

Software User Manual

WIN-POD, WIN-TRACK, WIN-TRACK MINI
POWERTRACK



medicapteurs
PODOLOGIE, POSTUROLOGIE ET RÉÉDUCATION

Foreword

We appreciate your trust in the MEDICAPTEURS Company and we would like to thank you for choosing our product.

Our software has been designed to be user friendly and only requires basic computer skills. The friendliness of the software however, does not replace **the necessity of reading this manual** to guide you step by step through the procedures to properly use the software, and it will also help you save valuable time.

In addition to this manual, you will find the **Installation Manual** for the platform and the software on your Medicapteurs USB key.

Enjoy your reading and welcome to the privileged MEDICAPTEURS users' Club.

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Warranty

For a period ending on the date of the twelfth month anniversary of the date of delivery (such period being the "Warranty Period"), the equipment, used under normal operating conditions and not subject to misuse or abuse, shall be free from defects in material, workmanship and design and shall operate and conform to the performance capabilities, specifications, functions and other descriptions and standards as described in the specifications.

During the Warranty Period and subject to the exclusions below, Manufacturer at its option and expense, shall promptly repair or replace equipment that does not conform to the warranty. The procedure for effecting warranty replacement or repair will be as specified by Manufacturer. Purchaser shall ship Equipment for warranty replacement or repair to Manufacturer at Purchaser's expense, and Manufacturer shall ship repaired or replaced equipment to Purchaser at Manufacturer's expense.

For proper shipping of the equipment to MEDICAPTEURS for repair or maintenance, Purchaser shall include complete sender's information, the equipment serial number and a brief description of the problem.

Purchaser shall use preferably the original shipping package. If it is not available, Purchaser shall contact a professional shipping service company which will assist Purchaser with proper packaging instructions and materiel.

Limitations of warranty and disclaimer

The Software:

The Software is and shall remain the exclusive property of Manufacturer. This license confers no title or ownership in the Software and is not a sale of any rights in the Software. No license other than that specifically stated herein is granted to Purchaser, and Purchaser shall have neither right to sublicense the Software nor any right under any patent, trademark, copyright, trade secret or other intellectual property of Manufacturer other than that granted by this Agreement.

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Purchaser shall not make any modifications to the Software or remove any proprietary, regulatory or safety notices of Manufacturer in or on the Software. Purchaser further agrees not to reverse engineer, decompile or otherwise reverse assemble any portion of the software or create derivative works based upon the Software.

This Software Agreement does not grant Purchaser any rights in connection with any trademarks or service marks of Product.

Manufacturer warrants to purchaser that, in case of any software it has identified at its own property, the software will substantially conform to the applicable Manufacturer's specifications in the date of installation and for a period that is consistent with the warranty offered herein. Manufacturer's sole obligation under this agreement is limited to responding to purchaser's contact and to using commercially reasonable efforts to correct reported problems by supplying purchaser with a corrected version of the Software.

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Disclaimer:

Manufacturer does not warrant that operation of its Software will be uninterrupted or error free, or that any defects in the Software are correctable or will be corrected; or that functions contained in the Software will operate in the combinations which may be selected for use by purchaser to meet Purchaser's requirements. Manufacturer's warranty and seller's obligations will be void if the Software is modified without the prior written consent of Manufacturer.

Except for the express limited Software warranty for the Software, Manufacturer and seller expressly disclaim and exclude all other warranties, whether express, implied in law or otherwise to the fullest extent permitted by law, and the above limited Software warranty is in lieu of all obligations and liabilities on the part of the Manufacturer for damages arising out of or in connection with the Software, including without limitation any warranty of merchantability, satisfactory quality or fitness for a particular purpose.

Exclusions: Seller and Manufacturer shall have no obligations with respect to any defects, damage, or non-conformances of Equipment that result from: improper installation, operation or maintenance; unauthorized repair; tampering; any use of the Equipment not in conformance with the relevant Equipment specifications or from accidents, or "acts of God"; or other such occurrences after delivery. If any Equipment returned by Purchaser for repair or replacement is not defective or nonconforming or contains a defect or nonconformance caused by a factor outside the scope of Manufacturer's warranty, Manufacturer shall bill Purchaser at Manufacturer's normal service rate for services performed with respect to such defective returned Equipment or for "no fault found" with respect to returned Equipment which is not defective.

LIMITATION ON WARRANTY:

MANUFACTURER AND SELLER MAKE NO WARRANTIES REGARDING THE EQUIPMENT TO BE PROVIDED HEREUNDER OTHER THAN THE EXPRESS WARRANTIES IN THIS SECTION AND THERE SHALL BE NO IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. THE SOLE REMEDIES OF

PURCHASER FOR ANY BREACH OF WARRANTY ARE THE REMEDIES SET FORTH IN THIS SECTION. MANUFACTURER AND SELLER SPECIFICALLY DISCLAIMS ANY AND ALL WARRANTIES TO CUSTOMERS OF PURCHASER.

Limitation of Liability: In no event shall Manufacturer or its Affiliates, Seller or suppliers be liable for indirect, special, incidental, consequential, punitive or other damages (including lost revenue, lost profit, lost data, downtime costs,) arising out of the use, inability to use, or the result of the use of the Equipment whether based on warranty, breach of warranty, contract, tort, or other legal theory, and whether or not advised of the possibility of such damages. In no event shall Manufacturer or its Affiliates, Seller or suppliers be liable to Purchaser for any damages, however based, in excess of the amount paid by the Purchaser to Seller for the Equipment.

Historical background

The first recording of plantar support was performed in 1880 through the work of MAREY and DEMENY.

As early as 1947, SCHWARTZ used piezo-electric sensors positioned under the plantar surface of the feet to perform a dynamic gait analysis.

In 1962, CARLSON and TAILLARD further the studies on dynamic analysis.

In 1966, significant studies were conducted using the electro podography method established by INSERM research institute in Montpellier, France. It studied the static and dynamic behavior of plantar support with sensors/insoles and a dynamometric mat.

In 1983, the studies performed by Professor RABISCHONG led to the development of sensitive insoles using « artificial skin » technology (Registered by ANVAR/CNRS).

Simultaneously, Mr. CLOT's and Mr. ESTEVE's studies from the research labs of the LAAS/CNRS in Toulouse, France resulted in the design of an **Electronic Podometer**: a Platform for the Analysis of Static and Dynamic Plantar Supports.

In **1985**, the company MIDI-CAPTEURS manufactured and commercialized the **Electronic Podometer PEL 38**.

PEL 38 became the reference not only for the quality level of the analysis results but also for the design of the software and positioned MIDI-CAPTEURS as the European leader in the field of Electronic Podometers.

The **WIN-POD** system was born in 2003, using the latest calibrated sensors' technology for continuously improving performance.

In **2004**, MEDICAPTEURS launched the **FUSYO platform**, and became the **only manufacturer of a system integrating an electronic podometer into a posturology platform built according to APE specifications**.

With the introduction of **WIN-TRACK** in 2009, MEDICAPTEURS strengthened its leadership position in the design and manufacturing of podiatry, posturology, and biomechanical analysis platforms, serving more than 5000 customers and numerous renowned distributors, resulting in a constant progression in the global market.

IMPORTANT NOTICE


Your software integrates a patient database (**patient files**) which contains private health information related to the patients and their specific measurements.

In order to avoid losing the studies performed with your software, it is **necessary to perform a BACKUP to save the patient database on a regular basis**; in fact any technical problem on your computer may affect and destroy such valuable data.

We highly recommend a minimum of one backup on a weekly basis on an external drive, CD RW, etc. (see page 93).

Software Navigation

Start and exit software

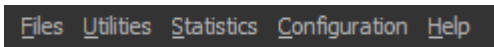
- ✓ Launch the software by double clicking on the following icon 
- ✓ Exit with the « Exit » button : click on the cross located in the upper right corner of the screen. And confirm your action by clicking on « **Ok** ».
- ✓ Exit with the « File » menu : click on « **File** » menu, select « **Quit** ». And confirm by clicking on « **Ok** ».

Title Bar



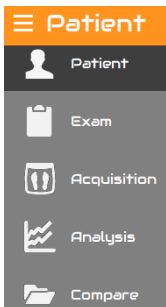
It includes the name of the software, the patient's last name and first name, the exam date and time of the recording.


Menu Bar



It contains the menu: **Files – Utilities - Statistics - Configuration - Help.**

Main Menu



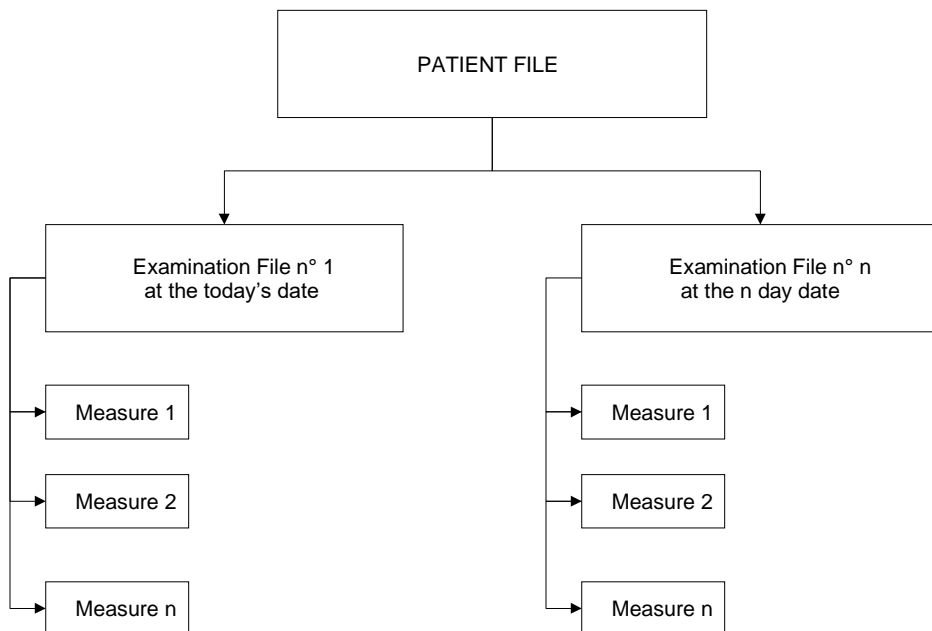
It allows access to all the phases of a podiatry assessment. The typical process is done by clicking on the tabs from the left to the right. You can hide this menu in order to take full advantage of the width of your screen, by clicking on the symbol  or simply hide the menu titles by right-clicking on the menu and selecting "Hide the titles".

Tool Bar



It includes the icons for quick access to the software functions. Several tool bars are available according to the displayed screens.

Visit Flow Chart



An assessment includes the following phases:

- 1) All the data from the **Patient File** including the patient's personal information and measurements.
- 2) All information from the **Exam File** related to the type of exam and patient's pathology.
- 3) Selecting the type of **Measurements** to be performed: static, dynamic or postural measurements. More than one measure can be done through one exam.
- 4) Recording the selected measurements on the hard disc through **Acquisition**.
- 5) **Analysis** of the measurements.

MENU BAR

"Files" Menu

This menu can be used for creating or changing pre-established lists which can be opened when completing the patient file and the exam file.

Available Lists


- Correspondents
- Clinical exam
- Complaints
- Professions

Adding Data to the List

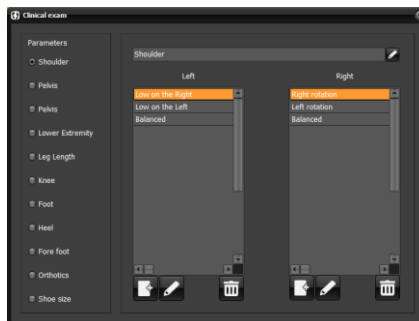
For the above mentioned lists, perform the following operations:

- ✓ Click on .
- ✓ Insert the text.
- ✓ Click on « **Ok** ».

Deleting Data from the List

- ✓ Click on the item to erase.
- ✓ Select .
- ✓ Confirm by clicking on « **Ok** ».

Special case: clinical exam



For the parameters of the clinical exam, you can modify each list as written above but also the name of the parameter. So you can entirely personalize the clinical exam.

MENU BAR

"Utilities" Menu

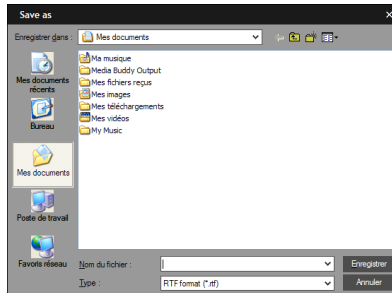
Exporting and importing exams

Exams can be imported or exported between software users.
Click on the option you selected and follow instructions.

Mass Mailing

The « Mass Mailing » function allows database selection according to specific categories

- By exam date
 - By complaint
 - By correspondent
- ✓ Choose your type of selection by clicking on exam date or a time range of exam dates.
- ✓ Click on « **Ok** » and the following window will open:




- ✓ Save your data as a text document.


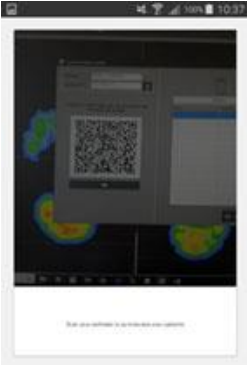
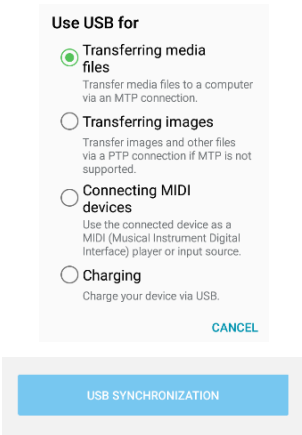

To open the selected listing in a table format:

- ✓ Open a table (Excel for example).
- ✓ Load the table in a text format ".txt".
The lines and columns will be automatically created in your mail message.

MENU BAR

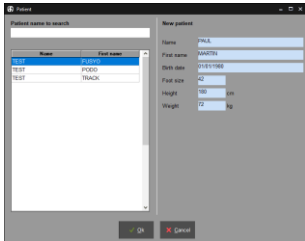
Mobile synchronization

The "Mobile synchronization" function is accessible from the Utilities menu or via the shortcut  on the right on the colored bar.

 <p>Uploading measurements on the PC</p>	<p>Accessible from the Patients screen of PodoCapture.</p>
<p>Uploading by wifi</p> 	<p>On the PC:</p> <ol style="list-style-type: none"> 1) Connect to a wifi network (box, etc.) 2) Open the software, go to the menu "Utility > Mobile Synchronization". 3) Check that the "Network" and "IP Address" fields are correctly filled in. <p>On the mobile:</p> <ol style="list-style-type: none"> 1) Connect to the same wifi network. 2) Scan the QR Code displayed on the PC.
<p>Uploading by usb (android)</p> 	<p>On the mobile:</p> <ol style="list-style-type: none"> 1) Connect the mobile to usb on the PC. 2) Switch the mobile to "Transfer media files" mode. 3) Click the "USB Synchronization" button. <p>On the PC:</p> <ol style="list-style-type: none"> 1) Open the software, go to the menu "Utility > Mobile Synchronization". 2) Click on the button  and look for the file Synch.json on the mobile in the folder "Download / Podocapture" or "Download / Podocapture".

MENU BAR

Synchronization on the PC



On the PC, once the uploading is finished (by wifi or usb), in the "Mobile synchronization" window:

1) You can double-click on each loaded patient if there is an assignment error to open the patient file and correct mis-assignments. For a new patient, you can complete the fields Size, Height and Weight if you have not done it in PodoCapture.

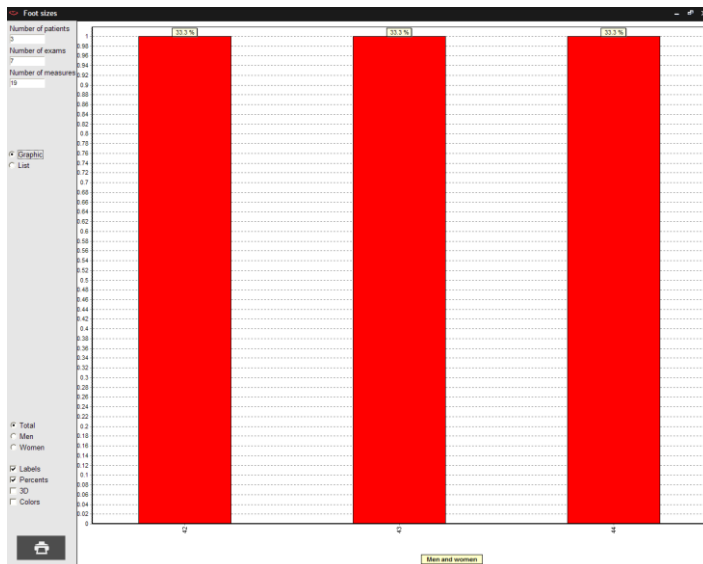
2) When everything is correct, click on "Synchronize".

3) Once synchronization is complete, this screen closes automatically and you can use your software as usual.

"Statistics" Menu

This menu allows the user to graph or list data by pathologies, practitioners, users, foot size, professions, and by gender.

Statistics on foot sizes



MENU BAR

"Configuration" Menu

Parameters



The Parameters window is accessible from the Configuration menu or via the shortcut on the right on the colored bar. It includes several tabs:

- The "**General**" tab allows to modify the following parameters:
 - **Expert mode**: Allows you to configure the screens to be displayed in the software. Disabling Expert mode simplifies the software (see page 20).
 - **Software Standby Mode**: Allows you to set a timer for the software to go on standby mode. The password is required to access the software when leaving the standby mode.
 - **Print preview**: Activated or not.
 - **Activation of Links with External Software**: Allows you to share patient data and recordings between this software and other software (example: RM informatics).
 - **Pressure unit**: Allows you to choose between Kpa, N/cm² and g/cm². After completing your selection, the message « Modifications will take effect the next time you start the application » appears. Exit the software and re-open it for your selections to be activated.
 - **Rectified dynamic acquisition**: Allows you to automatically rectify a dynamic measure at the end of an acquisition.
 - **Statics average**: Allows you to create a single static image using a static acquisition's measures, during a defined length of time (default: 5 secs).
 - **Display foot type**: Displays or not the foot type of a static analysis (see page 45).
 - **Potential risk**: Used to define the range from which it is considered that the value of the impulse of a dynamic acquisition becomes critical (by default 80% of the maximum value, see page 57).
 - **Resolution**: Allows you to modify the cartography's type of visualization.
 - **Phases of Gait**: Personalized norms of the three phases of the gait cycle (see page 61): you need to enter the relative timing of each phase of the cycle (in %) Heel Strike, Plantar, and Toe Off (by default 20, 60 et 20%).

MENU BAR

- **"Data Base"** tab
 - **Users:** When more than one person uses the software, the database can be filtered according to the end user (practitioner, clinic, assistant, etc.) Select the "Filter by user" icon and then select one particular user; the software will only access the selected user's database.
 - **Saving :** Allows to establish database backup folder and saving frequency (based on the number of times the user's has used the software).
- **"Plate"** tab is reserved for hardware maintenance.
- **"Colors"** tab is used to redefine the screen and printing colors used in the software.

To change a color, click on it. A color palette appears on screen. Click on the desired color then validate.
Note: Selecting « Default » will reset all colors to the software original colors.
- **"Graphs"** tab allows establishing preferences and parameters for visualizing graphs.

Medical office

Enter your office contact information and logo to be displayed at the top of printed documents.

Please perform this procedure when using the software for the first time.

Access Rights

The Software Administrator is the only person allowed to access this function. This function allows the administrator to set up other practitioners/users and their respective passwords.



More than one user can work on the same system (clinic setting). This function needs to be performed when using the software for the first time or when changes in users are necessary.

Language

Select the language you want. The message « Modifications will take effect the next time you start the application » appears. Exit the software and re-open it for your language to be activated.

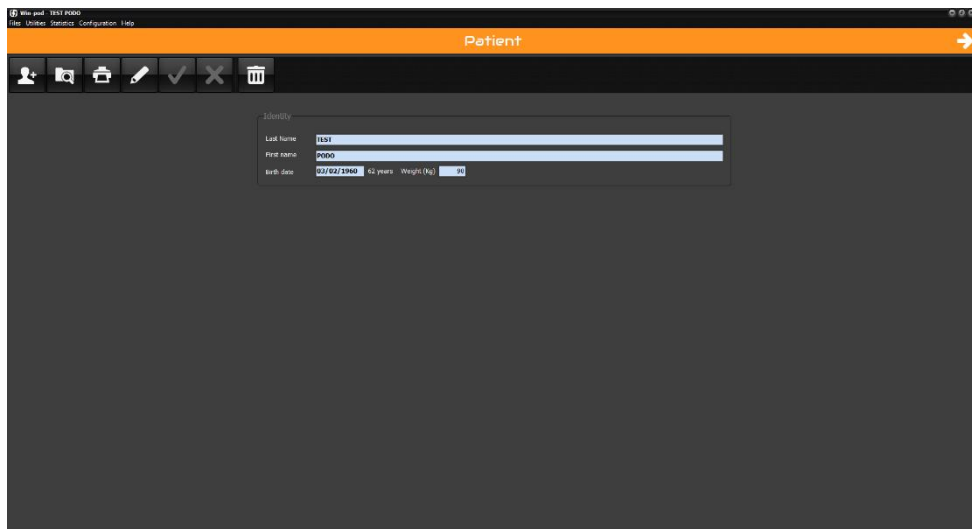
EASY MODE

It is possible to simplify the software to its essential functions in order to take it in hand more quickly. To do this, you must deactivate the "Expert mode" option in the *Configuration > Parameters > General* menu. The software is then reduced to 3 consecutive screens. We

go from one to the other using the arrows  and  located at the ends of the colored bar.

It is then possible to return to the full software at any time by reactivating the "Expert Mode". You will find all the patient or acquisition files made in easy mode.

Screen 1 : Patient



Win and TEST P000
File Utilities Statistics Configuration Help

Patient

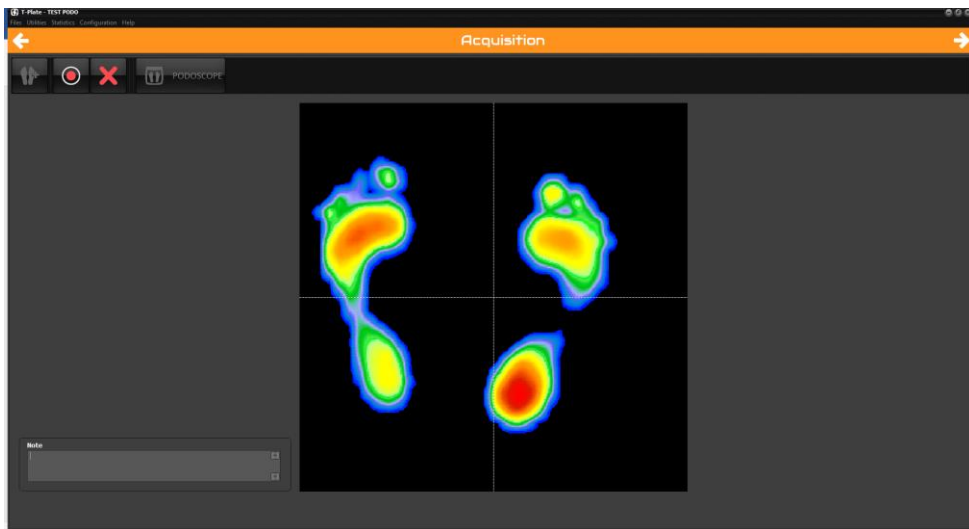
Identity

Last name	TEST			
First name	P000			
Birth date	02/02/1960	62 years	Weight (kg)	80

In the easy mode, this screen only contains the mandatory information for a patient file. See page 23 for the operation of the Patient file.

EASY MODE

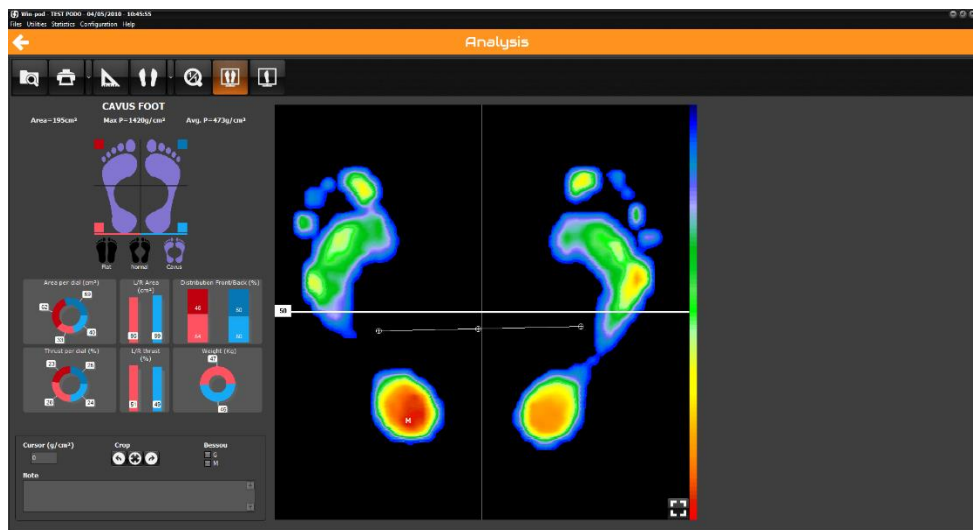
Screen 2 : Acquisition





In the easy mode, by clicking on the button  to make a new measurement, you launch a protocol which automatically links a static acquisition (see page 35) then a multiple dynamic acquisition (see page 38).

EASY MODE

Screen 3 : Analysis

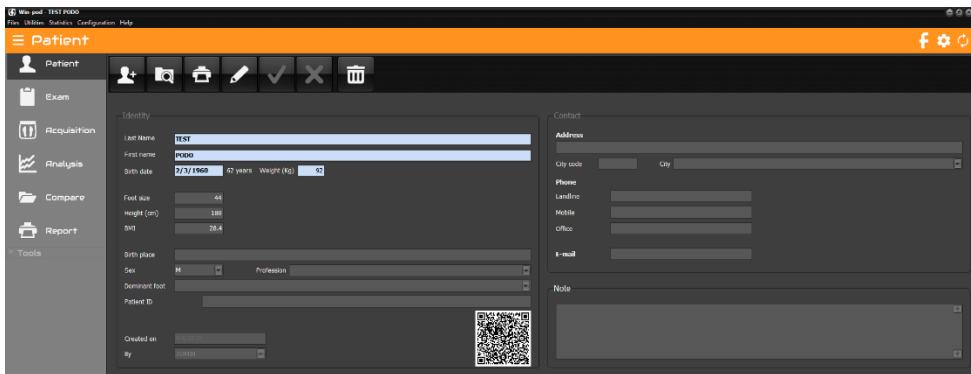


The Analysis screen allows you to analyze the 2 static and dynamic measurements made previously and to easily switch from one to the other using the button  to display the static and  to display the dynamic.

See page 42 for detailed description of static analysis
See page 53 for detailed description of Win-pod dynamic analysis or page 70 for Win-track analysis.

Caution: Posturological acquisition is only possible with Expert mode.

PATIENT



Tool Bar



New: Creating a new patient file.



Search: Search the database for an existing patient file.



Print a patient file.



Modify: Modify an existing patient file.



Validate.





Cancel.




Permanently delete a patient file and all measurements.

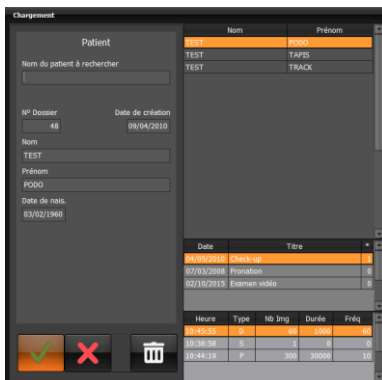
PATIENT

Creating a new patient file

- ✓ Click on .
- ✓ Enter patient data
Mandatory information fields will appear in blue: Name, First Name, Birth Date and Weight.
- ✓ Use pre-defined list (see « Files » menu) for the fields where a down arrow key is present ▼ “Gender” and “Profession”.
- ✓ Once the patient file is completed, click on .

Searching for an existing patient file

- ✓ Click on  to access the patient list:




N° Dossier	Date de création
48	09/04/2019

Nom	Prénom
TEST	TRUCK



Date	Titre
04/05/2019	Check-up
07/03/2018	Promotion
02/10/2015	Examen vidéo

Heure	Type	Nb Ing	Durée	Frdq
18:45:55	D	60	1000	60
18:36:49	F	12	0	9
18:44:19	F	300	30000	10

- ✓ Type the first letters of the name in the field "Patient name to search".
- ✓ Click on  or double-click directly on the patient's name.

PATIENT


Modifying an existing patient file

- ✓ Click on .
- ✓ Modify the relevant fields.
- ✓ Click on  to validate changes.

Synchronization to PodoCapture



The QRCode present on the patient file allows the patient to be imported into the PodoCapture database without having to re-enter their information. You can enlarge it by clicking on it.

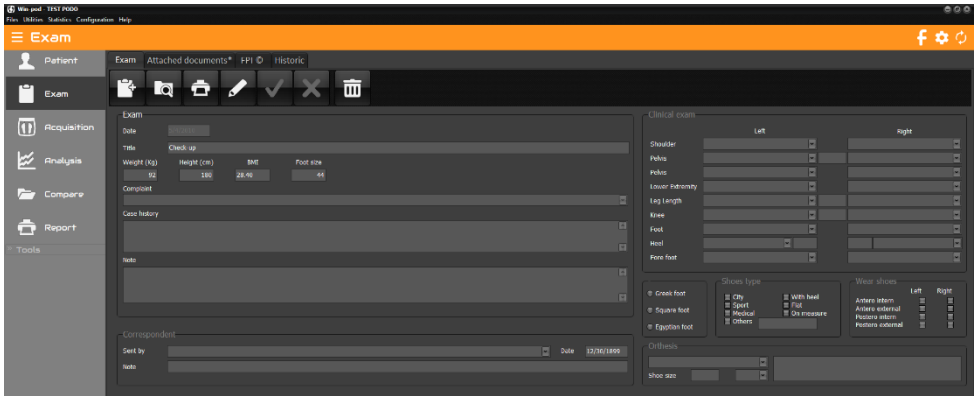
- ✓ In PodoCapture, click next to « Find / Create Patient » .
- ✓ With the mobile, scan the QRCode of the software.
- ✓ Use PodoCapture with the created patient.

Note: Conversely, to import the PodoCapture database into the software, see the procedure on page 16.

EXAM

An exam file consists of all the measurements performed (acquisitions) for a given patient, **on a given date**. A new exam file must be created at each patient visit.

An exam may contain an extensive number of measurements (acquisitions) from the same exam type or different types (static, dynamic, or postural measurements).



Tool bar



New: Creation of a new exam file.



Search: Search for an existing exam file.



Print an exam file.



Modify: Modify an existing exam file.



Validate.





Cancel.



Permanently delete an exam file and all associated measures.

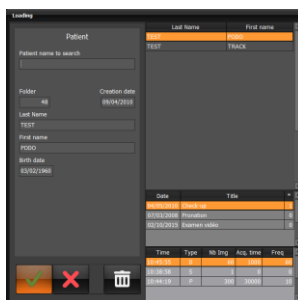
EXAM

Creating a new exam

- ✓ For an existing patient, click on .
- ✓ Complete the different sections.
- ✓ Validate by clicking on .

Searching for an existing exam



- ✓ Click on :



- ✓ Click on  or double-click directly on the exam.

Note: You can only add measurements to an existing exam on the date of the exam. If the date is later than the exam creation date, a new exam will be created automatically.


Modifying an exam file

- ✓ Click on .
- ✓ Modify the different sections you selected.
- ✓ Click on  to validate changes.

EXAM

Attaching documents to an exam

This function allows you to attach documents (word, pdf, picture, video) to an exam.

Click on  to search on your computer the document to be attached. The software will generate a copy of this document in the directory *Software directory\ Documents\Attached* in order to group all attached documents.

The following icons will allow you to manage attached documents:




Undo a document attachment. This function does not erase the document from the computer.



Rename the document



Erase a document from the computer.

The software also allows you to automatically attach pdf prints to the current exam, when the arrow is located on the print icon , or attach images when you right click on the footprint (menu "Attach to the exam").

Previous exams

View and print previous exam notes to facilitate patient care.

Do not forget to fill in "Title" area and the **exam notes** if you desire to see patient notes history throughout care.

EXAM

FPI © calculation

Foot Posture Index (©Antony Redmond) is a score that allows to determine the posture of the foot from 6 items and thus classifies the foot into 3 morphological groups: normal, potentially pathological and pathological.

The screenshot shows the 'Exam' software interface. The main window displays a table for FPI calculation. The table has columns for 'Factor', 'Plane', 'Left -2 to +2', and 'Right -2 to +2'. The 'Left -2 to +2' cell for 'Talar head palpation' is highlighted in orange. Below the table, there are 'Reference values' for Normal, Highly pronated, and Highly supine.

Factor	Plane	Left -2 to +2	Right -2 to +2
Talar head palpation	Transverse	Orange	
Signe and infra lateral malleolar curvature	Frontal / Transverse		
Calcaneal frontal plane position	Frontal		
Prominence in the region of the talonavicular joint	Transverse		
Congruence of the medial longitudinal arch	Sagittal		
Abd-adduction of the forefoot on the rearfoot	Transverse		
Total			

Reference values

- Normal = 0 to +5
- In pronation = +6 to +9, In supination = -1 to -4
- Highly pronated ≥ 10 , Highly supine ≤ -5



New: Creation of a new score.



Print the scores created.



Modify: Modify an existing scores.



Validate.



Cancel.



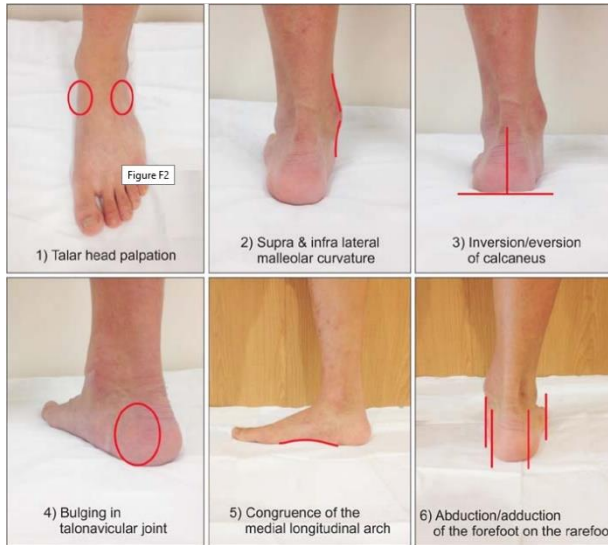
Export in Excel of the data entered for the FPI ©



Detailed user guide for FPI ©

EXAM

The 6 items to be scored from -2 to +2, so 5 possibilities knowing that - corresponds to a deviation in lateral (external) and + to deviation in medial (internal) are:



The normative values of the FPI © :

	-2	-1	0	1	2
Talar head palpation	Talar head palpable on lateral side/ but not on medial side	Talar head palpable on lateral side/ slightly palpable on medial side	Talar head equally palpable on lateral and medial side	Talar head slightly palpable on lateral side/ palpable on medial side	Talar head not palpable on lateral side/ but palpable on medial side
Supra and infra lateral malleolar curvature	Curve below the malleolus either straight or convex	Curve below the malleolus concave, but flatter/ more than the curve above the malleolus	Both infra and supra malleolar curves roughly equal	Curve below the malleolus more concave than curve above malleolus	Curve below the malleolus markedly more concave than curve above malleolus
Calcaneal frontal plane position	More than an estimated 5° inverted (varus)	Between vertical and an estimated 5° inverted (varus)	Vertical	Between vertical and an estimated 5° everted (valgus)	More than an estimated 5° everted (valgus)
Prominence in the region of the talonavicular joint (TNJ)	Area of TNJ markedly concave	Area of TNJ slightly, but definitely concave	Area of TNJ flat	Area of TNJ bulging slightly	Area of TNJ bulging markedly
Congruence of the medial longitudinal arch	Arch high and acutely angled towards the posterior end of the medial arch	Arch moderately high and slightly acute posteriorly	Arch height normal and concentrically curved	Arch lowered with some flattening in the central portion	Arch very low with severe flattening in the central portion - arch making ground contact
Abduction/adduction of the forefoot on the rarefoot	No lateral toes visible. Medial toes clearly visible	Medial toes clearly more visible than lateral	Medial and lateral toes equally visible	Lateral toes clearly more visible than medial	No medial toes visible. Lateral toes clearly visible

The final score makes it possible to say if the foot is:

- normal (0 à 5),
- supinator (-4 à -1) ou highly supinator (-12 à -5)
- pronator (6 à 9) ou highly pronator (greater than or equal to 10)

ACQUISITION

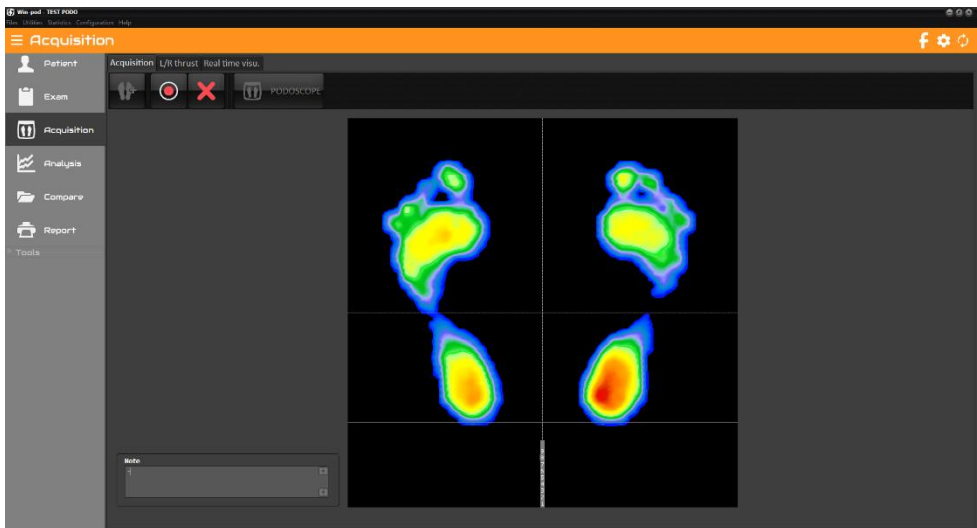
A measurement consists of the recording (**acquisition**) of data in three modes (Static, Dynamic (Gait), Postural).

For each acquisition, all the data are **automatically saved** on the hard disc.

A measurement is always related to a particular exam.

In the course of an exam, you can perform as many measurements as you want (for example, you can carry out 3 static acquisitions and 1 dynamic acquisition).

Note: The comments entered during the creation of an exam file are included on the analysis screens, comparison studies and prints (under the title).



Tool Bar



New: Creating a new measurement file.



Start the acquisition



Cancel.



Podoscope : View “real time” images of pressure mapping. This function is very useful to verify proper connection of system and to perform a quick visualization of foot mapping without saving the data.





Warning: This function does not allow acquisitions.

ACQUISITION

L/R thrust

View « real time » images of left-right thrust.



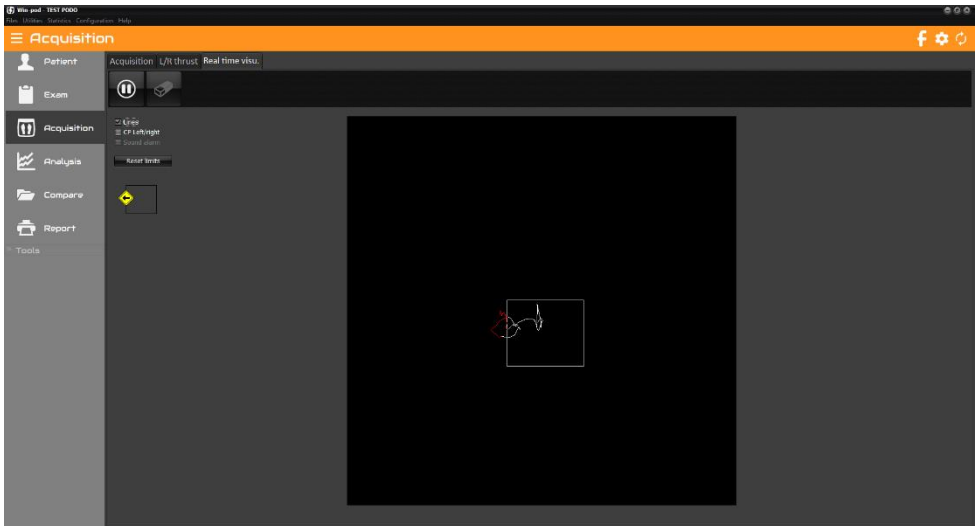
- ✓ Click on  to start the visualization.
- ✓ The message "Stand on two feet" appears. Click "Ok" when the patient is positioned.
- ✓ You can make a pause , delete the data displayed  or print the screen .




ACQUISITION

Real time visu

View « real time » images of the **Center of Pressure** with an option to select a limited zone of sway to train the patient to control their body's oscillations (Bio feedback).

To delineate the zone, click on the screen and move the mouse diagonally toward the bottom while maintaining left click on the mouse to delineate the Center of Pressure (COP). To erase the zone, click on « Reset limits ».



- ✓ Click on  to start the visualization.
- ✓ The message "Stand on two feet" appears. Click "Ok" when the patient is positioned.
- ✓ You can make a pause  or delete the data displayed .

ACQUISITION

Creating a measurement (Acquisition)

You can choose 3 types of acquisition:

- **Static**: To record the bipedal cartography of the plantar pressures.
- **Dynamic**: To record the foot progression on the platform through the gait cycle. A high acquisition frequency (up to 200 images per second) allows an accurate analysis of the evolution of plantar support.
- **Postural**: Posturology is in a way "the dynamic of static upright posture ». Instead of recording the patient's plantar supports at a particular time to obtain a single (static) image, recordings of the patient's bipedal support are performed during an established time period in order to analyze the variations of plantar support and the displacement of the foot pressure centers.

It is used for evaluating postural instability or analyzing plantar supports during movements for specific activities (sports, rehab, etc).



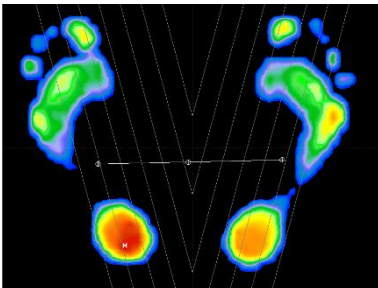
To create a new measure click on , then choose the type of acquisition.

« **Shortcut Options** » : virtual landmarks can be inserted during acquisition or analysis. To make landmarks appear on the screen, select the following keys:

/ : 30° Axis Lines.

- : Horizontal lines to control heel alignment and scale.

+ : Orthogonal axis to divide the screen in 4 quadrants.



Warning: Acquisitions use all computer resources and therefore other computer functions cannot be performed during acquisitions! Particularly live applications such as: antivirus, scan modem, downloading, skype... and with applications requiring large memory use such as: large word files, keyboard, etc.

ACQUISITION

Static Acquisition



- ✓ If you use the Medicauteurs positioner to position the patient, check “**With positioner**” in the "Type of Measurements" window.
- ✓ Click on « **Static** ».
- ✓ If you have the Medicauteur scanner, you can set the software so that the foot scan starts automatically after static acquisition. To do this, select the "Scan" check box on the "Static" button.
- ✓ Position the patient on the platform.

On the screen, you will see a real time image of the cartography of the plantar pressures and the **Center of Pressure (displayed as ⊕)**

You can type comments related to observations in the « Measurements Notes » section.

- ✓ Positioning the patient: in natural position or in standardized position using the virtual landmarks (see previous page) or the horizontal landmarks drawn on the surface of the platform. It is important to **align the heels** on the same line (use the horizontal half lines displayed behind each foot).

For **Win-track** and **Win-track mini**: The software records an area 50cm wide from the 1st active sensor on the left according to the occupation of the footprints on the platform, over 50cm high.

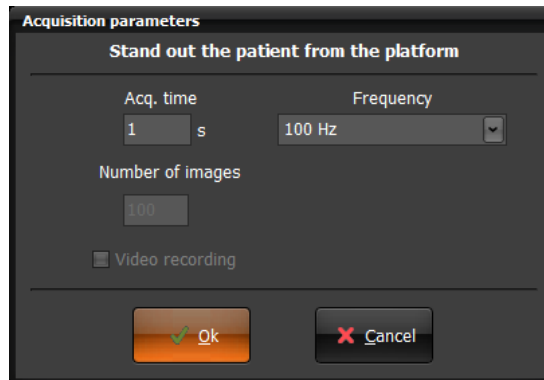
- ✓ Start acquisition by clicking on .
- ✓ When the "Acquisition" key turns gray, the acquisition is completed and the patient may step down. Data is recorded on the computer disc. You can delete by clicking on  on the patient file.

You may now either start a new acquisition or go on to another operation.

ACQUISITION

Basic Dynamic Acquisition

- ✓ Instruct the patient to step a couple times on the platform in order to feel relax and get accustomed to stepping properly on the platform.
- ✓ Click on « **Dynamic** » in the "Type of Measure" window.
- ✓ The **Acquisition Parameters** screen appears.




- ✓ Instruct the patient to step down from platform before clicking « Ok ».

Acquisition Parameters

Acq. Time (in seconds)

Time required by the patient to complete an entire step on the platform. Acquisition time is set **by default at 1 second for Win-pod or 2 seconds for Win-track and Win-track mini**. If the patient's gait is extremely slow due to difficulty in moving, this parameter may be increased. The "normal timing" for a full step progression is between 700 and 900 ms

Frequency

Click on  to select the acquisition frequency. This selection determines the number of images recorded (nb images = time x frequency).

ACQUISITION

- ✓ Once you have selected the acquisition parameters, click on « **Ok** ».

Win-pod :

- ✓ The message « Wait for left foot » appears. Then click « **OK** » to activate the platform and ask the patient to walk across the platform (striking the center portion of the platform) with the **left foot**.
Note: the recording starts as soon as contact is made with the platform!
- ✓ The patient may then step across the platform with the left foot. Recording starts as soon as the heel strikes the platform.
- ✓ Repeat the same sequence for the **Right Foot**.

Win-track et Win-track mini : The patient has 20 seconds to start walking on the platform.

Note: the recording starts as soon as you touch the platform!

Depending on the performance of the PC and the recording duration, the software may take a few seconds before displaying the measurement.

You may now either start a new acquisition or go on to another operation.

ACQUISITION

Multiple Dynamic Acquisition

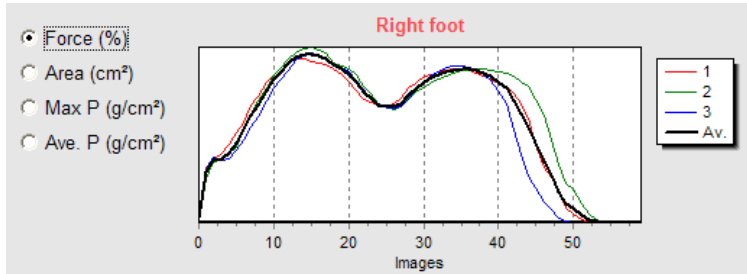
- ✓ Click on « **Multiple Dynamic** » in the "Type of Measurements" window.
- ✓ Select your acquisition parameters (see page 36) and click on « **Ok** ».
- ✓ When the “Multiple dynamic acquisition” window appears, you can start the acquisitions. You can make up to 16 dynamic acquisitions in a row (8 per foot) for the Win-pod and 6 for the Win-track and the Win-track mini.

Win-pod recording




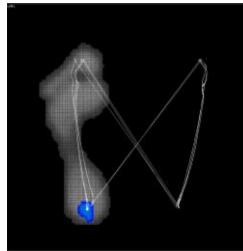
- ✓ Walk on the platform successively with the left and right foot (up to 8 steps for each foot) in which ever direction you prefer always striking the portion of the platform.
- ✓ Verify that the **automatic sequence** “Left Foot” and “Right Foot” is correct. In certain walking situations, the software may switch the “Left Foot” and “Right Foot” which will affect calculations and averages. In such instances, right click on the image which is improperly displayed and select proper action (delete, switch right/left).
- ✓ After verification and proper selection of images you want to keep (you can **zoom on each image** by double-clicking on it), click on one of the parameters (we recommend “**Force**”).

ACQUISITION



The software automatically selects the Left Foot and Right Foot images which are the closest to the average.

You can also check the symmetry of the passages by clicking on  :



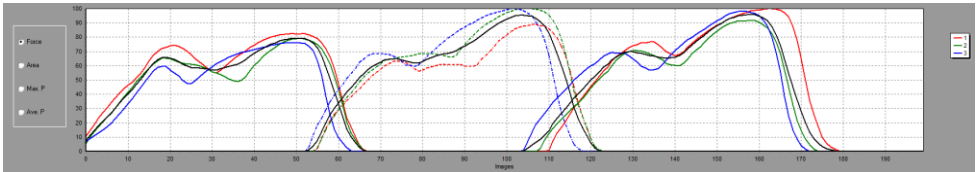
- ✓ Verify that the automatic selection of each foot is correct (yellow box).
- ✓ If you choose to modify this selection, you can select another image by clicking on it and moving the yellow box.
- ✓ You can also **print the screen** to keep a record of the images and graphs.
- ✓ Click on « **Save selection** » to save the 2 dynamic recordings selected in the patient file or on « **Multiple registration** » to save several couple "Left foot / Right foot".

You may now either start a new acquisition or go on to another operation.

ACQUISITION

Win-track et Win-track mini recording

- ✓ Walk on the platform (up to 6 acquisitions) in which ever direction you prefer always striking the gray portion of the platform.
- ✓ After verification and proper selection of images you want to keep (you can **zoom on each image** by double-clicking on it), click on one of the parameters (we recommend "**Force**").



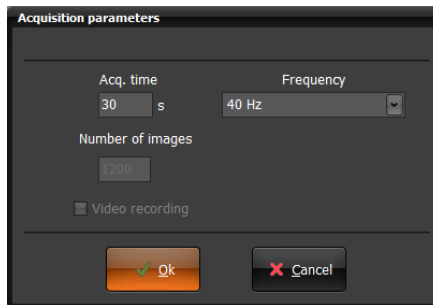
- The software automatically selects the acquisition which is the closest to the average (the yellow box).
- ✓ If you choose to modify this selection, you can select another image by clicking on it and moving the yellow box.
- ✓ You can also **print the screen** to keep a record of the images and graphs.
- ✓ Click on « Ok ». A new window appear to allow you to save all the acquisitions you want in the patient file.
- ✓ **With the Win-track mini**, you can select 2 passages where the feet are truncated to keep only the complete feet. To do this, click on "Convert to 'D'". The software will transform these 2 passages into a single "Win-pod dynamic" measurement (see page 53).

You may now either start a new acquisition or go on to another operation.

ACQUISITION

Postural Acquisition

- ✓ If you use the Medicapteurs positioner to position the patient, check “**With positioner**” in the "Type of Measure" window.
- ✓ Click on « **Postural** ».
- ✓ The Acquisition Parameters screen appears.



Acquisition parameters

Acq. time (in seconds)

The duration of the postural analysis recording is 30 seconds by default.

Frequency

Click on ▾ to select the acquisition frequency (5 or 40 Hz). This choice will determine the number of images recorded (nb of images = duration x frequency).

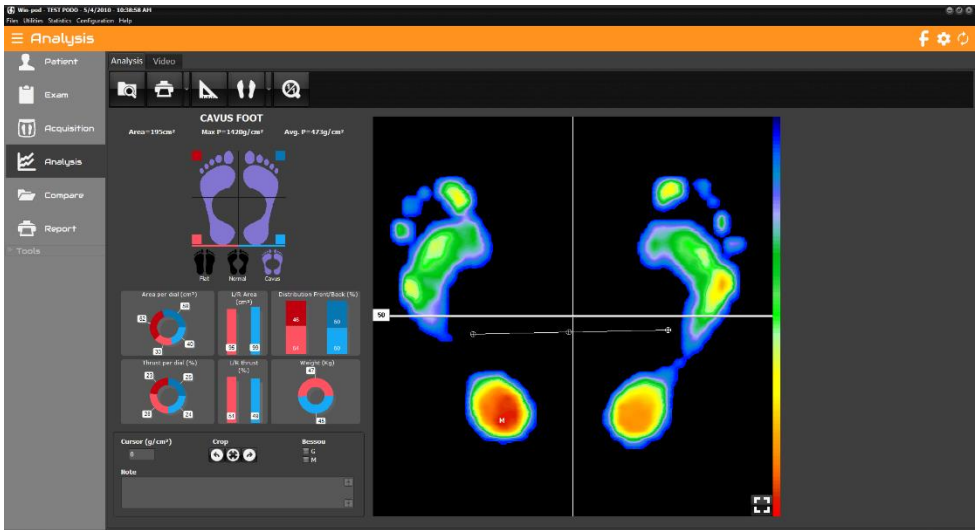
- ✓ When you have initialized the parameters, click on “**Ok**”. Position the patient on the platform. You have on the screen a real-time image of the cartography of the plantar pressures and the centers of pressure visualized by ⊕.

For Win-track and Win-track mini: The patient stands facing the unit: **you cannot rotate on the 1m wide measurements**. The software records an area of 50 cm or 1 meter wide from the 1st active sensor on the left depending on the occupation of the footprints on the platform, over 50 cm high.

- ✓ Click on  to start the acquisition.

When acquisition is completed, you may now either start a new acquisition or go on to another operation.

STATIC ANALYSIS



Tool Bar



Search: Opens the patient database to review a measurement.



Print. The arrow gives access to « Attaching documents to an exam » menu (see page 28) and « Scale 1 Printing » (see page 91).



Footprint Measurements.



Visualization of cartography. The arrow allows you to change visualization.



Return to normal scale 1 : 1.

STATIC ANALYSIS

Footprint Analysis


Framing the footprint





These keys are used for framing or rotating the footprint for easier review when your patient is not correctly positioned during acquisition or to modify the forefoot/heel limits used for calculations by sectors.

Important Note : When you re-frame a print, the initial print file is automatically replaced by a re-framed print file, on the hard disk (if you then open the print file, you will be able to see the re-framed print).

Footprint zoom

You can zoom in on a part of the footprint by clicking on the top and left of the part to be zoomed. Hold down the button and move the mouse to reveal a square of variable size. When you release, the squared inner surface appears zoomed. To return to the initial image, click on .

You can also view the footprint in full screen by clicking  bottom right of the picture. To exit full screen, click .

Cartography

The following information is displayed on the **cartography**:

M : Point of maximum pressure (the value is displayed in *Max P.*).

⊕ : These 3 marks depict the COP (Left foot, Right foot, and Center). The center ⊕ is the **Center of Pressure**.

STATIC ANALYSIS

Calculation on both feet

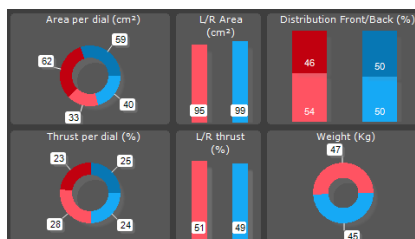
- **Cursor**: The pressure measured at the point where the cursor is located. Use the mouse to navigate this tool.

Area = 195cm² Max P = 1420g/cm² Ave. P = 473g/cm²

- **Area**: Surface Area covered by both feet (total support surface).
- **Max P**: The maximum pressure point measured.
- **Avg P**: Average pressure calculated over both feet.

Calculation per quadrant

Several calculations are performed in each of the 4 podometer sectors as defined by an axis on the cartography. The front/back boundary can be moved with the mouse and the number to the left of this boundary indicates its position (percentage of the overall height). Double-clicking the number repositions the boundary to half the height.



The following parameters are available:

For each quadrant

- **Area**: Support surface in the quadrant.
- **Thrust**: Percentage of Thrust in a quadrant, as a proportion of the total pressure through **both feet**.
- **Distribution**: Percentage of support in the front and back halves of the foot.

For each foot

- **Area**: Support surface of the foot.
- **Thrust**: total thrust of the foot.
- **Weight** applied on the foot.

STATIC ANALYSIS

Foot Type

The type of foot is defined by the software calculation from the width of the arch. This is only an indication. If you do not want to display it, you can deactivate it in the *Configuration* > *Parameters* > *General* menu, by unchecking the box "Display the type of foot".

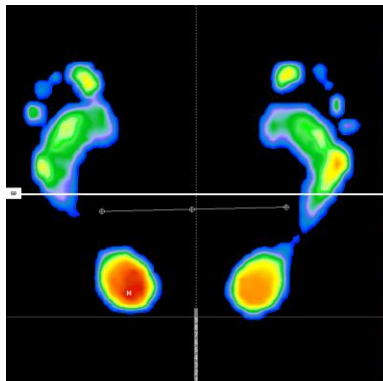


"Standard" View



The plantar pressures mapping is represented with a palette of different colors from blue (**low pressure**) to red (**high pressure**).

Note: The image resolution, screen display and the colors can be changed in the Configuration Menu: *Configuration* > *Parameters* > *Colors*.



You can select « Virtual Positioning » axis on the screen (see page 34).

STATIC ANALYSIS

"Isopression" View



In the standard view, the different levels of plantar pressures are represented with a continuous palette of colors from blue to red.

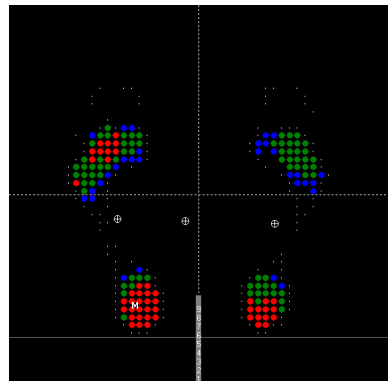
In the isopressure view, there are only 3 colors available (red, green and blue) corresponding to 3 pressure intervals:

- Blue : Low pressures.
- Green : Intermediate pressures.
- Red : High pressures

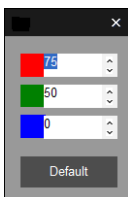
The pressure level which determines each color can be adjusted by the user by **increasing or decreasing** the pressure level corresponding to a color by clicking on

▲
▼ (see example below).

The value which is on the right of the color square represents the pressure level (expressed as a percentage of the maximum pressure point "M").



Example:



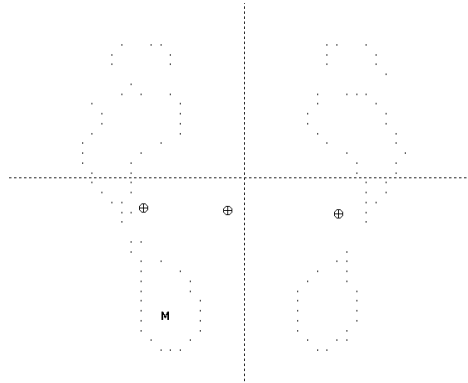
Red represents areas of pressure **above 75%** of the max pressure.
Green represents areas of pressure **between 50% and 75%** of the max. pressure.
Blue represents area of pressure **between 0% and 50%** of the max. pressure.

STATIC ANALYSIS

"Center of Pressure" View



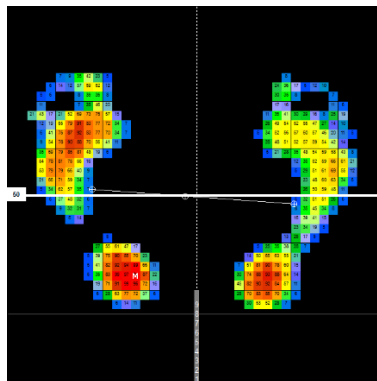
This mode is used for visualizing the foot shape, the centers of pressure (\oplus) and the max. pressure point (M). It is often used in dynamic analysis to display the "Gait Line".



"Percents" View



In this mode, the pressure points are expressed in % of max.pressure. The max.pressure points are represented with the sign « % ».



STATIC ANALYSIS

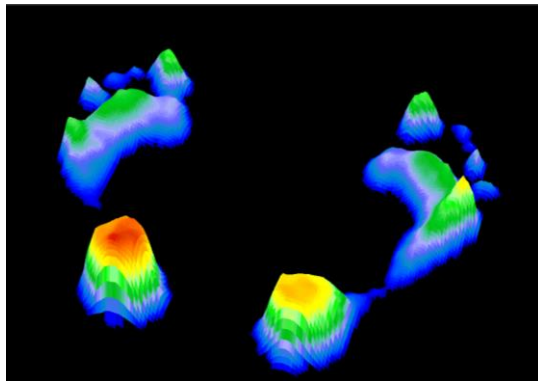
"3D" View



The cartography of pressures is visualized in **3 dimensions**.

The object of this image is not to permit an accurate analysis of support, but rather to produce an easily understandable and highly visible image for the patient.

You can rotate the 3D feet by holding down the left mouse button. Holding down the right mouse button will move the feet horizontally or vertically.



STATIC ANALYSIS

"Measurements" Tool



Measurements can be carried out and **comments** can be added on the cartographies. These measurements are saved with the acquisition in your patient file.

Click on the option to select:

- **Length**: Measuring one or more distance on the cartography.
Point and click (once) to define the first point of the segment to be measured.
Move mouse, point at a second point, then click.
- **Angle**: Measuring an angle on the cartography.
Point and click the 3 points forming the 2 generating lines of the angle to be measured.
- **Area**: Click once, and then move mouse to form an ellipse. Click a second time to display the surface area within the ellipse.
- **Zone**: **Maximum Pressure, Surface Area, Timing** calculations in a selected area (following the captors' distribution).
To open a zone, click on the upper left corner of the selected zone, keep the pressure on the mouse and move it towards the right lower corner. When you release the mouse, the measurements values will appear.
- **Pressure**: Click on point on the cartography to display the pressure at that particular point. You can click on the box with pressure value to move it and then double click to leave it at the position you selected.
- **>>>**: Insert an **icon** directly on the footprint.
- **Comment**: Used for inserting comments on the cartography. Proceed as for the "Length" option and fill in the "Comment" box in the Measurements tool.
- **Clear**: Deletes the **last** performed measurements.
- **Clear all**: Deletes **all** the performed measurements.

Once positioned, you can modify these measurements by clicking on them. As soon as the blue cursors appear on the selected measure, you can manipulate it with the mouse. By clicking on the map, you freeze and save your changes.

STATIC ANALYSIS

"Scanner" Option

If you have the Medcapteurs scanner, you can superimpose the image from the scanner with the podometric image from the platform.



Print. The arrow gives access to "Scale 1 Printing" menu (see page 91).



Measurements.



Scan feet.

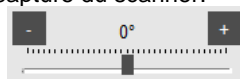



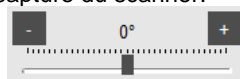
Link an existing scan to live exam recording.

This key allows exploring the hard drive to load an image in **jpg**, **jpeg** or **bmp** format.



Paramètres de capture du scanner.



The buttons  and  allow to adjust the scan of the feet to the podometric image if the automatic overlay is not exact.

STATIC ANALYSIS

"Lines of Bessou"

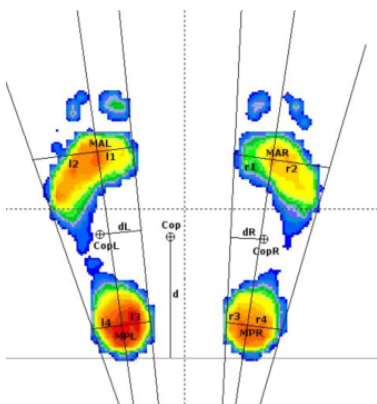
Presentation

Professor Paul Bessou, affiliated with the Podiatry School of Toulouse, France presented new description methods to clearly define static footprints and particularly compare to measurements with or without treatment plans (for example with or without orthotics).

In the "Analysis" section, if you click on M or G the following lines and calculations appear:

- Internal and external foot tangents
- The lines passing through the fore foot and heel centers of pressure (G)
- The lines passing through the maximum pressure points in the fore foot and heel (M)
- The line connecting the back of the heels (which should be aligned).

A reference was given for each of these parameters:



MAL : Max Anterior Left
MPL : Max Posterior Left
MAR : Max Anterior Right
MPR : Max Posterior Right

I1 : MAL – internal left tangent distance
I2 : MAL – external left tangent distance
I3 : MPL – internal left tangent distance
I4 : MPL – external left tangent distance

r1 : MAR – internal right tangent distance
r2 : MAR – external right tangent distance
r3 : MPR – internal right tangent distance
r4 : MPR – internal right tangent distance

Cop : Center of pressure
CopL : Center of pressure Left
CopR : Center of pressure Right

d : Cop and heels line distance
dL : CopL and internal tangent distance
dR : CopR and internal tangent distance
Angle : angle between internal tangents

Find out how to use the references on the next page.

STATIC ANALYSIS

Use

From the lines automatically displayed, the software calculates multiple measurements of distances to define the forefoot degrees of **rotation** (**I1** and **I2** for the left foot, **r1** and **r2** for the right foot) or for the heel (**I3** and **I4**, **r3** and **r4**).

The calculation of the **distance "d"** between the line posterior to the heels and the global center of pressure provide information on the antero posterior positioning of the patient: the greater the distance the greater the anterior positioning of the patient.

Finally, between the distances **dL** and **dR** between the lines passing through the global center of pressure of each foot and the internal tangents quantifies the global rotation of each foot.

The explanation of these parameters is extensive however they are really **easy to use** and it allows quantifying the effects of treatments on patients:

- ✓ Perform to successive recordings that you want to compare (typically with and without orthotics).
- ✓ Display the « lines of Bessou" according to M or C.
- ✓ Select the parameters you want to study and compare them with the results of the 2nd recording.

For example for the correction of excessive forefoot external rotation, compare the distances r1/r2 and I1/I2.

Similarly, study the evaluation of the parameter "d" to verify the effect of the treatment on the patient's antero-posterior position.

In 2006, the National Association for Research In Podiatry (ANREP) launched a study with MEDICAPTEURS and the French post graduate institutes on the effect of the supination corner on plantar pressures.

The WIN-POD system was selected for this particular study and the software was modified to include the « lines of Bessou » used for quantifying plantar pressure changes.

DYNAMIC ANALYSIS WIN-POD



Tool bar



Search: Access to patient file to load measurement.



Print. The arrow gives access to "Attaching documents to an exam" (see page 28) and "Scale 1 Printing" menu (see page 91).



Visualization of cartography. The arrow allows you to change visualization.




Return to normal scale 1 : 1.



Start or stop the step progress.



and  In mode pause, you can see a forward or backward image by image replay.



Displays the first image of the step progress.



Displays the mean results of all the progress images (global view).



Allows you to modify the animation speed.

DYNAMIC ANALYSIS WIN-POD

Footprint Analysis

Tools of visualization

You can crop or zoom the footprint (see page 43).

To make measurements, use the buttons  associated with each foot (see page 49).

On the cartography

On the cartography, the following information is available:

417 ms : Time elapsed since the beginning of acquisition. Expressed in milliseconds (ms).

If **M** and **G** are not selected:

M : Point of maximum pressure.

⊕ : Centre of de thrust calculated on the displayed image.

If **G** and/or **M** is/are selected:

Visualization of the **Gaitline** (curve representing the evolution of the thrust center) and/or the curve representing the evolution of maximum point of support (**Maxline**).

Calculations on displayed image

Cursor	266	g/cm ²	Area	140	cm ²	Max.P.	2608	g/cm ²	Avg.P.	1516	g/cm ²
--------	-----	-------------------	------	-----	-----------------	--------	------	-------------------	--------	------	-------------------

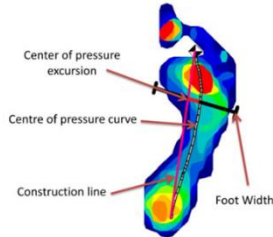
- **Cursor**: The pressure value of the support point which is pointed at with the mouse arrow is displayed in this box.
- **Area**: Total surface area of support.
- **Max P.**: Value of the M point: maximum Pressure.
- **Avg P.**: Average Pressure.

DYNAMIC ANALYSIS WIN-POD

CPEI calculation



Center of Pressure Excursion Index (CPEI) is a parameter which makes it possible to characterize the foot: pronator, normal or supinator.

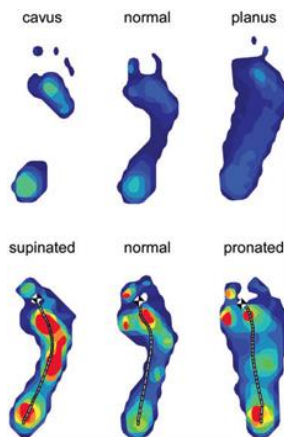


$$\text{CPEI} = \frac{\text{Center of Pressure}}{\text{Foot Width}} \times 100$$

The cut-off scores to define each category were as follows:

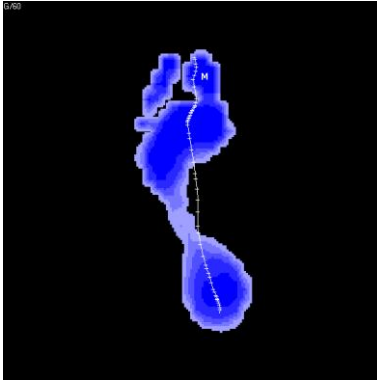
- for men: supinated (23.6 - 42.2), the normal reference group (10.3 - 23.4) and pronated (-25.3 - 10.2),
- for women: supinated (19.3 - 37.9), the reference group (6.2 - 19.2) and pronated (-11.2 - 6.1).

Typical examples of cavus, normal and planus foot posture categories (top) and supinated, normal and pronated foot function categories (bottom):

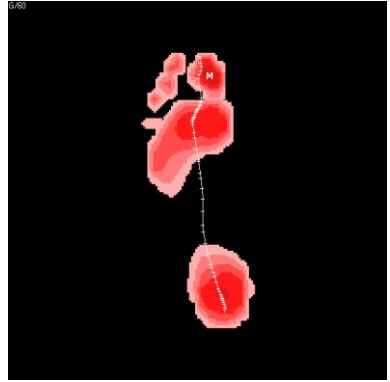


Extract from the article Foot posture, foot function and low back pain: the Framingham Foot Study by Hylton B. Menz, Alyssa B. Dufour, Jody L. Riskowski, Howard J. Hillstrom and Marian T. Hannan

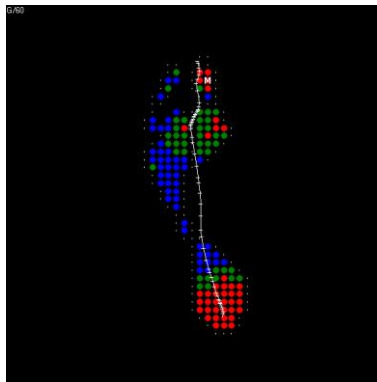
DYNAMIC ANALYSIS WIN-POD



Contact Duration



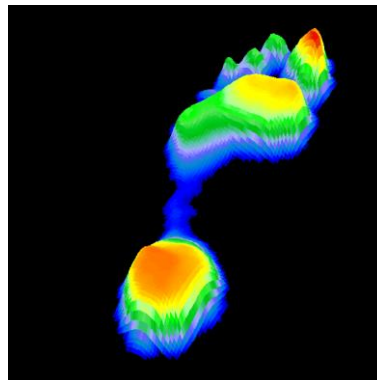
Impulse



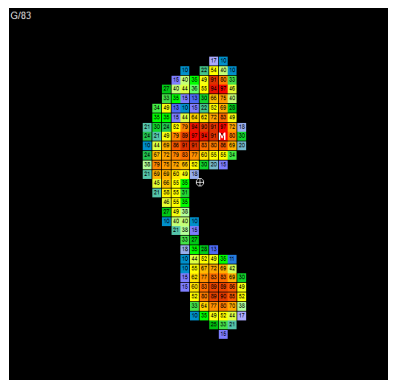
Isopressure



Risk zones



3D



Percents

DYNAMIC ANALYSIS WIN-POD

The different views



Standard view (See page 45).



Isopressure view (See page 46).



Percents view (See page 47).



Center of Pressure view (See page 47).



3D view (See page 48).



"Duration of contact" view.

This image displays the time length of foot support in each foot area during the step process : the darker the blue color, the longer the foot support lasts.



"Time x Pressure" (or "Impulse") view.

In dynamic analysis, hyper pressures and duration of contact can be studied, however the most interesting parameter is the **"Time x Pressure"** which defines **"Quantity of Charge"** applied for each foot area and allows to outline potential "risk areas" (particularly as a preventive measure for the "diabetic foot").

The cartography **"Time x Pressure"** can be easily analyzed: the darker the red color, the greater the charge quantity.



"Risk zones" view.

In dynamic analysis, the software calculates an ulceration risk index for a grade 2 or 3 neuropathic diabetic foot. This index is predictive from a few days to a few weeks, for more information you can read the publication accessible from the menu *Help > M/M references*.

The closer the index is to 2 or above, the higher the risk. Above 2, the perforating disease is certain, the index appears highlighted in red. Below 2, the risk is limited, the index is highlighted in green.

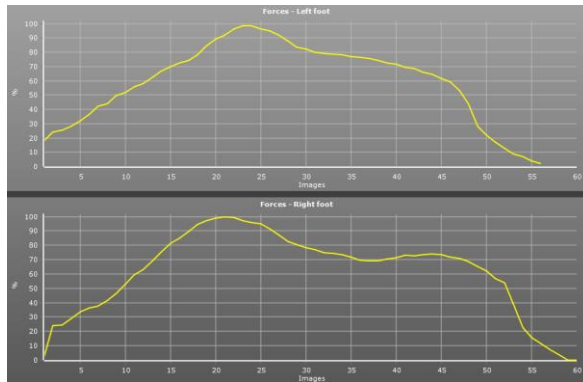
The cartography highlights in yellow the zones of future ulcerations (for an index higher than 2 highlighted in red) or the zones to be discharged.

DYNAMIC ANALYSIS WIN-POD

Graphs

A certain number of parameters are calculated for each image of the dynamic progress (surface, Max. Pressure, Aver. Pressure, Thrust center, etc).

The graphs display the evolution of these parameters throughout the step cycle.



Note: You have the option to visualize the foot pressure mapping (on the left side of the screen) at any time of the step process. Just click on the graph, hold and move the mouse from left to right.

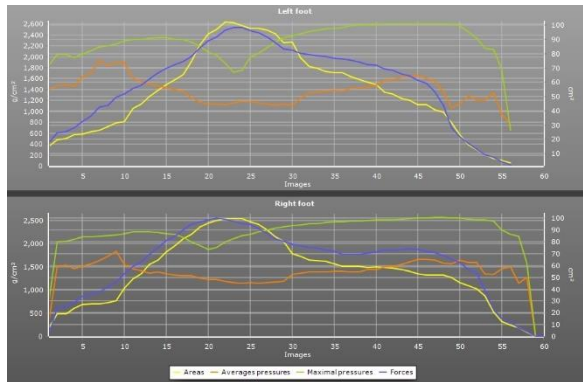
To see the global image, move the cursor to the right side of the graphs.

Click on the curve you want to be displayed:

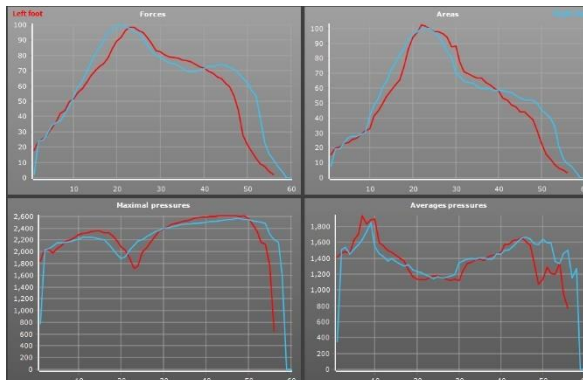
- **Forces:** Evolution of the force during step progression (%).
- **Area:** Evolution of the support surface during step progression.
- **Avg. P.:** Evolution of the average pressure calculated for each image.
- **Max P.:** Evolution of the value of the « Max.pressure» through the images of the step progression.
- **Speed:** Variation in speed during step progression. A very « irregular » speed curve betrays an irregularity in the gait/walk that may be due to poor acquisition (patient's hesitation).

DYNAMIC ANALYSIS WIN-POD

- **Rotation**: Position of the thrust center line as a proportion of the theoretical axis of progression. This graph is valid only if the patient steps along the platform axis or parallel to it.
- **Synthesis 1**: Superposition on the same graph of curves Forces, Surfaces, Average Pressures and Maximum Pressures.



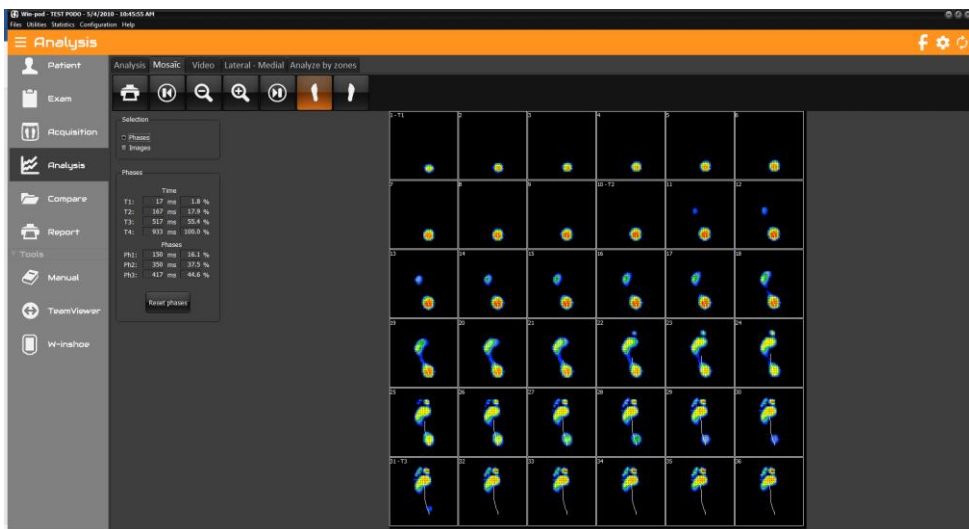
- **Synthesis 2**: Superposition on the same graph of the curves of the left foot and those of the right foot for Forces, Surfaces, Average Pressures and Maximum Pressures



DYNAMIC ANALYSIS WIN-POD

Mosaic tab

Display all the successive images of the step progression:



Print



and



Front and Back Zoom.



and



Forward or backward rewinding.



Select the foot to be displayed.

This tab allows you to select:

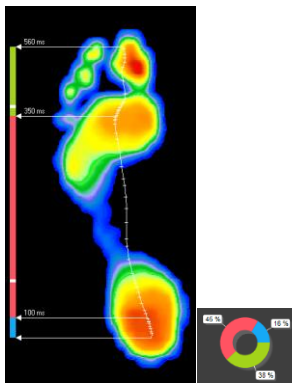
- step phases (see next page)
- up to 9 images to print. You can choose these images manually by clicking on each of them, or click on "Automatic", they will then be spaced regularly on the scroll.

Note: when you double-click an image from mosaic, you can directly see the analysis of this image.

DYNAMIC ANALYSIS WIN-POD

Step Phases Analysis

In « Analysis », by clicking on  the 3 phases of the step can be seen (Heel strike, Plantar, and Toe off phase) and compared with personalized normative values.



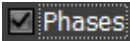
For this function, there are 2 steps:

1. Initializing normative data

The duration of each of the step phases can be captured by clicking successively on: *Configuration > Parameters > General* (see page 18).

By default, the phases' distribution are 20% 60% 20%.

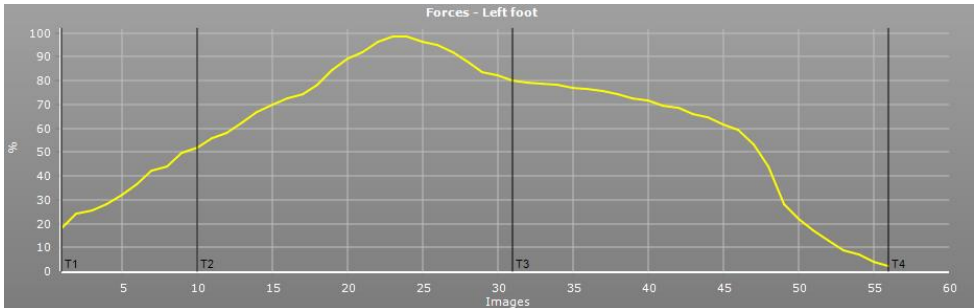
2. Outline the 3 phases with images of the process

- ✓ Go to the "Mosaic" tab. Select a foot.
- ✓ Choose "Phase selection".
- ✓ Click on « Reset Phases » and then click on the transition images to position the two cursors to delineate the three phases Heel strike (**T2**) and the end of plantar (**T3**). The cursors T1 and T4 relate to the beginning and end of the step and are automatically positioned on the display.
- ✓ Perform the same procedures on the other foot.
- ✓ Go back to the "Analysis" screen and click on  for visualizing the 3 phases and compare them to the normative data represented by the white marks on the vertical bar.

DYNAMIC ANALYSIS WIN-POD

3. Outline the 3 phases with the graphs

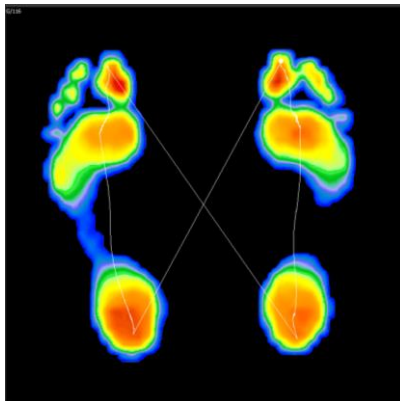
By clicking on different points on the graph's abscissa, you can position 4 cursors (T1 to T4) which allow to measure the duration of each phase of the step progression either in ms or in % of the entire duration of the step process:



The “Reset” buttons associated with each foot allow you to reset the different phases defined.

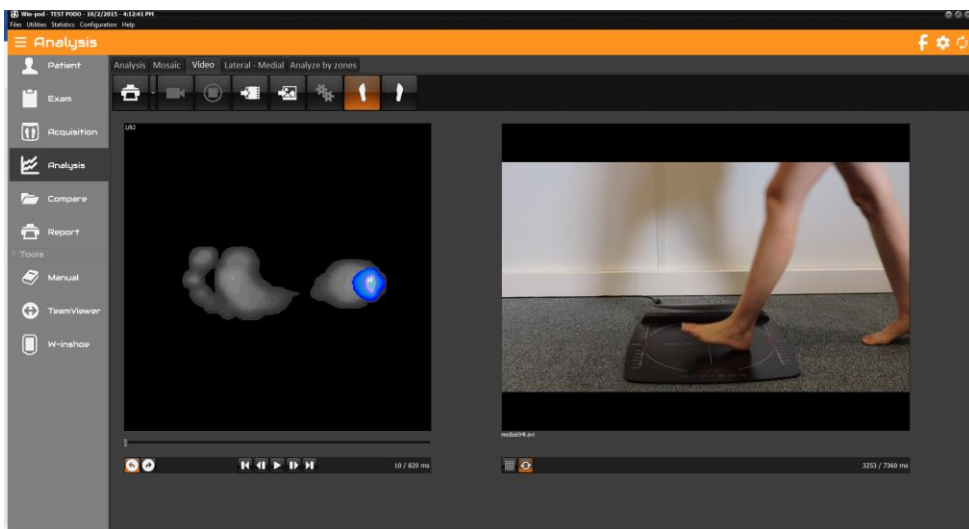
Butterfly tab

Allows you to study the symmetry of the left foot and right foot passages.



DYNAMIC ANALYSIS WIN-POD

Video



Print the podometry image and the video image associated. The arrow gives access to "Attaching documents to an exam" (see page 28).



Link an existing video to live exam recording.
This key allows exploring the hard drive to load a video in **asf**, **avi** or **wmv** format.



Link an existing image to live exam recording.
This key allows exploring the hard drive to load an image in **jpg**, **jpeg**, **png** or **bmp** format.



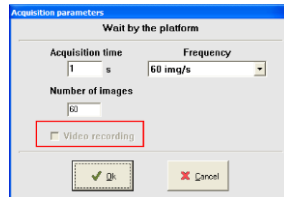
Allow recording video at a different time than the podometry acquisition.

DYNAMIC ANALYSIS WIN-POD

Simultaneous recording Video / Podometry

Only available with a Basic Dynamic (see page 36) et Postural (see page 41) acquisition.

- ✓ In "Acquisition", select "Dynamic" or "Postural".








- ✓ Check mark "Video Recording" (not available in "Multiple dynamic" acquisition").

Note: When the "Video Recording" message has a gray background, the computer did not detect the video acquisition system. Verify that the webcam is properly connected and device properly installed.

- ✓ Perform a normal measurement. The software will launch the video acquisition automatically.

Post-synchronization of the video with the dynamic footprint

- ✓ After the video is recorded, it is automatically synchronized with the podometry acquisition. In the "Video" tab, the buttons  and  under the video allow to perfect this synchronization. You must go to the first podometry image to access them and so fix the first video image.
- ✓ If you recorded the video with an other software, you can also synchronize it in the "Video" tab by clicking on right menu . When the two screens are « locked in position », click on .
- ✓ The left menu  then becomes the unique control bar for the 2 animations.

DYNAMIC ANALYSIS WIN-POD

Medio-lateral Analysis

This function allows studying the evolution of several parameters in selected medial and lateral areas of the foot.



The foot is divided into 2 zones on both sides of the "Gaitline" (evolution curve for the center of pressure). The **Gray** Color (for the **Lateral**, external side of the foot) and **Orange** color (for the **Medial**, interior side) make it possible to display the zones used for calculations.

The graphs represent the evolution over time of the **difference between the forces on the lateral side and the forces on the medial side of the foot (FL - FM)**. If the lateral value is stronger than the medial value, the curve is positive, and indicates the prevalence of the lateral forces.

These curves are very useful to evaluate and quantify **the torsion of the foot** during the gait cycle as well as the phases of **Heel strike, stabilization and propulsion** which are difficult to evaluate clinically.

The studies of these functions have been of particular interest to orthopedic surgeons.

L/M index is located on the bottom right corner of each screen displaying the calculation of the relationship between the lateral and medial forces. When the index is equal to "1" it indicates that the medial and lateral forces are equal (which corresponds to a curve passing through the origin of the graph: $FL - FM = 0$).

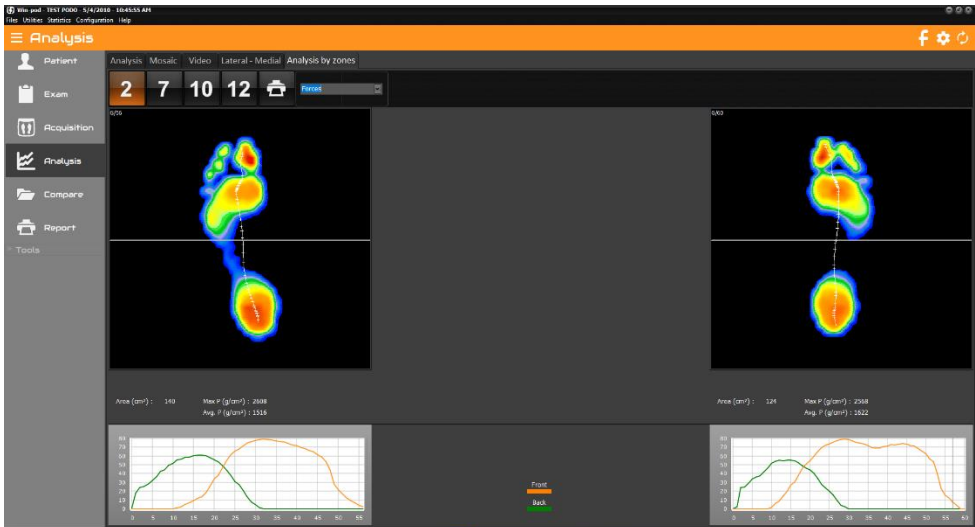
By moving the mouse cursor on the curves, the particular footprint and L/M index will be displayed for that selected time of the gait cycle.

Note: If 2 dynamic measurements are loaded in "Comparaison", you can compare the medio-lateral analysis of these 2 measurements.

DYNAMIC ANALYSIS WIN-POD

Analysis 2 areas

This function allows automatic front cutting of the foot into 2 equal parts. This option facilitates the analysis of the evolution of different parameters in the front and rear areas of the foot.



For a standard foot, the norm requires that the point of intersection of the 2 front and rear foot force curves is located at 50% of the timing of the step.

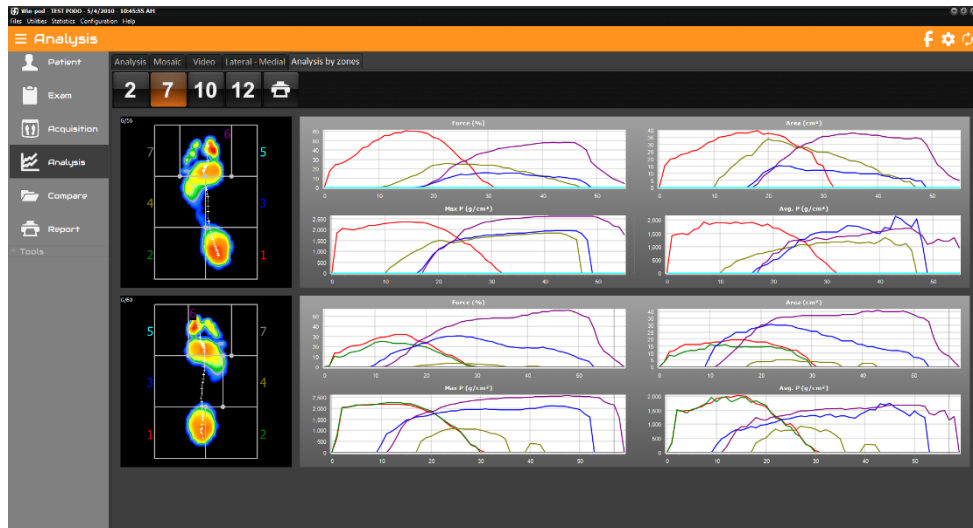
This analysis also highlights timing asymmetries between left and right foot.

Note that the automatic cutting bar can be moved manually

DYNAMIC ANALYSIS WIN-POD

Analysis 7 areas

This function allows studying the evolution of several parameters in selected areas of the foot. It is very helpful to study the pronation / supination phenomena and the timing of the step process.



The foot is divided into **7 areas** which can be re-sized by the user (click and shift the intersection points of the frame). A specific number and color is associated with each area and correspond to the same color graphs.

The progression of **forces**, **areas**, **maximum pressures** and **average pressures** are displayed on the right portion of the screen for each area.

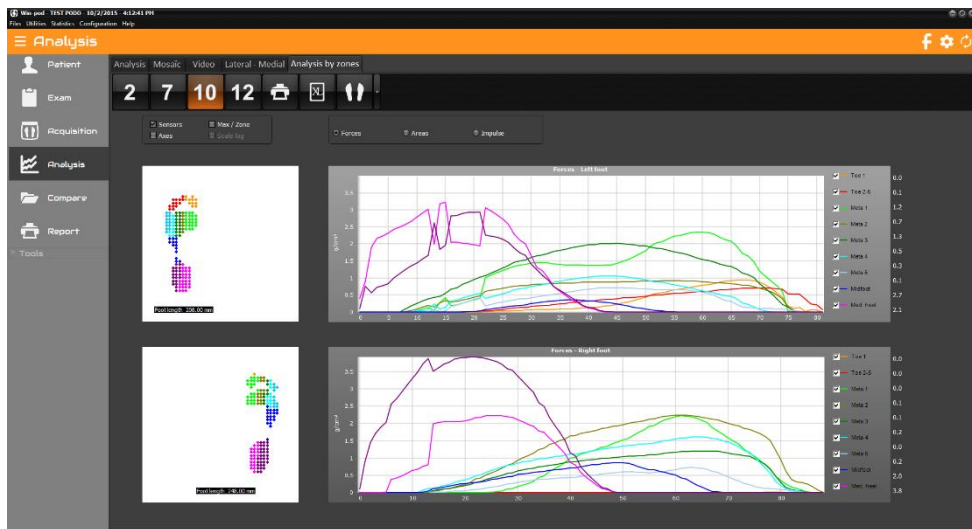
Note: You have the option to visualize the foot pressure mapping (on the left side of the screen) at any time of the step process. Just click on the graph, hold and move the mouse from left to right.

To see the global image, move the cursor to the right side of the graphs.

DYNAMIC ANALYSIS WIN-POD

Analysis 10 areas

This function allows you to study the evolution of 10 key areas of the foot. This division has become a standard in the international scientific literature. It is very useful to isolate or compare left foot right foot metatarsal heads, heels, midfoot etc.



The foot is automatically cut in the software into **10 zones**.

Each zone is associated with a number and a color shown on the graphs. To display or not a zone, all you have to do is click on the corresponding box on the right of the window.

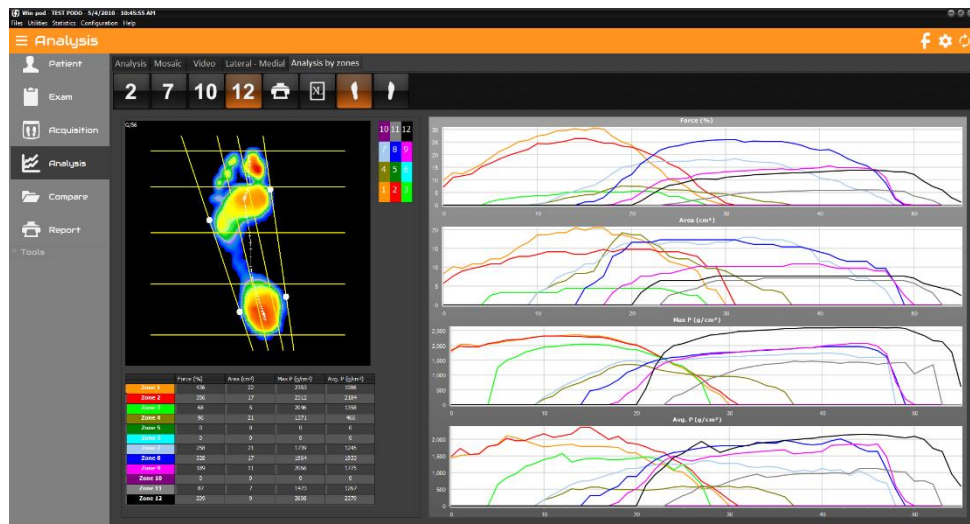
On the screen are visualized, as a function of time and in each zone, the evolution of the **forces**, of the **surface**, of the **impulse** and of the **maximum pressures**.

The XL button allows the automatic export of the 10 zones in the chosen format.

DYNAMIC ANALYSIS WIN-POD

Analysis 12 areas

This function allows studying the evolution of several parameters in selected areas of the foot.



The foot is divided into **12 areas**. From the anterior to the posterior portion of the foot, the foot is divided in 4 bands: the toes, the fore foot, the medial foot and the heel. From the lateral to the medial portion, the foot is divided in 3 areas determined by the line of the mechanical axis of the foot and the line bisecting the mechanical axis and the external edges of the foot. Normally these lines will position themselves automatically on the image however you can adjust their position manually by clicking on the white points and moving the line with the mouse.

A numbered and colored reference table assigns a particular number and color for each particular area of the foot. To visualize a particular area, you just need to click on the colored and numbered box corresponding in the table located next to the foot analysis display.

On the right portion of the screen, graphs display the evolution of the **forces, surfaces, pressures maximum** and **average pressures over time** for each area. On the left lower portion of the screen a table displays these parameters for each zone for the selected image of the foot. To select a different image of the foot in the gait cycle, just move the cursor under the image.

DYNAMIC ANALYSIS WIN-TRACK



Tool bar



Search: Access to patient file to load measurement.



Print. The arrow gives access to "Attaching documents to an exam" (see page 28) and "Scale 1 Printing" menu (see page 91).



Footprint measurements page 49).



Visualization of cartography. The arrow allows you to change visualization.



Space-time Calculation



Return to normal scale 1 : 1.



The "Convert to D" functionality allows you to select 2 feet and transform them into a "Dynamic win-pod" measurement to access other parameters (see page 53).



Animation of the sequence (see page 53).




Allows you to modify the animation speed.

DYNAMIC ANALYSIS WIN-TRACK

Footprint Analysis

Tools of visualization

You can crop or zoom the footprint (see page 43).

To take measurements, click  (see page 49).

Cartography

On the cartography, the following information is available:

417 ms : Time elapsed since the beginning of acquisition. Expressed in milliseconds (ms).

If **M** and **G** are not selected:


M : Point of maximum pressure.

⊕ : Centre of de thrust calculated on the displayed image.

If **G** and/or **M** is/are selected:

Visualization of the **Gaitline** (curve representing the evolution of the thrust center) and/or the curve representing the evolution of maximum point of support (**Maxline**).

Calculation on displayed image

Cursor	2281	g/cm²	
Cadence	81.4	Step/mm	
			
Area	141	114	138
Avg.P.	1097	1224	1192
Max.P.	2281	2880	2677



- **Cursor**: The pressure value of the support point which is pointed at with the mouse arrow is displayed in this box.
- **Cadence**: Cadence foot for the displayed image.

For each foot

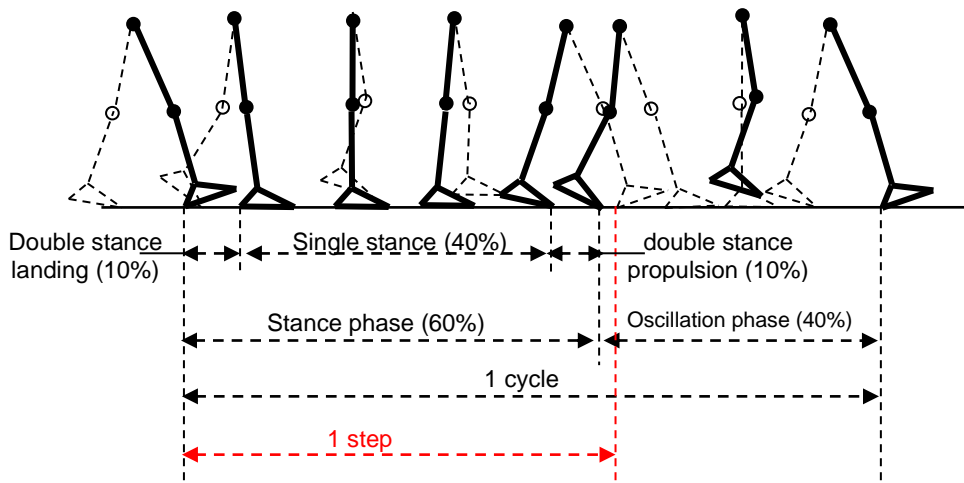
- **Area**: Support surface of the foot.
- **Max.P.**: The maximum pressure point measured.
- **Avg.P.**: Average pressure.

DYNAMIC ANALYSIS WIN-TRACK

Space-Time Calculation

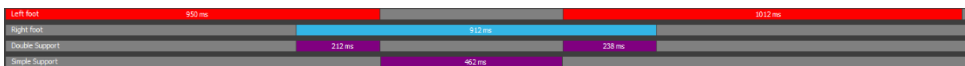
The button  allows displaying the Space-Time calculation window. The results can be printed by clicking on .

- **Step duration and length:** Timing and distance between the heel strike of one foot and the heel strike of the other foot.
 - **Gait cycle duration and length:** Timing and distance between the heel strike of one foot and the next heel strike of the same foot.
 - **Single stance duration:** Duration of the portion of the gait cycle when only one foot is in contact with the ground (around 40% of the cycle).
 - **Double stance duration:** Timing when both feet are in contact with the ground (around 10% of the cycle).
 - **Swing duration:** Time during which one foot is off the ground (around 40% of the cycle).
- Note:* the duration of a single stance is equivalent to the duration of the swing on the opposite foot.
- **Stride duration:** Time between the 1st contact on the ground and the last contact on the ground of the 2nd step for the same foot.



DYNAMIC ANALYSIS WIN-TRACK

The phases of the gait cycle



The first line displays the duration of the left foot strike in comparison to the entire duration of the walk through the platform.

The second displays the duration of the right foot, again in comparison to the entire duration of the walk through the platform.

The third and fourth lines displays the double and single support phases.

The different views



Standard view (See page 45).



Isopressure view (See page 46).



Percents view (See page 47).



Center of Pressure view (See page 47).



"Duration of contact" view.

This image displays the time length of foot support in each foot area during the step process : the darker the blue color, the longer the foot support lasts.



"Time x Pressure" (or "Impulse") view.

In dynamic analysis, hyper pressures and duration of contact can be studied, however the most interesting parameter is the **"Time x Pressure"** which defines **"Quantity of Charge"** applied for each foot area and allows to outline potential "risk areas" (particularly as a preventive measure for the "diabetic foot").

The cartography **"Time x Pressure"** can be easily analyzed: the darker the red color, the greater the charge quantity.



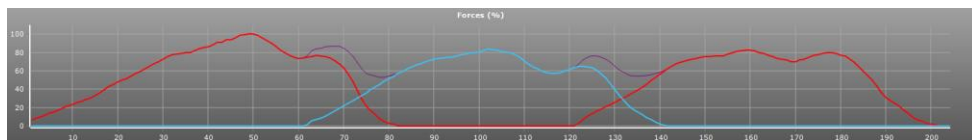
3D view (See page 48).

DYNAMIC ANALYSIS WIN-TRACK

Graphs

A certain number of parameters are calculated for each image of the dynamic progress (Forces, Surface, Maximum Pressure, Average Pressure).

The graphs display the evolution of these parameters throughout the step cycle using the colors assigned for each foot in the « phases of the gait cycle » section as well as when both feet are on the platform at the same time. The thicker graph displays the sum total of the forces.



Note: You have the option to visualize the foot pressure mapping (on the left side of the screen) at any time of the step process. Just click on the graph, hold and move the mouse from left to right.

To see the global image, move the cursor to the right side of the graphs.

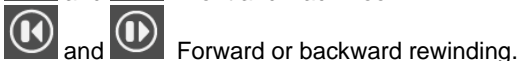
Click on the curve you want to be displayed:

- **Forces:** Evolution of the force during step progression (%).
- **Area:** Evolution of the support surface during step progression.
- **Avg. P.:** Evolution of the average pressure calculated for each image.
- **Max P.:** Evolution of the value of the « Max.pressure» through the images of the step progression.

DYNAMIC ANALYSIS WIN-TRACK

Mosaic tab

Display all the successive images of the step progression:



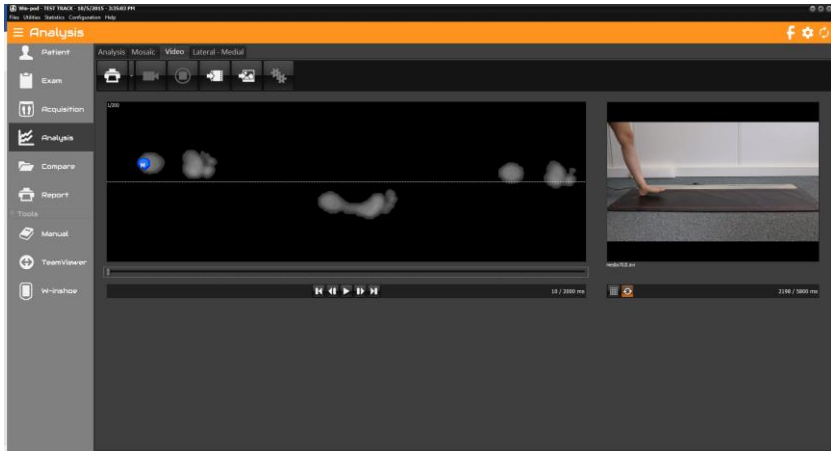
This tab allows you to select up to 9 images to print. You can choose these images manually by clicking on each of them, or click on "Automatic", they will then be spaced regularly on the scroll.

Note: when you double-click an image from mosaic, you can directly see the analysis of this image.

DYNAMIC ANALYSIS WIN-TRACK

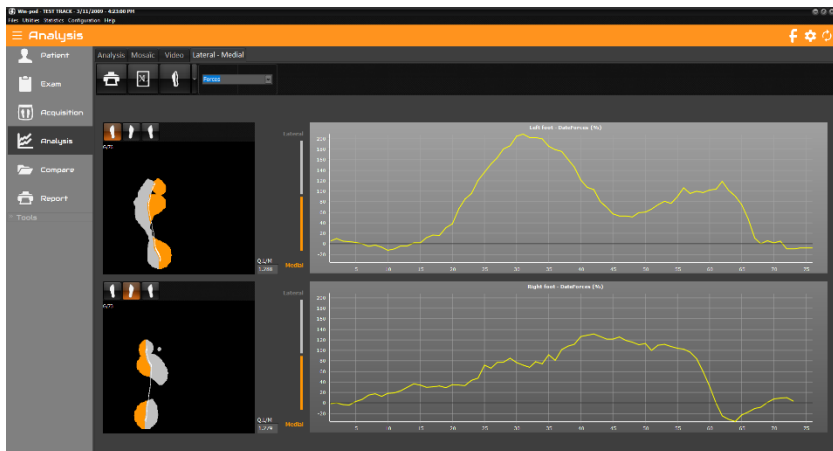
Video

Description page 63

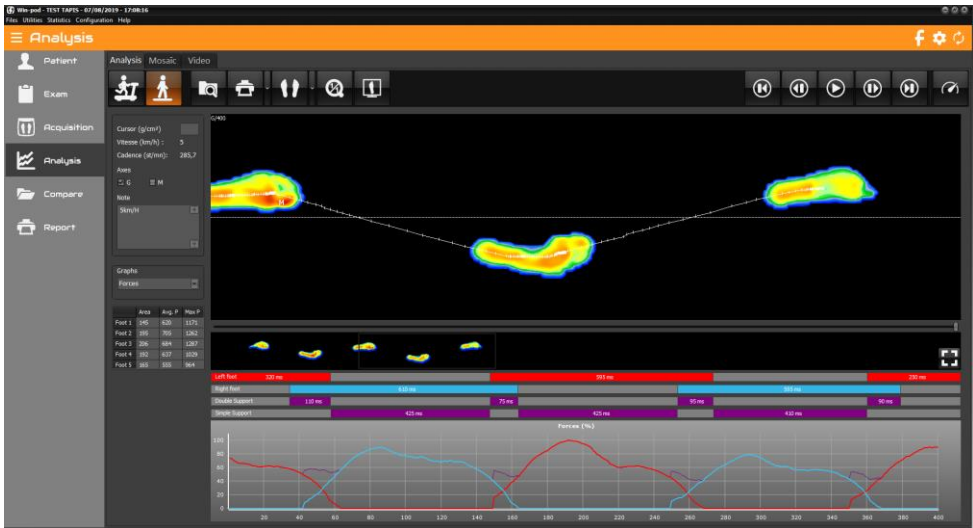


Medio-lateral Analysis

Description page 65



DYNAMIC ANALYSIS POWERTRACK



Tool bar



Treadmill or track visualization.



Search: Access to patient file to load measurement.



Print. The arrow gives access to "Attaching documents to an exam" (see page 28) and "Scale 1 Printing" menu (see page 91).



Visualization of cartography. The arrow allows you to change visualization.



Return to normal scale 1 : 1.



The "Convert to D" functionality allows you to select 2 feet and transform them into a "Dynamic win-pod" measurement to access other parameters (see page 53).



Animation of the sequence (see page 53).



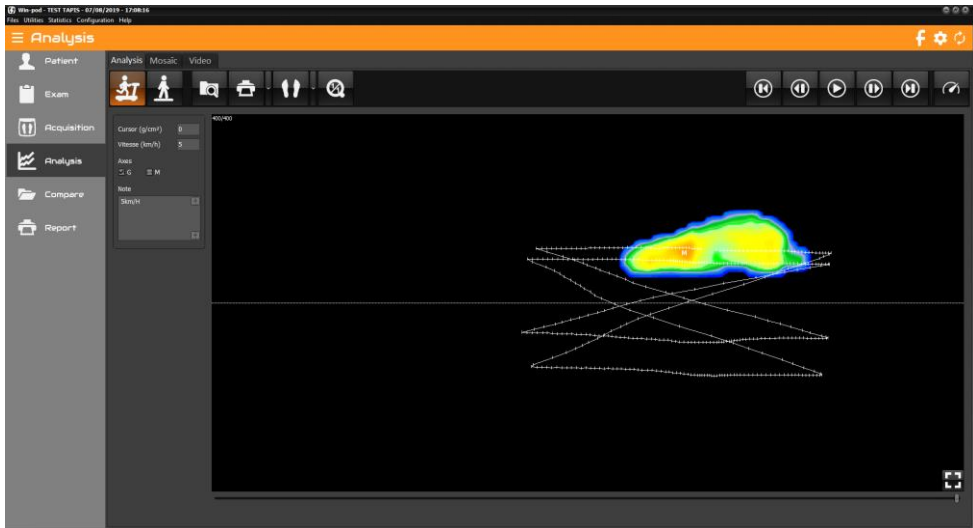
Allows you to modify the animation speed.

DYNAMIC ANALYSIS POWERTRACK

Treadmill visualization



: This visualization allows you to see the recording without modifying the pressures on the platform and thus to study the "butterfly".

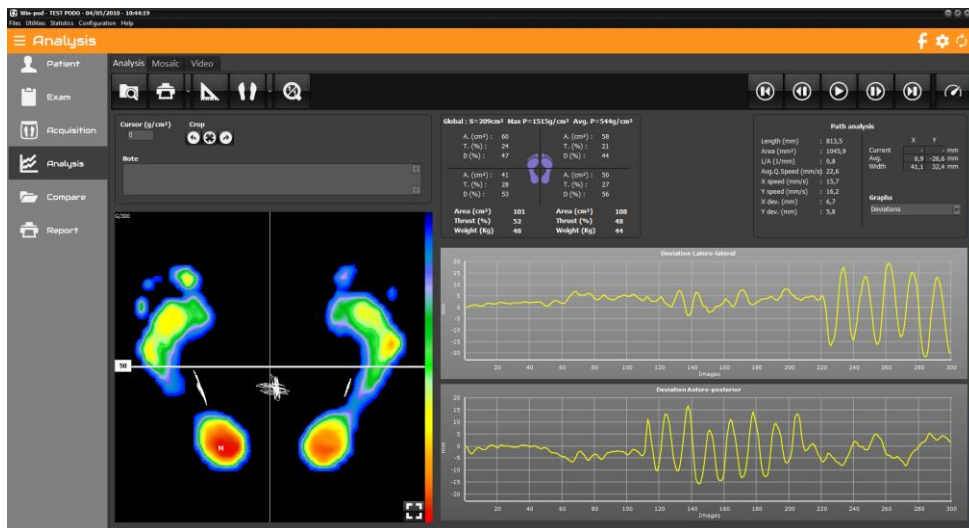


Track visualization



: This visualization allows you to transform the steps recorded on the treadmill into a step recorded on an infinite walking track.
See page 70 the dynamic analysis Win-track.

POSTURAL ANALYSIS



Tool bar



Search: Access to database to load a measurement.



Print. The arrow gives access to "Attaching documents to an exam" (see page 28) and "Scale 1 Printing" menu (see page 91).



Performing Footprint Measurements.



Visualization of cartography. The arrow allows you to change visualization.



Return to normal scale 1 : 1.



Animation of the sequence (see page 53).




Allows you to modify the animation speed.

POSTURAL ANALYSIS

Footprint Analysis

Visualization tools

You can crop or zoom the footprint (see page 43).

To take measurements, click  (see page 49).

Cartography

On the **cartography display**, the following information is available:



: Maximal pressure point (the absolute value is displayed in Max P).



: These three graphs (oscillograms) display the center of thrust under each foot and the global center of thrust primarily used in postural analysis.

417 ms

: Time elapse since the beginning of the acquisition in milliseconds (ms).

Calculation on both feet

- **Cursor**: In this box is displayed the foot pressure value on the point selected with the mouse.

Global : S=209cm² Max P=1515g/cm² Ave. P=544g/cm²

- **S**: Total surface area of both feet.
- **Max P**: Point M value : Maximal pressure on both feet.
- **Ave P**: Average pressure on both feet.

Calculations per sectors

Several calculations are performed in each of the 4 sectors (quadrants) of the podometer defined by the cross visible on the cartography. The front/back boundary can be moved with the mouse and the number to the left of this boundary indicates its position (percentage of the overall height). Double-clicking the number repositions the boundary to half the height.

POSTURAL ANALYSIS

For each sector

- **Area**: total footprint surface area in the sector.
- **Thrust**: Percentage of thrust in the sector, proportionally to the **2 feet** total thrust.
- **Distribution**: Percentage of support in the anterior sector and the posterior sector for each foot.

For each foot (in bold)

- **Area**: footprint surface area.
- **Thrust** total foot thrust.
- **Weight** distribution by foot.

Calculations related to the trace (curve between the feet)

- **Length** of the trajectory covered by the center of thrust (in all directions).
- **Area** of the closest ellipse to the stabilogram.
- The **Length/surface** ratio provides a “general value” of energy spent by the subject during the recording.
- The **quadratic average speed** parameter represents the vector sum of the antero-posterior and latero-lateral average speeds. This is not an algebraic sum but rather the square root of the sum of squares of the two previously mentioned speeds.
- The **average speed** (expressed in mm/sec) corresponds with the projection on the axis (Lat. in latero-lateral or frontal plan or Ant. in antero-posterior or sagittal plan) of the total displacements of the centre of thrust divided by the duration of the recording. Please note the displacements are measured in absolute value without addressing the direction of the patient’s movement. An elevated average speed of oscillations may indicate **postural instability**.
- The **variance or standard deviation** measures the scattering in relationship with the average position of the center of thrust. From a pure statistical point of view, 68% of the oscillations have amplitude between +1 and -1 standard deviation, 95% of the oscillations have amplitude between +2 and -2 standard deviations.

POSTURAL ANALYSIS

- **Cartesian Coordinates** of the global center of thrust averages: Average and on the displayed image: Current.
- **The Range** of the oscillations evaluates the distance in millimeters between the most anterior point (the farthest on the right) through which the center of thrust ran through and the most posterior point (the farthest on the left).
The range of the oscillations is independent from the positioning of the patient on the platform since the software searches for the extreme points reached by the center of thrust and then calculates the distance between these points along the antero-posterior axis (or latero-lateral).

The different views



Standard view (See page 45).



Isopressure view (See page 46).



Percents view (See page 47).



Center of Pressure view (See page 47).



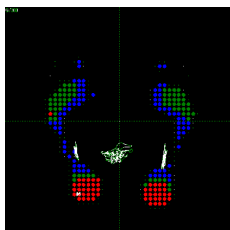
Contact duration view (See page 57).



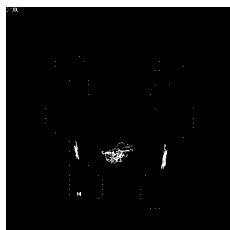
"Time x pressure" (or "Impulse") view (See page 57).



3D view (See page 48).



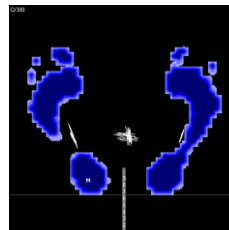
Isopressure



Center of Pressure



Impulse

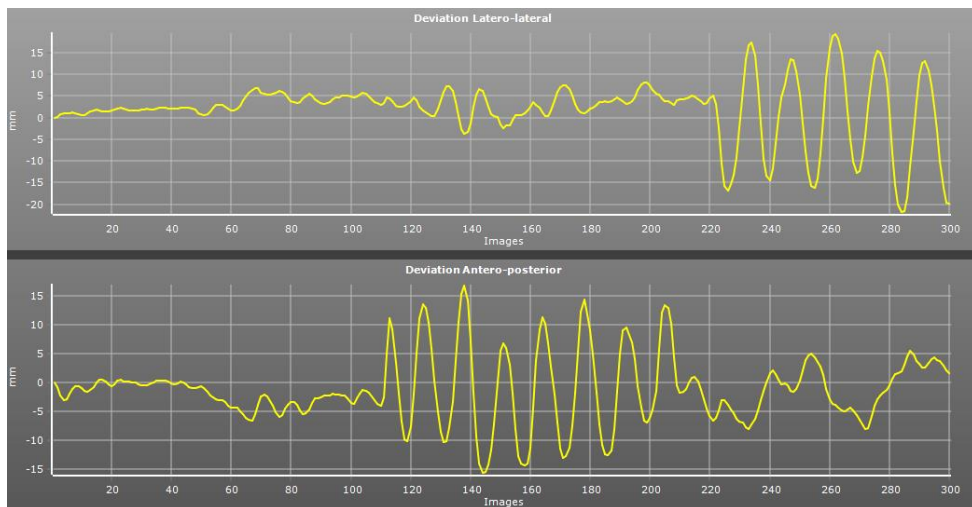


Contact duration

POSTURAL ANALYSIS

Graphs

Stabilometry analysis is performed through the study of 3 graphs associated with calculations of several physical parameters.



Click on the graph you want to select:

- **Deviations:** These graphs display the progression of the center of thrust in the antero-posterior and latero-lateral axes during the recording. The vertical values cover a range between 10mm to 50mm in the base of the polygon and along to the antero-posterior axis. The **positive values** on the graph **display the anterior or right side**, the **negative values** display represents **posterior or left side**.
- **Postural instability:** This postural instability displays the evolution of the speed of the body's center of thrust movement during the exam.

POSTURAL ANALYSIS

Mosaic tab

This mode is used for the analysis of major movements or high instability. It allows viewing all the acquisition images simultaneously and looking for the movement phases.



Print



and

Front and Back Zoom.



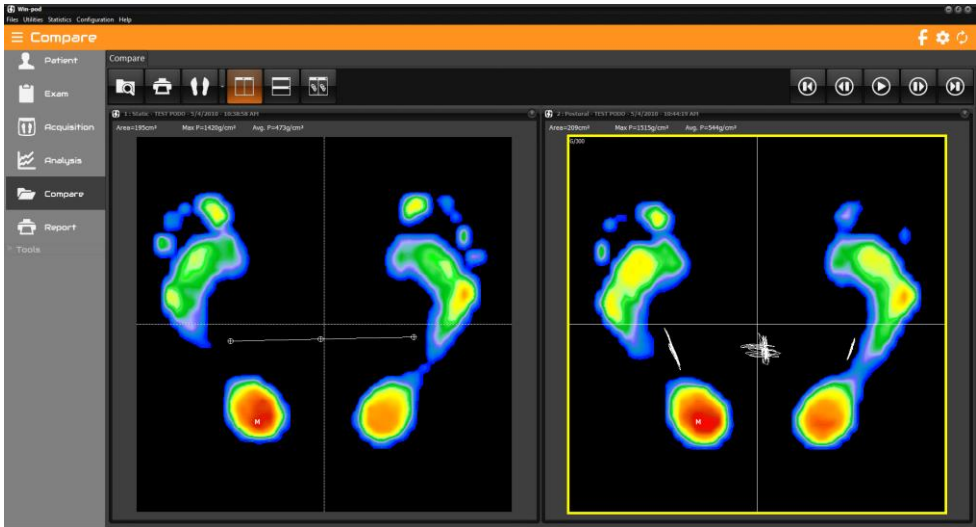
and

Forward or Backward display.

This tab allows you to select up to 9 images to print. You can choose these images manually by clicking on each of them, or click on "Automatic", they will then be spaced regularly on the acquisition.

Note: When you double-click on one image in the mosaic view, you directly access the analysis of that image.

COMPARISON



General information




It allows viewing several measurements simultaneously on the same screen.

This viewing mode provides the following options:


- **Patient follow up**: viewing measurements on different dates.
- **Comparative study** (Test/Re-Test): for example, viewing a static measurement without corrective procedure and with correction.
- **Comparison and correlation** of different types of measurements (viewing simultaneously a static, dynamic and postural measurement on the same patient).
- **Comparison between patients**.
- View a measurement in **different modes** of visualization (for example in Standard mode and Isopressure mode).

COMPARISON

Compare several measurements

- ✓ Load the measurement to compare by clicking on . Select the measurement in your patient database.
- ✓ Repeat the same procedure for all the measurement to compare. Buttons  and  allows viewing respectively vertical and horizontal mosaic.
- ✓ To unload a measurement, click on the white cross in the upper right corner of the window.

Note 1: The measurement circled in yellow corresponds to the measurement displayed in Analysis. You can modify it by clicking on the footprint of another measurement.

Note 2: You can also compare podometric measurements by clicking on .

Romberg Quotient


Romberg Quotient is calculated based on the length and surface parameters of 2 specific postural recordings: the first measurement is based on a recording with **eyes open** and the second with the **eyes closed**.

The recording procedure is described in the « postural acquisition » paragraph. If you want to perform the test of Romberg, you need to record 2 different postural measurements (in the same exam file).

- ✓ Open the patient's database.
- ✓ Create a new exam.
- ✓ Perform the first recording (eyes open).
- ✓ Perform a second recording (eyes closed).

For calculating Romberg's quotient, you need to:

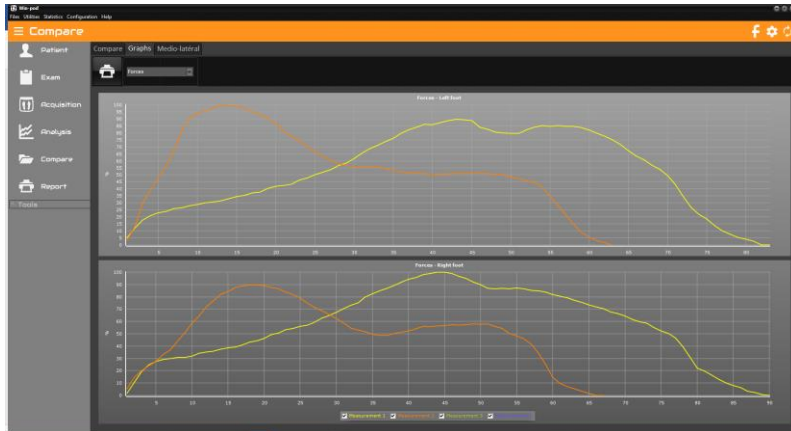
- ✓ Go to "**Comparison**".
- ✓ Load the "**eyes open**" and "**eyes closed**" recordings.

Visualize the quotients "**Area**" and "**Length**" by clicking on  (you can also compare postural measurements).

COMPARISON

Comparison of dynamic graphs

If several Dynamic measurements are loaded in "Comparison", you can see the curves associated with each measurement, superimposed in the "Graphs" tab (4 curves maximum):



The checkboxes under the curves allow you to visualize them or not.

Click on the desired curve: Forces, Surfaces, Avg P. or Max P. (see page 58).

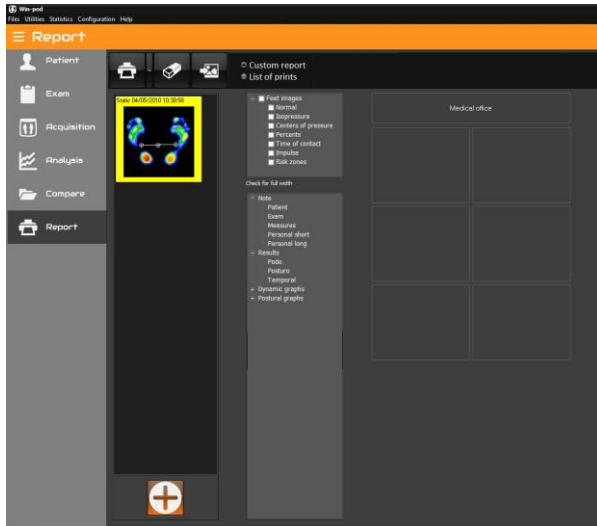
You can also see the overlay of the Medio-Lateral curves of the first 2 loaded Dynamic type measurements in Comparison:



REPORT

It is possible to compose two kinds of report from the different screens available in the software:

- The personalized report: on one page, in the 6 pre-positioned boxes, you can arrange the desired printable screens (cartography, curves, notes, etc.).
- A list of prints: you select a series of screens to print and the print will start (without preview) by positioning 6 screens per page, one behind the other.



Tool bar



Print a report. The arrow gives access to "Attaching documents to an exam" (see page 28).



Save a model report.



Load an existing report model.



Erase the report.





Link an existing image to live exam recording.

This key allows exploring the hard drive to load an image in **jpg**, **jpeg**, **png** or **bmp** format.

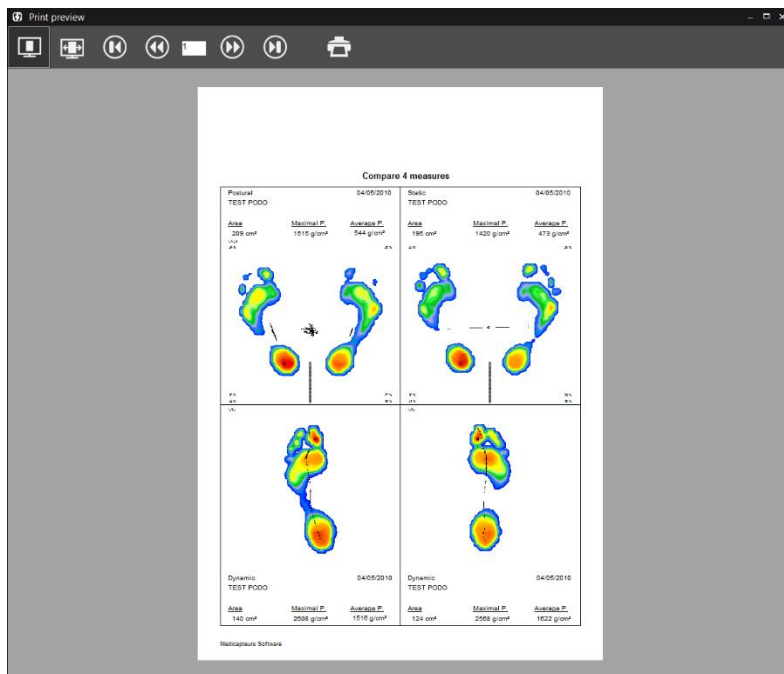
REPORT

Compose a report

- ✓ Select the measurements to be processed using the button . If you have loaded several measures, the one surrounded by yellow corresponds to the measure for which you are going to choose the information to print. You can delete the loaded measurements with a right click on the image.
- ✓ Double click on the screens you want to print.
For footprints, if you check the box corresponding to the visualization, it will be printed on 4 boxes.
- ✓ You can delete or edit a personal note with a right click on the thumbnail.
- ✓ **For custom report**, you can move chosen thumbnails. Once your report is composed, you can print it directly or save the model in order to recall it later for another measurement.
Note: The report template is only available for reports with 1 single measurement.
- ✓ **For the print list**, the number of thumbnails is not limited and the print will start without preview as soon as you click on .

EXPORT

Printing



Click on this button to access print menu.




Full page print preview.



View full screen preview.



Print.

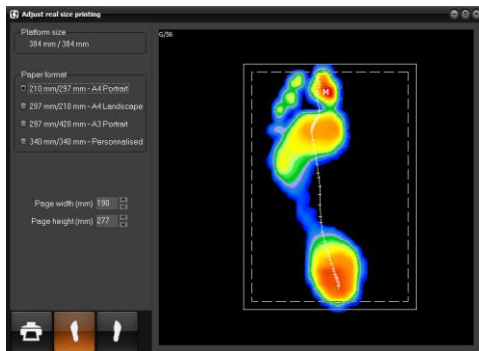
You can remove the print preview and printing will be launched when you click on  in the software. Go to *Configuration > Parameters > General* (see page 18).

Note: You can download and install pdf Creator or FOXIT, free softwares which appear as a printer and allow to create PDF format files.

EXPORT

Scale 1 Printing

In the "**Analysis**" section, you can print the foot pressure mapping in **real size** (within one captor resolution level).



Click on the arrow and select the menu "Print real size".

The "Centering of the real size footprint" appears:

This particular screen allows **defining the area to print**. In fact, the regular paper size is smaller than the active surface of the podometer; therefore, it is necessary to select the portion of the cartography you want to print.

Usually, you print one foot after the other.


The "**Format Paper**" window allows selecting a box which is superposed to the cartography.

This box coincides with the printable area which is properly displayed according to your paper size.

To position the box on the area to be printed, position the mouse inside the box. Left click and press on the mouse and move the box to the selected area.

Note 1: You can reduce the pre-selected "width" and "height" by clicking on the arrows .

Note 2: If you have a printer with A3 paper, you can print the 2 feet at the same time.

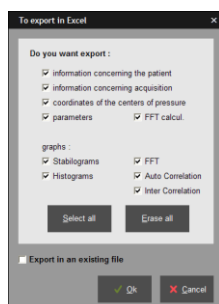
When the box is properly positioned on the footprint, click on  to access to the printing menu (see previous page).

EXPORT

Exporting data

By right clicking with the mouse on the footprints or the graphs on “Analysis”, you can:

- **Copy in the clipboard** the selected image.
- **Save to file** the selected image in Bitmap or Jpeg format. A window appears to target the file name and the folder.
- **Exporting series of recordings to Excel**. The window appears:



- ✓ Select the information to be exported.
 - ✓ If you have to export in an existing file, click on the corresponding check box.
 - ✓ Click on “Ok”. An excel file is open including multiple pages where each type of available information is presented.
 - ✓ Record the excel file on the hard drive.
- **Exporting matrix** (in “Analysis”). It allows creating a text file which contains all the captors’ numeric values. A window appears to specify the name and location of the file that is getting created.

EXPORT

Patient database backup

WARNING !

It is necessary to frequently backup the software patient database which includes all patients. In fact, a technical computer dysfunction may damage, even destroy all your data which then cannot be retrieved.

One backup per week is recommended.

Copy the folder **Data** with all its subfolders located in **the software installation directory (by default c:\win-pod)** to a backup unit, such as:

- CD or DVD writer
- ZIP Drive
- Another Hard drive
- USB Key

Reloading a saved patient database

If you are not certain of the procedure, please contact us.

Procedure to follow when installing the backup database on a new computer configuration:

- ✓ Install the software following the instruction manual.
- ✓ Launch the DBManager utility function which can be accessed through **Start/All programs/ Medicauteurs**.
- ✓ In the DBManager section:
 - Click on the command "**Import a database**".
 - The following window opens "Assistant for importing a database".
 - Select your backup unit.
 - Double-click on your backup DATA folder.
 - Then click on "**Next**" and then on "**Start**".
- ✓ When the import is completed all the patients are directly integrated in the software patient database. You can verify that importation was successfully completed by opening the software and then by clicking on "search" in the "Patient" section.
Verify then the displayed list and that the associated measurements are present.

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© MEDICAPTEURS - Toulouse - FRANCE - March 2023



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CE 0124
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