

FRESENIUS MEDICAL CARE

LEAN TRANSFORMATION OF HEMODIALYSIS MACHINE MANUFACTURING

Student Team:

Katie Redman – Master of Business Administration

Matt Riley – EGL (BSE Chemical Engineering/MSE Industrial and Operations Engineering)

Project Sponsors:

Christy Bangasser – Hemodialysis Production Manager

Chris Robinson – Vice President of Global Manufacturing Operations

Ryan Webb – Director of Engineering Project Management

Faculty Advisors:

Brian Love – College of Engineering

Eric Svaan – Ross School of Business

Fresenius Medical Care North America is a vertically integrated renal care organization whose durable goods division produces over 90% of all dialysis machines purchased in the United States. Fresenius is faced with increasing demand as more patients are diagnosed with end stage renal disease. As demand rises, they need to increase production capacity without using more resources. Because Fresenius dominates the market, it is critical that they maintain availability of the life-sustaining medical devices.

Hemodialysis is a treatment for patients with end stage renal disease that requires several visits each week to a dialysis clinic for 3-5 hour treatment sessions. The high market demand for Fresenius' hemodialysis machines makes them the most financially significant product at the Concord, CA facility. Any cost savings realized in the production of these machines has substantial impact on the bottom line.

To accommodate increasing demand, the Tauber team developed a plan for the lean transformation of hemodialysis machine assembly. Time studies of assembly processes were used to develop standard work, which was translated into new work instructions for the assembly line. The team trained assemblers and oversaw the success of a multi-day process change validation per FDA cGMP requirements to allow release to production. The team also performed a value stream mapping exercise to identify improvement initiatives and a five-year floor plan strategy to achieve the ideal state.

The team found significant opportunity to rebalance the assembly line and reduce waiting time by 60%. These findings were incorporated in the five year floor plan strategy to create space for increasing demand and new product introduction. The net present value of this plan is \$11 million in avoided cost. Of the total benefit, \$5 million was realized through changes that the team made while onsite. These savings were a result of reducing inventory, lowering overtime and rework labor costs, and avoiding the cost of additional floor space. Beyond tangible cost savings, benefits include line balance, improved material flow, frequent switching between product types, reduced compliance risk, and flexibility to introduce new products.

The team recommended a high-level implementation plan and took the first step of creating a business model to obtain internal funding. Fresenius will refine this model when additional information becomes available and dedicate the necessary resources to execute the implementation plan.