

## Algorithm for FISH and Karyotype Testing for Plasma Cell Myeloma Specimens to Optimize Results

### Aim of project:

To create an algorithm for FISH and karyotype testing for plasma cell myeloma specimens to optimize results based on (1) CD138 enrichment; (2) quantity of clonal plasma cells; and (3) quantity of specimen.

### Background of project:

Plasma cell myeloma prognosis and treatment is significantly impacted by the identification of specific abnormalities, typically identified by fluorescence in-situ hybridization (FISH) and karyotype analysis. However, limitations with regard to quantity of clonal plasma cells and quantity of specimen exist. A uniform and algorithmic approach to plasma cell myeloma specimen processing with testing tailored to plasma cell concentration and specimen volume may (1) reduce unnecessary testing; (2) improve diagnostic yield; and (3) yield significant cost savings.

### Planned intervention tested

An algorithmic approach has been developed for use in our department with regard to specimen triaging based on (1) the presence clonal plasma cells;

(2) plasma cell concentration of specimen; and (3) quantity of specimen. A 6-month retrospective review was performed that identified all cases with clonal plasma cells. Metrics for our study included number of cases where: (1) cytogenetic testing was unnecessarily performed on cases without clonal plasma cells; (2) cases with  $\geq 30\%$  clonal plasma cells where purification methods were unnecessarily used and/or appropriate cytogenetic stimulation was not used; and (3) cases with  $<30\%$  clonal plasma cells where appropriate specimen triage was not followed. A 6-month prospective analysis of these metrics will be reviewed following the implementation of our newly developed "Algorithm for Myeloma Testing."

### Prediction of Results and/or Intended Results:

The goals of the intervention were to standardize the approach to plasma cell myeloma FISH and karyotype testing within our laboratory. We anticipate (1) reduction in unnecessary testing and (2) improvement in diagnostic yield. Given the cost of testing, we further anticipate (3) an overall *cost-savings* to our organization as a result of this quality improvement.

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