Nutrition Knowledge and Competency Framework for Medical Graduates 2014

Explanatory Notes

The Nutrition Competency Framework (NCF) describes the learning outcomes for each of the knowledge and skill based competencies for medical graduates. A relevant range of variables provide contexts and environments in which competency could be demonstrated. Important explanatory notes to the NCF include:

- The competencies have been mapped to current Australian Medical Council (AMC) Graduate Outcome Statements:
- The nutrition competencies and associated student learning outcomes cannot be modified;
- Owing to the breadth of variables, some may be repeated as are applicable across many contexts and/or environment to demonstrate competency
- Assessment strategies have been developed
- A medical graduate should demonstrate all competencies by the end of the medical training. Due to various medical training models, time periods (eg: end year 1) have not been specified.
- The term Student Learning Outcome, Graduate Competencies and/or Graduate Attributes may be terms used across various institutions to describe the skills and knowledge students will achieve.

Glossary of Terms

ADGs	Australian Dietary Guidelines		
APD	Accredited Practising Dietitian		
CAM	Complementary and Alternative Therapies		
CCF	Congestive Cardiac Failure		
СНО	Carbohydrate		
СМР	Calcium / Magnesium / Phosphate (Blood Test)		
FBC	Full Blood Count		
Fe ²⁺	Iron		
GI	GlycaemicIndex		
K ⁺	Potassium		
MAO	Monoamine Oxidase Inhibitors		
MNA	Mini Nutrition Assessment		
MST	Malnutrition Screening Tool		
MUST	Malnutrition Universal Screening Tool		
Na⁺	Sodium		
NCDs	Non Communicable Diseases		
#NOF	Fracture Neck of Femur		
NRS	Nutrition Risk Screening Tool		
NTDs	Neural Tube Defects		
PCOS	Polycystic Ovary Syndrome		
PG-SGA	Patient Generated Subjective Global Assessment		
PO ₄	Phosphate		
SGA	Subjective Global Assessment		
T2DM	Type 2 Diabetes Mellitus		
UEC Urea / Electrolyte / Creatinine (Blood Test)			

Table 1: In the first column K= knowledge, S= skill

	NEW AMC	Nutrition	Student Learning Outcomes	Range of relevant variables	Examples of
	GOS	Competency			Assessment
		(Knowledge or Skill Based)			Strategies
K1	1.1	Demonstrate understanding of the basic sciences in relation to nutrition	 Describe the functions of essential nutrients, and the basis for the biochemical demand for energy and nutrients Describe the integrative normal processes of a ppetite, eating, intestinal function, digestion, absorption and nutrient utilisation and common disorders that affect them Differentiate the energy and nutrient requirements across the lifespan for normal growth, structure and function 	 Sources anthropometric standards and reference ranges for individuals/groups Recognises clinical/biochemical standards and reference ranges for individuals/groups Identifies key macronutrients and micronutrients requirements and understands their biochemical functions eg: energy, protein, CHO, fat, iron, calcium, vitamin D, zinc of individual and/or population group and disorders which may affect digestion, absorption and requirements for these Describes gastrointestinal tract structure function; digestive and absorptive processes Describes fuel metabolism and homeostasis of carbohydrates, fats and protein Discusses hormonal control of hunger and satiety Explains the impacts on biochemical demand and contributors to energy intake and energy expenditure in the body a cross life course Differentiates the nutritional requirements a cross lifespan including infancy, childhood, adolescence, a dulthood, pregnancy, lactation and later life Identifies a ppropriate strategies to address nutrition requirements of clients in a range of settings eg: acute, rehabilitation, nursing home, community, primary care settings 	Written exam/MCQ OSCE Case report/studies Individual or community based assessment
К2	1.3 2.1,3.3,3.5 3.2 1.1, 1.2, 1.4, 1.5 3.2	Demonstrate knowledge on the interactive role of nutrition in health and the prevention of disease	 Describe the common nutrition related causes of mortality and morbidity in the population Explain the biochemical basis of how nutrition affects health and risk factors for disease Translate how disease can affect nutritional status 	 Identifies evidence of dietary links with non-communicable diseases eg: Diabetes, obesity, CVD (including hypertension), cancer, osteoporosis, nutrient deficiencies (eg: vitamin D, iron, folate) Describes the nutrition related risk factors across the lifecourse for various disease and predictors of mortality including::	Written exam/MCQs OSCE Case report/studies Individual or community assessment Referral letter

	NEW AMC	Nutrition	Student Learning Outcomes	Range of relevant variables	Examples of
	GOS	Competency			Assessment
		(Knowledge or Skill Based)			Strategies
		Skill baseu)		 3. Describes how diseases/disease processes impact nutritional status including: a) Mal nutrition associated with increased requirements and or decreased intake in common conditions including respiratory disease, CCF, gastrointestinal disorders including those related to surgery, #NOF, cancer and associated treatments, neurological impairment including dementia b) Gas trointestinal disease and micronutrient deficiencies eg: coeliac disease, crohns disease, short gut c) Eating disorders and weight loss/malnutrition/deficiencies d) Increased macro/micronutrient requirements for healing of pressure a reas (eg: long term institutionalised) e) Chronic renal and end stage renal failure and energy, protein, fluid, Na, K, PO4 requirements f) Starvation and refeeding syndrome g) Cystic fibrosis/inborn errors of metabolism and child growth/development h) Food allergy/intolerance and other practices requiring dietary restriction 4) Seeks advice/refers to nutrition and dietetics professional for complex cases	
К3	1.3 2.7, 2.12	Demonstrate knowledge of evidence based dietary strategies for prevention and treatment of disease	 Describe the role of nutrition in treatment of disease Describe the dietary management strategies for relevant medical conditions and disease Demonstrate an appreciation of nutrient drug-interactions 	1) Outline evidence based dietary management of nutritional and medical conditions: a) Cardiovascular Risk Factors: O Hypercholesterolemia, trans and saturated fats, fibre, plant sterols, omega 3 PUFAs, MUFAs) O Hypertension (sodium, alcohol, obesity) Overweight/obesity (energy) Diabetes (energy, protein, CHO intake, physical inactivity, GI)	 MCQs Short answer questions Case report/studies OSCEs
				b) Metabolic / endocrine disorders o Diabetes (energy, protein, CHO intake, physical inactivity, GI)	

	NEW AMC GOS	Nutrition Competency (Knowledge or Skill Based)	Student Learning Outcomes	Range of relevant variables	Examples of Assessment Strategies
				 PCOS (obesity, physical inactivity GI) Gastrointestinal disorders Gall bladder disease (obesity, saturated fat) Coeliac disease (gluten) Constipation/diarrhoea/diverticular disease (soluble and insoluble fibre, fluids, microbiome) Inflammatory Bowel Disease (energy, protein, fluid, electrolytes) Dietary intolerance (fructose, lactose, fructans, oligosaccharides) 	
				d) Renal Disease O ARF (electrolytes, fluid, energy, protein) O CRF (protein, fluid, electrolytes) O ESRF (energy, protein, fluids) O Electrolytes (phosphate, potassium, sodium)	
				e) Oncology o Malnutrition/weight loss (protein/ energy) f) Burns	
				 Wound Healing (protein, energy, fluid, micronutrients eg: Zinc g) Pulmonary disorders Malnutrition/weight loss (protein/ energy) Fluid overload (fluid and sodium) 	
				2) Describe drugs / treatments used that may affect nutritional status and dietary requirements for example a) Cardiovascular eg: warfarin and Vit K b) Endocrinology eg: thyroid radiation and iodine; metformin and vitamin B12 c) Renal eg: dialysis and electrolytes, protein d) Psychiatric eg: MAO inhibiters and tyramine; medications associated with weight gain	
К4	3.2 3.4, 3.8, 3.9 1.1, 1.2, 1.4, 1.5	Demonstrate a wa reness of food s ources of nutrients, food habits and the	 List the food sources of major nutrients Describe how the social determinants of health influence food consumption patterns and the consequences of this 	 List the main and macro micro nutrients provided by each food group in the Australian Guide to Healthy Eating Describe how the Australian Dietary Guidelines are used to promote health for individuals and communities as promoted by the Department of Health and Ageing 	MCQs Short answer questions

	NEW AMC	Nutrition	Student Learning Outcomes	Range of relevant variables	Examples of
	GOS	Competency (Knowledge or			Assessment Strategies
		Skill Based)			Strategies
		cultural and social importance of food	3. Appreciate the social and cultural importance of food	 Describe the food groups as outlined by the Australian to Healthy Eating as promoted by the Commonwealth Department of Health and Ageing (www.nhmrc.gov.au) and how this is used to promote quality and quantity of dietary intake amongst various age groups Discuss foods providing high a mounts of carbohydrate, protein, fats (including high poly and monounsaturated fats) and dietary fibre that are protective against disease eg: CVD, overweight, some cancers, diabetes, hypertension Discuss foods that contain high a mounts of micronutrients, especially iron, zinc, B group vitamins, calcium Identify examples of processed, ta keaways and other discretionary foods that contain high saturated and trans fats, sodium, sugar that are linked to disease (as noted in K2) Examine food labels to determine the major macro and micronutrient profiles offoods Identify community groups vulnerable to food insecurity and factors contributing to food insecurity (individual, household, community and state/federal levels) Describe how social and cultural interactions impact food availability, dietary intakes of individuals and populations and the type offood consumed eg: cultural cuisine, impact of occupational environment 	 Case report/studies Referrals OSCEs
S1	2.2	Demonstrate	1. As sess nutrition risk factors pertaining to	1. Integrates appropriate nutrition assessment* as part of the overall medical	• MCQs
	2.4	skills in the identification of nutritional risk, nutritional deficits and excesses	 over and undernutrition Integrate nutrition in the medical history and physical examination Interpret and integrate findings from the assessment to define nutritional problems 	assessment in all patients including: a) Food/Nutrition-Related History – eg: food intake, medication, complementary/alternative medicine use, food knowledge/beliefs and availability, physical activity, mental health status b) Anthropometry – assesses and utilises anthropometric data using recognised methods (height, weight, weight history, BMI, waist circumference, growth charts). c) Biochemical Data, Tests, Procedures – identifies, requests and interprets results of relevant tests that are clinically applicable to assess nutritional status (eg: UEC, CMP, FBC, Iron studies, hormones, micronutrients) d) Nutrition Focussed Physical Findings – physical appearance, musde and fat wasting, swallow function, appetite and affect e) Client History – medical/health/family history, treatments, therapy, occupational and social history	 Short answer questions Case report/studies OSCEs
				2. As s essment includes s election of tools and procedures suitable to the situation including use of validated nutrition screening and assessment tools	

	NEW AMC	Nutrition	Student Learning Outcomes	Range of relevant variables	Examples of
	GOS	Competency			Assessment
		(Knowledge or			Strategies
		Skill Based)			
				(eg: MST, MUST, NRS, MNA-SF, MNA, SGA,PG-SGA); evaluating data for	
				relevance/significance and validating information collected where possible.	
				3. Seeks advice/refers to dietetics professional (Accredited Practising Dietitian; APD) a) Identifies dietetic service, provides referral and appropriate case documentation including history, results of investigations and	
				previous management plans	
				 b) Formulates strategies to access expertise in a range of settings including rural, city and remote locations 	
				* Adapted from Academy of Nutrition and Dietetics, IDNT Manual, 4 th Edition 2013.	
S2	1.1, 1.2,	Demonstrate	1. Locate and critically appraise literature on	1. Accesses and uses suitable resources related to nutrition management of	• MCQs
	1.4, 1.5	a bility to interpret	nutrition related to prevention and	patients: research databases, professional associations (eg Dietitians	 Short answer
	2.15,	nutrition e vidence	treatment of disease	As sociation of Australia, Diabetes Australia, Baker IDI, National Heart	questions
	3.5,4.2	in a critical and		Foundation, Cancer Council) and dietetic professionals with APD credential.	• Case
		s ci entific matter	2. Apply an evidence-based approachin the		report/studies
		and apply	delivery of a ppropriate nutrition	2. Research Analysis:	 Referrals
		appropriately in	management in clinical practice	a) Re cognises the difference between clinical versus statistical	 OSCEs
		clinical practice		significance in nutrition management of patients	
				b) Describes common confounding variables that can impact nutrition	
				related research c) Identifies examples of non-evidenced based materials including	
				 c) Identifies examples of non-evidenced based materials including some complementary and alternative therapies (CAM) and practitioners 	
				3. Utilises currents dentific evidence and incorporates into the nutrition	
<u></u>	27 242	Da maa matmata	4 Applicational recognition to make the contract of	management of patients and adjust practice relevant to current evidence	
\$3	2.7, 2.12 2.7, 2.9,	Demonstrate	Apply clinical reasoning to prioritise Apply clinical reasoning to prioritise	1. Riskfactors that should be discussed include:	Literature review
	3.2	ability to apply basic dietary	nutritional management strategies 2. Explain nutritional risk factors for	 a) I ow fi bre and wholegrain cereals related to constipation, diverticular disease 	• Case
	2.7, 2.8,	strategies for	common diseases to patients and their	b) fruit and vegetable intake and cancer	re port/studies
	2.7, 2.8,	prevention and	families	c) low calcium intake and osteoporosis	
		treatment of	3. Provide basic evidence based advice on	d) weight gain and inactivity and type 2 diabetes	
		medical	nutrition to patients	e) high saturated fat intake, sodium and CVD	
		conditions and	4. Where a ppropriate integrate nutrition	f) s we etened drinks and weight gain	
		dis ease a nd	goals into their care plan, induding referral		
		trauma, with	to other professionals as required,	2. Discuss aspects of ADG's that relate to the individual client	
		re cognition that	particularly dietitians.		
		ma ny nutritional			

	NEW AMC GOS	Nutrition Competency	Student Learning Outcomes	Range of relevant variables	Examples of Assessment
		(Knowledge or Skill Based)			Strategies
		is sues require s pe cialist man agement by a die titian	5. Dietary strategies may include those for non-communicable diseases	 Using S1 and S2 decide on a ppropriate nutrition management strategies such as: to improve type 2 diabetes control, suggest weight loss / maintenance to treat CVD, reduce saturated fat / increase MUFA AND PUFA to improve lipid profile to assist failure to thrive children, suggested increased energy using supplements with specialist input form a Dietitian for coeliac diseases uggest strict gluten avoidance with specialist input form a Dietitian for mal nourished nursing home patients suggest increased eating frequency, energy dense foods and specialist Dietitian input d) Provide referrals either dietetic trained professionals; work as a team to ensure all aspects of their care plan are regularly addressed; keep in close touch with the allied health staff and ask from details of treatment as a self-learning vehicle 	
S4	2.13 4.4 4.4	Demonstrate the ability to apply principles of ethics related to nutritional management	Applies ethical and legal requirements to the decision making process concerning nutrition.	 Including decisions on: a) withholding or withdrawing of nutrition or hydration support b) deciding when enteral or parenteral nutrition is required and seek specialised nutritional advice including respecting patient choices c) seek medicolegal advice when indicated, for example in chronic eating disorders, child malnourishment, meal provision in aged care services Respects patients choices in decisions related to provision of nutrition via oral, enteral or parenteral routes 	 OSCEs Case reports/studies Referrals
\$5	3.6,3.7 4.8	Demonstrate ability to work effectively in a team with other health professionals to deliver optimal nutrition care	 Recognise the limitations of own knowledge and skill and refer or consult with a nother health practitioner appropriately Understand, respect, incorporate and support the roles of other health professionals in nutritional management of patients 	 Re cognises the importance of using a multi-disciplinary team approach to nutritional assessment and management of individuals and groups Demonstrates ability to engage respectfully and effectively with multidisciplinary team members Locates and utilizes services of community based organisations and NGOS that promote health and nutrition (eg: the Red Cross; Meals on Wheels; community health centres) Provides a patient with a written referral including relevant assessment and diagnostic information or uses newer technologies to communicate with other allied health professionals Effectively discusses and counsels individuals and groups regarding non-evidenced based practices that may be harmful to health, nutrition, financial status for an individual 	OSCEs Case reports/studies Referrals



APPFNDIX 1:

Accreditation Standards for Primary Medical Education Providers and their Program of Study and Graduate Outcome Statements

Graduate Outcome Statements

Overview

A thematic framework has been used to organise the Australian Medical Council's Graduate Outcome Statements into four domains. These domains collectively provide the requirements that students must demonstrate at graduation. The outcomes contained in each domain are necessarily interlinked when students enter clinical practice.

The domain framework is a reference for medical education providers. A number of providers have similar frameworks and it is not envisaged that all providers will necessarily organise their curriculum themes in this way. Providers will need to demonstrate how their program enables their graduates to meet the outcomes, which specify what the Australian Medical Council expects the provider to achieve and the health service employer expects the graduate to deliver. Each provider in their own context may wish to enable their graduates to demonstrate additional outcomes to the ones specified.

The four domains are:

- 1. Science and Scholarship: the medical graduate as scientist and scholar
- 2. Clinical Practice: the medical graduate as practitioner
- 3. Health and Society: the medical graduate as a health advocate
- 4. Professionalism and Leadership: the medical graduate as a professional and leader

It is important that the Graduate Outcome Statements are interpreted according to the level of training and experience that will have been gained by an entry-level practitioner. Graduates will not possess the clinical experience, leadership skills or advocacy skills of an experienced practitioner; but they will need the foundation upon which to be thoroughly prepared for internship and for building and developing their expertise in all fields of the profession.

Clearly medical education is a continuum, and many of the outcomes specified will be reflected further in outcomes expected from early postgraduate training and throughout a medical career, as new graduates continue to develop their clinical abilities.



Domain 1

Science and Scholarship: the medical graduate as scientist and scholar

On entry to professional practice, Australian and New Zealand graduates are able to:

- 1.1 Demonstrate an understanding of established and evolving biological, clinical, epidemiological, social, and behavioural sciences.
- 1.2 Apply core medical and scientific knowledge to individual patients, populations and health systems.
- 1.3 Describe the aetiology, pathology, clinical features, natural history and prognosis of common and important presentations at all stages of life.
- 1.4 Access, critically appraise, interpret and apply evidence from the medical and scientific literature.
- 1.5 Apply knowledge of common scientific methods to formulate relevant research questions and select applicable study designs.
- 1.6 Demonstrate a commitment to excellence, evidence based practice and the generation of new scientific knowledge.

Domain 2

Clinical Practice: the medical graduate as practitioner

On entry to professional practice, Australian and New Zealand graduates are able to:

- 2.1 Demonstrate by listening, sharing and responding, the ability to communicate clearly, sensitively and effectively with patients, their family/carers, doctors and other health professionals.
- 2.2 Elicit an accurate, organised and problem-focussed medical history, including family and social occupational and lifestyle features, from the patient, and other sources.
- 2.3 Perform a full and accurate physical examination, including a mental state examination, or a problem-focused examination as indicated.
- 2.4 Integrate and interpret findings from the history and examination, to arrive at an initial assessment including a relevant differential diagnosis. Discriminate between possible differential diagnoses, justify the decisions taken and describe the processes for evaluating these.
- 2.5 Select and justify common investigations, with regard to the pathological basis of disease, utility, safety and cost effectiveness, and interpret their results.
- 2.6 Select and perform safely a range of common procedural skills.
- 2.7 Make clinical judgements and decisions based on the available evidence. Identify and justify relevant management options alone or in conjunction with colleagues, according to level of training and experience.
- 2.8 Elicit patients' questions and their views, concerns and preferences, promote rapport, and ensure patients' full understanding of their problem(s). Involve patients in decision-making and planning their treatment, including communicating risk and benefits of management options.



- 2.9 Provide information to patients, and family/carers where relevant, to enable them to make a fully informed choice among various diagnostic, therapeutic and management options.
- 2.10 Integrate prevention, early detection, health maintenance and chronic condition management where relevant into clinical practice.
- 2.11 Prescribe medications safely, effectively and economically using objective evidence. Safely administer other therapeutic agents including fluid, electrolytes, blood products and selected inhalational agents.
- 2.12 Recognise and assess deteriorating and critically unwell patients who require immediate care. Perform common emergency and life support procedures, including caring for the unconscious patient and performing CPR.
- 2.13 Describe the principles of care for patients at the end of their lives, avoiding unnecessary investigations or treatment, and ensuring physical comfort including pain relief, psychosocial support and other components of palliative care.
- 2.14 Place the needs and safety of patients at the centre of the care process. Demonstrate safety skills including infection control, graded assertiveness, adverse event reporting and effective clinical handover.
- 2.15 Retrieve, interpret and record information effectively in clinical data systems (both paper and electronic).

Domain 3

Health and Society: the medical graduate as a health advocate

On entry to professional practice, Australian and New Zealand graduates are able to:

- 3.1 Accept responsibility to protect and advance the health and wellbeing of individuals, communities and populations.
- 3.2 Explain factors that contribute to the health, illness, disease and success of treatment of populations, including issues relating to health inequities and inequalities, diversity of cultural, spiritual and community values, and socio-economic and physical environment factors.
- 3.3 Communicate effectively in wider roles including health advocacy, teaching, assessing and appraising.
- 3.4 Understand and describe the factors that contribute to the health and wellbeing of Aboriginal and Torres Strait Islander peoples and/or Māori, including history, spirituality and relationship to land, diversity of cultures and communities, epidemiology, social and political determinants of health and health experiences. Demonstrate effective and culturally competent communication and care for Aboriginal and Torres Strait Islander peoples and/or Māori.
- 3.5 Explain and evaluate common population health screening and prevention approaches, including the use of technology for surveillance and monitoring of the health status of populations. Explain environmental and lifestyle health risks and advocate for healthy lifestyle choices.
- 3.6 Describe a systems approach to improving the quality and safety of health care.



- 3.7 Understand and describe the roles and relationships between health agencies and services, and explain the principles of efficient and equitable allocation of finite resources, to meet individual, community and national health needs.
- 3.8 Describe the attributes of the national systems of health care including those that pertain to the health care of Aboriginal and Torres Strait Islander peoples and/or Maori.
- 3.9 Demonstrate an understanding of global health issues and determinants of health and disease including their relevance to health care delivery in Australia and New Zealand and the broader Western Pacific region.

Domain 4

Professionalism and Leadership: the medical graduate as a professional and leader

On entry to professional practice, Australian and New Zealand graduates are able to:

- 4.1 Provide care to all patients according to "Good Medical Practice: A Code of Conduct for Doctors in Australia" and "Good Medical Practice: A Guide for Doctors" in New Zealand.
- 4.2 Demonstrate professional values including commitment to high quality clinical standards, compassion, empathy and respect for all patients. Demonstrate the qualities of integrity, honesty, leadership and partnership to patients, the profession and society.
- 4.3 Describe the principles and practice of professionalism and leadership in health care.
- 4.4 Explain the main principles of ethical practice and apply these to learning scenarios in clinical practice. Communicate effectively about ethical issues with patients, family and other health care professionals.
- 4.5 Demonstrate awareness of factors that affect doctors' health and wellbeing, including fatigue, stress management and infection control, to mitigate health risks of professional practice. Recognise their own health needs, when to consult and follow advice of a health professional and identify risks posed to patients by their own health.
- 4.6 Identify the boundaries that define professional and therapeutic relationships and demonstrate respect for these in clinical practice.
- 4.7 Demonstrate awareness of and explain the options available when personal values or beliefs may influence patient care, including the obligation to refer to another practitioner.
- 4.8 Describe and respect the roles and expertise of other health care professionals, and demonstrate ability to learn and work effectively as a member of an inter-professional team or other professional group.
- 4.9 Self-evaluate their own professional practice; demonstrate lifelong learning behaviours and fundamental skills in educating colleagues. Recognise the limits of their own expertise and involve other professionals as needed to contribute to patient care.
- 4.10 Describe and apply the fundamental legal responsibilities of health professionals especially those relating to ability to complete relevant certificates and documents, informed consent, duty of care to patients and colleagues, privacy, confidentiality, mandatory reporting and notification. Demonstrate awareness of financial and other conflicts of interest.