Case C (Figure 3): PedCat CBCT sagittal plane reconstruction of navicular tuberosity fracture.

Clinical Relevance of the PedCat Study: Rather than being treated with physical therapy for a symptomatic accessory navicular, the patient was immobilized to facilitate bony healing.

Section 2: Foot Fracture Non-Unions

Case Study D: Styloid Process Fracture Non-Union

Clinical History: A 75 year old female, with a chronic pain syndrome (CRPS), presents complaining of an inversion injury to her left foot. Based upon the clinical exam and x-rays she was diagnosed with a left styloid process avulsion fracture. She was treated in an orthopedic walker boot for 3 months. As she had continued pain a CBCT study was performed documenting a styloid process fracture without bony healing. She was diagnosed with a fracture non-union. She was then treated with a bone growth stimulator and bony union was documented via CBCT.

X-Ray Findings: (Figures 1 & 2) The initial x-rays documented the styloid process avulsion fracture. Later x-rays could not distinguish between a partial union versus a non-union.
Case D (Figure 1): Medial oblique radiographs of styloid process fracture non-union

Case D (Figure 2): AP radiograph of styloid process fracture non-union.
CBCT Findings: (Figures 3 & 4) The reconstructed views in the transverse and sagittal planes demonstrate a displaced styloid process fracture that had not healed in 3 months confirming the diagnosis of a non-union. The fracture gap is most pronounced along the plantar margin with bony contact, but not bony bridging dorsally.

Case D (Figure 3): PedCat CBCT sagittal plane reconstruction of styloid process fracture non-union.

Case D (Figure 4): PedCat CBCT transverse plane reconstruction of styloid process fracture non-union.
Clinical Relevance of PedCat Study: The diagnosis of non-union was made thus directing definitive treatment: immobilization and the use of a bone growth stimulator. Bony union was documented 8 weeks later.

Case Study E: First Metatarsal Head Osteotomy Fracture Non-Union

Clinical History: R.Z. a 52 year old female, 6 months status post bunionectomy with metatarsal head osteotomy, presents complaining of persistent surgical pain.

X-Ray Findings: (Figures 1 & 2) AP and lateral radiographs demonstrate evidence of a prior first metatarsal head osteotomy. Lateral displacement of the first metatarsal head is noted on the AP view. There is a small cortical defect in the dorsal margin of the first metatarsal head, best seen on the lateral view. Thus the differential diagnosis includes partial union vs. non-union.

Case E (Figure 1): AP radiograph of suspected metatarsal head osteotomy non-union.
Case E (Figure 2): Lateral radiograph of suspected metatarsal head osteotomy non-union.

PedCat CBCT Findings: (Figures 3, 4 & 5) The 2-dimensional reconstruction views in the sagittal and transverse plane demonstrate a persistent fracture / osteotomy line within the first metatarsal head consistent with the diagnosis of fracture non-union. This is confirmed with the 3-dimensional reconstruction views.

Case E (Figure 3): PedCat CBCT transverse plane reconstruction of first metatarsal head osteotomy non-union.
Case E (Figure 4): PedCat CBCT sagittal plane reconstruction of first metatarsal head osteotomy non-union.

Clinical Relevance of the PedCat Study: The accurate diagnosis of non-union was made allowing for definitive care: Immobilization and use of a bone growth stimulator.