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MINIMUM COMPETENCE STANDARDS FOR LICENSURE OF PHARMACISTS TO WORK IN ZAMBIA

1.0 INTRODUCTION

The Health Professions Council of Zambia (HPCZ) is a statutory body that was established by the Health Professions Act No. 24 of 2009. The Act renames and continues the existence of the Medical Council of Zambia established by the Medical and Allied Professions Act of 1977. The Health Professions Act No. 24 provides for the registration of health practitioners and regulation of their professional conduct; provides for the licensing of health facilities and the accreditation of health care services provided by health facilities; and provides for the recognition and approval of training programmes for health practitioners.

Following the issuance of guidelines for the introduction of licensure examinations (LEX) for health professionals registrable with HPCZ, this bulletin provides an outline of the minimum competency standards for registrants who have successfully completed the Bachelor of Pharmacy degree (B.Pharm) or the equivalent seeking provisional or temporal registration to practice as a Pharmacist in Zambia.

2.0 Exit Examinations and Award of the Bachelor of Pharmacy Degree by Training Institutions

Training institutions, private or public, approved by the Health Professions Council of Zambia are mandated to examine and graduate their students under their own seal and authority. The Bachelor of Pharmacy degree or equivalent award is designated the primary qualification of the Pharmacist and it is a pre-requisite requirement for eligibility for licensure examinations. Accordingly, a holder of the Bachelor of Pharmacy degree or equivalent will be required to take and pass the HPCZ licensure examination to qualify for registration with the Council as a Pharmacist on **Provisional** or **Temporal** registration.

3.0 Licensure Examinations by the Health Professions Council of Zambia

A person shall not practise as a health practitioner, unless that person is registered as a health practitioner in accordance with the Health Professions Act No. 24 of 2009. In the exercise of its functions under this Act, the 2nd Council and the 3rd Council of the HPCZ instituted the LEX to help maintain standards given the emergence of multiple private and public training institutions. This “Minimum Competence Standards for LEX for Pharmacists to Work in Zambia” binds all parties regulated under this Act. Examination fees for licensure

examinations, as prescribed by the Council, are payable to the HPCZ as part of the eligibility to sit for licensing examinations.

The HPCZ Licensing Examination assesses a Bachelor of Pharmacy graduate's ability to apply scientific knowledge, skills and professional attitudes that are important in the practice of pharmacy and that constitute the basis of safe and effective pharmaceutical care for the patient. The HPCZ Licensing Examination includes, but is not limited to, theoretical and practical examinations which complement each and the other components. No component is a stand-alone in the assessment of readiness for professional pharmacy practice in Zambia.

The candidate will be assessed under three domains, namely:-

- Knowledge,
- Skills
- Attitude.

The above domains will be assessed by means of a theory exam comprising of multiple choice questions followed by a composite objective structured clinical/Practical examination (OSCE/OSPE).

The main **subject areas** (assessed under all three learning domains**)** for Pharmacists in Zambia are:

1. Pharmaceutics
2. Pharmaceutical and Medicinal Chemistry
3. Pharmacognosy
4. Clinical and General Pharmacology
5. Clinical and General Pharmacy practice
6. Toxicology and Therapeutics
7. Biopharmaceutics and Pharmacokinetics
8. Pharmaceutical Research processes

4.0 COMPETENCE OUTCOME GUIDELINES

The process of licensure seeks to detect the candidate's attainment in each educational domain (knowledge, skills and attitude) and evaluates the minimum competence standards as benchmarks for licensure to practice the profession. It also guides prospective candidate's learning and assessment by examiners. HPCZ, on behalf of the general public and

professional stakeholders, expects holders of the Bachelor of Pharmacy degree to meet the minimum competence standards outlined in this document.

5.0 OVERALL BACHELOR OF PHARMACY CURRICULUM OUTCOMES

At the successful completion of the programme, a graduate with Bachelor of Pharmacy degree or equivalent should be able to demonstrate the following competences:

1. Designs active pharmaceutical ingredients and products
2. Manages the manufacturing of pharmaceutical products
3. Designs optimal drug dosage regimens and conduct drug therapeutic monitoring
4. Provides pharmaceutical care and initiate pharmacotherapy as part of multi-disciplinary team as well as diagnose and treat minor ailments
5. Manages the pharmaceutical and medical devices supply chain
6. Evaluates medicines prescribed and dispense to the patients
7. Practices rational use of all medicines
8. Provides information and education on all medicines
9. Provides information and education natural sources of drugs and practice of alternative medicine
10. Demonstrates good leadership, communication and management skills and promotes public health
11. Conducts pharmaceutical and integrated health research
12. Exhibits professional and ethical conduct and demonstrates life-long learning skills.

KNOWLEDGE DOMAIN		
Competency/ Outcome	**Competency Statement**	**Specific Competencies**
1. Designs active pharmaceutical ingredients	The candidate should be able to apply Medicinal and Pharmaceutical Chemistry sciences to the practice of pharmacy:	1. Describes the principles and applications of chemical thermodynamics, reaction kinetics, electrolyte conductance, laws of electrolysis and the concept of photochemistry. 2. Describes the synthetic pathways for various chemical/drug substances and propose reasonable mechanism for the reaction. 3. Describes the general methods of preparations for both biological and pharmaceutical applications. 4. Explains the principles of the discovery, design and development of active pharmaceutical ingredients. 5. Illustrates the importance of quality concepts such as accuracy and precision. 6. Explains the principles and applications of Recombinant-DNA technology and Monoclonal antibodies
2. Manufacture, compound and manage the manufacturing/compounding of pharmaceutical products	The candidate should be able to apply Pharmaceutics and related sciences to the practice of pharmacy	1. Explain the physical properties of matter and relate them to drug preparations. 2. Explain the pharmaceutical unit processes according to pharmaceutical manufacturing. 3. Explain various pharmaceutical dosage forms that are available on the market and their fundamental manufacturing processes and principles. 4. Analyses radiopharmaceutical substances and dosage forms that are available on the market and their applications. 5. Assesses the quality of pharmaceutical dosage forms available on the market. 6. Explains the important principles in pharmaceutical Biotechnology and its applications in medicine and pharmacy
3. Design optimal drug dosage regimens and conduct drug therapeutic monitoring	The candidate should be able to apply Biopharmaceutics, pharmacokinetics and related sciences to the practice of pharmacy	1. Applies the principles of biopharmaceutics and pharmacokinetics to optimal drug design. 2. Utilizes biopharmaceutical principles and data in the assessment and selection of medicines, drug delivery systems and routes of administration. 3. Applies basic and clinical pharmacokinetic principles to the optimization of medication regimens for individual patient

KNOWLEDGE DOMAIN		
4. Provide information and education on drugs and medicines (human and veterinary) including toxicity issues	The candidate should be able to apply Pharmacology and related sciences to the practice of pharmacy	1. Explains molecular mechanism of drug action. 2. Applies the principles of drug action and handling of drugs by the body in normal individuals, in special populations and disease states. 3. Applies knowledge of pharmacokinetics and pharmacodynamics to manage clinical manifestations of disease. 4. Evaluates evidence and recommends quality, cost-effective pharmacological intervention through well designed treatment strategies. 5. Understands and describes mechanisms of toxicity and toxicity testing. 6. Demonstrates understanding of drugs used in veterinary medicine.
5. Provide information and education natural sources of drugs and practice of alternative medicine	The candidate should be able to apply Pharmacognosy and related sciences to the practice of pharmacy	1. Identifies plants and isolate active components of pharmaceutical significance. 2. Describes the pharmacological activities of drugs of natural origin. 3. Analyses the macroscopic structures of different groups of pharmaceutically active ingredients. 4. Explains the clinical application of drugs derived from plants and other natural sources in the management of infections and chronic conditions. 5. Describes the toxicological effect of pesticides and toxic agents from plants. 6. Explains the role of complementary and alternative medicine in modern medicine in various cultures. 7. Evaluates the plants used in African traditional medicine
6. Provide pharmaceutical care and initiate pharmacotherapy as part of multi-disciplinary team as well as diagnose and treat minor ailments	The candidate should be able to apply Clinical pharmacy and therapeutics to the practice of pharmacy	1. Illustrates critical reasoning skills in solving clinical patient cases as part of a multidisciplinary team. 2. Illustrates real-life cases seen in the practice of Pharmacy, and to practice solving clinical pharmaceutical problems. 3. Interprets clinical laboratory tests and apply them to the design of dosage and therapeutic regimens. 4. Applies principles of biomedical sciences and pharmacology/pharmacotherapy to respond to symptoms of minor ailments by diagnosing and initiating treatment in the community, and refer appropriately (major ailments)

KNOWLEDGE DOMAIN		
7. Effectively Manage the dispensing process, pharmacy business, the pharmaceutical supply chain and provide professional guidance/service in different settings of pharmacy practice	The candidate should be able to apply general pharmacy practice principles to the practice of pharmacy	1. Describes the health team and the Zambian Health System. 2. Explains the basic elements of effective communication in the practice of pharmacy. 3. Describes the fundamental principles of dispensing medicines and related substances as a professional process. 4. Explains the fundamental concepts of professional ethics and their application to pharmacy practice. 5. Describes the fundamental principles of dispensing medicines and related substances as a professional process. 6. Explains the principles of pharmacy law and ethics. 7. Explains the fundamental principles of pharmaceutical supply chain management. 8. Applies the concepts and principles of standards of practice and good professional practices in various settings of pharmacy practice including in professional growth and interactions
8. Undertake pharmaceutical and integrated health research	The candidate should be able to apply pharmaceutical Research to the practice of pharmacy	1. Analyses data using simple statistical tests. 2. Applies scientific writing skills to develop a research proposal and report. 3. Demonstrates knowledge of how to critically evaluate relevant literature

SKILLS DOMAIN		
Competency/ Outcome	**Competency Statement**	**Specific Competencies**
1. Designs active pharmaceutical ingredients	The candidate should be able to apply Medicinal and Pharmaceutical Chemistry sciences to the practice of pharmacy.	1. Carries out qualitative and quantitative chemical analysis of inorganic compounds. 2. Obtains and interpret analytical assay data to the approved standards in the country. 3. Uses structure activity relationships in drug optimization and selection for representative disease management and patient care
2. Manufacture, compound and manage the manufacturing/compounding of pharmaceutical products	The candidate should be able to apply Pharmaceutics and related sciences to the practice of pharmacy	1. Solves pharmaceutical-based calculations in the process of pharmaceutical care delivery services. 2. Performs the processes of solubility assessment, solubilisation, micellisation
3. Design optimal drug dosage regimens and conduct drug therapeutic monitoring	The candidate should be able to apply Biopharmaceutics, pharmacokinetics and related sciences to the practice of pharmacy	1. Characterizes and quantifies the time-course of processes of drug liberation, absorption, distribution, metabolism and elimination. 2. Use suitable methods to carry out the analysis of drugs in body fluids
4. Provide information and education on drugs and medicines (human and veterinary) including toxicity issues	The candidate should be able to apply Pharmacology and related sciences to the practice of pharmacy	1. Characterises the mechanisms of action, uses and side effects of drugs in various systems of the human body. 2. Effectively manages a poisoned patient. 3. Practices and promotes medication safety. 4. Demonstrates understanding of drug development, evaluation and regulation. 5. Participates in drug development and clinical trials and adopts innovative approaches in pharmacology. 6. Conducts therapeutic drug monitoring. 7. Detects, manages and analyses adverse drug reactions, and report them via the appropriate channel.

SKILLS DOMAIN		
5. Provide information and education natural sources of drugs and practice of alternative medicine	The candidate should be able to apply Pharmacognosy and related sciences to the practice of pharmacy	1. Undertakes quality assessment of alternative and herbal medicines. 2. Performs microscopic and macroscopic analysis of structures of different groups of pharmaceutically active ingredients of plant and natural sources. 3. Utilizes principles of rational drug use to make informed drug management decisions that are patient focused, evidence based, cost effective and clinically sound
6. Provide pharmaceutical care and initiate pharmacotherapy as part of multi-disciplinary team as well as diagnose and treat minor ailments	The candidate should be able to apply Clinical pharmacy and therapeutics to the practice of pharmacy	1. Adopts, designs and implements the pharmaceutical care process and plan in collaboration with other health care members in the provision of health care services 2. Illustrates critical reasoning skills in solving patient cases as part of a multidisciplinary team 3. Undertakes patient medication history, assessment and evaluation and appropriately refer.
7. Effectively Manage the dispensing process, pharmacy business, the pharmaceutical supply chain and provide professional guidance/service in different settings of pharmacy practice	The candidate should be able to apply general pharmacy practice to the practice of pharmacy	1. Appreciates the scope of pharmacy as a profession, its history and evolution, its responsibility to society and its role in the health system. 2. Appreciates the hierarchy of compliance, adherence and concordance. 3. Undertakes extemporaneous compounding of medicines. 4. Manages the manufacture of pharmaceutical products. 5. Participates in the planning and implementation of clinical trials. 6. Adopts an integrated approach to quality assurance of pharmaceutical products. 7. Manages community pharmacy, hospital pharmacy, industrial pharmacy and veterinary pharmacy professionally. 8. Serves as a member of policy-making (including Pharmacy and Therapeutics Committees). 9. Participates in national immunization programs/activities.
8. Undertake pharmaceutical and integrated health research	The candidate should be able to apply pharmaceutical Research to the practice of pharmacy	1. Develops an organized approach to identifying a pharmacy/integrated health topic of interest for independent as well as collaborative study. 2. Effectively utilizes various sources to gather literature for a research paper. 3. Illustrates abilities to organize ideas and summarize data for research.

		4. Develops research questions to be studied. 5. Develops research proposal based on research ethics committee proposal recommendations. 6. Conducts data collection efficiently and ethically. 7. Communicates effectively project details and final conclusion 8. Advocates for research

PROFESSIONAL ATITUDES		
Competency/ Outcome	**Competency Statement**	**Specific Competencies**
1. Communication Skills	The candidate should be able to effectively communicate with patients, clients, and other health workers whilst applying the knowledge and skills to the practice of pharmacy	1. Communicates effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding. 2. Demonstrates cultural awareness, sensitivity and Tailor communication to patient needs. 3. Uses appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)
2. Professionalism	The candidate must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, law & sensitivity to a diverse patient population	1. Demonstrates ethically sound practice 2. Practices informed decision making 3. Respects patients privacy in handling matters 4. Practices confidentiality with patient information 5. Demonstrates adherence to code of practice Demonstrates sensitivity to diverse patient groups

6.0 COMPETENCE WEIGHTING

COMPETENCE	WEIGHTING (%)
1. Design active pharmaceutical ingredients	10
2. Manufacture, compound and manage the manufacturing/compounding of pharmaceutical products	15
3. Design optimal drug dosage regimens and conduct drug therapeutic monitoring	15
4. Provide information and education on drugs and medicines (human and veterinary) including toxicity issues	15
5. Provide information and education natural sources of drugs and practice of alternative medicine in an ethical manner	10
6. Provide pharmaceutical care and initiates pharmacotherapy as part of multi-disciplinary team as well as diagnose and treat minor ailments in an ethical manner	15
7. Effectively Manage the dispensing process, pharmacy business, the pharmaceutical supply chain and provide professional guidance/service in different settings of practice in an ethical manner	10
8. Undertake pharmaceutical and integrated health research in an ethical manner	5
TOTAL	**100**

NOTE: Theory and practical examination papers will carry the same weight.

7.0 REFERENCE MATERIALS

Competence/Outcome Number	References Resources
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2. **Manufacture, compound and manage the manufacturing/compounding of pharmaceutical products** (Subject area: Pharmaceutics)	2.1 David A, Alexander TF (2008) 1st Edition. Physical Pharmacy,Pharmaceutical Press. ISBN 978 0 85369 725 1 2.2 David A, Alexander TF (2006), 4th Edition. Physicochemical Principles of Pharmacy, Churchill Livingstone. ISBN: 0-85369-608-X. 2.3 Neena W, Clive W and Clive GW (2003), 2nd Edition. Physiological Pharmaceutics, Tailor & Francis. ISBN 0-748-40610-7. 2.4 Aulton M (2005), 2nd Edition. Pharmaceutics, The Science of Dosage Form Design, Churchill Livingstone Press. ISBN: 0-443-05550-5. 2.5 Shayne CG (2008). Pharmaceutical Manufacturing Handbook, John-Wiley & Sons. ISBN: 978-0-470-25958-0. 2.6 Gary W (2007). Pharmaceutical Biotechnology Concepts and Applications, Wiley & Sons. ISBN 978-0-470-01245-1

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3. Design optimal drug dosage regimens and conduct drug therapeutic monitoring (Subject Areas: Biopharmaceutics and Pharmacokinetics)	3.1 Gibaldi, M. (1991), Fourth Edition, Biopharmaceutics and Clinical Pharmacokinetic, Lea& Febiger, ISBN 0-8121-1346-2 3.2 Jambheker, S.S. and Breen, J.P. (2009), First Edition, Basic Pharmacokinetics, The Pharmaceutical Press, ISBN 978 O85369 7725 3.3 Rowland, M. and Tozer N.T. (1995), Third Edition, Clinical Pharmacokinetics, Concepts and Applications Lea & Febiger, ISBN 0-683-07404-0 (2007 Indian Reprint ISBN-13: 978 -81-89960-52-0)
4. Provide information and education on drugs and medicines (human and veterinary) including toxicity issues (Subject area: General and Clinical Pharmacology, Toxicology, Therapeutics and Veterinary Pharmacology)	4.1 Katzung BG. (2011). 12th Edition. Basic and Clinical Pharmacology. Mc Graw Hill, Medical Publishing Division. New York. ISBN: 978-0-07-1764018 4.2 Rang HP, Dale M.M. Ritter J.M. Moore P.K. (2012). 7th Edition. Pharmacology. Churchill Livingstone. UK. ISBN 978-0-7020-3471-8. 4.3 Brunton, L.L, Lazo, J.S, and Parker, K.L. 2010. Goodman & Gilman's The Pharmacological Basis of Therapeutics. 12thEdition. McGraw-Hill Medical Publishing Division. ISBN 0071422803. 4.4 Marsha D. Ford, Kathleen A. Delaney, Louis J. Ling, Timothy Erickson. Clinical Toxicology, 1st ed. 2001 W. B. Saunders Company. Philadelphia. ISBN 0–7216–5485–1. 4.5 Zambia Medicines Regulatory Authority. Zambia National Pharmacovigilance

	Manual (Latest edition). 4.6 Graeme-Smith D.G., Aronson J. K. 2002. Oxford Textbook of Clinical Pharmacology and drug treatment, 3rd edition, 2002. Oxford University Press. ISBN 978-0192632340 4.7 Hsu W.H. 2008. Handbook of Veterinary Pharmacology. Wiley-Blackwell, UK. ISBN 9780813828374 4.8 McKay G.A., Reid J.L., Walters M.R. 2013. Lecture notes: Clinical Pharmacology & Therapeutics, 9th Edition. Wiley-Blackwell. ISBN 9781118344811 4.9 Gupta SK. 2011. Textbook of Pharmacovigilance. Jaypee Brothers Medical Publishers, India.
5. Provide information and education natural sources of drugs and practice of alternative medicine (subject areas: General and Clinical Pharmacognosy)	5.1 Evans W.C. (2009). Trease & Evans Pharmacognosy, 16th Edition. Saunders Ltd. ISBN-13: 978-0702029332 5.2 Dr rer nat habil M.H., Barnes J., Gibbons S., Williamson E.M. (2012). Fundamentals of Pharmacognosy & Phytotherapy, 2nd Edition. Churchill Livingstone. ISBN: 9780702033889 5.3 Cseke LJ, Kirakosyan A, Kaufman PB, Warber S, Duke JA, Brielmann HL. (2006). Natural Products from Plants, 2nd Edition. CRC Press; ISBN 0-8493-2976-0 5.4 Silverstein RM, Bassler GC, Morrill TC 7TH Edition. 2005. Spectrometric Identification of Organic Compounds, 5th Ed., 1998, John Wiley and Sons Inc. ISBN-13: 978-0471393627 5.5 Beckett AH, Stenlake JB. 4th edition. 2005. Practical Pharmaceutical Chemistry Part Two. CBS. ISBN-13: 978-8123905136
6. Provide pharmaceutical care and initiate pharmacotherapy as part of multi-disciplinary team as well as diagnose and treat minor ailments (Subject Area: Clinical Pharmacy Practice)	6.1 Alldredge BK, Corelli RL, Ernst ME, Gughelmo BJ, et al. (2012). 10th Edition. Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs, BrianK. Alldredge et al. Lippincott Williams & Wilkins. 978-1609137137. 6.2 Walker, R & Edwards, C (2011). 5th Edition. Clinical Pharmacy & Therapeutics. Church Livingstone. ISBN 9780702042935. International ISBN 9780702042942. 6.3 Tietze, K. J (2011). 3rd Edition. Clinical Skills for Pharmacists: A Patient-Focused Approach. Mosby, St. Louis. ISBN 9780323077385 6.4 Snelling, M. & Stoner, N (2012). 2nd Edition. Oxford Handbook of Clinical

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7. Effectively Manage the dispensing process, the pharmaceutical supply chain, pharmacy business and provide professional guidance/service in different settings of practice (General Pharmacy Practice, Professionalism and Medical Legal Issues)	7.1 Desselle, S, Zgarrick, D, and Alston, G (2012). 3rd Edition. Pharmacy management: Essentials for all practice settings. McGraw Hill. Medical Publishing Division. ISBN 9780071774314. 7.2 Winfield et al (2009). 4th edition. Pharmaceutical Practice. Churchill Livingstone. 7.3 Winfield A.J, Rees, J.A, Smith, I (2009). 4th edition. Pharmaceutical practice. Churchill-Livingstone. ISBN 9780443069062 7.4 Desselle, S, Zgarrick, D, and Alston, G (2012). 3rd Edition. Pharmacy management: Essentials for all practice settings. McGraw Hill. Medical Publishing Division. ISBN 9780071774314/0071774319. 7.5 Cipolle, R.J, Strand, L and Morley, P (2012). 3rd edition. Pharmaceutical care practice: The patient-centered approach to medication management. McGraw Hill Medical. ISBN 9780071790864 7.6 PRA- The medicines and Allies Substances Act 2013; Dangerous Drugs Act, Narcotic Drugs and Psychotropic Substances Act, Health Professions Act; Food and Drugs Act; Nurses and Midwives Act 7.7 Purtilo, R.B and Dohert, R (2010). 5th edition. Ethical Dimensions in the Health Professions. Elseiver. ISBN 9781437708967 7.8 Beardsley, R.S, Kimberlin, C.L, and Tindall, W.M (2012). 6th edition. Communication skills in pharmacy practice. Lippincott, Williams & Wilkins. ISBN 9781469812632 7.9 Spinelli, S. & Adams, R., 9th Edition (2012). New Venture Creation: entrepreneurship for the 21st century, New York: McGraw Hill. 7.10 Byrd, M., 7th Edition (2017). Small Business Management: An Entrepreneur's Guidebook. New York: McGraw-Hill. 7.11 Renee, J. G. A., (2009). Pharmacoeconomics: From Theory to Practice, CRC Press. 7.12 Sherman, F., Allen, C. G., Miron, S., 7th Edition, (2013). The Economics of Health and Health Care. 7.13 Beardsley, R.S, Kimberlin, C.L, and Tindall, W.M (2012). 6th edition. Communication skills in pharmacy practice. Lippincott, Williams & Wilkins. ISBN 9781469812632

	7.14 Purtilo, R.B and Dohert, R (2010). 5th edition. Ethical Dimensions in the Health Professions. Elseiver. ISBN 9781437708967
8. Undertake Pharmaceutical and Integrated Health Research (Subject Areas: Research Methodology, Biostatistics and epidemiology)	8.1 Betty R. Kirkwood and Jonathan A.C Sterne (2003) second edition. Essential medical statistics. ISBN: 978-0-86542-871-3. 8.2 Wayne W. Daniel (2010) ninth edition. Biostatistics, Basic concepts and methodology for the Health sciences. ISBN: 978-0-470-41333-3. 8.3 Kenneth j. Rothman, Sander Greenland and Timoth L. Lash. Modern Epidemiology (2008). ISBN: 978-0-07817-5564-1. 8.4 Kenneth J. Rothman (2012) second edition. Epidemiology an introduction.ISBN:978-0-19-975455-7. 8.5 Koning, and Martin Meds. (1996). Participatory research in health. Zed book. London UK. ISBN: 1-85649-352-2 (hb) or-0 (pb) 8.6 Varkevisser, C.M. et al (1992). Designing and conducting health system research project. Vol2 part1. Ottawa, Canada. ISBN: 0-88936-584-9

8.0 APPENDIX 1: LIST OF SKILLS AND PROCEDURES BY COMPETENCE AREA

Competences	Behaviours
1.Pharmaceutical Public Health Competences	
1.1 Health Promotion	1.1.1 Assess the primary healthcare needs (taking into account the cultural and social setting of the patient) 1.1.2 Advise on health promotion, disease prevention and control, and healthy lifestyle
1.2 Medicines information and advice	1.2.1 Counsel population on safe and rational use of medicines and devices (including the selection, use, contraindications, storage, and side effects of non-prescription and prescription medicines 1.2.2 Identify sources, retrieve, evaluate, organize, assess and disseminate relevant medicines information according to the needs of the patients and clients and provide appropriate information
2. Pharmaceutical Care Competences	
2.1 Assessment of medicines	2.1.1 Appropriately select human and veterinary medicines (e.g. according to the patient, hospital, government policy etc.) 2.1.2 Identify, prioritize and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicine-food interactions
2.2 Compounding medicines	2.2.1 Prepare pharmaceutical medicines (e.g. extemporaneous and cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment, etc.) 2.2.2 Compound under the good manufacturing practice for pharmaceutical (GMP) medicines
2.3 Dispensing	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments and monitor the use of dispensed medicines (re-checking the medicines) 2.3.2 Accurately report defective or substandard medicines to the appropriate authorities 2.3.3 Appropriately validate prescriptions, ensuring that prescriptions are correctly interpreted and legal 2.3.4 Dispense devices (e.g. Inhaler or a blood glucose meter) 2.3.5 Document and act upon dispensing errors 2.3.6 Implement and maintain a dispensing error reporting system and a ‘near misses’ reporting system 2.3.7 Label the medicines (with the required and appropriate information) 2.3.8 Learn from and act upon previous ‘near misses’ and ‘dispensing errors’
2.4 Medicines	2.4.1 Advise patients on proper storage conditions of the medicines and ensure that medicines are

	stored appropriately (e.g. humidity, temperature, expiry date, etc.) 2.4.2 Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites, etc.) 2.4.3 Ensure appropriate medicines use, route, time, dose, documentation, action, form and response for individual patients 2.4.4 Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)
2.5 Monitor medicines therapy	2.5.1 Apply guidelines, medicines formulary system, protocols and treatment pathways 2.5.2 Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures) 2.5.3 Identify, prioritise and resolve medicines management problems (including errors)
2.6 Patient consultation and diagnosis	2.6.1 Apply first aid and act upon arranging follow up care 2.6.2 Appropriately refer 2.6.3 Assess and diagnose based on objective and subjective measures 2.6.4 Discuss and agree with the patients the appropriate use of medicines, taking into account the patients' preferences 2.6.5 Document any interventions (e.g. document allergies, medicines and food, in patient medicine history) 2.6.6 Obtain, reconcile, review, maintain and update relevant patient medication and diseases history

3. **Organisation and Management Competencies**	
3.1 Budget and reimbursement	3.1.1 Acknowledge the organizational structure 3.1.2 Effectively set and apply budgets 3.1.3 Ensure appropriate claim for the reimbursement 3.1.4 Ensure financial transparency 3.1.5 Ensure proper reference sources for service reimbursement
3.2 Human resource management	3.2.1 Demonstrate organizational and management skills (e.g. know, understand and lead on medicines management, risk management, self-management, time management, people management, project management, policy management) 3.2.2 Identify and manage human resources and staffing issues 3.2.3 Participate, collaborate, advise in therapeutic decision-making and use appropriate referral in a multi-disciplinary 3.2.4 Recognise and manage the potential of each member of staff and utilize systems for performance management (e.g. carry out staff appraisals) 3.2.5 Recognise the value of a pharmacy team and of a multidisciplinary team 3.2.6 Support and facilitate staff training and continuous professional development
3.3 Improvement of service	3.3.1 Identify and implement new services (according to local needs) 3.3.2 Resolve, follow up and prevent medicines related problems
3.4 Procurement	3.4.1 Access reliable information and ensure the most cost effective medicines in the right quantities and appropriate quality 3.4.2 Develop and implement contingency plans for shortages 3.4.3 Efficiently link procurement to formulary, push/pull system (supply chain management) and payment mechanisms 3.4.4 Ensure there is no conflict of interest 3.4.5 Select reliable suppliers of high quality products (including appropriate selection process, cost effectiveness and timely delivery) 3.4.5 Supervise procurement activities 3.4.6 Understand the tendering methods and evaluation of tender bids
3.5 Supply chain and management	3.5.1 Demonstrate knowledge in store medicines to minimise errors and maximise accuracy 3.5.2 Ensure accurate verification of rolling stocks 3.5.3 Ensure effective stock management and running of service with the dispensary

	3.5.4 Ensure logistics of delivery and storage 3.5.5 Implement a system for documentation and record keeping 3.5.6 Take responsibility for quantification of forecasting
3.6 Workplace management	3.6.1 Address and manage day to day management issues 3.6.2 Demonstrate the ability to take accurate and timely decisions and make appropriate judgments 3.6.3 Ensure the production schedules are appropriately planned and managed 3.6.4 Ensure the work time is appropriately planned and managed 3.6.7 Improve and manage provision of pharmaceutical services 3.6.8 Recognize and manage pharmacy resources (financial, infrastructure)
4. Professional/Personal Competences	
4.1 Communication skills	4.1.1 Communicate clearly, precisely and appropriately while being a mentor or tutor 4.1.2 Communicate effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding 4.1.3 Demonstrate cultural awareness and sensitivity 4.1.4 Tailor communications to patient needs 4.1.5 Use appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)
4.2 Legal and regulatory practice	4.3.1 Apply and understand regulatory affairs and the key aspects of pharmaceutical registration and legislation 4.3.2 Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretation 4.3.3 Be aware of and identify the new medicines coming to the market 4.3.4 Comply with legislation for drugs with the potential for abuse 4.3.5 Demonstrate knowledge in marketing and sales 4.3.6 Engage with health and medicines policies 4.3.7 Understand the steps needed to bring a medicinal product to the market including the safety, quality, efficacy, pharmacoeconomic assessments of the product
4.3 Quality Assurance and Research in the work place	4.3.1 Apply research findings and understand the benefits and risks (e.g. preclinical, clinical trials, experimental-clinical pharmacological research and risk management) 4.3.2 Audit quality of service (ensure they meet local and national standards and specifications) 4.3.3 Develop and implement Standard Operating Procedures (SOPs)

	4.3.5 Ensure appropriate quality control tests are performed and managed appropriately 4.3.6 Ensure medicines are not counterfeit and meet quality standards 4.3.7 Identify and evaluate evidence-base to improve the use of medicines and services 4.3.8 Identify, investigate, conduct, supervise and support research at the work workplace (enquiry driven practice) 4.3.9 Implement, conduct and maintain a reporting system of pharmacovigilance (e.g. report adverse drug reactions) 4.3.10 Initiate and implement audit and research activities

5. Professional Attitudes

8.7 **Professional and ethical practice**	1.1 Demonstrate awareness of local national and international code of ethics 1.2 Ensure confidentiality (with the patient and other healthcare professionals) 1.3 Obtain patient consent (it can be implicit on occasion) 1.4 Recognise own professional limitations 1.5 Take responsibility for own action and for patient care
5.2 Self-management	2.1 Apply assertive skills (inspire confidence) 2.2 Demonstrate leadership and practice management skills, initiate and efficiency 2.3 Document risk management (e.g. critical incidents) 2.4 Ensure punctuality 2.5 Prioritize work and implement innovative ideas
5.3 Continuous Professional Development (CPD)	3.1 Document CPD activities 3.2 Engage with students/interns/residents 3.3 Evaluate currency of knowledge and skills 3.4 Evaluate learning 3.5 Identify if expertise needed outside the scope of knowledge 3.6 Identify learning needs 3.7 Recognize own limitation and act upon them 3.8 Reflect on performance