Escalator Injuries in the Pediatric Population: A Case Study
Andrea Cirilli, BSN, RN; Laura Schera, BSN, RN
The Children’s Hospital of Philadelphia, Philadelphia, PA

Introduction
A study, published in the Journal of Pediatric Orthopedics in July/August 2010, reviewed the charts of 17 children with escalator related foot injuries in one hospital within a two year time span. In this study, thirteen children were wearing rubber clogs. Nine of these 13 children sustained severe foot injuries and one child had an unsalvageable traumatic amputation. The injuries included a traumatic amputation of the great toe, and others with fractures, lacerations and cuts.

Case Presentation
J.R., a seven year-old, Spanish-speaking male, while at the mall with his father, going down the escalator his right Croc and foot got caught in the step and the escalator that did not stop. He presented on December 14, 2014 to The Children’s Hospital of Philadelphia’s Emergency Department via air lift with a right foot traumatic amputation. He was brought emergently to the operating room and was admitted under the Trauma Service.

Operative Course
- 12/14 (Orthopedics): Incision and Debridement (I&D), removal of muscle, fat, skin and bone. Amputation through metatarsophalangeal joints 1, 2, 3, 4, 5 with Vacuum Assisted Closure (VAC) placement.
- 12/16 (Orthopedics): I&D with VAC change
- 12/19 (Orthopedics): I&D with VAC change
- 12/21 (Orthopedics): I&D with VAC change
- 12/23 (Orthopedics): Wound debridement
- 12/23 (Plastic Surgery): Right anterolateral thigh fasciocutaneous microvascular free flap, reconstruction of distal forefoot, saphenous vein interposition graft, Split Thickness Skin Graft (STSG) (80sq cm) to dorsum of foot
- 1/20 (Plastic Surgery): Returned with a necrotic area, for a STSG right foot flap (50sq cm)

Complications
- While in PICU, loss of pulse via Doppler
- Provided bear hugger
- Increased intravenous fluids, in which pulse returned
- During hospitalization, developed Rhinovirus
- Contact and Droplet precautions until symptoms resolved
- Developed necrotic tissue at the flap site
- Required a return to the operating room for I&D

Post-Operative Nursing Care:
Surgical/Trauma Unit
- Post the initial and subsequent I&Ds with VAC changes
  - Pain Management: Patient Controlled Analgesia (PCA), Oral Pain Medications
  - Hydration: Intravenous Fluids, Oral Hydration
  - Diet: Advance as tolerated
  - Antibiotics: Cefazolin and Gentamycin
  - VAC monitoring
  - Neurovascular and Compartment checks every four hours
  - Physical Therapy and Occupational Therapy for gait training
  - Interpreters for updates and plan of care

Post-Operative Nursing Care:
Pediatric Intensive Care Unit (PICU)
- Post-operative from a vein and skin graft with Plastic Surgery
  - Perfusion: Continuous Heparin infusion, Aspirin
  - Doppler checks every hour
  - Pain Management: Intravenous pain medication, Oral pain medication
  - Diet: Advance as tolerated
  - Antibiotics: Cefazolin and Gentamycin
  - Labs: Complete Blood Count
  - Activity: Bedrest
  - Interpreters for updates and plan of care

Outcome
J.R. discharged on January 2, 2015 ambulating with a walker and will receive outpatient physical therapy.

Discussion
Escalator-related traumatic amputations result in severe tissue-mangling injuries that require multiple trips to the operating room and Interdisciplinary collaboration including but not limited to: Pain Team, Social Work, Case Management, Dietary, and Child Life. The US Consumer Product Safety Commission has published a general interest in safety brochure on escalator injuries; however it has not reconsidered mandatory standards (accessed November 11, 2016). The brochure includes recommendations including:
- Stand facing forward in the center of the step
- Step on and off carefully
- Do not touch sides below handrail
- Avoid the sides of the steps where shoe and loose clothing entrapment can occur
- Supervise children at all times
- Do not let children sit on the steps

References