

RTC GREAT LAKES DEVELOPS SAFETY BOOTS THAT PREVENT MUSCULOSKELETAL DISORDERS AND INJURIES

New Sailors begin their careers in the U. S. Navy at Recruit Training Center (RTC) Great Lakes, Illinois. The Navy issues them uniforms at the start of Basic Training, including safety footwear that the recruits will continue to wear after they graduate and serve onboard Navy ships.



Recruits are issued safety footwear at the start of Basic Training at Navy Recruit Training Center (RTC) Great Lakes, IL

Physical Therapist, Captain Kerry Thompson, became concerned about the number of foot and leg injuries that he was seeing among recruits. Thompson looked for a common source for the high rate of stress fractures and other overuse musculoskeletal injuries of the feet and legs that he saw among new Sailors.

to appear in the bar; eventually, the numerous small cracks combine to produce large cracks that finally break the bar into pieces. Overuse musculoskeletal injuries occur in a similar manner, from repeatedly stressing the same muscles, ligaments, and tendons without adequate rest between episodes.

A stress fracture is similar to what happens to an iron bar after constantly being bent and straightened out. Tiny cracks start

Captain Thompson, with the assistance of Industrial Hygiene Officer Lieutenant Commander Jean Carmona from the Naval Education & Training Command (CNET) parent command of RTC Great Lakes, concluded that there was a relationship between musculoskeletal injuries and the wearing of *boondocker*-style safety boots issued to the recruits. Mr. Ron Fry, who issues safety boots and other uniform items to new recruits, agreed. "The boots the recruits had been wearing were not designed for recruits who march 26 miles a week; they were designed for shipboard life."



Boots worn aboard ship must meet strict fire retardant and other safety standards

In response to Captain Thompson's and LCDR Carmona's observations of an apparent relationship between the *boondockers* and foot and leg injuries, the RTC Safety Department worked with civilian shoe manufacturers to develop a safety boot that would reduce the risk of leg and foot injuries while continuing to meet the Navy's safety requirements. RTC commissioned the manufacturer of a suitably flexible, shock absorbent, cushioned-soled *chukka* boot to develop a version of their boot that would satisfy the Navy safety footwear



Chukka-style boot changed the standard for Navy footwear.

for most wearer's feet and ankles. According to Lieutenant Commander Lanny Boswell, a medical researcher and sports medicine doctor, "This boot is more orthopedically correct, more compliant with the movement of the foot and ankle. It's one-third lighter, and 60 percent more shock absorbent. This is premium footwear for any Sailor."

Scientists are well aware that differences in bone structure and musculature between men and women translate into differences in the way their feet strike the ground. Therefore, women require footwear designed to accommodate those differences.

According to Captain Thompson, this gender difference accounts for the fact that, during recruit training, women used to experience higher rates of musculoskeletal injuries than men.

When the RTC-sponsored *chukka* safety boot was ready for testing on recruits,

requirements. LCDR Carmona and officials at Great Lakes also worked closely with the Navy Uniform Board and Navy safety experts to ensure that the new boot would meet the Navy's strict standards for fire retardant characteristics and other shipboard safety concerns.

Once the *chukka*-style boot was selected, it was subjected to extensive research and exhaustive tests that verified that the boots were more shock absorbent than the *boondockers*, and provided a better fit



Women require footwear designed to accommodate their bone structure and musculature.

CNET purchased 2,000 pairs of the new *chukka*-style safety boots. Captain Thompson then initiated a pilot study in which one division of women recruits, the Test Group, wore the *chukka* boots. Another division of women recruits continued to wear the *boondockers*; they served as the Control Group.



The Navy Uniform Board has approved the new safety boots for issue to Sailors throughout the Navy.

The Test Group wore the *chukka* boots every day to determine whether the boots' improved shock absorbing potential would reduce numbers of foot and leg injuries. Comparison of the Test Group with the Control Group showed that the *chukka* boot reduced the number of stress fractures and other overuse musculoskeletal injuries, and the Test Group reported pain in the knees and lower back less frequently. Commander Thompson reported in the analysis findings, "When compared to their sister division, there was a significant reduction in the number of injuries among the women who wore the *chukkas*. In addition to a reduction in stress fractures, there were also fewer foot problems, including fewer blisters."

RTC now issues the *chukka* safety boots to all new recruits. One Sailor was overheard to comment that his safety boots were "more comfortable than my tennis shoes!" That,

CAPT Thompson observed, was typical of the favorable comments from the pilot study test group.

LCDR Carmona realized the new boots being used at RTC for recruits had great potential as the standard issue boot for the entire Navy. She supported the preparation of a proposal, which resulted in the Navy Uniform Board's decision to approve the *chukkas* for issue to Sailors throughout the Navy. The *chukka*-style boot does more than reduce the risk of back injuries and orthopedic injuries throughout the wearer's Naval career. It is also heat, flame, water, and oil-resistant, is non-conductive to electricity, and is safe to wear in shipboard fire rooms, main machinery spaces, and in hot work areas on Navy ships.

Approval of the *chukka* changed the standard for Navy safety footwear. Now, all U.S. Navy Sailors are experiencing the benefits of *chukka* safety boots. They benefit from the reduced risks of foot and back injuries while continuing to be protected from injuries due to other duty-related mishaps.
