

The Art of Hair Diagnosis!



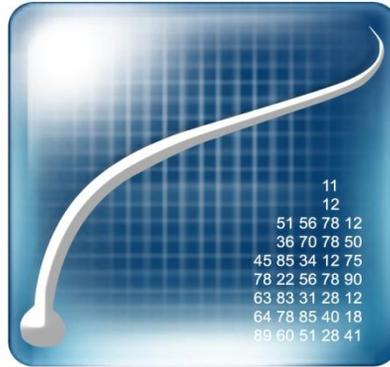
Professional hair and scalp diagnostic software
TrichoSciencePro[®]

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Professional hair and scalp diagnostic software

TrichoSciencePro[©]



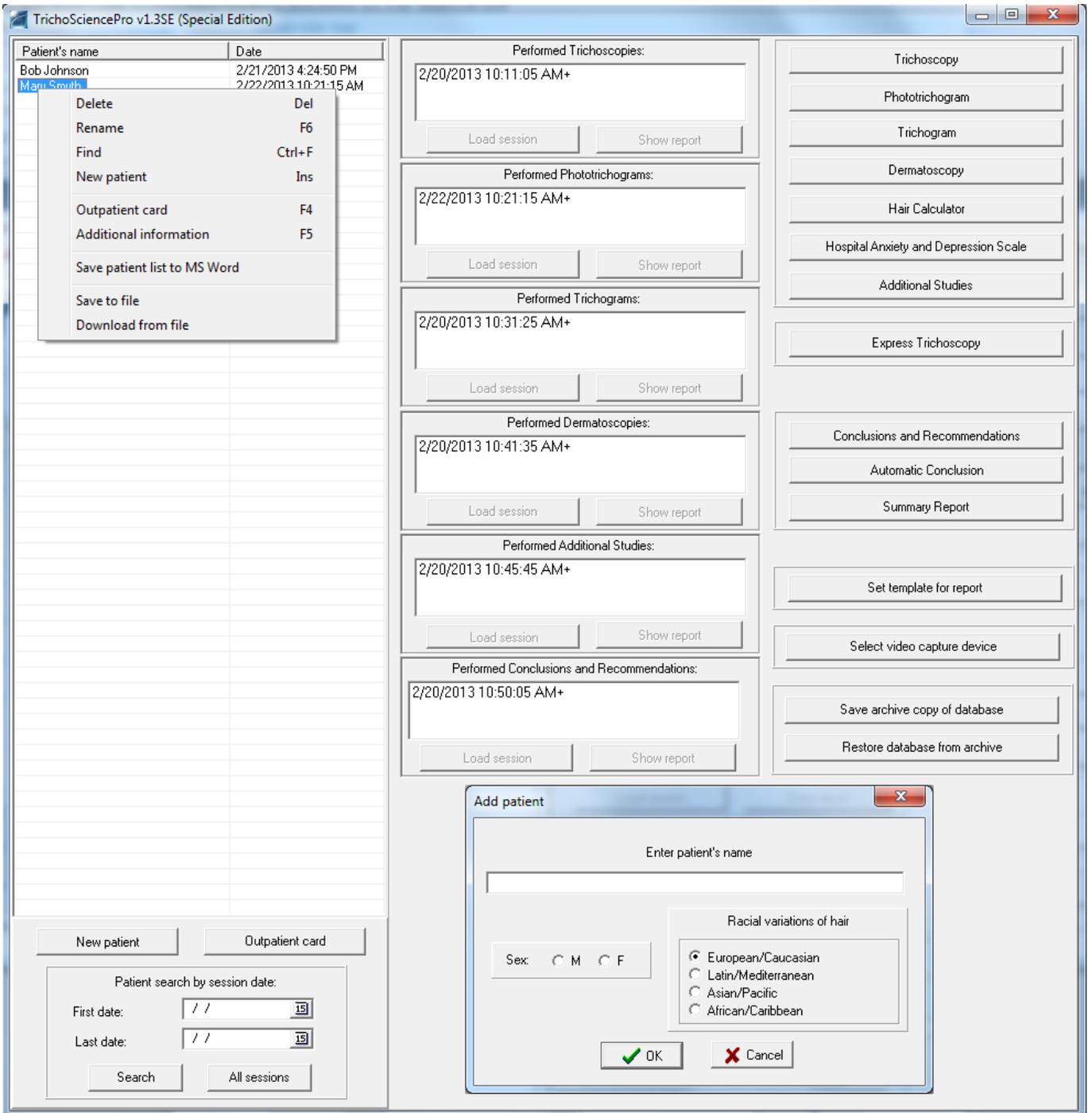
TrichoSciencePro ©

Professional hair and scalp diagnostic software

PRESENTATION

The latest program version of TrichoSciencePro © version 1.3SE was released in 2015 and has numerous important updates and additions in comparison to older TrichoScience © versions. The program incorporates some of the most relevant diagnostic and analytic studies in Trichology accumulated thus far. It also meets rapidly increasing demands for a single software source to perform and manage all typical clinical and non-clinical practice-associated activities. The program allows to run complete Trichoscopy, Phototrichogram, Trichogram, Dermatoscopy diagnostic studies. In addition, it offers modules to evaluate scalp pigmented lesions, perform global photograph studies, run fully automatic measurements and calculations, use specialty hair calculators, view previously held sessions, build analytic diagnostic session reports, get automatic conclusions and summaries, manage patient sessions, outpatient cards, scheduling , databases and much more.

TRIOLOGIC



The program has convenient and user friendly interface. Program Manager module allows easy access to all program features. It enables to perform and control all new and previously held diagnostic sessions, manage patient's databases and much more.



Outpatient card \ Patient: Mary Smyth \ Start session: 2/22/2015

Outpatient card | Journal (course of disease, prescriptions, analysis)

Date of visit: 2/22/2015

Patient's name: Mary Smyth

Address: _____

Telephone: _____

Email: _____

Age: 30 Height: m. _____ cm. _____ Weight: kg. _____ lbs. 105

Sex: Female BMI: 17.5

Occupation or professional environment: Teacher

Referral from: Physician

Complaints: Hair loss, dandruff, scalp sensitivity

Questionnaire

Hair and scalp condition:

Onset of hair loss: 5 months

Intensity of hair loss: None Moderate or slightly-expressed Strongly-expressed

Duration of hairloss: Less than 6 months Over 6 months
 Over 6 months with periods of hair improvement and volume restoration

Hair thinning: No Yes Frontal-parietal area is more affected Diffuse

Female Pattern Baldness:

Ludwig Scale, type: I-1 I-2 I-3 I-4 II-1 II-2 III Advanced Frontal

Ludwig Scale, class: 1 2 3

Ebling-Rook Scale, type: I II III IV V Heredity factor in first degree relatives: Yes No

Heredity factor in other relatives: None

Hair type:	Hair form:	Hair sort:
<input type="checkbox"/> Normal	<input type="checkbox"/> Straight	<input type="checkbox"/> Normal
<input type="checkbox"/> Oily	<input checked="" type="checkbox"/> Wavy	<input checked="" type="checkbox"/> Thin
<input checked="" type="checkbox"/> Mixed	<input type="checkbox"/> Curly	<input type="checkbox"/> Wiry
<input type="checkbox"/> Dry	<input type="checkbox"/> Chem.curl	<input type="checkbox"/> Long
<input type="checkbox"/> Extremely dry	<input type="checkbox"/> Chem.wave	<input type="checkbox"/> Brittle
<input type="checkbox"/> Damaged	<input type="checkbox"/> Chem.straight	<input type="checkbox"/> Split ends

Hair length and natural color: 16", brown

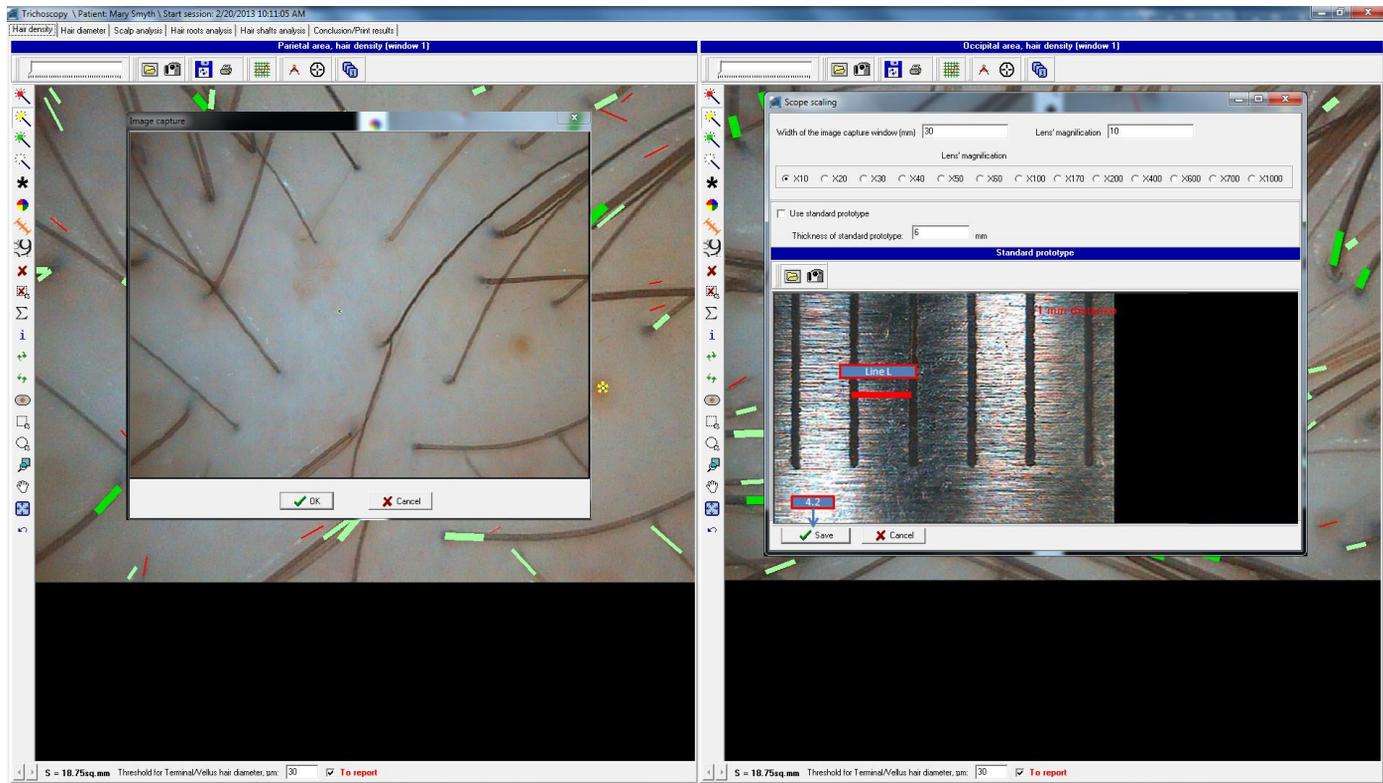
Profile picture:

Racial variations of hair: European/Caucasian Latin/Mediterranean Asian/Pacific African/Caribbean

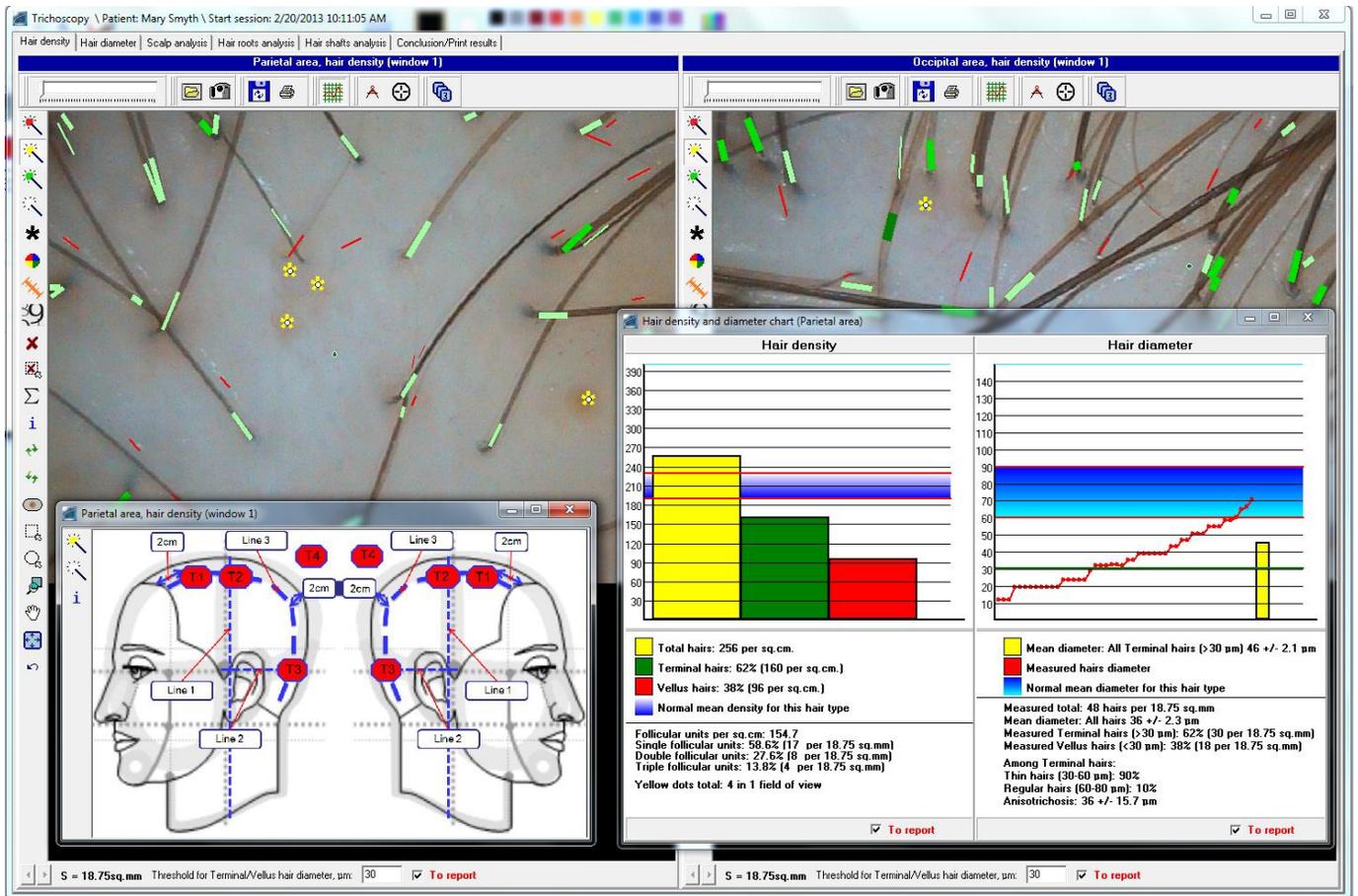
Buttons: Save, Cancel, Print, To report, Additional files, Additional information

Setting the password for access to the information dialog box: Password: _____ Repeat password: _____ OK, Cancel

The “Outpatient card” for new patients entry is built to include a comprehensive list of features that should be considered in management of patients with hair and scalp diseases or disorders. The accuracy and extent of information supplied in the “Outpatient card”, especially its “Questionnaire” section, affects objectivity of the “Automatic Conclusion” module.



The “Trichoscopy” module allows to estimate density and diameters of hairs in different zones of the scalp, as well as to access their distribution in the follicular units. Any values obtained can be compared to mean values All measured and calculated data to mean values based on patients racial hair variations. Measurements can be carried out in a semi-automatic or manual modes. There are also scalp, hair roots and shafts studies and analyses included.



The "Hair Density" section of "Trichoscopy" module allows for semiautomatic and manual hair density measurements simultaneously with hairs diameters estimates, as well as to access their distribution in the follicular units. Other functions include "Perifollicular sign" mark ups and counts ("Pointed hair", "Exclamation mark hair", "Broken hair", "Cadaverized hair", "Yellow dots", "Red dots" and "White dots"). "Hair length" function allows to perform linear length measurements of any growing hair within the site of view. "Point localization" function allows to mark up specific measurement points on the scalp diagram, where the hair counts have been performed. All collected information is being represented on charts in form of graphs and data, both obtained from measurements and calculations. This information is also being compared to mean values based on patients racial hair variations.



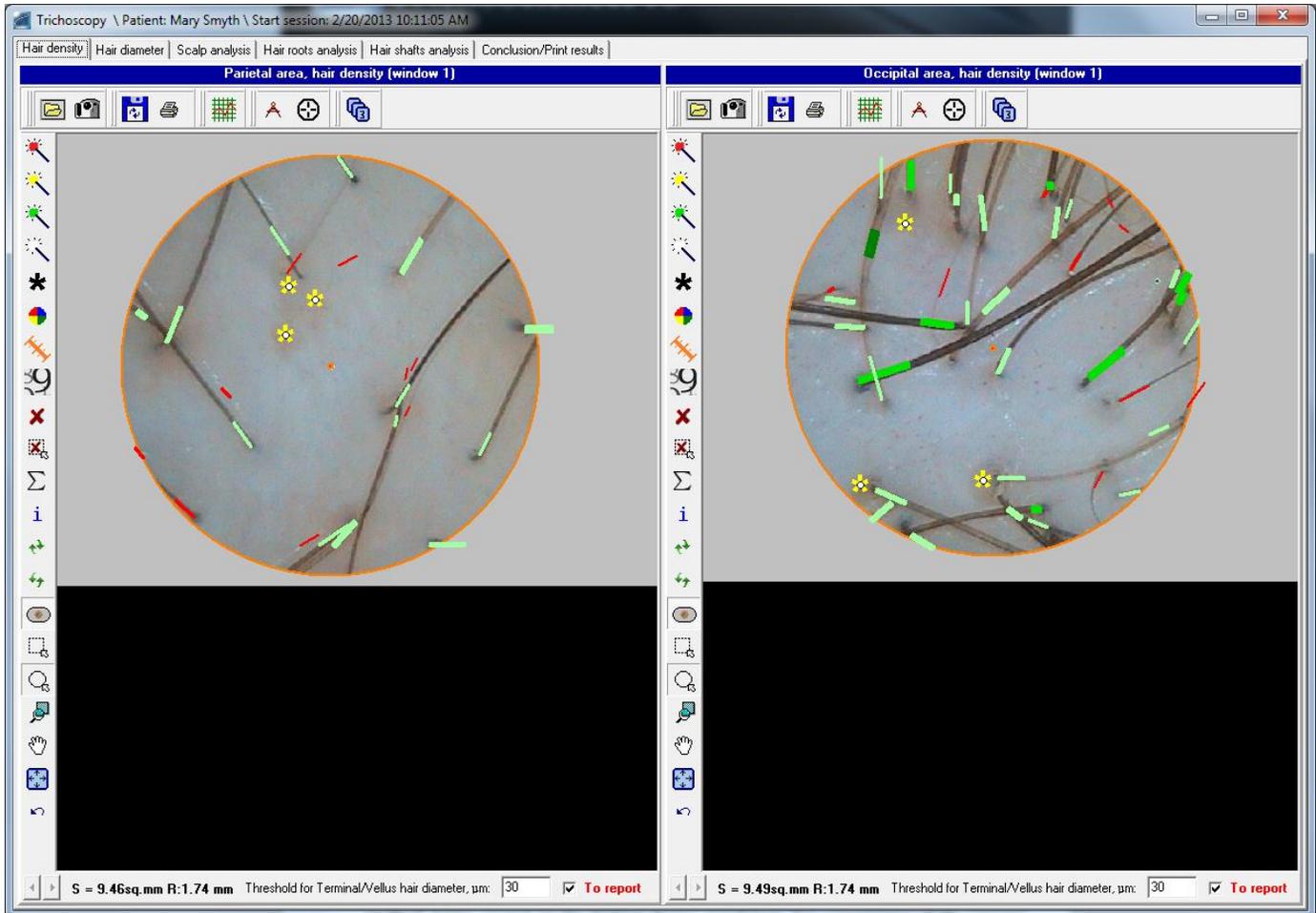
In addition to hair density and diameters evaluation, the severity of Anisotrichosis (or Polymorphism, that reflects the degree of deviation of hair diameters from norm), which is an important parameter that assesses progressive hair thinning, is taken into consideration along with percentages of Vellus hair less than 30 microns in diameter. This allows for a more comprehensive evaluation of the severity of ongoing pattern alopecia processes. In these cases it is also important that hair assessments are not limited to diameter estimates only, but include classification by type (i.e. thin, medium, and thick hair) along with calculations of the percentages for each of those types of hair. The resulting data is useful for assessing the current hair condition, as well as for the dynamic observation of patients during treatment or scientific studies. In each field of view, it is recommended to account for presence of various Perifollicular signs, such as "yellow dots" (reflect delays of new hair growth phases), "white dots" (reflect the presence of follicle fibrosis, typical for scarring forms of alopecia), "spiky hair" (reflect the intensity of hair loss), "red dots" (reflect vascular changes, typical for Psoriasis, Discoid Lupus), hair in the form of an "exclamation mark" and "black dots" (characteristic of Alopecia Areata). Below are sample images contrasting Female Pattern Hair Loss (FPHL) and stable condition:

Signs of FPHL progression. Single units.
Yellow dots. Anisotrichosis.

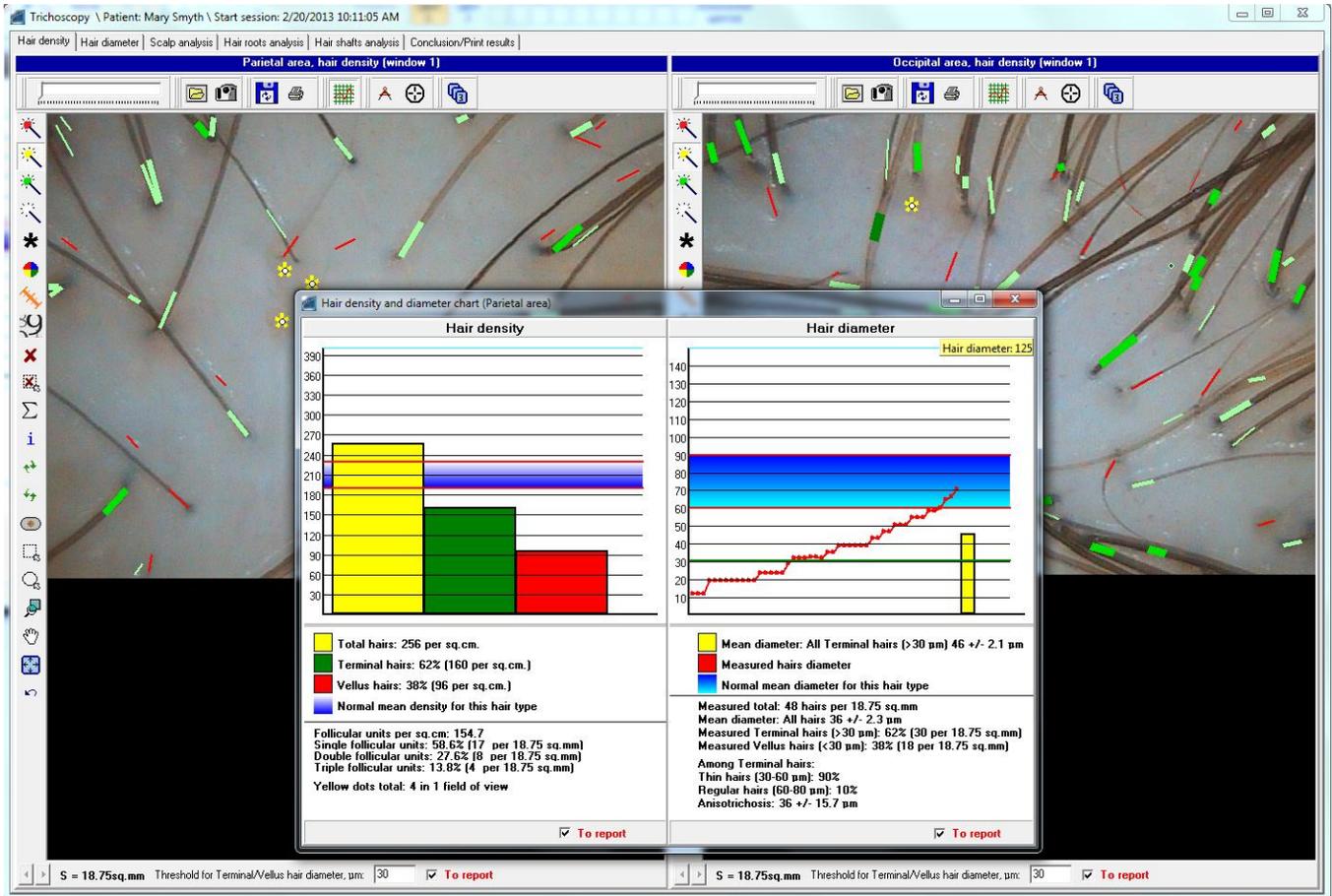


No signs of FPHL. Stable condition.

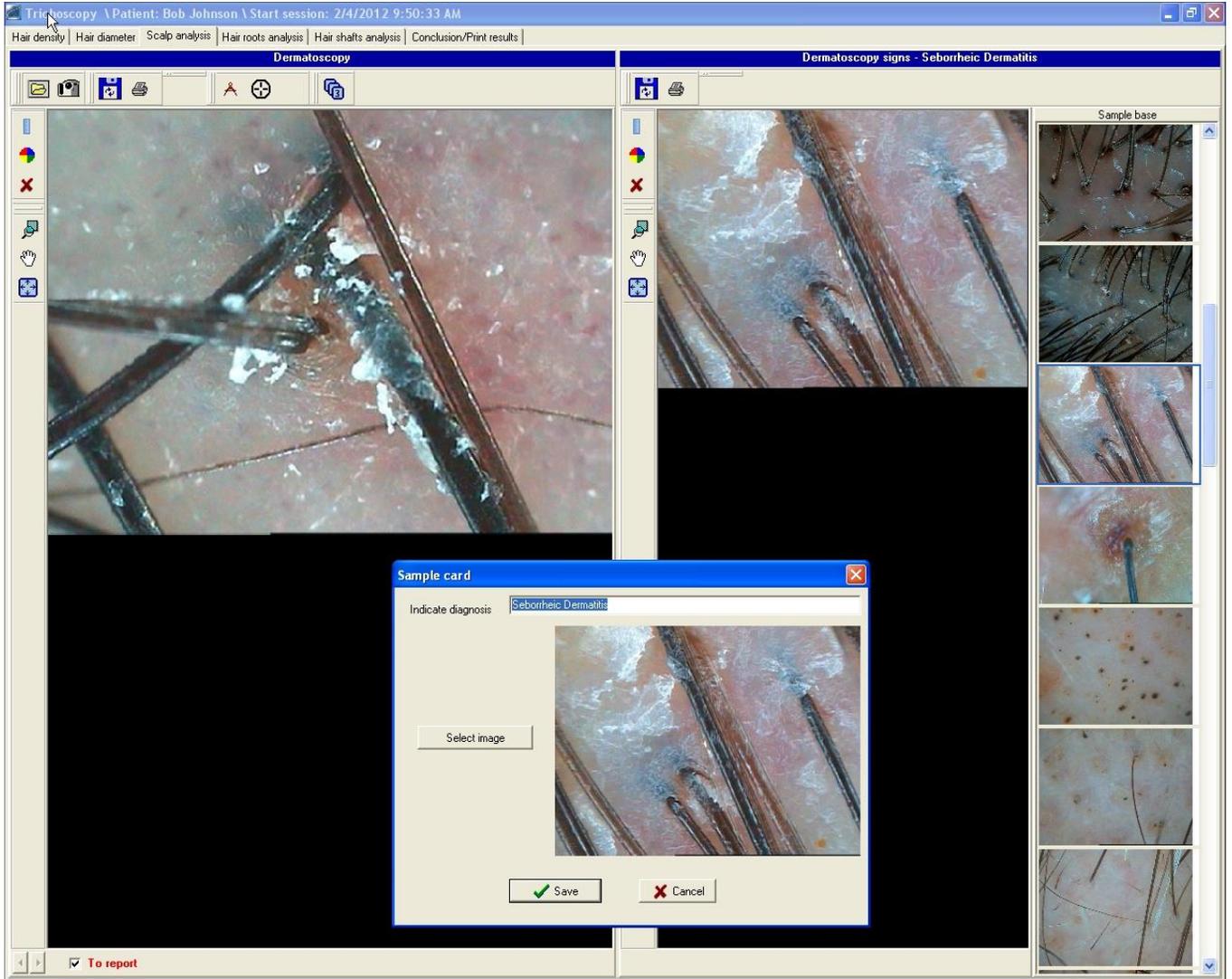




Trichoscopic assessment can be conducted in the circular fields of view, established per preset size. This is an important tool to be used in clinical trials or scientific researches, since this function allows to synchronize symmetric sites for evaluation, regardless of the angle used to obtain the images of study sites.



Hair diameter measurements and subsequent evaluation can be carried out under higher magnification, thus allowing for greater accuracy while obtaining data.

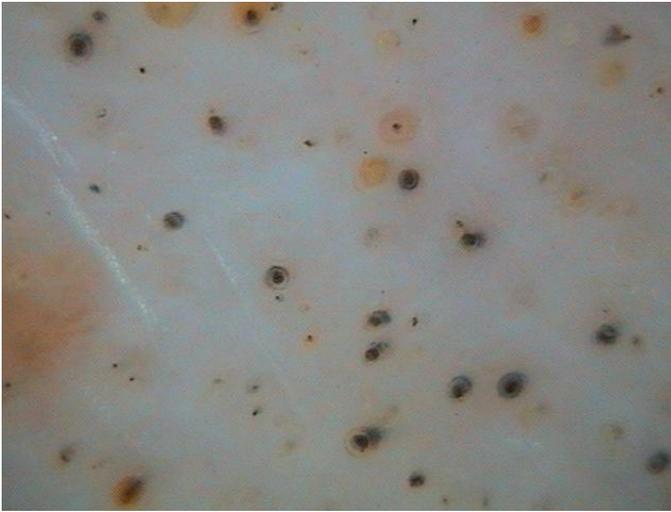


No less important is the proper assessment of the scalp condition. Detectable changes in the Perifollicular zone should be considered when selecting treatment for patients with alopecia or dermatosis signs.

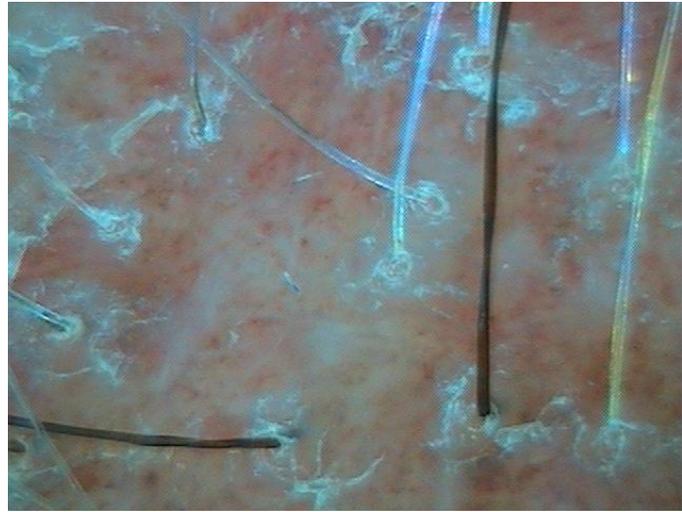


Below are the sample images showing in detail some alopecia and dermatoses signs :

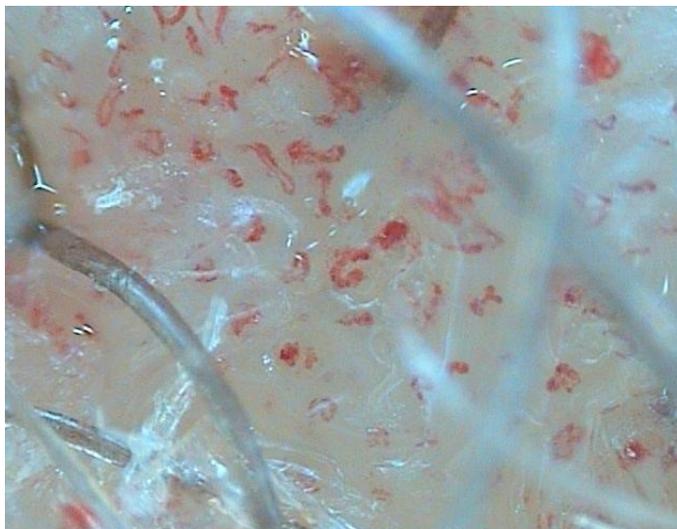
“Black dots” and “yellow dots” typical for Alopecia Areata

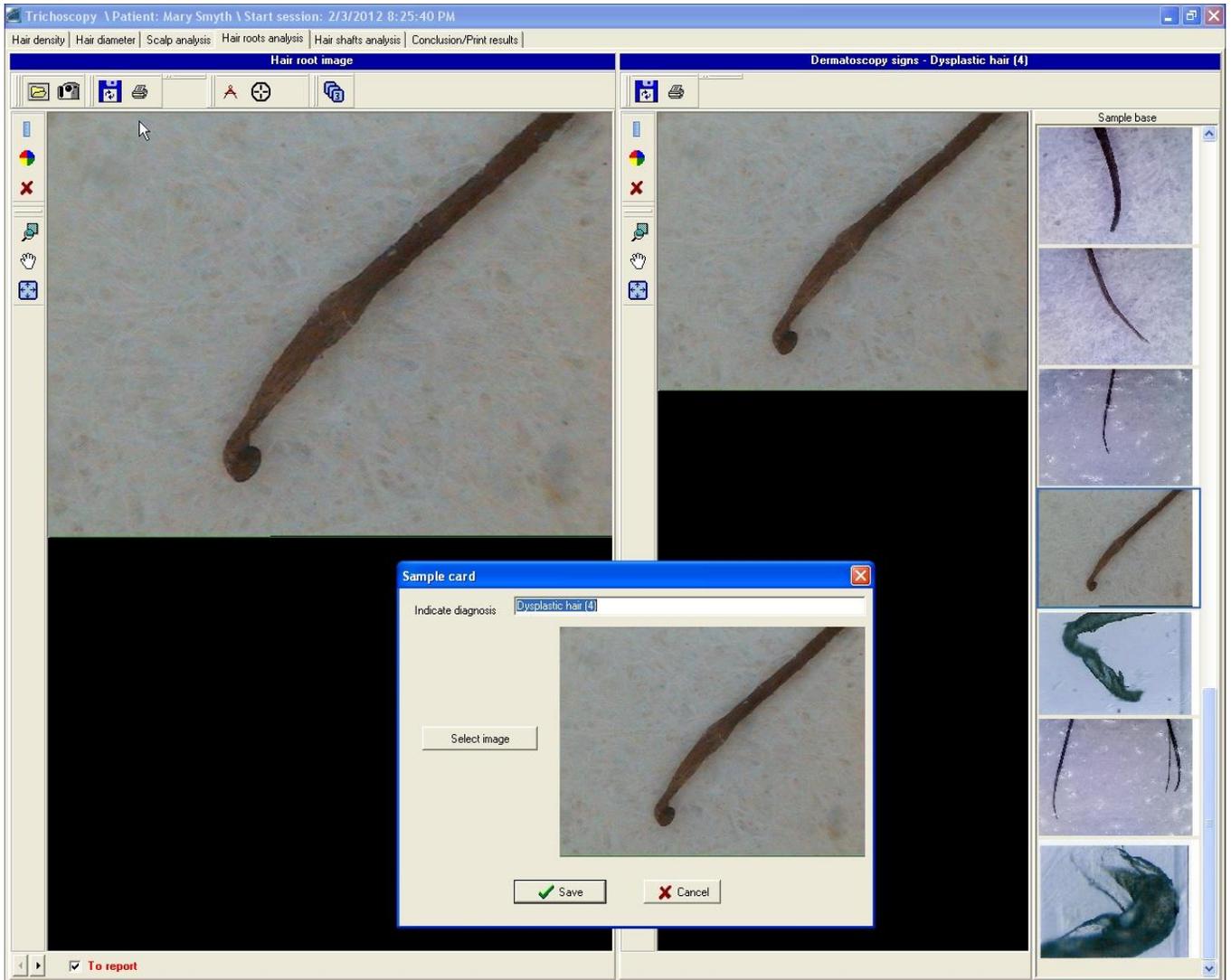


“White” dots typical for Lichen Planopilaris

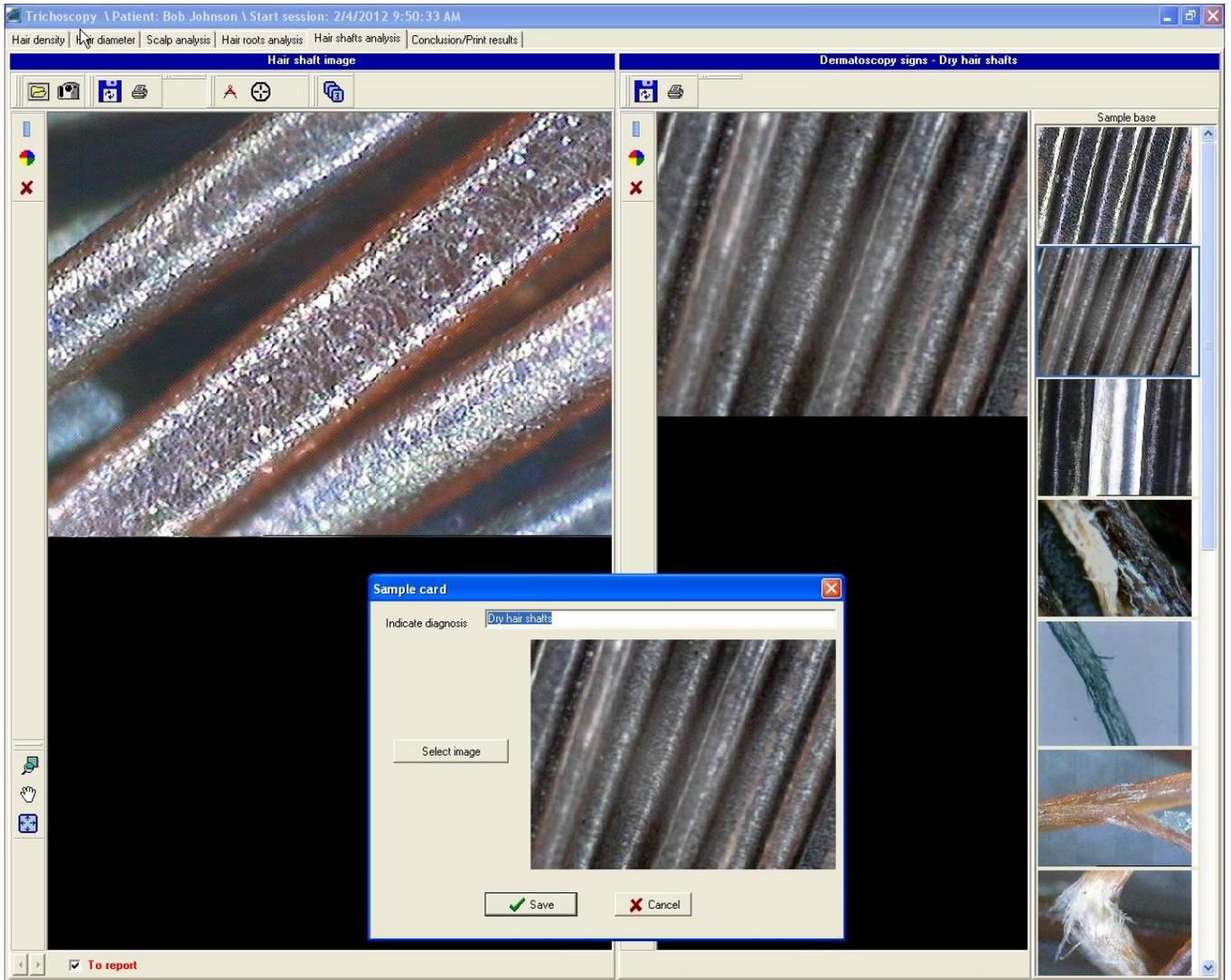


“Red globular rings” typical for Psoriasis

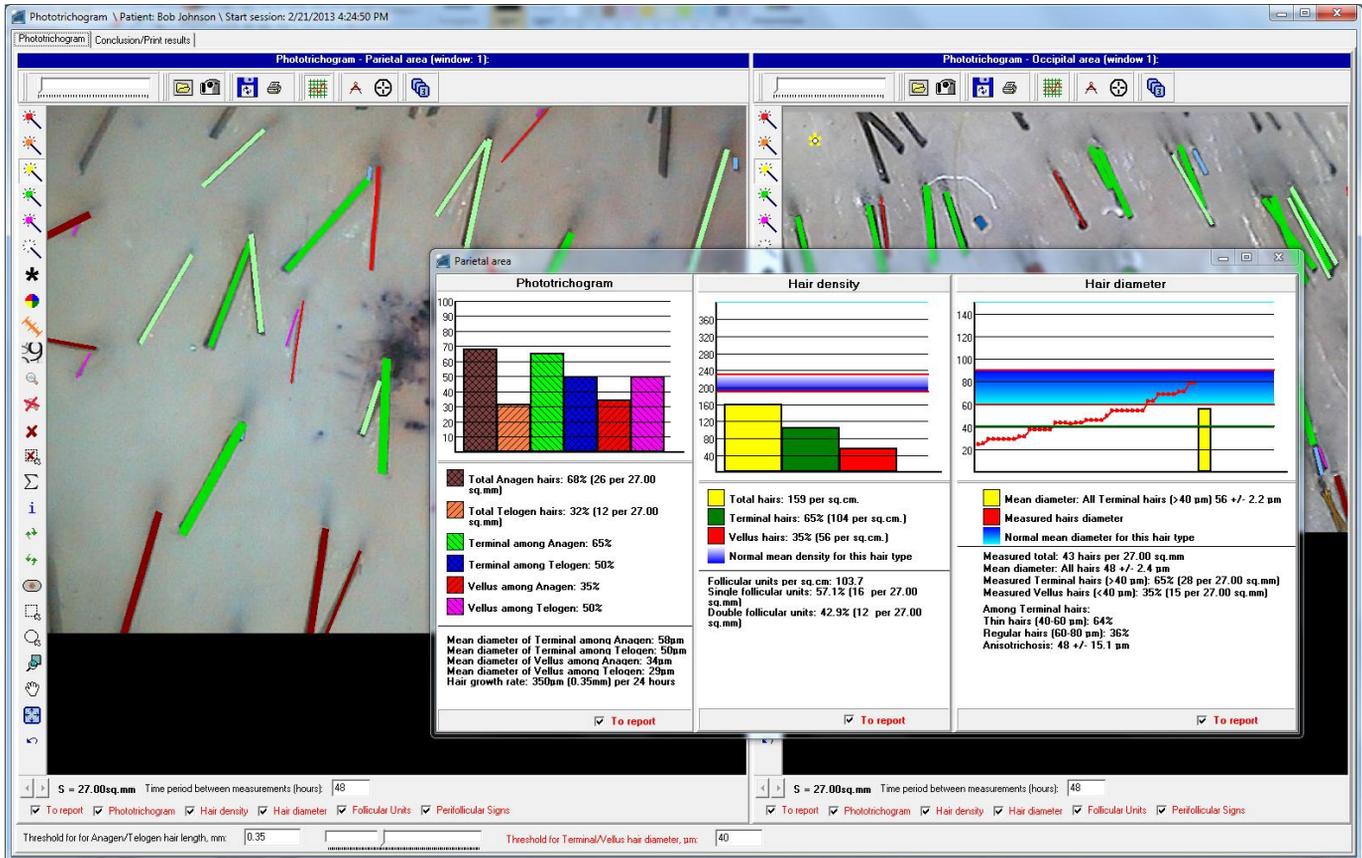




The proper microscopic evaluation of the extracted hair roots allows to quickly and accurately differentiate Anagen Alopecia from Telogen Alopecia. For example, presence of more than 80% of dystrophic hair roots in Anagen phase is the characteristic of Anagen Alopecia, which is associated with influence of toxic factors or autoimmune reactions. Dystrophic hairs have shattered bulb, conically narrowing shaft and no root sheath. In dysplastic hairs root bulb is deformed, reduced in diameter, root sheath is completely or partially absent. Dysplastic and dystrophic hairs are typically the signs of Alopecia Areata, however may also be present in hair loss induced by factors that affect hair follicle state at dermal papilla, such as effects of chemo- or radiation therapy, poisoning by salts of heavy metals, due to anticoagulant or interferon medication therapy, etc.



Microscopy of hair shafts allows to reveal various defects of hair keratinization that are hereditary in nature, as well as hair structural damages associated with improper care due to cumulative effects of physical, chemical and mechanical actions.



Currently, the Phototrichogram study is widely recognized and prevalent in clinical Trichology practice due to its high precision and affordability. For example, this methodology allows to distinguish subclinical forms of Female Pattern Hair Loss alopecia (FPHL) at early stages of disease, conduct differential diagnosis between androgenetic alopecia (AGA) and diffuse Chronic Telogen Effluvium alopecia (CTE), evaluate efficiency of alopecia dynamic treatment regimes, etc. The program calculates total number of hairs per square centimeter of skin, quantities and percentage of thick, regular and thin hairs, Terminal or Vellus hairs and Anagen or Telogen hairs among them. One of the most important diagnostic features is the predominance of Vellus hair in Telogen phase. The Phototrichogram study also allows to determine the average rate of hair growth.



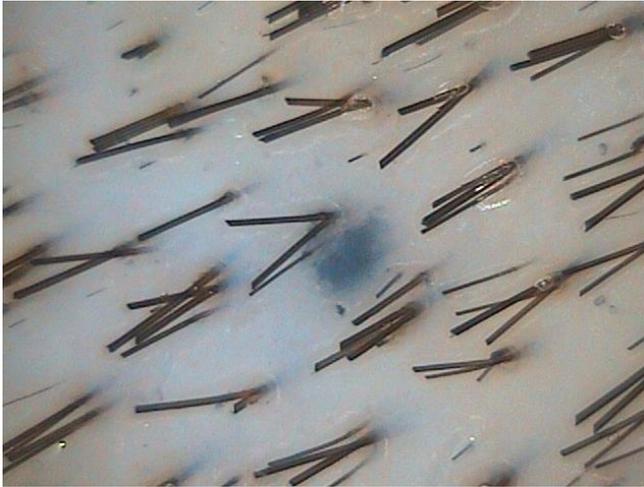
The following significant features distinguish AGA from CTE in women in the early stages of hair loss development:

- In the early stages of AGA, despite the reduction in hair density in the Parietal area, the total quantity of hairs within the Parietal area remains higher than in the Occipital area. The average diameter of hairs in the Parietal area is also reduced, but there are no significant changes in diameters of the hairs in the Occipital area;
- With the AGA development, percentage of Vellus-like hairs averages to 20 +/-3.9%, while it averages 12+/- 1.5% in the control group. With appearance of the “yellow dots”, indicating presence of empty follicles, the calculation of percentage of Vellus-like hair is considered impractical, as their quantity begins to decline;
- A pronounced condition of the Anisotrichosis is clearly applicable. When calculating the coefficient of the Anisotrichosis in the early stages of AGA, this value is greater than 12;
- There is an increase in the quantity of fine hairs (30-40 microns in diameter) in the Parietal area, as compared to the Occipital area;
- There is a reduction in the quantity of thick hairs (over 70 microns in diameter) in the Parietal area, as compared to the Occipital area;
- An increased percentage of single follicular units (up to 30%) in the Parietal area, as compared to the Occipital area;
- A significant increase in the percentage of Telogen hairs in the Parietal area, as compared to the Occipital area;
- Out of the total quantity of Telogen hairs more than 50% are Vellus-like hairs. It shall be noted that in the later stages of AGA the proportion of Vellus-like hairs in Telogen phase may decrease as empty follicles in form of “yellow dots” start to replace thinning hairs;
- Appearance of the "spiky hairs" indicates the intensity of hair loss, but does not reflect progressive hair thinning. The progressive thinning of hair is best reflected by the Anisotrichosis value and the proportion of Vellus-like hairs in Telogen phase.



Below are sample images of the Phototrichogram studies with tattoo application, showing the detectable contrast between “FPHL” and “CTE”, as well as evaluation of the effectiveness of “AGA” treatment in dynamics.

Progressing “FHPL”. Hairs in the Telogen phase are significantly thinner compared to hairs in the Anagen phase.



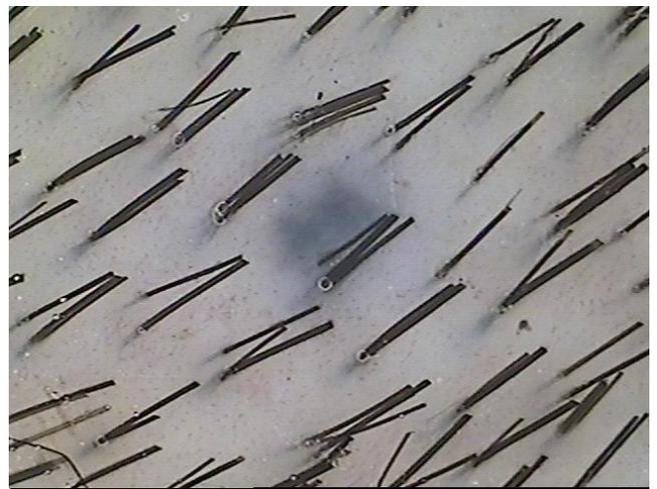
Progressing “CTE”. Telogen hair diameters do not differ from Anagen hair diameters.



Evaluation of efficiency of a non-specific dynamic treatment regime of “AGA” .



Before treatment



After four months of treatment



Trichogram \ Patient: Mary Smyth \ Start session: 04.02.2012 9:04:27

Trichogram | Conclusion/Print results

Parietal area (window - 1):

To report

Occipital area (window 1):

To report

Sample database

Trichogram table

Epilated hair type	Parietal area			Occipital area		
	Absolute amount	%	Norm	Absolute amount	%	Norm
Anagen	9	38	Total Anagen To 95%	4	27	Total Anagen To 95%
Displastic Anagen	5	21		5	33	
Broken Anagen	1	4		1	7	
Anagen with papilla	0	0	0%	0	0	0%
Telogen	9	38	To 18%	5	33	To 18%
Catagen	0	0	To 3%	0	0	To 3%
Dystrophic	0	0	To 4%	0	0	To 4%
Sum	24			15		

Close

Sample card

Sample title: Trichogram 1

Select image

Save Cancel

The Trichogram study is a semi-invasive method used to evaluate the roots of extracted hairs. The hair roots are examined in order to determine and calculate percentages of hairs in each of three phases of the hair growth cycle (Anagen, Catagen, or Telogen). Anagen hairs usually have living cells on the root end and often a sheath of living cells around the lower hair fiber. Telogen hairs have a club end, they do not have any living cells attached to the root. Catagen hairs are more difficult to differentiate, but usually these hairs have a tapered end to the root. Extracted Anagen and Telogen hairs may sometimes be difficult to distinguish based on their microscopic appearance. Extracted hairs thickness can be measured to find out whether they are Terminal or Vellus hairs in order to determine association with pattern or chronic diffuse hair loss forms. After counting process completion all results are being recorded and evaluated in the “Trichogram table”. There is a sample image database of hair roots included.



Dermatoscopy \ Patient: Mary Smyth \ Start session: 2/4/2012 9:12:39 AM

General Dermatoscopy | Pigmented lesions | Conclusion/Print results

Pigmented lesions

Pigmented lesions - Nevus Jadassohn

Sample database

Measured length: 9.42 mm

Sample card

Indicate diagnosis

Select image

Save Cancel

S = 1871.91sq.mm R:24.41 mm To report

Algorithm for melanoma and other tumor estimation by Argenziano

Criteria	Features	Points	Mark if applicable
Evolution of tumors			
Atypical pigment grid	By color, wall thickness and cell size	2	<input type="checkbox"/>
A shroud or blue-white veil	Distinguish from dermatoscopic signs of pigment regression in skin lesion. Morphological substrate of a shroud or blue-white veil is represented by foci of acanthosis and hypergranulosis over the clusters of melanocytes in dermis.	2	<input type="checkbox"/>
Atypical vessels	Atypical convoluted linear and dotted vessels	2	<input type="checkbox"/>
Small criteria			
Atypical stripes	By color, shape and location	1	<input type="checkbox"/>
Dots/granules, unevenly distributed	By color and size	1	<input type="checkbox"/>
Blots (ink stains)	Assymmetric and atypical by color	1	<input type="checkbox"/>
Dermatoscopic signs of pigment regression in skin lesion	Scar-like patches of depigmentation and dots, often described as "pepper-like" in pattern	1	<input type="checkbox"/>
Results			

Evaluation of results To report

Close

The “Dermatoscopy” module allows to conduct general study and carry out pigmented lesion identification, measurement and determination of their boundaries symmetry. The data obtained can be evaluated based on well-known “ABC”, “ABCD”, “Argenziano” algorithms. There is a dermatoscopic sample image database included.



The screenshot displays the TrichoSciencePro v1.15E software interface. At the top left, there is a 'Patients' table with columns for 'Patient's name' and 'Date'. Below it, a 'Performed Trichoscopies' section shows a date and time '2/4/2012 9:50:33 AM+' with 'Load session' and 'Show report' buttons. To the right, a vertical menu lists various diagnostic tools: Trichoscopy, Phototrichogram, Trichogram, Dermatoscopy, Hair calculator, Hospital Anxiety and Depression Scale, and Additional studies.

Three calculation windows are open over the main interface:

- Hair calculator \ Patient: Bob Johnson**: This window contains a list of hair density and growth rate metrics for the Parietal and Occipital areas, categorized by Terminal and Vellus hair. It also includes fields for Sex (M, F, A), Age, and Racial variations of hair (set to European/Caucasian). A summary table at the bottom provides total mean and actual quantities of scalp hair, terminal and vellus hair, and mean hair growth rates.
- Trichometry (hair wash test) \ Patient: Bob Johnson**: This window is for hair wash test results. It includes a date of hair sampling, a field for current mean hair length, and a table to fill in 'Hair quantity' and 'Percentage of hair' for different hair lengths (Under 3 cm, 3-5 cm, Over 5 cm, Total hair shed).
- Trichometry (growing hair test) \ Patient: Bob Johnson**: This window is for growing hair test results. It includes a date of hair sampling and a table to fill in 'Total amount' and 'Intensity of monthly hair loss' for different hair lengths (Over 5 cm, 4-5 cm, 3-4 cm, 2-3 cm, 1-2 cm, Total).

The “Hair calculator” module allows to calculate total quantity of scalp hairs, hair growth and hair loss rates, as well as to compare this data to average values based on patient’s sex, age and racial hair variations, and much more. The module functions are set in automatic mode by default. The data is obtained from corresponding “Trichoscopy” and “Phototrichogram” sessions, as well as from the “Outpatient card”. All the data that was obtained for calculations automatically may be modified or corrected at anytime by typing in new information. Furthermore, included are two additional calculators, representing “Trichometry” functions, based on hair wash test and growing hair test results.

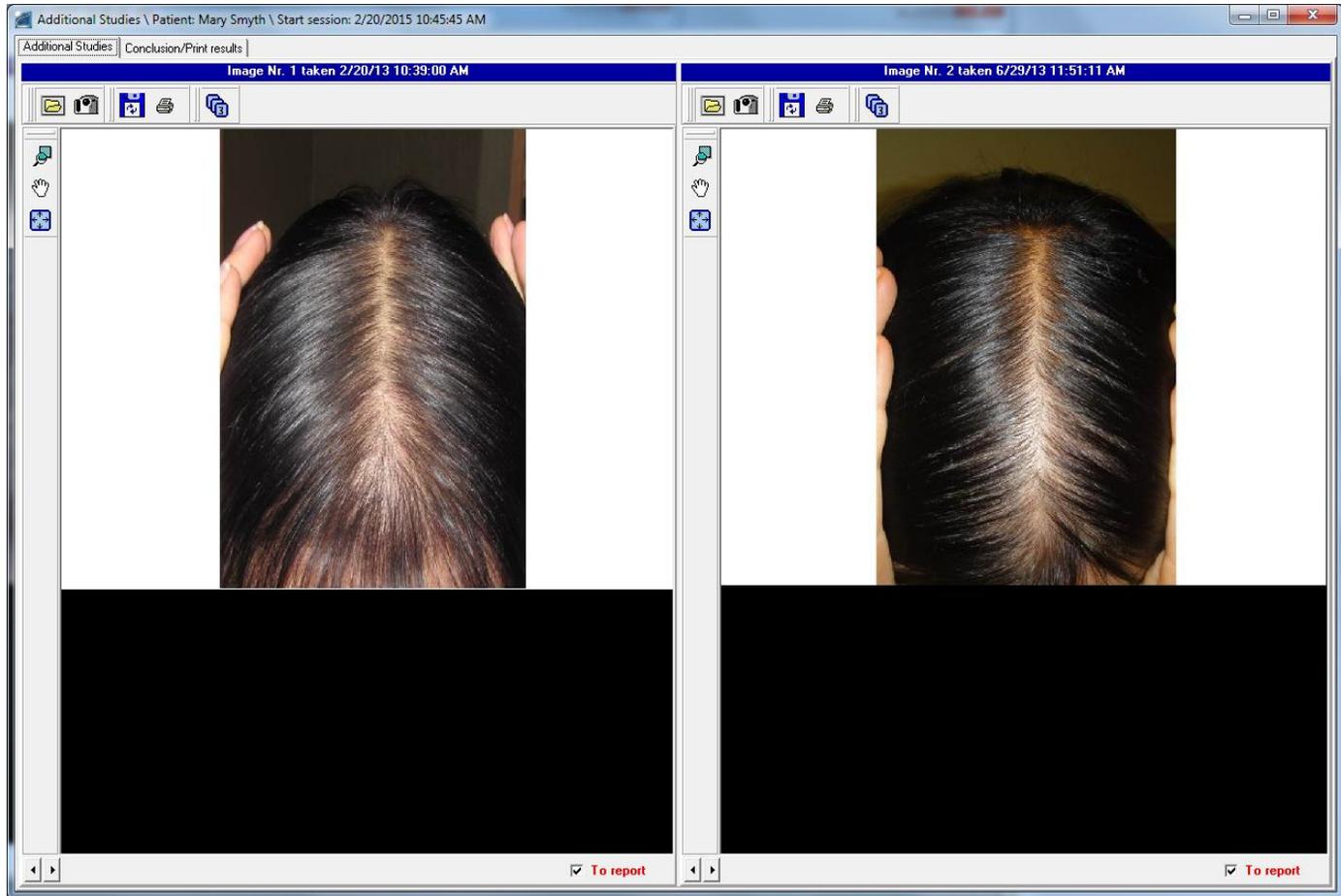


The screenshot displays the TrichoSciencePro v1.1SE software interface. At the top, a patient list shows Bob Johnson and Mary Smyth. The main window is titled "Hospital Anxiety and Depression Scale \ Patient: Mary Smyth". It contains 14 multiple-choice questions with dropdown menus for answers. An "Automatic Conclusion" window shows the result: "Subclinical depression. Clinical anxiety." A "Detailed report" window provides a summary of the patient's answers and the same conclusion. The background window shows a menu with options like Trichoscopy, Phototrichogram, Trichogram, Dermatoscopy, Hair calculator, and Hospital Anxiety and Depression Scale.

Question	Answer
1. I feel tense or 'wound up':	Most of the time
2. I still enjoy the things I used to enjoy:	Definitely as much
3. I get a sort of frightened feeling as if something awful is about to happen:	Yes, but not too badly
4. I can laugh and see the funny side of things:	Not quite so much now
5. Worrying thoughts go through my mind:	A lot of the time
6. I feel cheerful:	Not often
7. I can sit at ease and feel relaxed:	Very often
8. I feel as if I am slowed down:	Sometimes
9. I get a sort of frightened feeling like 'butterflies' in the stomach:	Occasionally
10. I have lost interest in my appearance:	I don't take as much care as I should
11. I feel restless as I have to be on the move:	Quite a lot
12. I look forward with enjoyment to things:	Definitely less than I used to
13. I get sudden feelings of panic:	Not very often
14. I can enjoy a good book or radio or TV program:	Not often

Conclusion:
Subclinical depression. Clinical anxiety.

The “Hospital Anxiety and Depression Scale” module is a useful tool for rapid assessment of patients emotional background . It is based on “Zigmond A., Snaith R., 1983” questionnaire. Assessment conclusions are generated automatically when all 14 multiple-choice questions are answered by patient.



While the “Additional Studies” module is intended to be used primarily for “Global photographs” study assessment for evaluation of treatment results and progress, any other diagnostic images, for example, any specific scalp area changes, etc., may be uploaded, compared and stored in the patient’s file.



Conclusions and Recommendations \ Patient: Mary Smyth \ Start session: 2/4/2012 9:26:53 AM

Search: _____

Diagnosis: | List of diagnoses | **Diagnostic tests** | Topical treatment | Oral therapy | Physiotherapy | Reference materials

Hair growth assessment

- Videodermoscopy
- Dermatoscopy
- Classic Trichogram
- Phototrichogram
- Conventional and contrast-enhanced Phototrichogram
- Unit Area Trichogram
- Hair pull test
- Daily hair counts
- Hair Densitometry
- Standardized wash test, Hair Weighing
- 60-second hair count
- Global Photographs
- Hair Feathering test
- Hair Weighing
- Mechanical test of hair quality
- Optical light and polarizing microscopy
- Confocal laser scanning microscopy

Iron status blood

- Complete Blood Count (CBC)
- Serum Ferritin
- Serum Iron
- Iron Saturation
- Transferrin
- Total iron binding capacity (TIBC)

Electrolytes and blood

- Total protein
- Albumin
- Globulin
- Albumin/Globulin ratio
- Calcium
- Calcium, ionized
- Magnesium
- Potassium
- Sodium
- Glucose, fasting (mg/dl)
- Glucose (2 hours postprandial) (mg/dl)
- Hemoglobin A1c
- LDH (lactate dehydrogenase)
- SGOT (AST)
- SGPT (ALT)
- Uric acid (male)
- Uric acid (female)
- C-reactive protein (CRP)

Selected

- Videodermoscopy
- Phototrichogram
- Global Photographs
- Complete Blood Count (CBC)
- Serum Ferritin
- Serum Iron
- Iron Saturation
- Transferrin
- Total iron binding capacity (TIBC)
- Total protein
- Albumin
- Calcium, ionized
- Magnesium
- Glucose, fasting (mg/dl)
- 25-Hydroxyvitamin D [25(OH)D]
- Bilirubin, total
- Bilirubin, Direct
- Triglycerides
- Total Serum Cholesterol
- HDL Cholesterol

Add record

Add

To the beginning

To current position

To the end

Section title

Download image

OK Cancel

Print report | Download into MS Word | Close | To report

The “Conclusions and Recommendations” module is intended to record patient’s diagnostic conclusions, results and applicable notes. It also offers extended listings of common diagnoses and additional diagnostic tests, as well as frequently used topical, oral and physical therapy products and practices.



TrichoSciencePro v1.1SE

Patient's name: Performed Trichoscopies:

Patient name	Date
Bob Johnson	04.02.2012 10:31:15
Mary Smyth	04.02.2012 9:26:53

03.02.2012 20:25:40

Automatic Conclusion \ Patient: Mary Smyth

Patient name: Mary Smyth

Criteria for differential diagnosis of female pattern and diffuse telogen hair loss in women

Criteria	Female pattern alopecia	Telogen Diffuse Alopecia
Clinical history		
Hair and scalp condition:		
Intensity of hair loss:	Moderate or slightly-expressed	
Duration of hairloss:	Over 6 months	
Hair thinning:	Frontal-parietal area is more affected	
Female Pattern Baldness:		
Ludwig Scale, type:	I-2	
Heredity factor in first degree relatives:		No
Scalp condition:	Combination	
Seborrheic dermatitis:	Areas of redness	
Data of Trichologic objective study		
Trichoscopy Terminal hair count in parietal area	Less than 250 for sq.cm.	Over 250 for sq.cm.
Trichoscopy Average Terminal hair diameter without Vellus hair accounted	In parietal area is less than in occipital	In parietal area is more than in occipital
Trichoscopy Percent of Vellus hair in parietal area	More than 20%	Less than 20%
Trichoscopy Anisotrichosis in parietal area	Over 12 for parietal area	Less than 12 for parietal area
Trichoscopy Presence of thin, medium and thick hair in parietal area	Presence of all types	Presence of 2 types out of 3
Trichoscopy Yellow dots Pointed hair (in parietal area)	Yellow dots applicable Presence of all types	No yellow dots. Pointed hair possible

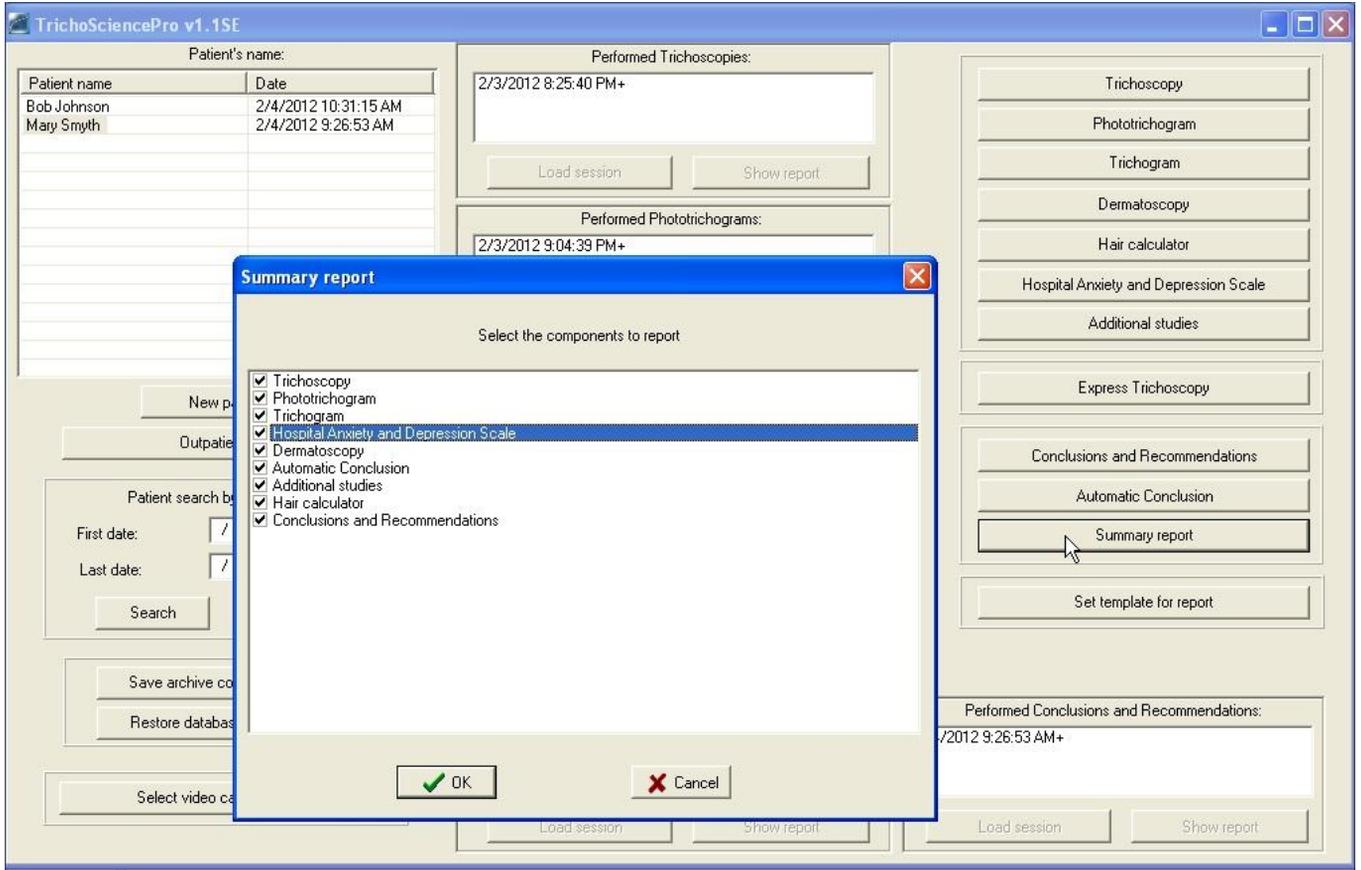
Print report Download into MS Word Close To report

Trichoscopy
Phototrichogram
Trichogram
Dermatoscopy
Hair calculator
Hospital Anxiety and Depression Scale
Additional studies
Express Trichoscopy
Conclusions and Recommendations
Automatic Conclusion
Summary report
Set template for report

Performed Conclusions and Recommendations:
2.2012 9:26:53+

Load session Show report

The “Automatic Conclusion” function is implemented to differentiate between most common “AGA” and “CTE” diagnoses. Calculations are based on “Trichoscopy”, “Phototrichogram”, “Trichogram” session summaries and “Outpatient card” data. This information gets processed in a specialized table, which assigns and counts specific points. Total results obtained in this table indicate activity of each of these processes. Since signs of “AGA” and “CTE” often overlap, leading frequently to diagnostic difficulties, this function helps with more proper preventive diagnosis establishment.



After completing all diagnostic sessions and studies, as well as generating conclusions and reports for the patient, the “Summary report” function allows to select components to be included into the final report, such as “Trichoscopy”, “Phototrichogram”, “Trichogram”, “Dermatoscopy”, “Hair calculator”, “Hospital Anxiety and Depression Scale”, “Additional Studies”, “Conclusions and Recommendations” and “Automatic Conclusion” data. The “Summary report” is generated as an MS Word document, which is convenient for making any additional adjustments to the final data to be printed.



Professional hair and scalp diagnostic software

TrichoSciencePro[©]

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