Pentacam in Refractive Surgery

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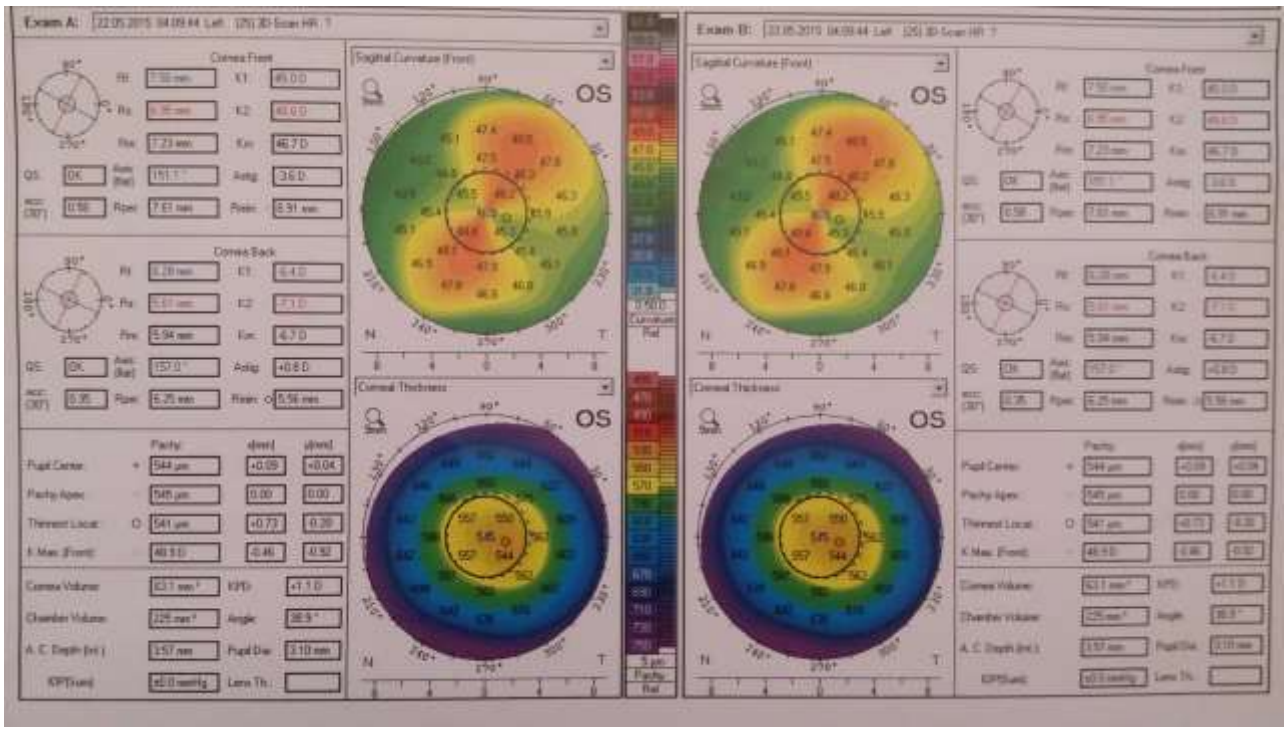

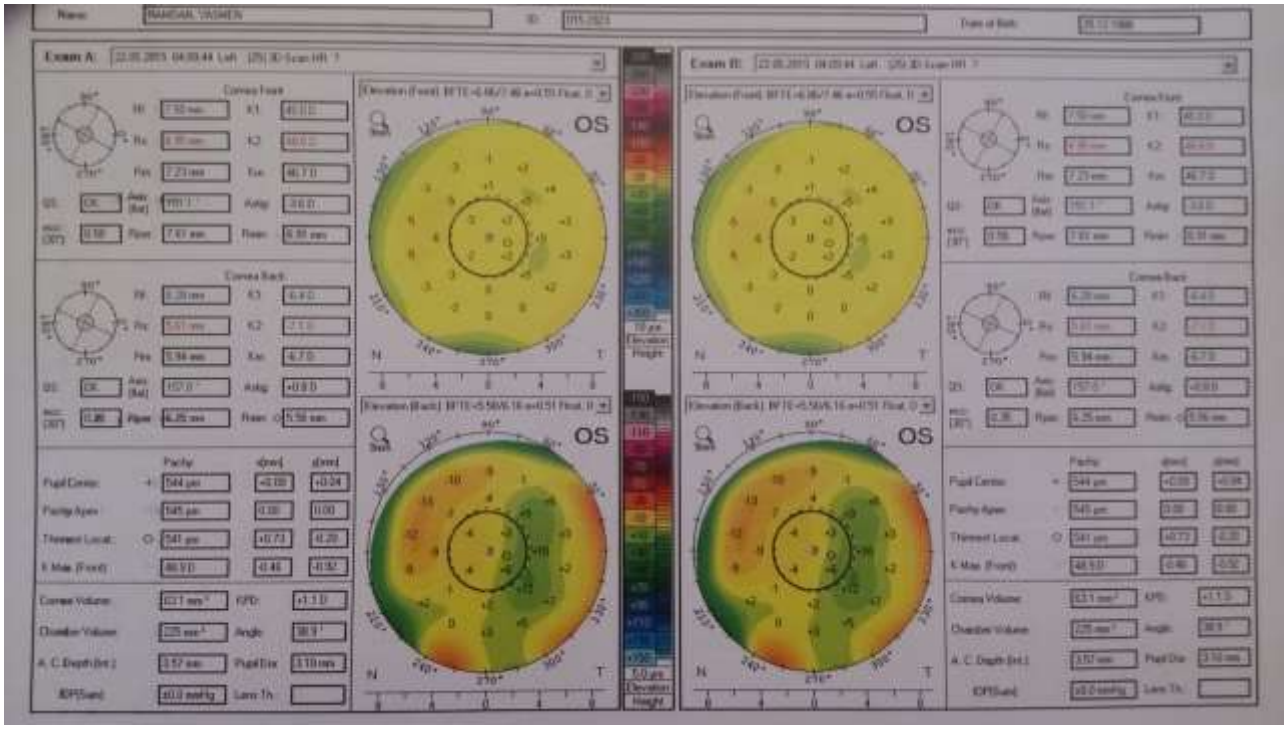
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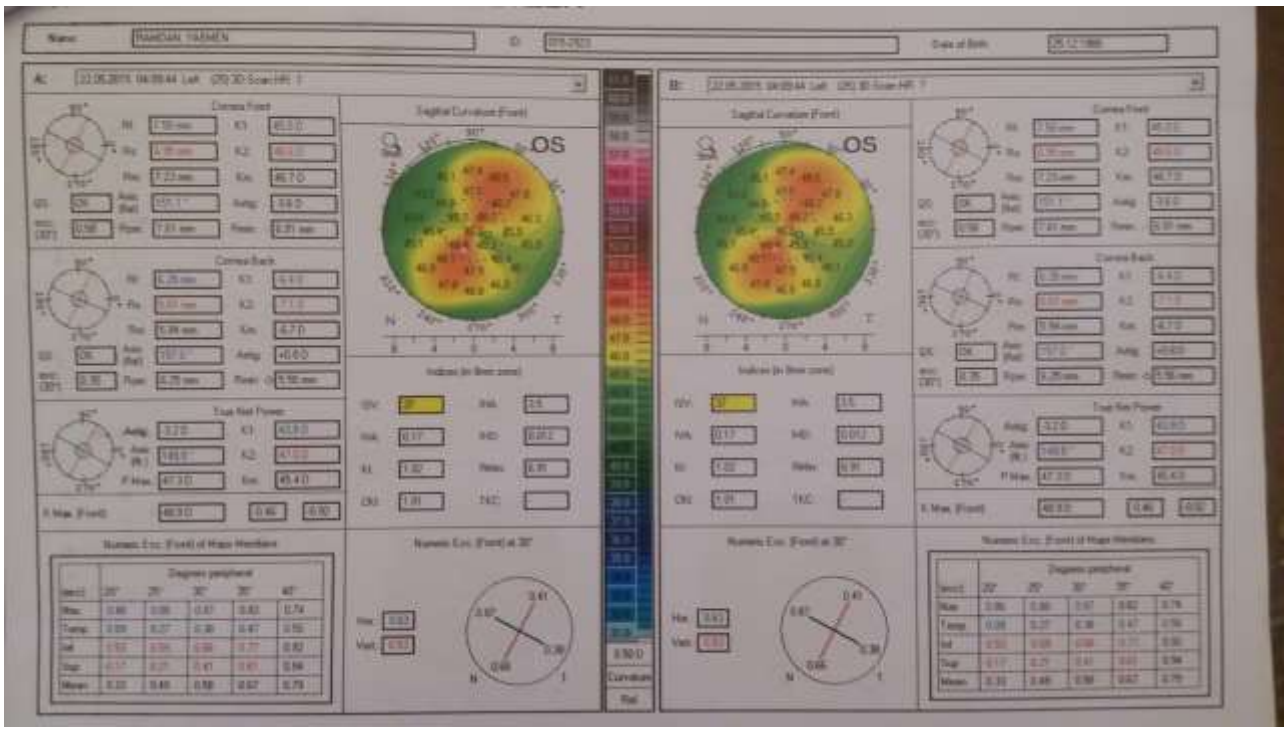
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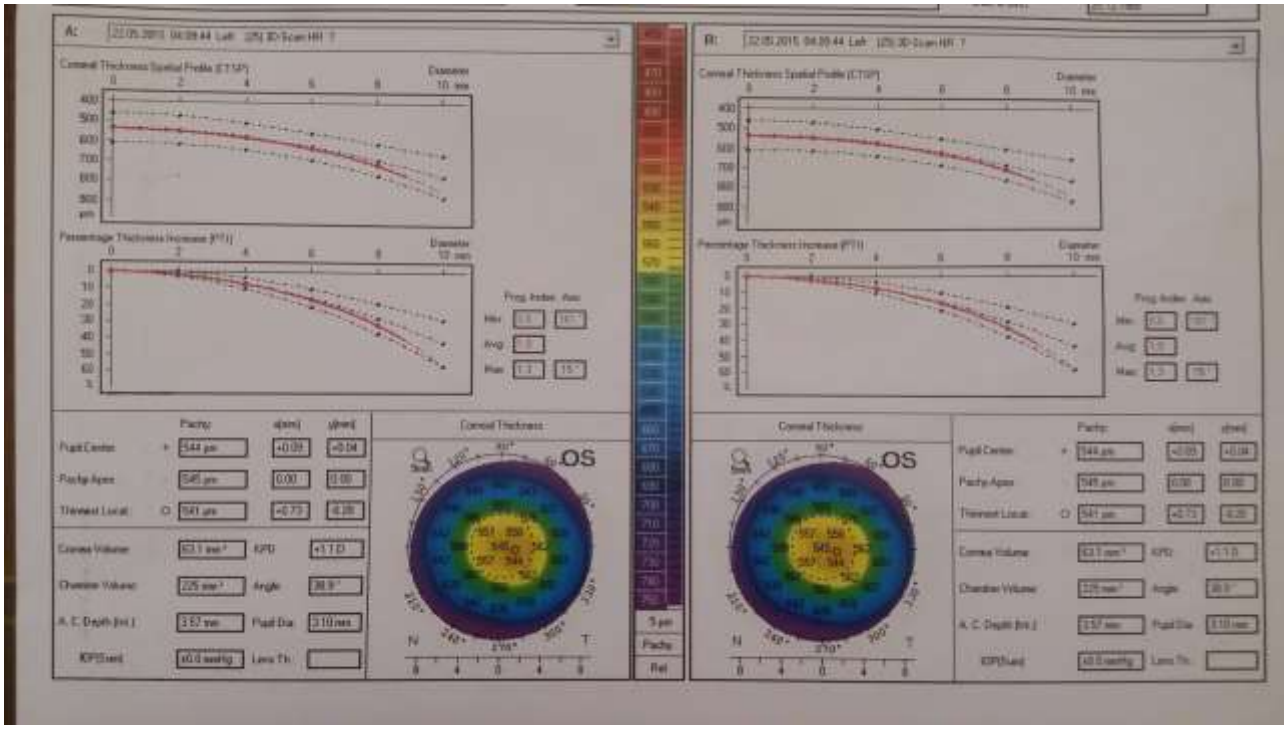


Refractive Surgery:

1

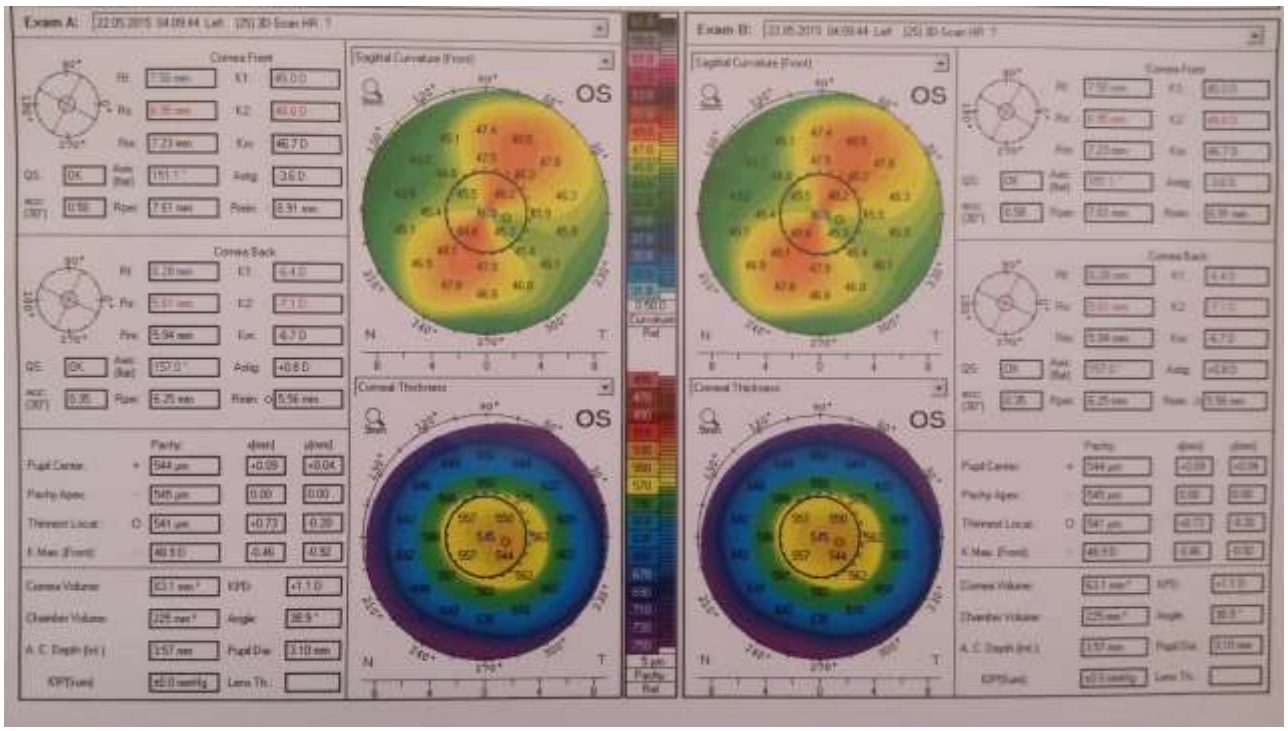
Screening for ectasia cases

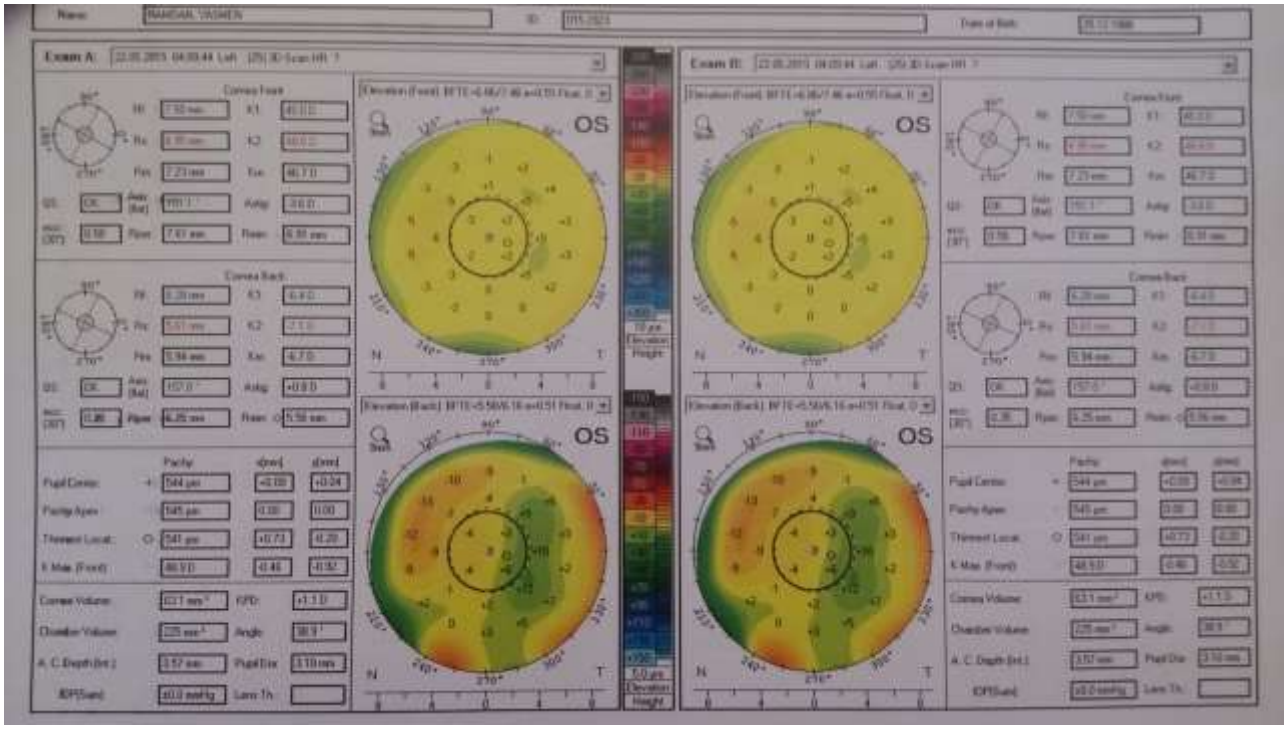
2

Planing for refractive laser surgery

1st step:

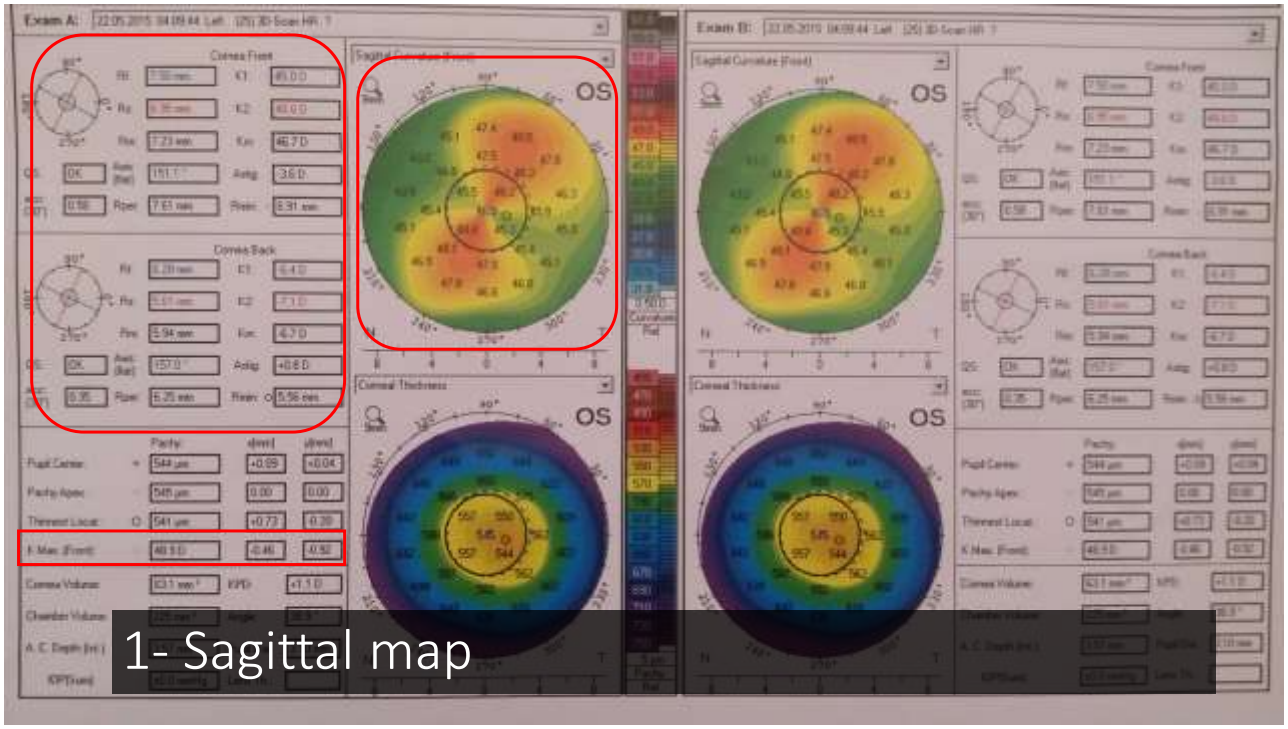
- Quality check
- Patient centration
- Refraction

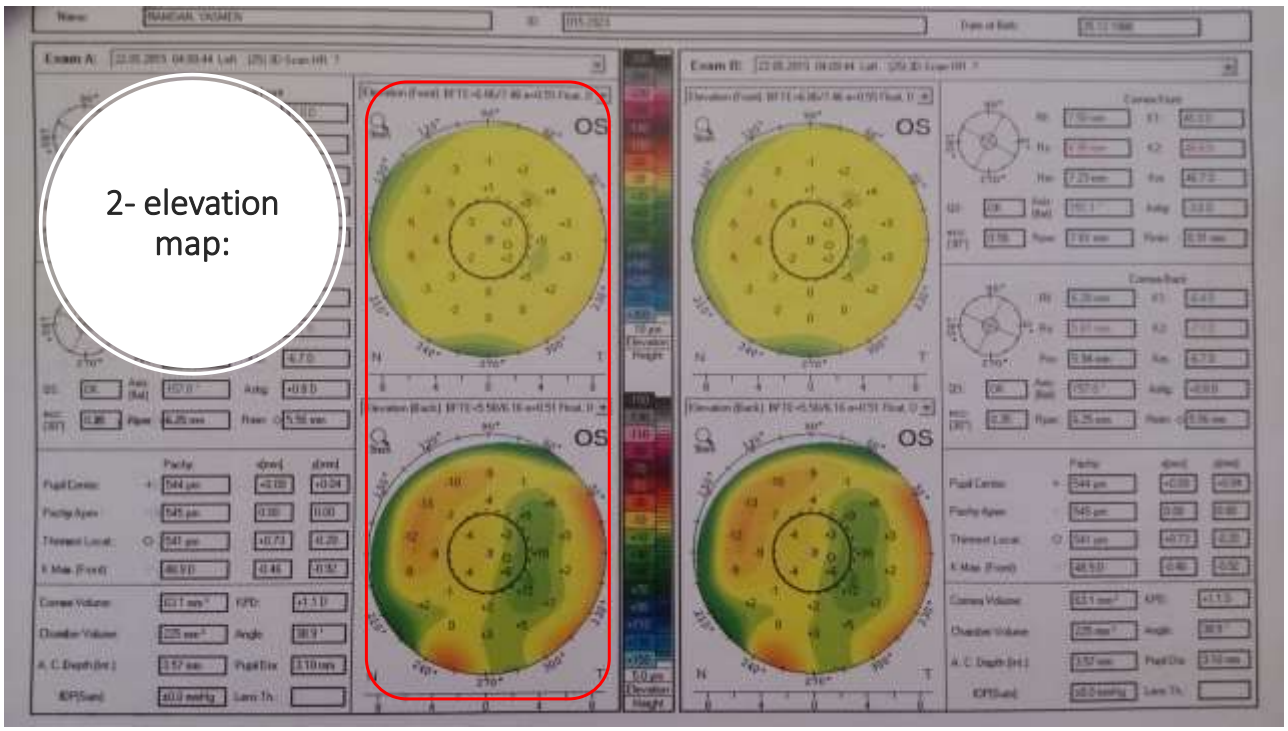


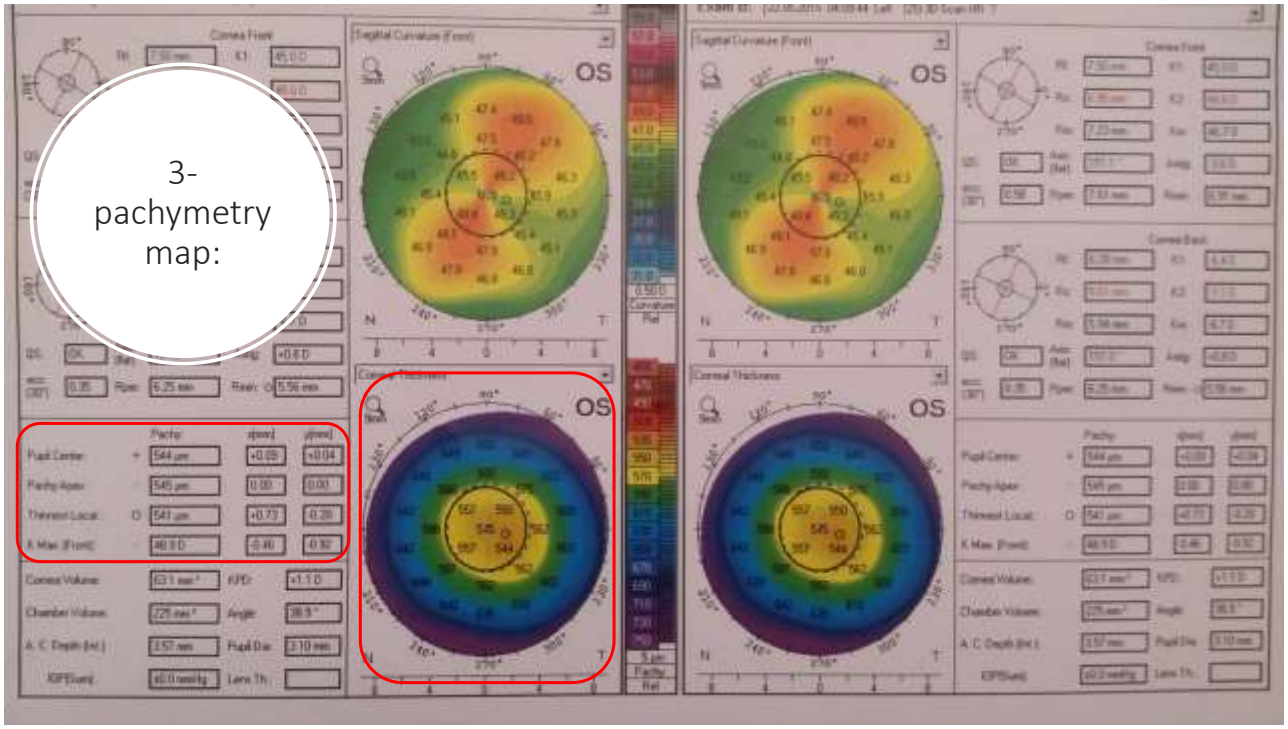


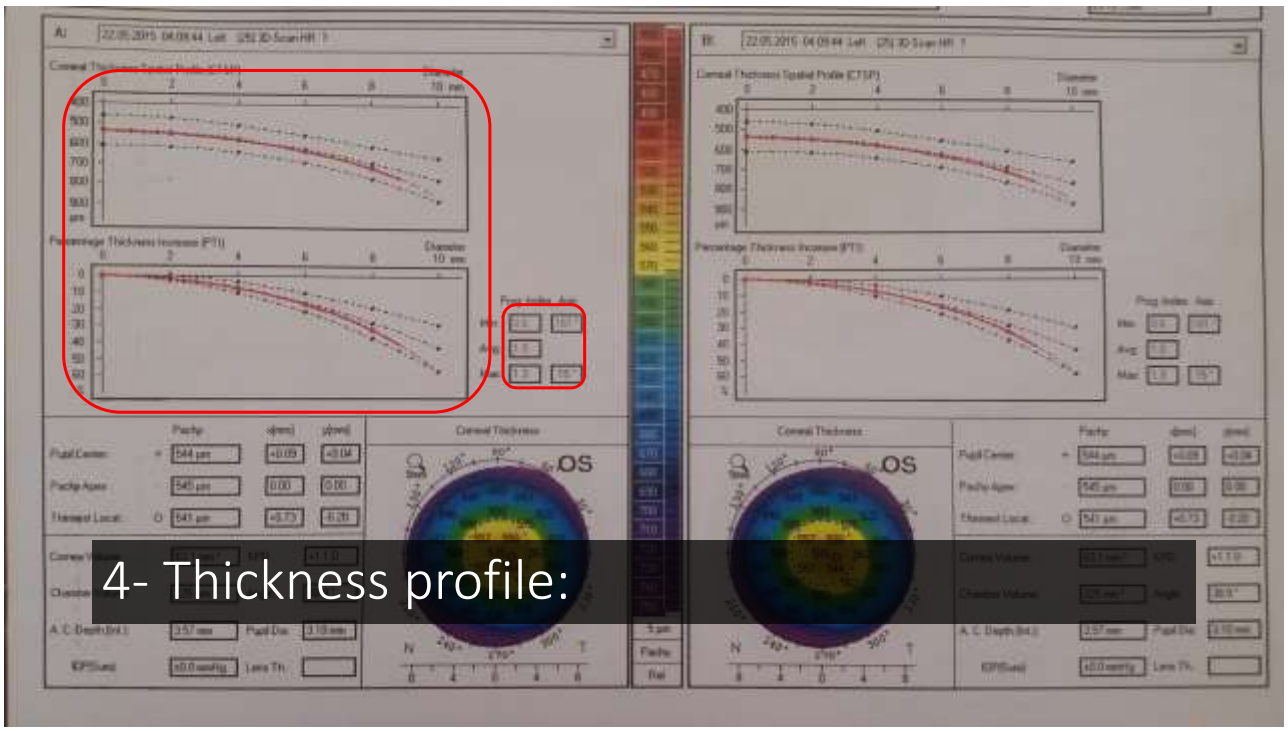
Screening for ecatasia:

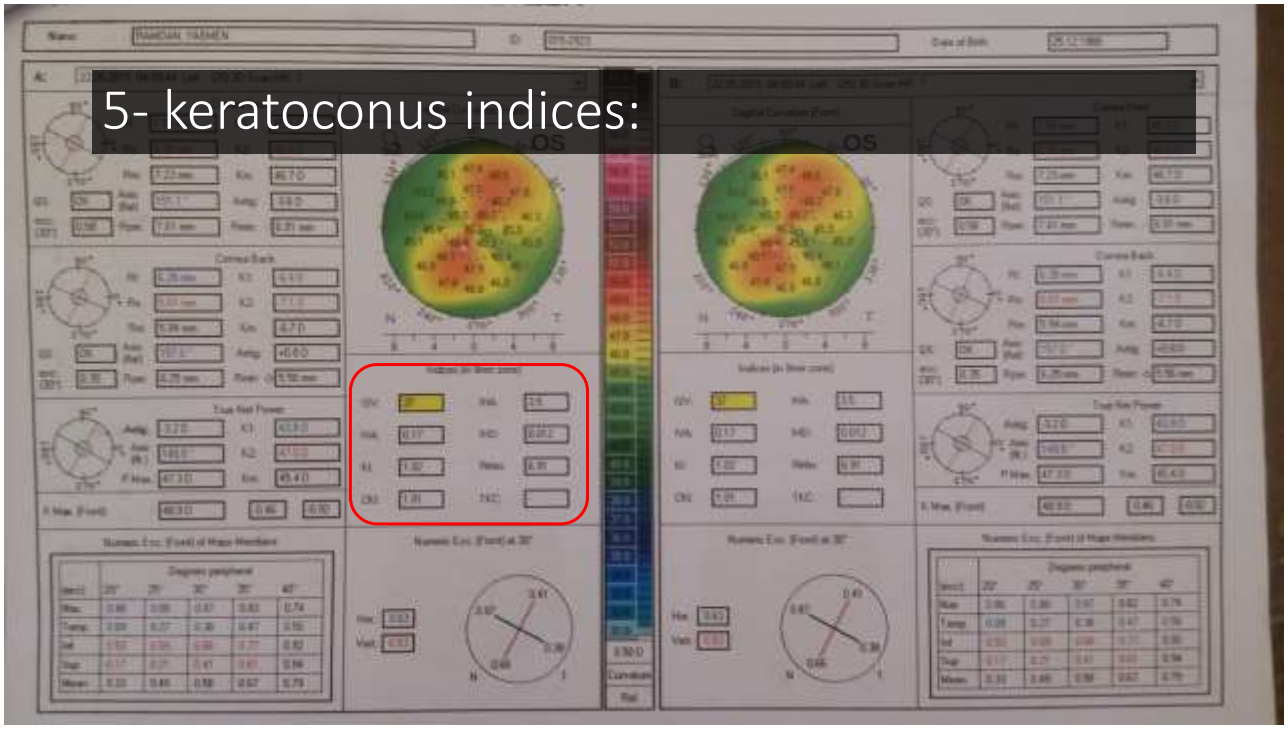
- 5 maps:
  - In each, look at:
    - Shapes
    - Numbers
- 2 reports:
  - Belin/Ambrosio Enhanced Ectasia Report
  - Holladay Report

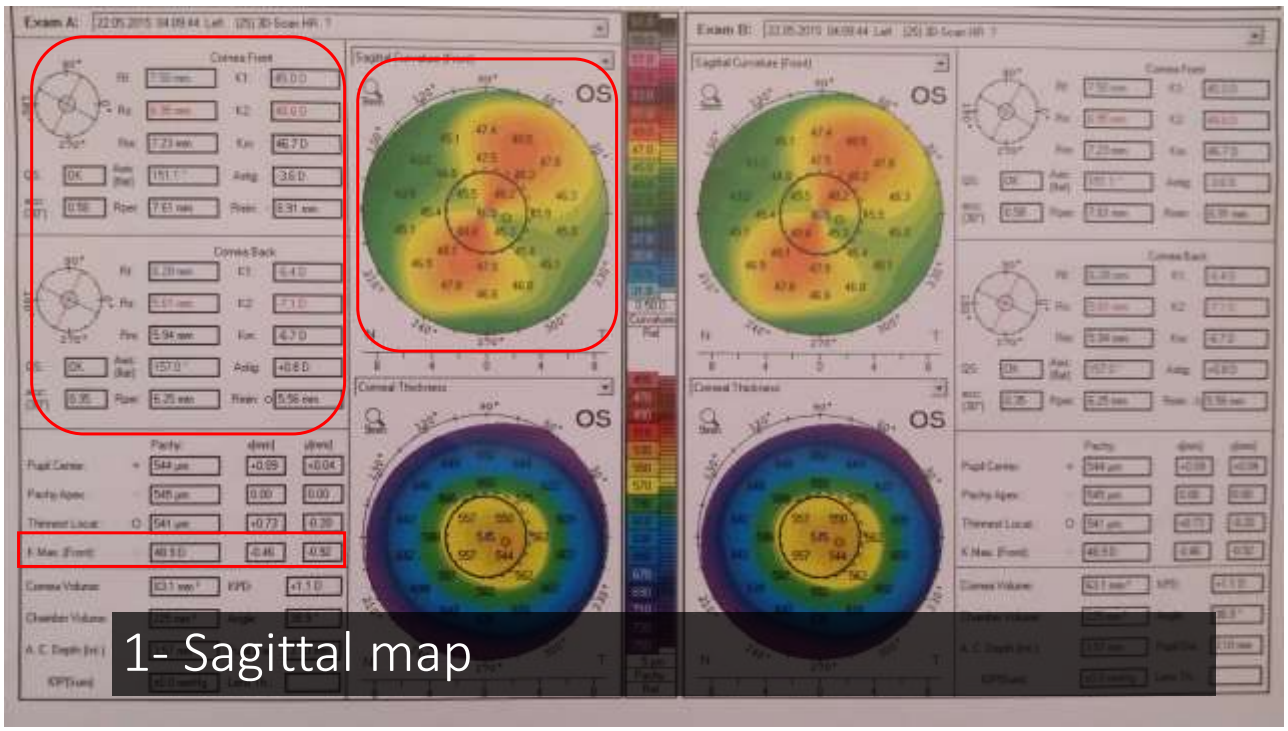

1- Sagittal map


2- elevation map:


3- pachymetry map:
OS
OS
OS
OS

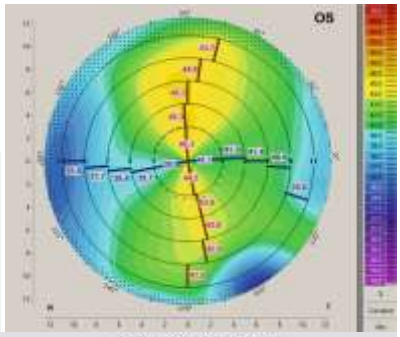

4- Thickness profile:
OS
OS

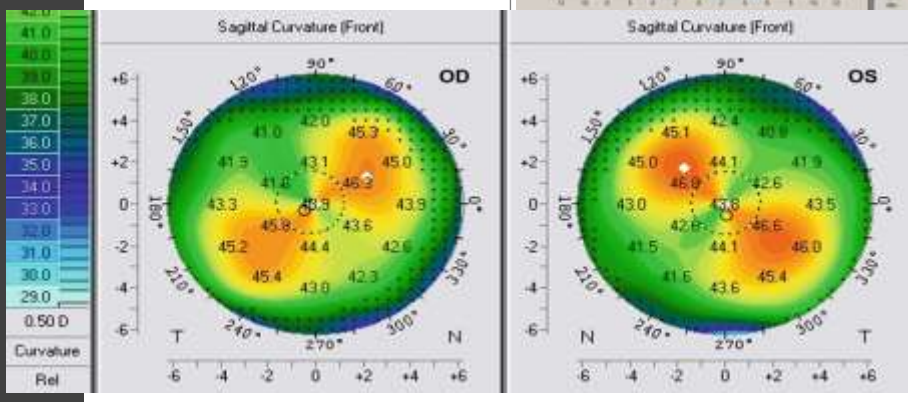

5- keratoconus indices:


1- Sagittal map

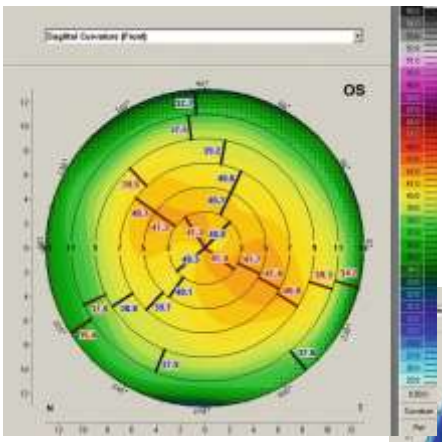
Corneal shapes:

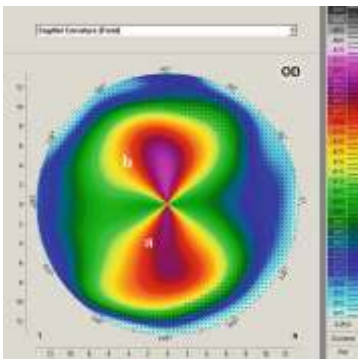
- Entatiomorphism

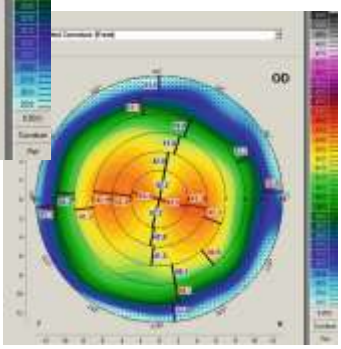




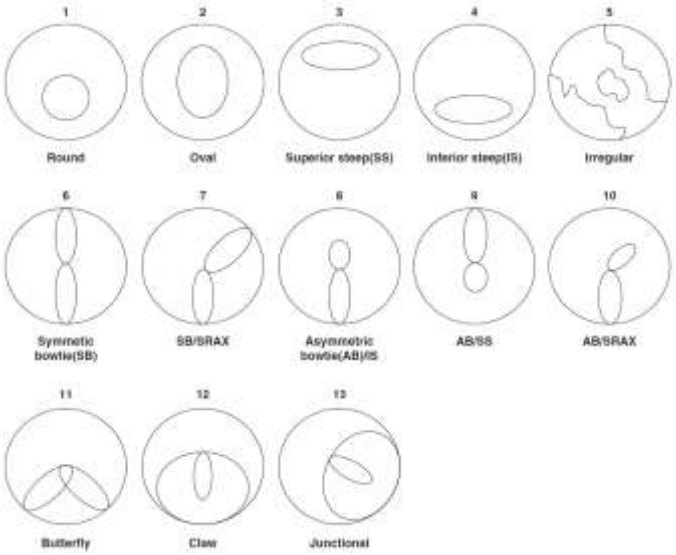
Normal cornea:



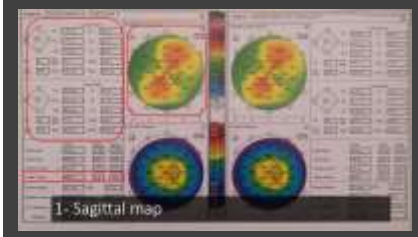




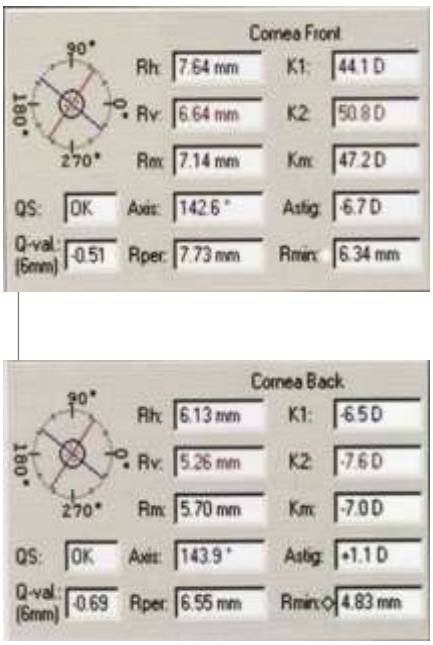
Irregular cornea

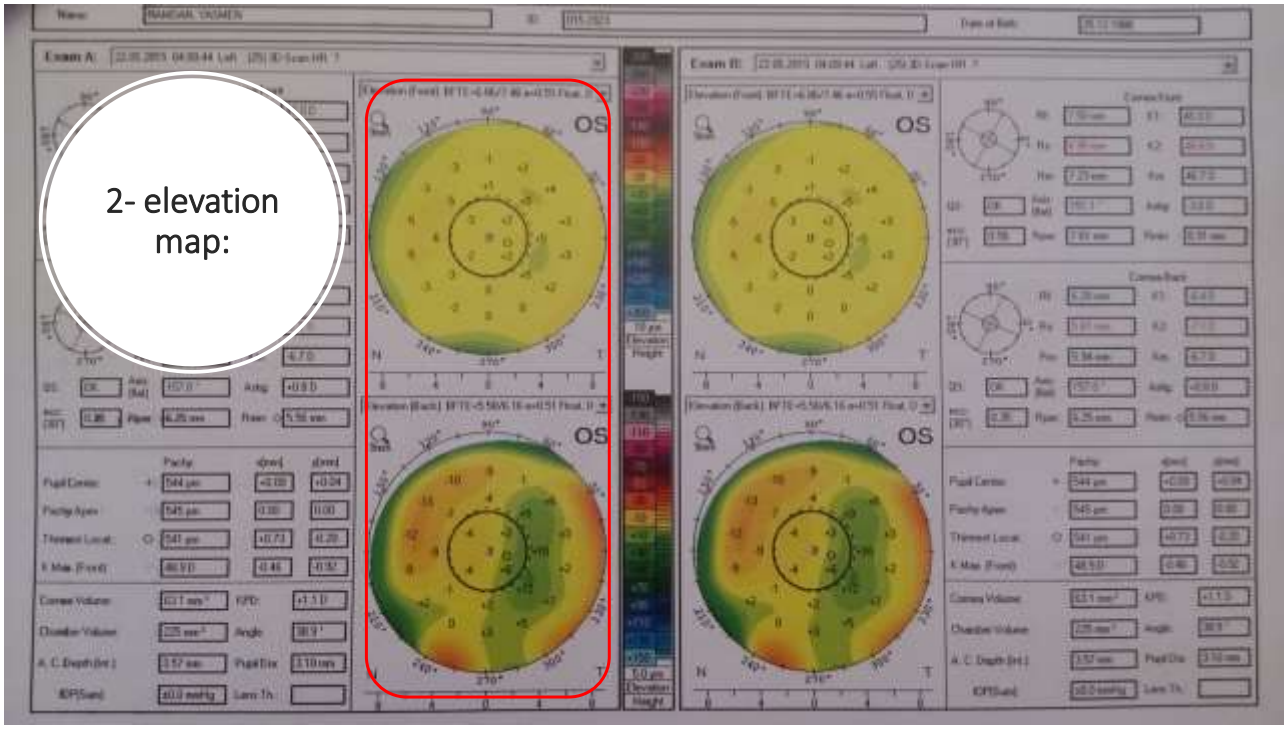


Numbers:



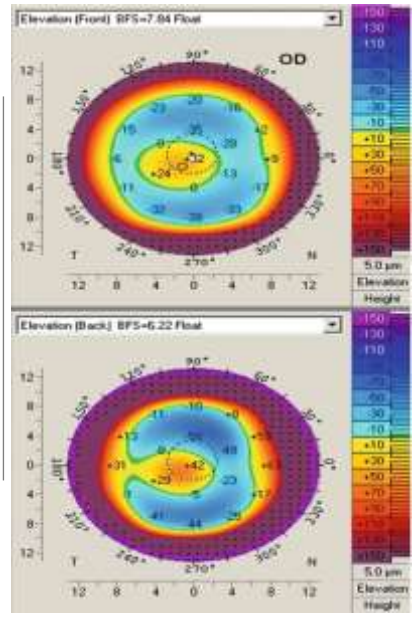
- K-readings < 48 dpt.
- Corneal astigmatism on either surface < 6D.
- Inferior–Superior difference (I-S) < 1.5 dpt.
- Superior–inferior difference (S-I) on the 5 mm circle < 2.5 dpt.

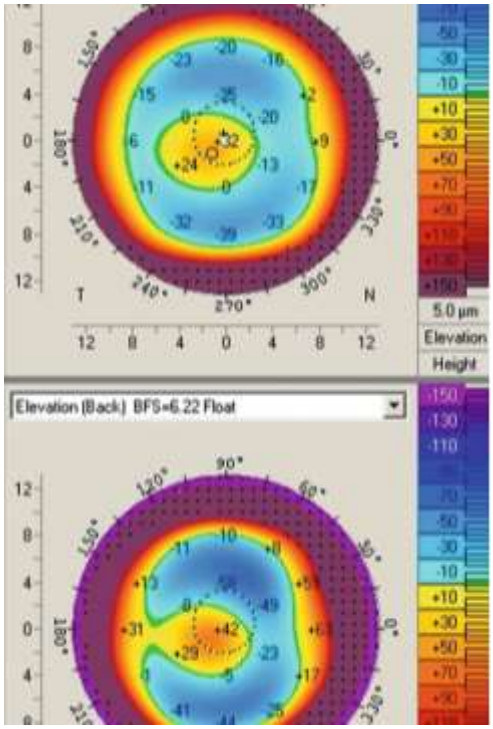




Shapes

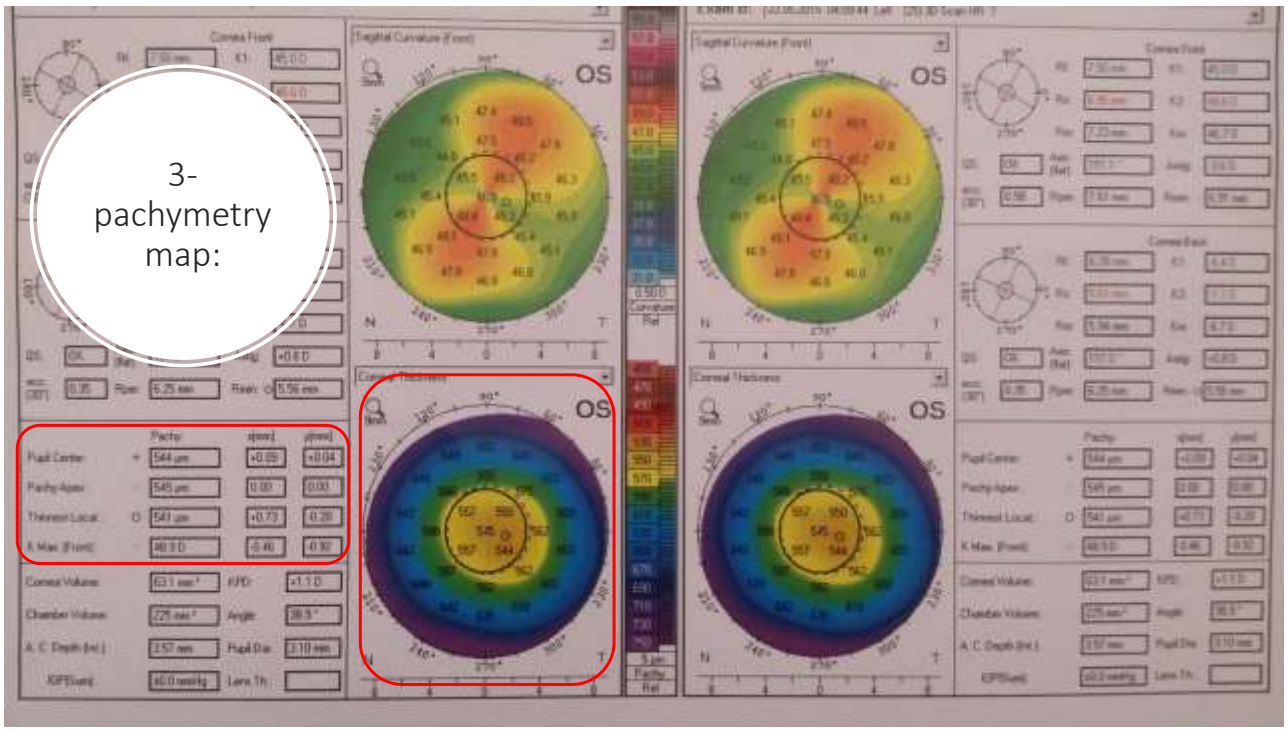
- BFS mode on either surface
  - Isolated island
  - tongue-like extension





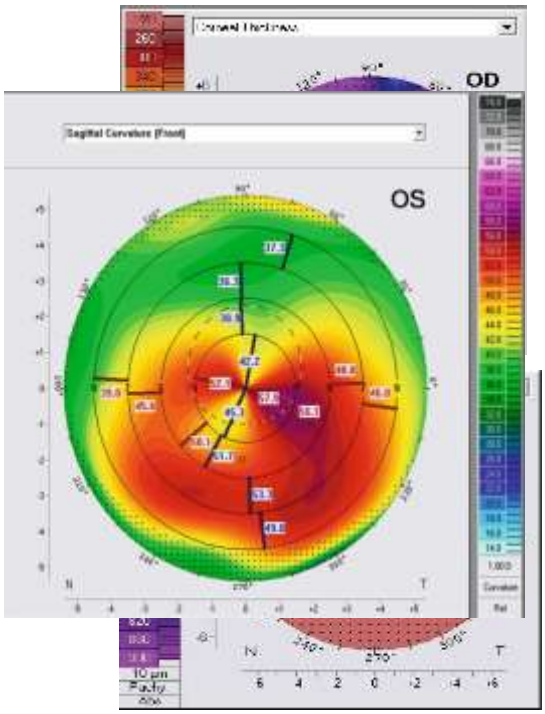
Numbers (within the central 5 mm)

- BFS (9 mm)
  - Values <15 µ anterior elevation map
  - Values < 20 µ posterior elevation map
- BFTE
  - Values < 12 µ anterior elevation map
  - Values < 15 µ posterior elevation map
- Difference between front and back surfaces < 5 µ at same point



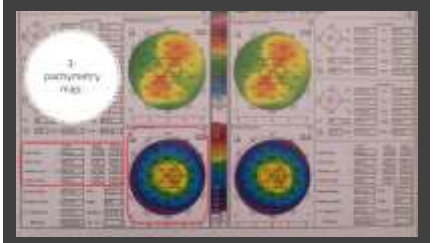
Shapes

- Cone-like shape.

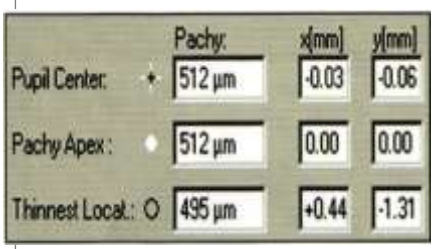


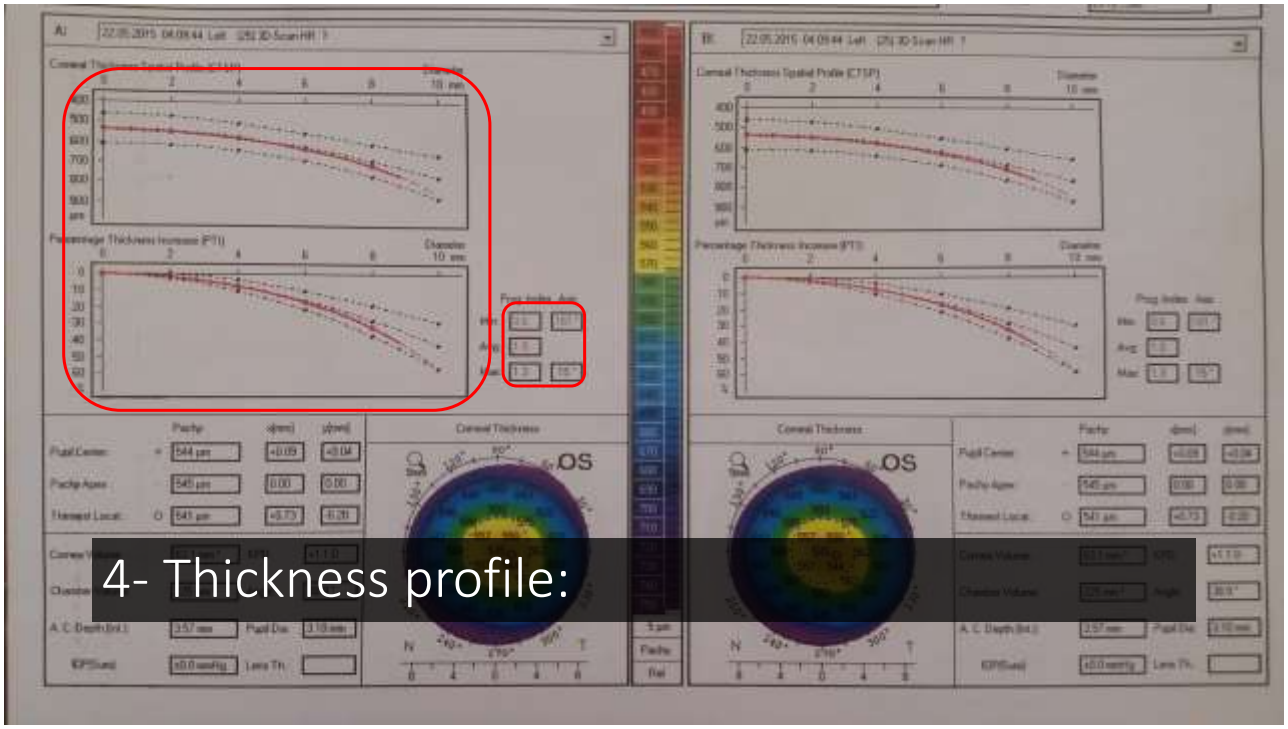
• Bell sign

Numbers:

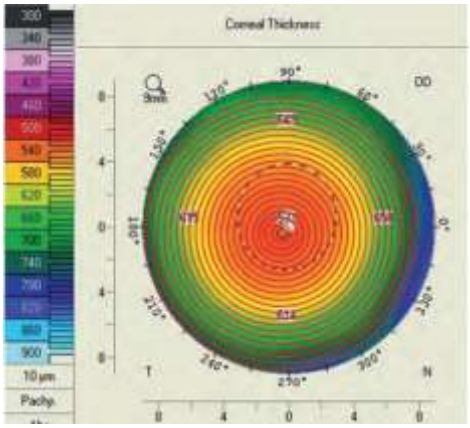


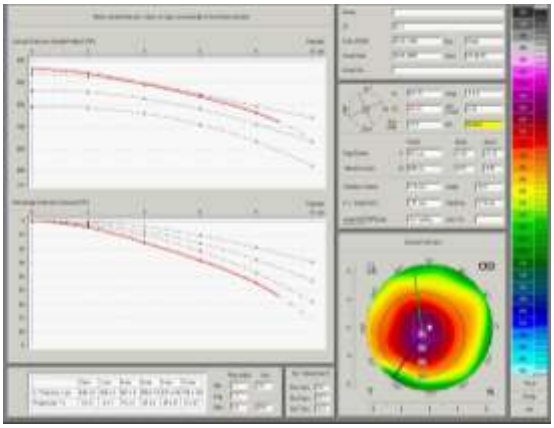
- Thinnest location > 470 µ
- Thickness at pachy apex – thickness at thinnest location < 10 µ
- Y coordinate value of the thinnest location < −500 µ
- Superior–inferior at 5 mm circle < 30 µ
- Difference in thickness between both eyes at thinnest locations < 30 µ





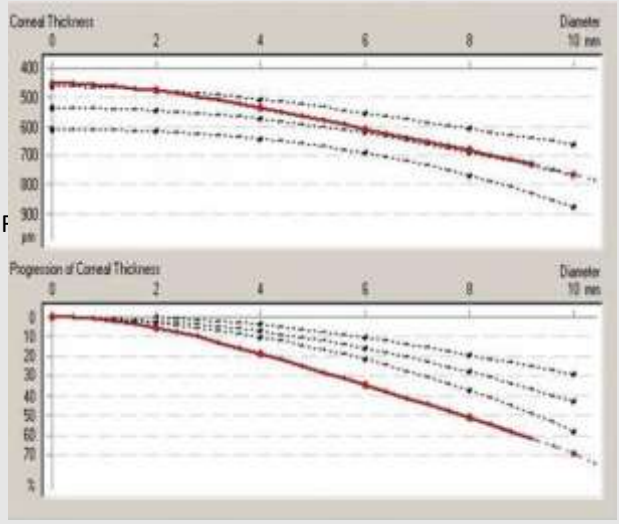
Idea:





Shape:

- F



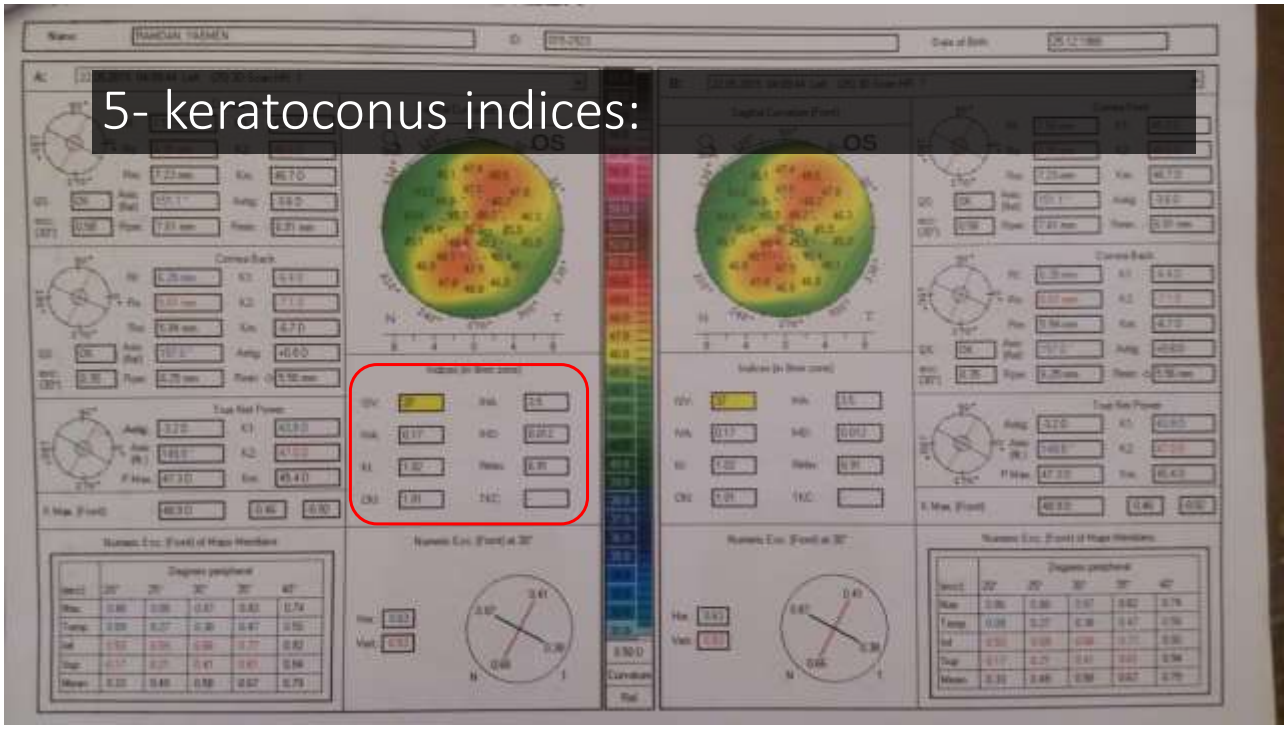
Numbers:

- Progression index
  - Important indicator of corneal stability
  - ≤ 1 normal or accepted
  - > 1 suspicious

	0 mm	2 mm	4 mm	6 mm	8 mm	10 mm
C. Thickness / µm	452 ± 0	476 ± 8	536 ± 25	609 ± 44	682 ± 62	765 ± 72
Progression / %	0 ± 0	5 ± 2	19 ± 9	35 ± 20	51 ± 34	69 ± 48

Prog. Index Axis
Min. 1.4 7°
Avg. 2.4
Max. 3.6 270°

5- keratoconus indices:



Indices (in 8mm zone)				Keratoconus Level Topogr.
ISV:	134	IHA:	44.3	KK 3-4
IVA:	1.49	IHD:	0.103	
KI:	1.38	RMin:	5.67	
CKI:	1.11	ABR:	2.6	

Screening for ecatasia:

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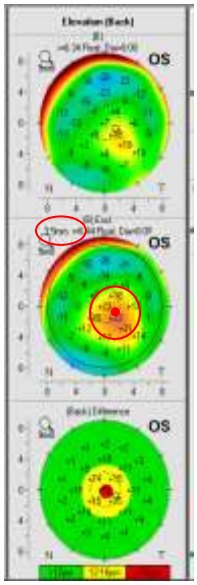
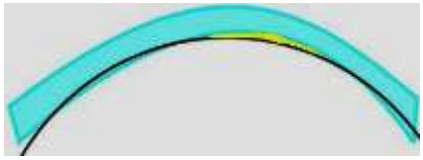
Belin/Ambrosio Enhanced Ectasia Report

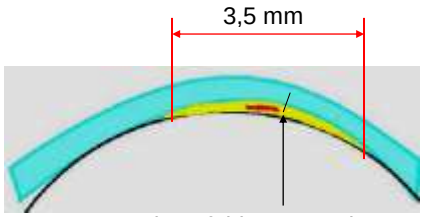


Best fit sphere



Enhanced Best fit sphere

Excluding 3.5mm circular area around thinnest pachy location!



Location of thinnest pachy

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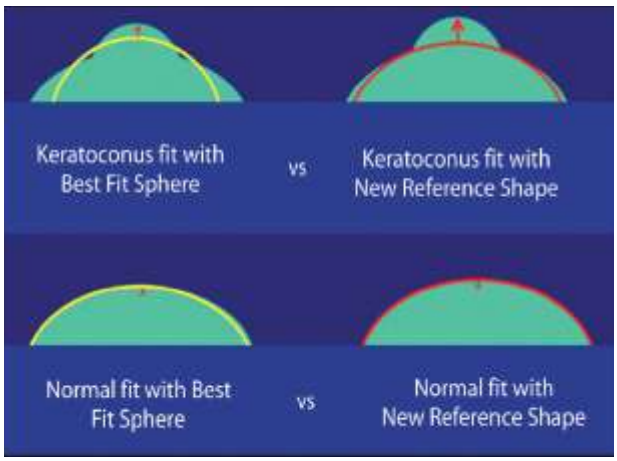
Different ways to fit the sphere to the cornea



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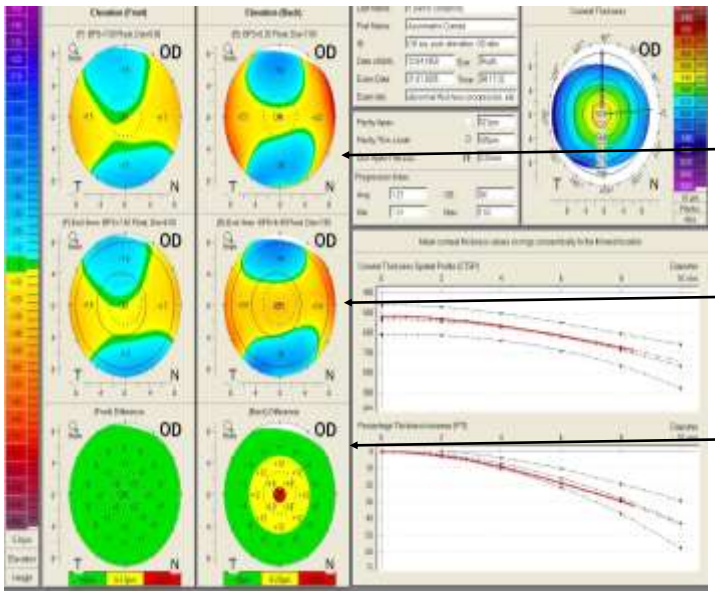

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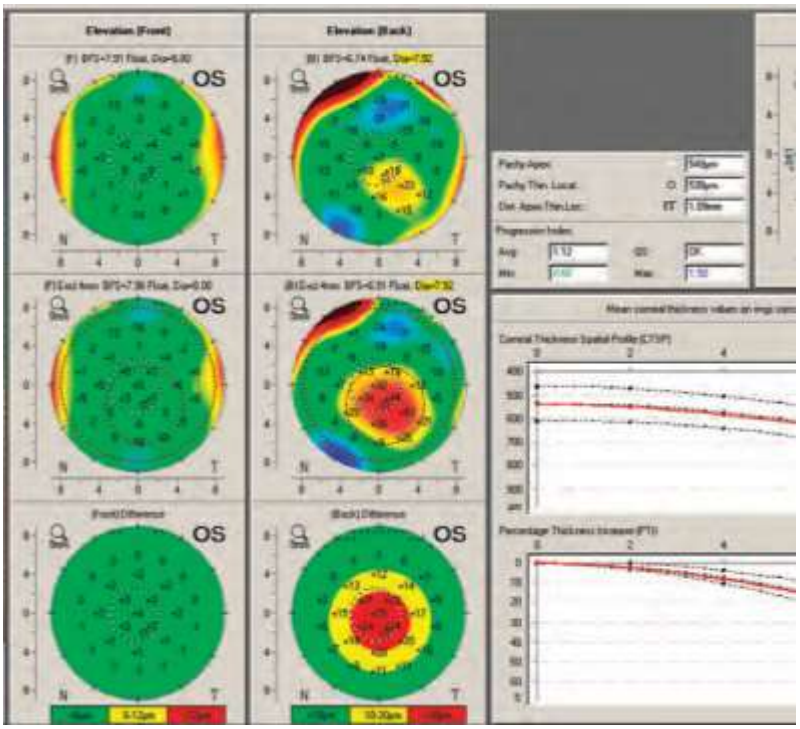
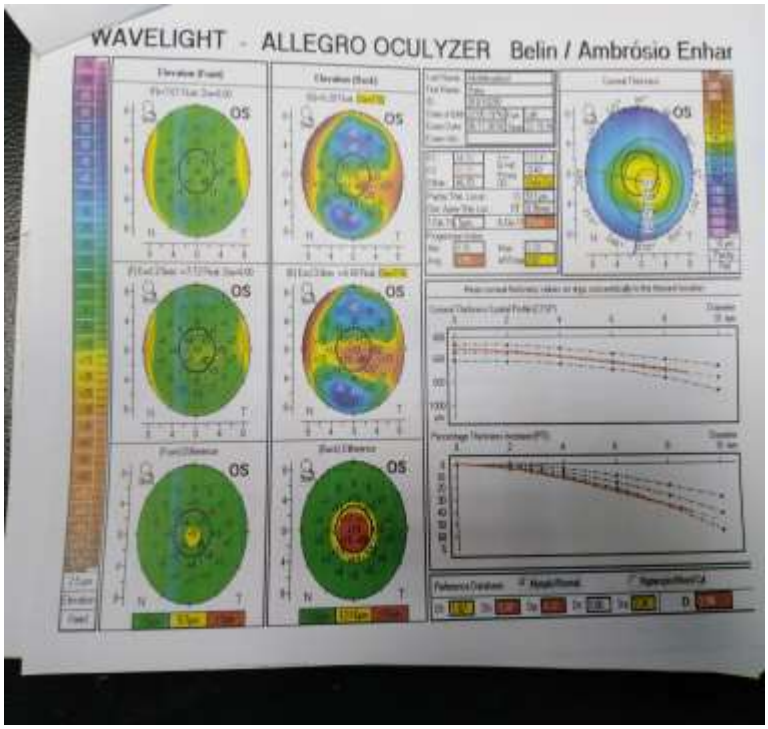
Belin/Ambrosio Enhanced Ectasia Report I

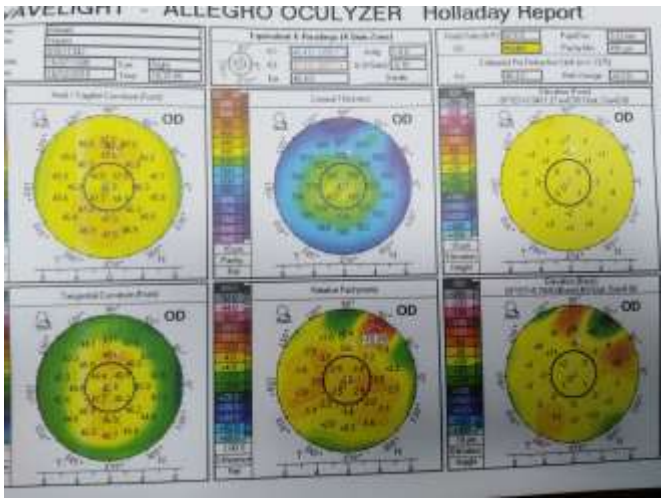


Belin/Ambrosio Enhanced Ectasia Report II

- Df (front)
- Db (back)
- Dp (pach. Prog.)
- Dt (thinnest point)
- Da (thinnest displacement)
- ART Max
  - Normal 517
  - Suspicious 207 – 340
  - KC ≤ 207

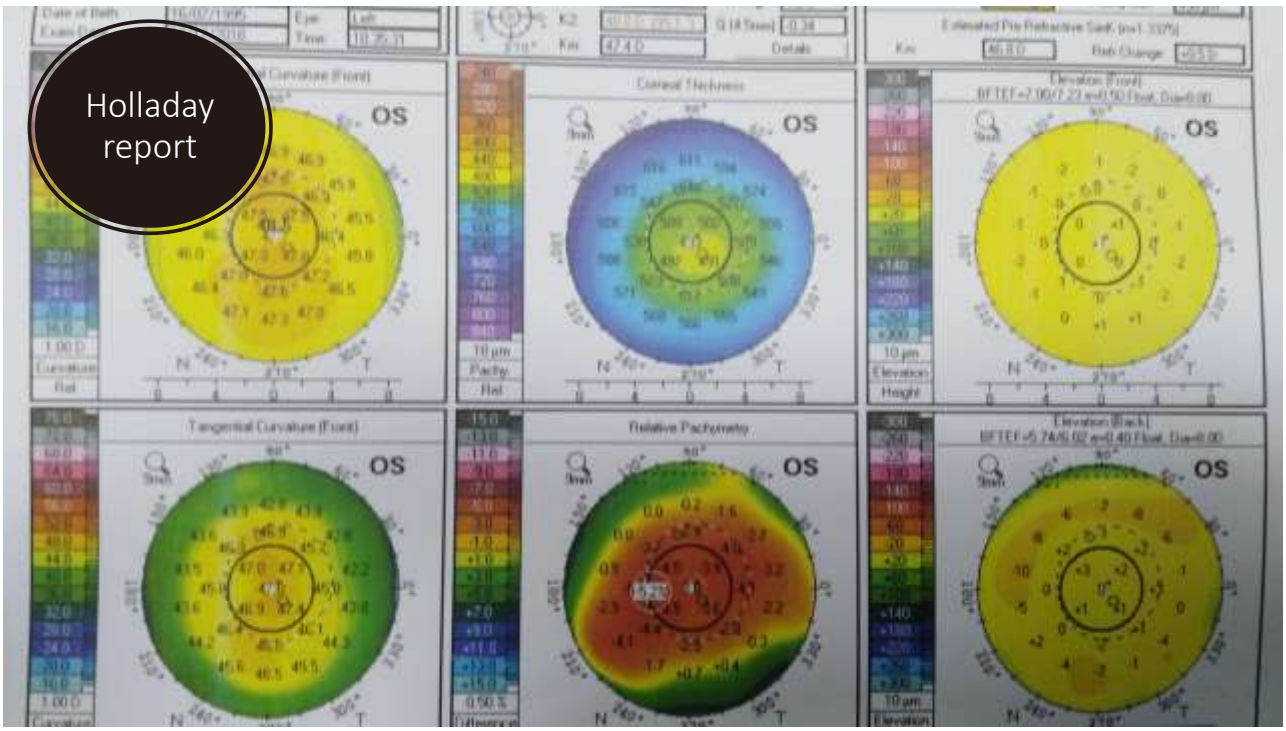


Holladay Report



Holladay report:

- 6 maps
  - Tangential
  - Relative pachymetry
  - Elevation back



Take home message:

- Combination of the anterior surface irregularity indices alone only detect frank keratoconus.
- Posterior corneal surface study is mandatory for detection of subclinical keratoconus.
- No single parameter can sufficiently distinguish a normal from a suspect cornea.