

ASHP Guidelines on Medication-Use Evaluation

Medication-use evaluation (MUE) is a performance improvement method that focuses on evaluating and improving medication-use processes with the goal of optimal patient outcomes. MUE may be applied to a medication or therapeutic class, disease state or condition, a medication-use process (prescribing, preparing and dispensing, administering, and monitoring), or specific outcomes.¹ Further, it may be applied in and among the various practice settings of organized health systems.

MUE encompasses the goals and objectives of drug-use evaluation (DUE) in its broadest application, with an emphasis on improving patient outcomes. Use of “MUE,” rather than “DUE,”² emphasizes the need for a more multifaceted approach to improving medication use. MUE has a common goal with the pharmaceutical care it supports: to improve an individual patient’s quality of life through achievement of predefined, medication-related therapeutic outcomes.^{3,4} Through its focus on the system of medication use, the MUE process helps to identify actual and potential medication-related problems, resolve actual medication-related problems, and prevent potential medication-related problems that could interfere with achieving optimum outcomes from medication therapy.

In organized health systems, MUE must be conducted as an organizationally authorized program or process that is proactive, criteria based, designed and managed by an interdisciplinary team, and systematically carried out. It is conducted as a collaborative effort of prescribers, pharmacists, nurses, administrators, and other health care professionals on behalf of their patients.

MUE Objectives

Some typical objectives of MUE include

- Promoting optimal medication therapy.
- Preventing medication-related problems.
- Evaluating the effectiveness of medication therapy.
- Improving patient safety.
- Establishing interdisciplinary consensus on medication-use processes.
- Stimulating improvements in medication-use processes.
- Stimulating standardization in medication-use processes.
- Enhancing opportunities, through standardization, to assess the value of innovative medication-use practices from both patient-outcome and resource-utilization perspectives.
- Minimizing procedural variations that contribute to suboptimal outcomes of medication use.
- Identifying areas in which further information and education for health care professionals may be needed.
- Minimizing costs of medication therapy. These costs may be only partly related to the direct cost of medications themselves. When medications are selected and managed optimally from the outset, the costs of complications and wasted resources are minimized, and overall costs are decreased.
- Meeting or exceeding internal and external quality standards (e.g., professional practice standards, accreditation standards, or government laws and regulations).

Steps of the MUE Process

While the specific approach varies with the practice setting and patient population being served, the following common steps occur in the ongoing MUE process:

- Establish organizational authority for the MUE process and identify responsible individuals and groups.
- Develop screening mechanisms (indicators) for comprehensive surveillance of the medication-use system.
- Set priorities for in-depth analysis of important aspects of medication use.
- Inform health care professionals (and others as necessary) in the practice setting(s) about the objectives and expected benefits of the MUE process.
- Establish criteria, guidelines, treatment protocols, and standards of care for specific medications and medication-use processes. These should be based on sound scientific evidence from the medical and pharmaceutical literature.
- Educate health care professionals to promote the use of criteria, guidelines, treatment protocols, and standards of care.
- Establish mechanisms for timely communication among health care professionals.
- Initiate the use of MUE criteria, guidelines, treatment protocols, and standards of care in the medication-use process.
- Collect data and evaluate care.
- Develop and implement plans for improvement of the medication-use process based on MUE findings (if indicated).
- Assess the effectiveness of actions taken, and document improvements.
- Incorporate improvements into criteria, guidelines, treatment protocols, and standards of care, when indicated.
- Repeat the cycle of planning, evaluating, and taking action for ongoing improvement in medication-use processes.
- Regularly assess the effectiveness of the MUE process itself and make needed improvements.

Selecting Medications and Medication-Use Processes for Evaluation

Medications or medication-use processes should be selected for evaluation for one or more of the following reasons:

1. The medication is known or suspected to cause adverse reactions, or it interacts with another medication, food, or diagnostic procedure in a way that presents a significant health risk.
2. The medication is used in the treatment of patients who may be at high risk for adverse reactions.
3. The medication-use process affects a large number of patients or the medication is frequently prescribed.
4. The medication or medication-use process is a critical component of care for a specific disease, condition, or procedure.

5. The medication is potentially toxic or causes discomfort at normal doses.
6. The medication is most effective when used in a specific way.
7. The medication is under consideration for formulary retention, addition, or deletion.
8. The medication or medication-use process is one for which suboptimal use would have a negative effect on patient outcomes or system costs.
9. Use of the medication is expensive.

Indicators Suggesting a Need for MUE Analysis

Certain events (indicators) serve as “flags” of potential opportunities to improve medication use. Some are

- Adverse medication events, including medication errors, preventable adverse drug reactions, and toxicity.
- Signs of treatment failures, such as unexpected readmissions and bacterial resistance to anti-infective therapy.
- Pharmacist interventions to improve medication therapy, categorized by medication and type of intervention.
- Nonformulary medications used or requested.
- Patient dissatisfaction or deterioration in quality of life.

Roles and Responsibilities in the MUE Process

The roles of individual health care professionals in MUE may vary according to practice setting, organizational goals, and available resources. The organizational body (e.g., quality management committee, pharmacy and therapeutics committee) responsible for the MUE process should have, at a minimum, prescriber, pharmacist, nurse, and administrator representation. Other health care professionals should contribute their unique perspectives when the evaluation and improvement process addresses their areas of expertise and responsibility. Temporary working groups may be used for specific improvement efforts.

Pharmacist’s Responsibilities in MUE

Pharmacists, by virtue of their expertise and their mission of ensuring proper medication use, should exert leadership and work collaboratively with other members of the health care team in the ongoing process of medication-use evaluation and improvement.⁵ Responsibilities of pharmacists in the MUE process include

- Developing an operational plan for MUE programs and processes that are consistent with the health system’s overall goals and resource capabilities.
- Working collaboratively with prescribers and others to develop criteria for specific medications and to design effective medication-use processes.
- Reviewing individual medication orders against medication-use criteria and consulting with prescribers and others in the process as needed.
- Managing MUE programs and processes.

- Collecting, analyzing, and evaluating patient-specific data to identify, resolve, and prevent medication-related problems.
- Interpreting and reporting MUE findings and recommending changes in medication-use processes.
- Providing information and education based on MUE findings.

Resources

Some resources helpful in designing and managing an MUE process are listed here.

- The primary professional literature and up-to-date reference texts are key resources necessary for the development of MUE criteria. In general, local consensus should be based on medical and pharmaceutical literature recommendations.
- Published criteria, such as found in *AJHP* and ASHP’s *Criteria for Drug Use Evaluation* (volumes 1–4), provide medication-specific criteria that may be adapted for local use.
- Computer software programs, including proprietary programs designed specifically for MUE functions, may be helpful in managing data and reporting.
- External standards-setting bodies, such as the Joint Commission on Accreditation of Healthcare Organizations, publish medication-use indicators that can help to identify portions of the medication-use system that require improvement.

Follow-up Actions in an MUE Process

The MUE process itself should be reviewed regularly to identify opportunities for its improvement. The success of an MUE process should be assessed in terms of improved patient outcomes. Medication-use system changes that evolve from MUE findings should be developed by the departments and medical services with responsibility for providing care, rather than solely through a committee having oversight for MUE (e.g., a pharmacy and therapeutics committee). Typical follow-up actions based on MUE findings include contact with individual prescribers and other health care professionals, information and education (newsletters, seminars, clinical care guidelines) for health care professionals, changes in medication-use systems, and changes in medication-therapy monitoring processes. MUE should be conducted as an ongoing interdisciplinary and collaborative improvement process. Punitive reactions to quality concerns are often counterproductive. It is important to communicate and commend positive achievements (care that meets or exceeds expectations) and improvements.

Pitfalls

Some common pitfalls to avoid in performing MUE activities include the following:⁶

1. Lack of authority. An MUE process that does not involve the medical staff is likely to be ineffective. Authoritative medical staff support and formal organizational recognition of the MUE process are necessary.

2. Lack of organization. Without a clear definition of the roles and responsibilities of individuals involved (e.g., who will develop criteria, who will communicate with other departments, who will collect and summarize data, and who will evaluate data), an MUE process may not succeed.
3. Poor communication. Everyone affected by the MUE process should understand its importance to the health system, its goals, and its procedures. The pharmacist should manage the MUE process and have the responsibility and authority to ensure timely communication among all professionals involved in the medication-use process. Criteria for medication use should be communicated to all affected professionals prior to the evaluation of care. MUE activity should be a standing agenda item for appropriate quality-of-care committees responsible for aspects of medication use.
4. Poor documentation. MUE activities should be well documented, including summaries of MUE actions with respect to individual medication orders and the findings and conclusions from collective evaluations. Documentation should address recommendations made and follow-up actions.
5. Lack of involvement. The MUE process is not a one-person task, nor is it the responsibility of a single department or professional group. Medication-use criteria should be developed through an interdisciplinary consensus process. Lack of administrative support can severely limit the effectiveness of MUE. The benefits of MUE should be conveyed in terms of improving patient outcomes and minimizing health-system costs.
6. Lack of follow-through. A one-time study or evaluation independent of the overall MUE process will have limited success in improving patient outcomes. The effectiveness of initial actions must be assessed and the action plan adjusted if necessary. It is important not to lose sight of the improvement goals.
7. Evaluation methodology that impedes patient care. Data collection should not consume so much time that patient care activities suffer. Interventions that can improve care for an individual patient should not be withheld because of the sampling technique or evaluation methodology.
8. Lack of readily retrievable data and information management. Existing data capabilities need to be assessed and maximum benefit obtained from available

computerized information management resources. Deficiencies in information gathering and analysis should be identified and priorities for upgrading information support established.

References

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Approved by the ASHP Board of Directors, April 24, 1996. Developed by the ASHP Council on Professional Affairs. Supersedes the ASHP Guidelines on the Pharmacist's Role in Drug-Use Evaluation, dated November 19, 1987.

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The bibliographic citation for this document is as follows: American Society of Health-System Pharmacists. ASHP guidelines on medication-use evaluation. *Am J Health-Syst Pharm.* 1996; 53:1953–5.