

APPENDIX 1 Assessment Reference Framework for Medicine LEVEL 7 (EQF) Master/Single Cycle

DIMENSION 1: MEDICAL EXPERT			
	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate a depth and breadth of understanding of biomedical and clinical sciences, and other domains which are relevant to health.	Demonstrate the ability to perform patient-centered clinical assessment, make an informed shared decision to establish a management plan, and deliver supportive and empathetic care.	Act on the basis of professional values to provide evidence-informed, effective, efficient and safe patient- or community-oriented care.
Biomedical and Clinical Sciences	Subset 1.1 Explain key elements of the biomedical and clinical sciences, and the main strategies, methods, and resources used in the diagnostic process and treatment of patients.	Demonstrate basic examination, diagnostic and therapeutic and rehabilitation skills appropriate to the situation, and in a manner that is respectful to patients.	Apply medical practice to the patient in an evidence-informed manner considering profession-specific ethical and legal principles.
Evidence-informed Medicine	Subset 1.2 Explain the principles and methods of evidence-informed medicine.	Develop searchable questions based on clinical problems, search and evaluate the best available evidence, and communicate the evidence empathically in a form that patients can understand.	Apply the principles and methods of evidence-informed medicine to specific clinical problems; provide evidence-informed shared decision-making in cooperation with patients.
Patient Safety	Subset 1.3 Explain the major patient safety issues in inpatient and outpatient healthcare settings and the frequency with which they occur.	Identify patient safety factors in one's own work environment as a cause of adverse events and potential harm.	Respond appropriately to patient safety issues; use research evidence to advocate and promote standards and legal frameworks to improve safety.

DIMENSION 2: SCHOLAR

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of relevant medical humanities, and of the strategies and methods of scientific research, communication, and facilitated learning.	Identify, interpret and communicate medical knowledge; propose and design research in accordance with scientific and ethical principles; use tools and strategies to facilitate learning relevant to healthcare.	Contribute to the advancement of evidence-informed medical practice through research, learning facilitation and scientific communication.
Subset 2.1 Medical humanities	Demonstrate knowledge and understanding of relevant medical humanities.	Reflect upon and discuss the influence of medical humanities on current medical practice.	Critically integrate knowledge of medical humanities into clinical care.
Subset 2.2 Research	Demonstrate knowledge and understanding of the principal strategies, methods, and resources for healthcare research, as well as their application, limitations, and underlying principles of bioethics and scientific integrity.	Propose and design a research project, choosing appropriate strategies, methods, and resources to address a specific medical question; identify and critically appraise information for the practice of evidence-informed medicine; recognize bioethical issues relevant to medical research and propose measures to ensure scientific integrity.	Engage in research on a relevant medical question resorting to diverse strategies, methods and resources from multiple disciplines.
Subset 2.3 Scientific communication	Demonstrate knowledge and understanding of methods and tools of scientific communication, including written, verbal, technology-enabled, and alternative forms, as well as their purpose and limitations.	Use different methods and tools of scientific communication, including written, verbal, technology-enabled, and alternate forms, considering their context and purpose; identify the context in which specific information was created and disseminated, and critically evaluate the quality, credibility, reliability and	Share specific knowledge of the medical sciences using tools and methods that are appropriate to the context and specific needs of the targeted audience; analyse communicated information from healthcare stakeholders with critical evaluation of sources.

		relevance of information and its sources.	
Subset 2.4 Learning facilitation	Explain the basic principles of learning and its facilitation.	Use tools and strategies to facilitate learning.	Apply appropriate tools and strategies for effective learning facilitation in different contexts.

DIMENSION 3: INNOVATOR

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge of the strategies and resources necessary for innovation and implementation in order to improve and ensure equitable and sustainable healthcare.	Demonstrate critical and strategic thinking to contribute to equitable and sustainable healthcare in diverse multidisciplinary settings.	Identify the need for change and drive innovation in order to improve equitable and sustainable healthcare.
Subset 3.1 Health Technologies	Describe the latest healthcare technologies and their applications.	Demonstrate skills to effectively deal with healthcare technologies, to collect, analyze, and interpret data, to make decisions in and for multidisciplinary settings.	Use health technologies critically and appropriately to improve healthcare and environmental sustainability.
Subset 3.2 Health Care Resources	Describe the principles of healthcare economics, resource allocation, incentive systems and quality management, as well as their significance for the practice and sustainability of healthcare.	Recognize resource needs and gaps, assess appropriate allocation and prioritization strategies, propose new perspectives, and consider their implication in setting goals.	Make decisions that result in the allocation and prioritization of healthcare resources.
Subset 3.3 Evolving Healthcare	Describe innovation and change management strategies; discuss the importance of managing the emotional and psychological impact of change, and the role of leadership and communication.	Plan and set goals for innovation and meaningful change using appropriate change management strategies applicable to healthcare.	Develop and implement new processes in the healthcare system and participate in the medical/scientific and structural improvement of healthcare in order to safeguard sustainable, patient-centered medicine.

DIMENSION 4: COLLABORATOR

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility Competences)</i>	<i>(Wider</i>
Level descriptor	Demonstrate a depth and breadth of knowledge required to collaborate effectively with patients and their personal networks, healthcare professionals, the community and other relevant stakeholders.	Demonstrate the capability to engage in effective collaboration with patients and their personal networks, healthcare professionals, the community, and other relevant stakeholders.	Participate in effective collaboration with patients and their personal networks, healthcare professionals, the community, and other relevant stakeholders to promote healthcare.	
Subset 4.1 Patient-centered collaboration	Explain the methods and strategies for effective collaboration with patients and their personal networks, considering one's own roles, duties and responsibilities.	Demonstrate effective and trusting collaboration with diverse patients and their personal networks.	Create a trusting and effective collaboration with patients and their personal networks for shared decision-making.	
Subset 4.2 Collaboration with healthcare professionals	Explain the methods and strategies for effective collaboration with healthcare professionals, considering one's own roles, duties, and responsibilities, as well as that of other collaborators.	Demonstrate effective and trusting collaboration with members of multidisciplinary and interprofessional teams to optimize patient care.	Collaborate with members of multidisciplinary and interprofessional teams to optimize patient care.	
Subset 4.3 Collaboration with the community and other stakeholders	Explain the methods and strategies for effective collaboration with the community and other relevant stakeholders, considering one's own roles, duties and responsibilities.	Reflect on the dynamics of collaboration with the community and other relevant stakeholders.	Engage critically with the community and other relevant stakeholders to promote healthcare.	

DIMENSION 5: LEADER

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of the role and function of a leader in a healthcare team and in healthcare systems.	Demonstrate the ability to lead a multidisciplinary healthcare team, manage time and resources effectively, and delegate or hand over patient care appropriately.	Lead a healthcare team and foster teamwork to facilitate strategic planning and decision-making in patient care.
Subset 5.1 Team leader	Explain essential concepts of group and power dynamics, and of leadership and teamwork; describe the roles, duties and responsibilities of the leader and other members of the healthcare team, recognizing the sociocultural and professional characteristics of each and considering their potential impact on the intended goal.	Demonstrate the ability to lead a multidisciplinary healthcare team using effective verbal and non-verbal communication methods and adopting an open and respectful attitude; organize worktime for oneself and the team; define priorities, goals and tasks, including delegating and handing over patient care.	Lead a healthcare team, act as a role model, and foster a culture of safety, trust, openness, fairness, honesty, and accountability within the team; take defined organizational, work and treatment procedures into account, recognize errors and communicate adequately with colleagues and superiors as well as with patients and their network.
Subset 5.2 Care and resource management	Describe the tasks and functions of institutions, organizations, associations in the healthcare system, and the essential legal and financial foundations of healthcare.	Demonstrate the ability to strive for a balance between cost, effectiveness, and available resources.	Incorporate cost, effectiveness and availability of resources in the decision-making process on an individual and community level.

DIMENSION 6: PROFESSIONAL

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of relevant ethical, legal and professional standards, quality assurance, reflective practice and accountability towards patients, and one's own professional identity and well-being.	Demonstrate the ability to act in accordance with ethical, legal and professional standards; reflect and manage personal and professional demands and uncertainties; recognize and manage conflicts of interest; engage in self- and peer-reflection and feedback.	Act professionally in accordance with ethical, legal, and professional standards, be accountable for patient safety within the healthcare system, and engage in self-care and reflection.
Subset 6.1 Professional identity and Wellbeing	Describe the values, norms, roles, and responsibilities of the profession; describe aspects influencing the well-being of a professional, including environmental, emotional, and physical factors, and how to prevent burnout.	Reflect on roles, behaviors and attitudes that constitute the professional identity; apply techniques and strategies for professional selfcare to promote well-being and prevent turnout.	Integrate personal values and beliefs with the norms of the profession to develop a cohesive professional identity; perceive own well-being and its effects on others; apply techniques and strategies for selfcare as a professional.
Subset 6.2 Ethical, legal, and professional standards	Describe basic ethical and legal principles governing the practice of medicine; describe professional standards and critically assess their significance for the medical profession and its legal context.	Demonstrate the ability to adhere to ethical, legal and professional standards in different contexts, in relation to patients and other health professionals.	Treat patients safely and respectfully according to ethical standards while preserving their autonomy and their individual values and needs; act in compliance with professional and legal standards.
Subset 6.3 Quality assurance	Explain the essential legal requirements of quality management, including quality assurance, and the principles of clinical risk management.	Demonstrate the ability to apply quality assurance strategies and promote adherence to them by the healthcare team.	Apply quality assurance and management measures.

Subset 6.4
Reflective practice and
accountability

Describe reflection techniques and strategies, and the principles of constructive feedback.

Reflect on knowledge of health and disease along social, biological, psychological, historical, and cultural dimensions, and recognize uncertainties; analyze situations in terms of success, mistakes, conflict of interest, biases, and uncertainties, manage alternatives, and make decisions for future practice accordingly; provide timely, appropriate and constructive feedback within the healthcare team; reflect and recognize one's own strengths, weaknesses and biases that may interfere with the quality of patient care.

Reflect upon one's own competencies realistically and assigns tasks and responsibilities accordingly; accept feedback, reflect on it and act upon it; consider the patient's individual ideas of health and illness, adopt different perspectives including deliberate non-action and watchful waiting, and be at the disposal of the patient as an expression of caring support; participate regularly in communities of reflection

DIMENSION 7: COMMUNICATOR

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of communication methods and strategies to handle complex information in multidimensional contexts.	Demonstrate the ability to communicate with patients and their networks, with members of interprofessional and multidisciplinary teams, with members of the community and with other relevant stakeholders.	Communicate effectively and respectfully with patients and their networks, healthcare teams, members of the community and other relevant stakeholders
Subset 7.1 Foundations of Communication	Explain key elements of medical communication, including their theoretical principles, purpose and limitations.	Use different means of communication effectively according to its purpose.	Communicate effectively using a method and manner that is appropriate to the context and its purpose.
Subset 7.2 Patient-centered communication	Explain methods and strategies for effective communication with patients and their personal networks.	Demonstrate active listening, considering patient diversity and responding to different perceptions of illness; engage in shared decision-making with patients and their personal networks.	Create a trusting and effective relationship with the patient and their personal network utilizing relevant forms of communication; demonstrate positive influence of communication on patient autonomy and empowerment.
Subset 7.3 Communication in healthcare teams	Explain methods and strategies for effective communication within multidisciplinary and interprofessional healthcare teams.	Demonstrate effective communication within multidisciplinary and interprofessional healthcare teams using appropriate methods and strategies.	Communicate openly, respectfully, and effectively in multidisciplinary and interprofessional teams.
Subset 7.4 Communication with the community and other stakeholders	Explain methods and strategies for effective communication with members of the community, patient/professional associations, institutions, the media and other relevant stakeholders.	Demonstrate effective communication with members of the community and other relevant stakeholders using diverse methods appropriate to the context.	Communicate effectively with members of the community and other relevant stakeholders, using appropriate methods and strategies.

DIMENSION 8: HEALTH ADVOCATE

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of the determinants of health, healthcare systems and policies for disease prevention and health promotion, the interdependence of human and planetary health, and the role of climate and environmental crises in local and global health threats.	Demonstrate the ability to identify the health needs of individuals and populations, and the barriers to healthcare they may encounter; discuss the link between human health and the health of the planet; propose sustainable measures for health promotion and disease prevention to address local and global health challenges, including those related to climate and environmental crises.	Promote human health, including health empowerment on an individual, community and planetary level, health literacy, and change in healthcare systems and policies to encourage sustainability, equality, equity, diversity and inclusiveness.
Subset 8.1 Individual and community health	Demonstrate knowledge and understanding of the determinants of health, including biological, psychological, social, cultural, environmental, educational, and economic determinants; describe essential concepts in public health including disease prevention and health promotion, the role and responsibilities of healthcare professionals, the determinants of health and health disparities, and the barriers to healthcare at local, national, and global levels.	Identify the health needs of individuals and populations, considering their biopsychosocial status, their health-related risk and protective factors, and the barriers to healthcare they may encounter; propose measures for health promotion and disease prevention that can be incorporated into the individual consultation or can be applied at the level of the community or population, locally or globally.	Assess and promote healthy living and literacy of individuals and communities; advocate proactively for the health needs of individuals and communities.
Subset 8.2 Healthcare systems and policies	Describe local, regional, national and international institutions and organizations, as well as public health systems and healthcare policies, as they relate to health promotion and disease prevention.	Contribute to the duties and responsibilities of local, regional, national and international institutions and organizations, as well as public health systems and healthcare policies, in promoting health and preventing disease, and discuss the challenges and opportunities faced.	Promote change in healthcare systems and policies to encourage sustainability, equality, equity, diversity, and inclusiveness.

Subset 8.3
Health and environment

Describe fundamental concepts of planetary health and sustainability in relation to human health and healthcare provision; recognize key local and global health challenges related to the interdependence of human health and ecosystems, and how climate and environmental crises affect health and contribute to health disparities.

Discuss the link between human health and the environment in complex socio-ecological systems; critically examine the local and global origins of health challenges, considering their social, cultural, economic and ecological dimensions; compare and contrast the sustainability of tools, technologies, and approaches to address emerging health threats.

Identify healthcare areas that require innovation, improvement, or transformative change to meet environmental health threats; promote sustainable health on an individual, societal and planetary level; advocate for sustainable healthcare practices to safeguard the local and global environment; disseminate planetary health values at various levels of society and governance and contribute to preparedness for emerging global crises.

DIMENSION 9: LIFELONG LEARNER

	<i>Knowledge</i>	<i>Skills</i>	<i>Autonomy and Responsibility (Wider Competences)</i>
Level descriptor	Demonstrate knowledge and understanding of strategies and resources for lifelong learning and professional development.	Identify professional development needs and use available resources to address them.	Commit to excellence in practice through lifelong learning and take responsibility for continuous personal and professional development.
Subset 9.1 Self-awareness	Demonstrate awareness of oneself, current knowledge and skills, the need for development, and personal learning preferences; describe strategies for self-evaluation and reflection.	Critically evaluate one's own level of training, recognizes its limits, and reflect on learning and development needs.	Demonstrate adequate self-awareness, act upon it, and be mindful of one's influence on interactions with others and on decisions made in patient care.
Subset 9.2 Self-directed learning	Demonstrates knowledge of learning styles and strategies, including time management, to facilitate self-directed learning; describe primary, secondary, and tertiary sources of health-related information (including scientific and medical literature, training courses and conferences, databases, guidelines, audiovisual media, and others), as well as the appropriate search systems and strategies to make selections.	Apply appropriate learning strategies to address professional development needs, including setting goals, planning, and managing time for self-directed learning; use available resources to search, identify and select health-related information, and critically appraise content and sources.	Exhibit autonomous motivation to develop continuously and lifelong through critical evaluation and application of health-related information and resources; show curiosity and develop professional competence as a continuous process of review and adaptation of medical practice and patient care.
Subset 9.3 Community/team-directed learning	Demonstrate knowledge of the functioning of professional networks, and the need for development in a changing professional context.	Demonstrate the ability to navigate the dynamics of professional networks, and be open to developing one's knowledge and skills according to the needs of the network.	Show self-development according to the needs of the professional network; uses appropriate sources and professionals to compensate for the gaps in one's own professional competence.

Sources of inspiration

- CanMeds Framework 2015 <https://www.royalcollege.ca/ca/en/canmeds/canmeds-framework.html>
- Patientensicherheit eV, A. (2016). Roads to patient safety: framework of learning goals for patient safety competencies. A Recommendation by Aktionsbündnis Patientensicherheit eV (APS) for organisations and teaching staff in the education and training of health care professionals.
- Andermann, A., Ginsburg, L., Norton, P., Arora, N., Bates, D., Wu, A., ... & Patient Safety Research Training and Education Expert Working Group of WHO Patient Safety. (2011). Core competencies for patient safety research: a cornerstone for global capacity strengthening. *BMJ quality & safety*, 20(1), 96-101.
- Wabnitz K, Schwienhorst-Stich EM, Asbeck F, Fellmann CS, Gepp S, Leberl J, Mezger NCS, Eichinger M. National Planetary Health learning objectives for Germany: A steppingstone for medical education to promote transformative change. *Front Public Health*. 2023 Feb 16;10:1093720. doi: 10.3389/fpubh.2022.1093720. PMID: 36937826; PMCID: PMC10015604.
- NKLM (National Competence-Based Learning Objectives Catalogue for Medicine (Germany), 3rd revised edition, 2020; MFT Medical Faculty Association of the Federal Republic of Germany e. V., was considered for the description of the nine dimensions level descriptors.
- Zinsstag J., Schelling E, Crump L, Whittaker M, Tanner M, Stephen C. One Health. 2nd Edition. The Theory and Practice of Integrated Health Approaches. CAB International 2021.
- Framework for undergraduate medical education in the Netherlands <https://www.nfu.nl/en/themes/professional-future/medicine-programmes/framework-undergraduate-medical-education>