TrichoScan® Smart Version 1.0

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Introduction

Background

Thinning hair and hair loss is a common complaint in clinical dermatology. In established cases of androgenetic alopecia (AGA) characteristic patterns are easily discernible. However, the clinician is often challenged by patients, especially females, with initial stages of AGA where hair loss is reported but alopecia is not visibly discernable, or where the effect of treatment attempts are hard to measure.

Often, described hair problems are hard to understand clinically, or success or failure of a chosen therapy is only conditionally assessable.

Therefore, there is a practical need for simple methods to reproducibly measure hair growth and hair loss. TrichoScan® Smart is a modern solution fulfilling these needs.

TrichoScan® Smart is able to measure hair volume, hair density, hair count, hair length, vellus hair count and length, and terminal hair count and length. These parameters of hair measurement can help to determine the success of a hair growth treatment much better than measuring the telogen rate alone.

TrichoScan® Smart enables an accurate analysis of hair density. It can be used to demonstrate hair growth changes in response to treatments for hair loss. Using TrichoScan® Smart improves patient compliance with treatment protocols and allows for an exact analysis of therapeutic response. Conversely, TrichoScan® Smart can also be used just as effectively to measure the success of depilation treatments for unwanted hair growth..

TrichoScan® Smart is an easy to use clinical application that significantly enhances the quality and accuracy of hair analysis for the benefit of both doctor and patient.

TrichoScan® Smart Procedure

A review of the procedure for taking and analyzing images is shown below.

Start the TrichoScan® Smart software program

Start the TrichoScan® Smart software program on the computer and make sure the TrichoScan® Smart camera is connected to the correct computer USB port.

Select the optimal measuring site

For an accurate TrichoScan® Smart analysis, the hair length in the scalp skin area to be measured must be approximately 1 mm. Do not choose the parting or the whorl regions of the scalp in order to avoid biased results. These areas tend to have a lower natural hair density.

It is not necessary to dye the hair to use TrichoScan® Smart. However, to ensure accuracy of results, please remove any clipped hairs with a brush, sticky tape, or similar.

Make the image

To ensure a clear image is produced by the TrichoScan® Smart camera, first spray some alcohol-based disinfectant-spray on the area to be measured to avoid unwanted light reflection. For the image recording, lightly press the camera cover glass onto the skin of the head- or body area to be measured. The red button should face upwards for easy access. Turn the focus zoom wheel to its lowest setting. Now turn the zoom wheel carefully up until you get a focused image. Press the red button to take the image.

TrichoScan® Smart – Analysis

When you start the TrichoScan® Smart software program the selected image will be automatically loaded into the software program. The scale for this picture will be automatically adjusted (see ImageDB manual).
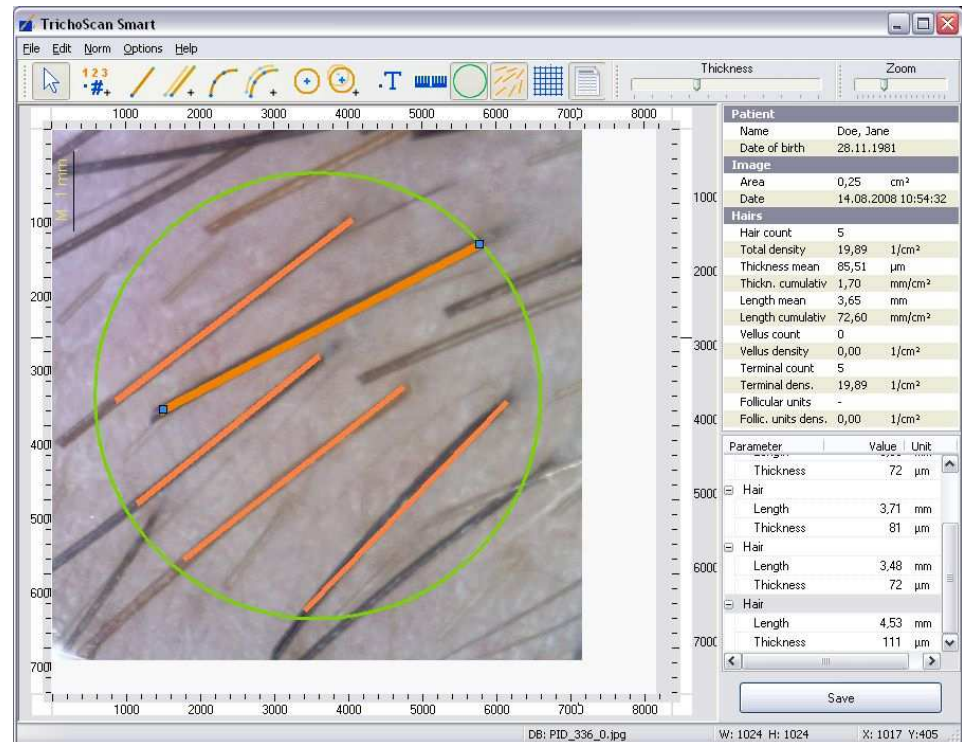
By clicking on the mouse icon the TrichoScan® Smart software program will be placed in selection mode. In this mode, objects can be selected and altered. The following options can be chosen.

Easy hair count

Use this tool if you only want to determine the hair count and hair density in the image shown.

Select the count tool icon for a quick hair count. Click on every single hair that you want to count.

If you have finished the hair count, click on the count tool icon again and the program will automatically return to the selection mode.

Measurement of straight hairs

Select the measurement tool icon for the measurement of straight hairs.

For repeated measurements, choose the multiple measurement tool icon . With the first click you will set the starting point, with the second click the end point.

Measurement of curved hairs

Select the curved hair measurement tool icon for the measurement of curved hairs. For a repeated measurement choose the multiple measurement tool icon . With the first click you will set the starting point with the second click the end point.

Measurement of follicular units

Select the follicular unit measurement tool icon for the measurement of follicular units. For repeated measurement choose the multiple follicular unit measurement tool icon .

The first click will create an ellipse over the image displayed. By moving the mouse you can increase or reduce the size of the ellipse. With the second click the dimension and the position of the ellipse will be set.

With another click on the ellipse and by holding down the left mouse button you can move the ellipse. Use the squares on the edge to resize the ellipse.

On holding down the CTRL key the tool will create a circle.

Label tool

The text label tool icon can be used to add text labeling to all measured objects. Click this icon to enter the text labeling mode.

Right clicking on an object will open a pop-up window in which the text label option can also selected. When more than one object is selected, these can labeled at the same time by clicking menu "options" >> "label".

If no object is selected, the label tool can also be used for placing text labels anywhere over the workspace.

Graphical scale tool

Using the scale tool icon you can calibrate the software for use with images taken with other cameras.

If the image scale for a recording system is known it can be entered directly into the scale window as a number in unit pixels/mm.

Switch the measure circle tool on and off

The area of the measure circle is used for all density calculations.

By clicking on the tool the measure circle can be switched off. With an another click the measure circle can be switched on again. Showing or hiding of the measurment circle does not influence the results.

Show and hide hairs

Click the manual hair count tool icon to show or hide the manually counted hair. This might be helpful for the exact adjustment of the hair diameter. Showing or hiding of the measurment lines does not influence the results.

Result table

The result table of the calculations made from the displayed image can be hidden or displayed by clicking the show results icon .

Measurement of hair diameters

With the first mouse click on a hair fiber you will set the starting point with the second click you will set the end point. By scrolling the mouse wheel you can make the hair thinner or thicker.

Alternatively, you can also use the slider tool "thickness" at the top right side of the program window.

Zoom

A measured object can be activated in the workspace by clicking on the object's edge. The activated object can be enlarged or reduced in size by clicking on the corner points of the object. It can also be moved by dragging and dropping the object.

Saving the measurement

The measurement can be saved by clicking the tool "save".

Software Description

Image transmission

The transmission of the digital image to the TrichoScan® Smart software takes place automatically. You can find more details in the documentation for the recording system.

Printing the results

In order to print the image and the corresponding results click the in the programs menu "file" >> "print". This will open the print preview window.

Support

Up to date and additional information about TrichoScan® Smart can be found at www.trichoscan.com.

In case of any problems concerning the recording of images and technical issues of the recording system, please contact us.

Medical questions such as enquiries about measurement results can be addressed to Prof. Rolf Hoffmann MD in Freiburg, Germany (info@tricholog.de, fax: ++49 761-6800113).

If you have any technical problems with the TrichoScan® Smart camera, or TrichoScan® Smart software faults, please contact the TrichoScan® Smart engineers (info@datinf.de, fax: +49 7071 253 6962).

Certification

A certification-list can be found on the TrichoScan® Smart website (www.trichoscan.com). However certification is only possible for medical doctors who have a licensed TrichoScan® Smart system. For more information please contact your distributor.

Hair Parameters

Hair density (n/cm2): With the TrichoScan®-Smart edition it is possible to calculate the number of hairs detected (hair count) and the hair density (hairs / cm2). Please note that due to the image resolution of digital cameras the TrichoScan software cannot detect very fine hairs (approx. less than 10μm diameter). As digital camera image resolution improves, these limitations may change in the future.

Hair thickness (mm and μm/cm2): With the TrichoScan®-Smart edition it is possible to calculate the cumulative (hair mass) and mean thickness of all hairs measured.

Terminal hair density (n/cm2): By definition a terminal hair is thicker than 40μm. TrichoScan® Smart uses this value to identify terminal hairs in images. The number of terminal hairs relative to vellus hairs is also calculated and provided in the analysis results.

Vellus hair density (n/cm2): By definition a vellus hair is thinner than 40μm. TrichoScan® Smart uses this value to identify vellus hairs in images. The number of vellus hairs relative to terminal hairs is also calculated and provided in the analysis results.

Interpretation

The TrichoScan® Smart ist not a diagnostic device. However, with this tool you can follow the response of the patient to treatment. TrichoScan® Smart can also be sued to conduct general dermoscopy of the scalp.

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