WHITEPAPER

Drug Monitoring: Three critical challenges faced by healthcare professionals in primary and secondary care and how to overcome them

Introduction

Healthcare professionals (HCPs) need access to accurate and independent drug monitoring information to support their clinical decision-making and ensure safe and effective patient care.

However, the lack of an overriding key authority for drug monitoring advice – to support GPs, hospital doctors, pharmacists, and other clinicians in their day-to-day work – currently represents a challenge to global care provision.

A miscellany of (free and paid-for) online and print drug monitoring resources exist, including manufacturer information, professional body guidance, major reference works and local protocols.

However, these are often inadequate, lacking in evidence, are time-consuming to navigate, and ill-suited for use at the point-of-care.

Information is inconsistent and requires HCPs to often check multiple sources to find actionable content (i.e. the when, what and how), taking time and contributing to confusion and inconsistent patient care.

The problem is compounded by the fact that HCPs are witnessing a significant rise in workload related to drug monitoring. Factors driving this include:

1. A growing ageing population with complex health prescribing needs

2. Greater laboratory test use, with results influencing **70%** of clinical decisions[1]

3. Increased prescribing of high-risk medicines by primary care clinicians

This whitepaper outlines the three critical challenges faced by HCPs in their management of drug monitoring in primary and secondary care:

1. **Time pressures of finding the right drug monitoring information**
2. **Navigation of vague and non-specific drug monitoring guidelines**
3. **Management of drug monitoring through transitions of care**

The paper also explores how a point-of-care resource for drug monitoring, tailored for use in primary and secondary care, can help overcome these difficulties to optimise patient outcomes.

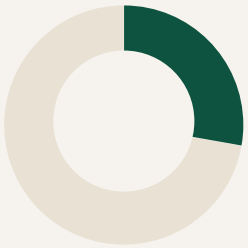
> *"A number of factors make drug therapy monitoring challenging, including fragmentation of the healthcare system, lack of a team-based approach, health information technology that is less than ideal and not integrated among members of the healthcare team, and conflicting evidence in the literature on appropriate monitoring of medications."*
>
> – Pharmacy Today: Monitoring Drug Therapy: Three Steps For Pharmacists[2]

RESEARCH BY PHARMACEUTICAL PRESS, THE ROYAL PHARMACEUTICAL SOCIETY'S KNOWLEDGE BUSINESS SHOWS THAT:

71%
of HCPs search for information about drug monitoring daily or multiple times a day^

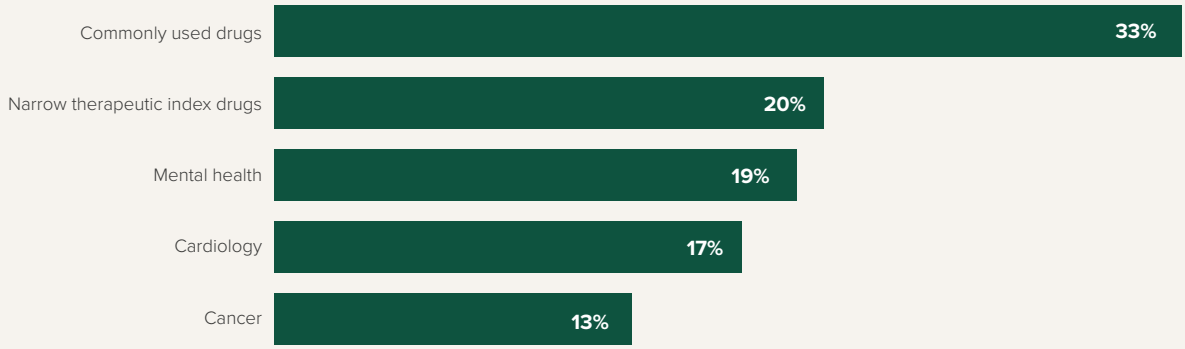
65%
of HCPs said more than 50% of their patients would benefit from them being able to access faster and improved information on drug monitoring+

27%
of HCPs said they find it 'very easy' to find drug monitoring information using currently available resources+



28%
of HCPs believe availability of improved drug monitoring resources would save them 5 – 10 hours per month and 40% said it would save them 1 – 5 hours per month+

The drug types that HCPs said they needed monitoring information most frequently for:*



The clinical roles of users who said that they required drug monitoring information with highly prescribed drugs included:^

* Results from a survey of 300 MedicinesComplete users in April 2020
^ Results from a survey of 500 MedicinesComplete users in May 2020
+ Results from a survey of 219 MedicinesComplete users in June 2020
The job roles of the survey respondents included GPs, hospital doctors, clinical/community pharmacists, nurses and academia.

What is drug monitoring?

Drug monitoring is the management of a patient's drug regimen by assessing laboratory and physical tests to optimise treatment and reduce harm, specifically to:

- Measure therapeutic effectiveness
- Screen for and prevent adverse drug reactions
- Assess patient compliance

Tests may be conducted before, during, and after treatment has been discontinued. Examples of tests include:

- Blood pressure
- Liver blood tests
- Full blood count
- Serum potassium concentration
- Chest X-ray
- Eye test
- Heart rate
- Renal function

Some drugs require therapeutic monitoring to ensure that efficacy is achieved whilst preventing toxicity. Contributing factors that can alter drug levels in patients include pregnancy, temporary illness, infection, emotional and physical stress, and surgical operations. Patient co-morbidities such as kidney or liver disease can also influence the handling of drugs and frequent monitoring is helpful to identify changes and guide drug therapy or dose adjustments, as needed.

CHALLENGE NO. 1

Time pressures of finding the right drug monitoring information

Most HCPs spend a significant part of their day assessing and interpreting laboratory and physical test results to optimise drug therapy and individualise patient care. Some examples include:

- A GP prescribes losartan to an elderly patient who has been newly diagnosed with hypertension and needs to know how frequently to monitor the patient's blood pressure.
- A hospital doctor is treating a patient with rheumatoid arthritis prescribed methotrexate whose bloods have highlighted abnormalities. She wants to know what actions to take next – and what instructions to give the GP in the discharge summary.
- A GP is reviewing a patient discharged from A&E who is diagnosed with atrial fibrillation and started on verapamil and warfarin. He now wants to know what ongoing monitoring is required.
- A hospital pharmacist is asked by a junior doctor how often to monitor sodium in a woman newly started on sertraline for depression and needs to know what to recommend.
- A specialist nurse running a diabetes clinic, has a patient newly started on pioglitazone and wants to know if she needs to monitor the HbA1c and how often.
- A medical student on a ward round wants to know why phosphate levels are being requested for a patient.

Getting the right monitoring information that HCPs need is rarely fast. It frequently requires searching across disparate sources – an exercise that swallows their valuable patient-facing work hours and that can result in slower delivery of patient care.

The clinical workload within primary and secondary care has grown in both volume and complexity in recent years. This burden is mainly due to an increasing number of patients with multiple co-morbidities on complex medication regimens resulting in poly-pharmacy.

Caring for complex patients and working under pressure, time is always in short supply for HCPs. But getting the right monitoring information is a lengthy process that often requires searching across various sources of information and interpreting clinical evidence.

"I often end up referring to a hotchpotch of sources for drug monitoring information, such as GPnotebook, SPCs, NICE, the BNF and other sites online," says one GP. "But not everything I need is always instantly found. I may have to skim-read a lot of pages or PDFs."

She adds: “In cases where I need more specific information, I can call our practice clinical pharmacist. But all this takes time out of the day – for me and her – and she’s likely scouring many of the same resources as I am.”

“It’s time that frankly I could be better spending with patients. It’s time that she could be using better, doing practical tasks like titrating patients up on meds, starting patients on drugs like statins, or doing medication reviews.”

GP Practice Partner
St Austell, United Kingdom

Pharmacist-led collaboration to handle the upward trend in the use of tests

Increased laboratory test use is being seen in both primary and secondary care[3] in the United Kingdom, as in many other countries.

In the United Kingdom between 2000 and 2015, general practice was the single largest contributor to test use, responsible for almost 45% of requests.[4]

There was an annual 8.5% increase in primary care tests[4] and a significant increase in the number of tests ordered per patient including imaging and miscellaneous tests i.e. spirometry, upper endoscopy, colonoscopy, cervical smear, and electrocardiography. Elderly patients recorded the greatest increase (a 4.6-fold increase for those aged more than 85).

Several studies conducted in the United Kingdom, Australia and Canada have shown that pharmacists are becoming more integrated within general practice and can have a positive impact on patient care and clinical workload.[5]

As part of the *NHS Long Term Plan*, a new workforce of up to 7,500 clinical pharmacists in England are being mobilised to support the management of patients with chronic diseases in primary care and care homes.[6] The aim is to have six pharmacists working in each of the 1,300 primary care networks by 2023-24.

However, in March 2021, pharmacists were added to the UK Home Office skills shortage occupation list therefore this goal appears ambitious and is causing challenges.[7]

CHALLENGE NO. 2

Navigation of vague and non-specific drug monitoring guidelines

There is an increase in the use of laboratory tests which is exerting pressure on the healthcare system, with evidence that many tests are inappropriate. In the United Kingdom around 25% of all tests are unnecessary repeats and almost a third have no impact on patient management.[8] The NHS, in its best practice guidelines, *Optimising blood testing in primary care* (September 2021), notes that "there is significant unwarranted variation in blood test requesting across primary care."[9]

Unnecessary testing in primary care can lead to false positive and false negative results, increased workload for clinicians, and increased costs for the health service.

But with drug monitoring information available to HCPs often insufficient, difficult to find or only available from manufacturers' data, determining clear testing recommendations based on the best available evidence can be burdensome.

Definitive frequencies and rationales for drug monitoring can be difficult to find, notably when information is required for specific indications or special populations i.e. according to age and ethnicity.

Most frustrating is when the available guidelines lack detail or refer the reader back to product information which is often vague, using non-specific phrases such as to "monitor regularly". This is not helpful as HCPs need a defined specific frequency of monitoring requirements and information on what to do if the test is abnormal.

National guidelines, also, can lack detail where monitoring is concerned. A review by the British Medical Journal of current UK guidelines found that "robust evidence for optimal monitoring strategies and testing intervals is lacking" for conditions such as type 2 diabetes, chronic kidney disease, and hypertension. Information is "scattered across most guidelines with no specific sections on monitoring".[10]

A further complication is differences between laboratories with reference target ranges and results, making comparisons difficult for HCPs.

With general practice now responsible for prescribing more high-risk medicines that were previously under specialist services, ensuring that the appropriate laboratory tests are done and assessed is an increasing responsibility.

While appropriate prescribing – selecting the most appropriate medication for a particular patient – is an important aspect of patient care, drug monitoring is also important to optimise care and prevent patient harm.

> *"Current UK guidelines for monitoring type 2 diabetes, chronic kidney disease, and hypertension are largely based on expert opinion; robust evidence for optimal monitoring strategies and testing intervals is lacking."*
>
> – BMJ: Are Guidelines For Monitoring Chronic Disease In Primary Care Evidence Based?

CHALLENGE NO. 3

Management of drug monitoring through transitions of care

One of the biggest challenges to making drug monitoring decisions for patients happens when clinical and prescribing responsibility for a patient is moved between care settings in 'transitions of care' – a broad term describing the transfer of a patient's care from one HCP and/or setting to another.

This may be between home, hospital, outpatient, residential care settings, palliative care or consultations with different healthcare providers. These transitions of care are the stages most prone to medication errors as drug therapy is changed, new drugs are added, and doses are altered.

Drug monitoring during care transitions of older adults

The most vulnerable patient populations are those with complex medication regimens, high-risk treatments, and multiple co-morbidities such as the elderly.

Older patients are at particular risk of harm from inadequate post-discharge management, notably between secondary and primary care, such as during a hospital to home transition, with reliance on discharge summaries that are commonly written by junior doctors.

During these interactions, medications are frequently stopped, adjusted, or newly prescribed. Differences between the medication lists, or discrepancies, are a common cause for confusion and can lead to nonadherence, as well as adverse drug events and patient harm.

A 2018 United Kingdom study by the British Pharmacological Society found that more than one in three older people experienced medicines-related harm in the first eight weeks after they had been discharged; either due to medication error or non-adherence to medications.[11]

In the United States, readmission rates to hospitals are high, often because of poor care transitions. Serious adverse drug events caused by an incomplete understanding of changes in complex drug regimens can be an important factor contributing to readmission rates.[12]

Problems can occur when communication systems (such as the dictated discharge summary) fail to reach outpatient providers in a timely fashion and lack essential information for adequate follow-up care and medication reconciliation.

It is the responsibility of everyone involved in the care of a patient to ensure the safe transfer of information about their medicines.

It is the responsibility of everyone involved in the care of a patient to ensure the safe transfer of information about their medicines.

However, this can be challenging with patients following complex pathways and the involvement of multiple healthcare professionals. Systems and processes can vary from organisation to organisation and appropriate drug monitoring can be missed.

In all these cases, point of care guidance for drug monitoring would be invaluable in overcoming inconsistencies and miscommunication in clinical records.

Not only would it instantly provide HCPs with practical, clinically relevant information, but it would save time and support safer decision making at the 'high-risk' stages of care.

Where drug monitoring resources fall short

A variety of resources for drug monitoring information are available to HCPs, all with different strengths and weaknesses.

Users must be aware that these should be consulted in context of their individual patients and that the full evidence base may not always be represented. In some cases, references may not be updated regularly to represent current clinical practice or new literature.

Few drug monitoring resources, as indicated below, fulfil all the needs of HCPs, namely:

1. Clear rationale
2. Defined frequencies
3. Indication-specific monitoring advice
4. Guidance to support interpretation of results
5. Evidence-graded recommendations to aid decision-making
6. Actionable advice for abnormal results
7. Updated at least monthly
8. Multiple routes of administration
9. Fast easily searchable guidance
10. Designed for point-of-care use

Bridging the gap

There is a gap between what is needed by HCPs for point-of-care drug monitoring information and the tools most widely used today.

The solution

To bridge this gap, a trusted source of drug monitoring for commonly prescribed and high-risk drugs is needed that is tailored for use in primary and secondary care.

Drug Monitoring Checker has been developed to meet this need.

Drug Monitoring Checker through MedicinesComplete

Drug Monitoring Checker provides HCPs with evidence-graded, actionable drug monitoring information.

Published by Pharmaceutical Press, the Royal Pharmaceutical Society's knowledge business, Drug Monitoring Checker contains trusted medicines information that has been validated by external experts and grounded in clinical practice.

The monitoring guidance has been produced by the Pharmaceutical Press skilled editorial team of clinical writers and uses the expertise of practising clinicians and professional bodies to ensure it follows best practice.

Importantly, the tools innovative design ensures HCPs can quickly find the expert guidance they are looking for, whether they are on ward rounds, at the patient bedside or on the move.

The resource gives guidance on over 175 commonly prescribed and/or high-risk drugs and 30 Parameter Profiles and provides:

- Clear rationales
- Defined frequencies
- Indication-specific monitoring advice
- Special populations monitoring advice
- Evidence-graded recommendations to aid decision-making
- Actionable advice for abnormal results
- SNOMED-coded monitoring parameters
- Multiple routes of administration for each drug where appropriate
- Parameter Profiles providing detailed information on tests and their interpretation

Users can search for a drug and results are returned as a list of required monitoring parameters with information about the frequency of monitoring, rationale, and advice on what to do if the parameter is outside of the normal range.

Additional information is included where needed for clinical decision-making, such as when drugs are used for different indications, which may have different monitoring requirements.

The easy to use, point-of-care tool allows for quick identification of the most important information for each drug, and where monitoring may be unnecessary.

Pharmaceutical Press
Royal Pharmaceutical Society's Knowledge Business

When healthcare professionals need to make the right decision, Pharmaceutical Press puts evidence-based pharmaceutical knowledge at their fingertips.

With an unmatched commitment to independently sourcing, evaluating and communicating the most accurate information, our expert knowledge whether online, via license or in print is trusted worldwide.

As the Royal Pharmaceutical Society's knowledge business, we invest our resources into creating world-class tools that promote best practice in medicines use, which means healthcare professionals can quickly and confidently make the most informed decisions.

about.medicinescomplete.com

For more information about MedicinesComplete, get in touch

Phone: +44 (0)20 7572 2737
Email: sales@medicinescomplete.com

The resource is also an essential tool trusted by academic institutions worldwide to advance drug monitoring knowledge and develop the next generation of pharmaceutical professionals.

For more information on Drug Monitoring Checker, please visit:
info.medicinescomplete.com/drug-monitoring-checker

References

1 Badrick T. Evidence-based laboratory medicine. Clin Biochem Rev. 2013;34(2):43–46.

2 McDonough R. Monitoring drug therapy: Three steps for pharmacists. Pharmacy Today. 2012;18(3):54.

3 Lord Carter of Coles. Report of the review of NHS pathology services in England. 2006. Available from https://www.networks.nhs.uk/nhs-networks/peninsula-pathology-network/documents/CarterReviewPathologyReport.pdf.

4 O'Sullivan J, Stevens S, Hobbs F et al. Temporal trends in use of tests in UK primary care. 2000-15: retrospective analysis of 250 million tests. BMJ. 2018;363.

5 Alshehri AA, Cheema E, Yahyouche A et al. Evaluating the role and integration of general practice pharmacists in England: a cross-sectional study. Int J Clin Pharm. 2021;43(6):1609–1618.

6 NHS Long Term Plan. Clinical pharmacists vital to patient care in five-year GP deal. 2019. Available from https://www.longtermplan.nhs.uk/clinical-pharmacists-vital-to-patient-care-in-five-year-gp-deal.

7 Bates I, John C, Seegobin P et al. An analysis of the global pharmacy workforce capacity trends from 2006 to 2012. Hum Resour Health. 2018;16(1):3.

8 Thurm M, Craggs H, Watts M et al. Reducing the number of unnecessary laboratory tests within hospital through the use of educational interventions. Ann Clin Biochem. 2021;58(6):632–637.

9 NHS. Optimising blood testing in primary care. 2021. Available from https://www.england.nhs.uk/wp-content/uploads/2021/09/B0960-optimising-blood-testing-primary-care.pdf.

10 Elwenspoek MMC, Patel R, Watson JC et al. Are guidelines for monitoring chronic disease in primary care evidence based? BMJ. 2019;365.

11 Parekh N, Ali K, Stevenson JM et al. Incidence and cost of medication harm in older adults following hospital discharge: a multicentre prospective study in the UK. Br J Clin Pharmacol. 2018;84(8):1789–1797.

12 Hume A, Kirwin J, Bieber H et al. Improving Care Transitions: Current Practice and Future Opportunities for Pharmacists. Pharmacotherapy. 2012;32(11):e326–e337.

Images from Shutterstock and are for illustrative purposes only.