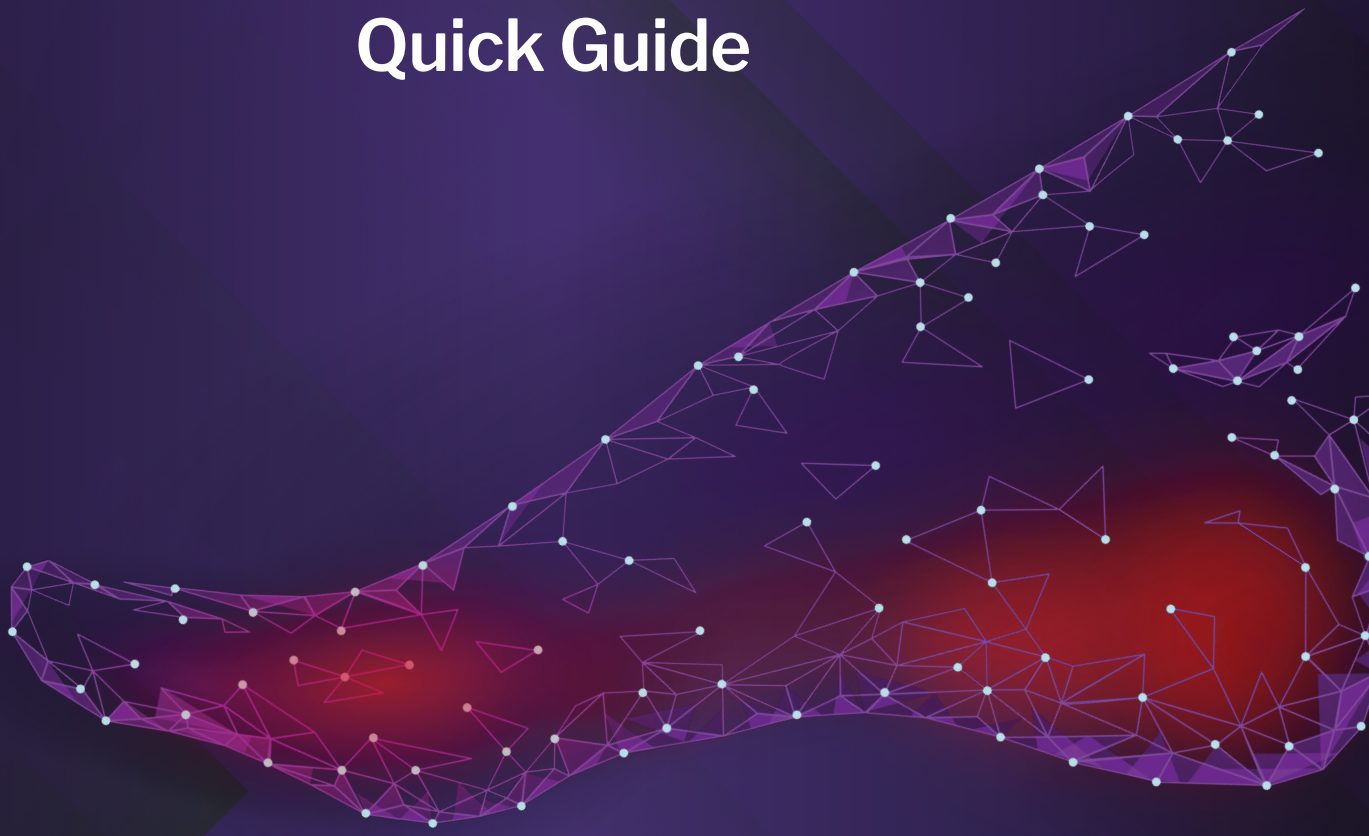
SMART28® PCFD

Quick Guide



Paragon 28®

a ZIMMER BIOMET company

INTRODUCTION

SMART28® PCFD is a cloud-based application to support diagnosis and surgical planning of Progressive Collapsing Foot Deformity. From a single weight-bearing CT series, the software automatically segments the foot and ankle, builds a three-dimensional model, and analyzes the shape of the deformity. It then estimates post-operative alignment using virtual osteotomies and suggests a combination of Medial Displacement Calcaneal Osteotomy (MDCO), Lateral Column Lengthening (LCL), and Cotton Osteotomy to correct the patient's deformity. It is the world's first AI-enabled pre-operative planning tool for progressive collapsing foot deformity, creating a personalized surgical plan in 3D. Conventional measurements do not always capture peritalar subluxation, which has been shown to affect patient-reported outcomes.[1]

SMART28® PCFD automates 3D measurements from WBCT and adds peritalar distance and coverage maps for the anterior, middle, and posterior facets and the sinus tarsi. The software works as a dosing engine, providing a triple osteotomy plan that addresses the deformity. Planning runs in a browser through the SMART28® Case Management Portal, a single access point for use across SMART28® PCFD, SMART Bun-Yo-Matic℠, MAVEN® Total Ankle, Additive Orthopaedics® Customs with no software installation required.

System Overview

The system is built around automated three dimensional analysis, patient specific suggested correction, and surgeon control. Segmentation and shape analysis are performed automatically from the patient's imaging, producing the measurements that define the deformity across all three planes.

Bone movements and measurement changes are modeled on MDCO displacement and on LCL and Cotton graft or wedge geometry, so the estimated correction is tied directly to the sizes the surgeon will implant.

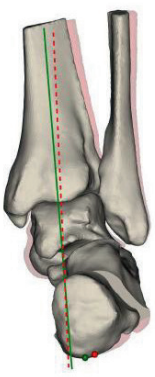
The software proposes the combination of these procedures that bring estimated post-operative alignment closest to reference population values. Software Suggested, Assisted, and Manual modes allow the surgeon to accept the suggested correction plan, adjust one operation while the engine re-optimizes the others, or define all three magnitudes directly.

Each case concludes in a reviewable, downloadable case report documenting the pre-operative state, the estimated correction, and the selected operation combination.

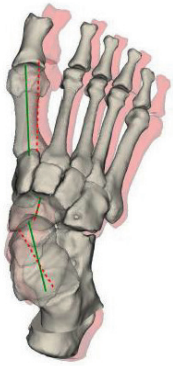
Preoperative Measurements

SMART28® PCFD automatically segments and conducts shape analysis of the weight-bearing CT images to show the preoperative and postoperative states in the posterior, axial, and sagittal views. The system shows key PCFD measurements, including the Hindfoot Moment Arm, Talonavicular Angle, and Meary's Angle in both the axial and sagittal planes. Peritalar Distances and angle are shown for analysis of the Subtalar facets within the application.

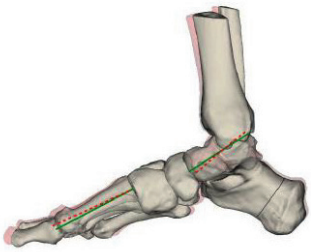
POSTERIOR



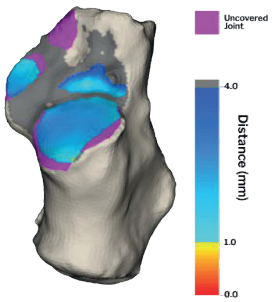
AXIAL



SAGITTAL



PERITALAR



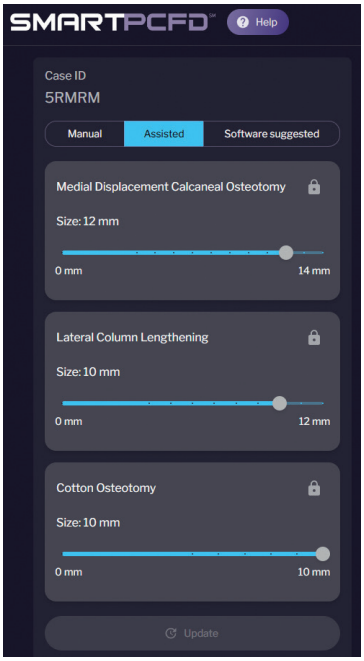
1 de Cesar Netto C, Barbachan Mansur NS, Lalevee M, et al. Effect of peritalar subluxation correction for progressive collapsing foot deformity on patient-reported outcomes. Foot Ankle Int. 2023;44(11):1128-1141. doi:10.1177/10711007231192479

SYSTEM FEATURES

Software Modes

The initial plan is generated automatically and displayed with the proposed combination of surgical operations, 3D visualizations, pre-op values, and target values. It automatically identifies the combination of corrective procedures estimated to bring the post-operative foot alignment closest to the predefined reference values. There are three separate modes that the surgeon can choose between, including the initial software-suggested mode. Alternatively, the surgeon can use Assisted Mode or Manual Mode to fine-tune or alter the operative plan.





Software Suggested Mode

The initial plan is generated automatically and displayed with the proposed combination of surgical operations, 3D visualizations, pre-op values, and target values. All three procedures are included, with small combined procedures prioritized over individual large ones.

Assisted Mode

The surgeon can unlock a single operation, set its magnitude on the slider, and the engine re-optimizes the remaining two so the combination brings estimated post-operative alignment closest to the pre-defined reference values.

Manual Mode

MDCO, LCL, and Cotton magnitudes can be set independently. Measurements and 3D visualizations update on demand. A notification appears if the MDCO magnitude would displace the calcaneus beyond half the bone's total width.

PLANNING OUTPUTS

Case Report

Every approved case produces a downloadable PDF documenting the preoperative state, peritalar distances and angle, the estimated postoperative state, and the selected operation combination.

- Correction magnitude for MDCO, and implant selection for LCL and Cotton
- Fixation hardware listing for each osteotomy
- Whether the plan was software suggested or user-adjusted
- Shareable with the patient to assist in preoperative conversation



GETTING STARTED

Case Workflow

1. Add a patient in the SMART28 Portal
2. Upload the weight bearing CT series (DICOM)
3. Plan the case in the preferred mode
4. Review, approve, and download

Associated Implants and Grafts

MDCO Fixation

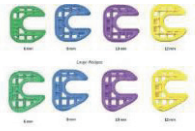
Gorilla® Calc Slide Plate
Monster® Hindfoot Screws

LCL Fixation

PRESERVE™ Evans Grafts · Titan 3-D™ Evans Wedges
Gorilla® HEvans® Plate · Gorilla® BOW & ARROW® Plates
Monster® Screws



PRESERVE™ Evans Grafts



Titan 3-D™ Evans Wedges

Cotton Fixation

PRESERVE™ Cotton Wedge
Monster® Screws
Titan 3-D™ Cotton Wedges



Titan 3-D™ Cotton Wedges



PRESERVE™ Cotton Grafts

Learn More

Instructions for Use are available on the SMART28® Case Management Portal Resources page.
To contact support, use the Contact Support option under the profile icon in the portal or on the software Help page, or email **smart28.support@paragon28.com**.

NOTES

NOTES

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