The NursingAI framework for technology-related competencies for nursing practice (TCNP) was developed in international and interprofessional collaboration. It is a dynamic document, divided into four core domains in terms of technology literacy, which are based on the nursing process.

Each domain is exemplified by competencies that are partly synthesized or taken out of existing frameworks and partly developed newly, as can be seen in table 1. Due to ongoing development of technologies, which differs according to clinical setting or country, competencies in the TCNP framework are formulated in broad terms, so as to facilitate their adaptation to local circumstances.

Table 1: NursingAI competency framework for the use of technologies in nursing practice (TCNP)

Domains	Competencies
Assessment Competencies that are needed for identification of technology-related needs and opportunities for improvement due to technologies in nursing practice	- Identification of *needs for systematic information processing* (Mantas & Hasman, 2017) - Identification of patients' needs that can be met by robotics and AI technology in nursing practice - Identification of working processes in nursing practice that can be supported by robotics and AI technology
Planning Competencies that are needed for identification of existing technologies and their added value to nursing practice, as well as for participation in design and development	- Generation and communication of ideas for information systems, robotics and AI technologies that might be helpful for nursing practice - Active participation in developmental processes by communication about nursing practice and needs with technologists - Consideration of legal aspects regarding the use of information and communication, robotic and AI technologies

of new technologies	- Identification of the *value and relevance of specific data and information systems*, robotic and AI technologies *for any given set of circumstances or health situations* (Nagle et al. 2017)
	- *Monitoring and maintaining vigilance over data/technologies to identify those that add value to a given health situation* (Nagle et al. 2017)
	- Knowing *characteristics, functionalities and examples of information systems*, robotics and AI technologies *in nursing practice and as support for patients* (Mantas & Hasman, 2017)
	- Reflection on ethical aspects concerning technologies in nursing practice
	- Anticipation of potential difficulties in nursing practice that come along with information and communication systems, robotics and AI technologies

Implementation
 	
Competencies that are needed to perform a patient-centred, efficient and responsible use of technologies in nursing practice
	- Usage of Communication and Documentation software
	
	   o Patient-centred *efficient and responsible use of information processing tools, to support nurses in their practice and decision making* (Mantas & Hasman, 2017)
	
	   o *Appropriate use of coding systems, terminologies, and taxonomies* (Mantas & Hasman, 2017)
	
	- *Engaging in data analytics* in terms of evidence based nursing practice
	
	   o *Reporting outcomes*
	
	   o *Predictive and retrospective analyses* (Nagle et al. 2017)
	
	   o *Ethical and security issues* (Mantas & Hasman, 2017)
	
	- Information literacy
	
	   o recognize when information is needed
	
	   o find it in digital databases

	o evaluate and use it appropriately (TIGER Initiative, 2015)
	- *Managing of information systems*, robotics and supportive AI technologies (Mantas & Hasman, 2017)
	- Patient-centred, efficient, and responsible controlling and handling of robotics and supportive AI technologies
	- Usage of robotics and supportive AI technologies with regard to ethical aspects, dignity, autonomy and self-responsibility of patients
	- *Identification of the broader scope and considerations for change management and the complexities of technology adoption in the context of connected health* (Nagle et al. 2017)
	- Consideration of *socio-organizational and socio-technical issues, including workflow/process modelling and reorganization* (Mantas & Hasman, 2017)
	- *Methods of project management and change management* (Mantas & Hasman, 2017)
	- Supporting and advising others (colleagues, patients) in the appropriate use of information and communication systems, robotics and AI technologies
	- Promoting the patient-centred and responsible use of information systems, robotics and AI technologies to support health care professionals' practice, patients' care and activities of daily living
	- Monitoring of robotics and AI technologies in terms of functionality, including adequate reaction in case of malfunctioning
Evaluation Competencies that are needed for the evaluation of technologies in terms of their usefulness for nursing practice	- Evaluation of information systems, robotics and AI technologies in nursing practice
	- Monitoring of information and communication systems, robotics and AI technologies in terms of quality, functionality and practicability
	- Reflection and discussion about ethical and legal aspects based on the experiences information and communication systems, robotics and AI

| | technologies in nursing practice |
| | - Documentation and reporting of lessons learned with information and communication systems, robotics and AI technologies in nursing practice |

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