

Improved Patient Pathway for Diagnosis, Follow-Up and Monitoring of Multiple Myeloma: A Multi-Disciplinary Collaboration to Improve the Path from Initial Request to Long-Term Monitoring

Hampshire Hospitals NHS Foundation Trust | Basingstoke, United Kingdom

Multiple myeloma is a cancer that forms in white blood cells called plasma cells. Healthy plasma cells are involved in the immune response, however, in multiple myeloma, cancerous plasma cells grow uncontrollably and affect the growth and production of normal blood-forming cells. Patients with multiple myeloma typically have non-specific symptoms at presentation, potentially impeding diagnosis and causing delayed or even missed diagnosis if appropriate tests are not undertaken or ordered late.

Complications of multiple myeloma include anemia, which occurs when production of red blood cells is diminished, and lowered platelet formation, which may cause bleeding. Additionally, when white blood cells are affected the way they are in multiple myeloma, a patients' risk of infection increase. Healthy plasma cells produce antibodies needed to fight infections, whereas the cancerous plasma cells continually produce the same 'monoclonal' antibody that does not fight infection, thus leaving patients unable to fight infections.

Measuring these monoclonal cell lines requires serum immunoelectrophoresis, a specialized laboratory testing method. The ability to measure these cell lines is increasingly important as availability of new treatments necessitates diagnosing multiple myeloma as early in the disease course as possible.

With an appreciation of the significance of early and accurate diagnosis, a multi-disciplinary myeloma working group at the Hampshire Hospitals NHS Foundation Trust conducted an internal audit to assess its performance against established criteria for multiple myeloma evaluation and diagnosis. The audit identified two key opportunities for improvement: many requests did not include all the appropriate tests, resulting in inappropriate referrals to the hematologist or necessary referrals being missed.

To improve the diagnostic pathway, the working group first developed and introduced an electronic test request profile for all required tests, including sample types and instructions that were accessible on all requesting platforms.

The next and most significant task was writing a complete interpretation algorithm with supporting IT rules, including a risk category escalation protocol. The algorithm and escalation protocol were meant to ensure all tests were analyzed on each sample, thereby reducing repeat testing while improving turnaround time through minimized need for manual intervention and reduced test variation. The many features included a result entry drop-down, auto-reflex testing rules, automatic generation of telephone limit actions and automatic notification of critical result reports, all of which dramatically reduced the time required to review patient results.

Concise, informative, and coded interpretive comments were created to refer clinicians to the most appropriate clinical guidance, and IT



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alerts were implemented for critical results and provision of interpretation support. A monthly pathology newsletter was also established to improve communication across departments and among service users. The impact on the evaluation and referral process was significant and facilitated improved patient outcomes.

Prior to protocol implementation, urgent patient reviews by hematology could take up to two weeks.

The new protocols reduced the review wait time to 24 hours, permitting same-day intervention. Patient redraws and delays were minimized, increasing first-pass order completeness by 13% and ensuring all ordered tests were completed. First-pass biomarker stewardship for oncology patients increased from 64% to 87%.

Hematology referrals improved with a 10% reduction in inappropriate referrals. This, in turn, improved clinician confidence, said Dr. H. Sheldon, general practitioner at Bodger Wood Surgery.

“Not only has this comprehensive and streamlined diagnostic pathway reduced appointments, repeat testing and referrals,” Dr. Sheldon said, “but it has improved our confidence in diagnostic exclusion of these hematological malignancies for non-specific presentations.”

An additional advantage of the protocol was the reduction in healthcare costs. By establishing and joining together minimum retesting intervals and request profiles, repeat testing was minimized and its associated costs savings realized.

“Building minimum retesting intervals and request profiles directly into the IT prevents unnecessary repeat testing and all of the associated costs, such as phlebotomy, transport services, testing and follow-up,” said Shaun Goldsmith, IT lead for Hampshire Hospitals NHS Foundation Trust. “In this way, the clinical care initiative saves NHS resources.”

Employees' involvement in cross-training also emerged as a benefit of the initiative. Four additional biomedical scientists were cross-trained on protein electrophoresis and became qualified on first-read interpretations, increasing employee engagement.

The multidisciplinary myeloma working group at the Hampshire Hospitals NHS Foundation Trust successfully implemented new steps to more effectively and efficiently evaluate and refer patients with multiple myeloma for hematology consultation and initiation of treatment. This improved patient experience, reduced patient wait times and improved clinical satisfaction with enhanced employee engagement, along with the added benefit of cost savings to their NHS Trust.

These achievements of this collaborative team substantially improved patient care, resulting in recognition by the UNIVANTS of Healthcare Excellence award program.

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