Decreasing Length of Stay in Patients Receiving High Dose Methotrexate A Quality Improvement Project

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A Quality Improvement Project
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Goal
Decrease length of stay by checking methotrexate levels more frequently and changing the methotrexate level for discharge from <0.1µM to <0.2µM.

Background
• In patients receiving high dose methotrexate, the greatest concern is renal toxicity
• The elimination half-life of high dose methotrexate is within the range of 8 to 15 hours
• After IV administration, approximately 80-90% of the methotrexate is excreted within the urine as unchanged drug within 24 hours
• The majority of patients will have a serum methotrexate level <0.1µM between 24 and 48 hours
• There is limited data detailing a safe methotrexate level for hospital discharge and no data to support that discharge with a methotrexate level of <0.1µM is safer than <0.2µM
• The cost of checking a stat serum methotrexate level is $64.45
• The cost of an additional night stay in the hospital is significantly more expensive
• It is cost effective to check methotrexate levels twice daily in an effort to decrease length of stay in patients receiving high dose methotrexate

Old Protocol
- 24 hours after methotrexate infusion is complete a methotrexate level is checked and leucovorin dose is based on the methotrexate level
- Methotrexate levels are then checked every 24 hours until levels are <0.1µM
- When levels are <0.1µM then the patient may be discharged on leucovorin 15mg PO every 6 hours for a total of 24 hours

New Protocol
- 24 hours after the completion of the methotrexate infusion, a methotrexate level will be checked and leucovorin started
- The methotrexate level will then be checked twice daily at 4:00 and 13:00 until the level is <0.2µM
- In patients with a normal creatinine (<1.2) and normal CrCl (>60 mL/min) or stable creatinine (no change >0.3mg/dL during the hospital stay), once levels are <0.2µM the patient is discharged to home and given a script to have a methotrexate level checked 24 hours later in the MPA to ensure that the level is <0.1µM
- In patients with a level <0.2µM and abnormal or unstable creatinine, they will remain in the hospital until the methotrexate level is <0.1µM

Results
• A total of 21 hospitalizations were reviewed prior to instituting the new protocol
• The average length of stay was 4.47 days
• In reviewing the 21 hospitalizations, 8 hospitalizations could have had reduced length of stay by at least 1 day implementing the new protocol
• One hospitalization could have been reduced by 2 nights if the new protocol had been implemented
• A total of 43 hospitalizations for high dose methotrexate were reviewed using the new protocol
• The average length of stay with the new protocol was 3 days
• Average LOS was reduced by 1.47 nights
• There were 7 hospitalizations where the patient was discharged with a methotrexate level >0.1µM
• All 7 had an outpatient methotrexate level the following day, all methotrexate levels were <0.1µM

Conclusions
• The average length of stay was decreased by 1.47 days implementing the new protocol.
• The new protocol is safe with regards to discharging patients with slightly higher methotrexate levels, all repeat methotrexate levels as an outpatient were at the goal of <0.1µM
• The new protocol for discharging patients receiving high dose methotrexate is both safe and cost effective.
• The new protocol is now the new standard of care in patients receiving high dose methotrexate.