance. Then after the first two years a total of 130 students will have been accepted into a medical degree program, and the remaining 70 students will pursue degrees in medical sciences, e.g., a BSc in medical sciences or biology, MSc, or PhD.

In the self-evaluation report the program is said to begin in the 2014-2015 academic year; but since no students have yet been admitted under the new construct, it is unlikely it will debut before 2015-2016. Its stated goals are to “better implement the Technion’s advantages in ... engineering and the exact sciences; refresh medical studies and adapt to modern needs in this area, and increase the number of PhD and MD/PhD students in the research conducted in the Faculty of Medicine.”

Though the stated intent is to integrate a medical context for the pre-clinical education of medical students in this program, the Committee is concerned that with the curriculum for first two years of both the “medical” and “scientific” tracks being identical, there will continue to be skewing of the curriculum in the first two years towards the exact sciences that are a prerequisite in the education of those entering the sciences. In addition, the Committee is concerned that the delay of substantive medical context and professional perspectives until the 3<sup>rd</sup> year will be exacerbated.

Another important consideration and concern is the way the proposed program is structured. This seems to imply that there will be 70 students who will not “make it” into the clinical medicine track and these will be earmarked for medical science degrees. In other words the “rejects” will be the potential researchers. That does not seem to the Committee to be the best way to select future groundbreakers in research. It would make more sense to the Committee if the overall admission process to the medical school, which now is geared to select future medical practitioners, included a method to seek out and identify potential researchers. The Committee recognizes this will not be easy, but we feel that an institution that espouses and excels in research should have some original ideas for identifying likely excellent future researchers.

### **MD/PhD Program**

The MD/PhD program has generally admitted four students per year, but this has now increased to 10 new students; and the Technion plans to continue to support

up to ten new students annually. There are presently 24 students in the program overall.

Students are usually selected for the MD/PhD program during the 3<sup>rd</sup> year of their MD program studies. They then receive tuition and a graduate student stipend from the Technion for 3 years of graduate study, as well as tuition for years 4-6 of the MD program. Although there are now twelve years of program graduates, the Committee was provided no data about the educational outcomes or career trajectories of these students. It was told most are pursuing clinician-scientist careers.

### **Technion American Medical Studies Program (TeAMS)**

The Technion American Medical Studies Program (TeAMS) admits qualified U.S. or Canadian college graduates to a four-year MD degree program, also conducted by the Faculty. Its mission is to produce outstanding clinicians. Approximately 30 students are admitted each year, for a total student body of 120. The curriculum, which is conducted in English, was restructured four years ago to incorporate courses in research methods & biostatistics, behavioral medicine and professionalism and communication skills and increase opportunities for case-based discussion and other interactive formats.

The core clinical rotations are completed at the same hospitals but asynchronously with the main MD program students, given the differing languages of instruction and overall curricular structure. TeAMS students also complete a research thesis as a requirement for graduation. The only substantive difference from the thesis requirement for Israeli students is a truncated initial review protocol in order for TeAMS students to complete their research in the reduced time available to them.

There are 36 months of formal study, completion of which, along with passing Steps 1 and 2 of the USMLE, qualifies students for postgraduate training in the United States.

Information on the TeAMS program was provided in an appendix to the main self-evaluation report that did not elaborate upon the program or its relationship to the other degree programs of the Faculty. No outcome data were available to the committee aside from the statement of a 95% USMLE 1 first time pass rate provided in the appendix.

### **Recommendations**

#### Short term/immediate (~ within 1 year)

- There should be a formal review of the proposal for the new Medical Sciences program to ensure that its content and methods will enhance the pre-professional preparation of those students in the medical track as well as

facilitate the development of self-directed and inquisitive learners. The review should state explicitly the program's strengths and weaknesses. In addition, the review should seriously consider this Committee's concern about the need to find a better way to select future medical scientists/researchers rather than their being rejects in a program largely geared towards educating clinicians and clinician scientists.

- Seriously reconsider adoption of a systems-based approach to teaching and integrating the medical sciences that learners most need for careers in medicine or careers in which extensive knowledge of humans, their illnesses, and maintenance of their health is important. NOTE: This was a prior recommendation of CHE's 2007 committee and the 2010 committee chaired by Prof. Spiegel.
- Develop comprehensive, curriculum-wide, outcomes-based learning goals or core competencies that students are expected to achieve, and develop specific learning objectives for each curricular component.
- Accelerate the incorporation of innovative pedagogical methods and instructional technologies that will enhance students' active learning. Educate/develop faculty so that they can use these methods and tools effectively.
  - Note: This requires planning extensive faculty development and teaching support programs. Implementation of these programs should be over the next 2-3 years.
- Conclusively address the paucity of ambulatory education in the curriculum.
  - Extend the use of the ambulatory setting for basic clinical education
  - Develop opportunities for longitudinal clinical experiences to better acquaint students with chronic disease management.
  - Expose students to opportunities to develop and use technology to improve the lives of persons with primarily ambulatory conditions
- Analyze the impact of the announced change in certification policy of the ECFMG (the Educational Committee for Foreign Medical Graduates) as of 2023. ECFMG certification is a pre-requisite for eligibility to take the USMLE (the United States Medical Licensing Examination). The announced change could affect the TeAMS program and the ability, in general, of Israeli medical school graduates to take the USMLE.

#### **4. Human Resources / Faculty**

- Observation and findings

The Committee was impressed with the quality of the teaching staff - senior and junior, basic and clinical. We noted their enthusiasm, professionalism, commitment and institutional pride. However, the number of pre-clinical faculty members (48) seems much too low, especially in view of the increased numbers of students presently studying in the Faculty of Medicine and particularly because of the projected further increase. The Committee's impression is that the teaching burden on this small number of pre-clinical faculty inhibits their ability to devote more time to research and places them in situations in which they are called upon to teach in areas outside their expertise. The report by the 2010 committee headed by Professor Spiegel also pointed out this shortcoming.

The clinical teachers we encountered were skilled and committed to all three classical roles: clinical care, teaching, and research, but they appeared to be carrying out these roles under far less than ideal conditions. It is rare that clinical teacher-researchers have protected time for research, and the research they carry out is a tribute to their intense commitment. In addition, academic positions are not abundant. While the ability to grant quarter and half time appointments has improved the situation somewhat, far too many teachers do not have any academic appointments at all and teach on a purely voluntary basis. There are approximately 700 clinical teachers. Several hundred have no appointment, and 198 have only an adjunct appointment. Thus, many carry out their teaching without any academic recognition. The committee regards this situation as highly undesirable and unsustainable in the long-run.

We applaud the granting of the rank of full professor to two clinician-teachers after a lengthy struggle by the leadership of the Faculty. We hope that this will not be an isolated event but will be the harbinger of greater appreciation of the teaching and research efforts of clinical faculty.

The Committee feels that, in spite of world-wide recommendations to move much of hospital-based teaching into the community, the Technion has not sufficiently recognized the importance of ambulatory and community-based teaching. The few teachers in this sector have even greater difficulty than the hospital-based physicians in obtaining academic appointments.

In sum, the Committee has serious concerns that in the absence of recognition and rewards for teaching such as faculty appointments and in view of the increasing teaching load that will accompany the increasing size of the student body and adoption of better teaching methods, there will likely be an erosion of willingness of current teachers to teach. Furthermore, in the face of the critical need to move more teaching into the ambulatory sector, the failure to give faculty appointments to physicians in the ambulatory sector is a serious problem.

The Faculty's Center for Medical Education has suffered the loss of two outstanding and highly respected persons who have not yet been replaced, apparently leaving a major gap in a critical academic function. In view of the Committee's concern with the slow progress in the wider introduction of innovative teaching methods at the Technion, the current limited staffing of the Center for Medical Education also represents a serious problem.

- **Recommendations**

a. Short term/immediate (~ within 1 year)

- Recruit additional staff for the Center for Medical Education to facilitate faculty development and remediation programs.
- Increase use of clinician specialists to do more teaching of basic sciences. This step will relieve some of the burdens on the overstretched basic scientists and will make the teaching more relevant for the students.
- Develop a plan for recognizing and rewarding excellent clinician-teachers, clinician-researchers, and clinician-teacher-researchers and then implement the plan. This plan should include better recognition for all levels of faculty including broadening the criteria for promotion of clinical faculty up to and including full professor. In addition, special consideration should be given to development of and recognition for teaching in the ambulatory sector.

b. Intermediate term (~ within 2-3 year)

- Develop and implement a plan to increase significantly the number of pre-clinical teachers.  
NOTE: The Committee has not examined the budget of the Faculty and its components. Funds will need to be secured to implement the above recommendation.<sup>3</sup> Expand faculty development and training programs particularly for the newer and younger staff members
- Expand faculty development and training programs particularly for the newer and younger staff members.
- Develop and implement methods of teacher evaluation that go beyond student feedback. This also will allow developing evidence of teaching quality in all promotion considerations (pre-clinical and clinical faculty).

---

<sup>3</sup> It is outside the scope of this Committee to determine sources of income that might be used to expand the pre-clinical faculty or to fund more academic appointments.

- Move a considerable portion of clinical teaching into the ambulatory sector, both in ambulatory specialty and primary care settings.
- Develop a plan to address and alleviate the gender gap in staff appointments and advancement. Although not a unique issue at the Technion, the requirement for PhDs to have a post-doc outside Israel appears to affect women more than men and may impede admitting a more gender-balanced group of researchers to the faculty.

## 5. Students

- Observation and findings

### Caliber of students and admissions procedure

The Technion uses the *sechem* formula in which 55% of the weighting is based on scores on the psychometric exams and 45% on matriculation grades. The scores for incoming medical students are above those of all other Technion programs, even the elite math and physics program. Uniquely, ranking for admission to the medical faculty is based only on scores in the noncognitive admission tests (MOR) after the threshold *sechem* score has been obtained.

Students are also admitted after partial or full Bachelors' degree studies and receive partial credit for their studies as well as exemptions from some courses. MD/PhD students are currently recruited from the pool of admitted medical students in the pre-clinical years, and the break for their research generally occurs after the third year. However there appears to be flexibility as to the timing of this break.

The proposed new program that will admit 200 students per year based on the *sechem* and the noncognitive test is discussed above (**see Section 3, Study Programs**). The top tier of 60 will already be accepted as medical students, albeit this decision can be reconsidered based on performance in the first two years. The rest will enter a pool to be judged further during the first two-years. During that time, based on their achievements and interests, they will differentiate toward the MD track (an additional 70) or Scientist track (the remaining 70).

The Committee questions whether students accepted to this program without a guaranteed place in the medical school program will understand the probabilities and possibilities for pursuing a medical or scientific career. The Committee has already stated its concerns about whether this proposed program will attract the best potential scientists.

TeAMS Program: The committee did not hear about the entry criteria for students in the American program.

### **Student numbers and career paths**

Six-Year MD Program: The size of the medical school class has already increased to about 130; and this increase places burdens on the existing infrastructure and human resources both in the clinical and pre-clinical years.

Technion graduates are highly regarded when they apply for residencies in Israel. The committee was informed that 10-15% do not end up practicing medicine. Since a survey initiated by Prof Lavie in the 1990s there has not been a formal follow-up survey of the career paths of Technion medical graduates.

TeAMS Program: This program has existed since 1983, but no follow-up was presented. The Committee was told that the vast majority of students pass the USMLE, but not all on the first try, and that most students match for PGY-1 residency programs.

Researchers: The Technion is highly interested in recruiting more graduate students for research in the biomedical sciences, a significant motivation for having the proposed new program. The committee heard from many faculty members that one of the major problems in the Faculty is a paucity of students in the research track. Incentives to graduate students include stipends which seem to be adequate. While the stipends for all PhD students are lower than those awarded to students at the Weizmann Institute, the stipends for the MD/PhD students continue into the clinical years.

PhD students are well mentored and produce publications; but the Committee does question whether the coursework for PhD students is of high enough quality and relevance. This observation was also made in the 2010 Spiegel report.

According to the informal assessments of the Faculty, follow-up of MD/PhD graduates show that approximately 1/3 become clinicians, 1/3 basic scientists and 1/3 physician-scientists who do some clinical work.

Gender: The committee was informed that about half of the medical students are women, and most of the graduate students in the Faculty are women. The stipulation for a Faculty appointment is a post-doctoral fellowship abroad, mainly in the U.S. Few women meet this requirement, since they find personal barriers to traveling abroad for an extended time. This has implications for recruiting Faculty members in the future from the Technion's own alumni. This may result in talented women being employed in low level and poorly paid positions as laboratory managers despite their rigorous scientific training.

There did not seem to be any data on gender-related issues, nor are there any professional development programs geared towards women. Recently the Faculty has enabled informal meetings in which women faculty members and students participate.

## **Learning Experience**

### 1. Pre-clinical studies:

It is the Committee's impression that the "To Be a Physician" course is a positive experience for students and for faculty. The quality of experience varies with the tutors, and clear learning objectives have not been set for parts of this course.

Students noted that much of their pre-clinical time is utilized for classroom instruction and labs. There is little time in the day for self-study and few facilities to study in the building, either individually or in groups. Students noted that they are given many assignments such as quizzes and lab reports, and they find these multiple small assignments overly time-consuming; such an overload of tasks may reflect a lack of confidence in the independent and self-directed learning of which these excellent students are capable. The students appreciated that they were studying in a technical institute that emphasizes exact sciences. While some students were pleased with the early mathematics and physics courses, most thought they were excessive, and students in the clinical years felt they had not retained their pre-clinical knowledge after the exams. This may be due to the fact that the courses do not focus on material that is clinically relevant and/or are not taught in a way that enhances retention of important concepts.

### 2. Integrative Course

Students enjoyed and appreciated the clinical relevance of this course. Some felt overwhelmed by the number of teachers in this course and discrepancies and contradictions found in the teaching material. Some of the material repeats information learned in the pre-clinical years. Students would like to have more Problem Based Learning (PBL) sessions, not just lectures.

### 3. Clinical years

Students enjoyed and were enthusiastic about their clinical rotations and felt that most of the teaching is high quality. The Committee was told that family physicians receive the highest evaluations.

Some clinical departments have a poor reputation for teaching, yet students continue to be sent to these facilities even though they have repeatedly received poor feedback from students. In addition, despite these being clinical rotations, much of the instruction consists of lectures, e.g., the psychiatry rotation is 70 percent lectures. Faculty noted that attendance is low in some of the clinical lectures.

The main concerns regarding the clinical rotations were large group size and lack of flexibility in assigning placements in the various clinical facilities.

For core rotations starting in the fourth year, students remain in the same group throughout their clinical exposure with very little possibility to change their assignments despite individual circumstances or needs. Since most students live in the Bat Galim neighborhood near the Faculty, transportation to and from sites outside of Rambam is an issue. Since the MD/PhD students continue to do work in the laboratory during their clinical years, having clinical assignments outside Haifa is particularly problematic for them.

4. TeAMs Program: Students have variable backgrounds in the sciences, and for those with extensive prior exposure to the life sciences the pre-clinical instruction can be redundant. Lectures vary in quality. Interestingly the course called “The Cell” was repetitive for students in the American program but welcomed by some of the Israeli students who felt it brought them closer to medicine than their math and physics courses. Students felt that cell biology and immunology courses could be made more clinically relevant. TeAMs students found their clinical rotations to be excellent. They also found that they were very well prepared for the Shelf examinations.
5. MD thesis: The Committee met students who were at various phases of their MD theses. The committee was impressed that students had an opportunity to both pursue their own research interests as well as join established research projects. Some seemed to be having an excellent experience performing clinical studies which entailed data collection and data analysis. Some students felt they were hampered in starting their work by delays in Helsinki Committee approval and other administrative delays. In addition, the website likely needs frequent updating in order to inform students of available topics and mentors.

#### **Access and responsiveness of the administration to student needs**

Students felt they had excellent communication and access to their teachers and professors. Access to the School’s administration seems more limited and occurs through representatives from the Students committee. Students felt that complaints were not always taken seriously and that there was no option for anonymous complaints. This limits the kinds of disclosures students are comfortable making. Student-faculty, or student-administration meetings are not held regularly.

The Committee learned that administrative support for the clinical rotations, the MD thesis, and other needed areas is not adequate to meet the students’ needs. It appears that the reduction in administrative staff has affected students directly and that the lack of this type of support results in delays in tasks such as processing approvals for the MD thesis and responsiveness to student requests regarding clinical rotations. Furthermore, since the Vice Dean for Education has many other responsibilities, there does not appear to be an identified available faculty member directly responsible for clinical rotations whom students could approach.

TeAMS students reported that the administration was responsive to them and willing to listen and change.

### **Student Health**

Student counseling and psychological services, as well as workshops on examination-related anxiety are available at the Technion campus for variable but modest fees. The Technion's safety and hygiene department is responsible for laboratory safety and hazardous materials. The Committee was not informed specifically about other student health services.

### **Professionalism**

The Committee notes that professionalism is one of the topics addressed in the eight existing Faculty Development sessions. However, the Committee did not hear specifically how professionalism – including respect for patients and team members, honesty, and self-reflection - is either taught to students or monitored. While previous comments about copying in exams were addressed in the self-evaluation report, the Committee did not receive information regarding the manner in which issues involving unprofessional behavior among students are handled, particularly during clinical rotations.

### **Facilities**

The Committee's understanding was that there is a dearth of adequate space for self-study and group-study, especially for the Israeli students and that many of the lecture rooms have infrastructure and technical problems such as frequent alarms. Similarly, there is a perceived shortage of facilities for photocopying and scanning as well as a shortage of books.

### **Examinations**

Students note that they are given more examinations per exam period than the University policy manual allows. Students would like to learn from their mistakes, but the specific examination questions and answers are open for review for very short periods, limiting access to this review.

### **Practical experience**

Recognizing that many medical students need to work, the committee lauds the Technion's efforts to provide practical experience to students via the laboratory assistants and physicians' assistants programs that provide both remuneration and valuable exposure for students. The self-evaluation report states that all students who wish to take part in these experiences have the option to do so.

#### **- Recommendations**

- a. Short term/immediate (~ within 1 year)

- Encourage students who need to work to participate in the physician assistants' program, which provides hands-on clinical experience, rather than work outside of the medical setting; ensure that all students who desire this exposure will have the opportunity. Participation should be tracked.
- Enhance administrative support for students and their issues:
  - Provide more personnel for handling clinical rotations and MD thesis management.
  - Appoint a faculty member to be in charge of clinical rotations, and ensure that there are regular formal and informal meetings between students and that faculty member.
  - Hold regular student-administration meetings.
  - Ensure that there are anonymous methods for students to report concerns.
- Work toward further decreasing the number of students per clinical rotation.
- Enable TeAMS students with extensive science backgrounds to receive exemptions from some of the pre-clinical courses and use that time to enhance their research exposure and experience.
  - b. Intermediate term (~ within 2-3 year)
- Reduce exposure to pure sciences in the pre-clinical years and make pre-clinical subjects more clinically relevant.
  - NOTE: The latter was also a CHE committee recommendation in 2007.
- Improve learning infrastructure including availability of study rooms for students.
- Increase active learning in pre-clinical years and minimize lecture-based learning in the clinical years.
- Decrease number of small, frequent assignments and tests, and enhance self-study opportunities.
  - c. Long term (until the next cycle of evaluation)
- Rethink the career pathway and recruitment methods for MD/PhDs
- Institute a tracking system and periodic surveys for students and alumni in order to evaluate chosen career paths and long term goals of producing physician-scientists.

## 6. Teaching and Learning Outcomes

### - Observation and findings

The Committee received some input about the teaching and the learning outcomes in the 6-year program and in the 4-year TeAMS program. Since it did not receive comparative quantitative information or summary evaluations of the two, it cannot easily compare teaching and learning outcomes between the two programs.

The Committee has already mentioned several issues related to teaching and learning outcomes in prior sections of this report, and will try not to repeat them here.

#### **Basic Science Education :**

The Faculty reported that in order to educate the planned increase in the student body in the new curriculum, there will simply be increased utilization of the traditional teaching methods, i.e., mostly lectures. Apparently, an incentive for an emphasis on frontal lectures is that the funding of teaching is linked closely to teacher-student contact hours. The Committee believes that the important issue for the Faculty and administration to consider is whether there is effective learning. Other than for knowledge transfer, lectures are generally considered to be significantly less effective than more active forms of learning.<sup>4</sup>

The Committee believes that the Faculty should become familiar with current scholarship in pedagogic methodologies and then creatively devise more effective methods of education than traditional didactic lectures. Didactic material can be read in advance or viewed on the web or a video. There are some efforts to do this at the Technion, but they are primarily in the clinical years in areas such as surgery and OB/GYN, as noted in Section 4 above. Furthermore, although small group formats are often employed in active learning methods, the Committee believes that it is possible to have large class formats that are extremely interactive. Other schools both in Israel and internationally have developed various innovative medical education platforms, and some of these may be available to use locally.

The ultimate objectives for the Faculty and its teachers should be that the students acquire the high level of basic science knowledge that they need for their future careers and at the same time become self-directed lifelong learners who will be motivated and equipped with the skills needed to continue to expand and update their knowledge base. Attainment of these objectives can and should be assessed carefully.

---

<sup>4</sup> For a summary of evidence on lectures vs. other teaching methods and also for information on how to increase the effectiveness of lectures, see: Bligh DA. "What's the Use of Lectures?" 2000. Jossey-Bass Publishers, San Francisco. 346pp.

**Clinical Education:**

There is some but not enough clinically-oriented and clinically relevant education in the pre-clinical curriculum. The course "To Be a Physician," given in the pre-clinical years, is taught by clinicians. There is also a communications course for students in the second year. The Committee was told that although this course did not involve standardized patients, the physician-instructor role-plays with the students.

The teaching in the clerkships is generally well-received, but there does appear to be variation in teaching depending upon location and instructor. Standardization of learning, which will be discussed further under Learning Objectives, is a process that should be managed carefully.

The Committee, consisting primarily of non-Israelis, was surprised to learn about the limited clinical responsibilities that medical students have and the limited time they spend in a clinical setting during the day. The Committee was told that the usual clerkship day is 8:00 – 16:00. Since many students must earn an income, by 16:00 students leave the clinical unit to go to jobs. That undoubtedly affects their clinical exposures and ability to experience continuity of patient responsibility, particularly in the hospital setting.

**Learning Objectives:**

Learning objectives are what a learner is expected to know, understand, and/or be able to do at the end of a period of learning. Learning objectives should be specific and map directly into measurable student performance. The self-evaluation report states that "use of learning outcomes is not widespread in the faculty though the discussion about shifting from teaching oriented to outcome-based learning education has begun and promoted both by the institute and by the medical education committee." From the Committee's perspective, the faculty as a whole should learn to develop clear learning objectives for each course, tailor the teaching to achieve the objectives, and ensure that assessments determine that the students have actually learned what was intended. Since this approach is essential to having effective and efficient educational processes, instituting it should be a high priority for immediate action. One cannot convincingly argue that a course or clerkship is good if one has not set meaningful outcomes-based objectives and determined that those objectives have been met.

The OB/GYN faculty, mentioned in Section 4 above, with the assistance of an external consultant, has developed a detailed syllabus with learning objectives. The clerkship is organized to ensure that each student has the experiences that will help to meet the objectives, and the students are assessed the students on the objectives. This should be considered as a model for others.

**Faculty Development:**

There are some workshops for faculty members related to writing multiple choice exams, creating learning objectives, and lecturing. The Committee's impression is

that these efforts are recent and relatively few in number. The Committee is pleased that there is a professional educator in the Center for Medical Education. Increasing the faculty development efforts and assisting faculty in improving effectiveness is likely, however, to require the input of additional medical education expertise. When fully staffed, the Center for Medical Education can design and implement additional faculty development programs, provide input to faculty on course design and assessment, and coach individual faculty.

**Assessment:**

Most assessment appears to be by multiple choice examinations and quizzes and thus assesses certain types of knowledge but is less suited to evaluation of skills and attitudes. In order to have effective learning, it is essential to deploy whatever assessment method is needed to determine that the learning objectives have been met. Multiple choice questions should be just one of several methods of assessment.

The Committee also understands that the 2007 CHE report noted a problem with cheating, and perhaps that is the reason for limited student access to their examination questions and answers; but feedback and discussion of a student's performance are important to facilitate learning.

The Committee did not learn how many Observed Standardized Clinical Examinations (OSCEs) a student has during the clinical period, and for which subjects. It was reported that the 6<sup>th</sup> year OSCE which had been a comprehensive assessment of a student's clinical skills was eliminated when the 6<sup>th</sup> year was shortened.

- **Recommendations**

a. Short term/immediate (~ within 1 year)

- Develop syllabi that include well-defined learning objectives for all clinical clerkships. Consider using the existing OB/GYN course as an example.
- Ensure that the Center for Medical Education is staffed with additional permanent staff and/or educational consultants.
- Develop a plan for enhancing faculty development
  - Assess faculty teaching needs and develop programs tailored to meet those needs
  - Extend current faculty development efforts to ensure that all faculty for whom it is relevant have participated in the existing faculty development workshops.
- Perform a careful assessment of existing learning objectives in pre-clinical courses.

- Develop processes that will increase the Faculty's responsiveness to students' educational needs, for example the need to discuss examinations so that students can learn from their performance.
- Do not assign students to educational experiences that have been repeatedly identified as suboptimal.

b. Intermediate term (~ within 2-3 year)

- Begin to monitor faculty performance in relation to student achievement of stated objectives (see Section 4, above).
- For the PhD and MD/PhD programs, develop a quality assurance program that evaluates annually whether each PhD candidate is meeting the goals for his/her work established at the beginning of each year. Use those evaluations to assess both learner and mentor performance.

## **7. Research**

- Observation and findings

Every major medical school considers research, education, and medical care as its primary functions. At the Faculty of Medicine, research is first among these priorities, and this ethos permeates every part of the Faculty that we visited. As the Dean put it in his introduction to the Committee, he is trying to brand the Technion as the research and technology Faculty of Medicine. The publication record of the Faculty is outstanding; in recent years, there have been nearly 1000 publications per year in peer-reviewed journals. The internal funding of research, with numerous initiatives that fill in the gaps in national funding, is exceptional. Although the physical facilities of the Faculty are constrained, it continues to be successful at finding space and funding equipment for recruiting new investigators.

The external committee chaired by Prof. Spiegel in 2010 made several observations. These included: scientific workforce shortages, particularly in the basic sciences faculty and the computational/quantitative sciences, and a heavy teaching load for clinicians. That committee recommended devoting a small number of appointments to clinicians who dedicate most of their time to teaching.

The Faculty response document includes plans to fulfill these recommendations, provides comparisons with American institutions documenting that there are too few academics to provide the proper quality and quantity of teaching, and outlines a reorganization of the Faculty of Medicine that has not yet been implemented. Notably, the response did not address the organizational tensions and obstacles that

exist between Faculties at the Technion; these are discussed elsewhere in this Committee's report (See section 3, above).

Our specific observations were as follows:

Laboratories: The laboratories we observed were modern, had acceptable space for students and investigators, and were well equipped. Newly recruited faculty reported that promises of equipment and space were kept. Laboratory construction for clinician-investigators is a priority in a new hospital building under construction.

Internal funding of research at this Faculty is innovative and extensive. The Rappaport Institute has a sizeable endowment and funds 28 basic and 12 clinical faculty. There is some funding through Rambam Hospital for research activities of resident physicians, and there is a program (Atidim) for some residents that supports them for 50 percent of their time for two years to conduct research. An external grant provides 3 to 5 years of support per person for a limited number of post-residency research fellowships at Rambam. There is also a program to enable post-residency qualification for a PhD. The Technion offers an opportunity for a second postdoctoral fellowship within its laboratories.

Although these initiatives are outstanding, the Committee was told that there are national problems of funding for translational research and in paying competitive stipends and salaries for research.

The MD thesis is a very well-organized program, and its features enhance the student experience. The students are strongly encouraged to attach themselves to a suitable faculty member early in their student years; there is vetting of each proposal by outside reviewers with review of theses by outside experts. The emphasis on publication is useful and enhances the quality of the output and the sense of achievement of the successful students. One problem is that insufficient dedicated time is allotted to performing these projects.

The Committee did not receive enough information on research grants to evaluate the fields that are most successfully funded and the ability of the Faculty of Medicine to compete for external and international funding. We also did not receive information on intellectual property as a possible or actual resource for research support at this Faculty.

The publication record of the Faculty can be used as a rough gauge of productivity. The number of peer reviewed publications is unusually high; the yearly number consistently falls between 900 and 1000. In 2011 there were 938 publications, of which two were in Nature. There was a wide range of journal quality, including top-tier and close to top tier, e.g., 13 articles in PLoS (Public Library of Science) journals. This appears to an indicator of success, and a citation analysis might give an even better sense of impact.

The MD/PhD program may be affected by the proposed new medical sciences program. If successful there could be an increased number of MD/PhD and PhD candidates.

The educational aspects of the PhD and other research programs were not discussed by the Faculty. Learning objectives would be desirable in these programs to aid in mentoring and to evaluate the PhD student's progress. For example, there might be milestones for quantitative and laboratory skills. It also would be desirable to monitor PhD candidates for issues such as isolation and student-mentor relationships.

- **Recommendations**

a. Short term (~ within 1 year)

- Re-evaluate carefully the strengths and weaknesses of the “medical sciences” proposal (also see Section 3, Study Programs). In particular, assess the potential impact of its new admissions process and pre-clinical curriculum on the pathways for PhD education and in relation to the research goals of the Technion. Although it is not the Committee's role to prescribe how to overcome what it perceives as likely weaknesses in the proposal, it believes that several possible approaches might be considered or developed.<sup>5</sup>

b. Intermediate term (~ within 2-3 years)

- Examine possibilities for expanding facilities for translational/clinical research.

---

<sup>5</sup> Incoming students who are not coming directly from a secondary school certificate (Bagrut) to a 6-year medical program should be students who have freely chosen to pursue studies at the other Technion faculties or at equivalent faculties at other Israeli universities. They would be starting with the requisite knowledge and skills.

Another possibility is that these students might enter a 4-year program like TeAMS and would be relieved of duplicative requirements. They would complete their Israeli medical qualification with an Israeli *ostageö*.

The Faculty of Medicine might also consider the model of the Harvard Health Sciences Technology program, which was initiated in 1963 (<http://hms.harvard.edu/departments/medical-education/md-programs/health-sciences-technology-hst>). This program gives an MD degree, and 40% of its graduates also get a PhD degree.

## **8. Infrastructure**

- Observation and findings

### **Development Plan**

The President of the Technion told the Committee that the major problem hindering the Faculty's development was the lack of space. Both the Faculty and Rambam Hospital benefit mutually from being adjacent to each other, but the potential for expansion is constrained by the neighboring buildings. The Committee was told that a plan for the use of an adjacent car park was being developed. It was also told that the Rambam Hospital was short of space for clinical research. The Committee concluded that imaginative plans for expansion were needed.

### **Space**

The Committee toured some of the laboratories and was impressed by the facilities. The metrics by which research space is allocated are unclear to the Committee and appear to be of some concern to the faculty. In addition, the Committee is concerned that with the proposed increased number of students who will be in the PhD or the new medical sciences track, there might not be adequate space for their research projects.

### **Students' Needs**

The Committee understands that more study space will be made available to students when the library refurbishment is completed. The Committee was unable to visit the space under construction and did not review its plans, but at the moment the amount of study space available appears insufficient.

The Committee saw two of the large lecture theaters that are used for frontal lectures; it was reported to the Committee that the facilities made available to the TeAMS students are superior to those generally offered to the Israeli students. The Israeli students are able to use some of the space allocated to the TeAMS students but must vacate it when required for the TeAMS students. The latter's lecture rooms were reportedly noisy (construction sounds), windowless, and the air conditioning was inadequate. In addition, alarms apparently go off regularly.

The Committee also saw some of the facilities for medical students in Rambam Hospital. There were seminar rooms attached to the wards that the students were able to use and in which journal clubs took place. There were also small rooms where students had access to computers.

### **Access to Books, Journals, and Information Technology (IT)**

The Committee was pleased to hear that the whole medical school building now has wi-fi. However, those students and clinical faculty who are outside the university complexes do not have sufficient access to library, clinical, and research data. In

modern universities in many parts of the world, access is routinely available from multiple hospitals and teaching facilities. Qualified persons should ideally have web-based access that is created with due regard for privacy and security and available wherever they may be located physically.

The Committee was told that electronic access to textbooks can be improved.

The Committee was impressed by the description of the new video-conferencing system that has just been introduced and hopes that this will improve communications greatly once more people learn how to use the system.

There appears to be IT support for minor computer problems but not for more complicated issues.

### **Transportation**

The Committee was told on many occasions that the present arrangement for traveling between the two campuses is grossly inadequate and that this is a deterrent to establishing good working links. A shuttle bus has been initiated recently but only runs three times a day. In addition, the Committee was told that there is a parking problem in the area near the medical school.

### **Animal Facilities**

The Committee heard that the animal facility located in the Faculty that serves research and commercial activity has been reviewed for accreditation. There were a number of deficiencies in the present arrangements including lack of a quarantine area and a disaster plan. The directors of the animal facility will be addressing these. There is a separate animal facility at the Technion, and some equipment has to be duplicated because of the difficulties in traveling between the two sites. We did not hear from researchers that the existing facilities were inadequate. Nonetheless, accreditation has not yet been received.

- **Recommendations**
  - a. Short term (~ within 1 year)
    - Provide faculty members and non-faculty members who teach students access to central library facilities wherever they are based.
    - Review the adequacy of study space (short term) and remedy it in all locations where students are taught (intermediate term).
    - Inform students at the time of each clinical placement about facilities that are available to them at the placement site. Check their continued availability annually.

- Increase the frequency of the shuttle bus to meet staff and student needs.
  - Perform a comprehensive review of staff and student transport needs, e.g., home to work and between campuses and produce a plan to address identified problems. Implement appropriate changes. (intermediate term)
  - Meet the requirements for international accreditation of the animal facilities as soon as possible.
  - Train all potential users of the new video-conferencing equipment in its use in order to maximize its potential to improve communication and teaching.
  - Improve IT support in order to resolve IT problems promptly. These problems should be prioritized by the degree to which they are or could impede students and staff's ability to work efficiently.
- b. Intermediate term (~ within 2-3 year)
- Create a space utilization masterplan to guide the future development of the Faculty site. The masterplan should also include the relevant needs of the Rambam Hospital. (See Section 2 recommendations on organization for multi-party decision-making). Consider renting or purchasing nearby, not necessarily contiguous, facilities either on a temporary or permanent basis both for temporary relocations during construction projects and for long-term relocation of some activities/departments outside the immediate campus if necessary.

## **9. Self-Evaluation Process**

### - Observation and findings

In the self-evaluation report, there is a description of the process used to create the document. The Committee appreciates the contributions of all who contributed chapters and materials to the report and particularly the efforts of Prof. Mordechai Choder who coordinated the process.

The Committee has the following observations related to the self-evaluation report and process:

- The report describes most existing programs, but the main body of the report does not include an adequate description of the TeAMS program.

- The report does not present detailed self-criticism including the degree to which previous recommendations of external committees have not been addressed.  
The Committee was made aware of the previous reports of these external committees and their recommendations for improvement. We comment on those in the Appendix at the end of this section.
- A formal strategic planning and review process<sup>6</sup> would permit the Technion to create a self-evaluation report that details both successes and challenges and the approaches that have been decided upon to address those challenges. That would be consistent with CHE's intent that its quality assurance program, including periodic reviews by an external committee, leads to improvements.
- Self-evaluation reports should be cogent and consistent. For example, we have pointed out earlier the numerous different statements of mission that are in this self-evaluation report.
- Furthermore, the Faculty should direct its attention to providing future committees with evidence to back up its assertions about the quality of its programs. The report should be as concise, consistent, and coherent as possible. The assertions should be documented and quantified to the extent possible.
- The Committee noted with some disappointment that in its site visit, we were taken to laboratories and hospital-based teaching units, but we did not meet a single primary care or ambulatory care physician.

- **Recommendations**

a. **Intermediate term (~ within 2-3 year)**

- The Committee recommends that the Faculty develop formal strategic planning and review processes and ensure that such review is performed/updated at least every other year.

---

<sup>6</sup> There is a large literature on formal strategic planning; and all faculties of business administration or management are likely to have one or more experts in the subject. In addition, there are many consultants to help organizations interested in doing strategic planning. The strategic planning process is specific. It is most effective when the plan, starting with the organization's mission and vision are driven through the organization and reflected in goals, strategies, and programs. Although the process was originally developed for profit-making enterprises, it is common in non-profits including universities and their Faculties. For an example, see the University of Toronto Faculty of Medicine's strategic plan: <http://www.facmed.utoronto.ca/Assets/FacMed+Digital+Assets/Faculty+of+Medicine+1/FacMed+Digital+Assets/misc/strategicplan.pdf>

b. Long term (until the next cycle of evaluation)

- The Committee recommends that the Faculty of Medicine at the Technion include in the future self-evaluation reports required by the CHE a specific listing of all new programs generated in each two year period since the prior review and a specific listing of all challenges or problems that have been revealed in internal reviews. This should also include specific plans for addressing each within a certain timeframe.

## APPENDIX TO SECTION 9

### **Observations Related to Implementation of October 2007 CHE Recommendations and to the 2010 Review by a Technion-chartered Committee Chaired by Prof. Spiegel**

In October 2007 the CHE committee on evaluation of the Technion School of Medicine submitted its report and recommendations. It is incumbent upon the present Committee to examine to what extent these recommendations have been implemented. A number of these recommendations were echoed in the internal report by the committee chaired by Professor Spiegel in 2010.

The major problem cited in the 2007 report was “the ratio of number of staff members to number of students.” There were then 46 pre-clinical staff members, whereas the present number is 48. In view of the increase that has already occurred in student numbers, the projected further increase of the student body, and the growing number of MD/PhD students, it is clear that the shortage in staff members may have worsened and is likely to be exacerbated by the increasing teaching demands.. This shortage remains a most serious problem and is reflected in practices such as having pre-clinical faculty teach subjects that are not within their expertise.

No less serious a problem was noted in the number of clinical teachers. We note with approval the change in policy by which some teachers may receive quarter academic positions, thereby increasing the number of teachers who receive academic appointments. But there still remain a large number of teachers who receive no official academic recognition for their excellent and devoted teaching efforts. This problem will be exacerbated with an increase in student numbers. The Committee notes that the Faculty’s external committee chaired by Professor Spiegel raised these same points.

The 2007 committee recommended “a thorough periodical and ongoing investigation...with regard to the quantity, quality and relevance of the mathematics, chemistry and physics courses, which according to almost all of the students....do not contribute sufficiently to the main purpose of their studies.” The

present Committee was informed of some examination of a limited number of courses, but the overall picture has not changed. Both faculty and students expressed strong feelings that major changes are essential. A major reduction and realigning of these courses could have important positive consequences on the quality of the education in the pre-clinical years. For example, more free time and opportunities could be made available to students for self-learning and exploration both of research options and clinical correlations.

The 2007 committee recommended greater allocation of funds to finance the physician assistant programs, whose scope was limited by resource limitation. The present Committee does not have quantitative data on scope of changes. It endorses the earlier recommendations for educational and financial reasons.

That committee recommended “a guiding hand needed for the entire pre-clinical teaching,” specifically citing moving the integrative course into the third year; greater integration between the various pre-clinical courses; greater integration between the pre-clinical and clinical courses; and consideration of systems teaching. The integrative course has remained in the fourth year, still largely in the classical format of lectures; its timing remains the same in spite of the almost universal opinion on the part of students and faculty that it would be better located in the third year. Were systems teaching introduced, one might be able to replace the integrative course or shorten it greatly. The 2010 committee also endorsed the introduction of system-based learning. The response of the Faculty that this kind of learning is applicable largely to students who have already attained a bachelor’s degree in premedical studies but is not suited to the Israeli medical school curriculum is belied by its use in some other Israeli medical schools with positive feedback.

The present Committee notes with satisfaction some increasing use of case-based teaching, problem based learning, and other innovative activities. There was a universally positive response on the part of both students and teachers to introduction and expansion of these learning methodologies. Nonetheless, frontal lectures remain the dominant form of instruction. The present Committee has emphasized elsewhere in this report its strong desire to see accelerated and more widespread use of more pedagogically sound teaching modalities.

The 2007 committee strongly recommended increasing the number of students who involve themselves in research, and the present Committee notes that the Faculty has indeed made significant efforts in this regard. It hopes these efforts will yield the desired results.

In addition, the present Committee hopes that in view of the fact that the Technion is widely and deservedly acclaimed as one of the leading universities in the world in technological and scientific innovation, it would manifest similar innovation and creativity in its medical educational efforts.

## 10: Additional Comments by the Committee:

The Committee appreciates the Faculty's passion for application of the natural and biological sciences and technology to medicine. The Committee also believes that there are other areas of scholarship important to the development of 21<sup>st</sup> century physicians. Although most of these have received some discussion above, we expand on them here:

- Simulation involves the combination of technologies with human interactions. It provides a safe environment in which learners can develop new and improve performance on old skills. It can be used in scenarios in which the learner must demonstrate mastery of scientific knowledge or demonstrate ability to acquire knowledge on-the-spot. This medical school has minimal use of simulation at a time when others are acquiring and developing further the technology. That does not seem consistent with the Technion's and the Faculty's missions and strengths in technology.
- There is an evolving field of interprofessional education (IPE) in which learners from different health professions learn with, from, and about each other in order to improve collaboration, quality of care, and patient outcomes. Technion graduates will work in a variety of health care settings, from intensive care units and operating rooms to ambulatory care clinics in which effective teamwork is essential to achieving better patient outcomes. The Committee did not hear whether there are existing efforts in IPE or plans to develop them.
- The Committee understands that the cardiac catheterization team at Carmel Hospital has done important work in improving its teamwork and achieving better patient outcomes. The work reportedly involved both interprofessional education of staff and enhanced collaboration by the team. On the basis of this example, we have reason to believe that there is local expertise in interprofessional work, patient safety, and quality management. Patient safety and quality management are subjects that are being introduced into medical education in other countries. Although the Committee was told that patient safety is one of several subjects covered in a 6<sup>th</sup> year medical management course, we do not know if students are just introduced to, or actually attain competence in, quality improvement and patient safety; and we do not know if the Faculty is applying its technologic expertise to these subjects.
- Although the Committee was told that professionalism is discussed in the "To Be a Doctor" course, this course is confined to the pre-clinical curriculum. We were also told that when some subjects, such as ethical ones, are raised in the clinical setting there is usually not enough time to discuss them.

Professionalism involves many different areas of physician performance. Indeed, there are 10 major areas listed in the Physicians' Charter on Medical Professionalism; only one of those relates to scientific knowledge.<sup>7</sup> Twenty-first century medical schools in several countries are not only emphasizing professionalism in their curriculum but working to determine that what is being taught is being practiced and role-modeled.

- We believe that ambulatory medical education should be important to the Faculty for several reasons.
  - First, much can be learned in the ambulatory environment more efficiently than in the hospital.
  - Second, there are things that can be learned in the ambulatory environment that cannot easily be learned in hospitalized patients, for instance, the use of time as a diagnostic and therapeutic variable.
  - Third, chronic conditions are increasing in most societies, and patients with multiple chronic conditions contribute disproportionately to the total costs of health care. Most of the time these patients are encountered in ambulatory settings, indeed, mostly in primary care settings. The object of their care is to prevent the need for hospitalization to the extent possible.
  - Fourth, in the primary care ambulatory setting, the interaction of mental and behavioral with physical health becomes much more apparent; and it is critically important that modern physicians and the teams with which they work manage these interactions.
  - Fifth, there are patients in the ambulatory setting with conditions that might benefit from development and application of new technologies and who might benefit from the special interest and the expertise of the Technion.
  - Sixth, there are international trends towards increased use of ambulatory care services as an alternative to hospitalization. Therefore, medical students need to be educated thoroughly about this form of service delivery, its strengths and weaknesses.

The Committee's understanding is that despite the 2007 committee's recommendations, ambulatory medical education remains a small part of the curriculum. We believe and have stated earlier in this report that there is an opportunity to expand ambulatory medical education significantly in both primary care and specialities. It should become an important feature of medical education at the Technion.

- 
- <sup>7</sup> See: [http://medprof.bjmu.edu.cn/xsqy/32\\_Medical%20Professionalism%20in%20the%20New%20Millennium%20A%20Physician%20Charter%2015%20Months%20Later.pdf](http://medprof.bjmu.edu.cn/xsqy/32_Medical%20Professionalism%20in%20the%20New%20Millennium%20A%20Physician%20Charter%2015%20Months%20Later.pdf) . Also, see: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1734181/pdf/v031p00404.pdf> for a Jewish ethical perspective on the charter, co-authored by one of the present Committee's members. These publications and others raise important points that should be considered in deciding the areas of professionalism that merit attention in a modern medical curriculum.

- The Committee noted at the outset its awareness of the many outstanding attributes of the Technion and its contributions to this country and the world. Given the Committee's emphasis on outcomes, we would argue that much about the way the Technion operates must be "right". But, we also believe that the Faculty of Medicine has unique challenges and opportunities compared to other Faculties at the Technion: Other Faculties do not require so many teachers; most other Faculties are not preparing so many students for an applied field such as medical practice vs. basic scholarship; and most other Faculties do not, in order to achieve their educational mission, have to have strong relationships with non-University entities such as hospitals and ambulatory care systems and providers. Accordingly, we do not believe a medical faculty, in general, and the Faculty of Medicine of the Technion specifically, should be handled in exactly the same way as others.

We have noted elsewhere some of the problems that the current organizational structure and rules appear to pose for the Technion's Faculty of Medicine. Indeed, the self-evaluation report notes some of these issues. We urge the Technion to begin immediately to re-evaluate the entire set of relationships it has with the Faculty of Medicine and the rules and regulations that govern the relationship between the Faculty of Medicine, other Faculties, and the Technion as a whole.

## **Chapter 4: Collected Recommendations**

Below, the Committee aggregates all of its recommendations from Sections 1-9 of Chapter 3B. The wording has been changed in some instances in an effort to put the recommendations in a similar and direct format. Short-term refers to “within 1 year”; intermediate-term refers to within approximately 2-3 years; and long-term refers either to “ongoing” or “until the next cycle of evaluation”. The intent of these recommendations is quality improvement. Many can be implemented locally within departments, the Faculty, or the University. Some encourage the University to advocate beyond its walls; and some encourage the University to collaborate with others beyond its walls. Though the list is long, the Committee believes that each merits attention and should generate a plan of action.

### **Section 1 - Mission:**

- i. Write a focused, clear mission and goals statement and promulgate it widely (short term)
- ii. List those processes and programs that support each goal (short term)
- iii. Delineate those existing processes and programs for which there is a gap between stated and achieved goals (short term)
- iv. Detail the means by which the Technion will determine whether it has closed the gaps and achieved the desired outcomes (short term)
- v. Develop processes for ongoing self-evaluation that allow for flexibility and innovation. These could be modeled, for example, on the principles of rapid cycle quality improvement such as PDSA (Plan-Do-Study-Act). (short term)
- vi. Summarize yearly achievements and achievement gaps (intermediate term)
- vii. Maintain/reinforce successes (intermediate term)
- viii. Develop alternative plans to address the largest achievement gaps (intermediate term)

### **Section 2 - Organizational Structure:**

- i. Revamp the process of appointment and promotion within the Faculty, with clearly defined timelines and revised criteria, including ones for peer review of teaching. Persons whose primary activities demonstrate clinical and teaching excellence and innovation should be eligible for promotion up to the level of full professor. (short term)
- ii. Devise a plan to improve and streamline the working relationships between the Technion, the Faculty of Medicine, and the health care providers, i.e., both Government (Rambam Hospital) and the sick funds (other hospitals and clinics), so that there can be multi-party high-level decision-making to advance the clinical and scientific education of future medical professionals

- and prompt implementation of measures to improve the training of clinical physicians and the professional lives of the teaching faculty. (short term recommendation for planning, intermediate term for implementation)
- a. Re-evaluate, and ideally lengthen, the position of Dean of the Faculty of Medicine. (short term)
  - b. Develop new educational approaches, e.g., longitudinal ambulatory clinical experiences, flipped classrooms, and take steps to ensure that changes within the curriculum are not impeded either by institutional processes or by inflexibility within the current delivery pattern. (planning – short term; implementation – intermediate term)
- iii. At a minimum, and as has been recommended in the past, provide significantly more opportunities for medical students to learn in ambulatory and long term care settings. (short term)
  - iv. Re-evaluate the administrative support structure within the Faculty to ensure that student needs are met. (short term)

### **Section 3 - Study Programs:**

- i. There should be a formal review of the proposal for the new Medical Sciences program to ensure that its content and methods will enhance the pre-professional preparation of those students in the medical track as well as facilitate the development of self-directed and inquisitive learners. The review should state explicitly the program's strengths and weaknesses. In addition, the review should seriously consider this Committee's concern about the need to find a better way to select future medical scientists/researchers rather than their being rejects in a program largely geared towards educating clinicians and clinician scientists. (immediate)
- ii. Adopt a systems-based approach to teaching and integrating the medical sciences that learners most need for careers in medicine or careers in which extensive knowledge of humans, their illnesses, and maintenance of their health is important. NOTE: This was a prior recommendation of CHE's 2007 committee and the 2010 committee chaired by Prof. Spiegel. (must be addressed short term)
- iii. Develop comprehensive, curriculum-wide, outcomes-based learning goals or core competencies that students are expected to achieve; and develop specific learning objectives for each curricular component. (short term)
- iv. Accelerate the incorporation of innovative pedagogical methods and instructional technologies that will enhance students' active learning.

Educate/develop faculty so that they can use these methods and tools effectively.

Note: This requires planning extensive faculty development and teaching support programs that can be done short term. Implementation of these programs should be a goal for the next 2-3 years.

- v. Conclusively address the paucity of ambulatory education in the curriculum.
  - a. Extend the use of the ambulatory setting for basic clinical education (must start short term)
  - b. Develop opportunities for longitudinal clinical experiences to better acquaint students with chronic disease management. (intermediate term)
  - c. Expose students to opportunities to develop and use technology to improve the lives of persons with primarily ambulatory conditions. (analysis should begin short term)
- vi. Analyze the impact of the announced change in certification policy of the ECFMG (the Educational Committee for Foreign Medical Graduates) as of 2023. ECFMG certification is a pre-requisite for eligibility to take the USMLE (the United States Medical Licensing Examination). The announced change could affect the TeAMS program and the ability, in general, of Israeli medical school graduates to take the USMLE. (short term)

#### **Section 4 – Faculty/HR:**

- i. Recruit additional staff for the Center for Medical Education to facilitate faculty development and remediation programs. (short term)
- ii. Increase use of clinician specialists to do more teaching of basic sciences. This step will relieve some of the burdens on the overstretched basic scientists and will make the teaching more relevant for the students. (short term)
- iii. Develop a plan for recognizing and rewarding clinician-teachers, clinician-researchers, and clinician-teacher-researchers, and then implement the plan. This plan should include better recognition for all levels of faculty including broadening the criteria for promotion of clinical faculty up to and including full professor. (short term)
- iv. Develop and implement a plan to increase significantly the number of pre-clinical teachers. This will require identifying appropriate sources of funding. (intermediate term)

- v. Expand faculty development and training programs particularly for the newer and younger staff members (intermediate term)
- vi. Develop and implement methods of teacher evaluation that go beyond student feedback. This also will allow developing evidence of teaching quality in all promotion considerations of pre-clinical and clinical faculty. (intermediate term)
- vii. Move a considerable portion of clinical teaching into the ambulatory sector, both in ambulatory specialty and primary care settings. (intermediate term)
- viii. Develop a plan to address and alleviate the gender gap in staff appointments and advancement. Although not a unique issue at the Technion, the requirement for PhDs to have a post-doc outside Israel appears to affect women more than men and may impede admitting a more gender-balanced group of researchers to the faculty. (intermediate term)

#### **Section 5 – Students:**

- i. Encourage students who need to work to participate in the physician assistants' program, which provides hands-on clinical experience, rather than work outside of the medical setting, and ensure that all students who desire this exposure will have the opportunity. Participation should be tracked. (short-term)
- ii. Enhance administrative support for students and their issues (short-term):
  - Provide personnel for handling clinical rotations and MD thesis management.
  - Appoint a faculty member to be in charge of clinical rotations, and ensure that there are regular formal and informal meetings between students and that faculty member.
  - Hold regular student-administration meetings.
  - Provide a process for anonymous concerns to be voiced and acted upon.
- iii. Work toward further decreasing the number of students per clinical rotation. (short-term)
- iv. Enable TeAMS students with extensive science backgrounds to receive exemptions from some of the pre-clinical courses and use that time to enhance their research exposure and experience. (short-term)
- v. Reduce exposure to pure sciences in the pre-clinical years and make pre-clinical subjects more clinically relevant. (intermediate term)

NOTE: The latter was also a CHE committee recommendation in 2007.

- vi. Improve learning infrastructure including availability of study rooms for students. (intermediate term)
- vii. Increase active learning in pre-clinical years and minimize lecture-based learning in the clinical years. (intermediate term)
- viii. Decrease the number of small, frequent assignments and tests, and enhance self-study opportunities. (intermediate term)
- ix. Rethink the career pathway and recruitment methods for MD/PhDs. (long-term)
- x. Institute a tracking system and periodic surveys for students and alumni in order to evaluate chosen career paths and long term goals of producing physician-scientists. (long-term)

**Section 6 – Teaching and Learning Outcomes:**

- i. Develop syllabi that include well-defined learning objectives for all clinical clerkships. Consider using the existing OB/GYN course as an example. (short term)
- ii. Ensure that the Center for Medical Education is staffed with additional permanent staff and/or educational consultants. (short term – see Section 4)
- iii. Develop a plan for enhancing faculty development (short term)
  - Assess faculty teaching needs and develop programs tailored to meet those needs (short term)
  - Extend current faculty development efforts to ensure that all faculty for whom it is relevant have participated in the existing faculty development workshops. (short term)
- iv. Perform a careful assessment of existing learning objectives in pre-clinical courses. (short term)
- v. Develop processes that will increase the Faculty’s responsiveness to students’ educational needs, for example the need to discuss examinations so that students can learn from their performance. (short term)
- vi. Do not assign students to educational experiences that have been repeatedly identified as suboptimal. (short term)
- vii. Begin to monitor faculty performance in relation to student achievement of stated learning objectives. (intermediate term – see Section 4 above)

- viii. For the PhD and MD/PhD programs, develop a quality assurance program that evaluates annually whether each PhD candidate is meeting the goals for his/her work established at the beginning of each year. Use those evaluations to assess both learner and mentor performance. (intermediate term)

**Section 7 – Research:**

- i. Re-evaluate carefully the strengths and weaknesses of the “medical sciences” proposal (also see Section 3). In particular, assess the potential impact of its new admissions process and pre-clinical curriculum on the pathways for PhD education and in relation to the research goals of the Technion. Although it is not the Committee’s role to prescribe how to overcome what it perceives as likely weaknesses in the proposal, it believes that several possible approaches might be considered or developed. (see Section 7, footnote 2). (short term)
- ii. Examine possibilities for expanding facilities for translational/clinical research. (intermediate term)

**Section 8 – Infrastructure:**

- i. Provide faculty members and non-faculty members who teach students access to central library facilities wherever they are based. (short term)
- ii. Review the adequacy of study space (short term) and remedy it in all locations where students are taught (intermediate term).
- iii. Inform students at the time of each clinical placement about facilities that are available to them at the placement site. Check their continued availability annually. (short term)
- iv. Perform a comprehensive review of staff and student transport needs, e.g., home to work and between campuses and produce a plan to address identified problems. Implement appropriate changes. (intermediate term)  
Increase the frequency of the existing shuttle bus service to meet staff and student needs. (short term)
- v. Meet the requirements for international accreditation of the animal facilities as soon as possible. (short term)
- vi. Train all potential users of the new video-conferencing equipment in its use in order to maximize its potential to improve communication and teaching. (short term)

- vii. Improve IT support in order to resolve IT problems promptly. These problems should be prioritized by the degree to which they are or could impede students and staff's ability to work efficiently. (short term)
- viii. Create a space utilization masterplan to guide the future development of the Faculty site. The masterplan should also include the relevant needs of the Rambam Hospital. (See Section 2 recommendations on organization for multi-party decision-making). (intermediate term)
  - Consider renting or purchasing nearby, not necessarily contiguous, facilities either on a temporary or permanent basis both for temporary relocations during construction projects and for long-term relocation of some activities/departments outside the immediate campus if necessary. (short and intermediate term)

**Section 9 – Self-evaluation Process:**

- i. The Committee recommends that the Faculty develop formal strategic planning and review processes and ensure that such review is performed/updated at least every other year. (intermediate term)
- ii. The Committee recommends that the Faculty of Medicine at the Technion include in the future self-evaluation reports required by the CHE a specific listing of all new programs generated in each two year period since the prior review and a specific listing of all challenges or problems that have been revealed in internal reviews. This should also include specific plans for addressing each within a certain timeframe. (long term)

**Signed by:**



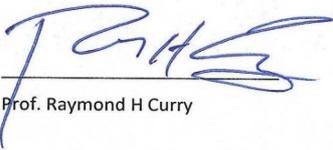
---

Prof. Stephen Schoenbaum – Chair



---

Prof. Peter Crome



---

Prof. Raymond H Curry



---

Prof. Elliot Gershon



---

Prof. Shimon Glick



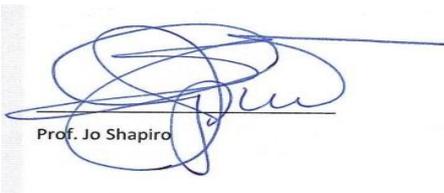
---

Prof. David Katz



---

Prof. Ora Paltiel



---

Prof. Jo Shapiro

***Appendix 1: Letter of Appointment***

February 2014

Prof. Stephen Schoenbaum  
The Josiah Macy Jr. Foundation,  
USA

Dear Professor Schoenbaum,

The Israeli Council for Higher Education (CHE) strives to ensure the continuing excellence and quality of Israeli higher education through a systematic evaluation process. By engaging upon this mission, the CHE seeks: to enhance and ensure the quality of academic studies, to provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel, and to ensure the continued integration of the Israeli system of higher education in the international academic arena.

As part of this important endeavor we reach out to world renowned academicians to help us meet the challenges that confront the Israeli higher education by accepting our invitation to participate in our international evaluation committees. This process establishes a structure for an ongoing consultative process around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial enterprise.

It is with great pleasure that I hereby appoint you to serve as the Chair of the Council for Higher Education's Committee for the Evaluation of the study programs in **Medical Studies**. In addition to yourself, the composition of the Committee will be as follows: Prof. Peter Crome, Prof. Raymond Curry, Prof. Shimon Glick, Prof. Jo Shapiro, Prof. Eliot Gershon, Prof. David Katz and Prof. Ora Paltiel-Clarfield.

Ms. Daniella Sandler will be the coordinator of the committee.

Details regarding the operation of the committee and its mandate are provided in the enclosed appendix.

I wish you much success in your role as the Chair of this most important committee.

Sincerely,

Prof. Hagit Messer-Yaron  
Deputy Chairperson,  
The Council for Higher Education (CHE)

*Enclosures:* Appendix to the Appointment Letter of Evaluation Committees

cc: Ms. Michal Neumann, Deputy Director-General for QA, CHE  
Ms. Daniella Sandler, Committee Coordinator

**Appendix 2: Site Visit Schedule**

**Site visit to The Technion – Israel Institute of Technology**

**Committee for the Evaluation of Medical Schools**

**Day 1: Faculty of Medicine**

- The meetings will take place at the Medical School

<b>Time</b>	<b>Subject</b>	<b>Participants</b>
9:00-10:15	Opening session	<p><b><u>President</u></b> - Prof. Peretz Lavie</p> <p><b><u>Senior Executive Vice Dean</u></b>- Prof. Moshe Sidi</p> <p><b><u>Deputy Senior Vice President</u></b> - Prof. Daniel Rittel</p> <p><b><u>Dean of Undergraduate Studies</u></b> -Prof. Yachin Cohen</p> <p><b><u>Dean of Graduate School</u></b> - Prof. Hillel Pratt</p> <p><b><u>Dean Faculty of Medicine</u></b> - Prof. Eliezer Shalev</p> <p><b><u>Senior Vice Dean</u></b> - Prof. Michael Aviram</p> <p><b><u>Coordinator of Self Evaluation</u></b> - Prof. Motti Choder</p>
10:15-11:15	School's academic and administrative leadership	<p><b><u>Dean Faculty of Medicine</u></b> - Prof. Eliezer Shalev</p> <p><b><u>Senior Vice Dean</u></b> - Prof. Michael Aviram</p> <p><b><u>Vice Dean for Education</u></b> - Prof. Zaher Azzam</p> <p><b><u>Vice Dean of Strategic Development</u></b>- Prof. Yaron Har-Shai</p> <p><b><u>Vice Dean Director of Technion American Medical Program</u></b>- Prof. Andrew Levy</p> <p><b><u>Head of Administration</u></b> - Ms. Asnat Erez</p>

11:15-12:15	Committees involved in pre-clinical education	Prof. Doron Melamed, Prof. Zaher Azzam Prof. Motti Choder, Prof. Serge Ankri Prof. Zaid Abassi, Prof. Yoram Gutfreund
12:15-13:15	Lunch	Closed door – committee only
13:15-14:00	Committees involved in clinical education	Prof. Martha Dirnfeld, Prof. Zaher Azzam Dr. Amir Karban, Prof. Doron Kopelman Dr. Yochai Adir, Prof. Ofer Lavie
14:00-14:30	Admission of Students	Prof. Elias Toubi, Prof. Dror Aizenbud
14:30-15:30	Senior academic staff	Prof. David Yarnitzky, Prof. Lior Gepstein Prof. Shimon Marom, Prof. Herman Wolosker Prof. Ofer Nativ, Prof. Ora Israel Prof. Nati Karin, Prof. Andrew Levy
15:30-16:30	Junior academic staff and Teaching assistants	Dr. Asya Rolls, Dr. Shai Shen-Orr Dr. Dori Derdikman, Dr. Itamar Kahn Dr. Ruth Hershberg, Dr. Oded Lewinson, Dr. Estee Kurant
16:30-17:30	Closed meeting	Committee members

### Day 2: Research and Students

- the meetings will take place at the Medical School

Time	Subject	Participants
09:00-10:00	Services for supporting teaching	Prof. Israel Zelikovic ( <b>Chairman, Library committee</b> ) Dr. Debbie Yablonski Dr. Oded Lewinson Dr. Shai Shen-Orr

		Dr. Rona Shofti ( <b>Head of the animal house</b> )
10:00-11:15	<b>Research</b>	Prof. Simone Engelender ( <b>Chairman, Research committee</b> ) Prof. Amir Orian ( <b>Coordinator, Search committee</b> ) Prof. Lior Gepstein ( <b>Head MD/PhD Program</b> ) Prof. Yaron Har-Shai ( <b>Head, Final Thesis Program</b> )
11:15-12:15	<b>Tour of the School - (Ms. Asnat Erez is escorting)</b>	<b>Labs - 11:15 - Dr. Itamar Kahn</b> <b>11:30 - Prof. Amir Orian</b> <b>11:45 - Class - Yellow Hall, Purple Hall</b> <b>Computer Farm</b>
12:15-13:15	Lunch	
13:15-14:15	Students - first to fourth year	
14:15-15:00	Students - fifth to sixth year	
15:00-15:10	Break	Committee members
15:10-16:00	MD\PhD students	
16:00-16:30	Alumni	
16:30-17:00	Closed meeting	Committee members

**Day3: clinical teaching- visit to chosen clinics and hospitals**

- **the first half of the day will take place at Rambam Hospital; the summation meeting will be back at the institution**

<b>Time</b>	<b>Subject</b>	<b>Participants</b>
09:00-10:15	Clinical Teaching	Prof. Rafi Beyar, Prof. Zaher Azzam, Dr. Miki Halberthal, Prof. Riva Brik

10:15-12:30	Tour of Clinical facilities- Rambam Hospital	Pediatrics B Internal Medicine B Obstetrics and Gynecology
12:30-14:30	Lunch +travel back to School	Lunch in the medical school.
14:30-15:00	Closed meeting	Committee members
15:00-15:30	Summation Meeting	<p><b><u>President</u></b> - Prof. Peretz Lavie</p> <p><b><u>Senior Executive Vice Dean</u></b>- Prof. Moshe Sidi</p> <p><b><u>Deputy Senior Vice President</u></b> - Prof. Daniel Rittel</p> <p><b><u>Dean of Undergraduate Studies</u></b> -Prof. Yachin Cohen</p> <p><b><u>Dean of Graduate School</u></b> - Prof. Hillel Pratt</p> <p><b><u>Dean Faculty of Medicine</u></b> - Prof. Eliezer Shalev</p> <p><b><u>Senior Vice Dean</u></b> - Prof. Michael Aviram</p> <p><b><u>Vice Dean for Education</u></b> - Prof. Zaher Azzam</p> <p><b><u>Vice Dean of Strategic Development</u></b>- Prof. Yaron Har-Shai</p> <p><b><u>Vice Dean Director of Technion American Medical Program</u></b>- Prof. Andrew Levy</p> <p><b><u>Head of Administration</u></b> - Ms. Asnat Erez</p>