

19th EADO CONGRESS

April 20th-22nd, 2023



Advanced 2D and 3D total body scanning for detection of melanoma

Josep Malvehy
Dermatology Department of Hospital Clinic of
Barcelona. Spain

DISCLOSURE OF CONFLICTS OF INTEREST

SPEAKER: Ammirall, BMS, ISDIN, La Roche Posay, Leo, Novartis, Pierre Fabre, Roche, Sanofi

HONORARIA OR CONSULTATIONS FEES : Ammirall, BMS, Biofrontera, GSK, ISDIN, La Roche Posay, Leo, Novartis, Polychem, Dermavision, Pierre Fabre.

GRANTS & RESEARCH SUPPORT: Ammirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder, GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Polychem, Roche, Dermavision

Spouse/partner: Ammirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder, GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Pierre Fabre, Polychem, Roche

Other support (please specify): Abbie (educational activities), Lilly (educational activities), Novartis
Co-Founder of Athena Tech.

RESEARCH AND INNOVATION GRANTS



Definition of TBP

TBP can help identify new or changing naevi through comparison of base-line TBP images with subsequent skin examinations or comparison of sequential TBP images over time, either by clinicians or computer-assisted algorithms.



- 2D TBP /3D TBP / Standard photography vs polarised light TBP
- TBP vs digital Dermoscopy follow-up



Digital follow-up (Dermoscopy)

The screenshot displays a digital dermoscopy software interface. At the top, there are three zoom level buttons: "25 x Macro", "0 x Detalles", and "36 x ELN". The main area is a grid of images. The left column shows macro images of a patient's back with a yellow dot indicating a lesion location. The middle column shows corresponding dermoscopy images. The right column shows a "Historial de imágenes" (Image History) panel with a vertical list of images and a "3x3" button. Below the grid are buttons for "Imagen", "Comparar", "Imprimir", "Detalles", and "Salir".

Zoom levels: 25 x Macro, 0 x Detalles, 36 x ELN

Grid of images (Date & ID):

- 19/5/2009 <96404,13> (Macro)
- 19/5/2009 <123332,12> (Dermoscopy)
- 19/5/2009 <96402,12> (Macro)
- 19/5/2009 <123331,6> (Dermoscopy)
- 19/5/2009 <96404,13> (Macro)
- 30/11/2007 <99673,3> (Dermoscopy)

Labels for macro images: espalda, cuello, brazo; lumbal izquierdo; espalda, cuello, brazo

Labels for dermoscopy images: region escapular; paravertebral, lumbal; paravertebral, lumbal; paravertebral, lumbal; paravertebral, lumbal; paravertebral, lumbal

Historial de imágenes (Image History):

- 19/5/2009 <123331>
- 20/10/2008 <113098>
- 9/5/2008 <106630>

Buttons on the right: 3x3, M+C, D, ALL, LV, PD, R, PE, T

Buttons at the bottom: Imagen, Comparar, Imprimir, Detalles, Salir

Digital follow-up (Dermoscopy)



t



t

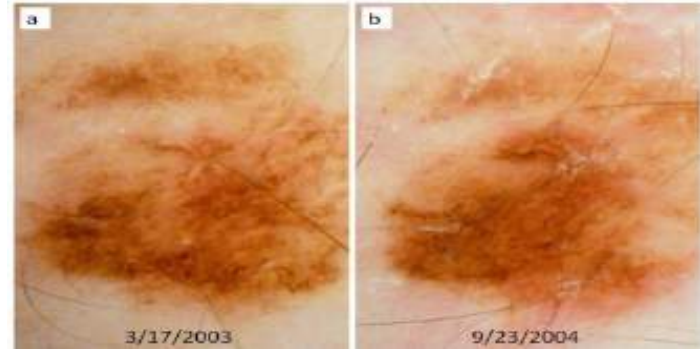


Total Body Photography



24 Photos per patient (15-56)

Digital Dermoscopy



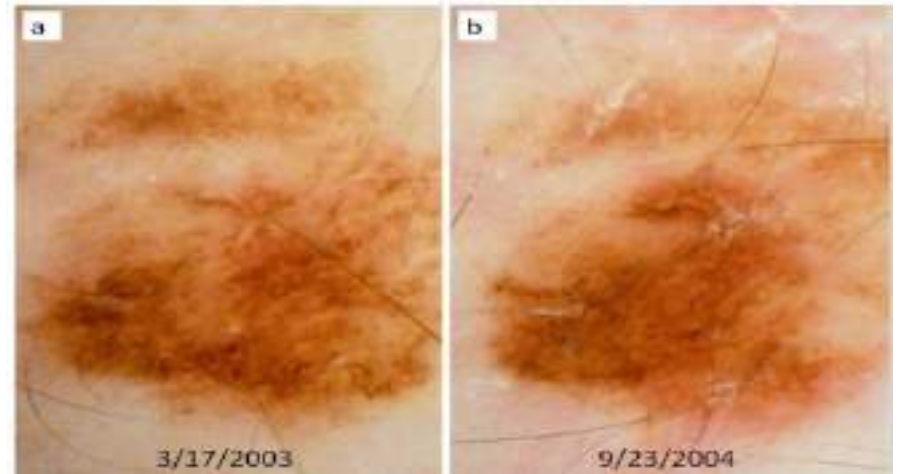
18.44 lesions /patient (15-25)

“Two steps method of digital follow-up”

**30% of lesions were excised because
changes in Total Body Photography
40% of the new MMs**



**70% excised because changes in digital
dermoscopy /60% of the new MMs**



Salerni G, et al. Benefits of total body photography and digital dermatoscopy ("two-step method of digital follow-up") in the early diagnosis of melanoma in patients at high risk for melanoma. JAAD 2012

Nelson KC, Swetter SM, Saboda K et al. Evaluation of the number- needed-to-biopsy metric for the diagnosis of cutaneous melanoma: a systematic review and meta-analysis. JAMA Dermatol 2019; 155:1167–74.

Study (year)	Patients receiving TBP	Total number of biopsies	Mean biopsies per patient	True positives	False positives	Number needed to biopsy	Naevus : melanoma ratio	MIS : MM ratio
Drugge (2020) ¹²	218	225	2.0	67	158	3.36	2.36	1.91
Feit (2004) ⁵	567	77	6.4	27	50	2.85	1.85	3.50
Goodson (2010) ⁷	1076	548	0.6	28	520	19.57	18.57	1.15
Greenwald (2020) ²⁰	36832	1571	1.1	260	1311	6.04	5.04	2.81
Lallas (2020) ¹³	977	121	NS	52	69	2.33	1.33	2.06
Mintsoulis (2016) ²¹	114	267	2.3	14	253	19.10	18.07	NA
Moloney (2014) ²²	311	770	NS	82	688	9.39	8.39	NA
Risser (2007) ¹¹	64	53	1.9	0	53	NE	NA	NA
Salerni (2012) ¹⁹	618	1152	1.9	98	1054	11.76	10.76	1.18
Truong (2016) ⁸	926	1419	1.6	93	1326	15.26	14.26	0.98
Total	41703	6203	NA	721	5482	NA	NA	NA
Range			0.6–6.4			2.33–19.6	1.33–18.57	0.98–3.50
Weighted mean			1.6			8.6	7.6	1.68

MIS, melanoma in situ; MM, malignant melanoma; NA, not applicable; NE, not estimable. Values were calculated from source study data when not directly provided in the manuscript. Mean biopsies per patient = number of lesions biopsied/number of patients biopsied. True positives (MIS or MM on histopathology), false positives (neither MIS nor MM on histopathology), and number needed to biopsy (lesions biopsied for one MIS or MM) are shown for combined MIS and MM.

455 496 biopsies and 29 257 melanomas from 46 studies, assessed the accuracy of clinicians diagnosing melanoma. Mean 4–12% of lesions biopsied demonstrated melanoma; NNB of 14,8

Diagnostic accuracy

1. Based on previous studies, **the sensitivity of TBP+SDD** is very low in the first visit (<25%) and increase to 100% in subsequent visits (1,2,3...) since we can assume that every MM can be detected when the tumor grows and exhibits a significant change.
2. However **benign lesions can change** as well, and this fact determines a **specificity** in this population that is very low (i.e. NNT= 1:12-14).

Metanalyses of TBP-SDD (Salerni G, Terán T, Puig S, Malvehy J, Zalaudek I, Argenziano G, Kittler H. Meta-analysis of digital dermoscopy follow-up of melanocytic skin lesions: a study on behalf of the International Dermoscopy Society. J Eur Acad Dermatol Venereol. 2013 Jul;27(7):805-14)

MELANOMA RISK SCORE: DEEP IMAGING



Automatic identification of lesions; detection of changes; lesion risk assessment; faster examination

HIGH-RESOLUTION TBP COMPARED WITH DIGITAL DERMOSCOPY

- New TBM photographic devices improved the quality and reduced the acquisition time
- Detection of changes in patients with atypical mole syndrome based on TBP is more accurate but there are no results from prospective studies with these new devices
- It is presumed that fewer dermoscopic images are needed to detect melanoma using new TBM devices. However there is no evidence of this assumption
- There is a lack of clinical standards for TBP + digital Dermoscopy

Next Gen TBM: cross-polarised light and higher resolution



Non polarized image (EOS 700D)

RAW processed image (full frame DSLR)

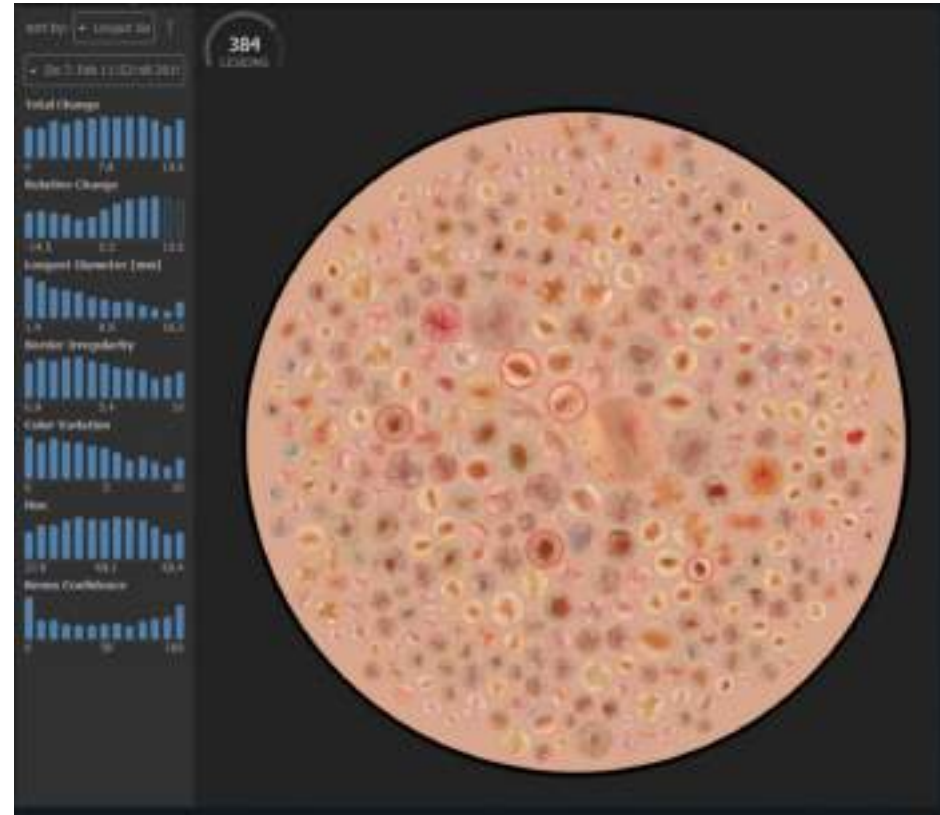


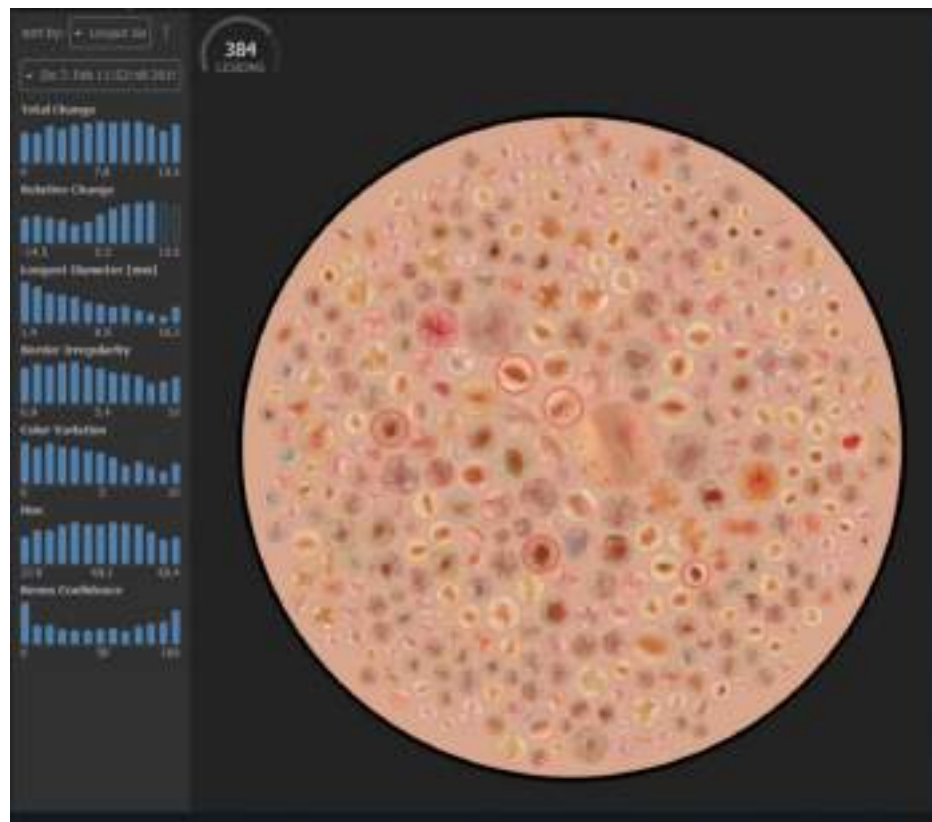
Non polarized image (EOS 700D)



RAW processed image (full frame DSLR)

MELANOMA RISK SCORE: DEEP IMAGING







DESCRIPTION OF IMAGES OF TBP AND D-DERMOSCOPY



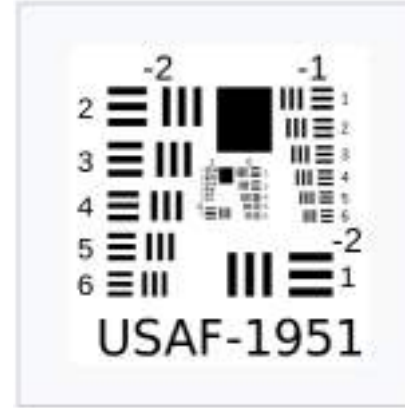
Number of Line Pairs / mm in USAF Resolving Power Test Target 1951

Element	Group Number											
	-2	-1	0	1	2	3	4	5	6	7	8	9
1	0.250	0.500	1.00	2.00	4.00	8.00	16.00	32.0	64.0	128.0	256.0	512.0
2	0.281	0.561	1.12	2.24	4.49	8.98	17.96	35.9	71.8	143.7	287.4	574.7
3	0.315	0.630	1.26	2.52	5.04	10.08	20.16	40.3	80.6	161.3	322.5	645.1
4	0.354	0.707	1.41	2.83	5.66	11.31	22.63	45.3	90.5	181.0	362.0	724.1
5	0.397	0.794	1.59	3.17	6.35	12.70	25.40	50.8	101.6	203.2	406.4	812.7
6	0.445	0.891	1.78	3.56	7.13	14.25	28.51	57.0	114.0	228.1	456.1	912.3

1951 USAF resolution test chart widely used in optical engineering laboratory work to analyze and validate imaging systems.

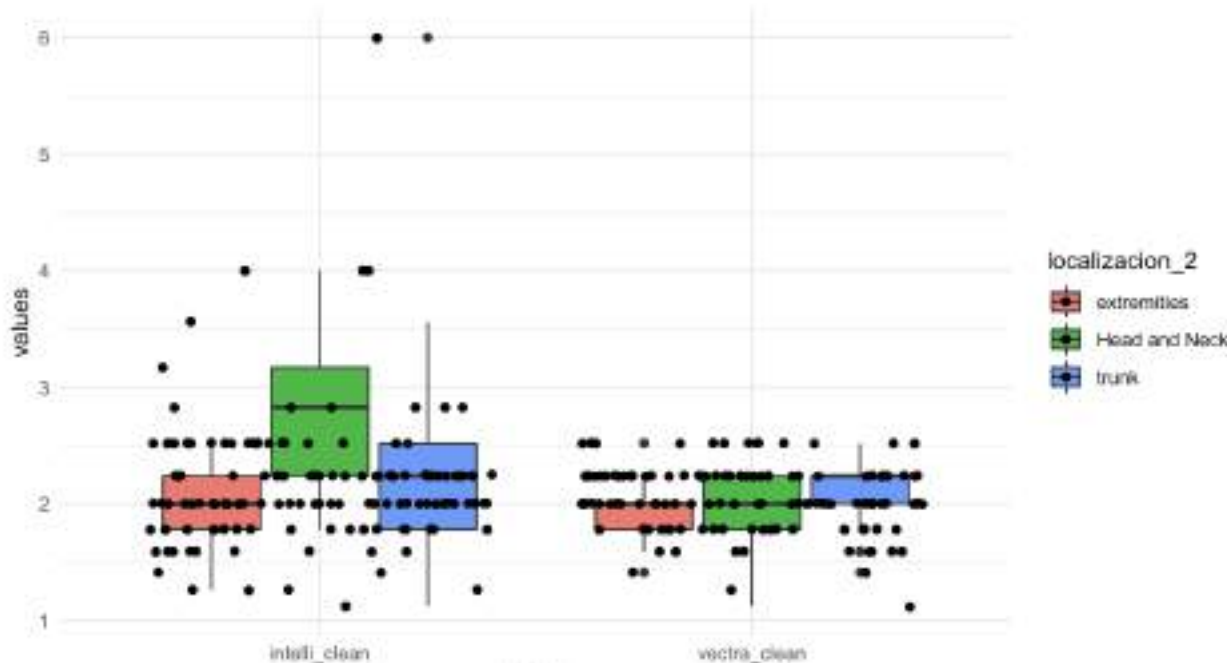
- [Koren 2003](#): Norman Koren's updated resolution chart better suited for computer analysis

DESCRIPTION OF IMAGES OF TBP AND D- DERMOSCOPY



1951 USAF resolution test chart widely used in optical engineering laboratory work to analyze and validate imaging systems.

DESCRIPTION OF IMAGES OF TBP AND D- DERMOSCOPY



TBP

1951 USAF (25 cm) = 3.56 lp/mm.
1951 USAF (150 cm) = 1 lp/mm.

**Cross-polarized
manual
dermatoscope**
USAF 1951 >14.3
lp/mm.

Figure 7 Graphic of 1951 USAF test mediums comparison according to body site

CLINICAL PROTOCOL HOSPITAL CLINIC OF BARCELONA

Inclusion criteria of patients

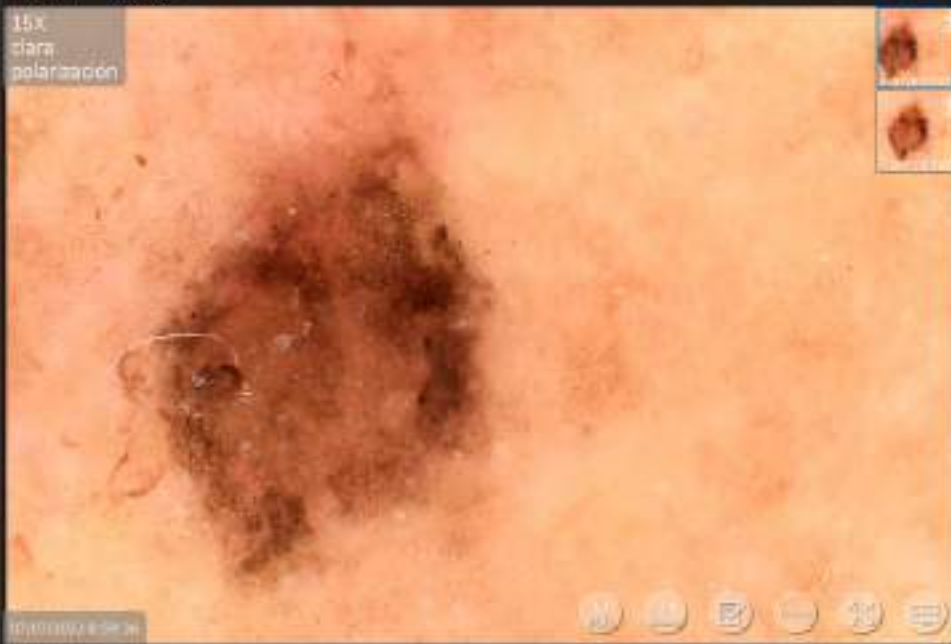
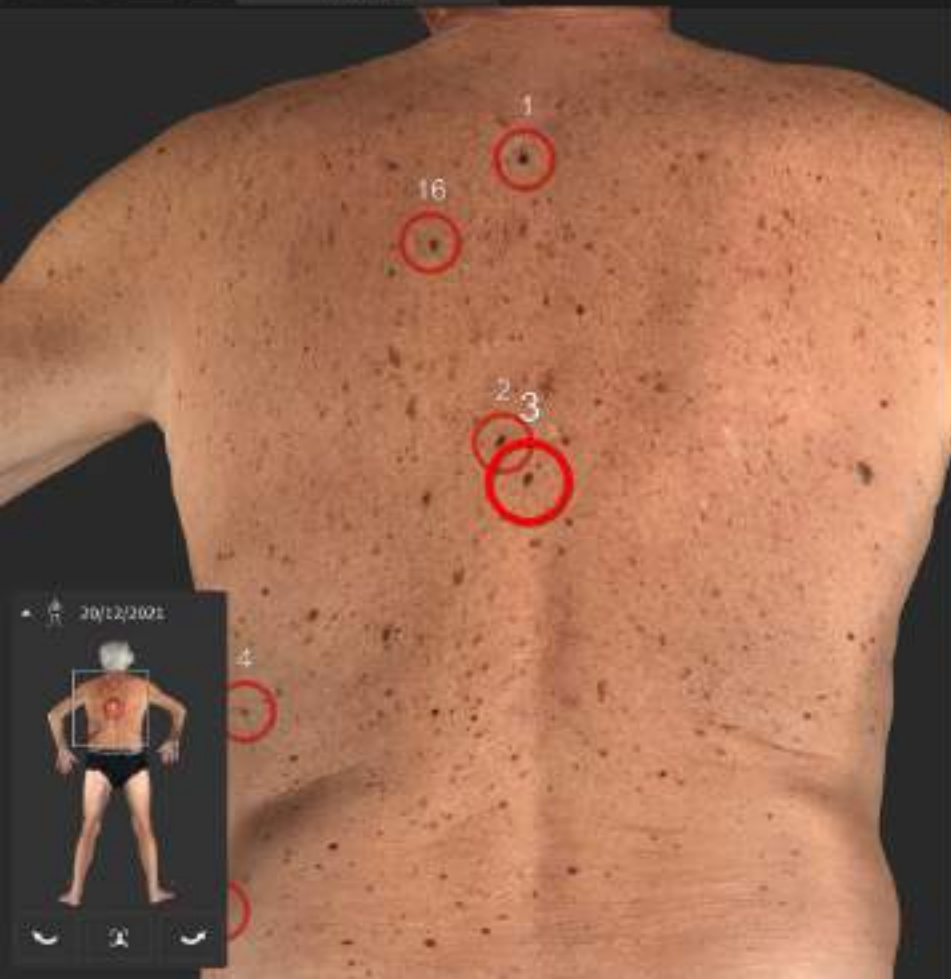
High-risk for melanoma due to multiple atypical melanocytic lesions +/- personal or familial melanoma +/- genetic syndromes

Schedule

1. Base line with full body exam +Dermoscopy-TBP+SDD
2. Follow-up: Imaging (detection of changes)- full body exam with Dermoscopy

Selection of lesions for Dermoscopy image

- Any lesion considered for excision;
- Lesions considered for follow-up with one or more of the following dermoscopic criterio: asymmetry, multicomponent pattern, negative of the pigmented network, regression structures, streaks, ring of globules or atypical vessels



10/10/2021 8:29:36

- 20120001 Estado - seguimiento
Configurar estado de lesión 3 a Follow-up
- 20120001 Lesión - seguimiento
Configurar estado de lesión 3 a No reeval.
- 20120001 Lesión - seguimiento
Configurar nombre de lesión como 3.

Vista en vivo



Lesión 3 20/12/2021 follow-up

15x clara polarización

10/10/2022 8:58:34

1.1

Knowledgebase

asymmetry	3.2
border	1.3
color	4.0
diameter	7.9mm

DEXI

20/12/2021 09:01 - Dermoscopia
Configurar estado de lesión 3 a Follow-up.

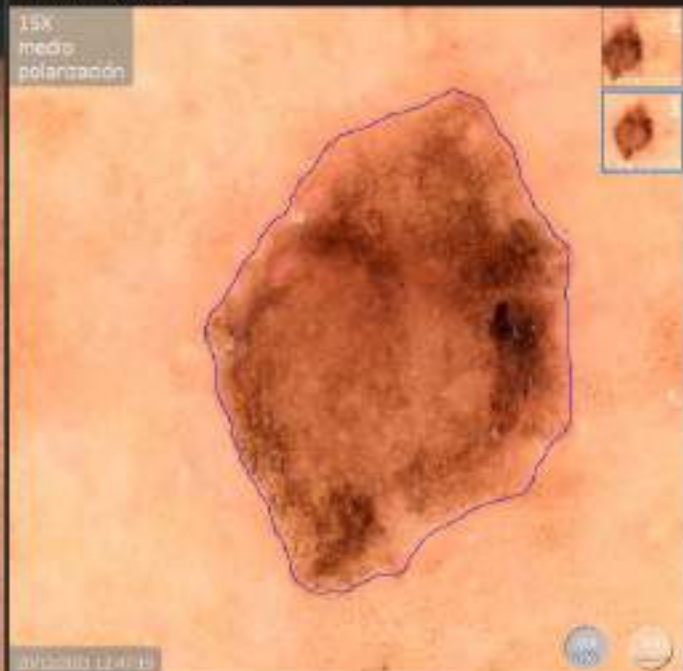
20/12/2021 10:02 - Dermoscopia
Configurar estado de lesión 3 a No remark.

20/12/2021 10:02 - Dermoscopia
Preferencias de configuración de lesión - Lesión 3

Vista en vivo



Lesión 3
 20/12/2021



20/12/2021 12:40:45

Risk assessment: **0.6**

Knowledgebase: **0.6**

geometry: 3.4
 border: 1.3
 color: 5.2
 diameter: 8.3mm

20/12/2021 12:40:45

Risk assessment: **1.1**

Knowledgebase: **1.1**

geometry: 3.2
 border: 1.3
 color: 4.8
 diameter: 7.9mm

4080002020122021-12-20-12:40:45
 Configurar estado de lesión 3 a Polbe-up

4080002020122021-12-20-12:40:45
 Configurar estado de lesión 3 a No-remark

Vista en vivo



20/12/2021 10:49:05

- 20/12/2021 10:49:05 - Configuración
Configurar estado de lesión 5 a Follow-up
- 20/12/2021 10:49:05 - Configuración
Configurar Asocia de lesión 5 a His renals.
Configurar nombre de lesión como 5.

Vista en vivo

20/12/2021



1.1

Knowledgebase

asymmetry	2.5
border	1.3
color	3.4
diameter	5.2mm

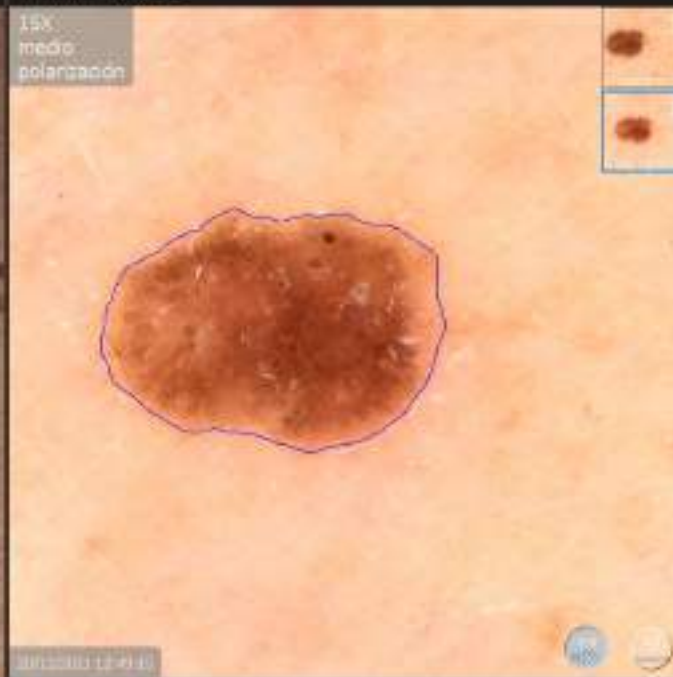
DEXI

- 30/12/2021 08:47 - 30/12/2021 08:47
Configurar estado de lesión 5 a Follow-up.
 - 30/12/2021 12:54 - 30/12/2021 12:54
Configurar estado de lesión 5 a No remark.
Configurar nombre de lesión contra 5.
- Vista en vivo

20/12/2021

0 1 1a 0 0 0 0
 10 de 10 fotos
 8 / 17 imágenes

Lesión 5
 20/12/2021 Pulso-up



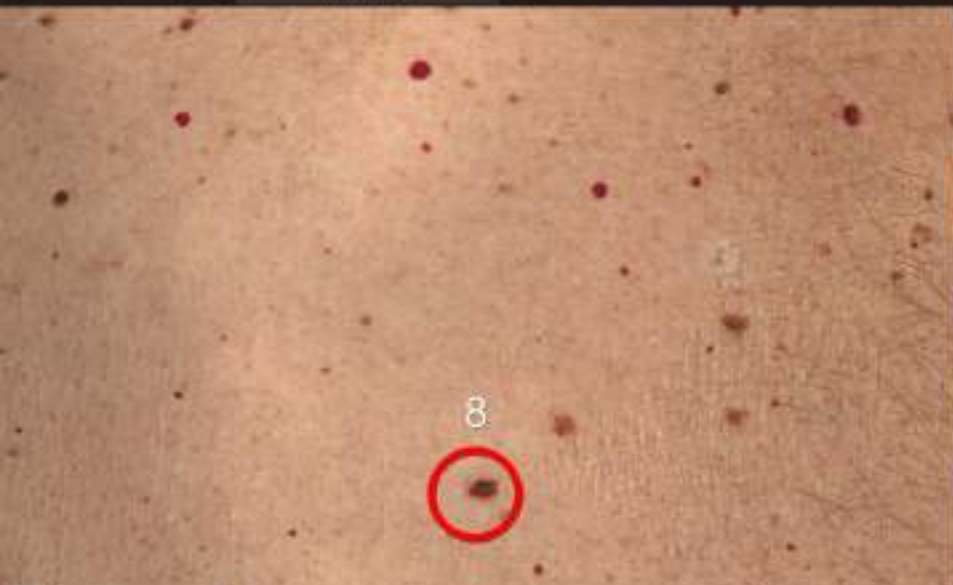
20/12/2021

20/12/2021 12:49:41
 Puls. assessment **0.6**
 Knowledgebase
 All lesion marks
 geometry 3.0
 border 1.6
 color 3.0
 diameter 5.6mm

20/12/2021 8:36:21
 Puls. assessment **1.1**
 Knowledgebase
 All lesion marks
 geometry 2.5
 border 1.3
 color 3.4
 diameter 5.7mm

Configuración de la lesión 5 a Pulso-up.
 Configuración estado de lesión 5 a No remark.
 Definición nombre de lesión como 5.

Vista en vivo



20/12/2021



20/12/2021 05:04:34

📄
Configurar estado de lesión 8 a Follow-up

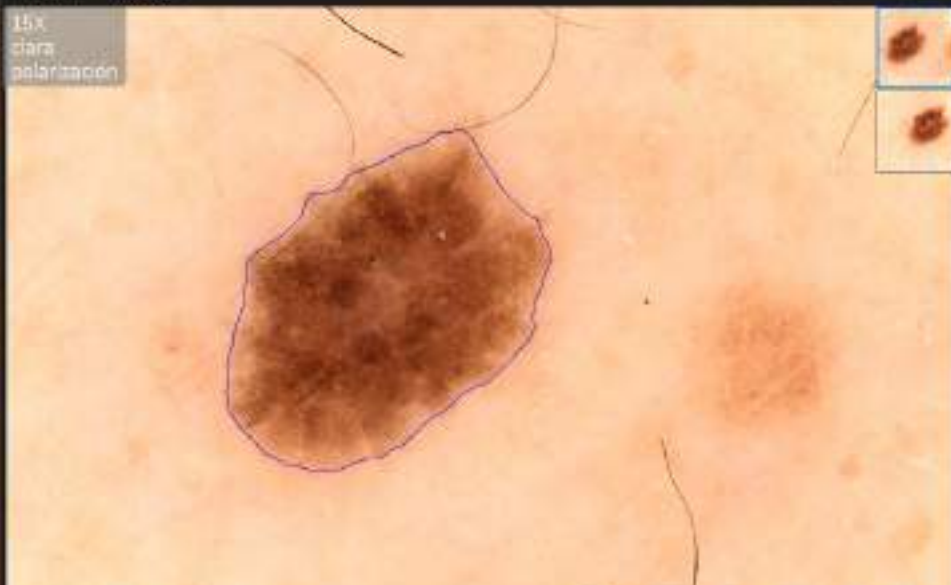
📄
20/12/2021 05:04:34 - Historial de imágenes
Configurar Asocia de lesión 8 a las imágenes
Configurar nombre de lesión como 8

Vista en vivo



20/12/2021

Body map showing the location of the scan on a human torso.



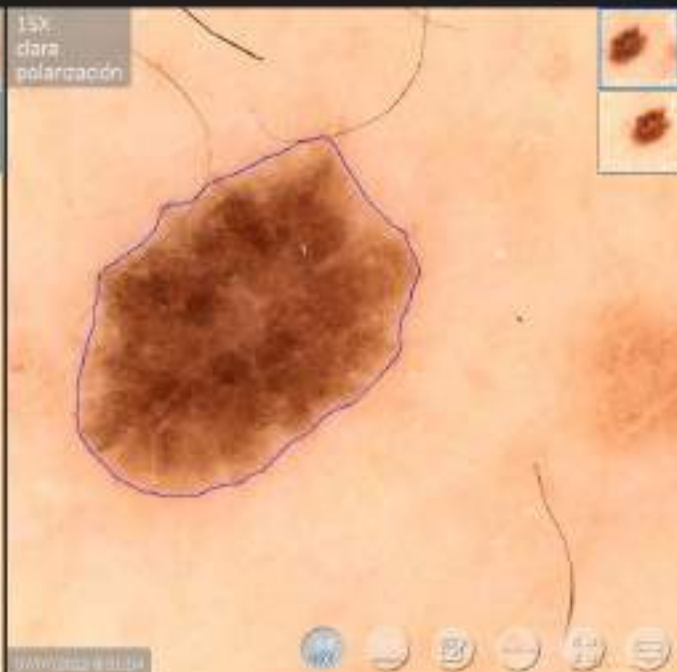
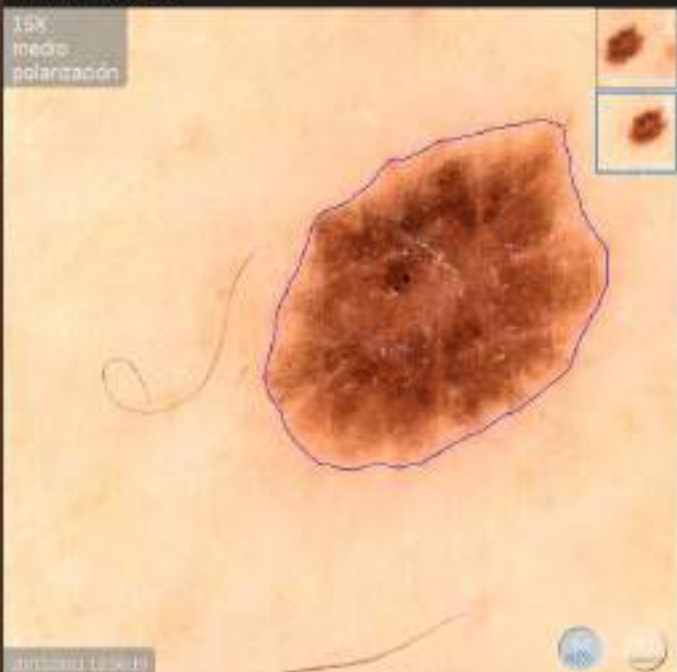
0.8

Knowledgebase

asymmetry	2.8
border	1.2
color	4.3
diameter	6.2mm

DEXI

- 20/12/2021 10:14 - 10/12/2021 10:14 Configurar estado de lesión 8 a Follow-up.
 - 20/12/2021 10:14 - 10/12/2021 10:14 Configurar estado de lesión 8 a No remark. Configurar nombre de lesión como 8.
- Vista en vivo

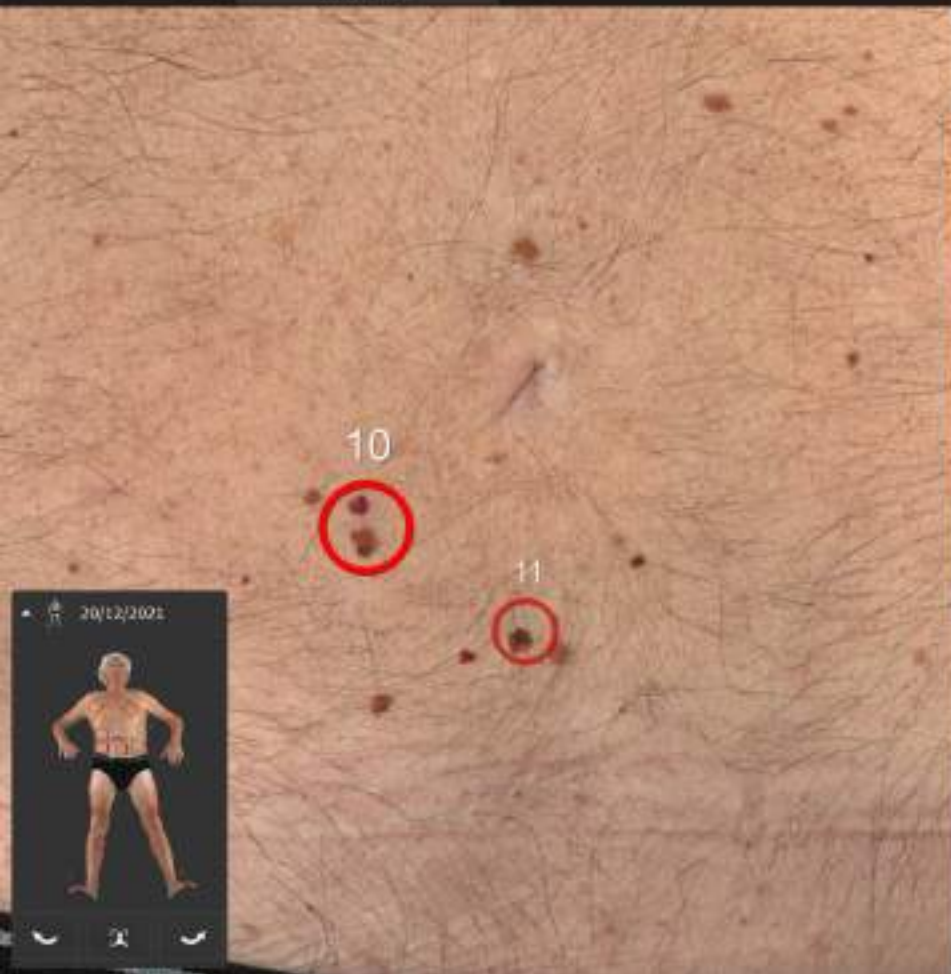


0.2

Asymmetry 3.0
Border 1.1
Color 5.0
Diameter 6.6mm

0.8

Asymmetry 2.0
Border 1.7
Color 4.3
Diameter 6.2mm



20/12/2021 10:30:21

Integración de imágenes
Configurar estado de lesión 10 a follow-up.

20/12/2021 10:30:21
Configurar estado de lesión 11 a no marcar.
Configurar nombre de lesión como 10.

Vista en vivo

Inicio de sesión 8 / 17 imágenes
0 1 18 0 0 0
Mapa del cuerpo

Eliminar Compartir Descargar Imagen



20/12/2021

30/12/2021 8:52:11

0.8
Knowledgebase
asymmetry 2.8
border 1.1
color 4.0
diameter 4.0mm

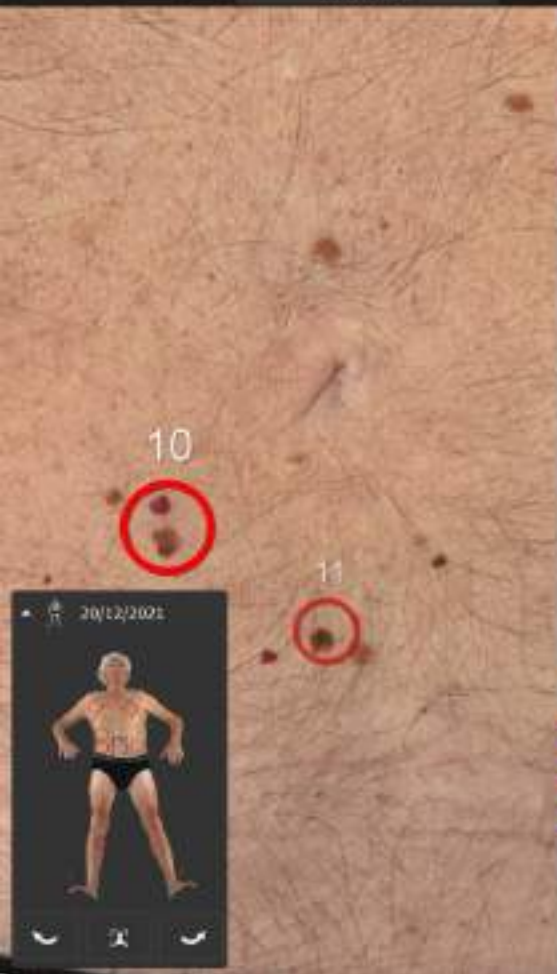
30/12/2021 8:52:11 - 30/12/2021 8:52:11
 Configurar estado de lesión 10 a Follow-up.

20/12/2021 12:04:14 - 30/12/2021 8:52:11
 Configurar estado de lesión 10 a No remark.
 Configurar nombre de lesión como 10.

Vista en vivo

10 de 100 fotos 17 májoras
0 1 18 0 0 0 0 0 0 0

Lección 10 20/12/2021 **0.7**



0.7

Asymmetry 3.8
border 1.3
color 5.7
diameter 5.4mm

0.8

Asymmetry 2.8
border 1.1
color 4.6
diameter 4.8mm

00000005023 - 479461833436
Configurar estado de lesión III a Filtro-U2.
00000005023 - 479461833436
Configurar estado de lesión 10 a No remark.
Definir nombre de lesión como 10.
Vista en vivo



- Entregado estado - confirmación
 Configurar estado de lesión 14 a follow-up.
- 408000244818 - confirmación
 Configurar estado de lesión 14 a fin de tarea.
 Configurar nombre de lesión como 14.



3.8

Asimetría 3.5
 Estructura 1.2
 Color 5.7
 Grosor 4.2mm

- 09/07/2021 08:31 - 09/07/2021 08:31
Configurar estado de lesión 14 a Follow-up.
- 09/07/2021 08:31 - 09/07/2021 08:31
Configurar estado de lesión 14 a No remark.
Configurar nombre de lesión como 14.

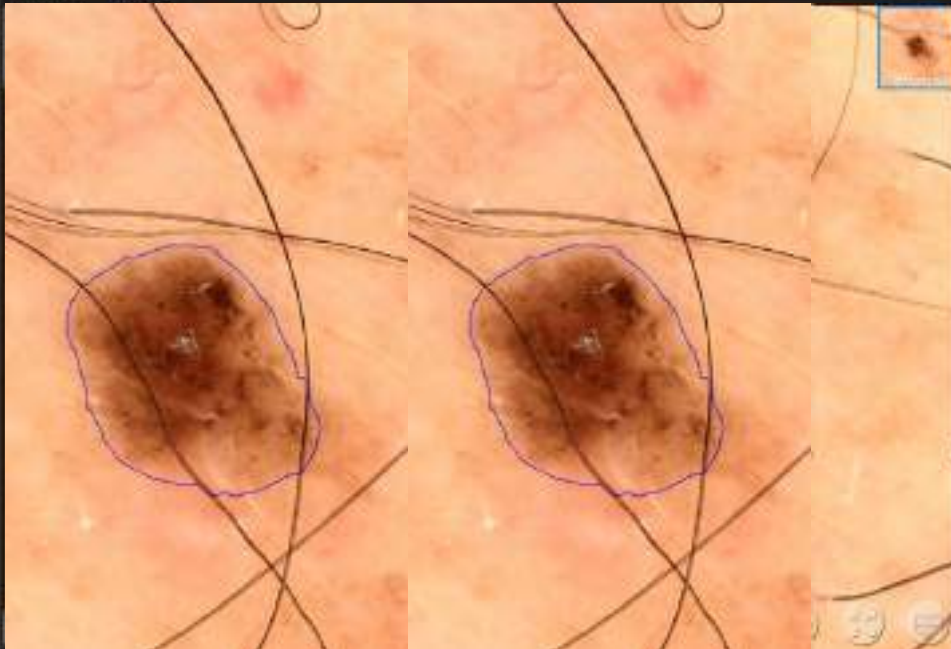
20/12/2021



14



20/12/2021



Así se ve el resultado de la medición de la lesión:

3.8

Así se ve el resultado de la medición de la lesión:

asimetría: 3,3
 borde: 1,2
 color: 5,7
 diámetro: 4,2mm

- 09/07/2021 09:31:11 - 09/07/2021 09:31:11
Configurar estado de lesión 14 a Follow-up.
- 09/07/2021 09:31:11 - 09/07/2021 09:31:11
Configurar estado de lesión 14 a No remark.
Configurar nombre de lesión como 14.

Vista en vivo

← → 0 1 18 0 0 0 0 0

Foto de referencia: 0 / 17 imágenes Buscar por nombre

Lesión 4 20/12/2021 Follow-up
🗑️ 📄 ⬇️ 📷

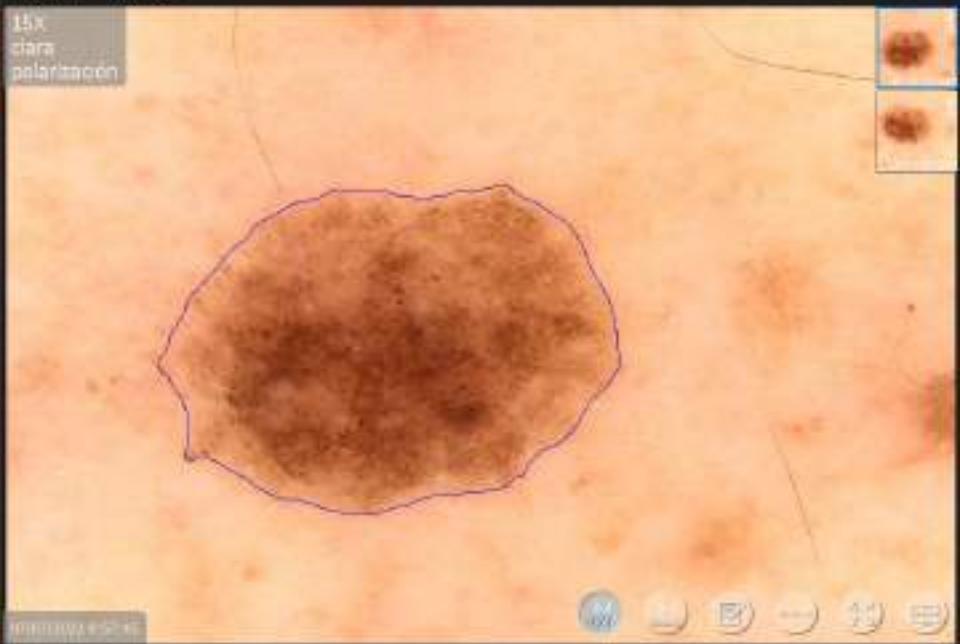


20/12/2021

20/12/2021 Lesión 4 - **Follow-up**
 Configurar estado de lesión 4 a Follow-up

20/12/2021 Lesión 4 - **Referencia**
 Configurar estado de lesión 4 a Referencia
 Configurar nombre de lesión como 4

Vista en vivo



ANÁLISIS DE LESIÓN

Auto assessment: **0.2**

Knowledgebase: **asymmetry 2.5**
border 0.9
color 4.1
diameter 7.9mm

📄 **30/12/2021 07:41** 📄 📄 📄 📄 📄 📄
Configurar estado de lesión 4 a Follow-up.

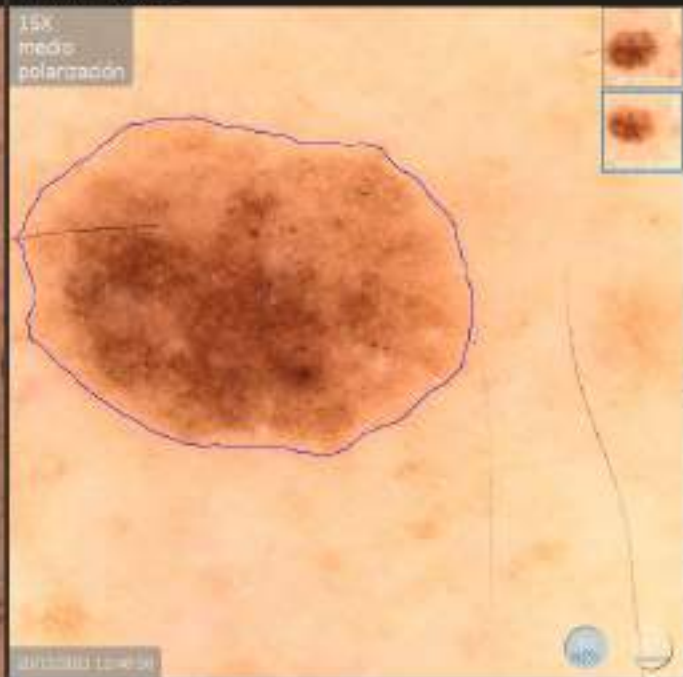
📄 **30/12/2021 10:04** 📄 📄 📄 📄 📄 📄
Configurar estado de lesión 4 a No remark.
Configurar nombre de lesión contra 4.

DEXI

Foto de referencia: 0 / 17 imágenes
 Mapa por niveles

Lesión 4

 20/12/2021 Pulso-up



0.1

 All lesion marks:

 geometry: 2.0
 border: 0.5
 color: 4.0
 diameter: 7.5mm

0.2

 All lesion marks:

 geometry: 2.5
 border: 0.9
 color: 4.1
 diameter: 7.9mm

4000002516 - 4000002516
 Configurar estado de lesión 4 a Pulso-up.

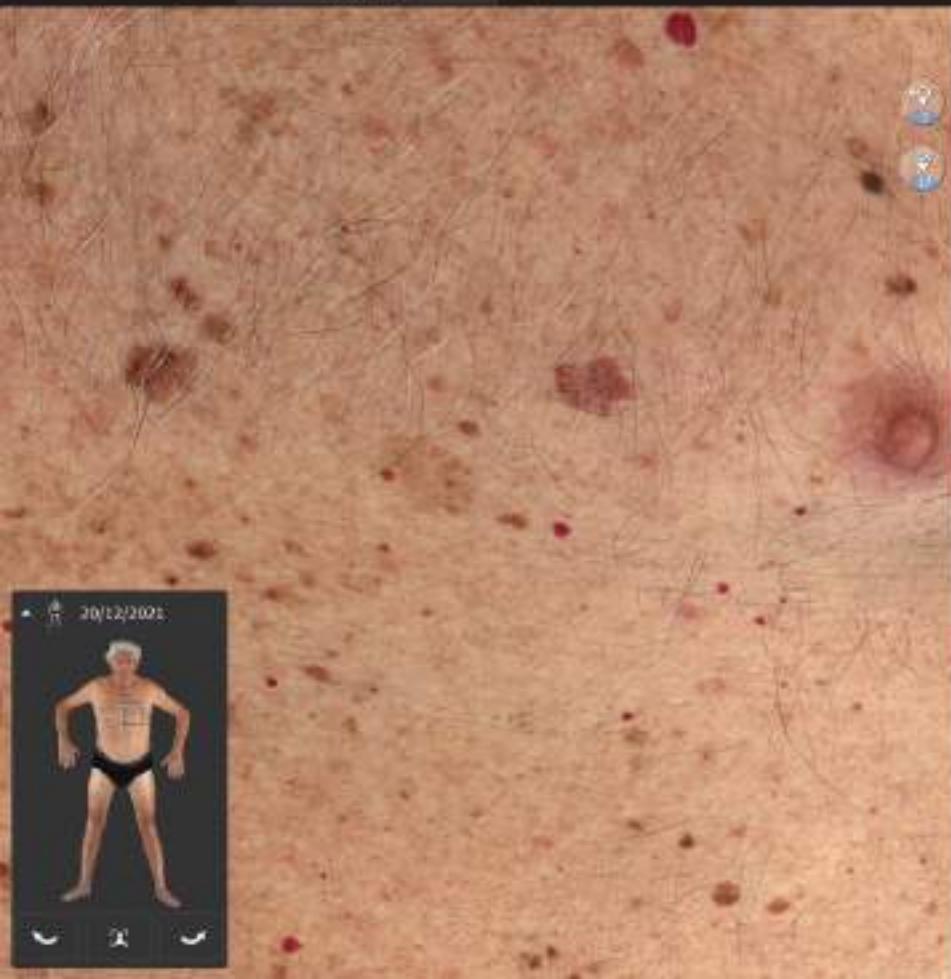
4000002516 - 4000002516
 Configurar estado de lesión 4 a No remark.
 Definir nombre de lesión como 4.

Vista en vivo

Lista de trabajos
0 / 17 imágenes

0 1 18 0 0 0 0

Mostrar por teclado

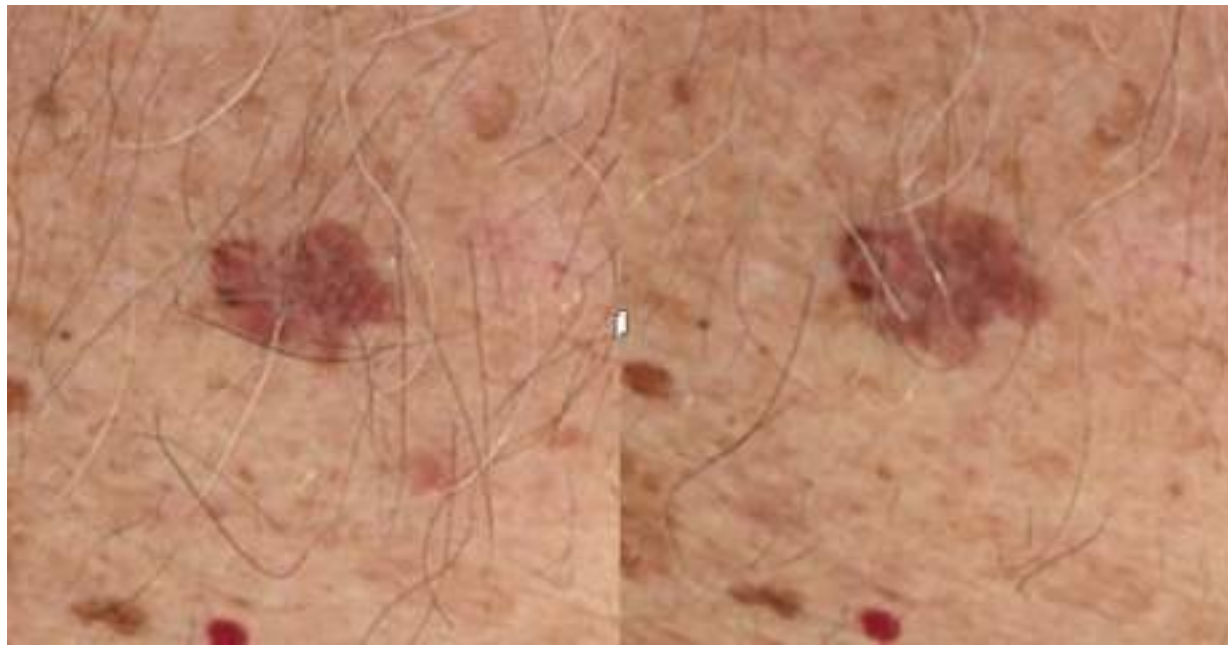


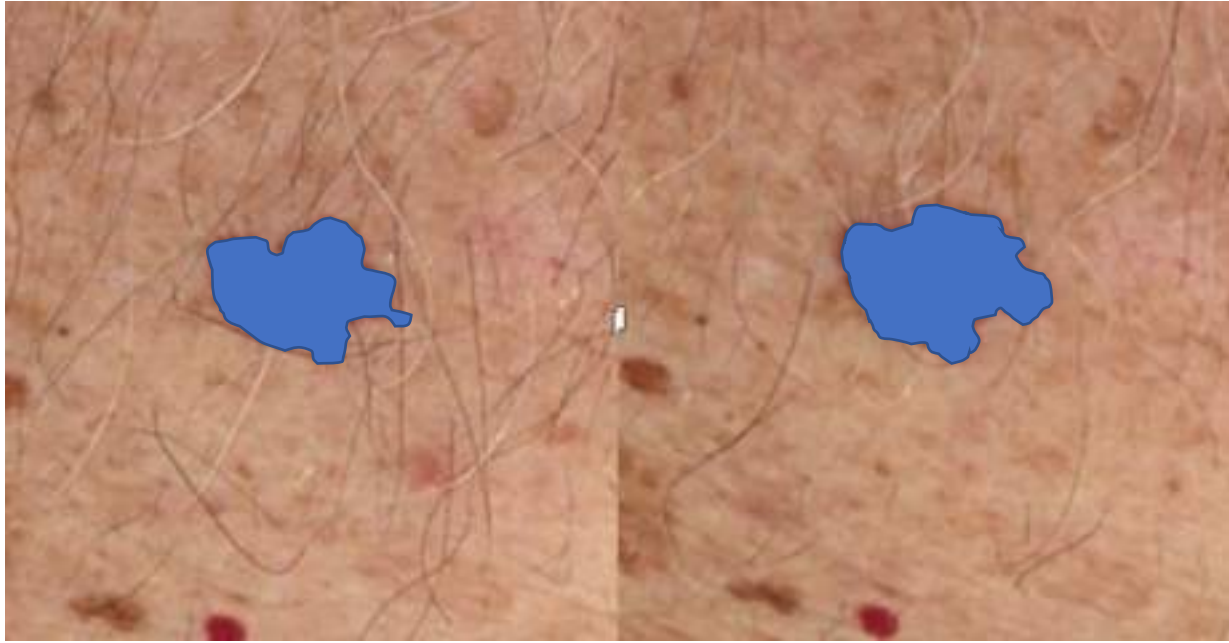
20/12/2021

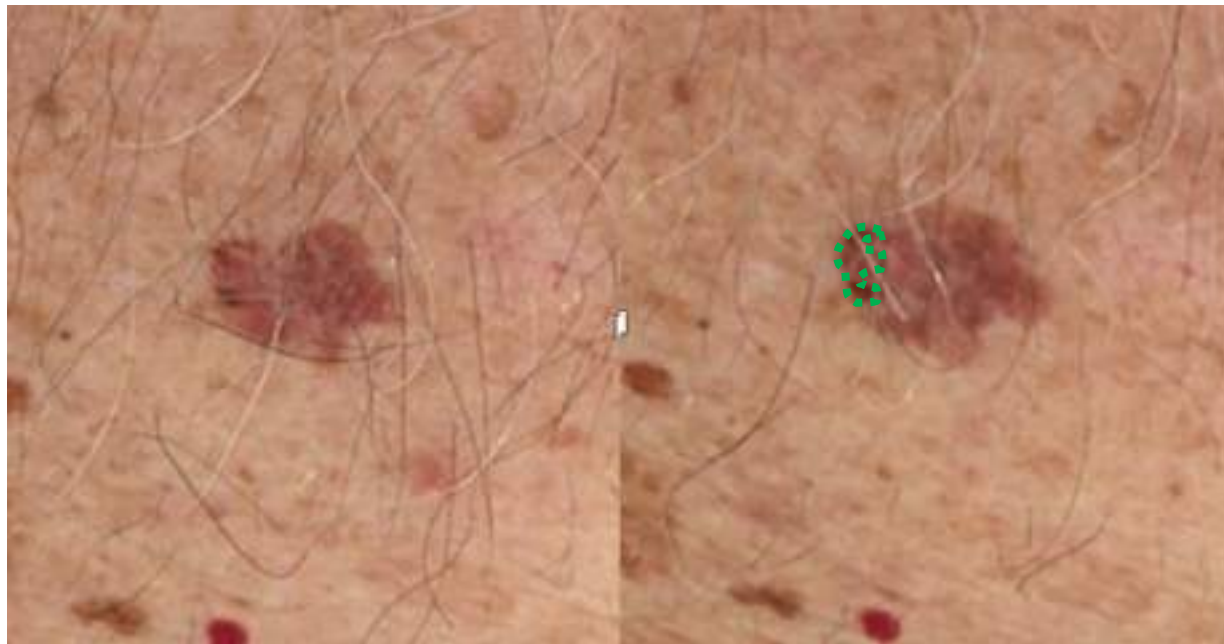
A body map showing the location of the lesion on the chest. The patient is wearing black briefs. The lesion is marked with a red dot on the upper chest area. Navigation icons are at the bottom.

17/07/2022

A body map showing the location of the lesion on the chest. The patient is wearing blue briefs. The lesion is marked with a red dot on the upper chest area. Navigation icons are at the bottom.









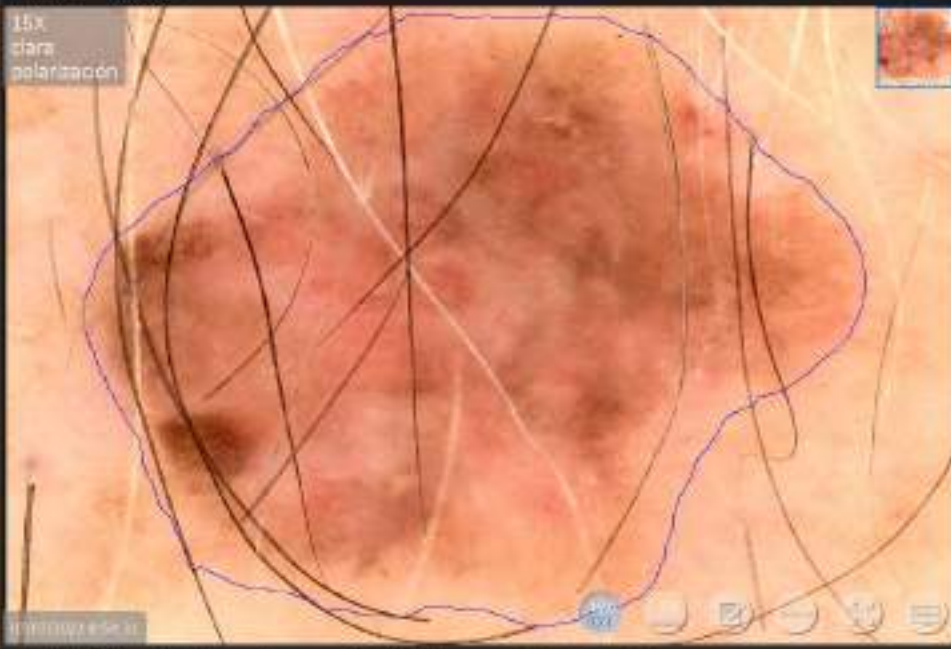
07/07/2022 8:54:11



Historial de fotos

- 09/07/2021 - 09/07/2021
Configurar estado de lesión 15 a follow-up.
- 09/07/2021 - 09/07/2021
Configurar estado de lesión 15 a fin remark.
Configurar nombre de lesión como 15.

Vista en vivo



10.0

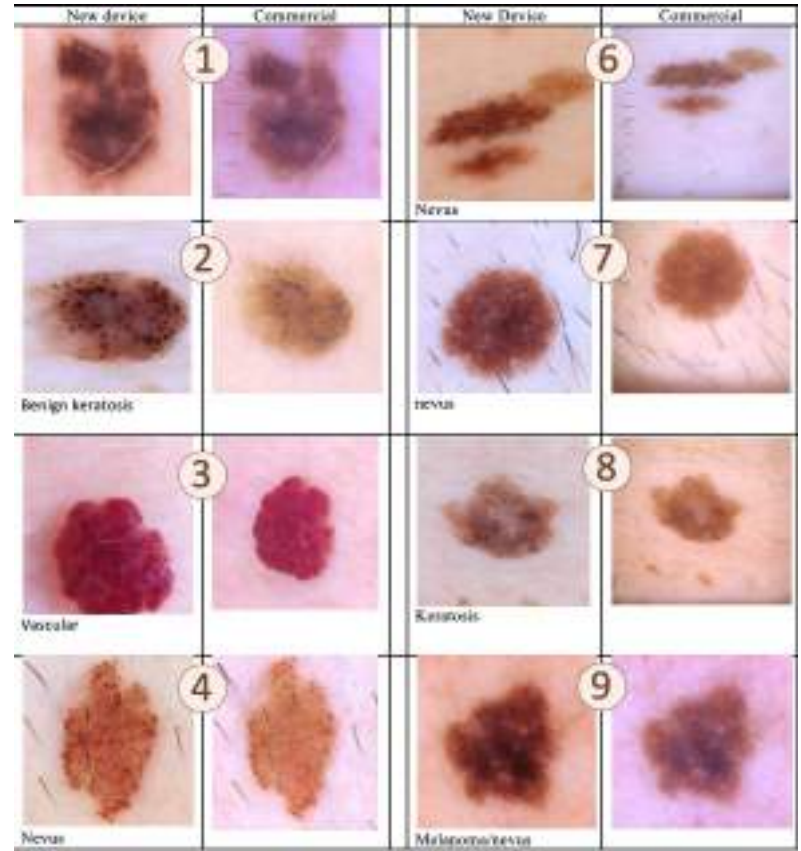
Knowledgebase

asymmetry	3.2
border	1.5
color	4.1
diameter	13.5mm

DEXI

- 07/07/2022 15:44:11 - 15/07/2022 - Configurar estado de lesión 15 a Follow-up.
 - 07/07/2022 15:46:11 - 15/07/2022 - Configurar estado de lesión 15 a No remark. Configurar nombre de lesión como 15.
- Vista en vivo

Autonomous Dermoscopy Scanner





Autonomous scanner

- Minimal human intervention for TBP and TBD
- High quality of imaging
- The patient follows the instructions of the robot
- Detection of body position
- TBP (n=36) with polarised light
- Software for the detection of lesions (Computer visión)
- Dermoscopic photos of the lesions

- Preliminary results in 50 volunteers
- Time of imaging = 10 min (6-12 min)
- Number of lesions = 40

Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022

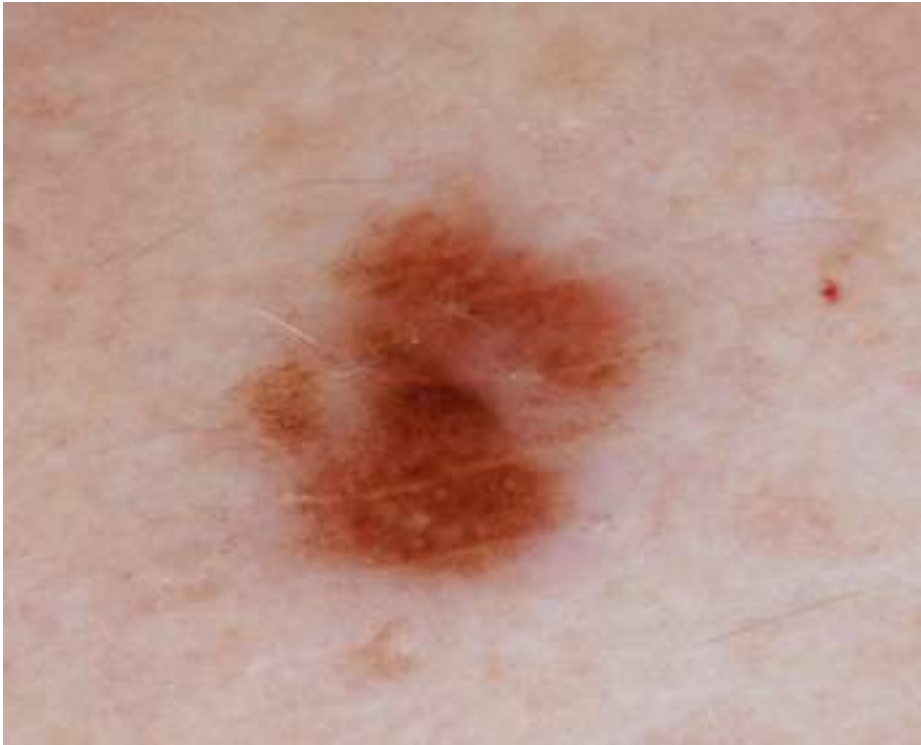
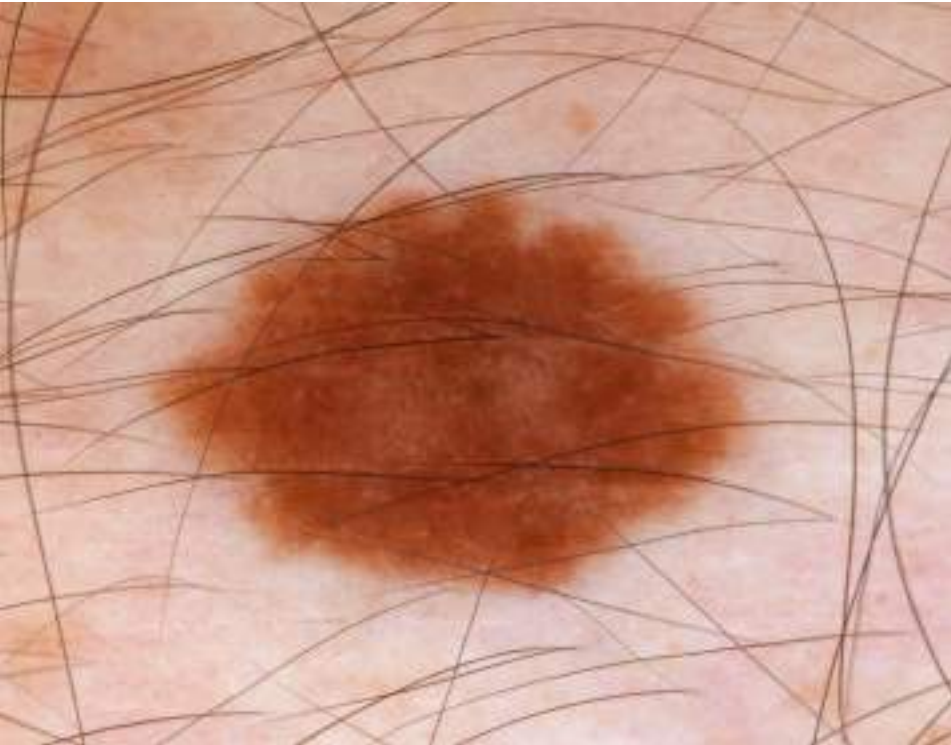








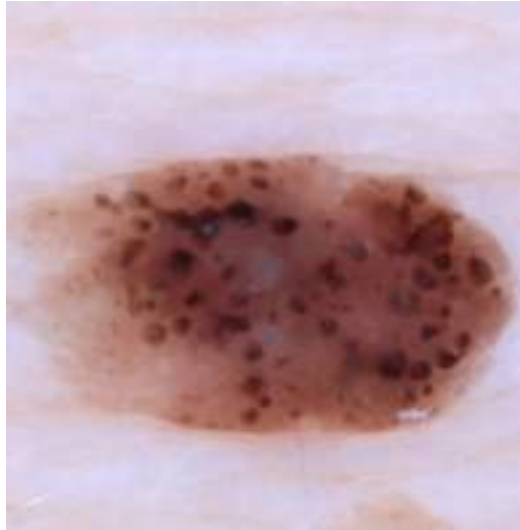
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



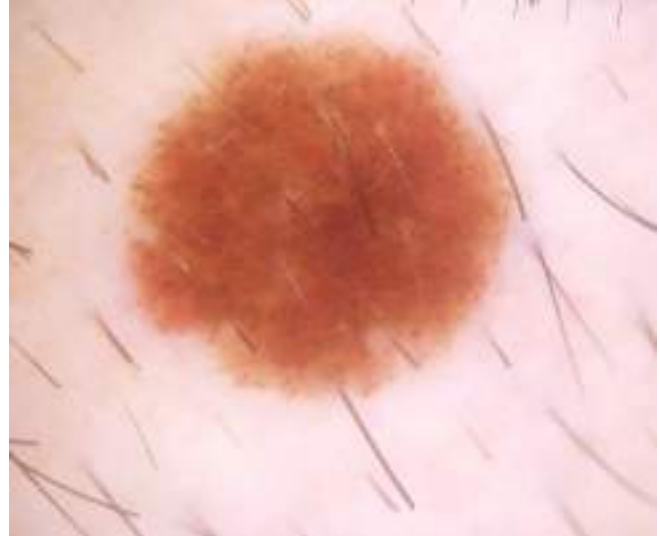
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



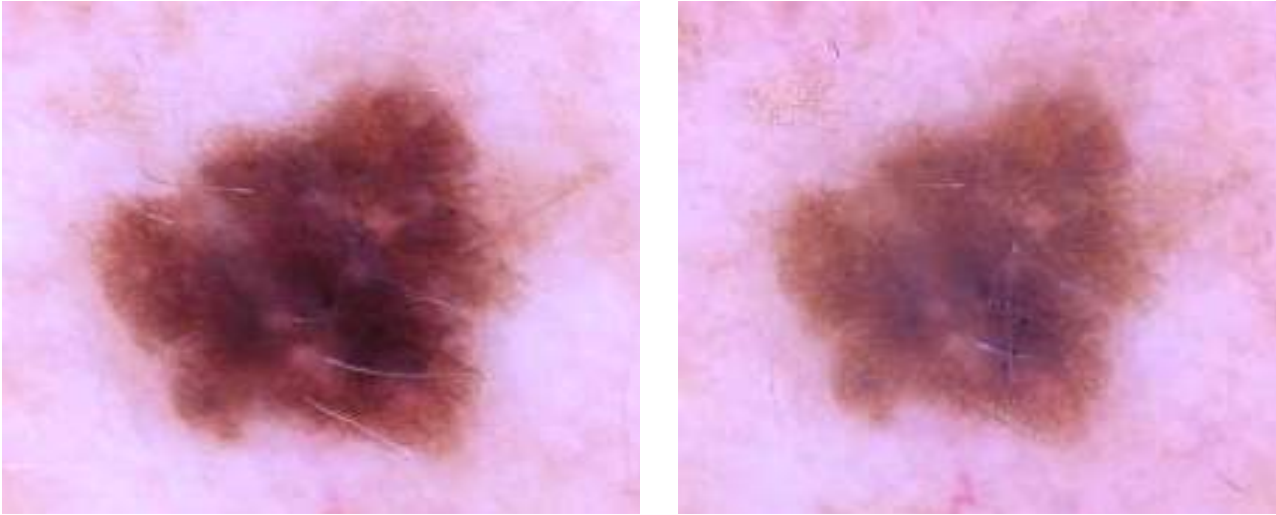
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022



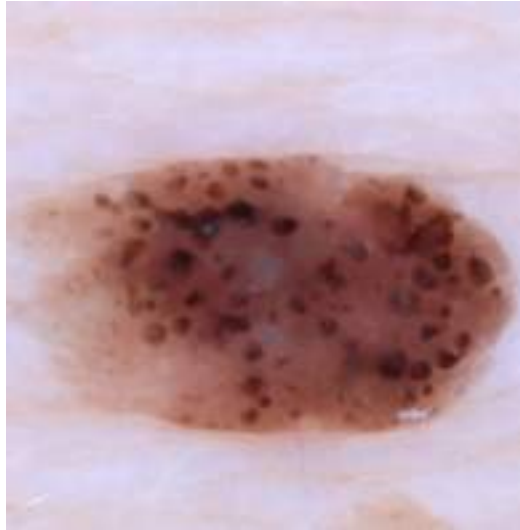
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022



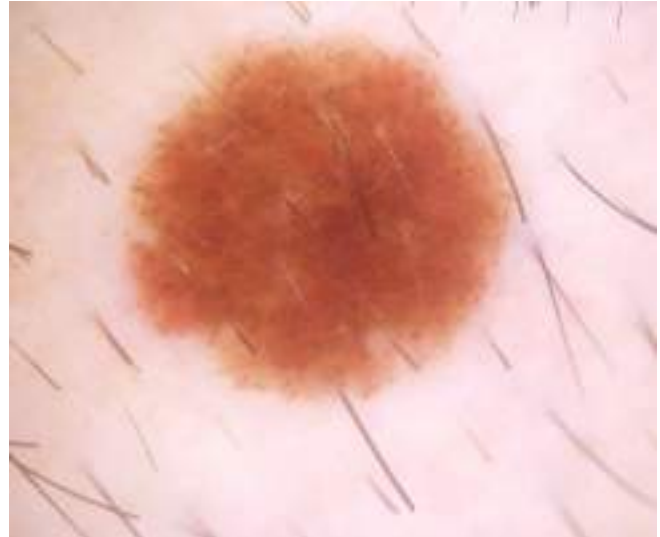
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



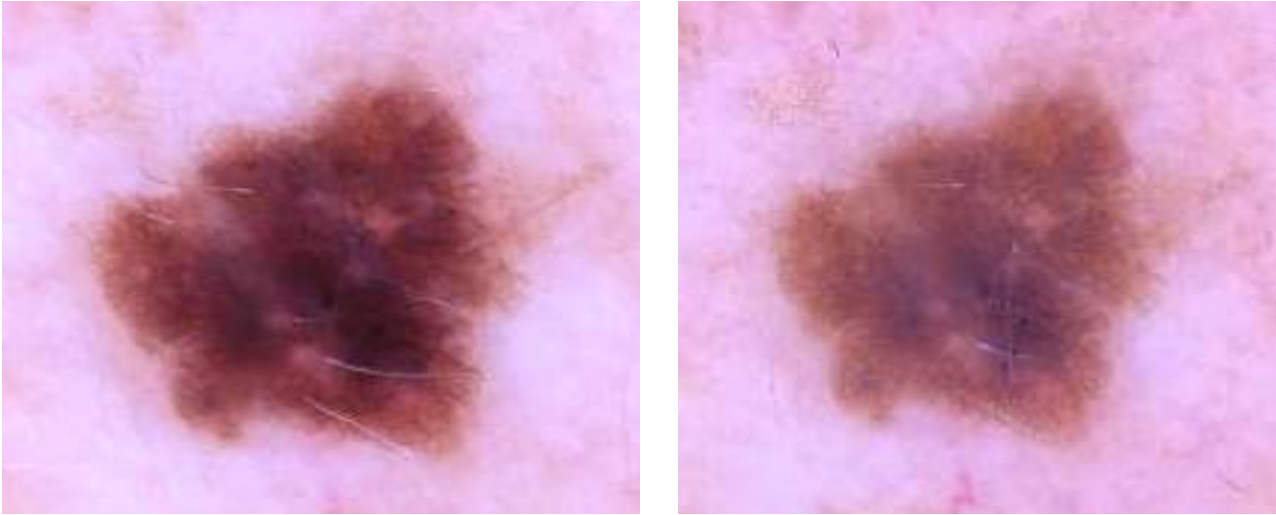
Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022

Woman 41 years old



MELANOMA RISK SCORE: DEEP PHENOTYPING



Deep imaging (phenotype)

- Skin type
 - Skin color (spectrophotometry)
 - Hair/eyes color
- Photoaging signature
 - Atrophy
 - Hypertrophy
 - Dyschromia
 - Solar lentigos
 - Field cancerization
- Atypical mole syndrome
 - Number of melanocytic lesions
 - Diameter, color, ...
 - Distribution
- Dermoscopic characteristics
 - Pigmentation
 - Pattern: reticular, globular, homogeneous,...
- Other skin lesions

Clinical information

- 45 years old woman
- No medications
- Previous MM (n=2 ; stage 1A; trunk; 2011,2014)
- Familial MM (3 members; Lung Ca, Breast Ca)

Phenotype

- Skin color 3
- Photodamage= 3
- 235 skin pigmented lesions

Reticular 70%; homogeneous 25%;
Combination patterns 5%; Brown light and dark

Others: seb ker =3; angiomas= 11; Other: 12
Trunk=70%; lower extrem=20%; upper
extre=7%;Other=3% ; special sites=0%

Genetics

CDKN2A G101w

MITF wt, *POT-1* wt, *TERT* wt

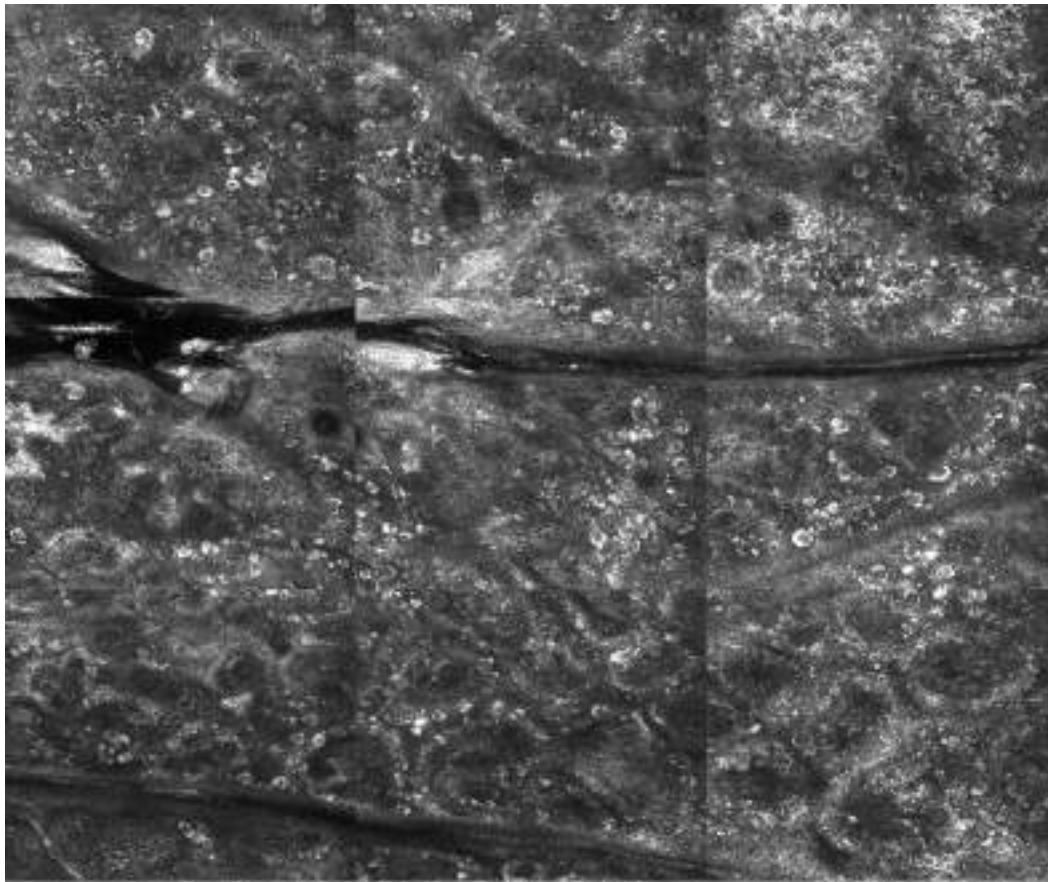
MC1R wt

Polygenic risk score= 2,45



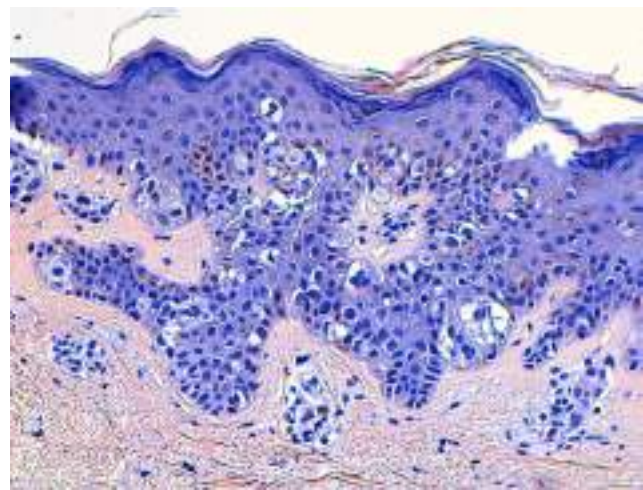




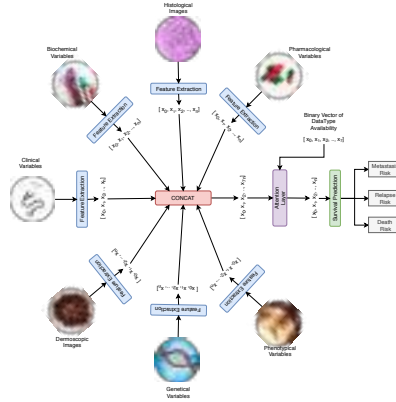


Lovatto L, Carrera C, Salerni G, Alós L, Malveyh J, Puig S. In vivo reflectance confocal microscopy of equivocal melanocytic lesions detected by digital dermoscopy follow-up. J Eur Acad Dermatol Venereol. 2015 Oct;29(10):1918-25

Stanganelli I, Longo C, et al. Integration of reflectance confocal microscopy in sequential dermoscopy follow-up improves melanoma detection accuracy. Br J Dermatol. 2015 Feb; 172(2):365-71



MELANOMA RISK SCORE: DEEP PHENOTYPING



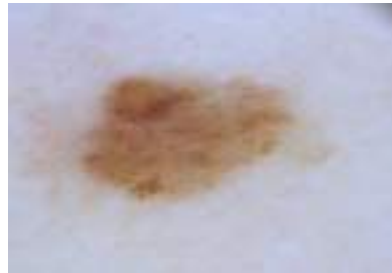
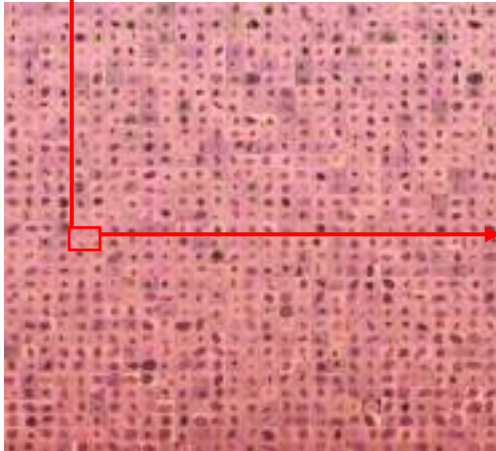
Age, sex, ethnicity, geography
Skin UV damage
Skin type (spectrophotometry)

CLINICAL

Clinical background
Previous MM
Familial MM
Medications

GENETIC

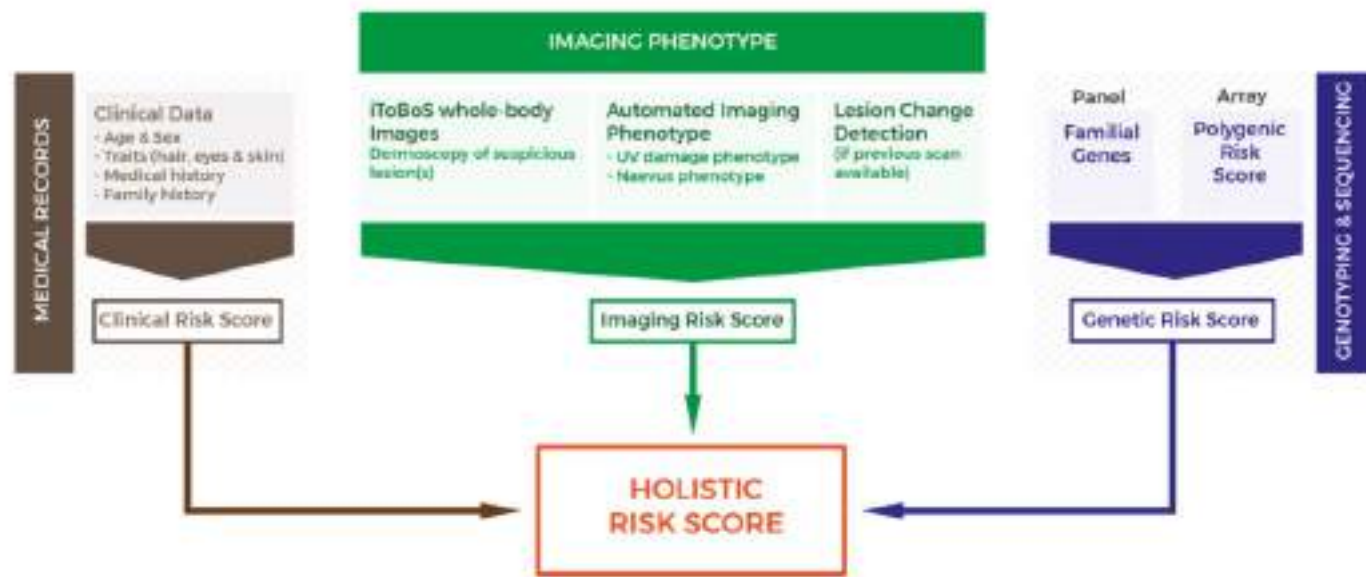
CDKN2A G101w
MITF wt, POT-1 wt, TERT wt
MC1R wt
Polygenic risk score



DEEP IMAGING

Full body Dermoscopy

HOLISTIC MELANOMA RISK STRATIFICATION



CONCLUSIONS

- Best current estimates suggest that in patients at high risk of melanoma, TBP-SDD has an acceptable NNB, when compared with previous studies using standard clinical examination without TBP.
- New technologies with faster examination and computed aided
- The combination of Deep phenotyping with machine learning can improve detection of skin cancer and risk stratification of patients





Research Team in AI. Dermatology Department. Hospital Clinic. Barcelona

Clinical team

Josep Malvehy
Susana Puig
Cristina Carrera
Sebastian Podlipnik
Javiera Pérez-Anker
Agustí Toll
Daniel Rizo

Fellows

Laura Serra
Pau Roses
Ana Claudia Rivas

Computer scientists and Engineering

Joan Ficapal
Marc Combalia
Sergio Campderrich
Rafael Garcia
Josep Quintana
Konstantin Korotkov

Imaging technicians

Beatriz Alejo
Abel Caño

