



National Orthotics and Prosthetics Company

Standardization Leads to a Better Customized Fit Clinicians, Customer Service & Manufacturing Work as One Team *A GBMP Client Case Study*

Boston Brace is the leading provider of pediatric orthotic and prosthetic products in the United States. Their life-changing products are used to treat scoliosis, infant cranial asymmetry and other orthopedic issues which, if left untreated, can impair heart and lung function and overall quality of life. According to the American Association of Neurological Surgeons (AANS), “Scoliosis affects an estimated 6 to 9 million people in the United States. Every year, scoliosis patients make more than 600,000 visits to private physician offices and an estimated 30,000 children are fitted with a brace.”

Boston Brace’s network of *National Orthotics and Prosthetics Company* (NOPCO) clinics are located across the country in world class medical facilities including Boston Children’s Hospital and Children’s Hospital of Philadelphia. The company, founded in 1970, is based in Avon, Massachusetts where 75 production and administrative employees support 19 NOPCO clinics and other select manufacturing and clinical partners.

Boston Brace started its Lean journey in 2005 with help from The Greater Boston Manufacturing Partnership (GBMP). At that time, Boston Brace introduced and implemented Lean Manufacturing concepts on its production floor. As a result, they reorganized 90% of the manufacturing facility, implemented a new software package, and made significant productivity gains throughout the organization. Most of those initial improvements have become standard for Boston Brace’s manufacturing operations. However, Boston Brace soon realized that while the training had been extremely effective on its production floor, few if any employees from other departments received Lean training or were expected to incorporate Continuous Improvement into their daily work.

In 2014 Boston Brace set out to fix this oversight and was awarded a Massachusetts Workforce Training Fund grant, administered by the Commonwealth Corporation, to extend its Lean initiative beyond the shop floor. In early 2015 Boston Brace began working with GBMP's CI Manager Bob Elliott to train its clinicians and customer service representatives on Lean principles and tools and to assist in its application across the entire organization.

After clinicians and CR reps participated in Lean classes and learned specific countermeasures to eliminate waste in their processes, cross functional teams set out to tackle a wide range of improvement projects. A project of importance was standardizing the layouts and uses of various forms. To begin, the team selected to pilot standardizing the form in its Ankle Foot Orthosis ("AFO") process.

NOPCO clinicians felt challenged by the concept of having a standard for something which they felt could not be standardized. As clinicians, they felt strongly that their work was more of an art form – each "AFO" is custom designed for a specific patient with a specific need. How in the world could that be standardized?

A cross-functional team meeting & report



According to GBMP Continuous Improvement Manager Bob Elliot:

“The NOPCO clinicians had to understand the need for a standardized process from the perspective of fellow team members from production and customer service. This helped them see that a basic guideline to follow, some key steps, could be the same regardless of the customization required of the product. If they could do this, all of the departments would benefit and Boston Brace would be able to provide a superior patient experience and brace to all of its customer.”

During one class the group listened to a conversation between Bruce Hamilton, President of GBMP, and Kevin J. McGuire MD, Chief, Orthopaedic Spine Surgery at BIDMC. Dr. McGuire shared the clinical viewpoint of how standardization brings people together. *“It’s a bottom up process not a top down process...the wealth is in understanding what each of us does because we often work in vacuums and silos and not in teams.”*

Bob concluded: “Having the team work together empowered Boston Brace employees – the process owners – to want to understand each department’s role in the AFO process, to learn what other departments need to make everyone’s job better, and most importantly to ensure the accuracy of the process from when a clinician first meets and measures a patient to the time the brace is completed.”

For the next few months the team met on a regular basis to define the process and identify what worked and what needed to be changed, eliminated or added. The form went through many iterations, and each time they piloted a revised form, the team got input from clinicians, CR reps and production employees so they could continue to refine both the form and the process.

The results were dramatic. The amount of vital information not provided to the plant after the initial consult was drastically reduced and the need for customer service to call clinicians to get missing details or data clarification has largely been eliminated. Missing information no longer results in mistakes during the manufacturing process! Judy Smith, a Customer Service representative from Boston Brace says,

“The improved brace-specific lower limb forms with clear standards has made identifying potential defects much easier for customer service. Questions and omissions jump right out at you and can be addressed prior to submission to production.”

In 2015 Return Authorizations were reduced by 64% simply because of the changes made to the forms. John Shimkus, a Certified Orthotist for one of the Nopco clinics says,

“The new forms and standards allow the clinicians to order lower limb devices more efficiently and receive a consistently higher quality product in return.”

There has also been a 31% reduction in product refunds resulting in a savings of more than \$3500 in the first year. One of the Lower Limb Fabrication team members added,

“Fabricating and finishing using the new forms, standards and guides provides better

flow through the shop. Forms are cleaner and standards are understood so we have fewer questions, fewer stoppages. We've also seen a big drop in the need for re-work."

The Boston Brace and NOPCO team know they are not done and continue to work on order forms for the Lower Limb Fabrication process. And now, new teams are being established to work on order forms for other products.

John Healey, VP of Operations at Boston Brace, had this to say about the new team-based learning and improvement processes:

"The real success of the team was that we opened clear, sustained lines of communication from the clinic, to customer service, to the production floor, and back to the clinic, creating a greater sense of teamwork throughout the entire lower limb product line."

About Boston Brace: Boston Brace specializes in Pediatric Orthotic products and services. Our mission is to be recognized as the leading provider of pediatric orthotic and prosthetic patient care and products in the United States; and to utilize that standing to substantially improve the quality of care for all orthotic and prosthetic services at [our network of clinics](#) located inside the top-rated Children's Hospitals in the country. If we treat each patient we see and each brace we fabricate for patients as if the patient is one of our own children, our business will thrive.

About GBMP: [GBMP](#) (The Greater Boston Manufacturing Partnership) is a not for profit offering customized Lean and Six Sigma training with a mission to increase global competitiveness and employment opportunities in the United States. GBMP is a licensed affiliate of The Shingo Institute with 4 certified instructors on staff. GBMP also produces the annual Northeast L.E.A.N. Conference which attracts more than 600 manufacturing professionals from around the country each autumn in New England, now in its 12th year. GBMP provides a membership community for Lean practitioners from manufacturing, healthcare, insurance and other industries and produces an award-winning library of Lean training materials comprised of more than 30 DVDs (available streaming by subscription at www.leanflix.org), games, manuals and workbooks,

including Toast Kaizen, the #1 selling Lean training video in the world. Learn more at www.gbmp.org

About The Commonwealth Corporation: Created by the Massachusetts Legislature in 1997, [The Commonwealth Corporation](#) is committed to ensuring that businesses have access to a pipeline of highly skilled workers and workers in Massachusetts have pathways to good jobs. Our mission is to strengthen the skills of the Massachusetts workforce by investing in innovative partnerships with industry, education and workforce organizations. We design and execute workforce programs in partnership with businesses, educators, and providers, support the development of skills training that connect to real job opportunities, so all can thrive in our dynamic economy.