



DIGITSOLE®
PRO

Case Study

Evaluate, propose treatment and monitor the evolution of an elderly person's walk using DigitsolePro

The practitioner

Fabrice Millet has been a sport podiatrist since 2003, specialising in running and cycling, and is an instructor in the Sport Podiatry D.U. in Lyon.

He has a highly varied patient clientele, including athletes and ranging from children to the elderly. In an ad hoc manner, he uses a pressure platform as well as a video device to analyse running for athletes.



Since November 2019, Fabrice Millet has used DigitsolePro for all of his podiatry consultations, which allows him to detect problems with mobility in both walking and running, and to obtain a better evaluation of his patients by measuring objective biomechanical data that cannot be observed with the naked eye.



Patient information & reason for the consultation

Elderly person in Ehpad, with trouble walking and having already fallen.

The aim of this consultation is to optimise the rehabilitation program to better maintain autonomy, to be able to inform loved ones of the patient's walking status and to be able to follow their walking progress in the weeks that follow

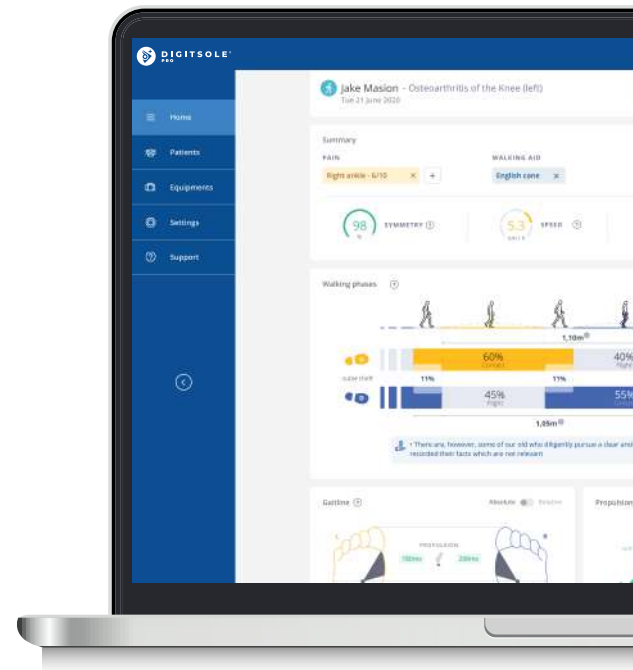
What information was collected during the clinical examination?

During the clinical examination, the patient did not have specific pain, but we observe deficits in the amplitudes of certain joints (especially the tibio-talar joint).

She has suffered several falls at home, which is why her family decided to place her in an establishment for dependent elderly persons.

The walking examination will be accompanied and done with DigitsolePro, lasting for 2 min.

She is wearing slippers.



Information collected using DigitsolePro during the walking examination.

Fabrice Millet uses DigitsolePro® for the dynamic analysis (walking or running depending on the patient).

He collects data on the patient's walking or running activity using the web interface available online at <https://app.DigitsolePro.com>.

The results are then presented to the patient, medical staff and loved ones, allowing the patient to integrate them into the treatment process and facilitating acceptance.

Different parameters will be used to complete the clinical examination:

Certain parameters will help to determine the quality of the resident's walk (angle of striking, propulsion ratio, height of toes from the ground) and others to quantify the walk.

• **The speed and cadence of the walk:** This is the average speed at which the patient walks during their analysis. If the walking speed decreases by 0.1km/h, the risk of falling increases.

The cadence determines the number of steps per minute, the norm being between 102 and 124 steps/minute for an adult.



In this case, very poor speed is also associated with a very poor cadence. Strength training will be proposed, and we will ask the patient to squat while holding a bar.

The aim is to see how this speed varies during the following weeks and months. But it does not demonstrate the quality of the walk.

After a little over a month of rehabilitation:



After two months of rehabilitation:



We see that the speed and cadence develop positively, in the context of the different parameters that demonstrate walking quality.

- **The length of the stride:** measure the distance between two heel contacts on the same side.



Very reduced distance, work on elongating the length of the step must be done.
In the physical therapy room, we place hoops between parallel bars in order to progressively elongate the stride.

We monitor the evolution of this parameter over the following weeks:

After a little over a month of rehabilitation:

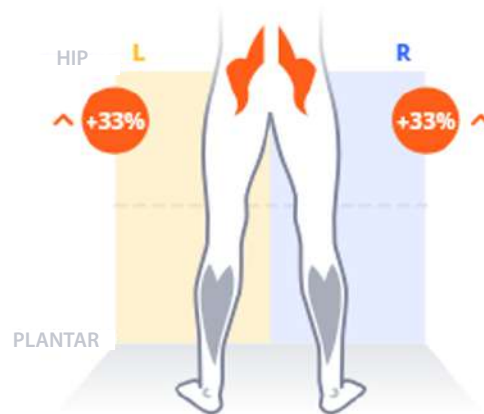


After two months of rehabilitation:



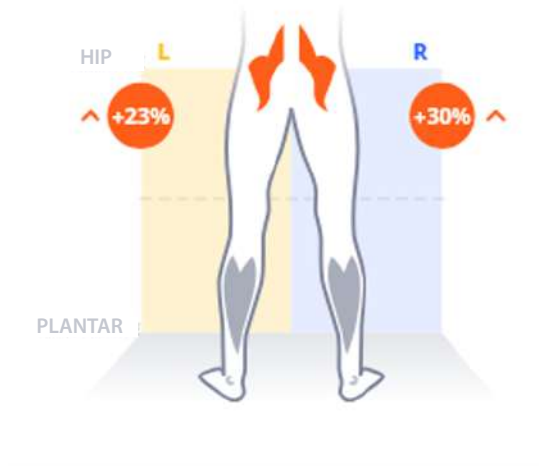
The development is positive - there is an elongation of the stride length.

- **The propulsion ratio:** this provides indications as to which muscles are the most utilised during propulsion, between hip flexors and plantar flexors.

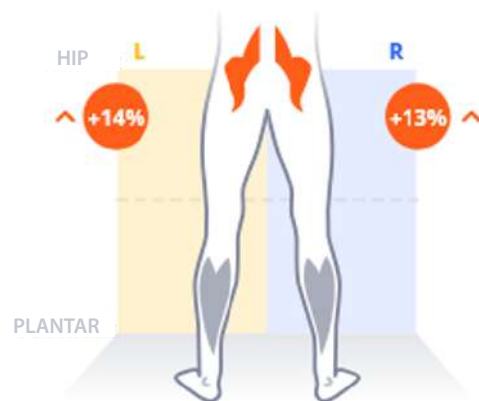


There is a greater use of the hip flexors. To increase the action of the plantar flexors, we have to put the patient on her toes.

After a little over a month of rehabilitation:

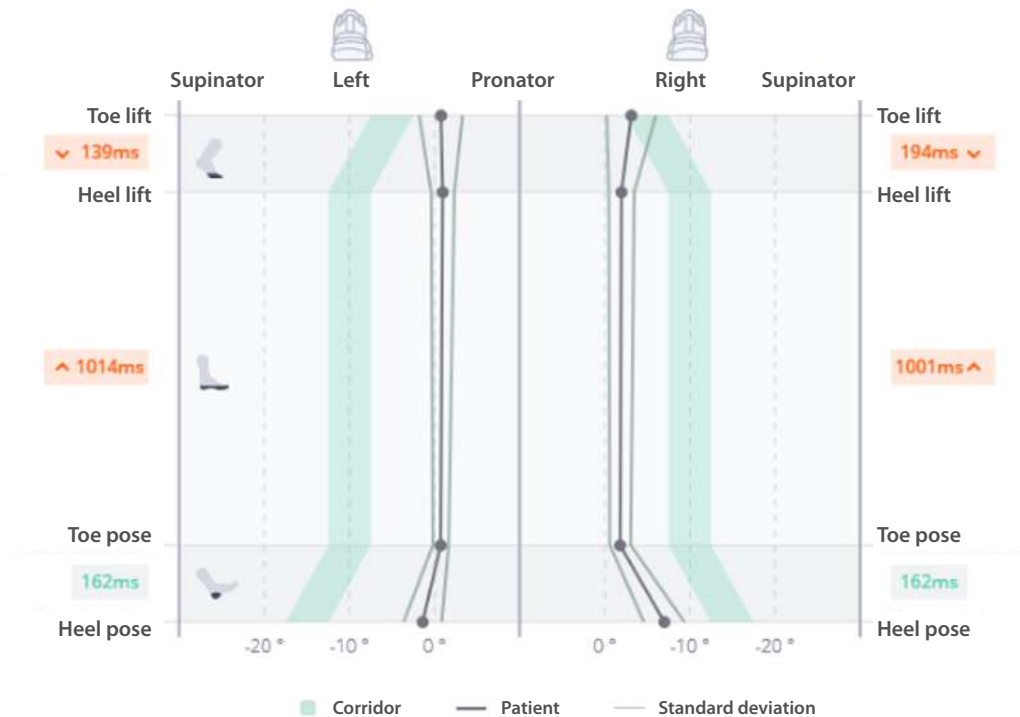


After two months of rehabilitation:



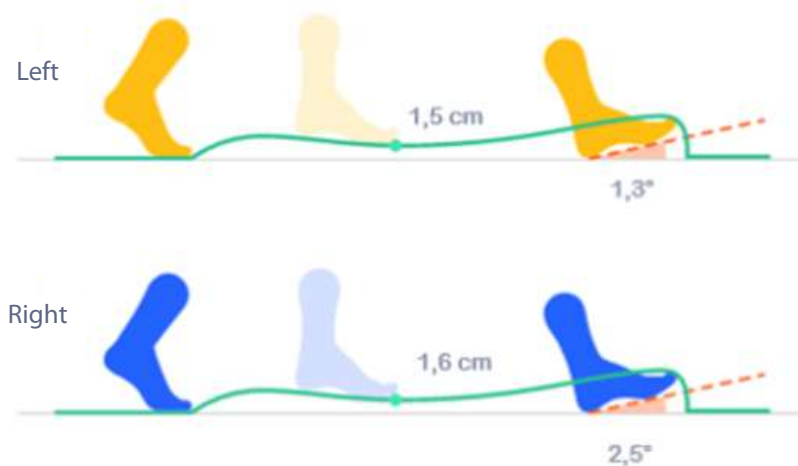
Positive development, ratios showing hip flexors decreasing.

- Walking pronation/supination angles:



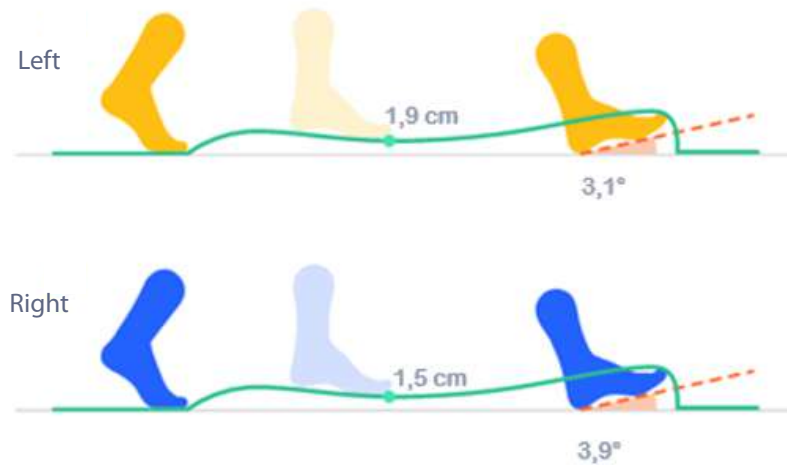
Significant pronation is measured. So that she has better stability, we will advise the patient to change shoes (she uses slippers for walking) so that the deformation is controlled better.

- **The striking angle and the height of the toes from the ground:** two important parameters that allow us to determine the quality of the walk:

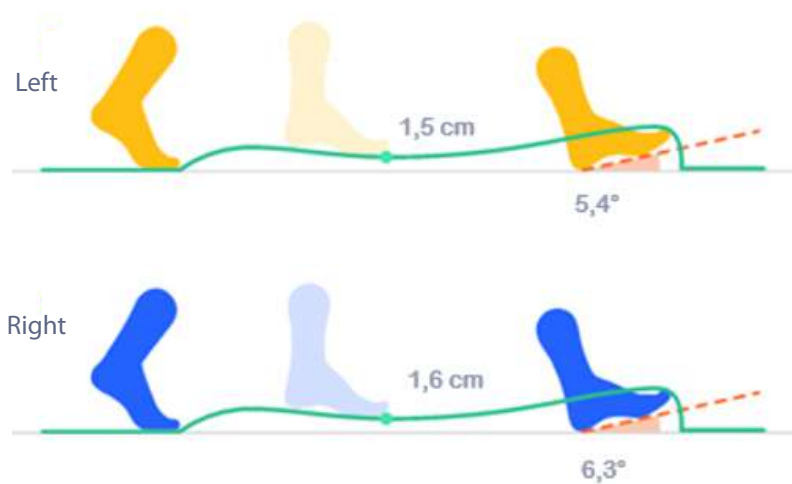


We note that the height of the step is good (if less than 2mm the risk of falling increases). However, the striking angle is too weak, and work will be done on the mobility of the ankle and on toe extensions.

After a little over a month of rehabilitation:



After two months of rehabilitation:



The patient has gained several degrees in the striking angle, work to be continued.

Conclusion

Following the first summary done with DigitsolePro, we were able to determine which parameters were the weakest.

Over the course of the weeks, we were able to track the changes in these parameters, also allowing the patient and her loved ones to visualise the progress that was being made and feel motivated.

Digitsole Pro, an international Establishment



ISO 27001 : 2017

International standard for information security. It's a requirement for establishing, implementing, maintaining and continually improving an information security management system (ISMS) –We make the information assets we hold more secure.



ISO 13485 : 2016

Regulatory requirements are increasingly stringent throughout every step of a product's life cycle, including service and delivery. Increasingly, organizations in the industry are expected to demonstrate their quality management processes and ensure best practice in everything they do. This internationally agreed standard sets out the requirements for a quality management system specific to the medical devices industry.



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