Medicines use review

A toolkit for pharmacists

2020

FIP Development Goals

fip International Pharmaceutical Federation

Colophon

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Executive summary

Emerging data show that medication errors and adverse events cause significant harm to patients' health and well-being. It is estimated that the burden of adverse events due to medicines is now comparable to that of widespread diseases, such as malaria or tuberculosis.[1] The impacts of medication errors also represent a burden for health systems, with the annual cost associated with medication errors estimated at USD 42 billion worldwide.[2] In the United States, at least one death per day is caused by medication errors.[2]

Nevertheless, the harm associated with medicines use is thought to be preventable in the vast majority of cases, underscoring the urgency for coordinated efforts to effectively address this issue.

Patient safety and medication-related harm has been a topic of importance for the World Health Organization (WHO), having set up the High 5s Project in 2007.[3] Moving forward and facing the need to tackle medication errors and adverse events, the WHO launched in March 2017 its third Global Patient Safety Challenge called "Medication without harm".[1] This is a global initiative to reduce medication-related harm in all countries by 50% within five years with three specific areas for commitment, namely in high-risk situations (such as those involving high-risk patients or high-risk medicines), in patients with polypharmacy, and at transitions of care.[1] The Challenge's strategic framework addresses each of these three action areas with regard to four domains: patients and the public, healthcare professionals, medicines and systems, and medication practices.[4]

It is evident that among healthcare professionals, pharmacists are essential team players in all settings to tackle medication errors. Their accessibility allows them to interact with, counsel and educate patients through a relationship of trust. Moreover, thanks to their expertise in medicines, pharmacists can detect potential and actual drug-related problems and suggest evidence-based, clinical interventions to optimise medication therapy and reduce the risk of medication errors. Pharmacists' roles as part of the healthcare team in the community, in primary health care, in hospitals and in other healthcare establishments and high-level organisations also allow them to significantly contribute to reducing medication-related harm.

In response to the launch of "Medication without harm", FIP published a reference document on the pharmacist's role in patient safety, echoing the call for greater pharmacist involvement within healthcare teams to optimise medication therapy.[1,5] The FIP reference document describes and suggests pharmacist-led interventions at the patient level in addition to organisational and policy development levels, including medicines use review (MUR).

Pharmacist-led MUR is therefore a contributory solution to ensuring patient safety by reducing medication harm. This toolkit serves as a practical reference guide to implementing and conducting optimal MUR. It includes service implementation tools which can be directly used or adapted for clinical practice at the patient level. The organisational topics featured in this toolkit can also be used in management and policy development contexts.

1 Background

1.1 Medication errors and patient safety

The discovery and development of medicines revolutionised health care as they cure, treat and prevent diseases that were once debilitating, if not fatal. Nevertheless, medicines also carry the potential for harm. Despite their benefits, medicines can affect individuals' health and well-being, and ultimately health systems, if they are taken or administered incorrectly or if their use is insufficiently monitored.[2]

Several definitions of a medication error have been proposed. The United States National Coordinating Council for Medication Error Reporting and Prevention defines a medication error as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring and use."[6]

The WHO stresses the fact that medication errors are largely, if not fully, preventable. As such, with an estimated annual burden associated with medication errors of USD 42 billion, it is evident that effective strategies are necessary to prevent these errors from occurring.[2] In addition, approximately 50% of all patients fail to take their medicines correctly, and it has been estimated that about 8% of total healthcare expenditure, or about USD 500 billion per year globally (as of 2011), could be avoided through optimised use of medicines.[7,8]

Pharmacists are essential players in combating medication errors. Due to their unique expertise in medicines, particularly in cases of polypharmacy, and to their key role within multidisciplinary teams, pharmacists are best suited to intervene and address medication errors. Furthermore, due to the relationship of trust they develop with patients, pharmacists are most adequately suited to provide education, reinforce adherence and dispel concerns about medicine use with their patients.

To address medication errors, structured approaches have been proposed and utilised. They include MUR, medication reconciliation, handover (sign outs), and multidisciplinary rounds. As medicines are involved in all treatment plans, it is therefore essential that pharmacists participate in and lead such approaches.

Among different services, MUR represents an organised approach to optimising medication therapy according to updated clinical information and patient preferences. This is especially critical in patients with polypharmacy, lost to follow-up, or who have gone through transitions of care. Conducting effective MUR will ultimately contribute to reducing adverse events and improving patients' health outcomes.

1.2 FIP's advocacy for pharmacist-led services to tackle medication errors

In 2020, FIP released the reference document "Pharmacists' role in 'medication without harm'" to showcase the potential for pharmacist intervention to promote medication safety at the patient, organisation and systemic levels. Evidence on the benefits of pharmacist-led services on patient and medication safety in addition to case examples were presented to reinforce pharmacists' pivotal role in addressing this public health issue.[5] This reference document adds to FIP's previous advocacy efforts on pharmacists in patient safety, including FIP's statement of policy on the role of pharmacists in promoting patient safety as well as collaboration and technical expertise with the WHO, including co-authoring the WHO Patient Safety Curriculum Guide and contributing to the Jeddah Declaration on Patient Safety.[9]

FIP defines patient safety as "freedom from accidental or preventable injuries produced by medical care", and the work of pharmacists is essential in ensuring such safety.

2 History and definition

2.1 History of MUR

While it is difficult to pinpoint the specific origins of MUR, data have been published since the late 20th century regarding different forms of structured medicines reviews. For example, in the United States, a quality assurance programme named the Drug Regimen Review was instituted in 1974 and has allowed for a reduction in adverse drug events, medication errors and medicine-medicines interactions.[10] Organised medicines use reviews were also described in Scotland as early as the 1990s, where pharmacists would partner with general practitioners in primary care clinics to review prescriptions and treatments for several targeted conditions.[11]

MUR has now grown to become more common practice in both the hospital and community settings, especially as pharmacists have begun to take on a more clinical, patient-centred role. As pharmacists' vital role in conducting and ensuring this service becomes more prevalent, data on its implementation, benefits, and challenges will continue to grow.

2.2 Definition of MUR

The WHO defines MUR as a "structured evaluation of patient's medicines with the aim of optimising medicines use and improving health outcomes. This entails detecting drug related problems and recommending interventions."[1]

In other words, MUR represents an opportunity for the healthcare team to assess a patient's current medicines in light of various clinical factors, such as their current health condition, past medical and surgical history, and actual treatment plan, all the while considering the patient's preferences and concerns. Through MUR, the use of over-the-counter medicines and natural health products should also be assessed, all in all in the context of the patient's lifestyle and dietary habits.

It is in this more wide-ranging regard that MUR can be defined as a structured, patient-centred assessment of the effectiveness and safety of a patient's medication therapy and adherence to such therapy. The goal of MUR is to ultimately identify, resolve and prevent medicines-related problems to optimise medication therapy, reduce drug adverse events and improve clinical outcomes.

As medicines experts, pharmacists undoubtedly play a key role in MUR. Pharmacists can take on a leading role by identifying patients at greater risk of medication errors, such as those with polypharmacy or taking high risk medicines, and by conducting MUR. Following their analysis, pharmacists may discuss their findings with prescribers or, in contexts where the legislation permits, optimise pharmacotherapy by their own initiative.

Analysing patients' medicines to optimise their pharmacotherapy can take place in different forms. For example, community pharmacists can meet with their patients, review their medicines and communicate with their prescriber to suggest changes to their pharmacotherapy. They may also develop and propose strategies to improve patients' use and understanding of their medicines, and their adherence to treatments.

Pharmacists in healthcare establishments and hospitals also conduct MUR, for example, when patients are first admitted to a ward, and take into account the patient's chief complaint, investigations and home medication, among other clinical information, to ensure safe and effective pharmacotherapy during their hospital stay. Of note, MUR is usually conducted along with a medication reconciliation to gain an accurate description of a patient's current pharmacotherapy.

Moving beyond a more patient-centred approach, MUR can also be executed collectively. For example, in a hospital ward, a pharmacist may retrospectively look at clinical data surrounding the use of a medicine and assess if it is prescribed within the appropriate conditions. Stewardship programmes, such as antimicrobial, opioid or antithrombotic stewardship, are examples. A similar exercise can also be done in the community setting to ensure patients are receiving medicines that are indicated. This is more commonly referred to as "medicines (or drug) use evaluation" and shares similar goals of reducing medication-related harm.

Formal MUR programmes have been implemented in different countries and territories worldwide, showcasing the opportunity for pharmacists to contribute to improve patient safety and directly take on the fight against medication errors. The 2017 FIP survey report "Pharmacy: A global overview" indicates that community pharmacies in 50 countries and territories (68% of the sample) offered MUR services, with nine countries (18%) reporting that third-party remuneration was provided for the service.[12] Furthermore, MUR was provided by more than 50% of hospital pharmacies in 16 countries and territories, while in 34 countries and territories, the service is available in less than 50% of hospitals.[12]

3 MUR practices around the world

Worldwide, MUR has been developed and implemented in different settings. Governmental health authorities, pharmacy regulatory bodies, and pharmacy professional organisations have contributed to the establishment of this service, having created reference and guidance documents, supported remuneration models and conducted research on different outcomes. Table 1 below is a non-exhaustive table summarising the service in several countries and territories.

Table 1. MUR services — country examples

Country	Name of programme	Description
Australia	Domiciliary medication management review (home medicines review) or residential medication management review	Pharmacists meet patients, review their medication management needs, consult with additional allied healthcare professionals, and suggest their changes to medication therapy to the general practitioner. The review aims to optimise medication therapy and prevent additional medication-related harm, especially in patients at risk of medication errors due to, for example, recent changes to their health or treatment plan. The medication management review is initiated by the general practitioner.[13]
Canada	MedsCheck	In the Canadian province of Ontario, MedsCheck is an interview conducted between the pharmacist and the patient as a form of MUR. Certain criteria must be met for patients to be eligible for this service, including a minimum number of prescription medicines and specific time-frames, such as a recent hospital discharge, referral from a physician or nurse practitioner, or a pharmacist's clinical judgement. The service is remunerated by the provincial government.[14]
Japan	Brown bag programme	Led by the Hiroshima Pharmaceutical Association, the brown bag programme is an MUR service conducted by community pharmacists, where patients from the region are invited to take all medicines they are taking to the pharmacy (in the commonly used brown paper bags).. A study conducted on the programme showed that pharmacists intervened in approximately half of cases.[15]
South Korea	Drug utilisation review programme	The drug utilisation review programme is an electronic information system that sends real-time alerts to physicians when prescribing and to pharmacists when dispensing, alerting them of potential medication-related adverse effects.[16]
Spain	REVISA study for MUR	The Medicines Use Review Subcommittee of the Spanish Society of Family and Community Pharmacy conducted the REVISA project to oversee the implementation of the MUR service. The main results of the study included referral to a physician following the consultation in close to one-third of encounters. In addition, there was a high degree of satisfaction by patients with the service and their willingness to pay for the service in the majority of cases.[17]
Sweden	High performance medicines management	The high performance medicines management programme offers a hospital-based audit of medicines use, and its findings notably contribute to improving patient safety and favouring cost-effectiveness with regard to medicines use.[18]

Country	Name of programme	Description
United Kingdom	MUR	MUR may take place across different healthcare settings and, when led by pharmacists, aims to optimise medicines therapy, address adherence, and ultimately improve health outcomes. Different publications by various institutions, including the Royal Pharmaceutical Society as well as the National Health Service, have published several reference and guidance documents regarding this service.[19,20,21] According to the National Pharmacy Association, the remuneration for MUR is GBP 27 per review.[22]
United States of America	Medication therapy management	Medication therapy management encompasses a variety of healthcare services provided by pharmacists, including medication therapy reviews. Such services have demonstrated both clinical and cost-effectiveness.[23,24]

4 Impact of MUR

4.1 Clinical impact

MUR is a structured approach to optimising medication therapy, and there are abundant quality data supporting the clinical impacts of this service. One systematic review that included 10 studies from different countries and territories demonstrated that, through MUR, pharmacists were capable of detecting a highly significant amount of medication-related issues in elderly patients.[25] Another study showed that, through MUR, Dutch community pharmacists identified a median of two medication-related problems per each elderly patient with polypharmacy.[26]

In Spain, the provision of MUR and follow-up by community pharmacists over a six-month period reduced by nearly 50% the number of patients visiting emergency departments and reduced by more than 50% the number of patients reporting having been hospitalised.[27]

Additional data have also shown that MUR is associated with improved prescribing outcomes, such as decreasing polypharmacy, selecting and prescribing the most appropriate medicines and formulations, and reducing preventable adverse drug events.[11,1]

The benefits of pharmacist-led medication reviews on a variety of clinical outcomes have also been demonstrated in the community setting, including improved disease control, medication adherence and medication management.[28] Furthermore, a randomised, controlled trial echoed the positive impacts of MUR. In fact, patients who received comprehensive pharmacist-led MUR experienced close to 20% fewer hospital admissions and approximately 50% less emergency room visits compared with those receiving usual care.[1] There was also an 80% reduction in medication-related readmissions.[1]

A 2013 study showed that improving the quality of the medication use process ensured a stronger patient-centred approach to care, it improved the quality of life, health and social care of people living with intellectual disabilities and the quality of life of their family and carers. It also improved key outcomes in dementia by reducing iatrogenic disease.[29]

The current data are encouraging and support the continued effectiveness of pharmacist-led MUR in clinical outcomes. More robust, tangible data on more specific clinical outcomes would allow further reinforcement of pharmacist-led MUR as an essential service in ensuring medication safety.

4.2 Economic impact

While there are data showcasing the clinical impacts of pharmacist-led MUR, data on the benefits on health systems and society are more scarce. On one hand, some data have estimated that through comprehensive medication reviews, there was a reduction of USD 230 of total hospital-based healthcare cost per patient.[1]

On the other hand, other studies have shown that pharmacist-led MUR was associated with no change in number of hospitalisations or cost-effectiveness.[11]

Facing these conflicting results, additional research efforts are admittedly needed to appropriately assess the benefits for healthcare costs and health systems that may be obtained with pharmacist-led MUR in addition to the clinical benefits.

5 Implementing an effective MUR service

5.1 Conditions and requirements

Conducting effective MUR requires the necessary operational and human resources and thus presents several challenges.[30] Certain conditions must therefore be met to ensure its optimal implementation.

5.1.1 Data and access to information

MUR is a structured assessment of a patient's medication therapy. Access to the necessary information to adequately analyse medication therapy, identify actual and potential medication-related problems, and suggest the necessary interventions is critical.

It is essential for the pharmacist to have access to the patient's medication profile. Information on active and previous medication is essential and should include, but is not limited to, the following elements:

1. Medicine names
2. Formulations
3. Doses
4. Regimens
5. Routes of administration
6. Start date
7. Duration of treatment
8. End date
9. Name of prescriber

This information should ideally be centralised and available for consultation, on paper or digitally, for adequate analysis of the patient's records. Alternatively, the information should be obtained directly from the patient together with any prescriptions or other documents linked to the patient's clinical and medication history.

Beyond information on the patient's medication, data on investigations and past medical history are also needed to ensure a proper understanding of the patient's current health status. Data on lab results, cultures and sensitivities, imaging reports, past medical and surgical history, recent hospital admissions, and social and lifestyle habits are all useful information in conducting a comprehensive MUR. This information can be accessed through electronic interfaces, paper files, or by interviewing the patient.

5.1.2 Resources and logistics

To conduct an MUR, adequate time, resources and logistics are necessary. Among pharmacists' other responsibilities, such as dispensing and counselling, specific time should be scheduled by employers to ensure proper execution of an MUR. Moreover, the necessary tools to conduct MUR, such as access to electronic equipment, software or documentation, are required to gather and document MUR interventions. A dedicated physical area to conduct patient interviews to complete MUR is also necessary.

An appropriate remuneration scheme is important to ensure the sustainability of pharmacist-led services, including MUR. This remuneration would not only compensate for the time, effort and tools required to conduct proper MUR, but also to recognise the pharmacist's expertise and experience and the savings generated by this service. Awareness will be required among stakeholders to ensure appropriate compensation for the service, preferably from public and/or private third-party payers.

5.1.3 Collaborative efforts

Interprofessional collaboration is essential to ensure beneficial outcomes of MUR. While a pharmacist may analyse a patient's file and make interventions deemed necessary, if these interventions are not well received and are not acted upon by other healthcare professionals, then the outcomes are bound to be limited. For example, in the community setting, collaborative approaches to solving pharmacotherapeutic problems and optimising medication therapy between prescribers and pharmacists are necessary. Ensuring excellent

communication channels, clear and concise documentation, and shared access to information are important features to ensure proper collaboration. In the example of health establishments and hospitals, collaboration between prescribers, nursing staff and other allied healthcare practitioners is also essential to ensure recommendations made regarding medication therapy are carried out.

In addition to counting on collaborative efforts with other healthcare providers, a relationship of trust is equally important. Being open-minded and attentive to patients' concerns regarding their medication therapy is essential to consider when analysing medication profiles, and patients' preferences can directly affect which interventions pharmacists make. Promoting patient-centred care by taking the time to adequately interview the patient and by explaining the rationale behind recommendations and choices is necessary.

5.2 Challenges for low-resource settings

As described, there are several conditions regarding the necessary data, logistics, systems and relationships that should be met to ensure MUR is optimal. It is important to note that these conditions can still be met in all instances, including smaller-scale pharmacies or developing regions, for optimal MUR.

Access to medication profiles, investigative data, clinical information and documentation can be achieved without elaborate software, and paper charts can still be organised and utilised. Engaging with the patient to collect information as well as reinforce compliance and education can be done in person and requires few material or technological resources.

Systemic change can also take place in all settings to advocate for pharmacist-led services, such as MUR, and ensure their appropriate recognition and compensation. Adopting a collaborative practice with prescribers and patients is also feasible in all settings. It is important to consider that MUR is ultimately conducted with the mindset to improve health outcomes.

6 The MUR process

6.1 Step-by-step process and minimum information set

The following steps represent a proposed process for MUR which may be directly used or adapted to local practices. It is based on the approach proposed by the WHO for conducting a patient-centred medicines use review.[1]

1. **Collecting all necessary data with the patient's consent, if required.**

   This includes any lab results, cultures and sensitivities, imaging results, information on past medical and surgical history, and recent hospitalisations.

   If the patient was recently discharged from a hospital or went through another transition of care, it may be beneficial to conduct a medicines reconciliation before the MUR to obtain an accurate, comprehensive understanding of the patient's current medication therapy.

2. **Reviewing diagnoses and medication**

   a. Is each medicine still indicated?
   b. Is each diagnosed disease being treated by a medicine?
   c. If the patient has renal or hepatic impairment, do medication dosages require adjusting?
   d. For each medicine, are there any adverse effects or laboratory markers to follow?
   e. Could there be there any medicine-medicine, medicine-disease, or medicine-natural product interactions?
   f. Can the dosing regimen or route of administration be simplified?
   g. Are there any more cost-effective alternatives to this medicine? Have new guidelines reinforced or discouraged its use?
   h. Are there any non-pharmacological methods that may be used?
   i. Do any natural health products or complementary or traditional medicines require intervention?

3. **Reviewing patient's level of literacy and self-monitoring**

   a. Does the patient understand their medicines and their indications?
   b. Is the patient capable of self-monitoring, if required (blood glucose, blood pressure, etc.)?
   c. Is the patient aware of red flag symptoms that would require an urgent medical consultation?

4. **Reassessing medicines management and adherence**

   a. Are medicine formulations and dosing schedules convenient for the patient?
   b. Can medication management be improved, for example, through the use of pillboxes?
   c. Is the patient adherent to their dosing schedules?

5. **Organising follow-up visits to assess symptoms, laboratory markers or other features to monitor**

6. **Communicating with prescribers and other allied healthcare professionals regarding suggested changes, and informing the patient of the results.**

Figure 1 and Figure 2 provide an overview of the MUR process and the minimum information that needs to be reviewed for each medicine, respectively.

Figure 1. Step-by-step process of medicines use review

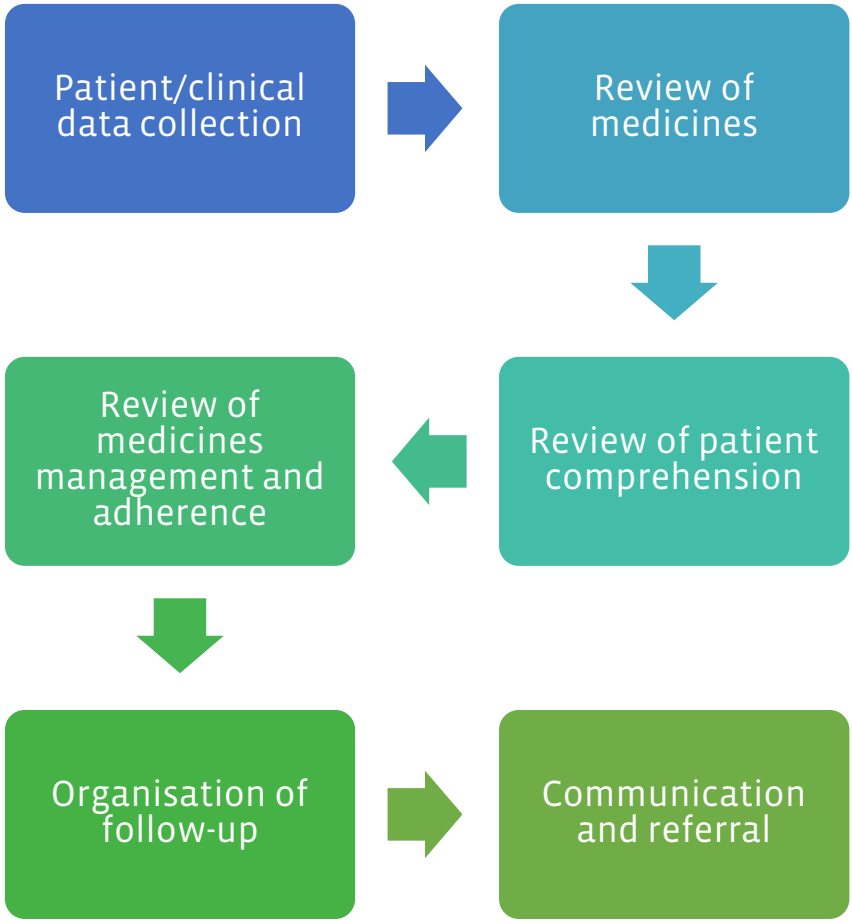
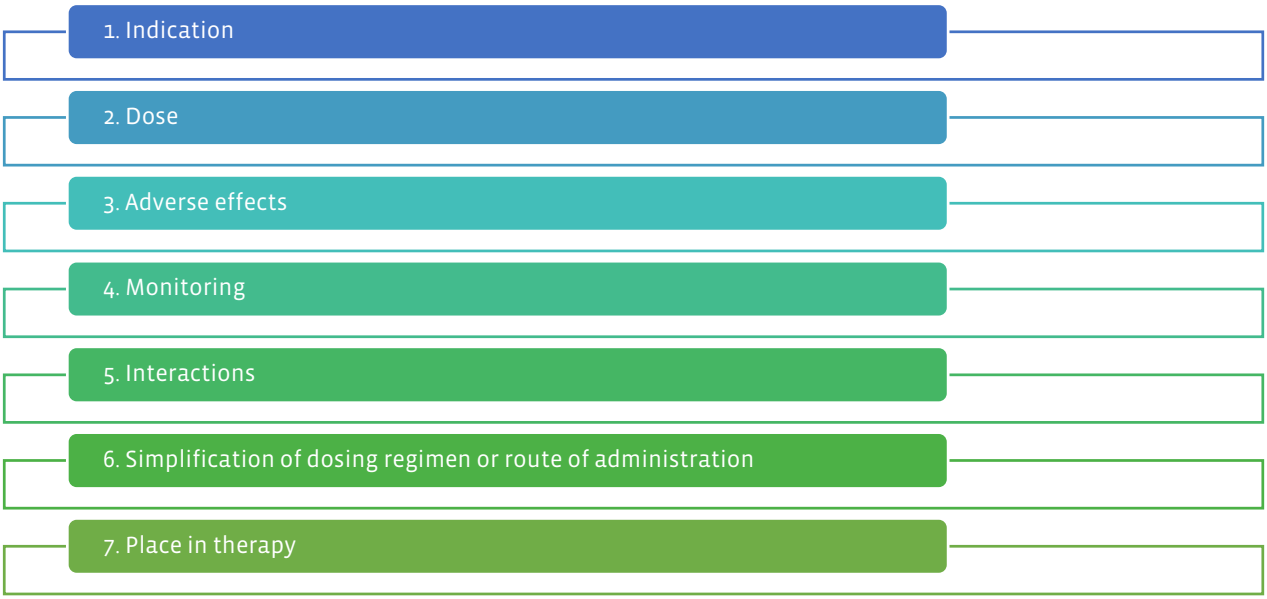


Figure 2. Information to review for each medicine



6.2 MUR implementation tools

6.2.1 MUR template form

The following forms can be used to assist in the implementation of MUR.

PERSONAL INFORMATION	
Date of interview	
Patient's name	
Date of birth	
Gender	
Height and weight	
Health insurance information	
Patient's telephone number	
Name of pharmacy	
Pharmacy's contact details	
Name of primary care physician	
Contact details of primary care physician	
Allergies	
Intolerances	
Medication management *(by patient or by care-giver)*	
Organisation of medication *(Pre-packaged or pillboxes; prepared by patient or by pharmacy)*	
Perceived level of health literacy	
Perceived adherence to home medicines	
Lifestyle habits *(smoking, drugs, alcohol)*	
Recent medication changes *(within previous 1–6 months)*	

CLINICAL DATA AND INVESTIGATIONS	
Past medical history	
Past surgical history	
Relevant laboratory results	
Relevant cultures and sensitivities	
Relevant imaging results	
Renal impairment (yes or no)	
Hepatic impairment (yes or no)	

[redacted]

MEDICINES REVIEW AND ASSESSMENT

Medicine *(non-proprietary name)*	**Brand name**	**Formulation**	**Dose**	**Frequency**	**Route of administration**	**Indication**	**Comments** *(adverse effects, action to take, interactions, required monitoring, etc.)*

7 Conclusion

This toolkit aims to provide a framework for implementing MUR as a structured process to optimise medication therapy. Its implementation tools are ready to be directly used or adapted to local practices. Regarding policy and practice development, this toolkit is also intended to support national and local development of optimal pharmacist-led MUR.

Based on the research work and available evidences in practice, services and guidelines, MUR is a valuable service to promote patient safety by addressing medication errors and reducing medication-related harm, especially when led by pharmacists.

Emerging data have demonstrated the multiple benefits of MUR, and pharmacists are called upon to take on leading roles in implementing, conducting and advocating this service. The necessary resources, frameworks, and conditions, including appropriate remuneration models by third-party payers, should also be set in place in the community and hospital pharmacy settings to provide the optimal conditions to set up effective MUR services and further contribute to the knowledge on their clinical benefits and cost-effectiveness.

MUR represents a compelling component in improving health outcomes, and an essential component in reducing medication errors and ensuring patient safety.

8 References

1. World Health Organization. Medication safety in polypharmacy. Geneva: World Health Organization; 2019. Available from: https://www.who.int/publications/i/item/medication-safety-in-polypharmacy-technical-report (accessed 9 December 2020).

2. World Health Organization. WHO launches global effort to halve medication-related errors in 5 years (2017). Available from: https://www.who.int/news/item/29-03-2017-who-launches-global-effort-to-halve-medication-related-errors-in-5-years (accessed 9 December 2020).

3. World Health Organization. The high 5s project: interim report. Geneva: World Health Organization; 2013. Available from: https://www.who.int/patientsafety/implementation/solutions/high5s/High5_InterimReport.pdf. (accessed 9 December 2020).

4. World Health Organization. Medication safety. Available from: https://www.who.int/patientsafety/medication-safety/en/ (accessed 9 December 2020).

5. International Pharmaceutical Federation. Patient safety: Pharmacists' role in "Medication without harm". The Hague: International Pharmaceutical Federation; 2020. Available from: https://www.fip.org/file/4757 (accessed 9 December 2020).

6. World Health Organization. Medication errors. Geneva: World Health Organization; 2016. Available from: https://apps.who.int/iris/handle/10665/252274 (accessed 9 December 2020).

7. World Health Organization. Adherence to long-term therapies: evidence for action. Geneva: World Health Organization; 2003. Available from: https://www.who.int/chp/knowledge/publications/adherence_report/en/. (accessed 9 December 2020).

8. Aitkin M, Gorokhovich L. Advancing the responsible use of medicines: Applying levers for change (17 September 2012). Available from: https://ssrn.com/abstract=2222541 (accessed 9 December 2020).

9. International Pharmaceutical Federation. FIP statement of policy: The role of pharmacists in promoting patient safety. The Hague: International Pharmaceutical Federation; 2020. Available from: https://www.fip.org/file/4788 (accessed 9 December 2020).

10. Kubacka RT. A primer on drug utilization review. Journal of the American Pharmacists Association 1996;NS36(4):257–61, 279.

11. Blenkinsopp A, Bond C, Raynor D. Medication reviews. British Journal of Clinical Pharmacology 2012;74(4):573–80.

12. International Pharmaceutical Federation. Pharmacy: a global overview — Workforce, medicines distribution, practice, regulation and remuneration. 2015–2017. The Hague: International Pharmaceutical Federation; 2017.

13. Australian Government Department of Health. Medication management reviews (2014). Available from: https://www1.health.gov.au/internet/main/publishing.nsf/Content/medication_management_reviews.htm (accessed 9 December 2020).

14. Ontario Ministry of Health. MedsCheck (2016). Available from: http://www.health.gov.on.ca/en/pro/programs/drugs/medscheck/medscheck_original.aspx (accessed 9 December 2020).

15. Akazawa M, Nomura K, Kusama M, et al. Drug utilization reviews by community pharmacists in Japan: Identification of potential safety concerns through the brown bag program. Value in Health Regional Issues 2012;1(1):98–104.

16. Health Insurance Review & Assessment Service. Total solution for value-based healthcare purchasing: HIRA system. Seoul. Available from: http://www.hira.or.kr/eng/ebook/00_Page_img/extra/00.pdf (accessed 9 December 2020).

17. García-Agua Soler N, Gómez-Bermúdez E, Baixauli-Fernández V, et al. Medicines use review service in community pharmacies in Spain: REVISA project. Inteernational Journal of Clinical Pharmacy. 2020 Sep. Available from: https://doi.org/10.1007/s11096-020-01158-2 (accessed 9 December 2020).

18. Söderlund L, Olsson Nerfeldt M, et al. High Performance Medicines Management — HPMM: For increased patient safety and maximum benefits of therapy. Stockholm: Apoteket. Available from: http://statements.eahp.eu/sites/default/files/resources/High%20Performance%20Medicine%20Management-HPMM.pdf (accessed 9 December 2020).

19. Royal Pharmaceutical Society. Medication review (2020). Available from: https://www.rpharms.com/resources/quick-reference-guides/medication-review (accessed 9 December 2020).

20. National Health Service. Medicines optimisation: clinical medication review. A practice guide (2014). Available from: https://www.sps.nhs.uk/wp-content/uploads/2016/08/Brent-CCG-Medication-Review-Practice-Guide-2014.pdf (accessed 9 December 2020).

21. National Health Service. Structured medication reviews and medicines optimisation: guidance (2020). Available from: https://www.england.nhs.uk/wp-content/uploads/2020/09/SMR-Spec-Guidance-2020-21-FINAL-.pdf (accessed 9 December 2020).

22. National Pharmacy Association. Medicines use review (2020). Available from: https://www.npa.co.uk/services-and-support/nhs-services/medicines-use-review/ (accessed 9 December 2020).

23. American Pharmacists Association. Medication therapy management (MTM) services (2020). Available from: https://www.pharmacist.com/medication-therapy-management-services (accessed 9 December 2020).

24. Centers for Disease Control and Prevention. Community pharmacists and medication therapy management (2020). Available from: https://www.cdc.gov/dhdsp/pubs/guides/best-practices/pharmacist-mtm.htm. (accessed 9 December 2020).

25. Gudi S, Kashyap A, Chhabra M, et al. Impact of pharmacist-led home medicines review services on drug-related problems among the elderly population: a systematic review. Epidemiology and Health 2019;41:e2019020.

26. Chau S, Jansen A, van de Ven P, et al. Clinical medication reviews in elderly patients with polypharmacy: a crosssectional study on drug-related problems in the Netherlands. International Journal of Clinical Pharmacy 2016;38(1):46–53.

27. García-Cárdenas V, Saez-Benito L, Farragher T, et al. Medication review with a six month follow up reduces hospitalizations and emergency department visits in ambulatory aged patients in Spain: conSIGUE program (2014).

28. Jokanovic N, Tan E, Sudhakaran S, et al. Pharmacist-led medication review in community settings: An overview of systematic reviews. Research in Social and Administraative Pharmacy 2017;13(4):661–85.

29. Flood B, Henman DM. The medication use process in people ageing with intellectual disabilities and behaviour disorders. 2013. Available from: https://bit.ly/3m1KMZx (accessed 9 December 2020).

30. Latif A. Community pharmacy medicines use review: Current challenges. Integrated Pharmacy Research and Practice 2017;7:83–92.

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