

## Supplement 1 – Inventory, Description and Examples of all Study Variables

**Table 1. Inventory, Description and Examples of all Study Variables and of the Risks to Competence and Supports to Competence Identified in the Literature**

Area	Risk/Support Category	Description	Examples
A. Type of health profession	Physician	One of 4 health professions in study. Other words for this profession include “doctor” and “medical doctor”. Refers to individuals at any stage of the physician competence life cycle (e.g. medical student, resident, practising physician).	
	Other health professions (e.g. dentists and nurses)	Other health professions were only included when the study also discussed one or more of the 4 professions of primary interest.	
	Pharmacist	One of 4 health professions in study.	
	Occupational therapist	One of 4 health professions in study.	
	Physical therapist	One of 4 health professions in study. Another word for this profession is “physiotherapist”.	
B. Competence life cycle	Practice	Working in the health field as an autonomous practitioner	
	Resident	Post-professional education of physicians, called residency education or graduate medical education, leading towards a certification or specialty designation. If education of another profession was not post-professional, it was considered field- based education.	
	Field-based education	The practical education of one or more of the health professions of interest. Includes clinical-based training for physiotherapists and clerkship or internship education for physicians.	
	Other	Articles where the competence life-cycle was not specifically mentioned.	
C. CanMEDS Roles <sup>15</sup>	Medical Expert	Demonstrating clinical knowledge, skills and abilities required for effective patient care.	Demonstrating mastery of clinical content related to discipline or profession.
	Communicator	Communicating with patients and providing appropriate written documentation.	Developing a rapport; appropriate delivery of information; developing a common understanding; promoting and practising shared-decision making; Includes communication through admission notes, progress notes, operative notes and/or discharge notes.
	Professional	Demonstrating ethical practice, high personal standards of behaviour, accountability to the profession and society, profession-led regulation, and	Demonstrating respectful conduct and behavior; utilizing ethical decision-making; self-confidence in one’s skills and abilities.

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		maintenance of personal health.	
	<b>Scholar</b>	Demonstrating commitment to life-long learning, utilizing evidence-informed decision making, teaching and research.	Utilizing evidence-based practice; teaching, at all levels; personal learning and study skills (but not exam support or preparation); accepting feedback; demonstrating the practice of reflection for lifelong learning.
	<b>Collaborator</b>	Working effectively with other health professions including teamwork, managing differences and resolving conflict.	Working within a team; communicating with colleagues; understanding and respecting both the shared and independent roles and responsibilities of all members of an interprofessional team.
	<b>Manager</b>	Managing time, resources and priorities, including supervision of learners.	Managing the operational and system aspects of care, including organization, quality improvement and patient safety.
	<b>Health Advocate</b>	Advocating for care or services for individual patients, the community or the patient population.	Mobilizing resources for patients and for health promotion and ongoing quality improvement activities.
<b>D. Risks to competence</b>	<b>Transitions</b>	Dyscompetence or differences in performance associated with change(s) in work or professional status, in focus of practice and/or as experienced by new graduates.	Transitioning back into clinical practice after time away (e.g. due to childrearing, health issues); retraining for a different specialty (most often from one's current specialty to Family Medicine); the transition from learner to independent practitioner.
	<b>International graduate</b>	Dyscompetence or differences in performance associated with health professionals that were educated in a different country than where the study took place.	Comparing the risk of disciplinary action between US medical graduates and non-US medical graduates; exam scores or certification results between locally educated and internationally educated practitioners.
	<b>Lack of clinical exposure/experience</b>	Dyscompetence or differences in performance associated with knowledge/competence <i>gaps in certain clinical areas arising from insufficient volume of procedures and patients</i> with a particular condition to attain or maintain competence.	Lack of sufficient volume of experience within a certain topic area to attain and maintain competence (e.g. HIV, obstetrics).
	<b>Age</b>	Dyscompetence or differences in performance associated with the person's age, including youth and older age.	Lower measures of competence with older practitioners close to retirement or younger physicians with little experience.
	<b>Gender</b>	Dyscompetence or differences in performance between men and women.	Assessments of knowledge, attitudes and/or clinical performance; risks/predictors for burnout and/or depression; adherence to guidelines; rate of complaints; predictors for disciplinary action.
	<b>Practice features</b>	Dyscompetence or differences in performance associated with geographical or office features of the practice.	Includes articles that discuss how the location of practice (e.g. rural versus urban), professional isolation, and/or size of practice affects competence.
	<b>No certification</b>	Dyscompetence or differences in	Examining the predictors of certification

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		performance associated with presence/absence of specific specialty certification.	(e.g. IMG failure rates on certification exams); examining the associations between certification status and quality assurance program results, risks for disciplinary action, rate of complaints and/or medical errors.
	<b>Wellness</b>	Dyscompetence or differences in performance associated with physical or mental health related issues.	The effects of fatigue, stress, burnout, substance abuse, physical health issues, and/or other mental health issues on competence.
	<b>Resources</b>	Dyscompetence or differences in performance associated with resources, including people, money and time.	The impact of insufficient administrative support; restricted access to library resources; high workload (as a systemic issue, e.g. facility or hospital does not hire sufficient quantity or quality of staff); and inadequate infrastructure (access to / quality of equipment, OR, medications) on competence.
	<b>Adequacy of practice or education</b>	Dyscompetence or differences in performance associated with a previous educational program that did not adequately prepare learners with particular skills or with specific knowledge due to brevity or low quality.	Lack of adequate coverage in entry-level training; practising professionals who lacked training on newer protocols.
	<b>Area of specialty/certification</b>	Specialty or certification-based variations in dyscompetence. Certification and specialty are often used interchangeably.	Comparing skills and abilities between professionals of different specialties.
	<b>Previous disciplinary activity</b>	Impact of previous complaint or discipline matter by a regulatory authority, specialty organization or health facility on dyscompetence.	Associations between current rates of disciplinary action(s), formal complaints or legal malpractice activities, with previous complaints or disciplinary actions for the same individual.
	<b>Other</b>	Differences related to risks to competence not included in the higher-volume defined topics.	Studies considering how practitioner language and/or ethnic background affects performance.
<b>E. Supports to competence</b>	<b>Continuing education participation</b>	Involvement in an educational activity, such as a course, workshop, or conference during the practice competence life-cycle (i.e. post-specialty/program-specific training).	Included any form of continuing education participation.
	<b>Educational information/program features</b>	Actions or interventions included in a pre-existing educational program that are designed to improve the learning, knowledge translation and application of the material.	Any activity that was designed to enhance the learning and application of material such as quizzes with feedback, readings, online modules, interactive activities, or small group work with follow-up. May also include new components brought into a program such as the re-introduction of ophthalmic training into the medical school curriculum.
	<b>Personal support and feedback</b>	Mentorship and feedback provided or	Includes mentoring, teaching and

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		available to individuals to inform or improve clinical skills and/or knowledge.	coaching others (e.g. students or colleagues) to improve their performance.
	<b>Clinical exposure/experience</b>	Time spent in specific rotations or at specific clinical sites, with a particular patient/client population.	Sufficient experience (e.g. with specific surgical and obstetrics procedures) and/or volume of patients with a certain condition, to support competence in this area.
	<b>Quality assurance participation</b>	Formal activities within a structured organizational quality assurance program, in the workplace.	The positive impact of participation in chart audits on competence; programs identifying the reasons behind a lack of adherence to guidelines.
	<b>Support through structure or organization</b>	Employer or site-specific structures or processes that develop or maintain individual or professional competence.	Reporting on the practice support needs of health professionals through some type of needs assessment (including community health promotion, federal regulation updates and technical assistance); providing time off, compensation and/or other institutional supports (such as online library access) to health professionals for CE/CPD.
	<b>Professional organization participation/systems</b>	Mandatory participation in formal personal activities to develop or maintain competence as established through regulatory, association, or specialization requirements.	Participation in the RCPSC Maintenance of Competence Program (MOCOMP), CFPC Mainpro and/or American Board of Internal Medicine (ABIM) Maintenance of Competence (MOC) exam.
	<b>Technology</b>	Mechanical or electronic means to develop or maintain competence via simulation, eLearning opportunities and electronic decision-support rules.	Examining whether simulation training results in short and/or long-term improvement in the management of clinical events; whether online learning activities enhance learning in comparison to other educational activities.
	<b>Reflection and self-assessment</b>	Approaches to developing or maintaining competence that include introspection, personal analysis and consideration of adequacy of competence or demonstration of competence.	Discussing the use of portfolios and the overall utility of reflective activities.
	<b>Assessment and feedback through tools</b>	Approaches that employed a specific tool to measure professional competencies, to determine the adequacy of performance and/or to provide information and motivation for improvement.	Exploring the value of an information management system to collect data on competencies and provide feedback to residents (e.g. chart entries for preventive health measures); multi-source feedback with reports back to the practitioner; knowledge tests associated with an education module that provided feedback to the learner.
	<b>Performance review</b>	A formal or structured work-based process whereby a practitioner is provided with information on the adequacy of performance and/or	Annual on-the-job evaluation of performance.

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		provided with information and motivation for improvement. This information is generally formative and intended to assist in performance improvement.	
	<b>Other</b>	Approaches to developing or maintaining competence not included in other high-volume defined topics.	Geographical location of education, institution and/or patient care; accreditation standards for educational programs; having core competencies defined; self-directed learning activities.