Seattle Children’s Hospital, the primary pediatric referral center for Washington, Alaska, Montana and Idaho, used Lean supply chain methods taught and initially implemented by a team from the Tauber Institute for Global Operations at the University of Michigan to free up clinical staff for more bedside care and build a new and smaller facility.

As part of an ongoing continuous improvement process, Children’s sought in 2008 to reduce operational wastes, one of which was inefficient inventory control. Supplies were regularly overstocked or understocked, resulting in obsolescence or stock-outs.

In addition, supplies throughout the hospital were maintained by clinical staff members through Children’s Central Services, rather than by a trained supply chain management team. A third problem was that equipment and supplies were occupying hospital areas that could be better used for patient care, and would thereby provide more revenue for the hospital and better service to the community.

Children’s contacted the Tauber Institute, asking for training on how Lean principles could be applied to the supply replenishment process.

Children’s asked the Tauber Institute for help with implementation, with Duenyas and Albert Shih, Professor of Mechanical and Biomedical Engineering, advising the project.

To implement Children’s Lean initiatives, a Tauber student team consisting of Ivan Goenawan, working on a Master of Science degree in Industrial and Operations Engineering; Sean Little, a member of the Engineering Global Leadership Honors (EGL) program pursuing BSE and MSE degrees in Industrial and Operations Engineering; and Lindsay Parker, an EGL student working on BSE in Aerospace Engineering and MSE in Industrial and Operations Engineering degrees, was tasked to reinforce a culture of continuous improvement through the completion of several projects.

The most important of these team projects was designing a supply replenishment process to be implemented throughout the hospital, beginning with the Dialysis Unit. Using Lean techniques and tools, including time flow charts, in-house software, employee engagement programs, and basic Lean instruction, the team aimed to improve efficiency and reduce waste.
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In the years since the Tauber team’s visit to

children, the hospital continued its supply

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management, the supply chain management

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atories, operative services, respiratory care,

environmental services and dietary services.

With the rollout of the supply replenishment

process to the entire hospital, Children’s was

able to repurpose more than 8,000 annual

hours to patient care, while eliminating costs

and time traveled.

In a major subsequent breakthrough beyond
delivery to the nursing units, the Toyota Pro-
duction System was extended to the patient

rooms. Beginning in April 2013, a rounding
cart began twice daily in-room replenish-

ment of the most common patient supplies

in a two-bin system, using cards tracking

the highest usage products. This bin system

enabled Children’s to reduce nurses’ search

travel time by 50 percent.

According to Beach, supplies were previ-

ously ordered and delivered on more than

15 pallets a night. Now, the hospital is on a
two-bin kanban system where supplies are
delivered in low unit of measure (LUM). As a
result, Children’s reduced its on-site inventory

from $1.5 million to less than $500,000, with

the remaining on-site inventory consisting

primarily of disaster supplies.

All departments’ supply management

systems were integrated to reduce staff-
ing required to manage supplies. This new

integrated delivery system also reduced travel
times, movement and inventories. Beach said
the hospital now has one group delivering on

a FedEx model.

The chaotic old delivery system, under which

a department would immediately request

an item as needed, has been replaced by a
planned delivery model, which has eliminated

85 percent of unplanned calls for materials,

and reduced nursing search and travel time

by more than 50 percent.

Through these changes, the supply chain

management team grew from managing

$6.3 million in distributed supplies in 2007
to $19.77 million in 2014 without adding

new staffing, at the same time maintaining

performance metrics and reducing travel and

warehouse space. One distributor, Medline,
holds most supplies, with a few items ordered
directly from manufacturers.

These supply management changes have
resulted in a savings of more than 80,000
clinical and supply chain hours annually. The

efficiencies that have been achieved bore full
fruit when Children’s opened its new building

in April 2014. This new facility has more than

300 beds, compared to 250 in the old one.
But because equipment and supplies occupy

far less space, the new building is smaller
in size.

After earning their degrees, the members
of the Tauber student team have launched
careers in the health care industry. Little is
now the Lean manufacturing leader for GE
Healthcare, Parker has become a health IT
business process improvement specialist for
KSH Solutions, Inc., and Goenawan is the
director of various limited partnerships in

Indonesia. Meanwhile, the Tauber Institute
added Mark J. Hayward, Administrator of the
Center for the Science of Healthcare Delivery
and Vice Chair of the Department of Facilities
and Support Services at the Mayo Clinic, to
its Industry Advisory Board.

To learn more about the Tauber Institute
for Global Operations, visit tauber.umich.edu
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