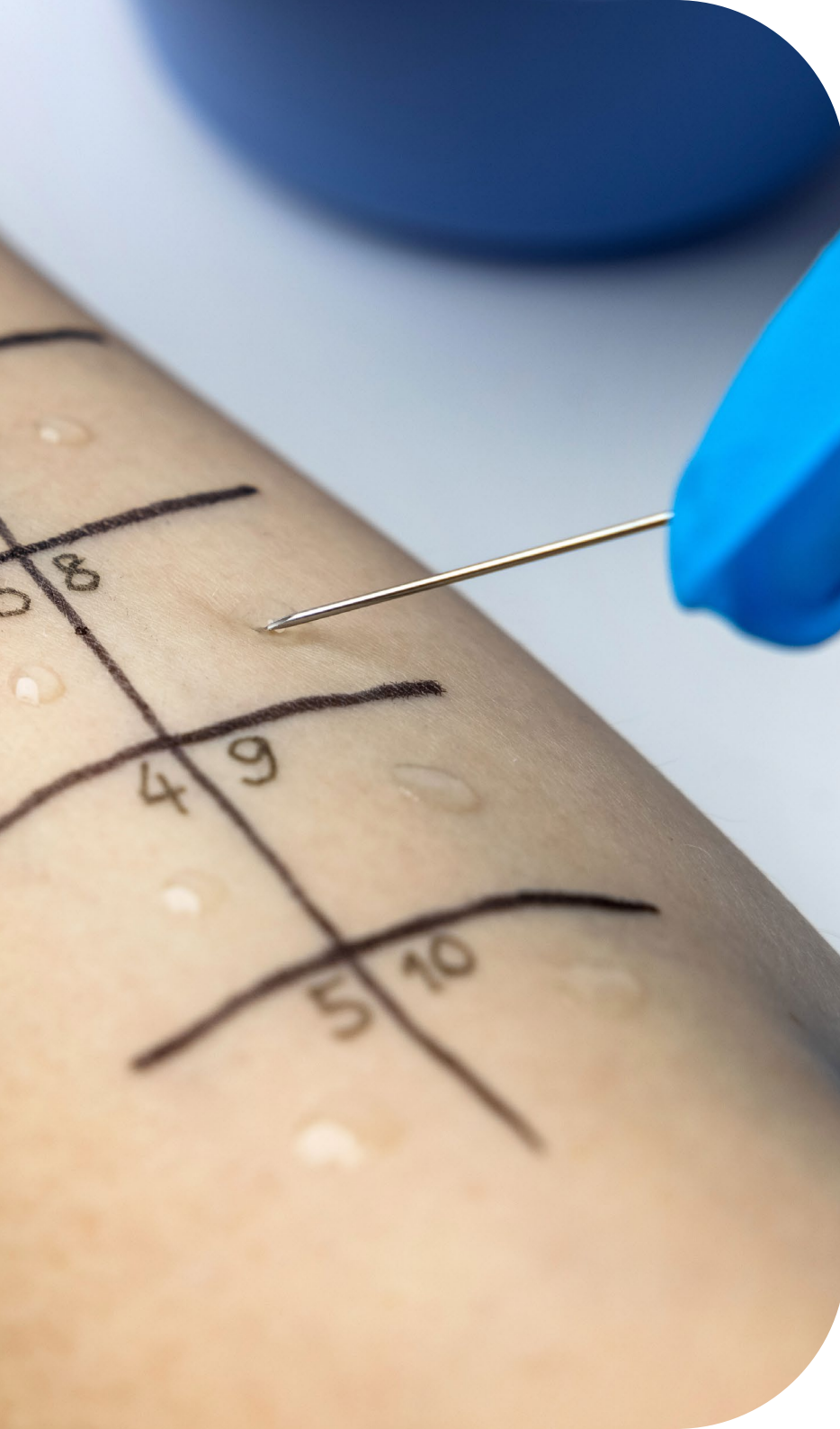


# Skin Prick Automated Test

Enhanced efficiency, standardised and patient-friendly





# Skin prick allergy testing has remained unchanged since 1959...

1959



**SPT**

## **Labour-intensive manual process**

- Time-consuming
- Repetitive task
- High administrative burden

## **Operator dependency**

- Trained allergy personnel required
- Operator dependent results
- Higher variability

## **Patient challenges**

- Slow and sequential pricking
- Delayed diagnosis due to waiting lists

## ...Until 2023. Introducing Skin Prick Automated Test.

2023

S.P.A.T.

### Enhanced efficiency

- Faster pricking and readout
- Less allergen consumption
- Digital results



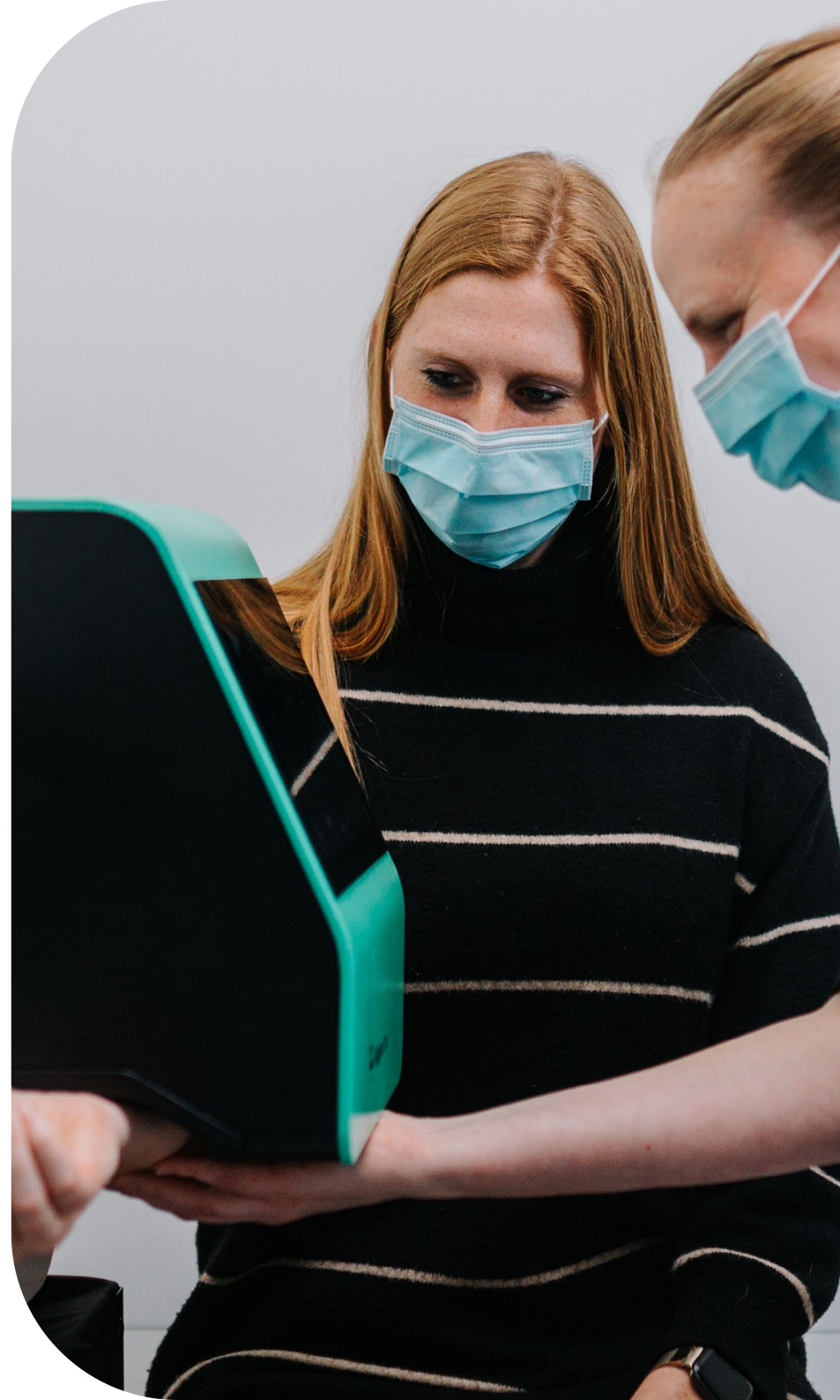
### Standardisation

- Automated pricking
- AI-assisted measurement
- Reduced variability & more consistent results



### Patient-friendly

- 12 simultaneous pricks in 20 seconds
- Less hands-on time, more time for patients





# How does it work?

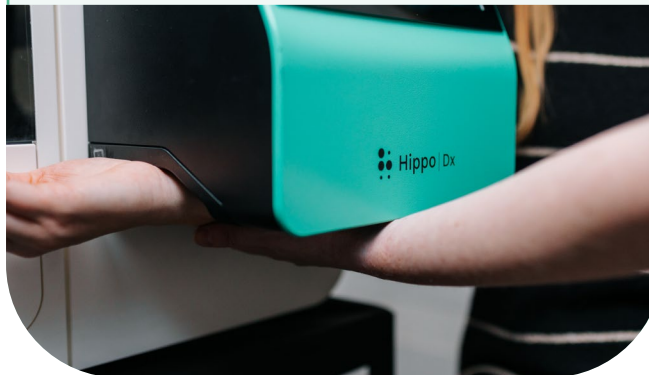
## Step 1: testing

- ✓ Load 12 sterile lancets in the device
- ✓ Select the allergens
- ✓ Enter patient and physician details
- ✓ Present the patient's arm to the device
- ✓ Confirm; prick test is done in 20 seconds



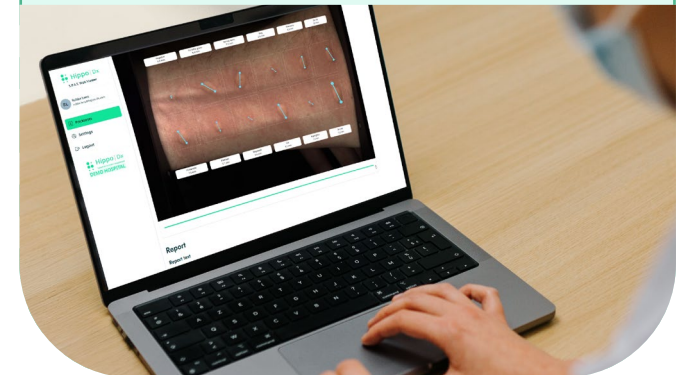
## Step 2: imaging

- ✓ After 15 minutes, present the patient's arm to the device
- ✓ Align the pricked locations with the screen dots
- ✓ Confirm; 35 images are captured in 10 seconds
- ✓ Results are ready in Web Viewer



## Step 3: readout

- ✓ Review AI-Assisted measurements
- ✓ Validate the test
- ✓ Create a PDF-report



### Tip

During the 15-minute waiting time for imaging, a new prick test with the next patient can be performed.

[Discover our detailed guidelines.](#)



## Cut-off value

A skin prick test with the S.P.A.T. device is considered positive if the longest wheal diameter is 4.5mm (Gorris et al., Allergy, 2023) or larger. This threshold is specifically determined for the S.P.A.T. device due to the type of lancets used and the rotating pricking technique.

### Tip

Learn more about the lancets on page 8.

## Allergy testing in children

The S.P.A.T. device is designed to perform skin prick tests for children aged 5 and older. While most patients in this age group can undergo a full 12-prick test, physicians have the option to perform the test with fewer pricks for patients with a shorter arm length.

## Allergens

The S.P.A.T. device is compatible with most of the commercially available allergen vials. This allows you to continue using allergens from your regular suppliers.

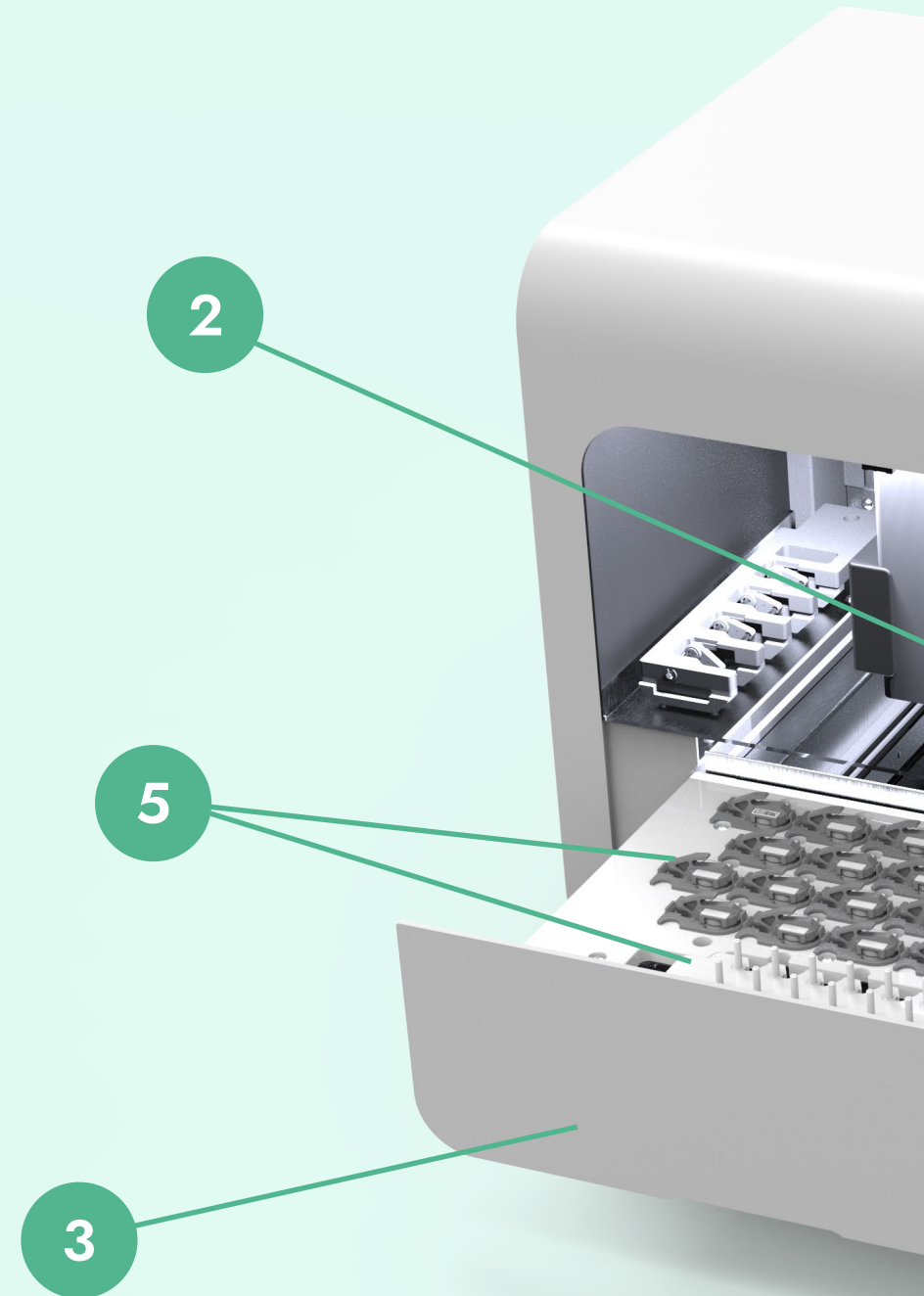
***“The device is incredibly user-friendly. Even with small children, it is very quick and minimally invasive.” – Dr. Lantsoght***

## Enhanced efficiency, standardised results and patient-friendly

Our CE-certified medical device takes the precision of traditional skin prick allergy testing to the next level with innovative technology. S.P.A.T. enhances the efficiency of testing and readout processes, offering standardised results, while improving patient comfort.

*“This innovative device provides standardisation that not only improves the efficiency and accuracy of tests but also ensures diagnostic consistency. It is reassuring to know that variations in results due to the person performing the test are now eliminated..”*

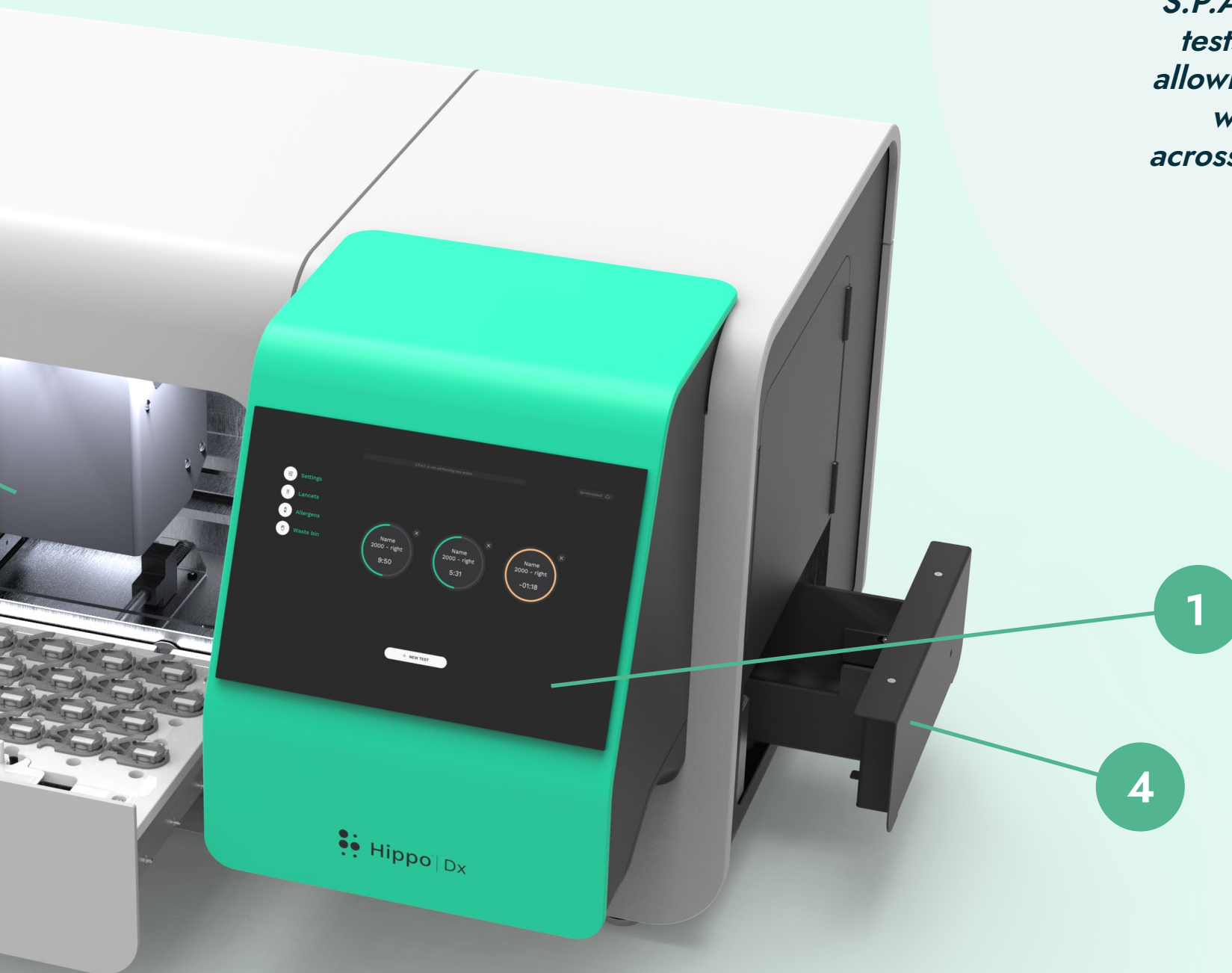
– Prof. Lefèbvre | CHU Liège





***“S.P.A.T. performs all skin prick tests at once in the same way, allowing comparisons over time within the same patient and across different patient groups”***

**– Dr. Van Gool**



## 1. Cockpit

The cockpit consists of a user interface, a camera system, and sensors. Beneath the cockpit, the patient's arm can be positioned for the prick test.

### Camera system

The camera captures 35 images of the pricked arm in 10 seconds. These images are sent to the Web Viewer, which generates a composite image with AI measurements. During the imaging, the lighting changes from different angles, creating a 3D effect on the composite image for improved visibility of the skin reactions.

#### Tip

Learn more about the Web Viewer on page 9.

### Sensors

The sensors verify that the patient's arm is properly positioned beneath the cockpit before starting the prick test.

### User interface

The user interface with a touch screen, is designed for optimal usability, guiding you through each step of the pricking and imaging process.

## 2. Prick tool

The prick tool is a key component of the S.P.A.T. device. It picks up the lancets, securely collects the allergens, and moves into the cockpit to apply the prick test on the arm. The 12 pricks are performed with uniform force, automatically adjusting to the arm's surface, reducing variability and improving the patient's experience. The prick tool contains a QR scanner that reads the unique QR codes on the caps of the allergen vials, ensuring accurate allergen identification.

## 3. Allergen tray

The allergen tray holds up to 24 vials and it is stored in an easily accessible drawer for quick replacement or addition of allergen vials. After each test session, the tray can be placed in the refrigerator to maintain allergen integrity.

## 4. Waste bin

After pricking, lancets are automatically discarded into a waste bin which alerts you when it is full. The bin can be easily removed from the device for disposal.



## 5. Consumables

### Lancet blisters

The sterile lancet blisters contain 12 lancets in each pack, designed for a single test with 12 different test solutions. Each lancet tip features two miniature prickers, applying a precise and minimal amount of allergen per drop, reducing allergen usage by threefold.

### Bottle caps

The bottle caps fit most commercially available allergen vials and can be used until the vial is replaced by a new one. The user can assign the allergen to the unique identifier on the cap using the QR scanner and touchscreen. The QR scanner then identifies the allergen location in the tray before each test. After the allergen collection, the caps are automatically closed to prevent cross-contamination.

Consult "[Bottle caps instructions for use](#)" for detailed guidelines.

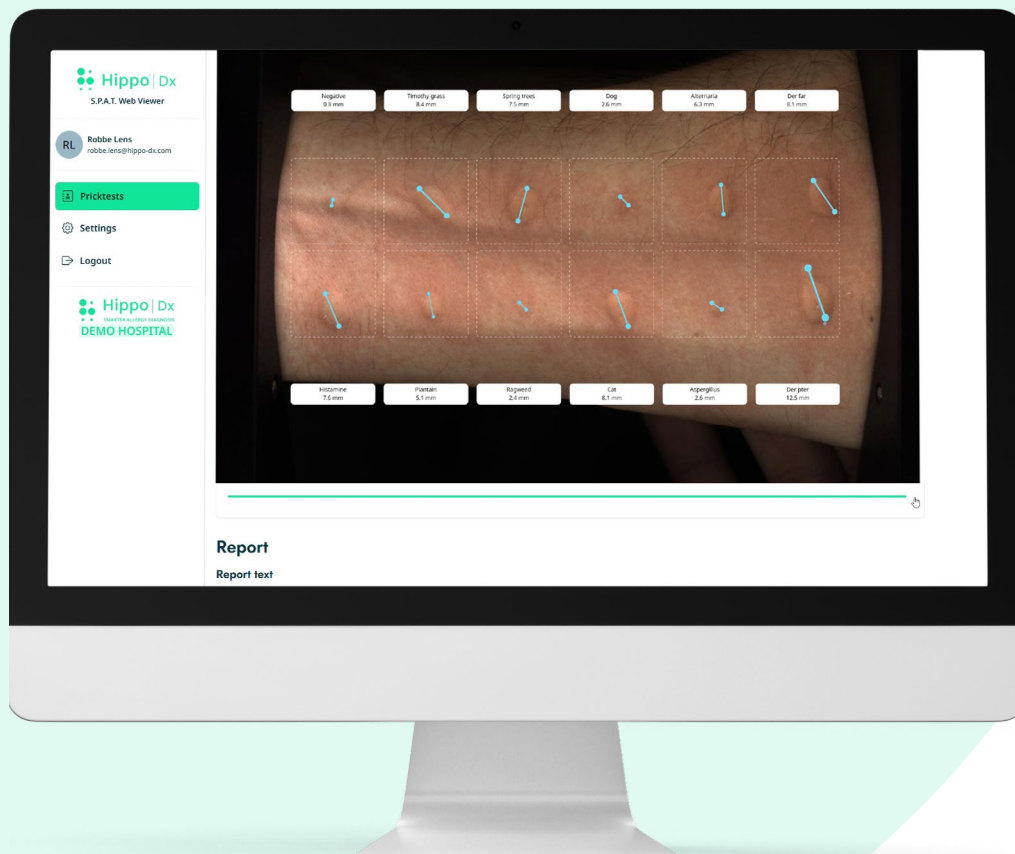
*"Thanks to S.P.A.T., anyone can now take a skin prick test. When this is widely known, S.P.A.T. will definitely become the new gold standard."*  
– Dr. Lantsoght



# Web Viewer software

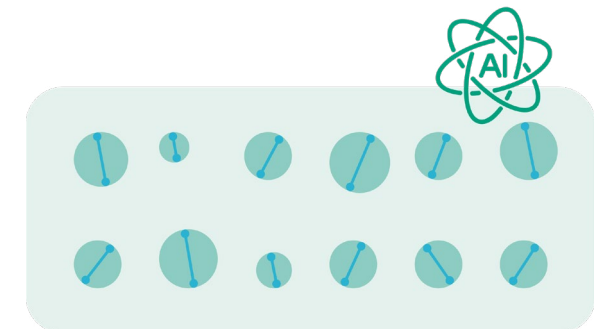
## Accurate digital results in just a few clicks

Physicians can easily access the Web Viewer via [my.hippo-dx.com](https://my.hippo-dx.com) to view test results. The Web Viewer offers filters by patient, physician, date, and status. Physicians can validate the results and generate a PDF report in just a few clicks. The report contains the full test results, including the annotated composite image, ready for download, printing or storage in the patient's file for seamless record-keeping.



## Composite image for enhanced visibility

The AI technology processes 35 images of the pricked locations into a single composite image, offering a clear and detailed view of the test results. For more granular analysis, users can scroll through the individual images with varying lighting conditions to consult each prick location in detail.



## AI-Assisted Readout: faster, standardised and accurate results

The AI-Assisted Readout feature accurately measures and automatically annotates the wheal size on the composite image, based on the cut-off value. It offers high accuracy and less variability and speeds up the readout process by 3.7 times compared to manual methods. This saves physicians' valuable time, allowing them to focus more on patient care while assisting them in the diagnostic pathways.

# Technology keeps on improving... So does S.P.A.T.

*"AI-Assisted Readout not only matches our diagnostic abilities but also provides an added layer of reliability and saves time, which is invaluable in a busy hospital setting"*

– Prof. Dr. Van Gerven  
UZ Leuven

## 1. Composite image

3D impression on 2D screen



35 images

AI



Constrained  
linear model



Composite image

## 2. AI-assisted readout

Accurate & time-saving readout of wheals

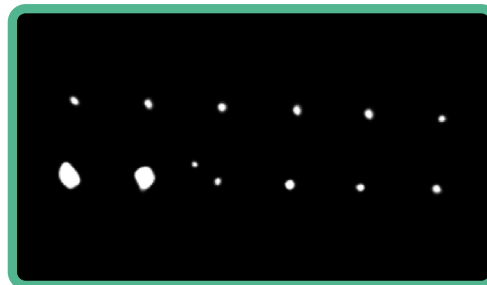


35 images

AI

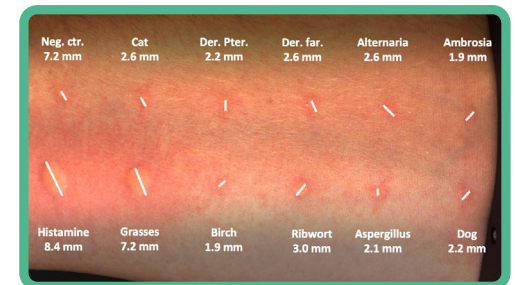


Convolutional  
neural network



Wheal prediction

Rule based  
algorithms



Wheal longest  
diameter estimates



# University Hospitals Leuven supports evidence-based innovation in skin prick allergy testing

## Challenges in traditional SPT

At University Hospitals Leuven, traditional skin prick testing (SPT) posed several challenges. It was a time-consuming manual process with inconsistent results and caused discomfort for patients, particularly children.

## Clinical studies

Prof. Dr. Van Gerven, ENT specialist, and her team collaborated with Hippo Dx in three clinical studies to assess S.P.A.T. Results showed improved reproducibility, fewer failed pricks, reduced allergen consumption, and greater patient comfort.

The AI-Assisted Readout study provided evidence for interpreting results with high accuracy and speed, compared to manual methods.

## From research to routine use

Beyond the clinical studies, the introduction of the S.P.A.T. device at University Hospitals Leuven significantly improved allergy testing. It provided consistent and reliable results while reducing manual tasks and offering digital outcomes. Patient comfort increased, especially for children, as all pricks were done in one go. Additionally, the device saved time for medical staff, allowing them to focus on other critical tasks while ensuring high-quality patient care.

***“It’s remarkably consistent, convenient, and time-saving for both patients and medical staff. Patients appreciate that all pricks are performed in one go, avoiding the distress associated with multiple pricks”***



**Prof. Dr. Van Gerven**  
UZ Leuven







# CHU Liège chooses to standardise skin prick tests with S.P.A.T.

## A revolution in allergy testing

Since adopting S.P.A.T. in 2023, the ENT department at CHU Liège, led by Prof. Lefèbvre, has experienced a remarkable transformation in its approach to allergy testing. The S.P.A.T. device not only enhances diagnostic precision but also significantly improves efficiency and patient comfort

## Standardisation & accuracy

Before S.P.A.T., traditional skin prick testing presented challenges with variability, as results could differ depending on who performed the test. With S.P.A.T., the hospital experienced an immediate and noticeable shift. The device's automated process delivers consistent and reliable results, reducing the chance of human error. The AI-assisted validation adds an extra layer of reliability, ensuring every test result meets the same high standard of accuracy.

## Efficiency & patient comfort

With optimised allergen use, more tests can be conducted per vial, reducing waiting times. Patients experience less discomfort, and medical staff benefit from reduced workload.

***“S.P.A.T. is not just a tool—it’s a breakthrough that transforms allergy testing and sets a new standard in our practice.”***



**Prof. Philippe Lefèbvre**  
**CHU Liège**

# Clinical study results

## Reduced intra-subject variability of an automated skin prick test device compared to a manual test

### Study methodology

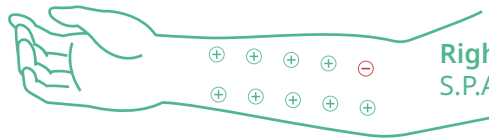


118 participants



UZ Leuven

Principal Investigator: Prof. Dr. Peter Hellings



Right arm  
S.P.A.T.

⊕ Histamine (9x)

⊖ Glycerol (1x)

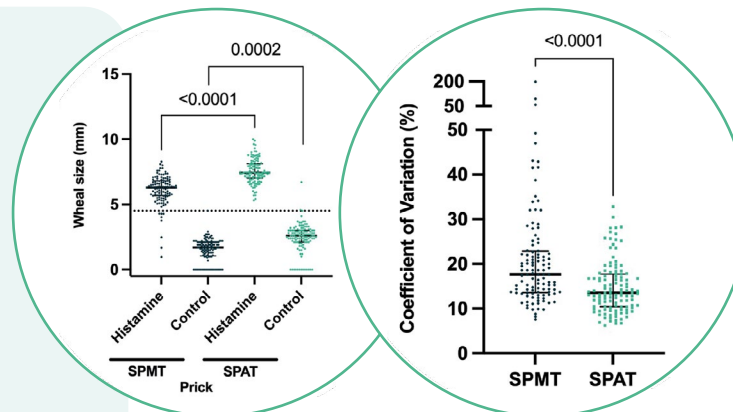


Left arm  
S.P.M.T.

- Variability between histamine pricks
- Visual analogue scale discomfort

### Study results

- S.P.A.T. shows significantly less variability in histamine wheal sizes.
- S.P.A.T. shows larger wheal sizes for both control and histamine pricks.
- S.P.A.T. and S.P.M.T. are equally accurate in distinguishing histamine and control wheals.



Better reproducibility  
and tolerance



Less failed pricks



Less allergen  
consumption



Improved patient  
experience

Read the  
full scientific  
publication.

[Click here](#)

**Peer-reviewed publication:**  
Gorris S, et al. Reduced intra-subject variability of an automated skin prick test device compared to a manual test. Allergy. 2023 May;78(5):1366-1368.

# Clinical study results

## Skin Prick Automated Test device offers more reliable allergy test results compared to a manual skin prick test

### Study methodology

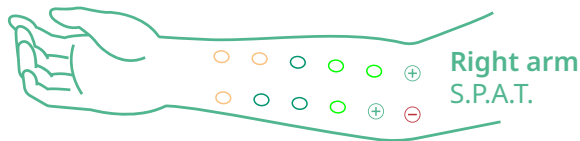


110 participants

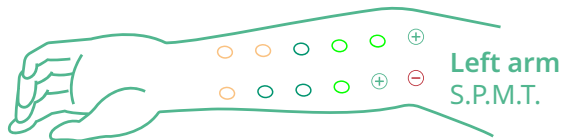


AZ Herentals

Principal Investigator: Dr. Hendrik Sebrechts



Right arm  
S.P.A.T.



Left arm  
S.P.M.T.



House dust mite (3x)



Timothy grass pollen (3x)



Birch pollen (3x)



Histamine (2x)

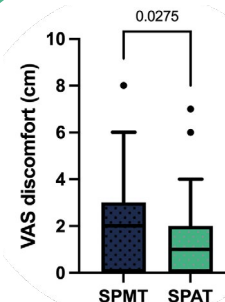
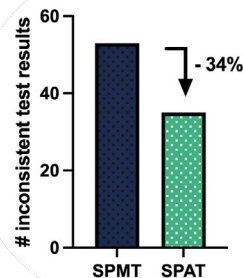


Glycerol (1x)

- **Consistent:** 3x positive or 3x negative test results
- **Inconsistent:** Other combinations

### Study results

- S.P.A.T. has 34% less inconsistent test results.
- S.P.A.T. shows less variation for house dust mite, timothy, and birch.
- S.P.A.T. participants report significantly less subjective discomfort.



More consistent and less variable allergy testing



Improved patient experience

Read the full scientific publication.

[Click here](#)

**Peer-reviewed publication:**  
Seys SF, et al. Skin Prick Automated Test device offers more reliable allergy test results compared to a manual skin prick test. Rhinology 62-2: 216-222, 2024

## About us

Hippo Dx is a MedTech company specialised in the automation, standardisation, and digitisation of skin prick allergy testing. We are a team of physicians, engineers, scientists, and entrepreneurs on a mission to enhance allergy patient care by combining evidence-based medicine with pioneering technology.

Beyond our focus on driving innovation, we are committed to providing fast and efficient technical servicing and support. Our customer support team ensures a seamless operation of your devices, providing comprehensive training, clear guidelines, and responsive remote and on-site maintenance to assist you at every stage.

## Contact us

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