

PROGRAMME SPECIFICATION

1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	MPharm (Hons)
4	Programme Title	Master of Pharmacy with Honours
5	Programme Code	B230
6	Programme Accreditation	General Pharmaceutical Council
7	QAA Subject Benchmark(s)	Pharmacy
8	FHEQ Level	7
9	Last updated	May 2023

10 Programme Aims

The aim of the proposed programme is to provide a high-quality, research-led educational experience that will educate and train pharmacy students to be competent healthcare professionals who are also adept as rigorous scientists and able to relate evidence-based research to their professional practice.

The MPharm programme develops graduates who:

- demonstrate applied knowledge of pharmaceutical science integrated with a range of skills and competencies appropriate to the practice of pharmacy in all sectors of the profession;
- demonstrate detailed knowledge of the National Health Service (NHS) and the role of pharmacists within the wider healthcare team;
- are capable of communicating with patients and professional colleagues to facilitate their role across the entire breadth of professional practice; and
- are research driven, demonstrating an enquiring attitude and a range of research skills suitable to develop the evidence-base of the profession.

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for the MPharm programme.

Knowledge and Understanding

On completing the programme students should demonstrate:

- A1 essential knowledge of fundamental chemical and pharmaceutical science to support patient care and professional practice;
- A2 essential knowledge of the normal anatomy, physiology and function of the human body including an understanding of associated nomenclature;
- A3 essential knowledge of the structure and function of eukaryotes, prokaryotes and viruses, their identification, isolation and quantification;
- A4 essential knowledge of communication skills and structured frameworks of consultation;
- A5 essential knowledge of the regulatory frameworks governing the profession of pharmacy;
- A6 systematic knowledge of the aetiology, epidemiology, pathophysiology, clinical

A7	presentation and appropriate therapeutic intervention within cardiovascular, respiratory, renal and gastrointestinal system disease states; applied understanding of physical examination and clinical monitoring of diseases of the cardiovascular, respiratory, renal and gastrointestinal systems including adverse effects of drugs used in management;
A8	understanding of pharmaceutical intervention in the context of patient care, multidisciplinary health teams, digital systems and environments and the wider National Health Service (NHS) community;
A9	applied knowledge of law and ethics and safe, effective and accountable practice;
A10	comprehension of the design of pharmaceutical preparations and the effect of individual components of a formulation in the context of the final medicinal product;
A11	applied knowledge of the factors affecting the absorption, distribution, metabolism and excretion of pharmaceutical compounds including the management of drug interactions and poisoning;
A12	understanding of the process of drug discovery, rational design or development, quality control and regulation, and sustainable practices in the manufacture, distribution, use and waste management of medicines;
A13	systematic knowledge of the aetiology, epidemiology, pathophysiology, clinical presentation and appropriate therapeutic intervention of central nervous, musculoskeletal, endocrine, urinary and reproductive system disease states;
A14	applied understanding of physical examination and clinical monitoring of diseases of the central nervous, musculoskeletal, endocrine, urinary and reproductive systems including adverse effects of drugs used in management;
A15	systematic understanding of the management of multiple treatment strategies for patients exhibiting co-morbid disease states;
A16	conceptual understanding that enables the student to critically evaluate current research and advanced scholarship in modern drug delivery and future drug development;
A17	comprehensive knowledge relating to the principles of oncology, immunological and infectious disease including fundamental physical examination and treatment;
A18	critical understanding of the role of pharmacists, in all branches of the profession, including the laws and ethical issues relating to practice;
A19	evaluate the management of chronic and multi-morbid conditions, including all aspects of medicine optimisation and justify therapeutic decisions to promote safe and effective prescribing practices;
A20	originality in the application of knowledge around a research topic relating to pharmacy;
A21	integrated knowledge of the management of complex patient cases involving co-morbid disease states and multiple therapeutic interventions.
Intellectual Skills	
On completing the programme students should be able to demonstrate:	
B1	the ability to study effectively, safely, ethically and lawfully for pharmacy at degree level, including the use of reflective techniques and teamwork;
B2	the ability to relate the activity and physical properties of pharmaceutical molecules and biological macromolecules to their structure;
B3	the ability to accurately and reliably perform pharmaceutical calculations;
B4	the ability to analyse and evaluate therapeutic regimens to treat single disease states;
B5	the ability to generate, search for, analyse and evaluate experimental data and relevant primary literature;
B6	capacity to evaluate and discuss therapeutic decisions and associated adverse outcomes in an informed manner with reference to appropriate literature;
B7	the ability to apply an appropriate quality management framework to ensure the safe checking and supply of medicines and medical devices;
B8	the ability to use valid decision making pathways with regard to safe, effective and personalised patient care;
B9	capacity to analyse and evaluate therapeutic regimens used to treat co-morbid disease;

B10	the ability to formulate and justify judgements in the absence of complete data and communicate their conclusions to patients, the public and professional colleagues;
B11	the ability to conceptualise, design and carry out a Masters Level research project related to pharmacy. This will entail a comprehensive understanding of specialist research techniques and the ability to relate these to advanced scholarship;
B12	an understanding of research ethics and the means of gaining approval for research projects.
Practical Skills	
On completing the programme students should be able to:	
C1	apply a range of laboratory techniques, analyse the data and present the outcomes in an appropriate form;
C2	conduct patient assessments and counselling using appropriate communication and consultation skills;
C3	choose appropriate equipment to measure basic physiological parameters;
C4	perform basic physical examinations on human volunteers and simulators with regard to the cardiovascular, respiratory, renal and gastro-intestinal systems;
C5	perform basic physical examinations on human volunteers and simulators with regard to the central nervous, endocrine and musculo-skeletal systems;
C6	act autonomously and efficiently in the planning and implementation of responsibilities at a professional level;
Transferable/Key Skills	
On completing the programme students should be able to:	
D1	the ability to express one's own ideas orally and in writing, to summarise the ideas of others and to distinguish between the two;
D2	the ability to manage time to meet a set of pre-determined deadlines both as an individual and as part of a team;
D3	the ability to understand and evaluate numerical data using basic statistical skills;
D4	the ability to outline key concepts and apply them to a specific issue, problem or question;
D5	the ability to apply basic theoretical frameworks at an intermediate level;
D6	confidence in identifying, analysing, interpreting and solving problems creatively using appropriate knowledge and skills;
D7	the ability to work as part of a multidisciplinary and diverse team and to address the relevance and importance of ideas with open-mindedness;
D8	the ability to articulate and communicate ideas, principles, theories, problems and solutions verbally and in writing to specialist and non-specialist audiences;
D9	the ability to distinguish and differentiate conceptual/theoretical models, and critically assess and evaluate their comparative strengths and weaknesses, detect false logic or reasoning, identify implicit values, defines terms adequately and generalise appropriately;
D10	self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level;
D11	confidence in dealing with complex issues, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences;
D12	initiative and adaptability in independent research and sustaining a project to deliver Masters level outcomes.
Teaching and Learning Methods	
The development of knowledge and understanding, intellectual skills, practical skills and transferable skills is delivered in an integrated manner through the programme. The strategy for supporting learning includes the following activities:	
<ul style="list-style-type: none"> • Lectures or equivalent: the teaching team delivers most formal lectures; visiting lecturers in specialised areas deliver keynote lectures, allowing them to share valuable, current experience with the students. We have a number of partners 	

around the region to help support this and, where possible, we involve students in research seminars with invited speakers. Students will have access to lecture notes or handouts, summarising beforehand via the VLE. Lectures are an essential part of the delivery strategy and when supplemented by other support mechanisms are effective. Staff offer guidance to students around developing strategies to supplement the material provided in lectures with their own study; this involves direction to specific references or by using personal experience to help demonstrate the context of learning. We use our own research experience to inform teaching in lectures and we integrate this with a wider discussion of the best current available evidence within the specific discipline. This is essential in the field of pharmacy and specifically therapeutics, as practice changes over time. Part of this strategy is to give students the tools to critically examine research and draw their own conclusions as to its validity/impact in the context of the subject area as a whole. This will be a key skill in their eventual independent professional practice.

We use a variety of multimedia resources to deliver lectures and to help students fully understand important concepts. This approach ensures that students are able to identify meaningfulness in the material being covered and that they can immediately see application for it within the context of professional practice. We employ student response systems within lectures to promote concentration and to test learning.

As the programme progresses there is less dependence on lectures as a delivery method and more focus on small group teaching and problem-based learning (PBL).

- **Laboratory Classes:** practical work, in the form of laboratory or workshop exercises, engages students in independently producing, analysing and interpreting results and information. Laboratory work is continued throughout the programme and at Stage 4, the emphasis differs depending on which project strand the student has chosen to pursue. Practical sessions relating to the checking process develop understanding of the law relating to pharmacy, competence in the supply of medicines and further develop students' communication skills. Checking sessions are considered as laboratory classes for the purpose of this documentation but are based in the working environments of our local stakeholders.

We make use of technology in the learning process wherever we can. We use IT platforms to support ADI PowerLab equipment meaning that students can perform physiological measurements on themselves and compare them to those within a clinical case designed as part of the experiment in question. We are also making use of platforms that support the development of skills and competencies that support prescribing practice. For example, platforms that allow students to virtually engage with simulated and in the long-term, real patient healthcare records. Students will be able to observe and actively communicate with patients about their ongoing care to understand the patient experience and management of their conditions.

The important aspect of this strategy is that the technology is used with practical experimentation rather than as a replacement for it. This approach augments the problem-based orientation of the programme and helps students to understand links between the material in the context of the care of patients.

Laboratory sessions test students' initiative, accuracy and ability to function as an individual and as part of a team. The eventual progression to the research project is facilitated by the range of understanding obtained from laboratory classes

- **Anatomy sessions:** students take part in sessions to observe anatomy. We use dissections to help students understand the structure and function of the human body. The focus of these sessions is around helping students to visualise the human body as a whole and to be aware of the various structures therein.

- **Clinical skills sessions:** students attend a variety of clinical skills sessions using peers, volunteers, and simulation facilities throughout the programme. Any ethical requirements associated with this teaching are managed in advance and in line with institutional requirements. Students develop physical examination skills, communication, and consultation skills as well as the confidence to approach patients in a structured manner.
- **Problem-based learning (PBL) sessions:** our strategy is to integrate PBL into the programme from the very start, using the premise of case-based learning outlined within the lecture course. We start with smaller groups at Stages 1 and 2 where students work in a relatively low-risk environment to develop their ideas and communication skills. The problems at these stages have a specific orientation to the integration and application of science to practice or industrial challenges. PBL sessions focus on the breadth of material within each stage and encourage students to deepen their understanding of what they are being taught and to create the basis for transfer of information to new, more advanced situations. The term 'case-based integration' is used to highlight these sessions to students, as we want them to be clear that the purpose is the development of integration strands within the material being taught. As the programme moves on, there will be an increased emphasis on PBL sessions, which become gradually more problem-orientated and require students to bring together large sections of knowledge to answer complex problems. We do not use PBL as the only teaching and learning strategy in the later years; it is part of a rounded approach to teaching.
- **Team-based learning (TBL) sessions:** students take part in this small-group learning sessions to consolidate and reinforce deep learning of specific concepts learnt from lectures.
- **Interprofessional education (IPE):** is a feature of our programme. Due to the acknowledged nature of organising and managing IPE with other programmes which have their own design and development strategies, we remain flexible in our approach to IPE. We have many potential IPE sessions designed and piloted with undergraduate students from medicine, dentistry, speech and language therapy and clinical psychology programmes. These sessions demonstrate the importance of multidisciplinary team working as well as the specific role of each professional group therein. Further to that, the sessions allow us to underpin our problem-based approach. We ensure our students have IPE experiences during the programme. We also facilitate students engaging and working with other students and professionals whilst on placements. The diversity and regularity of these placements means that the IPE opportunity will be authentic and occur through the hidden curriculum.
- **Practical experience:** our programme includes significant practical experience. We see this experience as essential in terms of contextualisation our students' knowledge, and to introduce them to the communities of practice within which they will ultimately work.

The practical experience is comprised of:

- Work with volunteer patients within and outside of the University (ethical considerations managed in advance as for clinical skills sessions);
 - Experience of working with other health professionals and students
 - Working with other health professionals and students whilst on placement across a range of environments. These are specifically designed to support students to develop and evidence the skills and competencies that underpin prescribing.
- **Webcasts:** these are used to support lecture and seminar material. They are in audio and video format. Webcasts are available in addition to material provided in

lectures, labs and PBL sessions and form part of the directed learning allocation for each stage. We use webcasts as a method of encouraging students to enquire more deeply, within specific areas of the programme and to challenge them to think and develop their own opinions on current issues. Webcasts will be used as method of introducing expert opinion on various subjects using a 'talking heads' approach. This material will involve current practitioners discussing an aspect of pharmacy in the context of current practice and best available evidence.

- **Directed self-study:** students are required to add to their knowledge by following the directed self-study recommendations made by academic staff. We offer guidance around self-study during Stages 1 and 2 by directing students to appropriate reading and begin the process of ensuring they have a critical approach to the literature or whatever they read in wider information sources. In many cases, this self-study is preparatory work for PBL sessions, or it may be practice for various practical aspects of the course, including introduction to some of the experimental techniques necessary for laboratory sessions. Students are given directed learning through the VLE, during lectures or other sessions and in the unit of study and programme guides.
- **Independent self-study:** references to additional sources of information are made available to enable students to read around the unit of study topic to provide opportunities for broadening of knowledge. They are expected to read widely, highlighting the importance of lifelong learning. Material covered within independent learning will be required to support all aspects of the programme. We clearly support students in this endeavour as they make the transition to higher education by demonstrating the benefit of further reading and highlighting areas of the students' performance, which would be improved by focused self-study.
- **Peer-assisted learning:** we support students from Stage 1 to contribute to the learning of their peers. We start this with formative peer review of student work, provide guidance and direction about best practices in conducting and delivering peer review towards engaging in summative peer review linked to existing assessments throughout the programme.
- **Research project:** all students are required to undertake a research project in Stage 4, which focuses on a particular aspect of the programme. Students choose their own area of speciality; where necessary competitive allocation of titles may be implemented. Groups of students working in each sub-discipline can form research clusters and have seminars on a monthly basis during their projects.

Our students will develop as independent learners, as they progress through the programme. In the higher stages students have developed independence and understand how to improve their own learning and knowledge base using strategies they feel comfortable with.

Assessment Strategy

For the purposes of this document, it is important to understand that the General Pharmaceutical Council (GPhC) have specific expectations in regard of certain aspects of the assessment strategy. The safety of patients and the public is expected to be the overriding priority of these aspects of the assessment strategy, any action, which is deemed to be unsafe or reflective of dangerous, illegal, or inappropriate practice should result in a failed assessment. For illustration the relevant types of assessment have been emboldened.

The assessment of knowledge and understanding, intellectual skills, practical skills and transferable skills is delivered in an integrated manner through a range of course-work tasks, competency assessments and examinations. The strategy for assessment includes the following:

- **Unseen examinations**, written and/or multiple-choice format. Test the range, depth and sophistication of students' knowledge and understanding of the unit of study material. Written examinations test student's ability to argue coherently, demonstrate creative thought, integrate information and communicate effectively in writing, working under time constraints. Due to the integrated nature of the programme long answer examination questions are 'composite' in that students apply a range of scientific and practice-based knowledge to a patient-based problem. In order to clearly satisfy the GPhC requirements, we have a separate law examination at Stage 1 and in Stage 2.
- **Pharmaceutical numeracy tests**, unseen tests included at each stage as 'must pass' items of assessment. This is to address the GPhC's requirements around pharmaceutical numeracy. This aspect of assessment addresses the concern within healthcare environments of errors resulting from failures of arithmetic. All graduates must pass a numeracy test as part of the GPhC Registration Assessment, these tests will ensure that our students are fully prepared for this eventuality and are safe to practice.
- **Placement portfolio** is used at Stages 1 – 3 of the MPharm. Students are required to capture, record and reflect on evidence about their developing professional and clinical practice. Students will be expected to map their progress against the competencies and learning standards for undergraduate and training pharmacists. The portfolio is crucial to support students' development through the programme and transition into their 5th year in training (foundation year). Evidence will be mandated from reflective activity, work-based learning, and peer/colleague feedback.
- **Objective Structured Clinical Examinations (OSCE)** are used at all stages of the programme to test students' ability to apply knowledge in the context of patient care, for example clinical examination skills. These assessments are 'must pass' and are not awarded a mark; rather, they are graded as pass/fail. The OSCE assessments do not contribute to the final unit of study mark or degree classification at any stage. Typically, students are presented with multiple 'stations', which must be completed in an allotted time without any significant error or demonstration of illegal or unsafe practice. Marking schedules are agreed prior to all OSCE assessments as part of a wider procedure designed to guarantee reliability and validity of the OSCE assessment strategy. As students progress through the programme, the OSCE assessment becomes more complex and assesses a wider range of knowledge and competency culminating in students being faced with the type of scenario they will face in practice.
- **Laboratory assessments** are essential to demonstrate students' ability to accurately record their experiments and subsequent results, whilst constructing an argument to explain the results in the context of the original hypothesis. In all instances students will be required to demonstrate a very high degree of accuracy within their experimental conduct in order to comply with the analytical standard in question. Laboratory assessments are included throughout the programme; they are used to develop students' ability to record, analyse and interpret data. Alongside these skills, students develop a systematic approach to methodology and the ability to analyse an experimental approach in the context of the ultimate validity of the results. As the programme progresses, we expect students to develop these skills throughout all of their work.
- **Oral presentations** are done individually and as part of a group; they are used throughout the programme allowing the students to consider and apply what they have learned in the context of a particular issue or problem. They are intended to develop students' analytical, presentational and interpersonal skills, including (in the case of group presentations) working effectively as part of a team. Students are required to undertake an oral defence of their research project. This is a discussion of the entire course of their project and includes consideration of their contribution to

the research team and/or the environment in which they have worked. Many students will undertake their research in a practice environment and the importance of team working should not be underestimated.

- **Poster presentations** require students to work as part of a team in order to present an area of research, either directly undertaken by the student or in summary of clinical literature. This exercise tests students' ability to work as a team and to present complex information in a visual format. The poster format is used in conjunction with an oral presentation as part of the student research project at Stage 4. This is an individual poster presentation to the research group and other academic staff from the School. Students are expected to clearly present their project and explain their methodology, results and the wider context of what they have done in relation to literature within the specific field.
- **Written reports** are used throughout the programme in a variety of formats including essays, reports, case-reviews and literature reviews. For example, students are required to write reports with regard to disease profiles, proposed therapeutic management plans or strategies to formulate poorly soluble drugs. These exercises test the students' ability to construct an argument with appropriate support from the literature, working under word-length and time restraints. As with other aspects of the assessment strategy students are required to demonstrate integrated, creative and critical thought within their writing, all supported by aspects of the literature within the field. These items of assessment demand that students can demonstrate skills including appropriate and thorough literature searching, critical appraisal and, where necessary, the application of statistics. The written reports are used as a strategy to support students in their progression towards the dissertation, ensuring that they have had sufficient challenge and feedback to be in a position at Stage 4 to successfully negotiate a significant research project.
- **A Project** is presented at the end of Stage 4; it must be a maximum of 10,000 words in length and is presented alongside an individual oral defence of a poster. The dissertation must be a fully referenced document demonstrating critical understanding of the specific subject area with clear evidence of the student constructing their own argument in the context of their results. The oral defence of the poster is presented separately to an audience of peers and academic staff as part of a mini-conference. The dissertation will test the students' ability to undertake a large-scale project and present it within the context of the available published literature. Students are given clear guidance as to the expectations of the dissertation including how different disciplines expect the final submission to be presented. The entire assessment strategy for the research project assesses students' ability to work in teams in either a laboratory context or within a working healthcare setting, students are required to articulate their performance to this end within the poster presentation.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This is a four year full-time non-modular programme. Stages 1, 2 and 3 individually consist of one Unit of Study equal to 120 credits. Stage 4 consists of two Units of Study, one comprising the taught element of the stage and the other the research element. Each Unit of Study is equivalent to 60 credits. To be awarded the Master of Pharmacy students must successfully complete each stage of the programme and gain the equivalent of 480 credits.

The programme is designed around the principle of an integrated, spiral curriculum, specifically focusing on multi- and inter-disciplinary teaching. This structure allows us to integrate the teaching and assessment and to focus on outcomes as required by the GPhC standards *Future Pharmacists-standards for the education and training of pharmacists*. The final-year project is essential in bringing the essence of research within a higher education context to the MPharm. We are able to provide a significant research experience designed

to help students understand the research process and to work very closely with the academic staff on an aspect of their research.

The programme is organised around case studies, both clinical and science-based. Students do not focus on any one academic discipline but use the case study as the point of orientation. The idea of this approach is to ensure that all aspects of what is taught are contextualised in terms of the practice of pharmacy. This is not to say that the science aspects of the programme will be reduced in favour of applied subjects or that we fail to have an industrial focus within our programme. The examples we use and the context is the important issue. These ideas clearly follow the constructivist approach to education by immediately including context and elaboration of examples to ensure that students can create links between factual material and their ultimate professional role. Experience of teaching pharmacy students from established schools has shown that some students do not really understand why they are learning basic pharmaceutical science at Stage 1. They sometimes neglect this material or develop a very superficial understanding. This then leads to problems as the students progress, because they do not have sufficient foundation knowledge or a true understanding of the material and thus how to apply it. Demonstrating context and encouraging transferability is the main focus of this approach.

The programme is designed around the concept of a spiral curriculum, where ideas are presented to students then repeated throughout the provision at increasing levels of complexity. Students orientate all theoretical and practical information around applied scenarios, which gradually become more complex and more detailed as they progress. Rather than signposting units of study with subject areas such as pharmaceutical chemistry or pharmacokinetics, we have strands within each unit of study based around cases studies, which combine issues from fundamental sciences and clinical medicine. Figure 1, below, demonstrates an example of a single disease state integration pathway. In this case, the teaching is orientated around a simple case, which then leads to a 'strand' within one of the large unit of study. The strand in this case is hypertension and is very clearly something that is understood at a broad level by the student as a problem for health and wellbeing; the initial premise is therefore within the bounds of the students' existing cognitive schemata. The issues around hypertension allow for a number of subject areas to be hooked on that particular case; for example, public health, formulation of controlled/sustained release devices and therapeutic drug monitoring. These issues have a wide application and are relevant throughout pharmacy, but, in this instance, we teach them in the context of hypertension then expect the student to take that knowledge and apply it in another case where it may be relevant. Pain relief is a prime example of where the principles of controlled/sustained release formulation are important. We do not repeat the principles of formulation in those cases but highlight any novel extensions to the field. This idea fits within a significant body of educational theory, which suggests that students are more likely to fully understand material if it makes sense in the context of what they already know and if it has an obvious application within their perceived, eventual professional role. The spiral curriculum model continues in this manner throughout the entire programme.

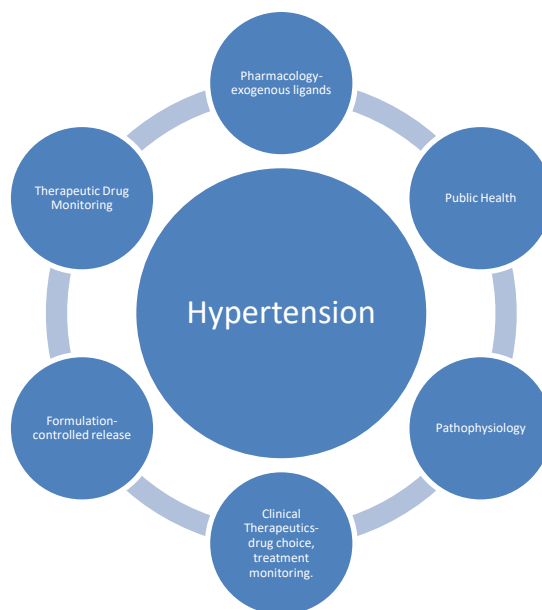


Figure 1 Example of a Case-based Pathway

The spiral curriculum results in major areas of conceptual understanding, which we would want students to grasp at each stage. These can be broadly thought of as being:

Stage 1: underpinning science including studies of anatomy and physiology, orientation to the profession and professionalism. Fundamental knowledge of formulation science and pharmaceutical chemistry in the context of the discovery, synthesis, formulation and stability of drugs and medicines. Underpinning knowledge of pharmacy law and ethics of clinical practice. Understanding of methodological approaches to research including the context of research being conducted within the University. Understanding of the process of academic writing including referencing and the construction of an argument based upon best available evidence.

Stage 2: aetiology, epidemiology pathology and therapeutics; strategies for treatment of disease. Students will learn to manage single disease states. The formulation of medicines will be examined in greater detail with students developing skills in predicting the effects of altering a formulation on the final medicinal product. Understanding the importance of sustainable practices in the design, manufacture, distribution, use and waste management of medicines. Applied understanding of the use of research within healthcare including both quantitative and qualitative methods of enquiry.

Stage 3: evidence-based decision making around semi-complex cases (i.e., involving more than one disease state). Further detail around advanced drug discovery, including molecular modelling techniques and nanotechnology. Critical approach to the use of research methods within their own personal work and in terms of the literature specific to relevant areas. Demonstrable use of research evidence within clinical decision-making.

Stage 4: applied therapeutics including critical analysis around complex clinical cases. Demonstrable research skills in a specific area of pharmacy.

In terms of key skills students will broadly develop:

Stage 1: writing and oral presentations skills along with fundamental research skills including data collection and literature searching. The assessment strategy encourages students to think creatively and start the process of developing their own integrations within the material. Initial team-working skills. Develop basic clinical skills and communication skills to support basic interactions with patients about minor conditions and public health interventions.

Stage 2: understanding theoretical frameworks and their application to pharmacy, team working within the University and during placement visits. Ability to communicate ideas to a range of audiences in writing and verbally. Clear evidence-based approach to subjects, drawing from appropriate research and literature to support arguments. Develop clinical and communication skills to support interactions about medicines and public health interventions with healthcare professionals and with patients from diverse backgrounds and with a range of health and social care needs.

Stage 3: increased problem-solving skills including the ability to construct and defend a cogent argument or question those of others. Analytical approach to therapeutic regimens incorporating fundamental scientific information with current best evidence to ensure maximum benefit to the patient in terms of symptom control and health benefit. Develop clinical and communication skills to support interactions about medicines, public health interventions and holistic care with healthcare professionals and with patients from diverse backgrounds and with a range of health and social care needs.

Stage 4: ability to make complex judgement in a professional manner, in the presence of incomplete data. Demonstrable research skills in a specialist area of pharmacy. Analytical and critical approach to research methodology. Develop clinical and communication skills to support interactions about complex medicine regimen, public health interventions and holistic care with healthcare professionals and with patients from diverse backgrounds and with a range of health and social care needs.

Our ability to teach anatomy at Newcastle is a significant benefit and is also fairly unique within pharmacy. Increasingly, clinical skills are part of a pharmacist's work as the ideas of healthy living pharmacies and pharmacist prescribers become fixed within healthcare in the UK. Our students will be graduating to enter and complete their Foundation year training to become independent prescribers by 2026. Reliable understanding of the diagnostic process or even the wider influence of therapeutic decision-making within the diagnostic process is not possible without an understanding of anatomy.

Stage 4 contains the research project. We are satisfied that the research-led nature of the programme results in final year projects that are of a very high standard and are closely linked to the research disciplines of the staff involved. The teaching and assessment strategies employed throughout the programme clearly direct the students to have a sharp research-focus. Our students have examined the full breadth of literature and methodology relating to fundamental science in chemistry, pharmacology and drug delivery including important work streams being conducted by academic staff within the teaching team. In terms of pharmacy practice research projects, we have identified systems, which will allow us to make ethical applications ahead of the student starting the project.

The programme is designed to examine the patient as a whole. We do not separate out the management of minor ailments from that of major disease or adult patients being different from paediatric or geriatric ones. The concepts around consultation, prescribing, examination and disease management are addressed in exactly the same way, irrespective of how the condition is managed or in what type of patient it appears. We discuss each minor condition within the relevant system area and relate dosage and drug interactions to the appropriate area when necessary.

Coherence: the MPharm has a clear focus around patient care. This does not mean that it is focused on producing graduates for the community and hospital sectors. All aspects of pharmacy are patient-driven including drug discovery and formulation sciences. We maintain that focus throughout the programme in order for students to understand the role of a pharmacist in detail. The programme has a clear sequence and logically moves from simple management of single component problems to the more complex management of real situations where incomplete data may regularly confound the issue at hand. This allows the student to construct management strategies around simple problems at a time when their

knowledge base is developing. By slowly increasing complexity, we allow students to elaborate on their knowledge and to transfer knowledge to new situations. This develops confidence and gives students a solid foundation for decision-making. Material is delivered, as described above, in the context of case studies.

The programme is designed to meet the learning outcomes in, *Standards for the education and training of pharmacists* and is thus focused on delivering a cogent set of nationally agreed outcomes shared by all UK providers of undergraduate pharmacy education.

Breadth: students cover a huge breadth of information at Stage1, including fundamental pharmaceutical chemistry, formulation, pharmaceutical microbiology, anatomy, physiology, and clinical biochemistry. The role of the pharmacist in all areas of practice is examined including the structure of the UK healthcare system. Things examined at this level include use of effective communication strategies and detailing formal models of consultation.

Moving through the programme, material builds upon the general principles delivered at Stage1, but focuses on areas of clinical medicine throughout Stage 2, 3 and 4. Formulation science and aspects of pharmaceutical chemistry are delivered throughout the remainder of the programme in the context of the specific disease being examined at that time. Material around law, ethics and other relevant areas of pharmacy practice are delivered specifically at Stage 1 and 2 with a short recap at Stage 4.

Depth: the programme is developed to facilitate a spiral curriculum in which core skills and knowledge are revisited at each stage but each time requiring a greater depth of understanding. Stage 3 and 4 units of study offer students an opportunity to engage with more complex issues including patients with multiple, co-morbid disease states and thus highly complex treatment regimens. Students are required to demonstrate a high-level understanding of the complexity of disease management, including application of therapeutic drug monitoring and implementation of the principles of pharmacokinetics. These units of study examine complex formulation and drug discovery issues including nanotechnology and the concept of 'designer' drugs.

At Stage 4 students choose a project area, which feeds into the research areas of the academic staff. This project runs for the first semester of the final year and demands that the students function as an integral part of a range of research teams. Students engage with research seminars within their groups and give a final oral presentation to peers and the wider academic staff and present a poster at the Annual Pharmacy Research Symposium to summarise the results of their research.

Our students engage with cutting edge research throughout the programme, much of which is conducted within the School or the wider University. Students are fully familiar with the concepts of critical appraisal and are able to understand research outputs in terms of the real effect on patients. This applies to clinical research and that based in the scientific disciplines, which is nonetheless related to patients, new approaches to therapeutic problems or drug delivery. Our students demonstrate a systematic understanding of quantitative and qualitative research methods.

International, intercultural or global dimension: pharmacy and the wider scope of 'health' are primarily engaged with issues of a global reach. The multi-cultural nature of our society results in the need to understand illness and treatment in the wider context of cultural beliefs and genetic predisposition to disease. Students are encouraged to situate their intellectual endeavours alongside personal interests and values, in the development of an active and engaged citizenship. Our students are encouraged to consider the key problems in 'health' as concerns for humanity in general rather than simply the NHS and the UK. This approach is essential within modern healthcare; pharmacy graduates work in a multi-cultural environment and must understand the different influences that patients bring to bear in the context of their health. We include instruction from anthropologists and psychologists within the course to ensure that students have a fundamental appreciation of the influence of culture

upon health and how health professionals should manage expectations based upon cultural variance.

The importance of communication in the context of health professionals working in a multicultural society is examined in depth and students are given the opportunity to engage with this in real-life practice throughout the programme. This includes examination of intercultural influences in terms of working with professional colleagues and managing patients.

We discuss other healthcare systems around the world to help students see the NHS in context and to appreciate the way other nations approach healthcare, particularly in view of those with less available resource. This is related to patterns of illness, which are directly attributable to cultural influences and the mechanisms of healthcare delivery.

The impact of digital health and technology is also covered in relation to the opportunities these provide to improve patient care and safety but also acknowledge the potential unforeseen inequities and disadvantage these present.

13. Key features of the programme (including what makes the programme distinctive)

Integrated/spiral curriculum one of the unique aspects of the MPharm programme is the way in which we provide an integrated spiral curriculum. Integration supports a reflective approach to the subject as a whole rather than bracketing learning off into individual subject disciplines it allows for the maintenance of a level of study as a coherent whole. This approach ensures that our graduates are confident and capable of systematic enquiry and application of their knowledge and skills to provide answers and solutions to complex problems not always enabled through more linear styles of learning.

Inter-Professional Education (IPE) IPE within the MPharm includes the planning of learning activities around the concept of learning with, from and about each other. The overall aim is to modify students thinking and understanding of interprofessional teamwork through the recognition of the roles and responsibilities played by different healthcare professionals, and as a consequence create respectful and conscious practitioners and team players. We provide every student IPE experiences within the programme with other undergraduate students and/or healthcare professionals.

Anatomy teaching One of the unique aspects of the MPharm is the use of cadavers giving hands on experience to support traditional anatomical teaching, an aspect not usually experienced within pharmacy education.

Placements There are a range of different placements that students are involved in during their time on the MPharm, each carefully thought out to ensure that students are able to benefit from learning and understanding the different roles that they will be able to take on once a qualified pharmacist. The placements help students develop a sense of identity as a developing pharmacist and are a place where practical knowledge and skills are acquired, crafted and developed. The placement is an essential part of preparation for clinical practice. Student are supported with an appropriate level of clinical supervision to actively participate in the placement environment. Students are prepared to make use of their developed skills in an authentic approach and recognisably contribute to service provision within that environment.

Programme regulations (link to on-line version)

[-RB230_vFinal.pdf](#)

14 Support for Student Learning

Generic information regarding University provision is available at the following link.

[qsh_progspec_generic_info.pdf](#)

15 Methods for evaluating and improving the quality and standards of teaching and learning

Generic information regarding University provision is available at the following link.

[qsh_progspec_generic_info.pdf](#)

16 Regulation of assessment

Generic information regarding University provision is available at the following link.

[qsh_progspec_generic_info.pdf](#)

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/degrees/#subject>

Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided.

Learning Outcome Mapping

Knowledge and Understanding		
A1	essential knowledge of fundamental chemical and pharmaceutical science to support patient care and professional practice	PHA1006
A2	essential knowledge of the normal anatomy, physiology and function of the human body including an understanding of associated nomenclature	PHA1006
A3	essential knowledge of the structure and function of eukaryotes, prokaryotes and viruses, their identification, isolation, and quantification	PHA1006
A4	essential knowledge of communication skills and structured frameworks of consultation	PHA1006
A5	essential knowledge of the regulatory frameworks governing the profession of pharmacy	PHA1006
A6	systematic knowledge of the aetiology, epidemiology, pathophysiology, clinical presentation and appropriate therapeutic intervention within cardiovascular, respiratory, renal and gastrointestinal system disease states	PHA2006
A7	applied understanding of physical examination and clinical monitoring of diseases of the cardiovascular, respiratory, renal and gastrointestinal systems including adverse effects of drugs used in management	PHA2006
A8	understanding of pharmaceutical intervention in the context of patient care, multidisciplinary health teams, digital systems and environments and the wider National Health Service (NHS) community	PHA2006
A9	applied knowledge of law and ethics and safe, effective and accountable practice	PHA1006 PHA2006
A10	comprehension of the design of pharmaceutical preparations and the effect of individual components of a formulation in the context of the final medicinal product;	PHA2006
A11	applied knowledge of the factors affecting the absorption, distribution, metabolism and excretion of pharmaceutical compounds including the management of drug interactions and poisoning;	PHA2006
A12	understanding of the process of drug discovery, rational design or development, quality control and regulation, and sustainable practices in the manufacture, distribution, use and waste management of medicines	PHA2006
A13	systematic knowledge of the aetiology, epidemiology, pathophysiology, clinical presentation and appropriate therapeutic intervention of central nervous, musculoskeletal, endocrine, urinary and reproductive system disease states	PHA3006
A14	applied understanding of physical examination and clinical monitoring of diseases of the central nervous, musculoskeletal, endocrine, urinary and reproductive systems including adverse effects of drugs used in management	PHA3006
A15	systematic understanding of the management of multiple treatment strategies for patients exhibiting co-morbid disease states	PHA3006
A16	conceptual understanding that enables the student to critically evaluate current research and advanced scholarship in modern drug delivery and future drug development	PHA3006
A17	comprehensive knowledge relating to the principles of oncology, immunological and infectious disease including fundamental physical examination and treatment	PHA4004
A18	critical understanding of the role of pharmacists, in all branches of the profession, including the laws and ethical issues relating to practice	PHA2006 PHA4004

A19	evaluate the management of chronic and multi-morbid conditions, including all aspects of medicine optimisation and justify therapeutic decisions to promote safe and effective prescribing practices	PHA4004
A20	originality in the application of knowledge around a research topic relating to pharmacy	PHA4014
A21	integrated knowledge of the management of complex patient cases involving co-morbid disease states and multiple therapeutic interventions	PHA4004
Intellectual Skills		
B1	the ability to study effectively, safely, ethically and lawfully for pharmacy at degree level, including the use of reflective techniques and teamwork	PHA1006
B2	the ability to relate the activity and physical properties of pharmaceutical molecules and biological macromolecules to their structure	PHA1006
B3	the ability to accurately and reliably perform pharmaceutical calculations;	PHA1006
B4	the ability to analyse and evaluate therapeutic regimens to treat single disease states	PHA2006
B5	the ability to generate, search for, analyse and evaluate experimental data and relevant primary literature	PHA2006 PHA4014
B6	capacity to evaluate and discuss therapeutic decisions and associated adverse outcomes in an informed manner with reference to appropriate literature	PHA2006
B7	the ability to apply an appropriate quality management framework to ensure the safe checking and supply of medicines and medical devices	PHA2006
B8	the ability to use valid decision making pathways with regard to safe, effective and personalised patient care	PHA2006
B9	capacity to analyse and evaluate therapeutic regimens used to treat co-morbid disease	PHA3006
B10	the ability to formulate and justify judgements in the absence of complete data and communicate their conclusions to patients, the public and professional colleagues	PHA3006 PHA4014
B11	the ability to conceptualise, design and carry out a Masters Level research project related to pharmacy. This will entail a comprehensive understanding of specialist research techniques and the ability to relate these to advanced scholarship	PHA4014
B12	an understanding of research ethics and the means of gaining approval for research projects	PHA4014
Practical Skills		
C1	apply a range of laboratory techniques, analyse the data and present the outcomes in an appropriate form	PHA1006 PHA4014
C2	conduct patient assessments and counselling using appropriate communication and consultation skills	PHA1006
C3	choose appropriate equipment to measure basic physiological parameters;	PHA1006 PHA2006
C4	perform basic physical examinations on human volunteers and simulators with regard to the cardiovascular, respiratory, renal and gastro-intestinal systems	PHA2006
C5	perform basic physical examinations on human volunteers and simulators with regard to the central nervous, endocrine and musculo-skeletal systems	PHA3006
C6	act autonomously and efficiently in the planning and implementation of responsibilities at a professional level	PHA4004
Transferable/Key Skills		
D1	the ability to express one's own ideas orally and in writing, to summarise the ideas of others and to distinguish between the two	PHA4014

D2	the ability to manage time to meet a set of pre-determined deadlines both as an individual and as part of a team	PHA4014
D3	the ability to understand and evaluate numerical data using basic statistical skills	PHA4014
D4	the ability to outline key concepts and apply them to a specific issue, problem or question	PHA4014
D5	the ability to apply basic theoretical frameworks at an intermediate level	PHA2006 PHA4014
D6	confidence in identifying, analysing, interpreting and solving problems creatively using appropriate knowledge and skills	PHA2006 PHA4014
D7	the ability to work as part of a multidisciplinary and diverse team and to address the relevance and importance of ideas with open-mindedness	PHA2006 PHA4014
D8	the ability to articulate and communicate ideas, principles, theories, problems and solutions verbally and in writing to specialist and non-specialist audiences	PHA2006 PHA4014
D9	the ability to distinguish and differentiate conceptual/theoretical models, and critically assess and evaluate their comparative strengths and weaknesses, detect false logic or reasoning, identify implicit values, defines terms adequately and generalise appropriately	PHA3006 PHA4014
D10	self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level	PHA3006 PHA4014
D11	confidence in dealing with complex issues, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences	PHA4004 PHA4014
D12	initiative and adaptability in independent research and sustaining a project to deliver Masters level outcomes	PHA4014