MRI-TRUS
Fusion Focal Prostate Cryoablation
Lessons We Learned and AI

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WHY? Prostate Cancer Surgery

Prostatectomy

Perineal

Nerve-Sparing

Laparoscopy

> 50 Robotics?

RETZIUS ???

>20 years of ROBOTICS

…Still going…

- Cancer Cells may be:
- Chemo resistant
- Radiation resistant

NO CELLS ARE THERMO RESITANT

The use of mpMRI fusion biopsy and FTC can be particularly beneficial for ethnic minorities and

vulnerable populations of patients who may not have access to newer technology or techniques,

leading to underdiagnosis and undertreatment.

August 2022- April 2023
54 men underwent MRI fusion prostate biopsy and FTC treatment (21 Caucasian, 16
Hispanic, 13 Black, and 4 Asian)
Majority of AA - Pirads 3 lesions, while Hispanics had Pirads 4 or 5
Asians had a lower incidence of significant lesions, and Caucasians had a higher incidence
of Pirads 4 and 5.

	Overall (n=54)	Minority – AA (n= 13)	Minority – Hispanic (n= 16)	Minority – other (n=4)	Caucasian (n=21)
Age	63.4 ± 7.5	61.8 ± 7.2	61.5 ± 9.1	68.8 ± 5.7	64.8 ± 6.1
Insurance					
DFAP	1	0	1 (100%)	0	0
Indigent	5	3 (60%)	2 (40%)	0	0
Medicaid/Medicare	39	7 (18%)	12 (31%)	4 (10%)	16 (41%)
Private	9	3 (33%)	1 (11%)	0	5 (56%)
BMI	28.4 ± 4.7	31.1 ± 5.3	28.9 ± 5.0	24.2 ± 1.2	27.1 ± 3.7
Prostate size, cm^3	60.3 (12.4-326.5)	51.5 (14.2-97.5)	68.1 (12.4-326.5)	68.4 (49.1-90.7)	59.0 (18.4-118.9)
Pirads Lesions #					
0	3	1 (33%)	1 (33%)	0	1 (33%)
1	25	6 (24%)	7 (28%)	1 (4%)	11 (44%)
2	15	3 (20%)	5 (30%)	1 (10%)	6 (40%)
3	4	2 (50%)	0	0	2 (50%)
4	1	0	0	1 (100%)	0
Highest Pirads Scores					
3	3	2 (67%)	1 (33%)	0	0
4	25	7 (28%)	5 (20%)	1 (4%)	12 (48%)
5	18	2 (11%)	6 (33%)	2 (11%)	8 (44%)

Pirads Locations					
Anterior	1	0	1 (100%)	0	0
Peripheral	31	11 (35%)	9 (29%)	1 (3%)	10 (32%)
Transitional	9	0	1 (11%)	2 (22%)	6 (67%)
P & T	3	0	0	0	3 (100%)
Gleason Score					
3+3	21	5 (24%)	5 (24%)	0	11 (52%)
3+4	8	3 (37.5%)	1 (12.5%)	0	4 (50%)
4+3	3	1 (33%)	2 (67%)	0	0
4+5	1	0	1 (100%)	0	0
Erectile Dysfunction	20 out of 26	4 out of 7	8 out of 9	1 out of 1	7 out of 9
IPSS	8	7.5	8.9	15	6.3
IPSS QoL	2.3	2.2	2.8	3	1.7
PSA density	0.181 (0.024-0.84)	0.245 (0.048-0.413)	0.149 (0.024-0.43)	0.114 (0.053-0.158)	0.175 (0.027-0.84)
PSA preop	8.1 ± 5.4	10.3 ± 6.4	6.6 ± 3.2	5.5 ± 3.6	8.4 ± 6.1

Cryoablation

Case Overview

- 59yo
- PSA density of .269 ng/mL/mL
- PIRADS 5 extra capsular MRI lesion in the left base PZ
- 4 targeted cores taken
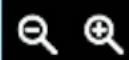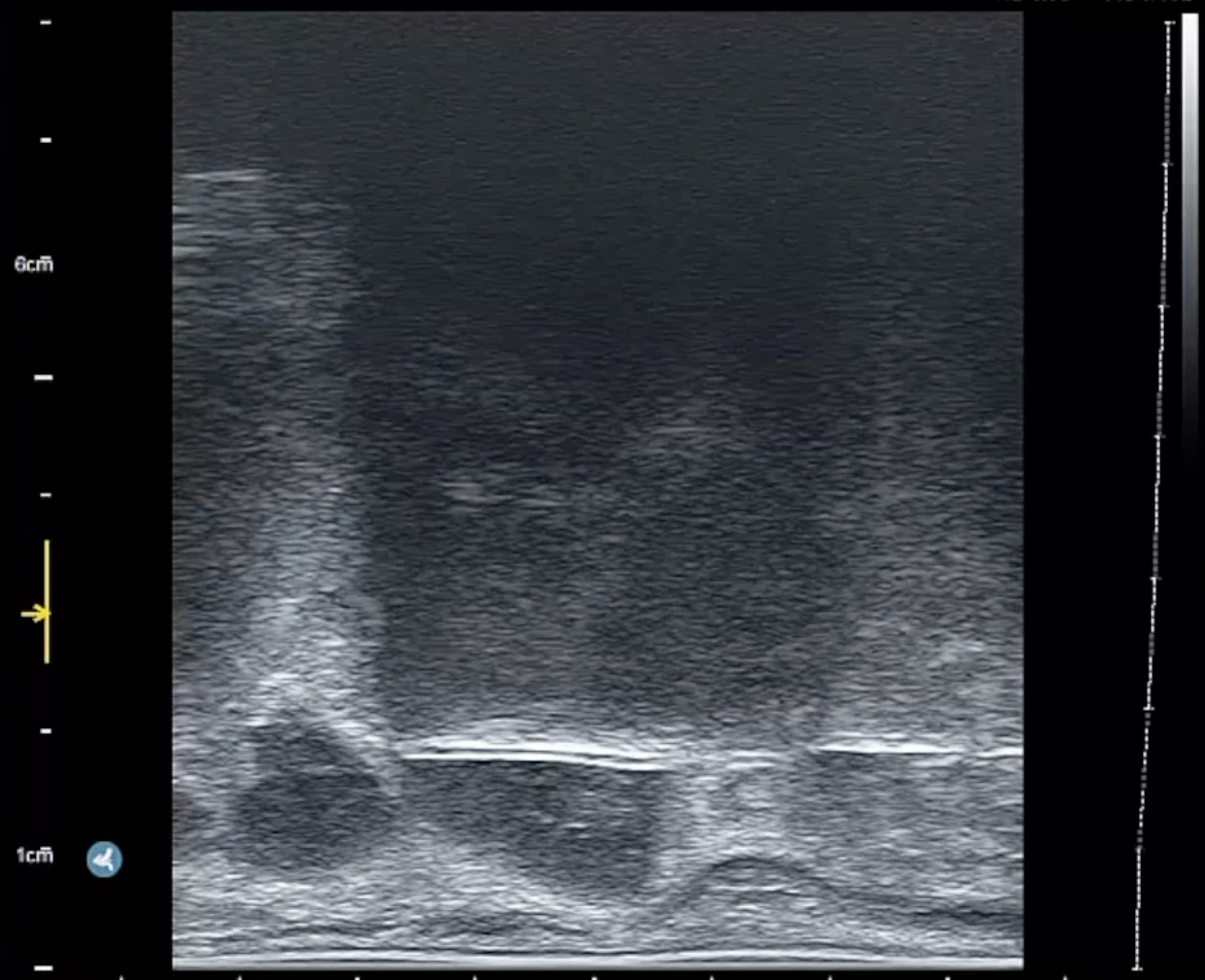- Pathology - Gleason score 4+3 (grade group 3)
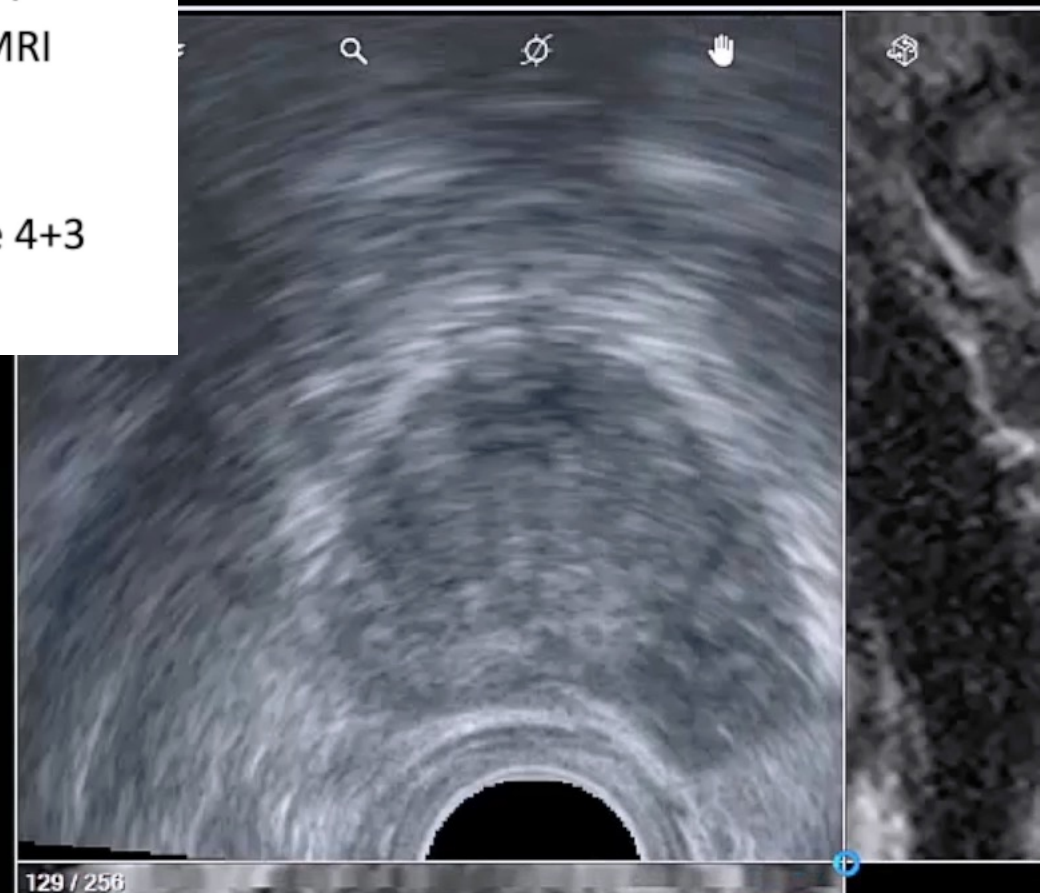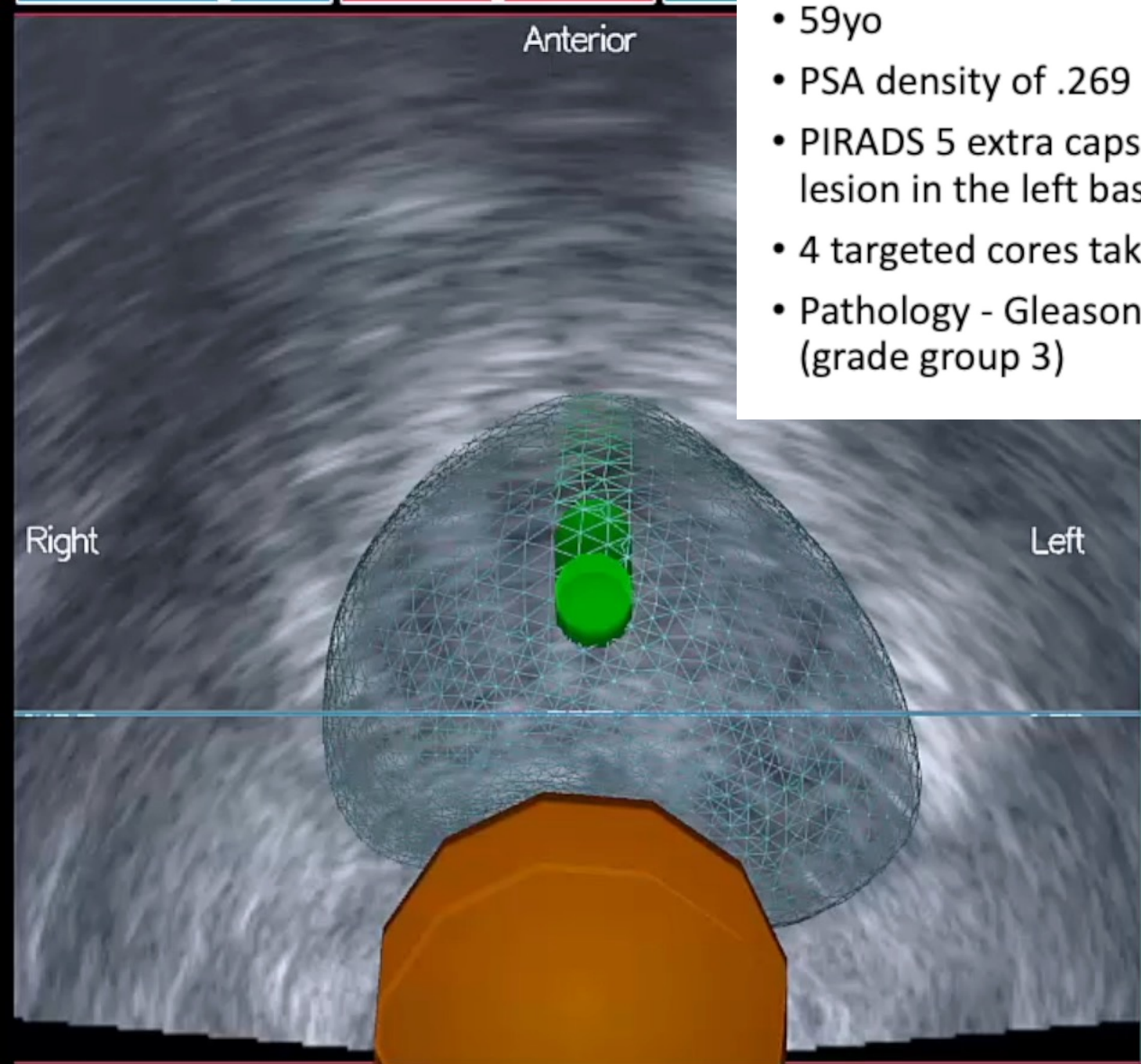
Conclusion

        Majority of AA - Pirads 3 lesions, while Hispanics had Pirads 4 or 5 lesions

        Asians had a lower incidence of significant lesions, and Caucasians had a higher incidence of Pirads 4 and 5.

        Pca is multifocal and Focal Cryoablation can be perform safely without major complications.

Big Question ??????????

DX and TREAT

PROS/CON:
Safe time/decrease anxiety/decrease cost

Quality Improvement
MRI Fusion BX and Fcryo

2 pts - Hispanics - Pirads 5- G 3+3; 3+4

3 pts - Caucasians - Pirads 5. G 3+4; 4+3
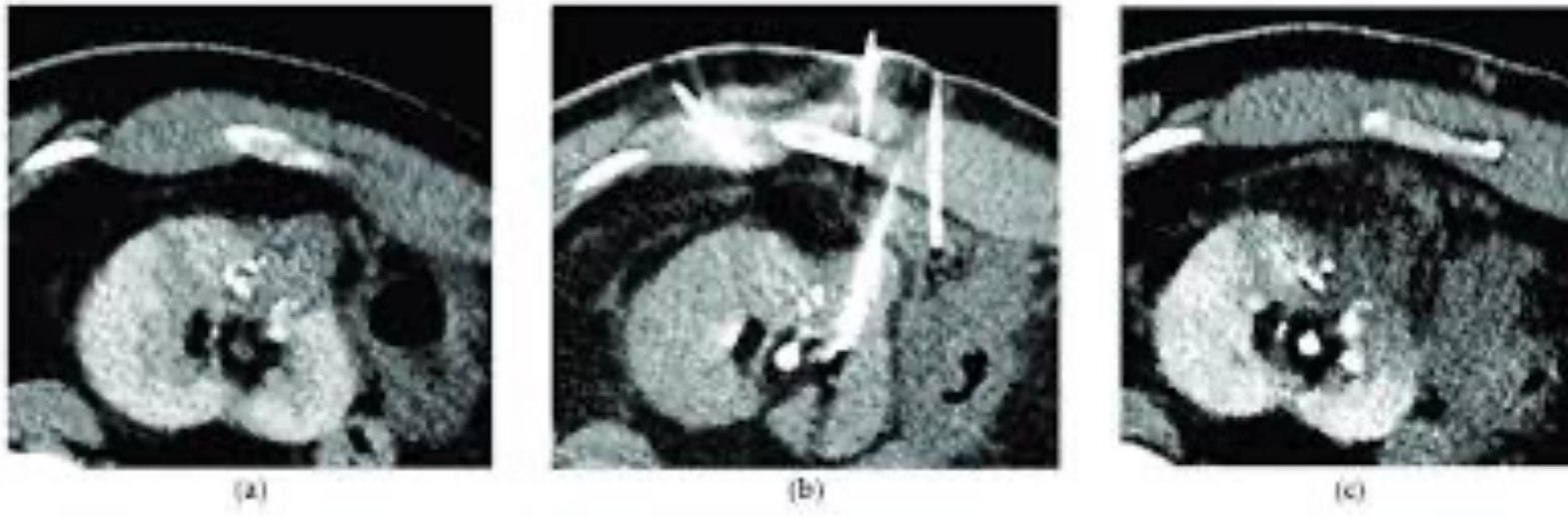
Big Question
??????????
DX and TREAT

fare pipì come un cavallo da corsa

PROS/CON:
Safe time/decrease anxiety/decrease cost

Is PCa so special?

- Renal Tumors are Bx and Cryotreated

Advantages ...

What is missing?

Patient Safety in Surgery

RESEARCH

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The value of artificial intelligence for detection and grading of prostate cancer in human prostatectomy specimens: a validation study

Maíra Suzuka Kudo[1], Vinicius Meneguette Gomes de Souza[2]*, Carmen Liane Neubarth Estivallet[2], Henrique Alves de Amorim[1], Fernando J. Kim[3], Katia Ramos Moreira Leite[2] and Matheus Cardoso Moraes[1]

Patient Safety in Surgery

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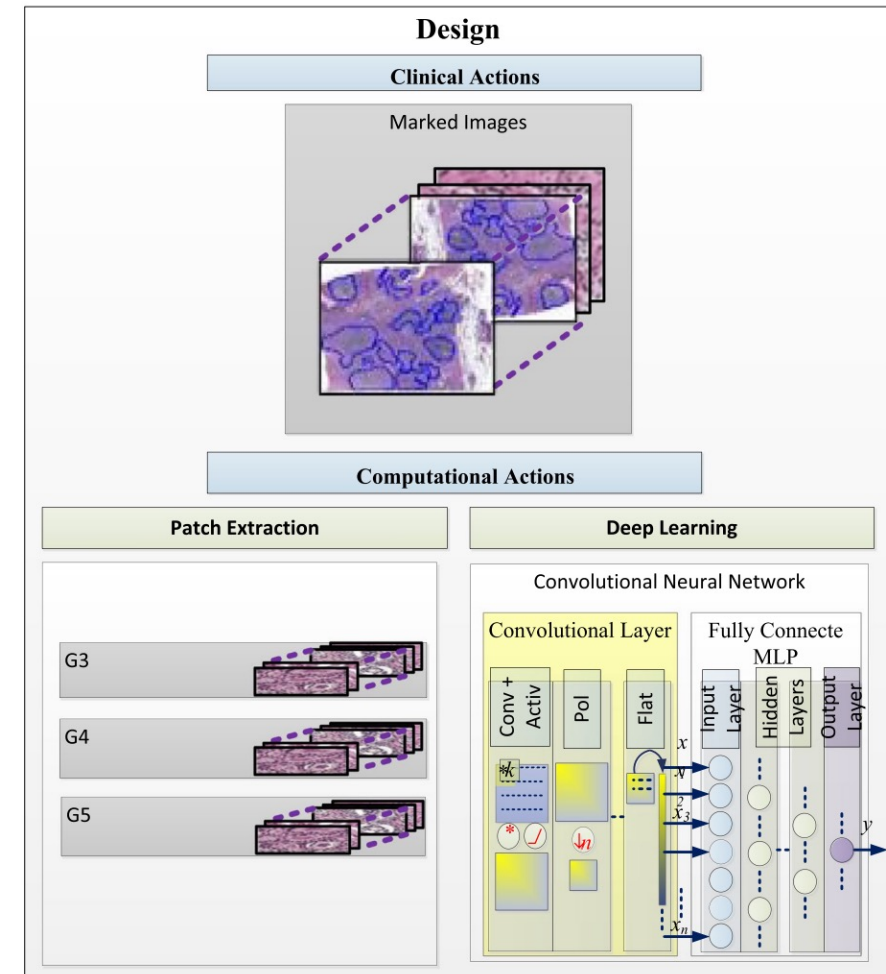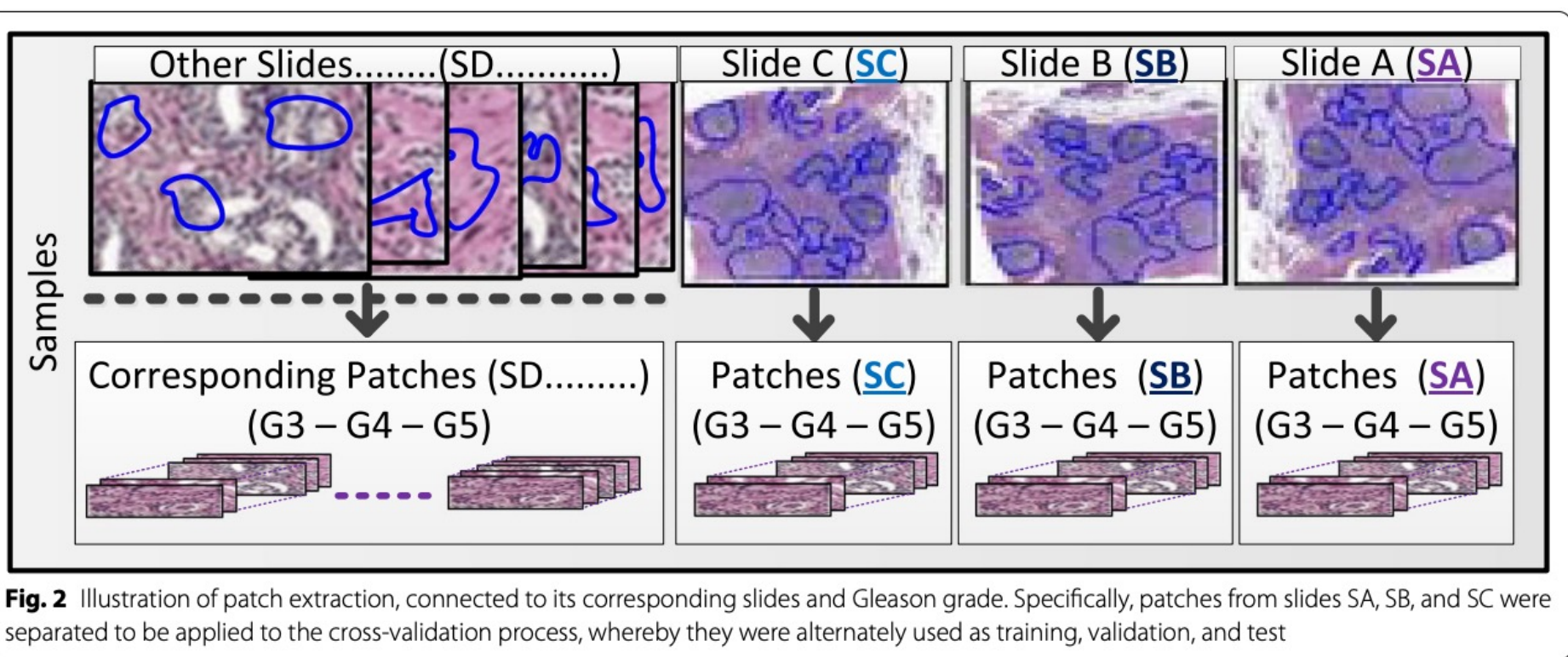

Fig. 1 The steps of the Design with their corresponding illustrations: 1st Clinical Actions, resulting in the marked images. 2nd the computational actions showing the two main steps: Patch Extraction Step, and Deep Learning Step

Fig. 2 Illustration of patch extraction, connected to its corresponding slides and Gleason grade. Specifically, patches from slides SA, SB, and SC were separated to be applied to the cross-validation process, whereby they were alternately used as training, validation, and test

In conclusion, the use of mpMRI fusion biopsy and targeted cryoablation focal treatment can improve the accuracy of prostate cancer diagnosis and reduce the side effects associated with traditional treatments such as radical prostatectomy or radiation therapy.

These methods can be particularly **beneficial for ethnic minorities and vulnerable populations of patients** who may not have access to robotics or other technology/techniques.

Future studies may demonstrate the advantages of simultaneous diagnosis and FTC treatment, resulting in decreased clinical visits, improved patient access and flow, and faster social and clinical recovery, ultimately leading to an improvement in the quality of life of these patients.

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