

Achieving safer prescription of cytotoxic agents: Academy recommendations

April 2015

Executive Summary

Prescribing of cytotoxic drugs, immunosuppressant agents and drugs with a narrow therapeutic index by inadequately trained doctors is a longstanding problem. Current systems lack appropriate safeguards and an ongoing and predictable risk to patient safety remains¹. Recommendations for actions required to address these safety concerns include:

1. Mandating the use of e-prescribing for these agents with prescribing rights restricted to appropriately trained practitioners
2. A single standard prescription chart should be used across the 4 nations until e-prescribing is universally available
3. Prominent warnings regarding these agents should appear in reference sources (such as the British National Formulary) and they should be highlighted in local and national formularies
4. Packaging and labeling should be standardised with dosage, dose schedule and appropriate warnings clearly visible. Warnings should be highlighted within patient information
5. Intravenous administration of cytotoxics should only be performed by appropriately trained staff.

Education and Training

6. Definitions of levels of training and competency, specific for the safe prescribing of cytotoxic and immunosuppressive agents, should be incorporated into all undergraduate and postgraduate training curricula
7. A training and assessment package relating to the prescribing and administering of cytotoxic and immunosuppressive agents should be developed, commissioned and made available on the Electronic Learning for Healthcare platform.

Organisation and Governance

Local education providers (LEPs) should ensure

8. Induction sessions include mandatory training and briefing on agents with a narrow therapeutic index likely to be encountered during a placement.
9. Compliance with any restrictions and training requirements in prescribing, mandated by training curricula and/or the LETB or Deanery

Chief Medical Officers along with National Agencies and Royal Colleges should act upon these recommendations in the interests of patient safety and institute and deliver appropriate standards and safeguards, applicable across specialties and across the four nations.

The impact of these changes should be the target of local quality improvement projects² assessed by local audit and repeating the national survey of practice carried out by local audit and periodic national surveys of practice.

Background

The National Association of Clinical Tutors (NACT UK) brought to the attention of the Foundation Programme Committee a concern regarding Foundation doctors prescribing cytotoxic and immunomodulating drugs. The Academy of Medical Royal Colleges (AoMRC) relayed this concern to the Chief Medical Officers who requested that the AoMRC investigate the extent to which doctors in Foundation Training were being required to prescribe and administer cytotoxic and immunosuppressant agents. The subsequent survey indicated that this was a widespread practice and a source of adverse events. The findings were published by the AoMRC in the report **'Concerns Regarding The Prescribing And Administration Of Cytotoxic And Immunosuppressant Agents By Foundation Doctors: An Investigation Of Prevailing Practice'**.¹

This report was not the first to draw attention to problems associated with prescribing these agents. In 2006 the National Patient Safety Agency (NPSA) published a series of documents for patients and healthcare professionals under the umbrella **'Improving compliance with oral methotrexate guidelines'**.³ In 2008 the NPSA published a rapid response report **'Risks of incorrect dosing of oral anti-cancer medicines'**⁴ which set out responsibilities for doctors, nurses and pharmacists when dealing with oral anti-cancer medicines. There have been several other reports and alerts including the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report **'For better, for worse?'**⁵ and **'Chemotherapy services in England: Ensuring quality and safety'**⁶ reports in England and in Scotland the Chief Executives Letter (Scottish government CEL 30, 2012)⁷. These reports have led to much greater regulation of prescribing of Systemic AntiCancer Therapy (SACT) in the context of treating cancer patients in oncology departments.

Inappropriate daily administration of Methotrexate is a **'never event'**⁸ in England. The **'Risks of incorrect dosing of oral anti-cancer medicines'**⁹ report highlighted increased risks associated with non-specialist practitioners. It is evident from the AoMRC survey that, despite these alerts, prescribing errors remain an important cause of adverse incidents related to methotrexate.

Prescribing and drug administration errors are common, potentially very harmful, a source of litigation and a clear target for risk reduction strategies. The **GMC EQIP study**¹⁰ identified prescribing error rates of 8-10%. Errors were most common at the time of admission. The **EQUIP study**¹⁰ emphasised the importance of attitudinal change and sufficient workplace support for junior doctors as part of any strategy to reduce prescribing error.

Concerns regarding cytotoxic and immunosuppressant agents stem from their narrow therapeutic index, a lack of understanding and knowledge of their usage leading to recurring errors. Clearly other drugs with a narrow therapeutic index are in common usage and are also associated with important adverse events and the recommendations in this report are equally applicable to these agents and also to prescribers at every level.

The potential for error with these agents can occur during prescribing, dispensing and administration. Every professional group involved including doctors, pharmacists and nurses have a role to play in minimising mistakes and preventing harm. Whilst not the remit of this group it is hoped that all of these areas will be considered by those with the power to affect changes in practice.

The following key areas arising from the AoMRC report were considered

Prescribing

Several issues fall under the umbrella of prescribing.

Electronic prescribing

There is a significant body of evidence, which has been reviewed in the Health Foundation's Evidence Scan: Reducing Prescribing Errors.¹¹ The weight of evidence indicates that prescribing using suitable systems reduces errors. Electronic prescribing is already extensively used in oncology services. There are several safety benefits associated with e-prescribing including automated warnings of improper dosage and drug interactions. In addition prescribing rights can be restricted to appropriately certified practitioners. Other users can be 'locked out' by the system if they attempt to prescribe certain drugs or regimes. Whilst electronic prescribing systems are not perfect they have tangible advantages over conventional prescribing using drug charts.

Recommendation

Electronic prescribing should be adopted universally within the NHS.

Prescription charts

A single national prescription chart has been used in Wales since 2004, the lack of a standard in-patient prescription chart across England, Scotland and Northern Ireland is a concern raised in the GMC EQUIP study.¹⁰ The General Medical Council, several Medical Royal Colleges, the Royal Pharmaceutical Society, Royal College of Nursing and the Medical Schools' Council (Safe Prescribing Working Group 2007) have all recommended the adoption of a single prescription chart. The AoMRC in conjunction with the Royal Pharmaceutical Society and Royal College of Nursing proposed 'Standards for the design of hospital in-patient prescription'¹² charts in 2011.

There is the option when considering the design of e-prescribing and standard prescription charts to involve the Helen Hamlyn Centre for Design at the Royal College of Art, which have a track record in health and patient safety¹³ and which brings a unique perspective from outside the 'medical' world.

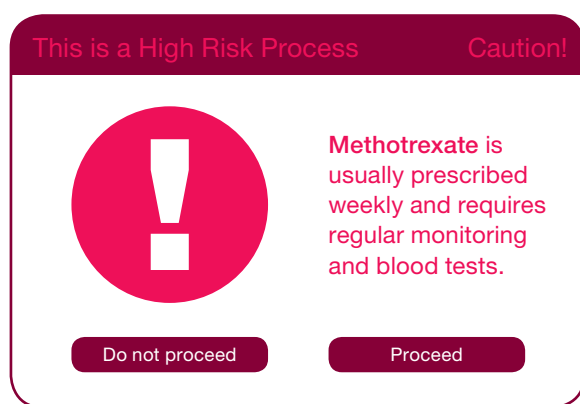
Recommendation

Until such time as electronic prescribing is universally adopted a standard prescription chart such as the all Wales inpatient chart should be adopted across all four nations and the NHS.

Sources of information on prescribing

Formularies such as the British National Formulary (BNF) would be improved by highlighting agents with a narrow therapeutic index, those associated with never events and those which are most associated with litigation.

The National Patient Safety Agency (NPSA) proposed that IT systems should provide alerts when high-risk agents were selected. A similar, highly visible warning would be particularly effective on web versions of the BNF. This is a sensible target for action as the BNF App is now widely used and digital formularies are likely to replace printed formularies in future. An example can be seen here.



NICE might also choose to work with the health and patient safety laboratory at the Royal College of Art¹³ to consider the best format for presenting these warnings.

Recommendation

NICE and NHS Commissioning Board Special Health Authority* should consider working with the Royal College of Art and the Royal Pharmaceutical Society to develop and place appropriate high visibility alerts in the BNF for high-risk agents with a narrow therapeutic index, those associated with never events and those which are most associated with litigation.

Packaging / labeling

Packaging should present information in a clear and consistent manner. The Royal College of Art¹³ in association with the NPSA published a guide to the graphic design of medication packaging¹⁴ in 2007

Recommendation

NICE should consider working with Royal College of Art¹³ and NHS Commissioning Board Special Health Authority to improve packaging and secondary labeling of high-risk agents with a narrow therapeutic index, those associated with never events and those most commonly associated with litigation.

* The NHS Commissioning Board Special Health Authority has subsumed the patient safety functions of the NPSA

Limiting Prescribing Rights

The group considered whether there should be a blanket ban on prescribing certain agents until either a stage of training had been reached or appropriate demonstration of competence via satisfactory completion of a nationally agreed educational package.

The advantage of restricting prescribing is that this would prevent undue pressure being brought to bear on foundation doctors to prescribe outside their level of competence.

There was concern that this might impact on service provision and hence not be universally achievable. Furthermore, this ignores other agents with a narrow therapeutic index, which are more commonly prescribed such as insulin and anticoagulant therapy. LEPs may wish to note that the London and Kent, Surrey and Sussex Local Education Training Boards have successfully introduced three 'red flag' events for FY1 doctors; taking consent, site marking and prescribing anti-cancer and immunomodulating agents without detrimental impact on service provision.

Recommendation

Induction sessions at the start of each placement should specifically state:

- If it is likely that trainees will encounter or be required to prescribe with high-risk drugs with a narrow therapeutic index, drugs associated with never events and drugs which are most commonly associated with litigation.
- If there are any restrictions on prescribing e.g. if prescribing of chemotherapy and immunosuppressive agents is prohibited without satisfactory demonstration of appropriate competence i.e. by completion of a designated and approved training programme.

Recommendation

Employers should:

- Ensure appropriate induction for every placement
- Ensure that Foundation Year 1 doctors never prescribe cytotoxic or immunosuppressant agents except corticosteroids.

Education and Training

Appropriate training is necessary for doctors (and others with prescribing rights), pharmacists and nurses in order to address prescribing dispensing and administration issues. Improvements in knowledge, skills and attitudes are required. Attitudinal change needs to be inculcated; starting early and regularly reinforced throughout the training of doctors, pharmacists and nurses. The EQUIP report suggested that doctors should develop generic competences – such as seeking information, help, and feedback on performance.

It is easy to appreciate how pharmacists and more senior doctors could contribute to education and development of learning by Foundation doctors. Pharmacists should be members of the Placement Supervision Group (PSG) and encouraged to participate in supervised learning events (SLE) and collaborate in quality improvement projects.

Recommendation

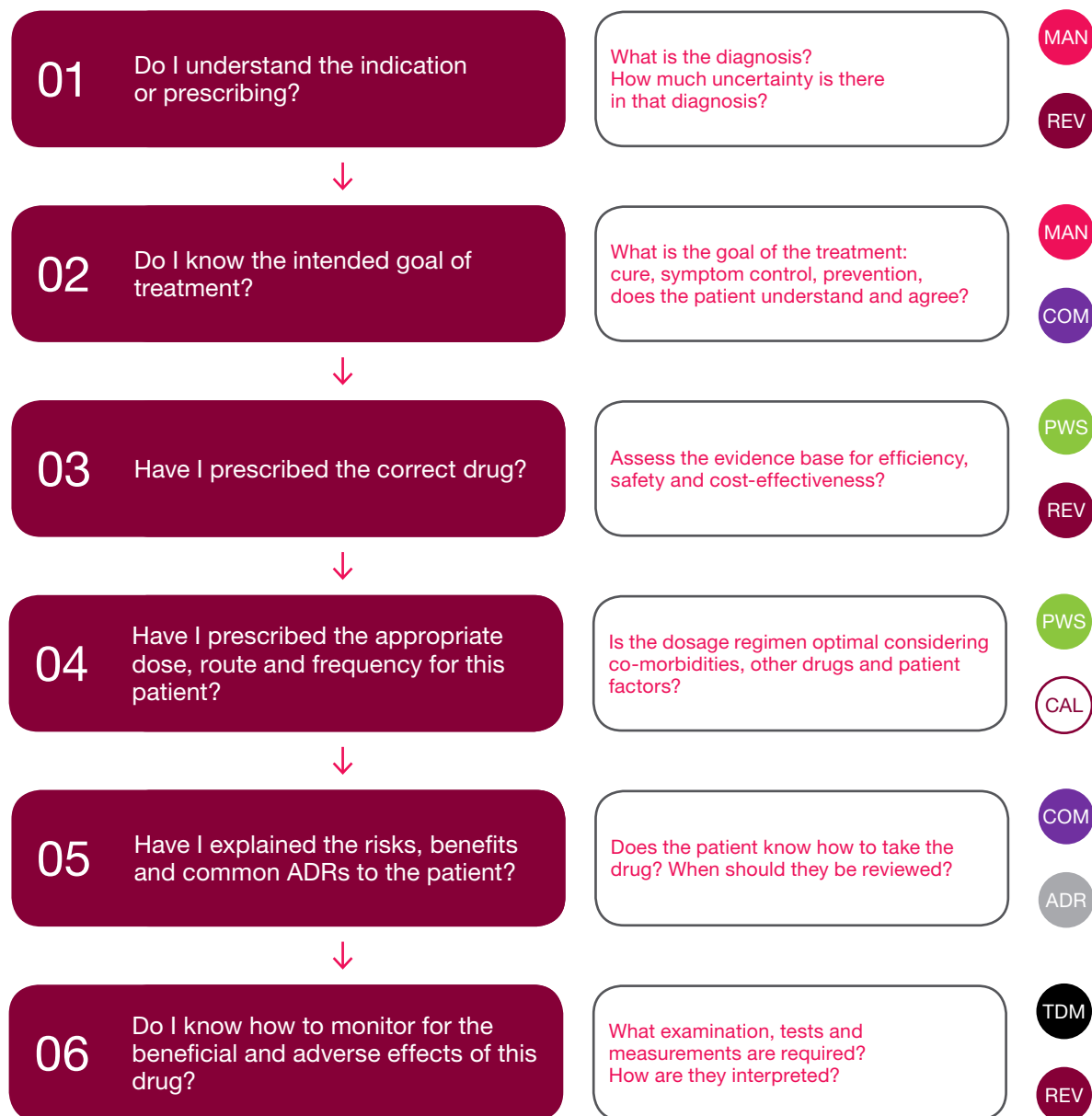
That the revision of the Foundation programme curriculum for 2016 entry should encourage opportunities to improve prescribing safety through the incorporation of pharmacists into the PSG whenever practicable.

There was agreement that overall prescribing skills should be a target for improvement at all levels of medical education and throughout a doctor's career.

Recommendation

- Attitudes to responsible prescribing should be started during undergraduate training and developed throughout each doctor's career.
- A simple flow process applicable to all prescribing should be adopted. See diagram below
- This approach should be integrated with undergraduate and postgraduate e-learning modules e.g. hosted by e-LFH and the British Oncology Pharmacy Association and that assessment of the approach could be incorporated within the Prescribing Safety Assessment.
- All prescribers should adhere to principles which underpin safe and effective prescribing in keeping with the British Pharmacological Society's 10 principles of good prescribing¹⁵.
- There should be assessment of prescribing in the workplace e.g. Review of charts with pharmacist, at ward rounds. In Foundation this would be an appropriate topic for Supervised Learning Events (SLE).

Prescribing: a simple flow process



PWS	prescribing
REV	reviewing prescriptions
MAN	planning management
COM	communicating information
ADR	adverse drug reactions
TDM	monitoring the effects of medicines
DAT	data interpretation
CAL	dose calculation skills

1. This approach is based on BPS Ten Principles of Good Prescribing and WHO Six-Step Guide to Prescribing and is intended as basic guidance for prescribers in training. More complex interpretations exist.
2. The pathway maps onto the eight sections BPS/MSc Prescribing Safety Assessment (see far column)
3. This approach to training should ideally be supplemented with a limited list of 'must know' drugs ('student formulary') and clinical conditions to which might apply based on local preference.
4. For students and new graduates it is recommended that prescribing decisions are supplemented by reference to the British National Formulary.

Levels of training

There was agreement that there should be common levels of training and competency related to prescribing cytotoxic and immunosuppressant agents which are applicable to prescribers regardless of specialty.

Recommendation

The following levels should be adopted by all specialties prescribing or administering cytotoxic or immunosuppressant agents.

Level	Summary
	Foundation and CMT
0	<p>Recognises when a patient is being treated with chemotherapy or immunomodulation.</p> <ul style="list-style-type: none"> Recognises that it is safe to miss a dose of these agents. Alerts senior team member when a patient is receiving these agents Does not prescribe or administer these agents.
1 (FY2/CMT)	<ul style="list-style-type: none"> Recognises important side effects of chemotherapy or immunomodulation including risks of neutropenia, anaemia, vomiting. Recognises that these agents may need to be stopped. Only repeatedly prescribes or administers chemotherapy or immunosuppressants after completing specific local or nationally approved training and when specifically authorised to do so.
	Specialty Training
2	<ul style="list-style-type: none"> Review patient on cytotoxics and/or a systemic anti-cancer therapy (SACT) authorise treatment to proceed. The prescription needs a counter-signature
3	<ul style="list-style-type: none"> Prescribes SACT from 2nd cycle
4	<ul style="list-style-type: none"> Initiate chemotherapy, prescribing within local guidelines. Prescribe subsequent therapy for patients on new therapeutic agents (in the context of clinical trials) and prescribing of intrathecal* chemotherapy
5	<ul style="list-style-type: none"> Introduce new therapies into a clinical department and act as a principal investigator on a clinical trial and act as a clinical supervisor for trainees in chemocompetency

* There are specific guidelines associated with intrathecal administration

Standardised educational material on prescribing cytotoxic and immunosuppressant agents

There should be an agreed national training and assessment package, which e-LFH appears to be well-placed to host and deliver. This will require collaboration between several specialties. It is possible that the AoMRC might wish to co-ordinate this work, this would overcome challenges relating to content, ownership and writing.

Recommendation

An e-LFH training package should be commissioned by NICE or by the Medical Royal Colleges - in particular the Royal College of Radiologists and the Royal College of Physicians.

Patient education

In addition to training for healthcare workers, there should be appropriate education of patients e.g. using the NPSA information for patients¹⁶ as recommended in 2006.

Recommendation

All patients should receive appropriate education regarding cytotoxic and immunosuppressant therapy.

Summary

There is much which could be done to improve patient safety and to prevent prescribing, dispensing and drug administration errors. Whilst this working group was established to consider issues relating to the prescribing and administration of cytotoxic and immunosuppressant agents by doctors in Foundation Training, the recommendations in the report would be equally applicable to other agents with narrow therapeutic index and to prescribing in general.

It is regrettable that despite previous reports indicating predictable and preventable errors and harm associated with prescribing cytotoxic and immunosuppressant agents there is still evidence of a problem. It is hoped that this report will provide the impetus for significant improvements in prescribing safety.

Appendix: Working Group Membership

The working group comprised membership from:

Academy of Medical Royal Colleges

United Kingdom Foundation Programme Office

Royal College of Radiologists

Royal College of Physicians of London
(including the Medical Oncology Specialty Advisory Committee)

Medical Schools Council

Prescribing Safety Assessment

Royal Pharmaceutical Society, South Thames Foundation School

Academy of Medical Royal Colleges Patient Lay Group.

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Dr Jan Welch	South Thames Foundation School

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