



Professional knowledge guide 2018

About the Royal Pharmaceutical Society

The Royal Pharmaceutical Society is the dedicated professional body for pharmacists and pharmacy in England, Scotland and Wales. We are the only body which represents all sectors of pharmacy in Great Britain. We lead and support the development of the pharmacy profession including the advancement of science, practice, education and knowledge in pharmacy.

We ensure the voice of the profession is heard and actively promoted in the development and delivery of healthcare policy and work to raise the profile of the profession.

We put pharmacy at the forefront of healthcare and are the world leader in the safe and effective use of medicines. We are committed to supporting and empowering our members to make a real difference to improving health outcomes for patients.

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**Details of the current national pharmacy
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Professional Development Curricula have been produced in collaboration with RPS Affiliated Partners, RPS Foundation Schools, RPS Accredited Providers, RPS Partners and expert groups to support continued advancement in all areas of pharmacy practice.

We will continue to develop the vision for post-graduate development to produce the highest quality pharmacy workforce, and continue to work with experts and specialist groups to form new guidance for professional advancement.

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RPS Professional Knowledge Guide – Core Advanced

This knowledge guide is a recommended list of the specific elements of pharmaceutical and related care to support a practitioner developing at advanced stages of practice. It is intended to guide practice rather than to be a prescriptive list that has to be adhered to in all cases.

1. Body systems

1.1. Blood

Anaemias	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of microcytic, macrocytic, normochronic and haemolytic anaemia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Antiplatelet and Anticoagulant Management	Demonstrates knowledge and understanding of dual antiplatelet therapy, including indications and duration.
Asplenia	Demonstrates knowledge and understanding of the management, mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for asplenia, including vaccination and antibiotic prophylaxis.
Dyslipidaemia	Demonstrates knowledge and understanding of: the pathophysiology of and risk factors for the development of dyslipidemia; and the mechanism of action, pharmacology pharmacokinetic characteristics, and clinical use of treatments for dyslipidemia.
Fluid Therapy	Demonstrates knowledge and understanding of: the principles, characteristics and clinical use of intravenous fluids, including an ability to describe and apply key monitoring parameters for the use of different fluids to inform decisions on appropriate fluid management; the properties and differences between the various classes of fluids e.g. crystalloids and colloids e.g. proteins, starches, dextrans, and the metabolic consequences of their use; the effect of the administration of fluid (or dehydration states) on various cardiovascular parameters, e.g. venous return, central venous pressure, cardiac output and arterial blood pressure; and the evidence base around current concepts and debates in fluid management.
Haematological Tests	Demonstrates knowledge and understanding of: haematological tests and the clinical consequences of abnormal results; the common medicines and diseases that cause abnormalities in haematological laboratory tests; an ability to interpret haematological tests including the full blood count and anaemias; and the ability to understand and interpret surrogate haematological markers for monitoring disease progression, efficacy and toxicity of medicines relevant to area of practice.
Intravenous Immunoglobulin	Demonstrates knowledge and understanding of the use of intravenous immunoglobulin, including the national demand programme.
Monoclonal Antibodies	Demonstrates knowledge and understanding of the use of monoclonal antibodies.
Thrombocytopenia	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of thrombocytopenia (including drug-induced); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for thrombocytopenia.

1.2. Cardiovascular system

Atherosclerosis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of atherosclerosis; and the mechanism of action, pharmacology, pharmacokinetic characteristics, and clinical use of treatments for atherosclerosis.
Cardiac Arrhythmias	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of common arrhythmias in the atria and the ventricles, including arrhythmias due to atrioventricular (AV) nodal dysfunction, and atrial fibrillation (AF); the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for arrhythmias, including antithrombotic, rate and rhythm strategy; and the effect of arrhythmias on falls risk and appropriate management in light of the risk.
Cardiovascular Disease Risk Calculation	Demonstrates knowledge and understanding of: cardiovascular disease risk calculation tools such as QRISK2; and an ability to calculate risk of cardiovascular disease.
Cardiovascular Function Monitoring	Demonstrates knowledge and understanding of the available invasive and non-invasive methods for monitoring cardiovascular function e.g. echocardiography, multigated acquisition scan, electrocardiogram, arterial blood pressure, cardiac output, mean arterial pressure, systemic vascular resistance, trans-oesophageal Doppler etc.; and an ability to interpret the specific parameters generated.
Hypertension	Demonstrates knowledge and understanding of the long-term risks associated with untreated hypertension.
Infective Endocarditis	Demonstrates knowledge and understanding of the pathophysiology, risk factors, diagnosis and treatment principles of infective endocarditis.
Ischaemic Heart Disease	Demonstrates knowledge and understanding of: primary and secondary prevention, including long-term secondary prevention of acute coronary syndromes (ST segment elevation myocardial infarction, non-ST segment elevation myocardial infarction, and unstable angina); pharmacological and cardiac rehabilitation; and an ability to discuss the implications that non-pharmacological interventions have on drug therapy for these conditions.
Peripheral Vascular Disease	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of peripheral vascular disease (PVD); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for PVD.
Postural Hypotension	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of postural hypotension; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for postural hypotension.
QTc Interval Prolongation and Torsades de Points	Demonstrates knowledge and understanding of prolongation of the QTc interval, the associated risks of Torsades de Points, and the medicines commonly known to affect/prolong QTc interval.
Valvular Heart Disease	Demonstrates knowledge and understanding of the two broad types of prosthetic valve replacement (tissue and mechanical valve), and the pharmacological considerations for both.
Venous Thromboembolism	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of venous thromboembolism (VTE), including the importance of risk stratification/assessment; the non-drug options for the prevention of thromboembolism; extended thromboprophylaxis; and the management of treatment options for VTE.

1.3. Ear, Nose and Throat

Ear Wax Management	Demonstrates knowledge and understanding of the pathophysiology and risk factors for the development of ear wax, and primary and secondary prevention and removal options.
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1.4. Endocrine system

Adrenal Gland Dysfunction	Demonstrates knowledge and understanding of the diagnosis and treatment of over- and under-active adrenal gland.
Diabetes Mellitus	Demonstrates knowledge and understanding of the acute treatment of diabetic patients e.g. diabetic ketoacidosis, hyper-/hypo-glycaemia.
	Demonstrates knowledge and understanding of short and long term complications of diabetes including the management of obesity and hyperlipidaemia.
	Demonstrates knowledge and understanding of diabetes management during intercurrent illness/travelling.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for diabetic foot ulcers; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for diabetic foot ulcers.
Metabolic Bone Disease	Demonstrates knowledge and understanding of: the physiology of bone metabolism; the pathophysiology of, and risk factors for the development of osteoporosis and osteopenia, including the effects of corticosteroid use; the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for osteoporosis; and national guidance on the treatment of osteoporosis.
Thyroid Disorders	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for thyroid disorders; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for thyroid disorders.
Thyroid Function Tests	Demonstrates knowledge and understanding of: thyroid function tests, including the clinical consequences of deranged test results; and an ability to understand and interpret thyroid function tests for monitoring disease progression, efficacy and toxicity of medicines relevant to area of practice.

1.5. Eye

Adverse Drug Reactions	Demonstrates knowledge and understanding of the common adverse ophthalmic drug reactions including ocular side effects of systemic drugs, systemic side effects of ocular drugs, and ocular side effects of ocular drugs.
Diagnostic Procedures in Ophthalmology	Demonstrates knowledge and understanding of the common diagnostic procedures used in ophthalmology. e.g. visual fields, visual acuity, tonometry (including Goldmann's).

1.6. Gastrointestinal system

Digestive Disorders	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for, the development of irritable bowel syndrome, diverticular disease and coeliac disease; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
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Dysphagia	Demonstrates knowledge and understanding of the role of the dietician and speech and language therapist in managing patients with dysphagia.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of dysphagia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for dysphagia and its implications for medicines management.
Faecal Incontinence	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of faecal incontinence; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for faecal incontinence.
Gastroenteritis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of gastroenteritis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for gastroenteritis.
Gastrointestinal Dysmotility	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of ileus states.
	Demonstrates knowledge and understanding of: the current concepts and debates around the management of gastrointestinal dysmotility; the treatment options used for the management of gastrointestinal dysmotility, including their pharmacology and pharmacokinetics; the key monitoring parameters for drugs used in the management of gastrointestinal dysmotility; and the options for non-drug management of gastrointestinal dysmotility
Peptic Ulcer Disease	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of peptic ulcer disease, H. pylori eradication and dyspepsia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Visualisation of the Gastrointestinal tract	Demonstrates knowledge and understanding of the procedures used for endoscopic visualisation of the gastrointestinal tract, and the medications used in endoscopy units.
	Demonstrates knowledge and understanding of: the procedures used for radiological visualisation of the gastrointestinal tract; and the medications used in radiology units.

1.7. Hepatic system

Hepatic Vascular Abnormalities	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of hepatic vascular abnormalities such as Budd-Chiari and veno-occlusive disease; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for hepatic vascular abnormalities.
Liver Function and Dysfunction	Demonstrates knowledge and understanding of: the role of the liver in the metabolism of alcohol, the impact increasing/chronic use of alcohol has on the risk of liver disease, alcohol withdrawal, alcohol abstinence, acute alcoholic hepatitis, steatosis, and cirrhosis.
	Demonstrates knowledge and understanding of the complications of liver dysfunction such as ascites, spontaneous bacterial peritonitis, portal hypertension, oesophageal and gastric varices, coagulopathy, hepatic encephalopathy and pruritus.
	Demonstrates knowledge and understanding of the need to monitor liver function in patient's using naltrexone as a relapse prevention intervention.
	Demonstrates knowledge and understanding of the specific impact of buprenorphine use in people with pre-existing liver disease.

	Demonstrates knowledge and understanding of: the options for the management of fulminant hepatic failure; key monitoring parameters; and prevention of fulminant hepatic failure in high risk patients.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of immune diseases of the liver e.g. autoimmune hepatitis, primary biliary cirrhosis, primary sclerosing cholangitis; the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for the management and prevention of these conditions; the non-drug management and prevention of these conditions; and the national and international guidelines for the prevention and treatment of these conditions.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of inherited and metabolic liver disorders such as Wilson's disease and haemochromatosis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for inherited and metabolic liver disorders.
Non-alcoholic Fatty Liver Disease and Non-alcoholic Steatohepatitis	Demonstrates knowledge and understanding of, and an ability to advise on: the pathophysiology of, and risk factors for the development of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Viral Hepatitis	Demonstrates knowledge and understanding of: the different types of hepatitis virus (A, B, C, D, E); the epidemiology and key risk factors for contracting a hepatitis virus; the national guidance in relation to viral hepatitis, including treatment options and current recommendations for vaccinations; and an ability to advise on which vaccination schedule is most appropriate at an individual patient level.

1.8. Immune system

Immune System Function	Demonstrates knowledge and understanding of the immune system function and immunology.
Immunoglobulin Therapy	Demonstrates knowledge and understanding of the background and theory of using immunoglobulin (IG) therapy including specific immunoglobulins and intravenous immunoglobulin (IVIG).
Immunosuppressants	Demonstrates knowledge and understanding of the implications, requirements and clinical use of infection prophylaxis when using immunosuppressant agents.
Prevention of Infectious Diseases in Immunocompromised Patients	Demonstrates knowledge and understanding of: the rationale for use of infection prophylaxis and vaccines in immunocompromised patients; the prophylactic antimicrobial (bacterial, fungal and viral) regimens required for patients on immunosuppressive therapy or in complex immunosuppressed patients e.g. patients with cancer, HIV, or post-transplant; and the therapeutic antimicrobial (bacterial, fungal and viral) regimens required for these patients.
Vaccine Preventable Diseases	Demonstrates knowledge and understanding of the current UK vaccination programme and its role in preventing infection, including primary, annual and catch up vaccinations for relevant at risk groups.
	Demonstrates knowledge and understanding of the specific patient groups and diseases states that need special consideration when administering vaccines and understand why.
	Demonstrates knowledge and understanding of, and an ability to advise on, the use of products to prevent tetanus in trauma patients.

Demonstrates knowledge and understanding of: the use, cautions and contraindications to travel vaccines; and an ability to advise on the most appropriate vaccination regimens specific to the area being travelled to, and protocols for supply.

1.9. Integumentary system

Leg Ulcers and Pressure Sores	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of leg ulcers and pressure sores; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Wound Management	Demonstrates knowledge and understanding of the characteristics of commonly used dressings, and their role in wound healing.
	Demonstrates knowledge and understanding of the principles of wound management and the healing process, including identification of patient and disease factors.

1.10. Musculoskeletal system

Hyperuricemia and Gout	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of hyperuricemia and gout; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for hyperuricemia and gout.
Rheumatoid Arthritis	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of rheumatoid arthritis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments in the management of rheumatoid arthritis.

1.11. Nervous system

Cerebral Circulation	Demonstrates knowledge and understanding of cerebral circulation and its determinants.
Cerebrovascular Disease	Demonstrates knowledge and understanding of: the pathophysiology, epidemiology and risk factors for the development of cerebrovascular disease including stroke, acute stroke, transient ischaemic attack, intracranial haemorrhage, cerebral infarction, cerebral venous thrombosis, cerebral aneurysm and arteriovenous malformation; the mechanism of action, pharmacology, pharmacokinetic characteristics, clinical use of treatments, and prevention of these conditions; and the investigation and management of these conditions as medical emergencies.
Encephalopathy	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of encephalopathy, including hepatic encephalopathy and Wernickes encephalopathy/Korsakoff psychosis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for encephalopathy.
Epilepsy and Seizure Disorders	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of more advanced stages of epilepsy, and refractory epilepsy; and the mechanism of action, pharmacology, pharmacokinetic characteristics, clinical use and principles of treatments for advanced/refractory epilepsy, including the use of anti-epileptic drugs and the role of epileptic surgery.

Neuropathies	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of neuropathies; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for neuropathies.
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1.12. Renal system

Renal Function and Dysfunction	Demonstrates knowledge and understanding of, and an ability to recognise and manage drug therapy that adversely affects renal function e.g. NSAIDS, contrast-induced nephropathy.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for acute kidney injury (AKI); an ability to recognise and manage treatment options for AKI e.g. temporary cessation of possible causative drugs, review of existing therapy; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for the management and prophylaxis of AKI.
Renal Replacement Therapy	Demonstrates knowledge and understanding of the differences between renal replacement fluids.
	Demonstrates knowledge and understanding of the indications for, key differences between, and the risks associated with the different methods of renal replacement therapies.
	Demonstrates knowledge and understanding of the objectives and monitoring parameters for anticoagulation strategies in patients on renal replacement therapy.
	Demonstrates knowledge and understanding of the various factors that affect drug removal in different methods of renal replacement therapy.
	Demonstrates knowledge and understanding of: the principles, characteristics and clinical use of renal replacement therapy (RRT); and an ability to recognise the need for, and make recommendations on drug regimen adjustments in RRT e.g. dose, frequency, timing etc.
Urinary Incontinence and Overactive Bladder	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for urinary incontinence and over active bladder; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.

1.13. Reproductive system

Contraceptives	Demonstrates knowledge and understanding of: available contraception methods and the differences and risks associated with their use; the factors that influence choice of hormonal contraceptive methods; and an ability to recommend appropriate choices of contraception with regard to patient lifestyle, preference and concomitant medication.
	Demonstrates knowledge and understanding of: the implications of missed contraceptive doses; indications for emergency hormonal contraception (EHC); and the clinical significance of drug interactions with contraceptive medicines.
Fertility Preservation	Demonstrates knowledge and understanding of the need for fertility preservation e.g. egg/sperm collection.
Risks of Disease and Drugs on Fertility and the Foetus	Demonstrates knowledge and understanding of the risks of disease and drug treatments on male and female fertility; and the paternal and maternal drug treatments which may pose a risk to the foetus.

Sexual Dysfunction	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for sexual dysfunction and its psychological impact; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for sexual dysfunction, including non-medical treatments.
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1.14. Respiratory system

Allergies	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of nasal allergy; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for nasal allergy.
Interstitial Lung Diseases	Demonstrates knowledge and understanding of the epidemiology and pathophysiology of idiopathic pulmonary fibrosis (IPF) and other interstitial lung diseases (ILD); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for IPF and other ILDs, including non-pharmacological treatments.
Peripheral and Pulmonary Oedema	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of peripheral and pulmonary oedema; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Respiratory Function Monitoring	Demonstrates knowledge and understanding of the available methods for assessing and monitoring of respiratory function.
Sinusitis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of acute and chronic sinusitis, including frontal and ethmoidal sinusitis; the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for bone and joint infections.

2. Medication supply/use

2.1. Biochemical Monitoring

Biochemical Data and Disease Markers	Demonstrates knowledge and understanding of: biochemical data such as urea and electrolytes, potassium, sodium, calcium, magnesium, phosphate, including the clinical consequences of deranged test results; and the ability to understand and interpret surrogate biochemical markers for monitoring disease progression, efficacy and toxicity of medicines relevant to area of practice.
Electrolyte Disturbances	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for, the development of electrolyte disturbances, including: common drugs causing changes to normal electrolyte ranges; the clinical consequences of electrolyte imbalance; and therapeutic strategies for correction of electrolyte imbalance.

2.2. Clinical Trials

Clinical Trial Design, Implementation and Management	Demonstrates knowledge and understanding of the legal and ethical considerations applicable to clinical trials; the regulatory framework for the conduct of clinical trials within the UK, and role of the Medicines and Healthcare products Regulatory Agency; ethical recruitment to clinical trials including consent and assent; and the importance of informing and supporting the patient.
	Demonstrates knowledge and understanding of, and participation in conducting, trials of new medication relevant to the substance misuse field.
	Demonstrates knowledge and understanding of: clinical trials in cancer patients including endpoints, the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use - Good Clinical Practice, and the EU directive; trust policies and procedures; the pharmacy documentation required; and the role of the multidisciplinary team in trials and phases of trials.
	Demonstrates knowledge and understanding of: the complexities of clinical trials, including issues such as changes in formulation; the role of the pharmacist in clinical trials; and an ability to provide pharmaceutical support for patients in specific groups who are participating in clinical trials, including supply of trial drugs according to protocol.
	Demonstrates knowledge and understanding of: the principles behind clinical trial design and implementation according to Good Clinical Practice regulations; the local procedures for the implementation of clinical trials; and undertakes training on a regular basis, with consideration of organisational requirements.
Clinical Trial General Knowledge	Demonstrates knowledge and understanding of the clinical trials open at the local site.

2.3. Complementary and Alternative Medicines/Therapies

Complementary and Alternative Medicines and Therapies	Demonstrates knowledge and understanding of, and an ability to manage, complementary and alternative medicines and therapies safely in combination with conventional medicines.
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2.4. Control, Manufacture and Distribution of Pharmaceuticals

Financial Management of Medicines and Medicines Services	Demonstrates knowledge and understanding of the need for financial control of drug costs within the NHS, and the tools which can be used to help control the cost of medicines.
	Demonstrates knowledge and understanding of the principles of pharmacoeconomics.
	Demonstrates knowledge and understanding of: the local commissioning structures; the way drug costs are remunerated from commissioners and the implications for local use; how changes to commissioning can impact upon drug usage and clinical pharmacy time; and an ability to supply necessary information to commissioners when required.
Licensing and Regulation of Medicines, Devices and Hazardous Substances	Demonstrates knowledge and understanding of the characteristics of parallel imports, pharmaceutical specials and imported medicines.

	Demonstrates knowledge and understanding of the legislation and parameters associated with drug and device use and disposal.
	Demonstrates knowledge and understanding of: pharmaceutical pricing including the Pharmaceutical Price Regulation Scheme (PPRS); the difference between primary and secondary care pricing; and the different types of discount.
	Demonstrates knowledge and understanding of: the regulation of the manufacture of licensed and unlicensed medicines; the principles behind quality assurance of procured medicines, including licensed and unlicensed products (specials, imports and food supplements etc.); and the role of the Medicines and Healthcare Products Regulatory Agency and European Medicines Agency.
Medicines Logistics and Supply Chain Management	Demonstrates knowledge and understanding of how medicines purchasing contributes to overall service delivery.
	Demonstrates knowledge and understanding of market management e.g. different pharmaceutical markets, generic and branded medicines.
	Demonstrates knowledge and understanding of supply chain management theory.
	Demonstrates knowledge and understanding of the fundamentals of stock control theory as applied to a pharmacy, and those important factors influencing a stock control policy.
	Demonstrates knowledge and understanding of the roles of external organisations in pharmaceutical purchasing and supply e.g. purchasing and Supply Agency pharmaceutical team, hubs and other regional organisations.
	Demonstrates knowledge and understanding of: medicines logistics; its application to pharmacy practice and impact on patient care; and the distribution channels for medicines including homecare, top up and direct delivery models.
Medicines Manufacturing and Preparation	Demonstrates knowledge and understanding of the pharmaceutical aspects of specials including sterile manufacturing, aseptic dispensing, microbiological testing, formulation etc.
Regulation of Healthcare Services and Professionals	Demonstrates knowledge and understanding of the regulation of services and professions within health systems.
Service Level Agreements	Demonstrates knowledge and understanding of the concept of Service Level Agreements, and the potential benefits in terms of aiding efficiency and consistency in the provision of pharmacy services.
Storage and Stability of Medicines	Demonstrates knowledge and understanding of, and an ability to make decisions on the use of medicines that have been stored outside their recommended storage conditions.
	Demonstrates knowledge and understanding of, and an ability to plan for and manage medicines use towards the end of their shelf life, to reduce wastage.
Unlicensed Medicines and Unlicensed Use	Demonstrates knowledge and understanding of, and an ability to evaluate and advise on the body of evidence supporting the unlicensed use of a medicine, or the use of an unlicensed medicine, where appropriate for patient care.

2.5. Drug Administration

Devices for Parenteral Drug Administration	Demonstrates knowledge and understanding of the use of specialty devices for parenteral drug administration e.g. syringe drivers, infusion pumps.
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Dose Calculations	Demonstrates knowledge and understanding of: the factors to be taken into consideration when advising on dose calculations; dose calculations and adjustments in children, including determination of body surface area (BSA), weight and age; and an ability to calculate doses from relevant parameters.
Drug Stability and Compatibility	Demonstrates knowledge and understanding of, and an ability to advise on: the stability and compatibilities of drugs in infusion fluids, drug admixtures, y-site", single lumen central venous catheters, and syringe drivers etc.; the basic properties of injectable medicines and their diluents, and the factors that can aid in predicting compatibility and incompatibility; drug-drug interactions in-vitro and their effects on stability; and commonly used drugs whose stability in solution limits the infusion volume in some way e.g. cyclizine, co-trimoxazole, phenytoin, etc."
Epidural Administration	Demonstrates knowledge and understanding of: drugs which are administered epidurally; and the national and local policies for epidural administration, including chemotherapy, analgesia, anaesthesia and antibiotic therapy.
Intramuscular Administration	Demonstrates knowledge and understanding of: drugs which are administered intramuscularly; the clinical situations when the intramuscular route is indicated or necessary; and the clinical situations when the intramuscular route is not appropriate.
Intra-thecal Administration	Demonstrates knowledge and understanding of: drugs which are administered intra-theCALLY; the timing of intra-theCALL administration in relation to other drugs in the regimen; the training requirements of the multidisciplinary team; and the national and local policies for intra-theCALL administration, including chemotherapy, analgesia, anaesthesia and antibiotic therapy.
Intravenous Administration	Demonstrates knowledge and understanding of, and an ability to advise on: the characteristics of different types of indwelling venous catheters and connectors, including central venous access devices; the differences between peripheral and central intravenous lines e.g. site of insertion, number of lumens etc., their specific roles and factors that may influence choice of line; and the key factors in line care management, including strategies for maintaining and unblocking central and peripheral venous routes.
	Demonstrates knowledge and understanding of: the safe and appropriate preparation and use of intravenous drugs e.g. bolus injection versus continuous infusion; the different factors that determine whether a drug may be infused via a peripheral or central line; minimum safe infusion fluid volume in general and fluid restricted patients; minimum/maximum infusion rates and concentrations; and intravenous drug administration to patients with restricted intravenous access etc.
Subcutaneous Administration	Demonstrates knowledge and understanding of skin site reactions in patients receiving subcutaneous infusions, and an ability to advise on how to manage these.
	Demonstrates knowledge and understanding of the clinical situations when drugs and fluids are normally administered via the subcutaneous route.
Topical Administration	Demonstrates knowledge and understanding of topical drug administration routes.

2.6. Electronic Health

See Foundation Knowledge Guide

2.7. Medication Safety

Patient Safety	Demonstrates knowledge and understanding of national safety alerts and legislation relating to enteral nutrition therapy.
	Demonstrates knowledge and understanding of national safety alerts and legislation relating to parenteral nutrition therapy.
	Demonstrates knowledge and understanding of a multidisciplinary approach to medication safety, and the respective roles and responsibilities within a multidisciplinary medication safety team.
	Demonstrates knowledge and understanding of how the design of patient and medication safety information e.g. patient information leaflets, package inserts, locally produced guidance etc., can impact patient safety.
	Demonstrates knowledge and understanding of internal and external medication safety structures, and agencies involved in clinical governance and risk (locally, regionally and nationally).
	Demonstrates knowledge and understanding of never events and strategies to reduce these occurring.
	Demonstrates knowledge and understanding of risk management and harm reduction principles and strategies, and their impact on patient care.
	Demonstrates knowledge and understanding of the contribution of organisational culture to patient safety and relate it to local practice.
	Demonstrates knowledge and understanding of the literature and resources available for managing medicines associated risk.
	Demonstrates knowledge and understanding of, and an ability to utilise cost data to provide basic measures of cost effectiveness of patient safety initiatives e.g. cost per event avoided.
	Demonstrates knowledge and understanding of: error and safety theories; their application to medicines use; and how factors relating to patients, healthcare professionals, workplace design and the design of medication processes contribute to medication errors e.g. the "Swiss cheese" model."
	Demonstrates knowledge and understanding of incident investigation tools e.g. root cause analysis, including their strengths and weaknesses.
	Demonstrates knowledge and understanding of: the principles and processes involved in pharmacovigilance and pharmacovigilance in monitoring drug safety e.g. local and national adverse-effect reporting systems, case-control and cohort studies; and their strengths and weaknesses.
	Demonstrates knowledge and understanding of local risk registers and their use.
	Demonstrates knowledge and understanding of the contribution product design makes to patient safety e.g. packaging and device technology.
	Demonstrates knowledge and understanding of, and an ability to identify potential risks of new presentations of medicines.
	Demonstrates knowledge and understanding of: risk assessments related to medicines use; and an ability to identify risk areas for errors.
	Demonstrates knowledge and understanding of: the risk relating to patients, medicines and processes; the importance of identifying and managing high risk drugs; and the importance of identifying and managing high risk patients e.g. cancer patients, organ dysfunction patients, to reduce the risk of drug toxicity.

2.8. Medicines Information

Adverse Drug Reactions	Demonstrates knowledge and understanding of: the types of adverse drug reactions e.g. Type A, Type B, idiosyncratic etc.; the mechanism and clinical significance of adverse drug reactions; the factors to consider when assessing the likely cause of an adverse reaction; emergency treatments for recognised adverse reactions e.g. rash, anaphylaxis, neuroleptic malignant syndrome; an ability to advise on the management and/or avoidance of side effects and adverse drug reactions; an ability to identify and report adverse drug reactions in children and adults; and promotion of appropriate reports when notified of drug related adverse events.
Evidence-based Medicine	Demonstrates knowledge and understanding of: the principles and application of evidence-based medicine (EBM) in answering medicines information enquiries and writing medicines information documents e.g. drug reviews; the EBM resources available; and the limitations of EBM, and other factors which may also be considered e.g. patient factors, local funding issues etc.
Medicines Information Services	Demonstrates knowledge and understanding of the hierarchy of evidence, and the strengths and weaknesses of different resources e.g. reference texts, databases, websites etc.
	Demonstrates knowledge and understanding of, and an ability to effectively retrieve relevant clinical data in the local setting from the available information resources.
	Demonstrates knowledge and understanding of, and an ability to identify external sources of information relevant to area of practice that can be used to obtain information for the pharmaceutical care of patients
	Demonstrates knowledge and understanding of, and an ability to use relevant resources for the pharmaceutical care of patients.
	Demonstrates knowledge and understanding of: Horizon Scanning resources; their use in supporting and advising colleagues on potential changes in prescribing practices; and the associated cost pressures.
Medicines Information Services	Demonstrates knowledge and understanding of the role of medicines information services such as UKMi in relation to area of practice.
Storage and Stability of Medicines	Demonstrates knowledge and understanding of appropriate information sources for storage queries.

2.9. Prescribing

See Foundation Knowledge Guide

2.10. Pharmacokinetics and Pharmacodynamics

Pharmacokinetics and Pharmacodynamics in Neonates and Paediatrics	Demonstrates knowledge and understanding of the pharmacokinetic and pharmacodynamic changes that occur throughout childhood; how these affect drug use in the neonatal and paediatric population; and why common medication errors related to these pharmacokinetic and pharmacodynamics changes occur.
Pharmacokinetics and Pharmacodynamics in the Elderly	Demonstrates knowledge and understanding of pharmacokinetic and pharmacodynamic changes in older people.

Principles of Pharmacokinetics and Pharmacodynamics	Demonstrates knowledge and understanding of the principles of pharmacodynamics; and the application of pharmacodynamic principles in pharmaceutical care planning e.g. drug selection, dose, frequency and route of administration.
	Demonstrates knowledge and understanding of the principles of pharmacokinetics, including common pharmacokinetic parameters such as absorption, distribution, metabolism and excretion; and the application of pharmacokinetic principles in pharmaceutical care planning e.g. drug selection, dose, frequency and route of administration.
	Demonstrates knowledge and understanding of: the effects that patient characteristics such as age, gender, environmental factors, genotype, phenotype and extremes of body weight have on pharmacokinetics and pharmacodynamics; and the risks associated with drug use in the context of these different characteristics.

2.11. Substance Dependence and Misuse

Alcohol Dependence and Use	Demonstrates knowledge and understanding of: alcohol screening tools such as Alcohol Use Disorders Identification Test (AUDIT); an ability to accurately determine alcohol consumption and patterns of use; the distinction between alcohol use, misuse and dependence; and an ability to provide appropriate brief advice to non-dependent drinkers to help reduce their alcohol intake.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of alcohol dependence; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for alcohol dependence, including the use and risks associated with relapse prevention medication used for alcohol dependence, management of acute alcohol withdrawal and its complications e.g. seizures, vitamin supplementation, and considerations for discharge.
Drug Dependence and Misuse	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of drug dependence; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for drug dependence.
	Demonstrates knowledge and understanding of the pharmacokinetics, pharmacodynamics and pharmacology of commonly used illicit drugs, including potentially significant interactions between illicit drugs and other medicines.
	Demonstrates knowledge and understanding of potentially significant interactions between opioid substitution medication and other medicines; and an ability to advise on their management.
	Demonstrates knowledge and understanding of the benefits of supervised consumption of medication in opioid addiction management, particularly during the early stages of treatment.
	Demonstrates knowledge and understanding of the pharmacological and non-pharmacological interventions available to reduce the risk of opioid dependence relapse.
	Demonstrates knowledge and understanding of the the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of medications used for managing opioid withdrawal symptoms.
	Demonstrates knowledge and understanding of: the impact of missed doses of opioid substitution medication on tolerance; and an ability to take appropriate action when this occurs.

	Demonstrates knowledge and understanding of: the specific risks associated with supervising consumption of opioid substitution medication whilst the patient is intoxicated; and an ability to take appropriate action when this occurs.
	Demonstrates knowledge and understanding of the risks associated with extended use of drugs with the potential for misuse e.g. over-the-counter products containing codeine or dihydrocodeine, sedating antihistamines etc.
	Demonstrates knowledge and understanding of the misuse potential and specific risks involved in the supply and use of prescription medicines e.g. codeine, cyclizine, ketamine, tramadol, pseudoephedrine etc.
Nicotine Dependence	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of smoking addiction; primary and secondary prevention of the addiction; the significance of smoking-associated gastrointestinal disorders; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for smoking addiction.
Pancreatitis	Demonstrates knowledge and understanding of the impact of long term heavy alcohol use in the development of pancreatitis.

2.12. Therapeutic Drug Monitoring

Therapeutic Drug Monitoring	Demonstrates knowledge and understanding of, and an ability to identify and advise on drugs requiring therapeutic drug monitoring (TDM); the therapeutic ranges for drugs requiring TDM; the appropriate timing for the sampling, and measuring of drug levels; the clinical significance of deviation from planned drug regimens in response to drug plasma levels; and an ability to interpret measured drug levels and make appropriate recommendations taking into account clinical risk and outcomes.
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2.13. Toxicology

Accidental and Self-Poisoning	Demonstrates knowledge and understanding of: the implications and presentation of accidental and self-poisoning; the risk minimisation strategies for both accidental and self-poisoning; an ability to obtain advice about the management of poisoning; use of Toxbase; and an ability to convey therapeutic options for the management of poisoning.
Decontaminants, Antidotes and Reversal Agents	Demonstrates knowledge and understanding of the basic pharmacology and pharmacokinetics of reversal agents e.g. naloxone, flumazenil and N-acetylcysteine, used for the management of toxicity caused by commonly used drugs.
	Demonstrates knowledge and understanding of the use of activated charcoal as an emergency decontaminant in the gastrointestinal tract to help treat drug overdose or poisoning.
Drug Toxicities	Demonstrates knowledge and understanding of: the pathophysiology, signs and symptoms of common drug toxicities e.g. paracetamol, iron, lithium, methotrexate, digoxin, warfarin, phenytoin, chemotherapeutic agents, opioids etc.; and management and treatment options for common drug toxicities.
Drug-induced Cardiovascular Toxicity	Demonstrates knowledge and understanding of the pathophysiology of, management options for, and primary and secondary prevention of drug-induced cardiovascular toxicity, including systemic therapies that are potentially cardiotoxic.
Drug-induced Ototoxicity	Demonstrates knowledge and understanding of the basic pathophysiology and management options for drug-induced toxicity e.g. gentamicin ototoxicity.

Drug-induced Pulmonary Toxicity	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of drug-induced pulmonary toxicity; primary and secondary prevention of drug-induced pulmonary toxicity; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for management and prophylaxis of this condition.
Drug-induced Skin Toxicity	Demonstrates knowledge and understanding of the basic pathophysiology and management options for drug-induced skin toxicity.
Polypharmacy and Drug Toxicity	Demonstrates knowledge and understanding of the possible toxic effects of drugs in patients taking multiple medicines, especially for patients with sub-optimal organ function.

3. Patient and Disease

3.1. Cancer

Benign Prostatic Hyperplasia	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for benign prostatic hyperplasia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for benign prostatic hyperplasia.
Biosimilars	Demonstrates knowledge and understanding of the use of biosimilars, and why they are not interchangeable.
Cancer Drugs and Non-Cancer Indications	Demonstrates knowledge and understanding of the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of cancer drugs for non-cancer indications e.g. rheumatoid arthritis, vasculitis.
Cancer Treatments	Demonstrates knowledge and understanding of, and an ability to identify, review, monitor and follow up medication issues for the treatment of cancer.
Oncology Patients and Surgery	Demonstrates knowledge and understanding of the management of the oncological patient undergoing surgery e.g. cachectic patients, swallowing difficulties etc.
Symptoms and Complications of Cancer	Demonstrates knowledge and understanding of the management of common symptoms and complications of cancer e.g. pain, diarrhoea, constipation, nausea and vomiting/emesis, infections, dyspnoea, bleeding and thrombosis, obstruction, bone complications, anaemia.
Venous Thromboembolism	Demonstrates knowledge and understanding of, and an ability to manage, the increased venous thromboembolism risks associated with malignancy.

3.2. Children

Legal, Professional and Ethical Patient Centred Care	Demonstrates knowledge and understanding of paediatric medicolegal and child protection principles and issues.
Topical Administration	Demonstrates knowledge and understanding of the potential risks from the immature skin barrier in children and neonates with use of topical preparations.
Vaccine Preventable Diseases	Demonstrates knowledge and understanding of common childhood infections including chickenpox (varicella), measles and whooping cough (pertussis).

3.3. Critical Care

Delirium	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of delirium; the current concepts, and national and international guidelines around management of this condition, including delirium level assessment the pharmacological and non-pharmacological preventative and treatment strategies; and the differences between the pharmacological agents used for the management of delirium, including mechanism of action, pharmacology, pharmacokinetic characteristics, clinical use and monitoring parameters.
Haemorrhage	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of an acute gastrointestinal haemorrhage; national and international guidelines on the prevention or treatment of gastrointestinal haemorrhage; the evidence base, current concepts and debates around the management of this condition; the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of acute and preventative treatments for an acute gastrointestinal haemorrhage; and the options for, and implications of non-pharmacological management of acute gastrointestinal haemorrhage.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for catastrophic bleeds, including the medicines that can cause catastrophic bleeds e.g. warfarin; and the pharmacological and non-pharmacological management of catastrophic bleeds.
Motor Neurone Diseases	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of motor neurone diseases (MND); the clinical features and differential diagnosis of MNDs; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for MNDs, including disease modifying and symptomatic treatments e.g. non-invasive ventilation.
Respiratory Depression	Demonstrates knowledge and understanding of respiratory depression, and the risk factors for its development in vulnerable groups, including children and the elderly.
Type I and II Respiratory Failure	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of type I and type II respiratory failure; the primary and secondary prevention of type I and type II respiratory failure; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.

3.4. Elderly

Dementia	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of Alzheimer's disease; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for Alzheimer's other dementias.
Healthcare Risk Assessment	Demonstrates knowledge and understanding of the application of assessments for older people e.g. comprehensive geriatric assessment, cognitive assessments, falls, venous thromboembolism (VTE).

3.5. End of life

Concordance and Adherence	Demonstrates knowledge and understanding of the factors which influence adherence to symptom management regimens in palliative patients.
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End of Life Care Guidance and Legislation	Demonstrates knowledge and understanding of end of life care guidance e.g. NICE guidance: Care of the Dying Adult 2015.
Fluid Therapy	Demonstrates knowledge and understanding of the appropriate use of fluids in the dying patient.
Medicines Management	Demonstrates knowledge and understanding of the management of medicines in the dying patient including stopping unnecessary medicines and changing route of administration of essential medicines.
Symptom Management in the Dying Patient	Demonstrates knowledge and understanding of: the principles of symptom management in palliative care; the prescribing and administration of medicines for symptom management of the dying patient including pain, nausea and vomiting/emetesis, breathlessness, secretions and agitation; and the routes of administration for symptom management and end of life care of the palliative patient.

3.6. HIV

Concordance and Adherence	Demonstrates knowledge and understanding of the importance of adherence to antiretroviral drugs, and the risk of non-adherence to the treatment of HIV infection.
Human Immunodeficiency Virus (HIV)	Demonstrates knowledge and understanding of the implications of HIV diagnosis on neonatal management e.g. post-exposure prophylaxis, infant feeding and risks to the newborn from exposure to anti-retroviral drugs, vitamin K administration, immunisation, and infant testing etc.
	Demonstrates knowledge and understanding of the management of patients with HIV undergoing surgery, e.g. managing and maintaining anti-retroviral drug administration in the context of nil-by-mouth policy and available formulations, and avoiding drug-drug interactions with routine post-operative treatments etc.
	Demonstrates knowledge and understanding of the risks to the foetus from exposure to anti-retrovirals.
	Demonstrates knowledge and understanding of the risks with, and management of, drug-drug interactions during the treatment of HIV infection.
	Demonstrates knowledge and understanding of: the pathophysiology of, method of transmission, natural history, and risk factors for the development of HIV infection; the national guidance on the treatment of HIV; the mechanism of action, pharmacology, pharmacokinetic characteristics, monitoring parameters, clinical use and adverse effects of treatment options for HIV infection, including supportive care; and the treatment options for both first line treatment and treatment of experienced patients.

3.7. Infection

Antimicrobial Stewardship	Demonstrates knowledge and understanding of national, European and global antimicrobial stewardship initiatives.
	Demonstrates knowledge and understanding of: local and national antimicrobial guidelines and policies, their development process and rationale for their content.
	Demonstrates knowledge and understanding of: the principles of outpatient parenteral antimicrobial therapy (OPAT); management of OPAT patients (treatment design/monitoring/follow up); practicalities of development and delivery of an OPAT service.

	Demonstrates knowledge and understanding of: the Start Smart then focus approach to antimicrobial prescribing; an ability to provide advice on antimicrobial treatment, including duration and monitoring, in accordance with local policies; the importance of antibiotic review as part of an antimicrobial stewardship programme, including the rationale for reviewing empiric antibiotic prescriptions within 72h of prescribing and daily review of intravenous antimicrobials; and the principles, local protocols and application of IV-oral switch within the inpatient setting and outpatient parenteral antimicrobial therapy (OPAT).
Antimicrobial use in special populations	Demonstrates knowledge and understanding of antimicrobial dose adjustment in patients with renal or hepatic impairment.
	Demonstrates knowledge and understanding of antimicrobial use in frail elderly patients, particularly in ÖÇÿend of lifeÖÇÖ situations, including physiological, pharmacological and safety issues which should be considered.
	Demonstrates knowledge and understanding of the dosing, contra-indications and monitoring requirements for the use of antimicrobials, including those with a narrow therapeutic index in children.
	Demonstrates knowledge and understanding of the dosing, contra-indications and monitoring requirements for the use of antimicrobials, including those with a narrow therapeutic index in pregnancy.
	Demonstrates knowledge and understanding of the dosing, contra-indications and monitoring requirements for the use of antimicrobials, including those with a narrow therapeutic index in the newborn.
	Demonstrates knowledge and understanding of: monitoring requirements for use of antimicrobials in patients with liver disease; adverse effects of antimicrobials on the liver and how these are reported.
Antimicrobials and Surgery	Demonstrates knowledge and understanding of the pathophysiology and symptoms of surgical site infection (SSI); the methods of prevention of SSI; the role of SSI surveillance in developing effective prophylactic techniques; and the use of antimicrobial therapy to treat SSI and other management options.
Bacteraemia	Demonstrates knowledge and understanding of common types of bacteraemia encountered in the UK and the management options for Staphylococcus aureus and Escherichia coli bacteraemias.
Bone and Joint Infections	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of infection in bones or joints; the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for bone and joint infections; the duration of treatment and monitoring required; and the long term treatment of bone and joint infections, including outpatient parenteral antibiotic therapy (OPAT) arrangements.
Gastrointestinal Infections	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of Candida and other fungal infections affecting the gastrointestinal tract; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of Clostridium difficile infection (CDI), including severity assessment; the strategies and local protocols for managing recurrence of CDI; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for CDI, including infection control precautions and antimicrobial therapy.
Genito-urinary Infections	Demonstrates knowledge and understanding of symptoms of pelvic inflammatory disease and antimicrobial treatment options.
	Demonstrates knowledge and understanding of the main infections of the female genital tract and their management.

	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of upper and lower urinary tract infections (UTIs) and pyelonephritis in children, elderly, women, men and catheterised patients, including the common causative organisms; the symptoms and investigations required for diagnosis; the possible complications of UTIs; and the mechanism of action, pharmacology, pharmacokinetic characteristics, adverse effects, contraindications, interactions, monitoring requirements and clinical use of antimicrobial and non-antimicrobial management options for the treatment and prophylaxis of UTIs.
Healthcare Associated Infections	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of healthcare associated infections (HAIs); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for HAIs.
	Demonstrates knowledge and understanding of: the prevalence, aetiology, short and long term impact and specific risk factors associated with infectious diseases/infection within own healthcare setting, including key healthcare acquired infection (HCAI) rates and targets; the role of antimicrobial stewardship (AMS) as an integral part of multi-professional interventions to prevent HCAI; local, regional and national structures and relevant policy documents for HCAI and AMS.
Infection Prevention and Control	Demonstrates knowledge and understanding of the theory behind selective barrier nursing/isolation measures.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of alert gastrointestinal pathogens e.g. Clostridium difficile, norovirus, rotavirus; and the precautions required to prevent spread, including outbreak management in hospital and/or community settings.
Infections in Care Home Residents	Demonstrates knowledge and understanding of: the common infections in Care Home residents; issues associated with antimicrobial use in Care Home settings; and the implications of inappropriate antimicrobial use on Healthcare-associated Infections and resistant organisms in the Care Home population.
Infections in the Newborn	Demonstrates knowledge and understanding of the pre-emptive treatment of potential infections in the newborn.
Infectious Disease Markers	Demonstrates knowledge and understanding of common laboratory methods for culture and identification of pathogenic bacteria, fungi and viruses (including serology); use of appropriate laboratory tests in given clinical situations; interpretation of tests carried out in a laboratory and ability to discuss limitations associated with their use.
Infective Endocarditis	Demonstrates knowledge and understanding of the role of antimicrobials in the prevention of infective endocarditis.
Meningitis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for, the development of meningitis, including common causative organisms; the initial management of meningitis including investigations and antimicrobial therapy; the role of antimicrobial prophylaxis in contacts of meningitis patients; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for meningitis.
Pathophysiology of Infection	Demonstrates knowledge and understanding of the pathophysiological events underlying and leading to infection, including use of the national early warning score (NEWS), systemic inflammatory response syndrome (SIRS) and quick sepsis-related organ failure (qSOFA).

Resistant Organisms	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of infections due to resistant organisms e.g. methicillin-resistant <i>Staphylococcus aureus</i> (MRSA), carbapenem-resistant enterobacteriaceae (CRE); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for infections due to resistant organisms.
Respiratory Infections	Demonstrates knowledge and understanding of: the differentiation between primary and secondary respiratory infections i.e. community and hospital-acquired pneumonia, aspiration pneumonia, and exacerbation of chronic obstructive pulmonary disease/asthma, and the use of severity scales.
Septic Inflammatory Response Syndrome and Sepsis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of septic inflammatory response syndrome and sepsis; the Sepsis Campaign, Sepsis 6 measures and the role of prompt antimicrobial treatment in managing sepsis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.
Sexually Transmitted Infections	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of common sexually-transmitted infections (STIs) including syphilis, <i>Neisseria gonorrhoea</i> , <i>Chlamydia trachomatis</i> and <i>Lymphogranuloma venereum</i> ; the diagnosis of, and signs and symptoms of common STIs; the antimicrobial treatment options for STIs, including local protocols for supply; and the public health aspects related to prevention of transmission e.g. follow-up and contact tracing requirements.
Tuberculosis	Demonstrates knowledge and understanding of: the risk factors for the development of tuberculosis (TB), including multi-drug resistant TB (MDRTB); the diagnosis of TB and MDRTB; the mechanism of action, pharmacology; pharmacokinetic characteristics and clinical use of treatments for TB and MDRTB; and the primary and secondary prevention of TB and MDRTB.

3.8. Mental health

Anxiety	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of anxiety; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for anxiety.
Attention Deficit Hyperactivity Disorder	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of attention deficit hyperactivity disorder (ADHD); and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for ADHD.
Legal, Professional and Ethical Patient Centred Care	Demonstrates knowledge and understanding of the broad remit and powers of the Mental Capacity Act 2005.
Paranoid Disorders	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of paranoid disorders; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for paranoid disorders.
Schizophrenia	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of schizophrenia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for schizophrenia.

Sleep and Sleep Disorders	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of insomnia; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for insomnia.
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3.9. Organ transplantation

Neutropenia and Neutropenic Sepsis	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of neutropenia and neutropenic sepsis, including in people with cancer; the diagnosis and prevention of neutropenic sepsis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of antimicrobials and other treatments for these conditions.
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3.10. Pain

Opioids	Demonstrates knowledge and understanding of opioid conversion taking into account different routes of administration, drug choice and indications for therapy.
Pain Assessment and Management	Demonstrates knowledge and understanding of current pain management concepts, and the management options for indirect factors contributing to pain.
	Demonstrates knowledge and understanding of current pain management concepts, and the management options for indirect factors contributing to pain.
	Demonstrates knowledge and understanding of the management of pain in opioid dependent patients.
	Demonstrates knowledge and understanding of the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of patient controlled analgesia, nurse controlled analgesia, and epidural controlled analgesia.
	Demonstrates knowledge and understanding of the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for acute and chronic, psychosomatic or other, bone, muscle and/or joint pain management.
	Demonstrates knowledge and understanding of the various methods of assessing pain and their practical use in optimising pain management outcomes.
	Demonstrates knowledge and understanding of: the pathophysiology of, and risk factors for the development of acute, chronic and neuropathic pain; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for these conditions.

3.11. Surgery

Anaesthesia and Sedation	Demonstrates knowledge and understanding of the use of local anaesthesia for the insertion of central lines and cannulation e.g. EMLATM and AmetopTM.
	Demonstrates knowledge and understanding of, and an ability to provide advice on which medicines to give and which to omit if a patient is nil-by-mouth prior to surgery under a general anaesthetic.
	Demonstrates knowledge and understanding of: the different characteristics of various local and regional anaesthetic agents; and the risks and benefits of specific agents and their impact on surgical pathways, including enhanced recovery e.g. nerve blocks, wound infiltration.

	Demonstrates knowledge and understanding of: the pharmacology, pharmacokinetics and treatment options for sedation, monitoring and reversal; the risks of administering sedation in non-anaesthetic areas; and the safe administration of sedation in non-anaesthetic areas.
Antiplatelet and Anticoagulant Management	Demonstrates knowledge and understanding of the impact and management of peri-operative bridging in anticoagulated patients.
	Demonstrates knowledge and understanding of the management of, and an ability to provide advice to, patients taking single or dual antiplatelet therapy and/or anticoagulants, including warfarin and new oral anticoagulants (NOACs), who are undergoing elective and emergency surgical procedures.
Hypothalamic Pituitary Adrenal Axis Suppression	Demonstrates knowledge and understanding of patients at risk of post hypothalamic pituitary adrenal axis suppression, and management options to optimise surgical recovery.
Nausea and Vomiting/Emesis	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of nausea and vomiting/emesis, including drug-induced and post-operative nausea and vomiting; the key monitoring parameters for drugs used in the management of emesis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of anti-emetics.
Post-operative Complications	Demonstrates knowledge and understanding of the implications and management of post-operative complications involving the gastrointestinal system e.g. post-operative ileus, altered stoma output.
Scoliosis	Demonstrates knowledge and understanding of the pathophysiology of, and risk factors for the development of scoliosis; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments for scoliosis, including post-operative pain management.

3.12. Women

Epilepsy and Seizure Disorders	Demonstrates knowledge and understanding of risks to the newborn and infant resulting from exposure to anti-epileptic drugs via breastmilk, and strategies to reduce risk during breastfeeding.
	Demonstrates knowledge and understanding of the drugs that are commonly used in the antenatal, peri- and post-partum periods, and the issues that may arise with their use in women with epilepsy e.g. eliptogenic drugs such as pethidine, drugs which interact with enzyme inducing anti-epileptic drugs, etc.
	Demonstrates knowledge and understanding of the obstetric risks to women with epilepsy; the differences between seizures due to epilepsy and that of other aetiology e.g. pre-eclampsia in pregnancy; and the optimum management of epileptic seizures during pregnancy and while in labour.
	Demonstrates knowledge and understanding of: risks to the foetus and newborn resulting from exposure to anti-epileptic drugs during gestation; the importance of pre-pregnancy counselling; and strategies to reduce risk, including consideration of suitable contraceptive methods for women with epilepsy.
	Demonstrates knowledge and understanding of: the pharmacokinetic and pharmacodynamic changes that alter the handling and effects of anti-epileptic drugs during pregnancy; the dosing and monitoring requirements for anti-epileptic drugs during the antenatal, peri- and post-partum periods and how these may change as the pregnancy progresses.

Lactation	Demonstrates knowledge and understanding of: the factors which affect the choice of drug treatment in the woman who is breastfeeding; the main drug characteristics which determine the extent to which the drug will pass into breast milk; the factors which influence the risk/benefit assessment including the risk of drug exposure to the infant, and the risk of non-treatment; and strategies for reducing risk.
Pregnancy	Demonstrates knowledge and understanding of the common health problems experienced by women during pregnancy.
	Demonstrates knowledge and understanding of the risks of infection during pregnancy and the peripartum period and strategies to reduce risk e.g. vaccination.
	Demonstrates knowledge and understanding of: the pharmacological management of commonly incurred infections in pregnancy, at delivery, and in the peri- and post-partum periods, taking into consideration the risks to the foetus and newborn.
	Demonstrates knowledge and understanding of: the signs and symptoms of maternal sepsis; how these signs and symptoms are identified; and the monitoring required.
	Demonstrates knowledge and understanding of: the factors which affect the choice of drug treatment in the woman who is pregnant, including the range of adverse outcomes associated with drug exposure during pregnancy, the baby's gestational age and health; and the factors which influence the risk/benefit assessment including the risk to the foetus of drug exposure, and the risk of non-treatment.

4. Patient/Pharmaceutical care

4.1. Legal, Professional and Ethical Patient Centred Care

Ethical Decision-making	Demonstrates knowledge and understanding of: the legal and ethical factors that underpin decision-making in situations of moral conflict/ethical dilemma e.g. reconciling cost-containment with best standard of care, withholding information about a teenage patient's medication from their parent when they have differing beliefs etc.; and the importance of identifying the risks and benefits in situations of moral conflict/ethical dilemma.
Healthcare Standards	Demonstrates knowledge and understanding of the effect that healthcare standards have on patient treatment/care and local guidelines.
Legal, Professional and Ethical Patient Centred Care	Demonstrates knowledge and understanding of the medico-legal and consent issues involved with covert administration.
	Demonstrates knowledge and understanding of: the principles of consent and assent for both the competent and incompetent (including unconscious) patients; the principles of informed consent including provision of information, patient education and patient advocacy; and the ethical and compliance requirements of obtaining consent/assent.
	Demonstrates knowledge and understanding of, and an ability to comply with the principles of confidentiality and data protection.
	Demonstrates knowledge and understanding of the legal processes for taking controlled and prescription drugs to other countries.
	Demonstrates knowledge and understanding of the principles of emergency supply of medicines.

	Demonstrates knowledge and understanding of the principles of non-NHS prescribing.
	Demonstrates knowledge and understanding of, and an ability to comply with the relevant legal, ethical, professional and organisational policies, procedures and codes of conduct that govern the provision of pharmaceutical services.
	Demonstrates knowledge and understanding of the concept of clinical negligence, and its associated legal tests e.g. Bolam and Bolitho.
	Demonstrates knowledge and understanding of how the seven principles outlined in the Royal Pharmaceutical Society Code of Ethics and Professional Standards impact on UK medicines information services.
	Demonstrates knowledge and understanding of: relevant local governance, ethics and compliance policies e.g. complaints, confidentiality, freedom of information, incident reporting, IT policies, medicines policy, information storage etc.; and how these are implemented in practice.
Medicines Strategies	Demonstrates knowledge and understanding of key government documents and local guidance with regards to medicines strategies relevant to area of practice.
	Demonstrates knowledge and understanding of the role of government agencies in developing strategies and policies relevant to area(s) of practice.

4.2. Nutritional Management

Enteral Administration	Demonstrates knowledge and understanding of, and an ability to advise on: the pharmaceutical issues that arise with the administration of medication to patients with dysphagia and/or enteral feeding tubes/routes e.g. the effects of enteral nutrition on the absorption, distribution, metabolism, and excretion (ADME) of medications, absorption sites and mechanisms, medication-feed interactions, appropriate formulations, and appropriate dose timing etc.; and the legal issues e.g. unlicensed use, that need to be considered when administering medication via enteral feeding tubes.
Enteral Nutrition	Demonstrates knowledge and understanding of the uses of, need for, ethics and implications of gastrostomy tube placement via different techniques, e.g. percutaneous endoscopic gastrostomy (PEG), radiologically inserted gastrostomy (RIG).
	Demonstrates knowledge and understanding of, and an ability to advise on: the different routes and types of tubes that are used to deliver enteral nutrition e.g. oral, and nasogastric, nasojejunal, gastrostomy and jejunostomy tubes; and the benefits, risks and complications of enteral feeding, including how to unblock enteral feeding tubes.
Malnutrition	Demonstrates knowledge and understanding of: the pathophysiology of, causes, and risk factors for the development of malnourishment, undernourishment, anorexia, profound weight loss and cachexia, and the implications for medicines management; the mechanism of action, pharmacology, pharmacokinetic characteristics, and clinical use of treatments for these conditions; and an ability to recognise and refer patients with these conditions
Nutrition and Disease	Demonstrates knowledge and understanding of: the principles behind nutritional management and application to patient care; nutrition screening tools; and the implications of different disease states on the constitution of nutritional support.
Parenteral Nutrition	Demonstrates knowledge and understanding of the principles behind, benefits, risks and complications of parenteral nutrition and total parenteral nutrition, and its impact on patients.

Re-feeding Syndrome	Demonstrates knowledge and understanding of the prevention and management of re-feeding syndrome.
Vitamins and Minerals	Demonstrates knowledge and understanding of the appropriate use of vitamin and mineral supplements for replacement therapy and for other therapeutic purposes e.g. wound healing.

4.3. Pharmaceutical Care Planning

Cognitive Function Assessment	Demonstrates knowledge and understanding of the available methods for monitoring and assessing cognitive function.
Concordance and Adherence	Demonstrates knowledge and understanding of: the factors which affect patient compliance with treatment regimens; an ability to assess a patient's need for compliance aids e.g. evaluation of patient dexterity; the variety of compliance aids and resources available to support adherence e.g. drug administration aids, information provision in a suitable form, available patient support, low vision aids, formulation preference, feeding tubes, DDA responsibility etc; and an ability to critically appraise the advantages and disadvantages of compliance aids.
Drug Interactions	Demonstrates knowledge and understanding of: the mechanism and clinical significance of drug interactions; an ability to advise on the management and/or avoidance of drug interactions.
Formulary	Demonstrates knowledge and understanding of: local formulary and commonly used medicines, including their place in therapy, mechanism of action, indications, common adverse effects, drug interactions, precautions, genetic variation in metabolism etc.; and an ability to use a formulary to inform adult, paediatric and neonatal treatment choices in a number of conditions e.g. cardiology, respiratory, endocrinology, psychiatry and neurology, gastroenterology, rheumatology and musculoskeletal conditions, skin conditions, blood conditions, kidney and liver disease, infections and antimicrobial stewardship, minor ailments) etc.
Health and Social Care	Demonstrates knowledge and understanding of the interplay between health and social care processes; the impact of this interplay on the provision of pharmaceutical care; an ability to evaluate the full range of needs of an individual patient by adopting a holistic approach through consideration of both their health and social care problems; and the processes required to work with leaders of health and social care to develop new medicines optimisation services.
Omitted Doses	Demonstrates knowledge and understanding of, and an ability to advise on the management of missed drug doses.
Pharmaceutical Care Assessment, Planning and Delivery	Demonstrates knowledge and understanding of healthcare concepts such as holistic assessment, patient centeredness, survivorship and living with chronic disease, coping skills etc.
	Demonstrates knowledge and understanding of the principles, accountability, responsibility and aims of planning and delivering both pharmaceutical care and subsequent patient monitoring.
	Demonstrates knowledge and understanding of: a "body systems" approach to analyse pharmaceutical care needs of patients; and an ability to link the effects of disparate organ systems together in order to treat the patient holistically.
Spiritual and Cultural Beliefs	Demonstrates knowledge and understanding of spiritual and cultural beliefs, and their importance in the management of patients.

Transitional Care	Demonstrates knowledge and understanding of: the factors affecting the management of patients moving across the healthcare interface, the barriers to optimising medicines management when working across healthcare interfaces and the strategies to overcome them; an ability to facilitate the safe and effective transition of patients to their preferred place of care; and an ability to plan the discharge or transfer of patients receiving complex pharmaceutical care.
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4.4. Public Health

Influenza	Demonstrates knowledge and understanding of: the basic pathophysiology, prevention and risk factors for the development of influenza including pandemic flu; and the mechanism of action, pharmacology, pharmacokinetic characteristics and clinical use of treatments of influenza.
Nicotine Dependence	Demonstrates knowledge and understanding of the risk factors associated with smoking in the development of cancers of the upper airway and digestive tract.
Patient Information and Education	Demonstrates knowledge and understanding of patient education and the pharmacists' role in the provision of education to patients.
	Demonstrates knowledge and understanding of public health education to prevent cancer, e.g. smoking cessation, weight loss programmes, sun protection.
	Demonstrates knowledge and understanding of: the health promotion interventions that pharmacy can provide to improve health; and an ability to offer general health promotion advice covering areas such as safe sex, alcohol use, smoking cessation, dental health, nutrition, exercise, vaccines, vitamins, weight control.
Pharmaceutical Care Assessment, Planning and Delivery	Demonstrates knowledge and understanding of, and an ability to use, recognised healthcare risk assessment tools e.g. hypertension, diabetes, heart disease, common public health issues.
Public Health Standards	Demonstrates knowledge and understanding of public health standards as outlined in the Royal Pharmaceutical Society Professional Standards for Public Health Practice for Pharmacy.
	Demonstrates knowledge and understanding of the government documents with regards to public health.

4.5. Quality Improvement

Quality Assurance and Improvement	Demonstrates knowledge and understanding of quality systems and metrics in healthcare, and the importance of quality assurance and improvement to facilitate the delivery of good medical care.
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4.6. Travel

Travel Health	Demonstrates knowledge and understanding of the general precautions that travellers should observe to: reduce risk of contracting malaria/being bitten by mosquitoes; avoid gastrointestinal upset when eating and drinking; and to reduce possible sun induced skin damage.
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5. Collaborative Working Relationships

See Advanced Pharmacy Framework (APF).

6. Management

See Advanced Pharmacy Framework (APF).

7. Leadership

See Advanced Pharmacy Framework (APF) and Leadership Development Framework (LDF)

8. Education, Training and Development

See Advanced Pharmacy Framework (APF).

9. Research & Evaluation

See Advanced Pharmacy Framework (APF).

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Association of Supportive and Palliative Care Pharmacy
Boots UK
British Oncology Pharmacy Association
British Pharmaceutical Nutrition Group
Cardiff University
College of Mental Health Pharmacy
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Expert Group: Urgent and Emergency Care – NHS111 (England and Wales)
HIV Pharmacy Association
Kings College London
Liverpool John Moores University
Neonatal and Paediatric Pharmacists Group
NHS Pharmaceutical Production Committee
NHS Pharmacy Education and Development Group
NHS Technical Services Education and Training
NHS Pharmaceutical Quality Assurance Committee
Pharmaceutical Aseptic Services Group
Primary and Community Care Pharmacy Network
Primary Care Pharmacists' Association
Robert Gordon University
Scottish Palliative Care Pharmacist's Association
Solid Organ Transplant Pharmacists Association

United Kingdom Clinical Pharmacy Association:
UKCPA Cardiac
UKCPA Care of Elderly
UKCPA Community
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