PHASE 3 READINESS FOR AUTOLOGOUS CELL THERAPIES: UNIQUE SOFTWARE APPLICATIONS FOR TRAINING, SCHEDULING AND MANUFACTURING OF IXMYELOCEL-T

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ABSTRACT

Aastrom is developing ixmyelocel-T, a patient-specific, expanded multicellular therapy for use in the treatment of severe chronic cardiovascular diseases. It is an autologous product derived from patient bone marrow, regulated as a biologic and manufactured in a centralized facility under Good Manufacturing Practices (GMP). For Phase 3 readiness, drug developers targeting autologous cell therapies must identify optimal strategies to manufacture cell therapies safely while being able to manufacture at a higher volume without compromising quality. While most pharmaceutical manufacturing processes can take advantage of sharing a single production batch among multiple patients, this is not the case for autologous cell therapies. The core steps for manufacturing cannot be shared, so companies need to look for other ways to achieve efficiencies while meeting quality standards, including computerization, process automation, and engineering integration. Prior to Phase 3 startup, the final process must be locked, specifications finalized and GMP system development must be completed (e.g., quality systems, materials management, facilities). In addition, specific for autologous products, patient and sample identification tracking, training systems, and scheduling must be in place. Not only do activities within the manufacturing facility need to be managed to insure quality, but also the initial collection of patient material and preparation of the final product at the clinical site. Quality assurance for the manufacture if the product does not end until the product has been administered to the patient. Web-based applications have been developed and applied to manage training and scheduling of clinical site activities and coordination with activities at the manufacturing site. Additional software applications have been developed to efficiently execute manufacturing support systems such as batch record issuance, scheduling and workflow management. Together these system enable increased capacity and mitigate risks such as chain of identity, which are both challenges for autologous cell therapy.

CONCLUSIONS

GMP manufacturing of autologous cell products presents unique logistical challenges including the insurance of chain of identity and chain of custody and complicated scheduling requirements. In commercial scale manufacturing these types of logistical issues are handled by Manufacturing Execution Systems (MES) which are customized to the specific manufacturing processes. A typical MES takes significant time and money to configure and implement.

Aastrom has utilized the IXRS and Firecrest software applications to assist with clinical training, ordering, scheduling, randomization, etc. Customization of these software solutions were necessary to meet Aastrom’s requirements.

Aastrom has developed the AutoLotrack software to support scheduling, chain of identity, chain of custody and management of batch records - essential support systems that were not available in off-the-shelf software. The AutoLotrack software was also designed to be highly configurable so that it can be used as new products and manufacturing Unit Operations are developed and also interface with a full-scale.