

Applying Quality Improvement to Medication Management

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Reasons for Using the Quality Improvement Process

If you have a pattern of medication use that is inconsistent with recommended practices, then using the quality improvement process may be extremely valuable to you. By approaching the issue in this way you can:

- 1) *Achieve agreement* on the standard of care,
- 2) *Measure current activities* against the standard,
- 3) *Identify opportunities* for improvement,
- 4) *Implement corrective* measures, and
- 5) *Evaluate the impact* of the corrective measures.

Conversely, if these issues are addressed on a case by case basis you may find that:

- 1) The person intervening has to explain the concern over and over again.
- 2) The problem continues because all practitioners are not aware of the issue until they receive a recommendation for one of their residents.
- 3) Suggestions for modification may not be accepted because there is not agreement on the recommendation.

Here is an example of how the process can work for you. You may notice that several of your residents with a history of myocardial infarction are not on a beta-blocker. Instead of just bringing this issue up to the individual physician on these select cases, it may be effective to also create a quality improvement/drug use evaluation (QI/DUE) project. This will achieve the aims mentioned above. The utility of this approach would be even greater for the consultant

pharmacist who provides medication review to a number of facilities. In fact, sharing monitors between facilities can improve efficiency.

Process

The QI/DUE process includes two aspects. The first aspect involves designing the monitor.

This entails clarifying the issue, identifying standards of care, setting goals, selecting a team, reviewing the facilities process related to the issue, and outlining how data will be collected.

(Appendix A contains the framework and questions to ask in each step. This document has been adapted from the *Steps to Quality Improvement* created by the Quality Partners of Rhode Island¹.) It is important to involve the medical director, consultant pharmacist, director of nursing, floor or charge nurse, and certified nursing assistant as appropriate in this step.

Designing the monitor may seem time consuming but your efforts in this step will make the remainder of your work easier. In addition, carrying out this portion of the process will help enhance concurrence on the appropriate use of medications.

In my experience I have noticed some common problems. First, do not pick an issue that doesn't have an agreed upon approach. If the experts are still debating treatment, you can't create a definitive standard to measure activities. Second, do not try to address a broad or ill-defined issue. For example, you may be concerned about proper use of antipsychotic agents but the issue will need to be narrowed and refined a great deal to be an acceptable issue for the quality improvement process. Third, if there are multiple variables that dictate the proper use of medications, you will end up with a very complex standard of care with a long list of exclusions and exceptions. If it takes that much individual adjustment, then it probably isn't a good issue to address with this process. Fourth, make sure that you find a high quality literature source for

your standard of care. The reference needs to provide the definitive word on treatment and it must be accepted by the medical director/medical staff prior to implementation of the monitor. Finally, carefully think over what type of data you want to collect. This will save going back to get more information because you missed an important element.

The second aspect of the QI/DUE process involves data analysis and actions. This aspect begins with a summary of the results. This is followed by an analysis of the cause, a corrective strategy, and a plan for follow-up monitoring. (Appendix A contains the framework and questions to ask in each step.) The most common problems include not figuring out why results varied from the standard and not creating an effective approach to decrease the problem.

To help you understand how the process works, two examples are attached (Appendix B and Appendix C). The monitors were written for actual practice situations but the results are fictitious.

Conclusions

The QI/DUE process can be a very powerful mechanism for examining medication related practices in your facility and will allow you to achieve high quality care for your residents. If you're at a loss as to where to start, ask your pharmacist if there are patterns of medication use that may be improved. Once the issue is identified, you are on your way to developing a monitor, analyzing data, and optimizing drug therapy.

References:

1. Steps to Quality Improvement, Quality Partners of Rhode Island, Worksheet A-L.
http://www.sdfmc.org/ClassLibrary/Page/Information/DataInstances/81/Files/251/Steps_to_Quality_Improvement.pdf Accessed 6/04.

Appendix A

Quality Improvement or Drug Utilization Review Form

This format is adapted in part from the following link:

http://www.sdfmc.org/ClassLibrary/Page/Information/DataInstances/81/Files/251/Steps_to_Quality_Improvement.pdf (1)

A. Design a Monitor

- I. **Issue** – Select one issue that needs to be reviewed and state why you think it needs to be reviewed.

Example: Residents on nitrofurantoin need to have adequate renal function. This issue needs to be reviewed because the consultant pharmacist has found several residents in one home that do not have adequate renal function for nitrofurantoin use.

- II. **Standard of Care** - What is the standard of care for this issue? This must be based on sound medical literature or a regulation.

Example – All residents must have a creatinine clearance of 40 ml/min for nitrofurantoin to be effective. These patients are also at greater risk for toxicity (e.g., neuropathy is more common in patients with a creatinine clearance of < 60 ml/min). (AHFS Drug Information 2004)

- III. **Goal** - What is the goal? (Should all residents be at the standard of care or will a lesser percentage be acceptable?)

Example – 100% of residents receiving nitrofurantoin will have a creatinine clearance of 40 ml/min or greater.

- IV. **Team** - Who needs to be on the team to evaluate this issue? (These people will help you understand the process and need to agree with the standard and goal that is set.)

Example – Director of Nursing, Medical Director, Pharmacists

- V. **Process Analysis** - What steps are involved in the process? Are there policies and procedures in place that affect this process? Does the physical environment support or hinder the process? Which staff members are involved?

Example – Policies and Procedures - Resident is evaluated and medication is ordered by MD, NP or PA. Are there standing orders for labs to be done at the time nitrofurantoin is started? How is the order processed?

- VI. **Data Collection** - What data needs to be collected to determine if the goal is being met? Include a formula that will be used to calculate the percent of residents meeting the goal.

Data collection must be very specific. You should be able to give these instructions to someone who doesn't know anything about the study and that person should be able to collect the correct information.

Example: Record resident's name, start date of nitrofurantoin, creatinine level and date obtained, etc.

% on nitrofurantoin with CrCl >40 ml/min = $\frac{\# \text{ on nitrofurantoin with CrCl} > 40 \text{ ml/min}}{\# \text{ on nitrofurantoin}}$

B. Data Analysis and Actions

I. Results – Did your results meet the goal?

If yes, you do not need to go any further. However, if you set your goal at <100% and you identified some trend in the resident cases not meeting the standard, you should evaluate this to improve care if possible.

If no, proceed to the next step.

Example: Goal not met. 80% of residents (8 out of 10) on nitrofurantoin have a CrCl > 40 ml/min.

II. Root-cause analysis – What factors may influence the problem? (What causes are identified using the cause and effect diagram (fishbone)? See Worksheet G from http://www.sdfmc.org/ClassLibrary/Page/Information/DataInstances/81/Files/251/Steps_to_Quality_Improvement.pdf) (1).

Example: The two residents not having a CrCl >40 ml/min did not have a creatinine level done. The process was reviewed and it was found that no safeguards are in place to assure creatinine levels are ordered for those on nitrofurantoin.

III. Implementation strategy – What can be done to correct the cause of the deviation from the desired results?

- A. What is the change?
- B. Who will implement it?
- C. Where will it start? (all of the facility or trial in part)
- D. When will it start?
- E. When will it be evaluated?
- F. Share the results with staff.

Example: A procedure was put into place so that when an order for nitrofurantoin is processed by nursing staff, the nurse will obtain an order for a creatinine level. Staff was provided with an inservice on UTIs and the data was reviewed.

IV. Follow-up Evaluation – Use the same monitor that identified the opportunity for improvement unless information from the quality improvement process has helped to refine the monitor.

Example: 2 months later data was collected using the monitor and the results found 100% of the residents (9 of 9) had a creatinine clearance >40 ml/min.

V. Continue quality improvement process until desired results have been obtained and then periodically screen as necessary.

Example: Monitor was repeated one more time 6 months later. The goal was met and the monitor was checked routinely at 24-month intervals (sooner if the consultant's reviews indicated problems).

References

1. Steps to Quality Improvement, Quality Partners of Rhode Island, Worksheet A-L.
http://www.sdfmc.org/ClassLibrary/Page/Information/DataInstances/81/Files/251/Steps_to_Quality_Improvement.pdf Accessed 6/04.

Appendix B
EXAMPLE
Results are Fictitious

Quality Improvement
Myocardial Infarction
2004

A. Monitor Design

- I. Issue – A review is needed to determine if beta blocker treatment is employed for residents with a diagnosis of myocardial infarction.
- II. Standard of Care – Myocardial infarction (with or without ST segment elevation) requires indefinite beta blocker therapy to reduce morbidity and mortality (1,2). Contraindications to therapy include beta blocker allergy, heart rate less than 60 bpm, systolic arterial pressure less than 90 mm Hg, 2nd or 3rd degree heart block on ECG, potential other reasons documented by staff (3). While contraindications exist, data suggest benefits outweigh risks and monitoring should prevent complications (1).
- III. Goal – 100% of residents with a diagnosis of myocardial infarction will be treated with a beta blocker unless contraindicated.
- V. Process Analysis - Myocardial infarction is diagnosed by a medical doctor, who evaluates patient and determines if beta blocker therapy is appropriate for post-myocardial infarction care.

IV. Data Collections

Sample will be obtained by looking at bottom of MAR, problem list, discharge notes, and doctor's notes for a diagnosis of myocardial infarction and then checking the current MAR for a beta blocker.

Data will include patient's name, age, race, sex, primary care physician, location of myocardial infarction diagnosis, contraindications to beta blocker use, and name of beta blocker.

$$\frac{\text{\# of residents with a diagnosis of myocardial infarction on a beta blocker}}{\text{\# of residents with a diagnosis of myocardial infarction}} \times 100$$

B. Data Analysis and Actions

I. Results

After looking through the facility's charts, 20 residents were flagged as having a diagnosis of myocardial infarction. Of these 20 residents, 8 were found to not be currently taking a beta blocker. Therefore, 12 residents with a diagnosis of myocardial infarction were currently taking a beta blocker.

$$\frac{12 \text{ of residents with a diagnosis of myocardial infarction on a beta blocker}}{20 \text{ of residents with a diagnosis of myocardial infarction}} \times 100 = 60.0\%$$

Goal : 60.0% of residents with a diagnosis of myocardial infarction were treated with a beta blocker unless contraindicated.

II. Root-cause Analysis

Of the 8 residents not taking a beta blocker, ages ranged from 87-95 with a mean of 91. The 12 residents taking a beta blocker had an average age of 82 with a range of 74-90.

Two of residents not receiving a beta blocker had a history of hypotension although systolic blood pressures in the last 6 months were not below 90 mm Hg. None of the residents had bradycardia (i.e., < 60 bpm), an allergy to beta blockers, or a history of heart block.

Of the 8 residents who were taking beta blockers 2 were men and 6 were women. This group can be compared to the 12 residents taking a beta blocker that was made up of 3 men and 9 women. This indicates that there was not a difference in prescribing based on sex.

Conclusion - Those not treated with a beta blocker were older than those receiving treatment. Currently contraindications to therapy do not exist for these residents.

Elderly people are at greatest risk of having a second myocardial infarction and therefore they will receive the greatest benefit of secondary protection (4). Because of the proven benefits of beta blocker therapy, residents not receiving therapy should be considered for implementation of beta blockers.

III. Implementation strategy – Suggested approach

This data will be shared with the Medical Director, medical staff, and nursing staff. The consultant pharmacist will review the medical record of each resident who is not receiving a beta blocker and has a history of myocardial infarction. The attending physician will be contacted based on the consultant pharmacist's review.

IV. Follow-up Evaluation – Collect data again in 3 months to determine if improvements have been made.

V. Continue quality improvement strategy until standard is met.

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References

1. ACC/AHA Guidelines for the Management of Patients with ST-Elevation Myocardial Infarction.
<http://www.acc.org/clinical/guidelines/stemi/index.pdf>. Accessed 7/23/04.
2. ACC/AHA 2002 Guideline Update for Management of Patients with Unstable Angina and Non-ST-Segment Elevation Myocardial Infarction.
<http://www.acc.org/clinical/guidelines/unstable/incorporated/index.htm>.
Accessed 7/23/04.
3. CMS MI guidelines
<http://www.cms.hhs.gov/quality/hospital/HeartAttack.pdf>. Accessed 7/23/04.
4. Howard PA, Ellerbeck EF. Optimizing Beta Blocker Use After Myocardial Infarction. American Family Physician 2000; 62(8): 1853-60.

Appendix C
EXAMPLE
Results are Fictitious

Quality Improvement
Depression Management
2004

A. Monitor Design

I. Issue – A review needs to take place concerning the lack of antidepressant treatment in residents with depression and inadequate treatment of depressed residents.

II. Standard of Care

- A. Depression requires treatment with antidepressants or psychotherapy (1,2). Residents who have depression can be identified by examining residents who currently have symptoms of depression according to the MDS (specific subsections include E2, E1a, E1n, E4e, E1o, E1p, E1j, N1d, N1a, N1b, N1c, B1, E1g, K3a, Oc4) and determining if each of these residents has a diagnosis of depression (3).
- B. Treatment to full remission of symptoms is a necessary endpoint for depression. (2) Residual symptoms are associated with higher relapse rates and significant morbidity. (4) Lack of remission can be identified by persistence of symptoms noted in the MDS (specific subsections include E2, E1a, E1n, E4e, E1o, E1p, E1j, N1d, N1a, N1b, N1c, B1, E1g, K3a, Oc4)(3). While many studies have evaluated remission after 6-8 weeks of antidepressant efficacy, it has been suggested that this is too short of a time frame (5). Therefore, a minimum of 16 weeks of antidepressant therapy will be required to assess for remission.

III. Goal

- A. 100% of residents with symptoms of depression and a diagnosis of depression will be treated with an antidepressant or psychotherapy.
- B. 100% of residents with a diagnosis of depression who receive an antidepressant will not have symptoms of depression after 16 weeks or more of treatment.

IV. Team – The analysis team should include the director of nursing, medical director, and consultant pharmacist.

V. Process Analysis – Upon admission, the resident receives full physical and mental exam and the MDS will flag the resident for possible depression. Nursing staff takes notes on the resident's mental state and this is considered in diagnosis of depression made by the physician. The physician evaluates residents flagged by the MDS for depression.

Residents receiving antidepressants are routinely evaluated by the physician and social worker as to the status of the depressive symptoms.

VI. Data Collection –

Group A will be obtained by taking the residents who flagged for QI4 (symptoms of depression) and including only those who have a diagnosis of depression.

Data will include resident's name, sex, age, race, primary care physician, diagnosis of depression and location of this information, name of current antidepressant medication, presence of psychotherapy.

Group B will include all residents who have a diagnosis of depression and are on antidepressants.

Data collected will include resident's name, sex, age, race, primary care physician, name of all antidepressants prescribed for the resident (include all antidepressants prescribed without significant interruption – that is – include all antidepressants received with no break in antidepressant use of more than 2 weeks), date started, depression diagnosis and location of information, and MDS depression symptoms (specific subsections include E2, E1a, E1n, E4e, E1o, E1p, E1j, N1d, N1a, N1b, N1c, B1, E1g, K3a, Oc4).

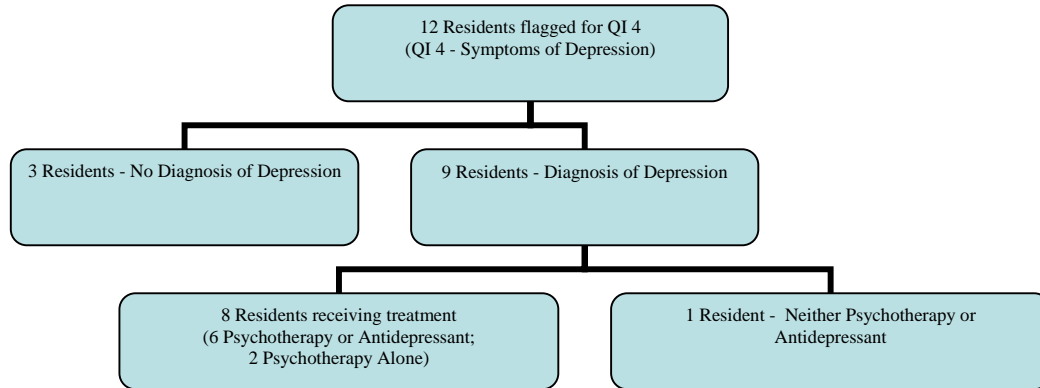
Calculations:

- A.
$$\frac{\text{\# residents with diagnosis of depression and symptoms of depression on antidepressant agent or psychotherapy}}{\text{\# residents with diagnosis of depression \& symptoms of depression}} \times 100 =$$
- B.
$$\frac{\text{\# residents on antidepressants (16 wks) with diagnosis of depression and no symptoms}}{\text{\# resident on antidepressants (16 wks) with diagnosis of depression}} \times 100 =$$

B. Data Analysis and Actions

I. Results

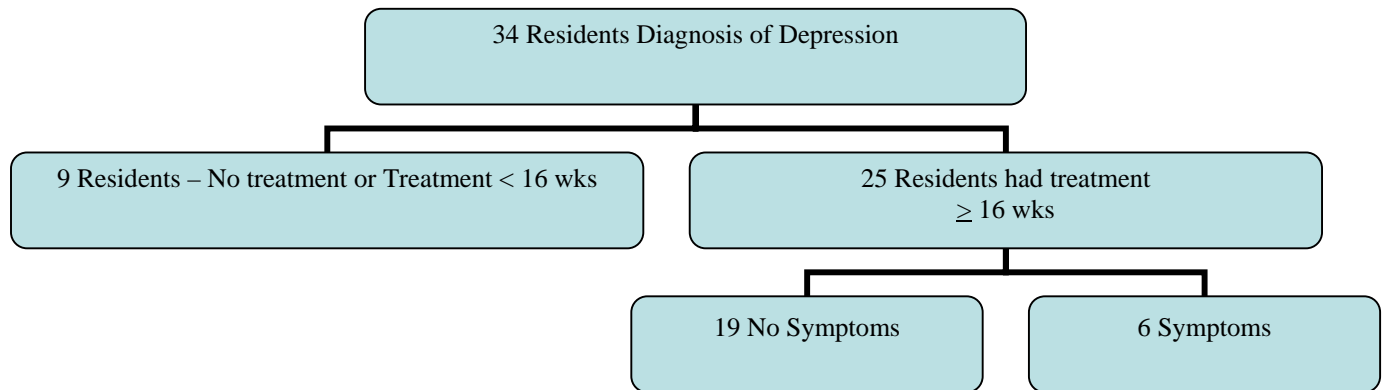
Goal A.



$$\frac{8 \text{ residents with diagnosis of depression and symptoms of depression on antidepressant agent or psychotherapy}}{9 \text{ residents with diagnosis of depression \& symptoms of depression}} \times 100 = 88.9 \%$$

Goal A. 88.9 % of the residents with symptoms of depression and a diagnosis of depression were treated with an antidepressant or psychotherapy.

Goal B.



19 residents on antidepressants (16 wks)
with diagnosis of depression and no symptoms _____ X 100 = 76 %
25 residents on antidepressants (16 wks) with diagnosis of depression

Goal B. 76 % of residents with a diagnosis of depression who received an antidepressant and had no symptoms of depression after 16 weeks or more of antidepressant treatment

II. Root-cause analysis

Goal A. *Residents with symptoms of depression and a diagnosis of depression will be treated with an antidepressant or psychotherapy.*

On further review the one resident with a diagnosis of depression and symptoms of depression was receiving an antianxiety agent (benzodiazepine). Benzodiazepines are not appropriate monotherapy for residents with anxiety and depression. (6) Therefore, this resident's medication regimen needs to be evaluated. Sex, age, race, choice of primary care physician, and location did not seem to play a role in this study.

Symptoms of depression but no diagnosis - 3 residents with symptoms of depression did not have a diagnosis of depression. All 3 had other psychiatric diagnosis (ie, dementia, anxiety). These residents need to be reevaluated to determine if they have depression. Appropriate therapy can then be considered if depression is present.

Goal B. *Residents with a diagnosis of depression who receive an antidepressant will not have symptoms of depression after 16 weeks of treatment.*

Of the residents diagnosed with depression, on an antidepressant treatment for 16 weeks or more, and having symptoms of depression (n=6, 24%), all 6 had not received a change in

their medications within the last year and all 6 were receiving the typical starting dose of the antidepressant. This would suggest that there was an acceptance of the persistent depressive symptoms despite opportunities for dosage increases.

Once again sex, age race, primary care physician, and location within the facility did not seem to play a role. A review of the process of resident evaluation after starting an antidepressant is necessary. This may involve examining the care planning process, how information is shared etc.

III. Implementation strategy – Suggestions:

Goal A. The consultant pharmacist will ask the physician to review the medication regimen of the one resident having symptoms of depression, a diagnosis of depression and no antidepressant treatment (resident is receiving benzodiazepines). Information will be shared regarding the optimal treatment of concurrent depression and anxiety.

Additional issue raised by process:

Residents with symptoms of depression and no diagnosis should be reviewed to determine if the resident currently has depression. The facility may wish to look at how physicians are being made aware of residents with symptoms of depression.

Goal B. Residents with a diagnosis of depression and persistence of symptoms after being treated for at least 16 weeks should be reviewed to determine if a change in therapy is needed.

Reason	Approach
A. The information is not conveyed to the physician.	A. 1. Share information with attending physician during next visit. A. 2. Educate nursing staff on the goals of antidepressant therapy in order to improve sharing of information.
B. The physician may be accepting partial response (this will be identified if approach A.1. above was unsuccessful).	B. 1. The consultant pharmacist will provide individual recommendations to the attending physician regarding the importance of treating depression to remission. B. 2. The consultant pharmacist will present information on treating depression to remission at the next medical staff meeting.

IV. Follow-up Evaluation – Collect data again in 3 months to determine if progress is made.

V. Continue quality improvement process until goal is met.

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References

1. Alexopoulos GS, Katz IR, Reynolds CF, et al. The Expert Consensus Guideline Series: Pharmacotherapy of depressive disorders in older patients. Post grad Med Special Report [serial online] 2001 October [cited 2004 July 21]; 1 (1) [12 screens]. Available from URL: <http://www.psychguides.com/Geriatric%20Depression%20LP%20Guide.pdf>
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3. Heaton WH, Pate T, Lovvorn B, editors. Long-Term Care Resident Assessment Instrument User's Manual. Ohio: Med-Pass Inc; Dec. 2002.
4. Rabheru K,. Special Issues in the Management of Depression in Older Patients. Can J Psychiatry Vol. 49 Suppl 1 March 2004.
5. Tranter R, O'Donovan C, Chandarana P, et al. Prevalence and outcome of partial remission in depression. J Psychiatry Neurosci 2002; 27 (4) 241-7.
6. Lenze EJ. Comorbidity of depression and anxiety in the elderly. Current Psychiatry Reports 2003;5:62-87.