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# Outcomes of Toddler's Fractures after Implementation of Comprehensive Care Management Protocol with Controlled Ankle (CAM) Boots

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**Outcomes of Toddler's Fractures after Implementation of Comprehensive Care Management Protocol with Controlled Ankle (CAM) Boots**

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**Resident/Psychology Intern (≤ 1 month of dedicated research time)**
**Resident/Ph.D/post graduate (> 1 month of dedicated research time)**
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**Other authors/contributors involved in project:** Janet K. O'Rear BSN, Julia Leamon MSN, Olivia Pruss BS, McKenna C. Noe, BS, Micah K. Sinclair, MD

**IRB Number:** 00002257

**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**
Presenting trainee has made substantial contributions to data acquisition, analysis, and interpretation, as well as to formulation of this manuscript.

**Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words**

**Background:** Toddler's fractures (TF) are stable tibia fractures in children 1-4 years of age. Skin breakdown is a known complication associated with casting/splinting this population and has been a continued issue at our institution. Based on literature review and clinical evidence we implemented a new treatment algorithm for TF.

**Objectives/Goal:** The purpose of this study is to evaluate the outcomes of that new protocol with a particular focus on skin breakdown. We hypothesized that there would be a decrease in the percentage of patients with TF who develop skin breakdown complications following implementation of the CAM-boot policy for management of TF compared to before.

**Methods/Design:** Our protocol included CAM boots for immobilization, coaching ED and urgent care teams on proper CAM boot placement, parent handouts with an emphasis on frequent boot removal and skin checks, and standardized scheduling protocols. A retrospective chart review of 445 patients with TF between 2019-2023 was performed. This included 370 patients prior to implementation of the new protocol (pre-protocol) and 71 patients after protocol implementation (post-protocol). Patient demographics, immobilization method, and skin breakdown complications

were recorded. Results were analyzed with SPSS, using student's t-test for continuous variables and Fisher's exact test for categorical variables.

**Results:** There was no difference in patient age or sex between the 2 groups. Significantly more patients were treated in CAM boots in the post-protocol group as compared to the pre-protocol group, 66/71 (93%) vs. 116/370 (32.4%), p-value=0.0001. In the pre-protocol group, 61/370 (16.5%) had skin breakdown, the majority of those had been treated in a LLC (85.2%). In the post-protocol group, 7/71 (9.9%) had skin breakdown. This was not statistically different as compared to the pre-protocol group (p-value=0.208). However, in the post-protocol group, all patients with skin breakdown originated from outside facilities and all wounds were present at the initial visit to our institution. When comparing wounds that developed during our treatment, the post-protocol group had significantly less skin breakdown as compared to the pre-protocol group, 0/7 (0%) vs. 27/61 (44.3%), p-value=0.037.

**Conclusions:** A care management protocol using CAM boots for TF was successfully implemented at our institution and has decreased skin breakdown complications for our internally managed patients. We continue to see skin breakdown in patients whose care originated at outside facilities unfamiliar with the protocol. A treatment protocol for TF has helped decrease skin complications rates at our institution. This is an ongoing project and future efforts will focus on early clinic follow up to assess properly fitting CAM boots, provide parent education, expand the protocol to referring institutions, and reducing healthcare cost and radiation by limiting unnecessary clinic visits and x-rays.