

SCRIPT prescribing e-learning tool

A guide for trainees and trusts in the Foundation Programme within Health Education England working across the East of England (HEEEoE)

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1. BACKGROUND

It is estimated that one in ten patients is harmed while receiving hospital care. Medication errors can be defined as “a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient”. Medication prescribing errors are those that have specifically occurred during the prescribing process, where there is a failure to order the right drug at the right dose at the right frequency for the right patient. In the UK, medication errors account for 10–20% of all adverse events in the National Health Service (NHS), and preventable harm from medicines is estimated to cost more than £750 million each year. A quarter of litigation claims in the NHS also stem from such errors.

In the UK, the majority of prescribing in hospitals is undertaken by Foundation trainee doctors in the first and second year of foundation training. Given the rate of errors, in 2009, the General Medical Council (GMC) commissioned a study to determine the causes of prescribing errors made by Foundation trainee doctors with the aim that this could inform evidence-based recommendations to improve patient safety and define a future research agenda. The EQUIP study² found that the rate of error varied depending on the grade of the doctor, but that year 1 and year 2 trainee doctors prescribed with an error rate of 8% and 10% respectively. The findings of this study highlighted serious weaknesses in existing educational approaches indicating that many newly qualified doctors are poorly prepared for prescribing. The authors found that poor prescribing was widespread and results in the underuse of effective medicines; avoidable adverse drug reactions; and medication errors. The study made three key recommendations:

- Education in practical prescribing should be part of foundation year one education.
- Foundation trainee doctors should be given explicit feedback regarding their prescribing practice during foundation education.
- Help-seeking and feedback-seeking behaviours should be encouraged in workplace education and appraisal.

As a result of the EQUIP study, in 2010 Health Education West Midlands (or then the Strategic Health Authority) commissioned the Universities of Birmingham, Warwick and Keele to develop an online eLearning programme to improve prescribing competency of trainee doctors. The overall aims of the project were to:

- Encourage safe, effective, and rational prescribing by developing learning modules that reflect current prescribing practice in the NHS.
- Improve the prescribing knowledge and skills of newly qualified doctors during the formative years of their professional development, in order to reduce medication errors and improve patient safety.

SCRIPT (Standardised Computerised Revalidation Instrument for Prescribing and Therapeutics) was created in 2011 by a team of clinical pharmacists and clinical pharmacologists working in both education and healthcare. SCRIPT was first purchased for use with HEE, EoE Foundation School trainees in 2016 to assist in the development of prescribing skills within the region. This has encompassed both the East Anglian Foundation School [EAFS] and from 2017 the Essex, Beds, Herts foundation School [EBH]

2. THE RESOURCE

The programme comprises 47 web-based eLearning modules relating to prescribing and therapeutics across a wide range of subject areas (Appendix 1). All modules have been authored by specialist healthcare professionals and were externally peer reviewed to ensure accuracy and relevance to practice. The 47 modules are divided into seven categories:

- Principles of Prescribing
- Prescribing in Medical Emergencies
- Prescribing in Special Circumstances
- Managing the Risks of Prescribing
- Therapeutic Groups
- Clinical Governance

- Advanced Prescribing

The learning outcomes for the modules are based on the outcomes and competencies outlined in the Foundation Programme Curriculum, particularly those related to Good Clinical Care: Safe Prescribing.

2.1 Structure of the modules

Each module has the same core components, commencing with a brief session overview and recommendations for any reading that might facilitate progress through the module ('Pre-requisites') and learning outcomes. You will then sit a pre-test of 10 questions with True/False or multiple choice formats. You will be given a score out of ten at the end of the test, but will not be provided with feedback at this stage. The learning starts with a Case Vignette that will introduce some key concepts from the module. Additional activities are presented throughout the module to embed learning. Note that some of the key learning points may be provided within the feedback to these cases. At the end of the module, you will sit a post-test of the same 10 questions presented in the pre-test. These will be asked in a random order, and as the resource develops, the post-test questions may be different for some modules. In order for the post-test to be activated you must have viewed all content in each module. Guidance on this is given in the 'Post-test' page in the Summary section of each module.

2.2 Certification Upon completion of the module

A certificate will be made available as a PDF stating:

- Your name.
- The module title.
- The learning outcomes of the module.
- The date and time the certificate was generated.

It is expected that you will upload the certificates into your eportfolio library as named script certificates and link to the curriculum.

2.3 The pre/post-test score

The pre/post-test is intended to help you determine your baseline knowledge on the module subject, and be a measure of knowledge acquisition. It also adds an element of interactivity. The pass mark has been set at 70%, consistent with that in other Foundation Schools.

3. INTEGRATION INTO FOUNDATION TRAINING

3.1. Mandatory modules

The SCRIPT eLearning is fully integrated in the HEE, EoE programme, both for EAFS from Sept 2016 and for EBHFS from August 2017 following repatriation. In both F1 and F2, you are required to complete a minimum of 6 mandatory modules per year. In the initial year, these have been set by the foundation school, however in future years there will be discussion with local trusts.

Local trusts may set additional modules in response to local need or clinical incidents, and educational or clinical supervisors may recommend module completion related to speciality or due to trainee need after an educational meeting.

Medical education departments will monitor whether SCRIPT modules are being completed and completion will be part of the checklist for ARCP.

Your local trust will confirm your SCRIPT programme for the year including mandatory and advisory elements

Suggested template:

Year	Mandatory for ARCP?	Module name
FY1	yes	principles of prescribing: Prescription Documentation
FY1	yes	principles of prescribing: Taking a Safe and Effective Drug History
FY1	yes	prescribing in emergencies: Fluids
FY1	yes	managing the risks: Adverse Drug Reactions
FY1	yes	managing the risks: Medication Errors
FY1	yes	prescribing in medical emergencies: sepsis
FY1	Advisory	Trust mandated module
FY1	Advisory	Trust mandated module
FY1	Advisory	Your educational supervisor may also recommend further modules
FY2	yes	prescribing in medical emergencies: anaphylaxis
FY2	yes	prescribing in medical emergencies: cardiac arrest
FY2	yes	prescribing in medical emergencies: diabetic emergencies
FY2	yes	managing the risks: Monitoring Drug Therapy
FY2	yes	managing the risks: Drug Interactions
FY2	yes	Clinical governance: rational drug choice
FY2	Advisory	Trust mandated module
FY2	Advisory	Trust mandated module
FY2	Advisory	Your educational supervisor may also recommend further modules

3.2. How is my progress monitored?

SCRIPT eLearning has a dedicated management site that is accessed by prescribing leads and postgraduate centre managers to monitor the progress of their Trust trainees through the mandatory modules. This serves two purposes:

- We can ensure that you are taking steps to develop your prescribing knowledge in postgraduate education.
- We can encourage discussion about prescribing in workplace education and during your appraisals.

The 'managers' will see the following information about your progress:

- When you have completed the modules (day of week and time of day).
- How long you spent on the learning.
- Your pre- and post-test scores.

The management site will be used prior to Annual Review of Competence Progression (ARCP) to sign-off that mandated modules have been completed.

3.3. *SCRIPT and the ePortfolio*

It is expected that you save your certificates and upload these to your ePortfolio as evidence of module completion. These may be assessed during the progress review meetings, in addition to the information gathered from the management site.

3.4. *Re-taking the pre/post-test*

The passmark has been set at 70%, If you do not achieve this you will need to retake the test, and it is recommended that you re-review all areas of the module before doing so. We have also created a lock so that the module review time must be at least 10 minutes before you can sit the post test successfully. This is in line with other foundation schools.

3.5. *Modules completed in undergraduate education*

SCRIPT eLearning is now being used in some academic institutions (e.g. the University of Birmingham). Therefore you may have completed some modules during your degree, for example, in preparation for the Prescribing Safety Assessment. If you have completed any of the mandated modules within 12 months of starting your F1, these can be used to fulfil the Foundation requirements. However, your clinical tutor or postgraduate centre manager will need evidence of the module(s) being completed, so upload any certificates to your ePortfolio. We would strongly recommend that your educational supervisor suggest alternative modules for you to complete.

3.6. *Probity*

Probity is at the heart of medical professionalism. Probity means being honest and trustworthy and acting with integrity. The GMC Good Clinical Practice states: “You must always be honest about your experience, qualifications and current role” [Act with honesty and integrity; paragraph 66]⁴. SCRIPT was introduced in the West Midlands in 2011. During this time, tutors in the West Midlands learned of dishonest behaviours to ‘work around’ the mandated modules in order to progress through the ARCP. This includes fraudulently creating certificates for modules that have not been completed and completing multiple modules simultaneously by opening a number of tabs on the computer. These behaviours can now be identified from the management site, as can modules that are completed in less than 10 minutes (the average time to complete a module is 30 minutes). We would like to remind you of the standards set out by the GMC.

4. REGISTRATION

Registration is a simple process; the website address is <http://eoe3.safeprescriber.org/login>

As you will not have accounts yet you will need to register by clicking on the ‘**Get Started**’ button.

You will be asked to provide the following information:

- a. Name
- b. Profession (F1 or F2)
- c. GMC number (professional number)
- d. Foundation School
- e. NHS Trust
- f. Email address and password

When you have entered your details, you will need to agree to the terms and conditions.

You will receive an email confirming your registration. When this is complete, you can login and access all the modules.

When you have completed a module, a certificate will be made available which you can upload to your ePortfolio.

Your registration information is not shared with a third party, and is maintained on a secure server.

4.1. Moving from F1 to F2

When you move from F1 to F2 you will be required to update your profile on SCRIPT to your new trust (if applicable) and from F1 to F2.

5 SCRIPT and the PSA

Prescribing topics of the PSA have been mapped to SCRIPT modules and are useful for remediation.

This matrix has been created by mapping the topics of the relevant sections of the PSA to the SCRIPT module learning outcomes. Performance in the PSA is broken down by section. Some PSA sections have greater weight than others.

If you have under-performed in several PSA sections, or are new to the PSA/prescribing in the NHS, it may be helpful to undertake the following recommended modules in priority order (as there are 18 SCRIPT modules within the matrix). These have been selected based on the weight of the section in which they appear and the number of times they occur in the matrix:

1. Rational Drug Choice
2. Utilising the BNF
3. Prescription Documentation
4. Fluids
5. Taking a Safe and Effective Drug History
6. Adverse Drug Reactions
7. Dosing and Calculation
8. Drug Interactions
9. Adherence and Concordance

PSA Prescribing Area / Topics included	SCRIPT Module
Prescribing	Weight 40%

Drug history	Taking a Safe and Effective Drug History
Fluid management	Fluids
Prescription Documentation	Prescription Documentation
Rational Drug Choice	Rational Drug Choice
Utilising information to inform prescribing	Utilising the BNF / BNFc
Prescription Review	Weight 16%
Adherence	Adherence and Concordance
Adverse Drug Reactions	Adverse Drug Reactions
Dosing	Dosing and Calculation
Drug history	Taking a Safe and Effective Drug History
Hepatic Impairment	Prescribing in Hepatic Dysfunction
Interactions	Drug Interactions
Medication Errors	Medication Errors
Polypharmacy	Prescribing in Older Adults
Rational Drug Choice	Rational Drug Choice
Renal impairment	Prescribing in Renal Dysfunction
Utilising information to inform prescribing	Utilising the BNF / BNFc
Planning Management	Weight 8%
Adherence	Adherence and Concordance
Drug history	Taking a Safe and Effective Drug History
Rational Drug Choice	Rational Drug Choice

PSA Prescribing Area / Topics included	SCRIPT Module
Providing Information	Weight 6%
Adherence	Adherence and Concordance
Adverse Drug Reactions	Adverse Drug Reactions
Dosing	Dosing and Calculation
Formulation and Administration	Formulation and Administration
Interactions	Drug Interactions
Calculation Skills	Weight 8%
Administration	Formulation and Administration
Calculations	Dosing and Calculation
Adverse Drug Reactions	Weight 8%
Adverse Drug Reactions	Adverse Drug Reactions
Anaphylaxis	Drug Allergy and Anaphylaxis
Interaction	Drug Interactions
Management of ADRs	Parenteral Poisons
Management of ADRs	Toxic Tablets
Utilising information to inform prescribing	Utilising the BNF / BNFc
Drug Monitoring	Weight 8%
Adverse Drug Reactions	Adverse Drug Reactions
Rational Drug Choice	Rational Drug Choice
Therapeutic Drug Monitoring	Monitoring Drug Therapy
Utilising information to inform prescribing	Utilising the BNF / BNFc
Data Interpretation	Weight 6%
Hepatic Impairment	Prescribing in Hepatic Dysfunction

Rational Drug Choice	Rational Drug Choice
Renal impairment	Prescribing in Renal Dysfunction
Therapeutic Drug Monitoring	Monitoring Drug Therapy
Utilising information to inform prescribing	Utilising the BNF / BNFc

6. FREQUENTLY ASKED QUESTIONS

6.1. Technical problems

What do I do if I have forgotten my password?

Enter your email address and click 'Forgotten Password'. This will send you an email containing a link which takes you to a page to change the password.

What do I do if I have forgotten the email address I registered with?

Email us at info@safeprescriber.org or click 'Feedback' in the bottom left hand corner of the homepage. The technical team will respond accordingly.

When I go to register I cannot find my Trust – where is it?

Please ensure you are going to <http://eoe3.safeprescriber.org/login> (and not www.) to access the HEEoE SCRIPT site.

6.2. Content queries and feedback

Who do I contact if I spot an error on the site?

Email us at info@safeprescriber.org or click 'Feedback' in the bottom left hand corner of the homepage. The editorial team will review your query and respond accordingly.

6.3. SCRIPT and the Foundation Programme

What are the requirements for module completion in EAFS from 2016 and EBHFS from 2017

HEE,EoE foundation trainees are required to complete a minimum of 6 modules in both F1 and F2 (see section 3.1), as well as any further modules mandated by your trust or educational supervisor.

How long do the modules take to complete?

Each module takes an average of 30 minutes to complete. Within the HEE,EoE SCRIPT site there is a minimum time requirement of 10 minutes. Undertaking a module in less than this time will lead to a failure to complete the module. If this occurs the trainee will need to repeat the module. At the home screen the module will

have a triangle with an examination mark symbol, if you click on this; it will allow you to retake the module.

Is there a pass mark for the post-test?

The pre/post-test is intended to help you determine your baseline knowledge on the module subject, and be a measure of knowledge acquisition. It also adds an element of interactivity. Within the HEE, EoE SCRIPT site the post-test pass mark has been set at 70%. If a trainee fails to achieve 70% they will need to repeat the module. At the home screen the module will have a triangle with an examination mark symbol, if you click on this; it will allow you to retake the module.

What should I do if I have completed some or all of the F1 mandated at undergraduate level?

If you have completed any of the mandated modules within 12 months of starting your F1, these can be used to fulfil the Foundation requirements. However, your prescribing lead or postgraduate centre manager will need evidence of the module(s) being completed, so upload any certificates to your ePortfolio.

How do I get the module certificate?

A certificate is generated upon completion of all elements of the module. If you score less than 70% in a module or complete it in less than 10 minutes, then you will be required to repeat the module.

How do I repeat a module?

If you have failed to complete the module (<10mins or <70% pass mark) at the home screen the module will have a triangle with an examination mark symbol, if you click on this; it will allow you to retake the module.

6.4. What are the IT requirements for SCRIPT?

SCRIPT requires computers with the following technical specification:

Resolution	1024x768 or above
Browsers	Internet Explorer 8+ (9+ Recommended) Mozilla Firefox 5+ Google Chrome 20+ Opera 11 Apple Safari 6+
Platforms	Windows XP, Vista, 7 Apple Mac OSX 10.x
Connection Speed	ADSL 2 mbps
Adobe Flash Player	Flash Player 10.3+
JavaScript enabled	Required
Cookies Enabled	Required
Video/Audio	Mp3/Flv: Flash Player 9.0, 10
Memory	128MB of RAM

* iPad compatible (HTML5) course player was released in January 2013. Whether exported as a SCORM package or used in nimbleLMS[®], courses will automatically toggle to HTML5 when Flash is not available.

APPENDIX 1: Module titles and learning outcomes

Module Title Learning Outcomes
<p><i>Prescription Documentation</i></p> <p>At the end of this module, and with reference to 'The Ten Principles of Good Prescribing' (accessible via the British Pharmacological Society website: www.bps.ac.uk), you should be able to:</p> <ul style="list-style-type: none"> • Describe the legal aspects of prescribing, including the prescribing of drugs subject to control under the Misuse of Drugs Act 1971. • List the different types of prescription documentation available in both primary and secondary care. • Explain unlicensed and off-label prescribing and the role of any applicable good practice guidelines. • Describe the standards expected of both hand-written and computer-generated prescriptions. • Discuss the importance of prescribing within the limits, knowledge, skills and experience of the prescriber.
<p><i>Introduction to the Foundation Programme</i></p> <p>By the end of the session, you should have an understanding of:</p> <ul style="list-style-type: none"> • The assessments integrated within the Foundation programme. • The aim and objectives of supervised learning events. • Where to find help and support about the Foundation programme. • How to make the most of the year with respect to improving skills in prescribing and therapeutics.
<p><i>Fundamentals of Pharmacology</i></p> <p>At the end of this module, you should be able to:</p> <ul style="list-style-type: none"> • Define the following terms: agonist, antagonist, partial agonist, and allosteric modulator. • Define, and explain the differences between affinity, efficacy and potency. • Be able to understand and use graphical methods to relate dose and response. • Define up-regulation and down-regulation of receptors and using examples, explain how this can affect the response to drugs or alter physiological behaviour. • Define, using key examples, how drugs can act on different types of chemically sensitive sites, including G-protein coupled receptors, ion channels, nuclear receptors, carrier molecules, and enzymes.
<p><i>Taking a Safe and Effective Drug History</i></p> <p>At the end of this module, you should be able to:</p> <ul style="list-style-type: none"> • Describe the information needed to complete a safe and effective drug history. • Describe the different information sources available when obtaining or confirming a drug history, and their limitations. • Be able to overcome difficulties in eliciting a drug history. • Identify non-adherence and the impact this can have on the drug treatments prescribed. • Understand what is meant by Medicines Reconciliation, and their role and responsibility in this process.

- Understand the importance of effective communication at the transfer of patient care.

Adherence and Concordance

At the end of this module, you should be able to:

- Understand medicines adherence and discuss the importance of informed choice and shared decision-making in optimising the safe and effective use of medicines.
- Define adherence and how this differs to compliance in relation to drug treatment.
- Discuss the influences that affect patient adherence to medicines.
- Describe interventions to actively support adherence to medicines and treatment regimens.
- Discuss the implications of non-adherence to both the patient and the National Health Service (NHS).

Clinical Kinetics

At the end of this module, you should be able to:

- Know the different routes of drug administration.
- Know how a change in route can influence pharmacokinetic parameters.
- Define 'bioavailability', 'volume of distribution', 'half-life', and 'clearance', and the factors that can affect these.
- Using graphical representation, discuss simple models of pharmacokinetics.
- Discuss the main processes of drug metabolism in the body and the factors affecting it.
- Relate the pharmacokinetics of a drug to the adjustments in dose, frequency and choice of formulation.

Dosing and Calculation

At the end of this module, you should be able to:

- Describe the different dose units and their equivalencies (e.g. milligrams and grams).
- Demonstrate the different ways a dose may need to be calculated, including those based on Actual Body Weight (ABW), Ideal Body Weight (IBW) and Body Surface Area (BSA).
- Understand the dose adjustments that may be required in hepatic or renal dysfunction.
- Calculate complex dose regimens and intravenous infusions.
- Understand the importance of a second-check when undertaking dose calculations.
- Apply simple mathematics to day to day prescribing scenarios.

Formulation and Administration

At the end of this module, you should be able to:

- Describe how different formulations of a drug can differ in their pharmacokinetic properties and how this can affect dosing.
- Understand which route or formulation should be prescribed to achieve an optimum therapeutic response and avoid harm.
- Describe how formulation change can help patients take their medicines and appreciate the value of sharing decisions with the patient when choosing suitable formulations.
- Understand how the timing of administration can be crucial for therapeutic response and safety.

- Describe the factors that should be considered when prescribing and administering unlicensed medicines.
- Describe the relevance of consent in relation to drug administration.

Prescribing in Infection

At the end of this module, you should be able to:

- Describe the different classes of antibacterials available and their site of action on a microorganism.
- Describe how bacteria can be resistant to antibacterials.
- Explain why certain antimicrobials might be restricted in a Trust, and how access to them could be obtained.
- Know where to look for guidelines on treating infections and why adherence is important.

Drug Allergy and Anaphylaxis

At the end of this module, you should be able to:

- Take an accurate history of any previous reactions to drugs, medicinal and related products and non-drug allergies.
- Examine a drug chart, and decide which drugs might pose a risk to the patient in light of known allergies.
- Recognise the signs and symptoms of allergic reactions to drugs.
- Distinguish allergic reactions from other adverse drug reactions.
- Manage acute allergic reactions to drugs.
- Arrange appropriate follow up in cases of suspected drug reactions.

Poisoning

At the end of this module, you should be able to:

- Describe the risks associated with taking specific drugs in overdose.
- Manage a patient presenting with poisoning.
- Describe the role of the National Poisons Information Service (NPIS).
- Describe the information available on TOXBASE and how to access this.

Cardiac Arrest

At the end of this module, you should be able to:

- Explain the steps involved in the management of an adult in cardiac arrest.
- Recall the reversible causes of cardiac arrest.
- Describe the modifications to practice when resuscitating a pregnant woman.
- Manage the care of patients post-resuscitation.

Fluids

At the end of this module, you should be able to:

- Describe the signs and symptoms of hypovolaemia and hypervolaemia.
- Calculate fluid loss, gains and requirements.
- Calculate electrolyte requirements.
- Explain the difference between crystalloid and colloid fluid replacement therapy and when each might be appropriate for use.
- Monitor fluid replacement therapy effectively to avoid adverse effects and achieve optimal response.

Diabetic Emergencies

At the end of this module, you should be able to:

- Manage hypoglycaemia in a conscious, semi- or unconscious patient.
- Take appropriate samples for unexplained episodes of hypoglycaemia.
- Describe the characteristic features of Diabetic Ketoacidosis (DKA).
- Initiate appropriate fluid replacement and a fixed rate intravenous insulin infusion for a patient with DKA.
- Effectively monitor a patient with DKA and know when to request senior review.
- Identify and treat any precipitating factors for an episode of DKA.
- Distinguish between DKA and Hyperosmolar Hyperglycaemic State (HHS).
- Describe the characteristic features of HHS.
- Describe the principles of treatment of HHS and initiate immediate management.

Adverse Drug Reactions

At the end of this module, you should be able to:

- Define an ADR and the classification of ADRs.
- Identify susceptibility factors that place patients at increased risk of ADRs.
- Discuss the concepts of pharmacovigilance and its importance for public health.
- Explain the role and function of the Yellow Card scheme.
- Identify sources of information on ADRs.

Medication Errors

At the end of this module, you should be able to:

- Define medication errors, including subtypes.
- Identify individual and systems factors leading to error.
- Describe how medication errors are reported.
- Describe the role and impact of electronic prescribing.

Monitoring Drug Therapy

At the end of this module, you should be able to:

- Understand why it is important to monitor drug therapy.
- Identify the commonly prescribed drug therapies that require monitoring before, during and after treatment.
- Understand the strategies for monitoring drug therapy, and the criteria that will determine whether such a strategies will be clinically accepted.
- Identify common drugs that require Therapeutic Drug Monitoring (TDM) during treatment to avoid sub-therapeutic plasma concentrations and toxicity.

Drug Interactions

At the end of this module, you should be able to:

- Demonstrate knowledge of potential drug-drug interactions (DDIs) mechanisms (pharmacodynamic and pharmacokinetic).
- List patient factors that may intensify drug-drug interactions, related to age, gender, metabolising enzyme profile (sometimes related to ethnicity), disease, diet, smoking and illicit drug use.
- Describe some of the common drug interactions seen in clinical practice and strategies for minimising their occurrence.
- Know where to find information on potential drug interactions.
- Highlight the importance of identifying and reporting 'suspected' drug interactions and Adverse Drug Reactions (ADRs) to the Medicines and Healthcare Products

Regulatory Agency (MHRA).

Toxic Tablets

At the end of this module, you should be able to:

- Describe the risks of drugs and how harm from the most dangerous drugs can be minimised.
- Discuss the general methods used to limit harm from drugs.
- Describe how the prescribing of dangerous drugs requires a concordant approach to therapy to avoid serious harm and adverse drug reactions.
- Describe the role of policy and protocol in preventing serious untoward medication errors.
- Understand the importance of monitoring drug therapy.

Parenteral Poisons

At the end of this module, you should be able to:

- Describe the risks of drugs and how harm from the most dangerous drugs can be minimised.
- Discuss the general methods used to limit harm from drugs.
- Describe how the prescribing of dangerous drugs requires a concordant approach to therapy to avoid serious harm and adverse drug reactions.
- Describe the role of policy and protocol in preventing serious untoward medication errors.
- Discuss the importance of monitoring drug therapy.

Perioperative Prescribing

At the end of this module, you should be able to:

- Describe the elements of the drug history that are important for preoperative patients.
- Examine a preoperative drug history, and decide which drugs to continue and/or omit.
- Define the drug classes where alternative treatments are required perioperatively.
- Explain the potential for adverse drug reactions (ADRs) and adverse drug-drug interactions in the perioperative period.
- Describe the actions to be taken when a surgical patient is discharged with regards to prior chronic therapy and new take home medicines.

Prescribing in Hepatic Dysfunction

At the end of this module, you should be able to:

- Describe the principles of safe prescribing in patients with hepatic dysfunction.
- Explain the effect of disease in hepatic dysfunction when prescribing.
- Discuss the important adverse effects of commonly prescribed drugs on the liver.
- Describe the metabolism of drugs by the liver.
- Describe the effect of some drugs on liver metabolism.
- Rationalise drug treatments in hepatic dysfunction, and make dose adjustments where necessary.
- Know where to access up-to-date and reliable information on the prescribing of drugs in hepatic dysfunction.

Prescribing in Renal Dysfunction

At the end of this module, you should be able to:

- Show how impaired renal function alters the pharmacokinetics of drugs.
- Know how to assess renal function and the limitations of the available methods.
- Know which drugs and agents can be nephrotoxic and how these can cause AKI.
- Identify common drugs that need dose adjustment in kidney disease.
- Demonstrate effective management of (a) intravenous fluid therapy (b) hyperkalaemia (c) antihypertensive therapy and (d) diuretics in kidney disease.
- Know where to find information to guide prescribing in kidney disease.

Prescribing in Older Adults

At the end of this module, you should be able to:

- Explain the processes of absorption, distribution, metabolism and excretion of drugs in the older patient.
- Describe how age-related physiological and pathological processes affect how the body reacts to drugs.
- Describe how physical, cognitive and social aspects may affect an older patient's ability to adhere to treatment.
- List the factors that make older adults more at risk of developing adverse drug reactions (ADRs).
- Develop strategies to reduce problems with medication in the older population.

Prescribing in Pregnancy

At the end of this module, you should be able to:

- Explain how the physiological changes during pregnancy can alter the pharmacokinetics of a drug, and therefore require dose adjustment.
- Discuss the risks/benefits of prescribing in pregnancy and how this risk changes depending on the trimester.
- Describe how to minimise the risk of harm to the fetus when prescribing in pregnancy.
- Describe the key drugs (or drug groups) to avoid during pregnancy and why.
- Describe how to minimise risks in women of child bearing potential.
- Provide examples of drugs where concurrent contraceptive use is essential and why.
- Identify the main sources of information to guide prescribing in pregnant women or women of child bearing potential.

Prescribing in Breastfeeding

At the end of this module, you should be able to:

- Discuss the risks and benefits of prescribing in patients who are breastfeeding. Considering the gestational age of the infant and both infant and mother's comorbidities.
- Describe the ways in which exposure to drug therapy via breast milk may be minimised.
- List some drugs known to suppress lactation and describe how they may be used therapeutically.
- Identify the sources of advice available to guide decision-making when prescribing for this group of patients.

Paediatric Prescribing

At the end of this module, you should be able to:

- Explain how children and neonates handle drugs differently from adults and how this influences prescribing.
- Calculate maintenance and rehydration fluid requirements for children of all weights and ages.
- Prescribe safely for children, avoiding medication errors, communicating effectively and encouraging good adherence.
- List some common medicines for children that are prescribed off-label or are unlicensed, and understand the legal position of this practice.
- Be familiar with common prescribing scenarios in paediatrics, including pain relief.

Dementia Friendly Prescribing

At the end of this module, you should be able to:

- Describe the common presentations and causes of dementia.
- Describe how to assess a patient for suspected dementia, and know which investigations are relevant.
- Identify which patients require referral to specialist services, and what these services will offer.
- Describe rational treatment choices to slow the progression of dementia, including NICE guidance on when these treatments should be prescribed.
- Choose suitable treatments for the behavioural and psychological symptoms of dementia (BPSD), including assessing the risk of the harm and benefit of antipsychotic use.

Respiratory Medicine

At the end of this module, you should be able to:

- Prescribe oxygen safely in both the acute and long-term settings.
- Counsel patients about the options available for smoking cessation and prescribe appropriate nicotine replacement therapy.
- Know the different devices available for delivering inhaled therapy, and be able to choose the most suitable device for the patient.
- Manage both acute and chronic COPD and asthma.
- Choose appropriate management strategies for patients with common respiratory infections.

Diabetes

At the end of this module, you should be able to:

- Describe the onset and duration of action of different insulins available in the UK.
- Discuss when a Variable Rate Intravenous Insulin Infusion (VRIII) is indicated.
- Know how to set up a VRIII insulin regimen.
- Know how to make the safe transition from intravenous insulin, to regular diabetes treatment.
- Know the importance of self-management, and the points to consider when educating a patient on their treatment.
- Know when to refer a patient to the specialist diabetes team.

Psychiatric Symptom Management in General Hospital Settings

At the end of this module, you should be able to:

- Assess and treat depression in a person suffering from a chronic physical illness.

- Understand the place in therapy, major adverse effects and interactions of key antidepressants.
- Know what the available options are for the treatment of anxiety.
- Know what the most effective interventions are for insomnia.
- Describe the aims of Rapid Tranquilisation (RT) together with the various treatment options available.
- Explain the risks of abrupt antidepressant withdrawal and benzodiazepine dependence.
- Emphasise the importance of good adherence in preventing relapse, together with the need for physical health monitoring where appropriate in severe mental illness.

Anticoagulation

At the end of this module, you should be able to:

- Discuss the indications, cautions, duration and monitoring requirements for anticoagulation therapy.
- Provide practical guidance on achieving and maintaining a target INR and managing patients with INRs above the recommended therapeutic range.
- Appreciate the need to balance benefit with the risk of harm when prescribing anticoagulant therapy.
- Understand the need to consider lifestyle changes, drug-drug interactions and drug-food interactions when making dosing decisions.
- Understand the role of the anticoagulant clinic and the importance of communication at the transfer of care.

Infection in Secondary Care

At the end of this module, you should be able to:

- Select the most appropriate drug, dose, route and duration of treatment for commonly encountered infections in secondary care.
- Describe which antibacterials are contraindicated in patients who are pregnant or breastfeeding, or who have hepatic or renal dysfunction.
- Recall the common drug-drug interactions encountered when prescribing in infection.
- Explain how and why to monitor and review treatment.
- Describe where to look for information regarding the safe and effective management of infection, both locally and nationally.

Management of Pain

At the end of this module, you should be able to:

- Describe how the WHO Pain ladder assists in rational prescribing of analgesic therapy for both acute and chronic pain.
- Understand the risks associated with paracetamol and NSAIDs, and how these may be minimised.
- Identify weak opioid analgesics and when they are appropriate for use.
- Identify strong opioid analgesics, and how to minimise the risks when switching between different opioid analgesics and titrating doses to meet individual patient requirements.
- Describe the indications and cautions of Patient Controlled Analgesia (PCA).
- Recall the stepwise management of neuropathic pain, and understand when a referral to the specialist Pain team is necessary.
- Describe the use of local anaesthetics in secondary care setting, and how to recognise and manage toxicity.
- Identify patients with complex analgesic requirements where input may be required

from specialist teams.

Heart Failure

At the end of this module, you should be able to:

- With reference to national and international guidelines, discuss the pharmacological management of heart failure.
- Discuss how drug treatment regimens are monitored to avoid harm and optimise therapeutic effect.
- Describe the cautions and contraindications of treatment regimens in patients with comorbidities.
- Discuss the risks of fluid replacement therapy in this patient group.

Cardiac Dysrhythmias

At the end of this module, you should be able to:

- Describe the common arrhythmias that are likely to present to secondary care.
- Recall cardiovascular physiology relevant to arrhythmia management.
- Recall the evidence-base for the management of common arrhythmias, and where best to find this evidence.
- Describe the pharmacological agents used in the management of different arrhythmias and know their cautions and contraindications for use.
- Describe how to reduce the risk of thromboembolic events in patients with AF and the importance of balancing this with the risk of bleeding.

Epilepsy

At the end of this module, you should be able to:

- Discuss the aims and objectives of drug treatment in the long-term management of epilepsy.
- Discuss the factors governing the choice of AED treatment including the adverse effects associated with them.
- Discuss the management options of epilepsy in women of child-bearing potential and during pregnancy.
- Describe some of the common drug-drug interactions associated with AEDs.
- Discuss the role of therapeutic drug monitoring (TDM) for AEDs.
- Describe the pharmacological management of status epilepticus in secondary care, and the monitoring requirements following the administration of drug treatment.

Drugs of Misuse

By the end of the session, you should be able to:

- List both the psychological and physical signs and symptoms of dependence and withdrawal.
- Describe the pharmacological mechanisms of dependence and withdrawal.
- List common legal and illegal substances of abuse.
- Discuss the impact of drug abuse on mental and physical health.
- Discuss pharmacological interventions for the management of substance misuse.
- Discuss non-pharmacological interventions for the management of substance misuse.
- Refer the patient for appropriate support and follow-up.

Rheumatology

By the end of the session, you should be able to:

- Describe the investigations used to support the diagnosis of RA.
- Discuss the investigations which should be used to monitor response to treatment.
- Discuss the step-wise pharmacological treatment options for the management of Rheumatoid Arthritis and the pharmacology of each of these.
- Describe the investigations required for the different treatment to monitor for the adverse effects of treatments.
- Describe the complications of RA.
- Discuss the impact of RA as a long-term condition on patient's quality of life, their families and carers.
- Discuss patient education and self-management with respect to RA.

Sepsis

By the end of the session, you should be able to:

- Diagnose sepsis early and initiate treatment.
- Select alternative antibacterial management for the septic patient with co-morbidities (e.g. Renal dysfunction).
- Initiate other resuscitation measures and considerations e.g. COPD patients.
- Discuss the importance of escalation and diagnosis of severe sepsis.
- Discuss the importance of patient follow-up and review.

Rational Drug Choice

At the end of this module, you should be able to:

- Describe the need for evidence-based practice (EBP).
- Explain how EBP can improve patient safety and outcomes.
- Describe the principles of evidence-based medicine and levels of evidence.
- Explain the difference between Relative Risk Reduction (RRR) and Absolute Risk Reduction (ARR).
- Define and be able to calculate the Number Needed to Treat (NNT).
- Determine if a trial is statistically significant, using P-values and confidence intervals.
- Describe the principles of critical appraisal, and the tools required to review industry advertising critically.
- Seek appropriate evidence and interpret it effectively to aid prescribing decisions.
- Describe how evidence-based medicine is crucial in the development of healthcare policies, protocols and Trust formularies.
- Describe the role of clinical audit and the stages involved.

Root Cause Analysis

At the end of this module, you should be able to:

- Discuss the importance of 'being open' when a patient safety incident occurs.
- Discuss the tools used in the Root Cause Analysis (RCA) of incidents.
- Explain how the tools for RCA help identify ways of improving patient safety.

Ethics and Consent

At the end of this module, you should be able to:

- Discuss the principles and processes of gaining consent for adult patients.
- Describe the process of assessing capacity and how it is affected by the Mental Capacity Act 2005.
- Explain how the principles of consent may differ depending on the circumstances.
- Discuss the GMC guidance on ethical issues and consent.

Critical Appraisal Skills

At the end of this module, you should be able to:

- Discuss the importance of 'being open' when a patient safety incident occurs.
- Discuss the tools used in the Root Cause Analysis (RCA) of incidents.
- Explain how the tools for RCA help identify ways of improving patient safety.
- Discuss the relevance and importance of outcome measures in clinical trials.
- Explain the common terms used to express the findings from clinical trials.
- Calculate the Number Needed to Treat (NNT) and Number Needed to Harm (NNH).

Prescribing at the Interface and Team Prescribing

At the end of this module, you should be able to:

- Explain the aims and objectives of Effective Shared Care Agreements and when and why they may be necessary.
- Describe the role of the Independent Prescriber (IP) and how their role relates to that of a medical practitioner.
- Describe the role of the Supplementary Prescriber (SP) and how their role relates to that of a medical practitioner.
- Describe the function of Patient Group Directions (PGDs).

Systemic Anticancer Therapy and Cytotoxics

At the end of this module, you should be able to:

- Describe the differences between the main groups of Systemic Anticancer Therapies (SACT).
- Explain the aims of SACT - maintaining the balance between maximised effect and minimised risk.
- Identify and formulate initial treatment plans for common oncological emergencies.
- Identify adverse effects of SACT and formulate simple treatment plans to deal with these complications.
- Know that only those practitioners who are identified on the local intrathecal register may be involved in any process surrounding the prescribing, supply and administration of intrathecal chemotherapy.

Palliative and End of Life Care

At the end of this module, you should be able to:

- Describe the principles of palliative care.
- Discuss the importance of shared decision-making in providing palliative care to patients, taking into account the priorities of the individual and their close family.
- Describe the principles of pain management in palliative care, including breakthrough pain.
- Commence morphine for a patient in chronic pain and how to alter the dose safely.
- Appreciate how a change in the route of administration can affect dose, and identify when dose conversion is necessary.
- Understand when to give a drug by continuous subcutaneous infusion using a syringe driver.
- Explain which drugs can be given by subcutaneous infusion using a syringe driver, and where to find information about compatibilities.
- Describe the pharmacological options available to provide comfort and well-being for the symptomatic relief of nausea and vomiting, terminal restlessness and agitation, respiratory secretions, and breathlessness.

APPENDIX 2: Check list of modules

Principles of Prescribing	Systemic Anticancer Therapy and	
Prescription Documentation	Introduction to the Foundation	
Fundamentals of Pharmacology	Taking a Safe and Effective Drug	
Adherence and Concordance	Clinical Kinetics	
Dosing and Calculation	Formulation and Administration	
Prescribing in Infection	Prescribing in Medical	
Emergencies	Drug Allergy and Anaphylaxis	
Poisoning	Cardiac Arrest	
Fluids	Diabetic Emergencies	
Managing the Risks of	Prescribing	
Adverse Drug Reactions	Medication Errors	
Monitoring Drug Therapy	Drug Interactions	
Toxic Tablets	Parenteral Poisons	
Prescribing in Special	Circumstances	
Perioperative Prescribing	Prescribing in Hepatic Dysfunction	
Prescribing in Renal Dysfunction	Prescribing in Older Adults	
Prescribing in Pregnancy	Prescribing in Breastfeeding	
Paediatric Prescribing	Dementia Friendly Prescribing	
Therapeutic Groups	Respiratory Medicine	
Diabetes	Psychiatric Symptom Management in	
Hospital Settings	Anticoagulation	
Infection in Secondary Care	Management of Pain	
Heart Failure	Cardiac Dysrhythmias	
Epilepsy	Drugs of Misuse	
Rheumatology	Sepsis	
Clinical Governance	Rational Drug Choice	
Root Cause Analysis	Ethics and Consent	
Critical Appraisal Skills	Advanced Prescribing	
Prescribing at the Interface and Team		
Palliative and End of Life Care		

APPENDIX 3: Information for Employing Trusts

SCRIPT (Standardised Computerised Revalidation Instrument for Prescribing and Therapeutics) was created in 2011 by a team of clinical pharmacists and clinical pharmacologists working in both education and healthcare. SCRIPT was first purchased for use with HEE, EoE Foundation School trainees in 2016 to assist in the development of prescribing skills within the region. This has encompassed both the East Anglian Foundation School [EAFS] and from 2017 the Essex, Beds, Herts foundation School [EBH]. The SCRIPT manager guide is also available from HEE, EoE website or through the foundation school manager.

SCRIPT Monitoring

When your instance of SCRIPT is setup you will be asked for a named representative to act as monitoring manager for your trainees (**this would usually be the Foundation Programme Administrator or Postgraduate Centre Manager**). This named contact will have full access to all relevant trainees and be able to monitor and re report on trainee use at any point. The system is very self-explanatory in terms of monitoring trainees and their completion of modules.

Foundation training programme administrators can request 1:1 training if it is felt to be useful. Please contact markbullock@nhs.net if you have reviewed the system and this guidance and would like to visit HEE for a 1:1 training session. **Please note that this will only be a short demo of the Live Management site.**

Full SCRIPT support is provided by Jenni Ferguson at OCB Media who can be contacted on jenni@ocbmedia.com

Module Choice: - mandatory and advisory

The SCRIPT eLearning is fully integrated in the HEE, EoE programme, both for EAFS from Sept 2016 and for EBHFS from August 2017 following repatriation. In both F1 and F2, Trainees are required to complete a minimum of 6 mandatory modules per year. These have been set by the foundation schools directors for 2016 but ongoing discussion with trusts for ongoing use.

Local trusts may set additional advisory modules in response to local need or clinical incidents. They may also be recommended as part of generic teaching to replace lecture format and to enhance a simulated environment training. These should be clearly identified to trainees. Since each module is anticipated to take in the region of 30 minutes, we would advise no more than three additional modules to balance the proportion of learning time devoted to prescribing within foundation training.

Educational or clinical supervisors may recommend module completion related to speciality or due to trainee need after an educational meeting.

Your medical education department will confirm your SCRIPT programme to trainees for the year including mandatory and trust advisory elements

Suggested template:

Year	Mandatory for ARCP?	Module name
FY1	yes	principles of prescribing: Prescription Documentation
FY1	yes	principles of prescribing: Taking a Safe and Effective Drug History
FY1	yes	prescribing in emergencies: Fluids
FY1	yes	managing the risks: Adverse Drug Reactions
FY1	yes	managing the risks: Medication Errors
FY1	yes	prescribing in medical emergencies: sepsis
FY1	Advisory	Trust mandated module
FY1	Advisory	Trust mandated module
FY1	Advisory	Your educational supervisor may also recommend further modules
FY2	yes	prescribing in medical emergencies: anaphylaxis
FY2	yes	prescribing in medical emergencies: cardiac arrest
	yes	prescribing in medical emergencies: diabetic emergencies
	yes	managing the risks: Monitoring Drug Therapy
	yes	managing the risks: Drug Interactions
	yes	Clinical governance: rational drug choice
	Advisory	Trust mandated module
	Advisory	Trust mandated module
	Advisory	Your educational supervisor may also recommend further modules

Monitoring module completion

Your medical education departments will monitor whether SCRIPT modules are being completed and completion of the mandatory modules will be part of the checklist for ARCP.

SCRIPT eLearning has a dedicated management site that can be accessed by both clinical tutors and postgraduate centre managers in order to monitor the progress of trainees.

The management site serves two purposes:

1. You can ensure that trainees are taking steps to develop their prescribing knowledge in postgraduate education.
2. It can encourage discussion about prescribing in workplace education and during appraisals or reviews.

In the 'managers' site, you can see the following information about your trainees' progress:

- When they completed the modules (day of week and time of day).
- How long they have spent on the learning.
- The pre- and post-test scores for each module.

The management site will facilitate the Annual Review of Competence Progression (ARCP) in signing off trainees for having completed their mandated modules.

SCRIPT and the ePortfolio

We have recommended to trainees that they save their certificates and upload these to their ePortfolio as evidence of module completion. You may use these as evidence in addition to the information gathered from the management site.

Probity

SCRIPT has been mandated in the West Midlands since 2011. During this time, we have learned of dishonest behaviours to 'work around' the mandated modules in order to progress through the ARCP. This includes fraudulently creating certificates for modules that have not been completed and completing multiple modules simultaneously by opening a number of tabs on the computer. These behaviours can now be identified from the management site, as can modules that are completed in less than 10 minutes (the average time to complete a module is 30 minutes).

Remind trainees of the GMC Good Clinical Practice relating to honesty and integrity: "You must always be honest about your experience, qualifications and current role" [paragraph 66]4 .

If you suspect a trainee has avoided completing modules as mandated by the HEE,EoE you might like to discuss this with the SCRIPT team. Email SCRIPT at info@safeprescriber.org

No trainee data is accessible by or shared with any other SCRIPT clients. Your trainee data is kept on a separate database on a secure external server. Also notify the Foundation School Manager and the Foundation School Director.

Technical problems: The management site

I cannot access the management site?

Enter your email address and click 'Forgotten Password'. This will send you an email containing a link which takes you to a page to change the password.

What does it mean when a trainee's name is highlighted in red?

This means that the trainee has completed the module in under 10 minutes. Each module takes an average of 30 minutes to complete. The only exception to this is 'Rational Drug Choice', which takes around 20 minutes to complete.

Technical problems: The eLearning programme

Can I have a username and password to see the modules my trainees are completing?

Email us at info@safeprescriber.org or click 'Feedback' on the home-page. The technical team will respond accordingly.

What do I do if I have forgotten my password?

On the login page, click to indicate you have forgotten your password. Enter your email address and click submit. You will receive an email that contains a link to change your password.

What do I do if I have forgotten the email address I registered with?

Email us at info@safeprescriber.org or click 'Feedback' on the home-page. The technical team will respond accordingly.

Who do I contact if I spot an error on the site?

Email us at info@safeprescriber.org or click 'Feedback' on the home-page. The editorial team will review your query and respond accordingly.

What are the requirements for module completion in the HEE, EoE?

In the EAFS from 2016 and EBHFS from 2017, trainees are required to complete 6 specific modules in F1 (see section 3.1) and FY2.

How do I know which modules are mandated?

Mandated F1 modules are highlighted with a **red flag** on the learner view. They are also listed above. Users are given a check list to facilitate the documentation of completion

How long do the modules take to complete?

Each module takes an average of 30 minutes to complete.

Is there a pass mark for the post-test?

The pre/post-test is intended to help the trainee determine their baseline knowledge on the module subject, and be a measure of knowledge acquisition. It also adds an element of interactivity. The pass mark is set at 70%

What should I do if a trainee has completed some or all of the F1 mandated at undergraduate?

If any of the mandated modules have been completed within 12 months of starting the F1 year, these can be used to fulfil the Foundation requirements. You will need to see the module certificates as evidence.

How does the trainee get the module certificate?

A certificate is generated upon completion of all elements of the module. This includes the pre- and post-test.

What should trainees do with their certificates?

Trainees should save their certificates and upload these to their ePortfolio.

Dr Helen Johnson, Foundation School Director EBHFS

In consultation with

Prof John Saetta, Foundation School Director EAFS

Mark Bullock, Foundation School Manager

Nicholas Blackwell, Director OCB Media

Reference documents

STFS SCRIPT user guide 2016

SCRIPT HEWM tutor guide