Jefferson Health

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Are PROs Worse in Female Patients Compared to Male Patients Undergoing Inguinal Hernia Repair?

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Disclosures

- No conflicts of interest relevant to this presentation

- Acknowledge:

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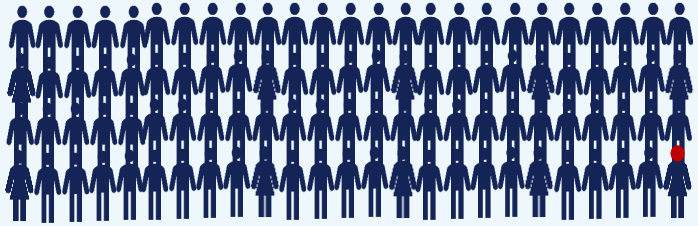
Background 1/2

-  Groin hernia surgery affects M>F (lifetime risk M 27-42% vs F 3-5.8%)
- ~ 90,000 females undergo groin hernia repair every year in the USA
-  <0.05% of patients included in groin hernia literature of the last 25 years were females

Background 2/2

- Most studies looking at outcomes after IHR in females are retrospective studies based on European registries

- <u>Main findings from these studies:</u>
  - Females are at higher risk of developing chronic pain after groin hernia surgery[1]
  - Risk factors: BMI, ASA classification, femoral hernia[1]
  - Laparoscopic repair has shown improved perioperative outcomes in females with lower risk of recurrence and pain[2]

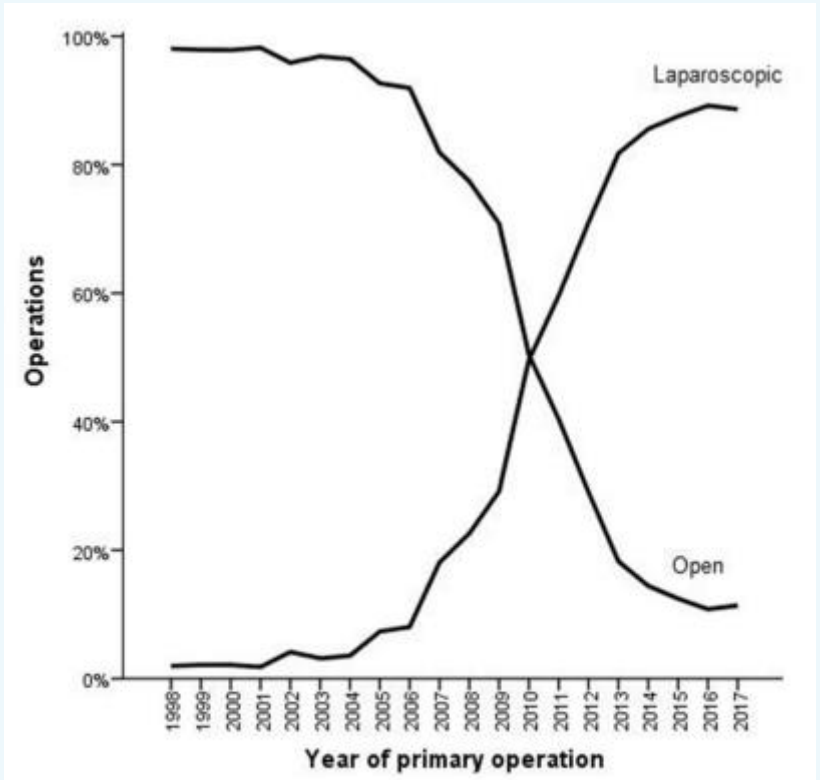


Fig. 2 Prevalence of laparoscopic and open groin hernia repairs in Denmark 1998–2017

Surgical Endoscopy (2019) 33:71–78

1. Jakobsson E, Lundström KJ, Holmberg H, De La Croix H, Nordin P. Chronic Pain After Groin Hernia Surgery in Women: A Patient-reported Outcome Study Based on Data From the Swedish Hernia Register. *Ann Surg*. 2022;275(2):213-219. doi:10.1097/SLA.0000000000005194

2. Köckerling F, Lorenz R, Hukauf M, et al. Influencing Factors on the Outcome in Female Groin Hernia Repair: A Registry-based Multivariable Analysis of 15,601 Patients. *Ann Surg*. 2019;270(1):1-9. doi:10.1097/SLA.0000000000003271

Objective

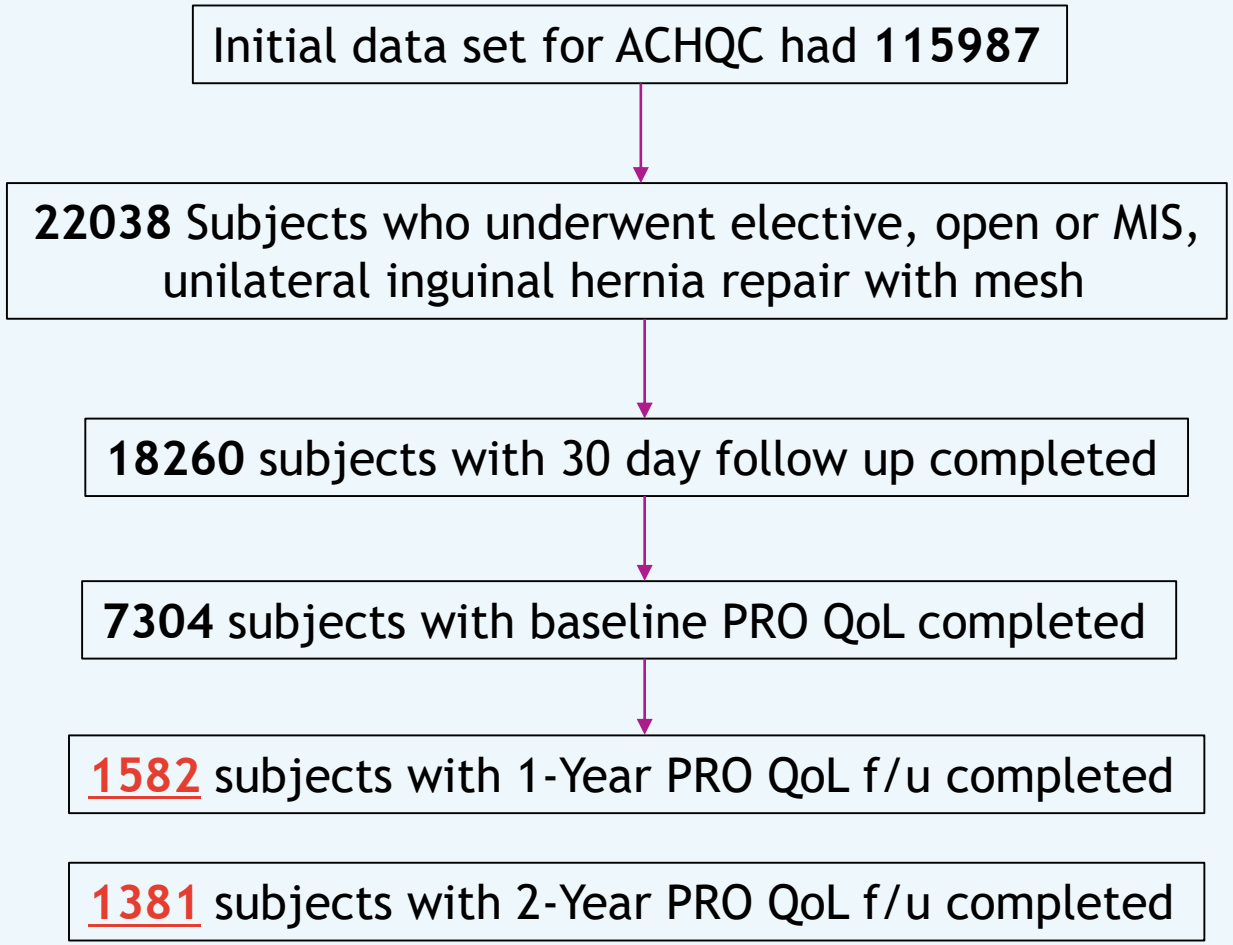
- Assess patient reported outcomes in female patients compared to male patients after elective unilateral inguinal hernia surgery in the ACHQC.

- Primary outcome measure:
  - All Patient reported outcomes at 30 days, 6 months, 12 months, 24 months

- Secondary outcome:
  - Recurrence

- Subgroup analysis:
  - Open inguinal hernia repairs
  - MIS (TEP, TAPP, rTAPP)

Flow Diagram



Lock date 7/3/2023

Descriptive statistics - Demographics

	Male n=1448	Female n=134
Median age (IQR)	65 (56, 71)	66 (57, 74)
Race		
White	1331 (92%)	126 (94%)
non-White	117 (8%)	8 (6%)
BMI (Capped)	26 (24, 28)	24 (22, 28)
Insurance		
Private	723 (50%)	58 (43%)
Medicare	547 (38%)	69 (51%)
Other/unknown	178 (12%)	7 (5%)
Ascites	4 (0%)	0 (0%)
DM	95 (7%)	7 (5%)
COPD	35 (2%)	8 (6%)
Smoker	97 (7%)	9 (7%)
Immunosuppression	23 (2%)	3 (2%)

- Generally, a 10 -11:1 ratio
- Consistent with reported incidence of inguinal hernia repairs Male vs Female
- Demographics and preoperative characteristics were similar between cohorts
- Median BMI for M>F (26 vs 24) $p<0.001$

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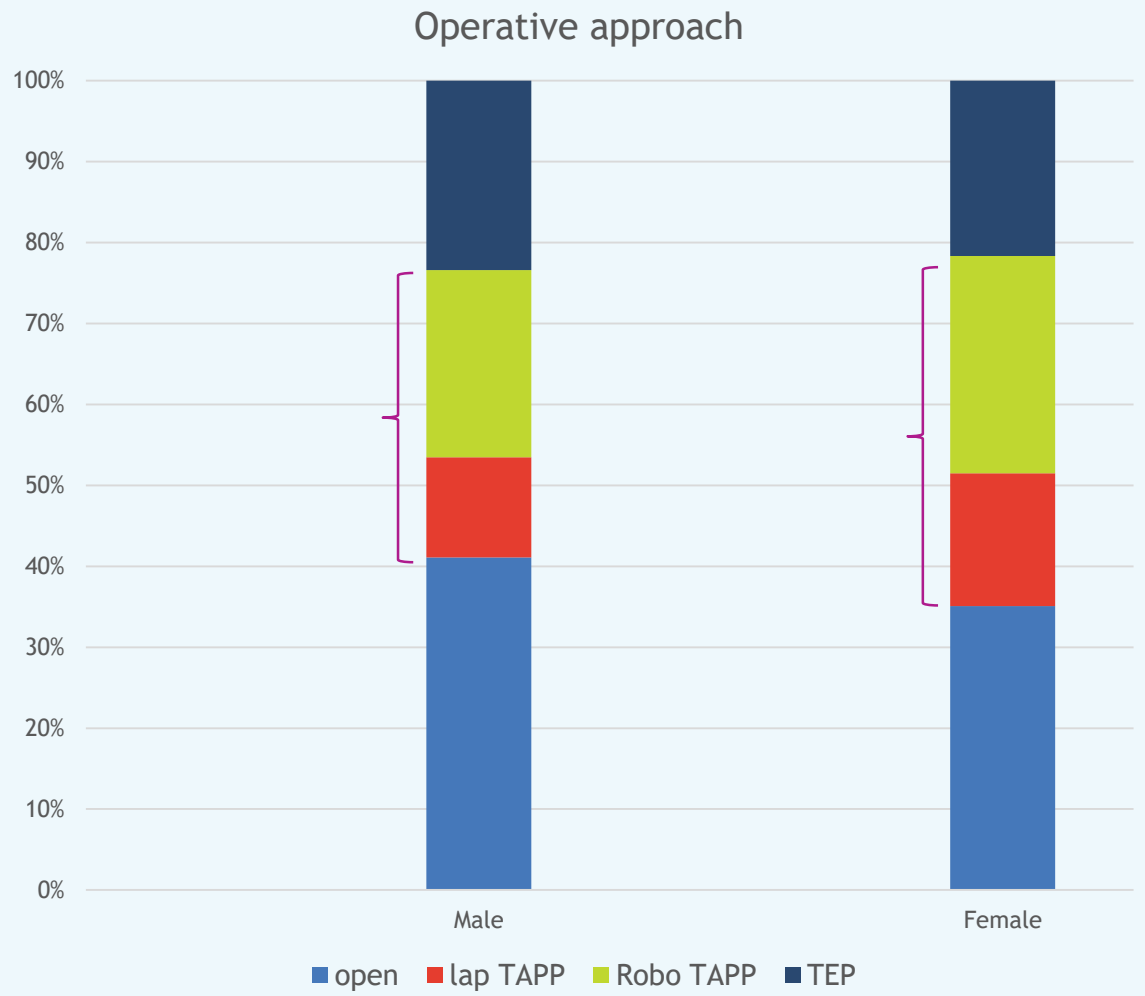
Descriptive statistics – Operative details

- Open: 41% in M and 35% in F
- TAPP (all): 35% vs 43%

- Operative times >55% under one hour (M=F)
- Prior pelvic operations 12% vs 22% (p<0.001)

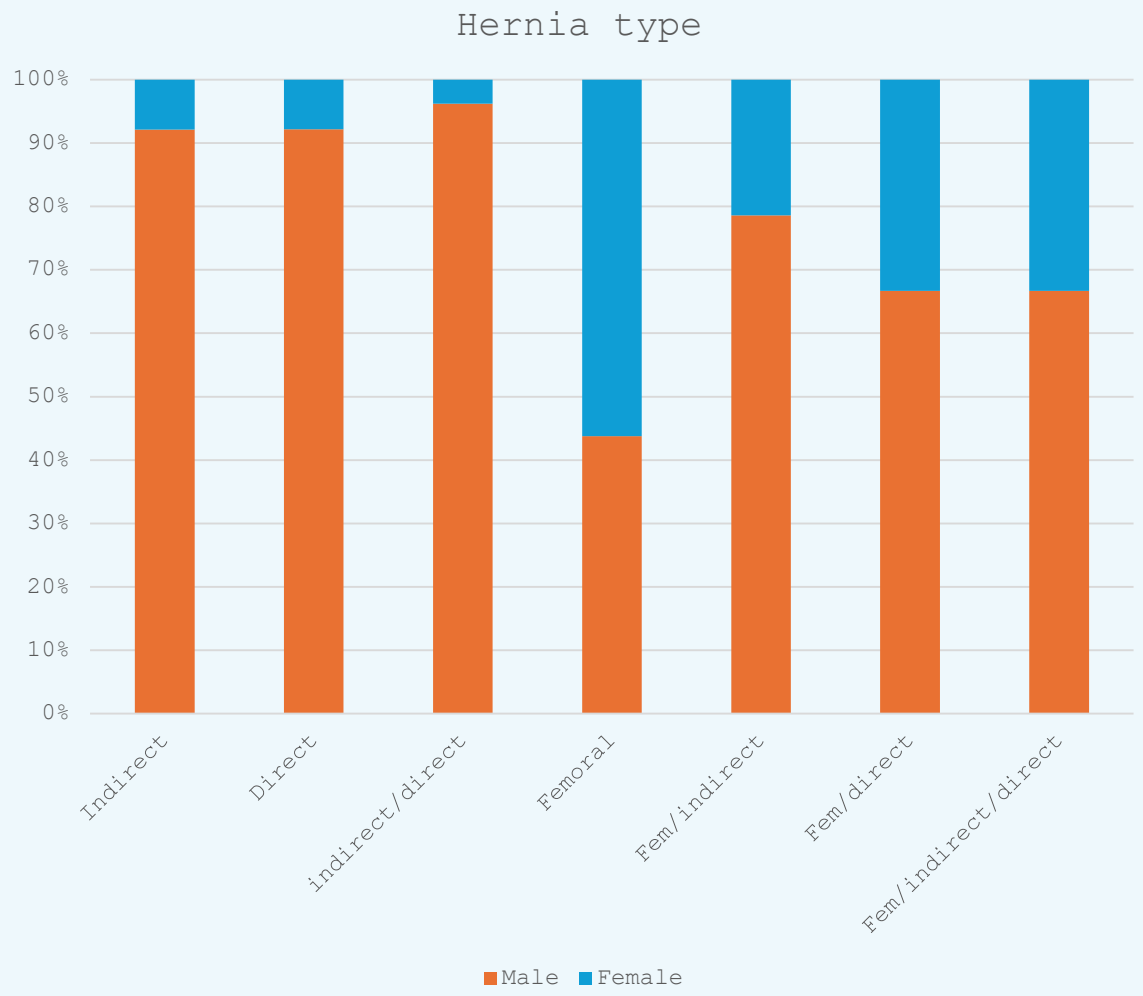
- Indications for repair:
  - Asymptomatic hernia: 3% (50) vs 9% (12)
  - Painful bulge: 92% (1327) vs 81% (109)
  - Pain without bulge: 2% (27) vs 7% (10)

  - Recurrent hernia: 10% (148) vs 1% (2)

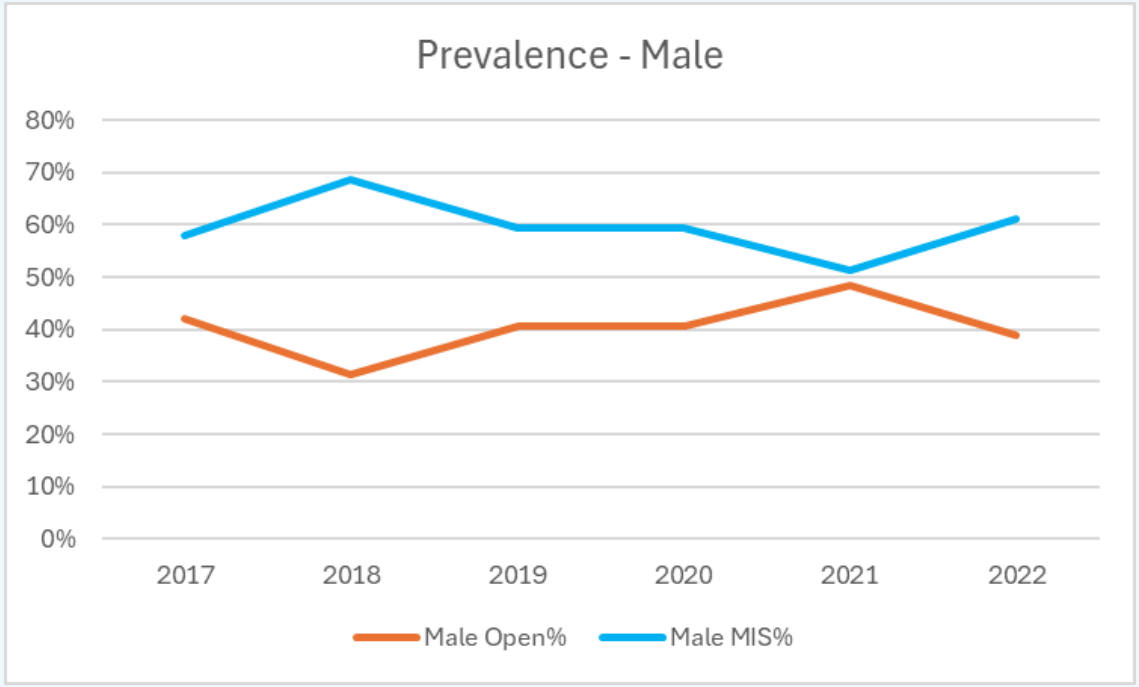


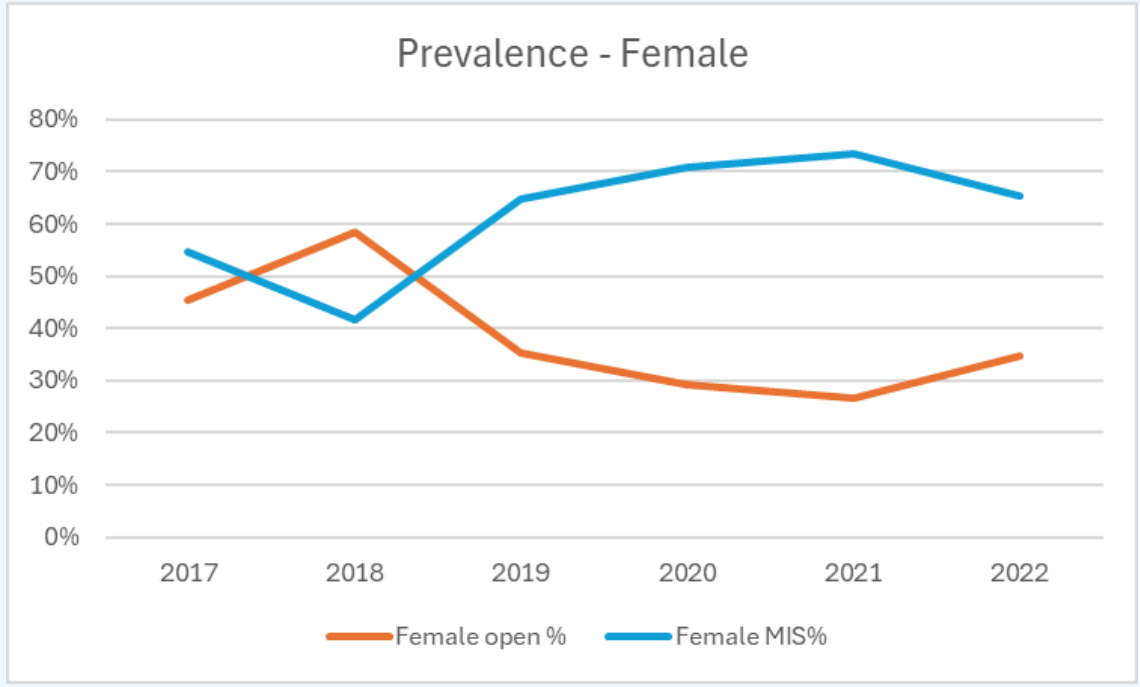
Descriptive statistics – Operative details and intraoperative finding

- Mesh size used was significantly smaller in female patients (open)
- Self fixating mesh 12% (169) vs 22% (30)
- No other differences in mesh fixation
- No differences in nerve management



Technical approach - Prevalence





Outcomes

- No readmissions
- 3 reoperations in the male cohort
  - 2 postoperative bleeding; 1 early recurrence
- No SSI

- SSOs 6% (82) vs 4% (5) p=0.35
- Hematomas/Seromas
- Small N of UTIs/other complications

- Postop complications 7% (104) vs 4% (6)
- No mortality

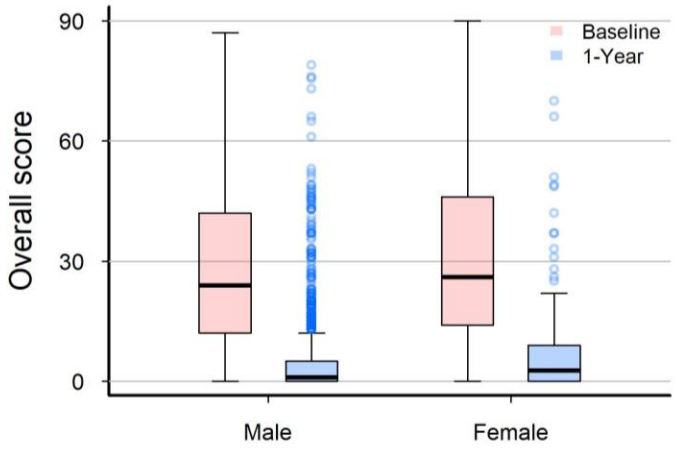
- Pragmatic recurrence

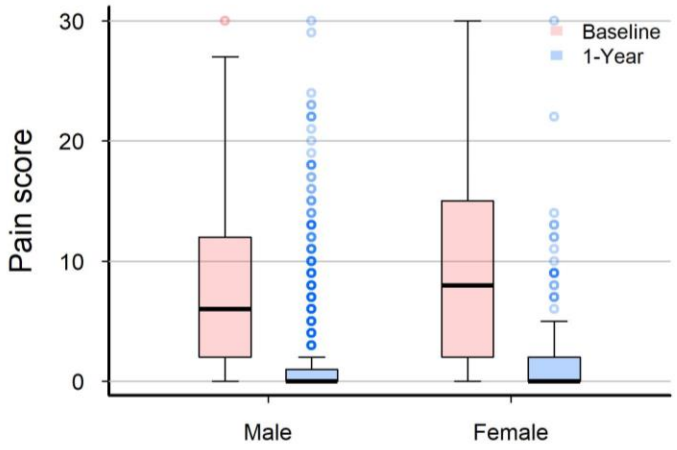
	M	F	p
1y recurrence	60 (4%)	11 (8%)	0.03
2y recurrence	31 (5%)	5 (8%)	0.25

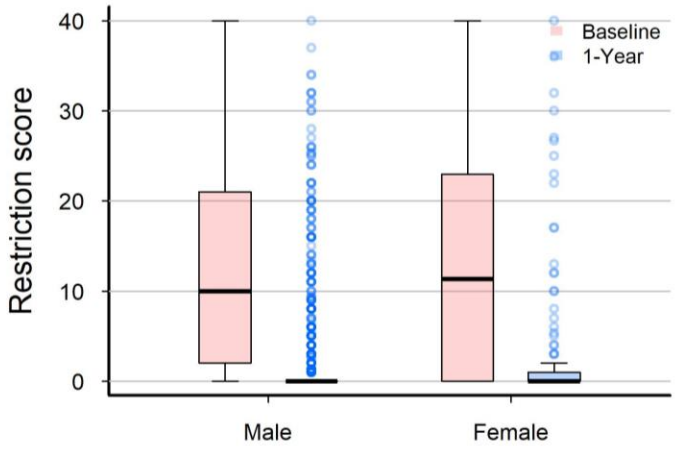
Patient reported outcomes - unadjusted

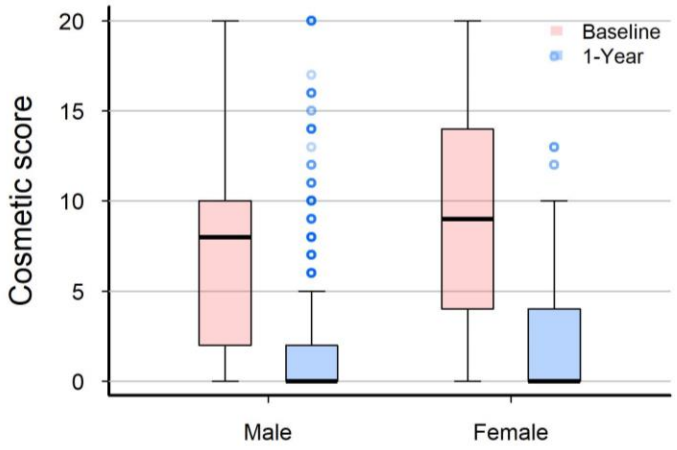
Eura HS Scores Overall Cohort			
	Male n= 1448 Median (IQR)	**Female n= 134 Median (IQR)**	**P value**
Baseline Overall score	24 (12-42)	26(14-46)	0.052
1 yr postoperative overall score	1.0 (0-5.0)	2.7 (0-8.8)	0.004
Baseline Pain Score	6.0 (2-12)	8 (2.2-15)	0.024
1 yr postoperative pain score	0 (0-1)	0 (0-2)	0.024
Baseline Restriction Score	10 (2-21)	11 (0-23)	1
1 yr postoperative Restriction score	0 (0-0)	0 (0-1)	0.11
Baseline Cosmetic Score	8 (2-10)	9 (4-14)	0.008
1 yr postoperative Cosmetic score	0 (0-2)	0 (0-4)	0.066

Patient reported outcomes - unadjusted



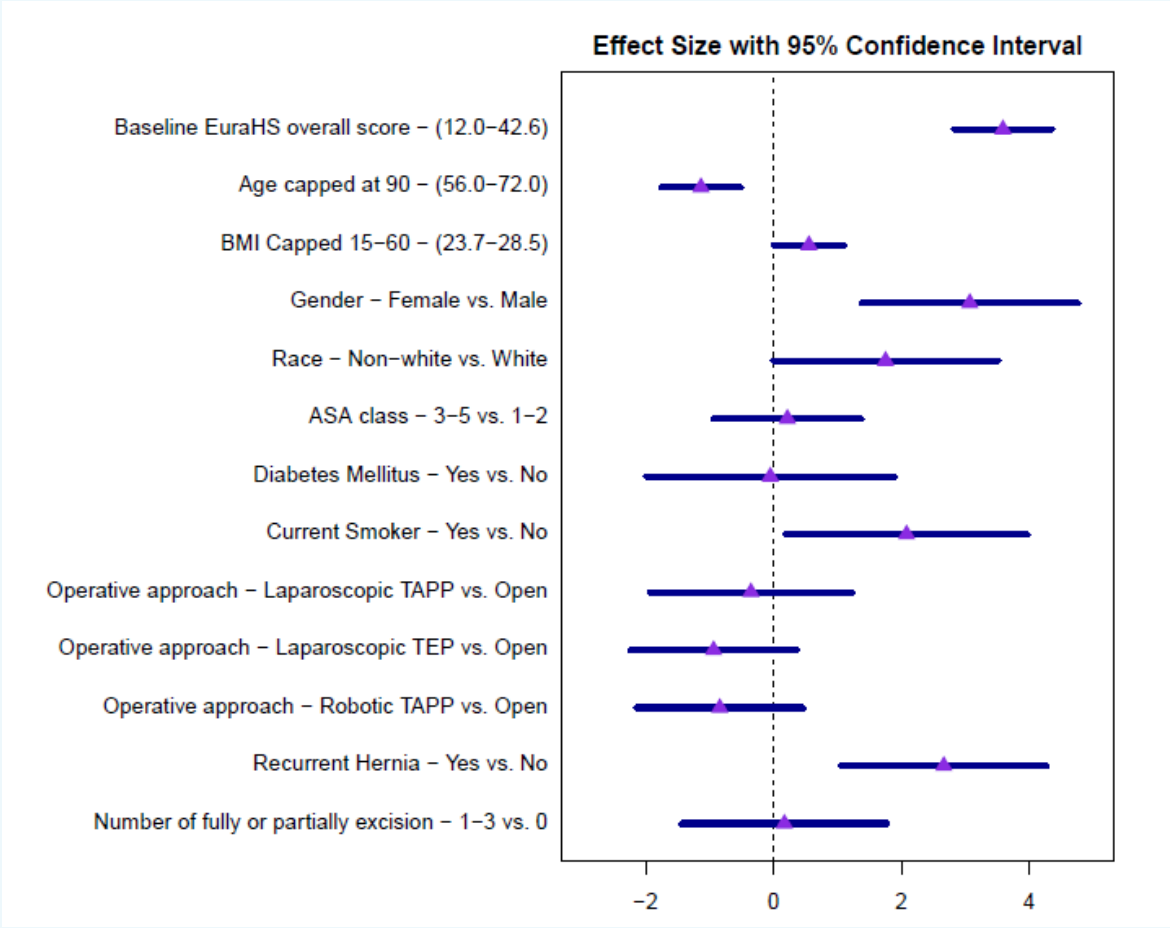






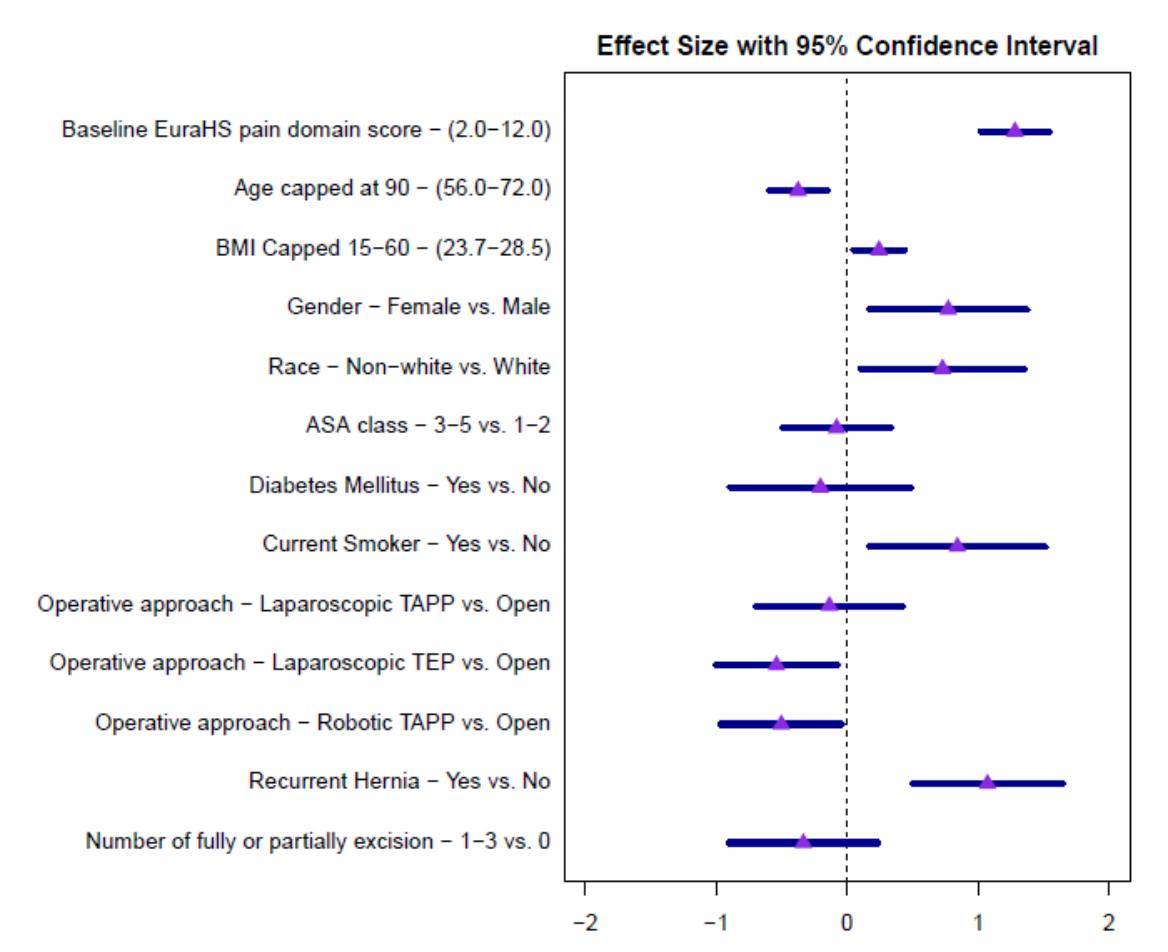
Patient reported outcomes - adjusted (linear regression on 1 year EuraHS)

- Overall Score



Patient reported outcomes – adjusted (linear regression on 1 year EuraHS)

- Pain domain
- Restriction domain
- Cosmesis domain



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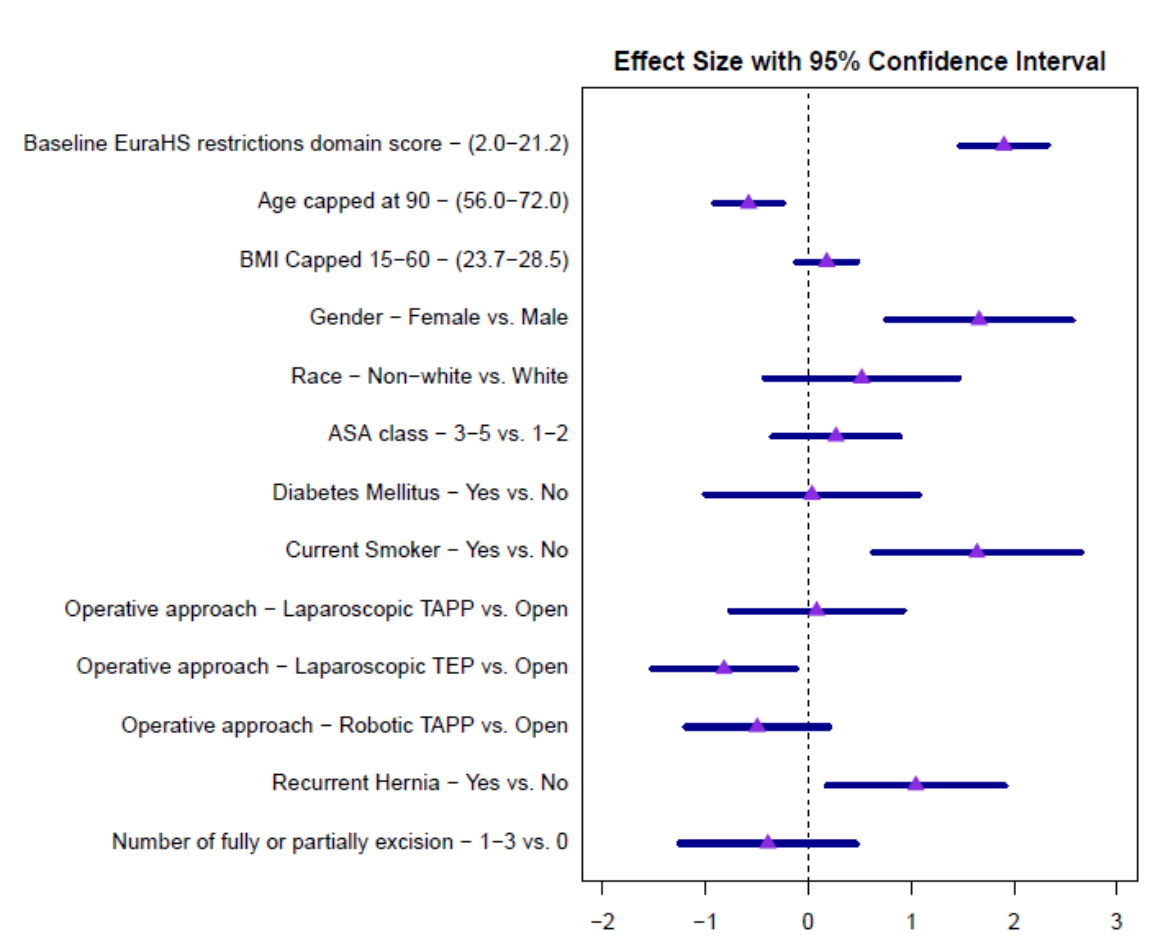

Patient reported outcomes - adjusted (linear regression on 1 year EuraHS)

- Pain domain
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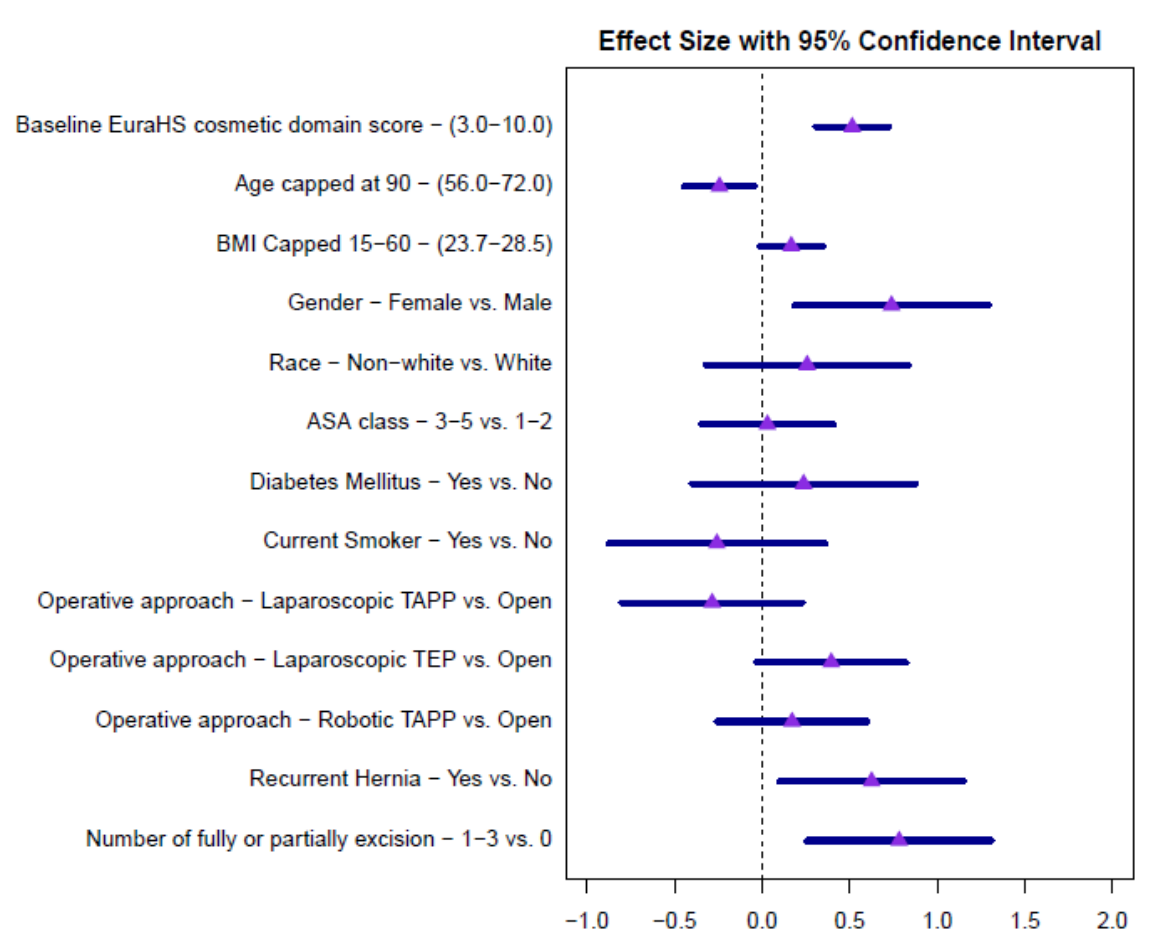


Snapshot from the Linear Regression – PROs OVERALL

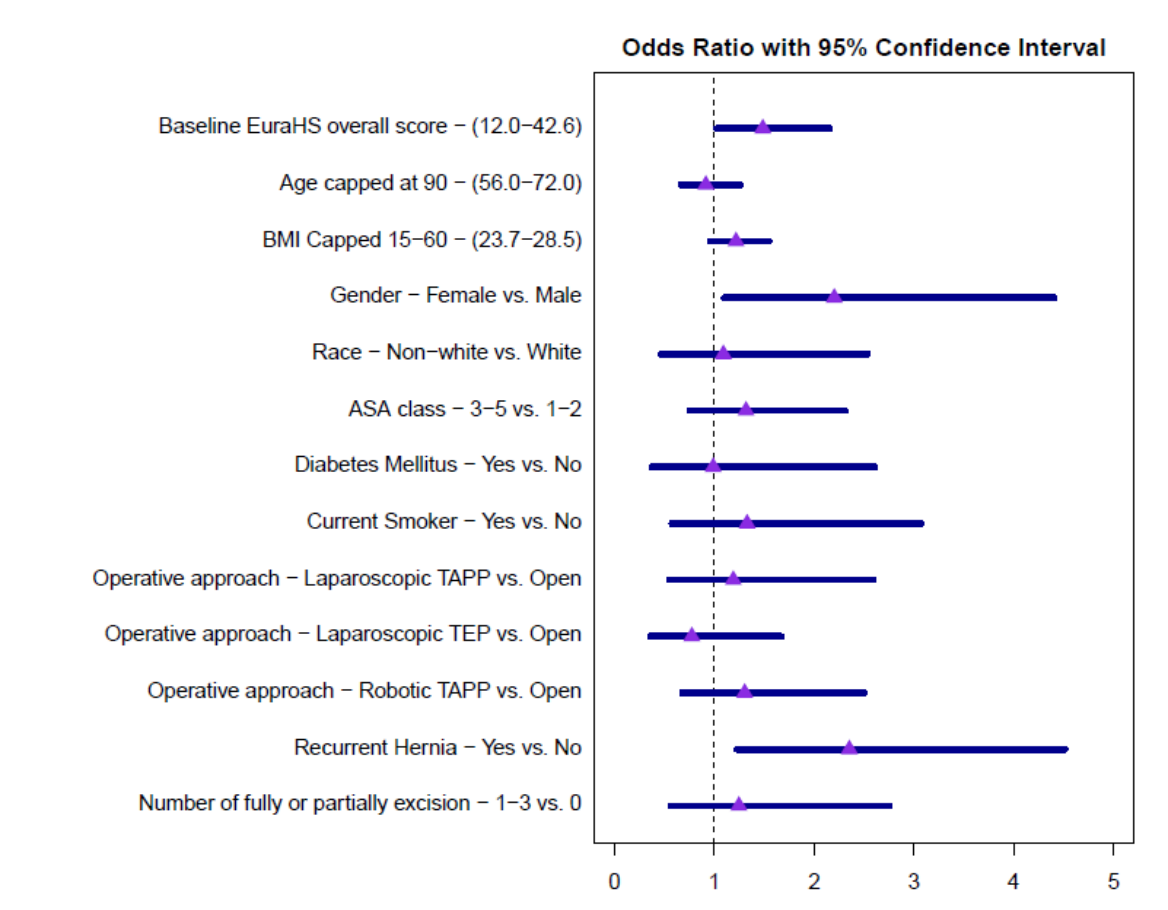
Variables associated with reporting worse outcomes

	P	R	C	Overall
Baseline score	✓	✓	✓	✓
BMI	✓	-	-	-
Female Gender	✓	✓	✓	✓
Current Smoker	✓	✓	-	✓
Recurrent hernia	✓	✓	✓	✓

Variables associated with reporting better outcomes

	P	R	C	Overall
Age	✓	✓	✓	✓
TEP	✓	✓	-	-
Robo TAPP	✓	-	-	-

Pragmatic Recurrence – Logistic regression



Subgroup analysis - Open

- Male: 595 Female: 47

- Medicare more common (60%) in Female group
- Distress score higher in female group
- BMI non SS different

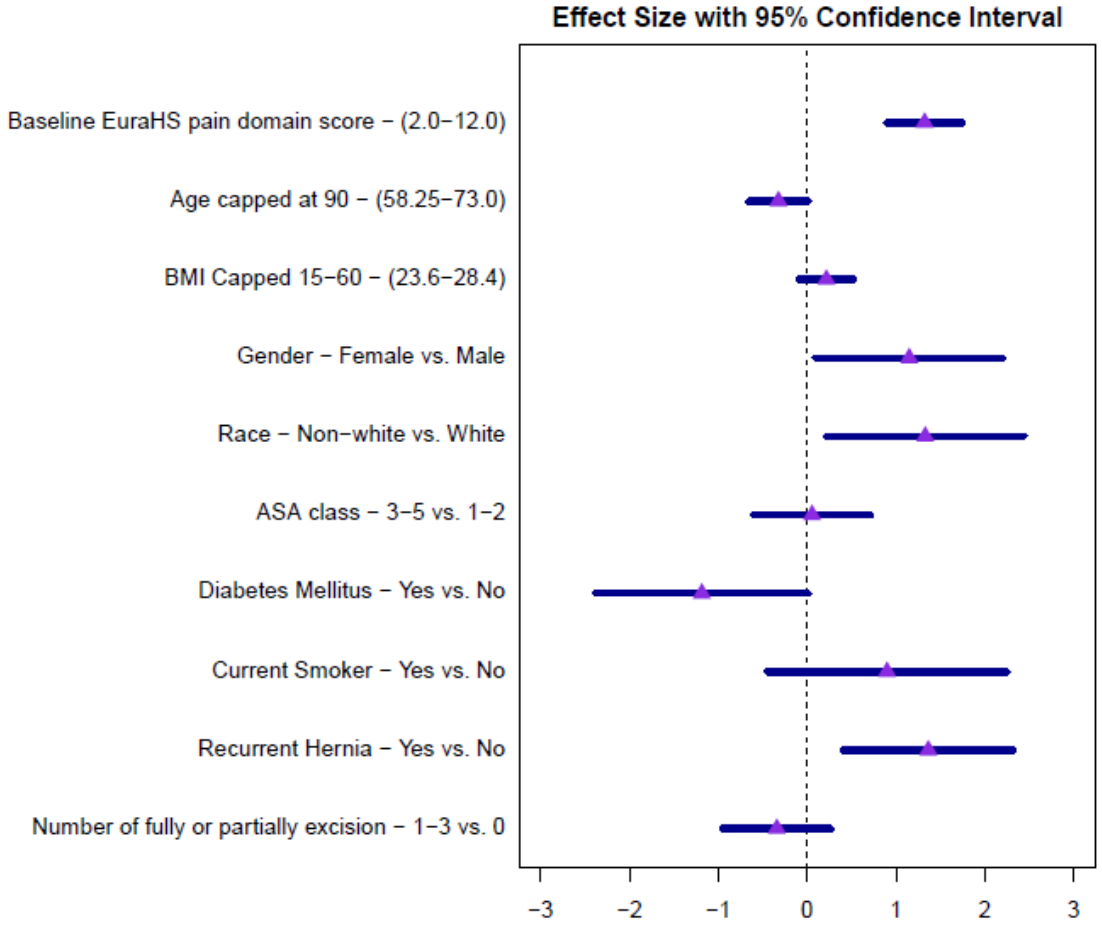
- More Femoral hernia in the Female group

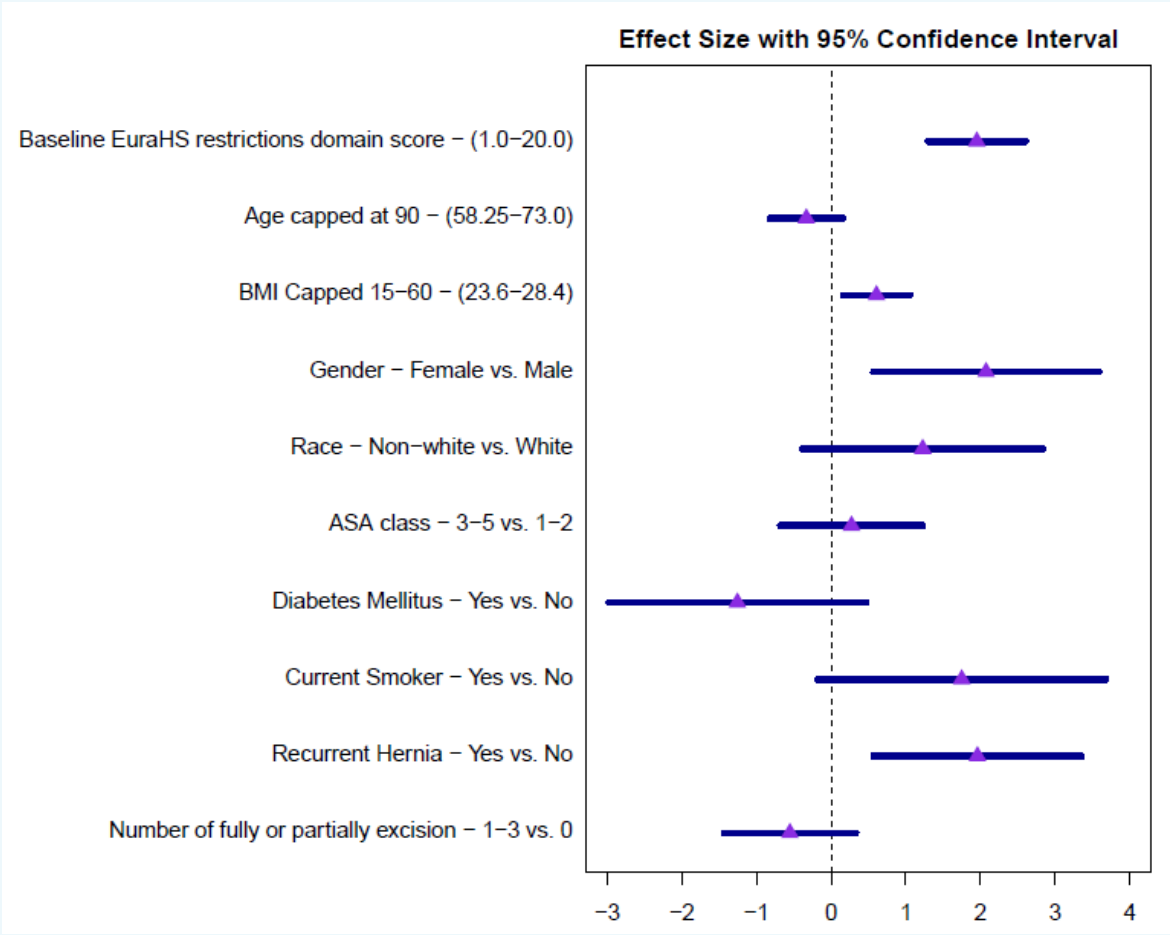
- Median length of mesh 14 cm vs 10 cm
- Median width of mesh 6.0 cm vs 11.0 cm

- Nerves fully or partially excised:
  - 1-3: 28% (169) 36%(17)
  - 0: 72% (426) 64% (30)

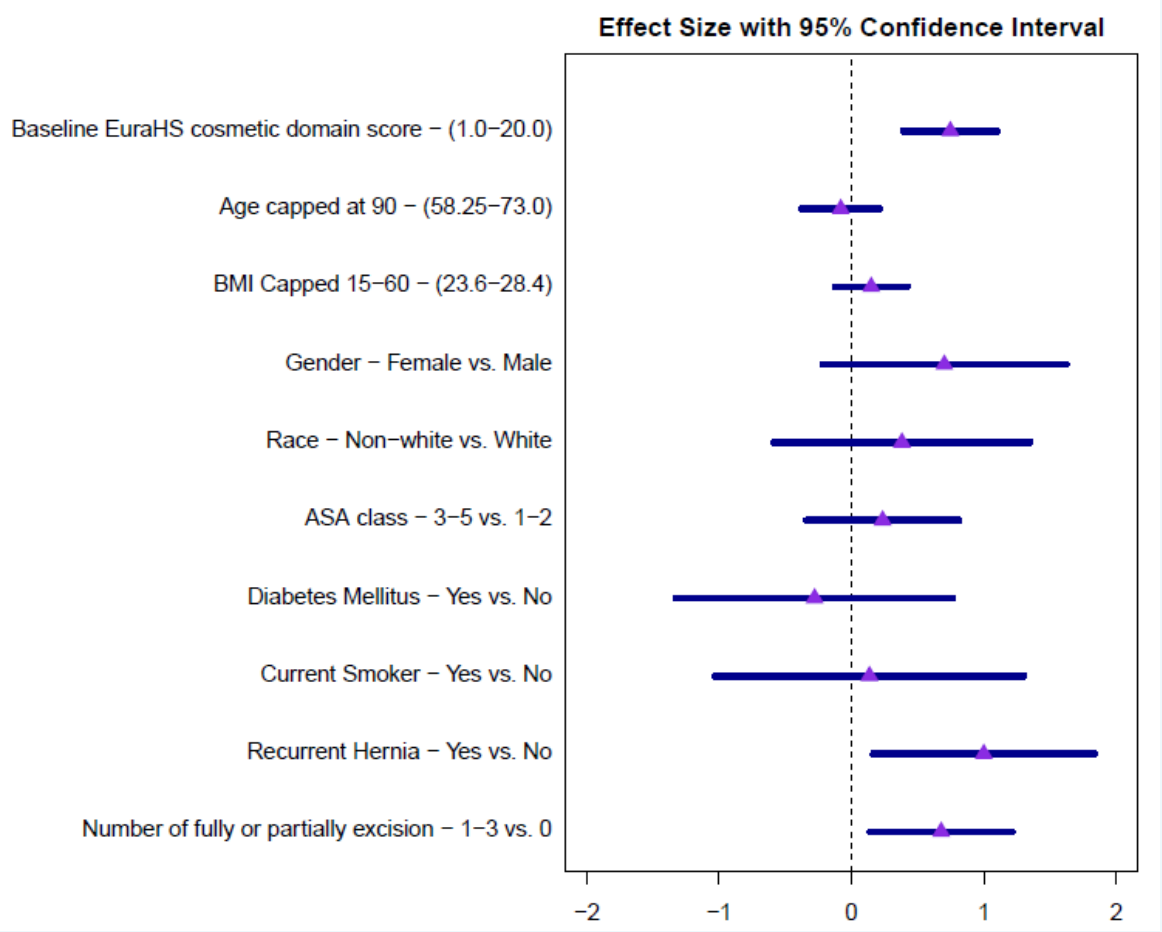
- Pragmatic recurrence 4% (23) vs 11% (5) at 1 yr
- Pragmatic recurrence 3% (9) vs 9% (2) at 2 yr

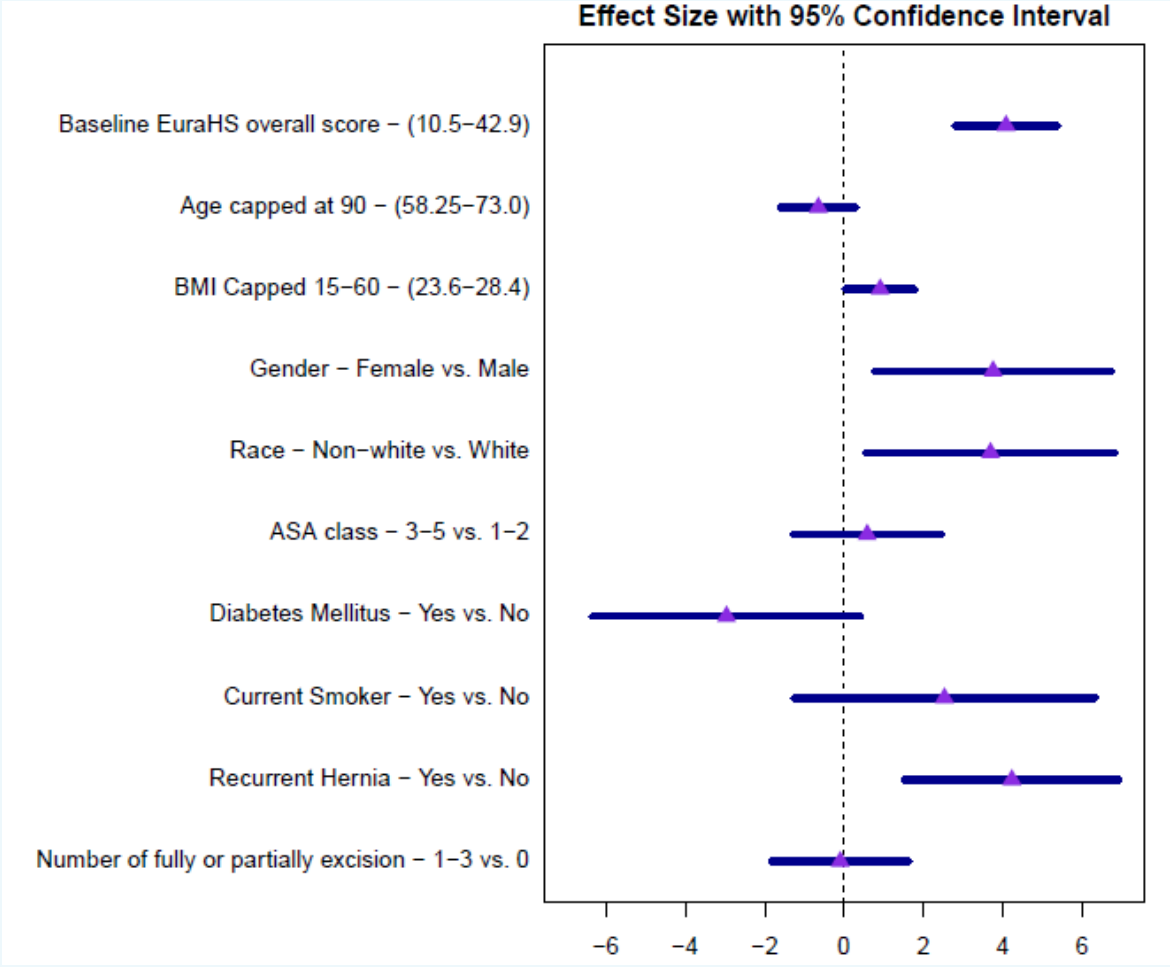
Subgroup analysis – Open repair PROs (Pain and Restriction)





Subgroup analysis – Open PROs (Cosmesis & Overall)





Snapshot from the Logistic Regression – PROs OPEN

Variables associated with reporting worse outcomes

	P	R	C	Overall
Baseline score	✓	✓	✓	✓
BMI	-	✓	-	✓
Female Gender	✓	✓	-	✓
Race	✓	-	-	✓
Recurrent hernia	✓	✓	✓	✓
Nerve excision	-	-	✓	-

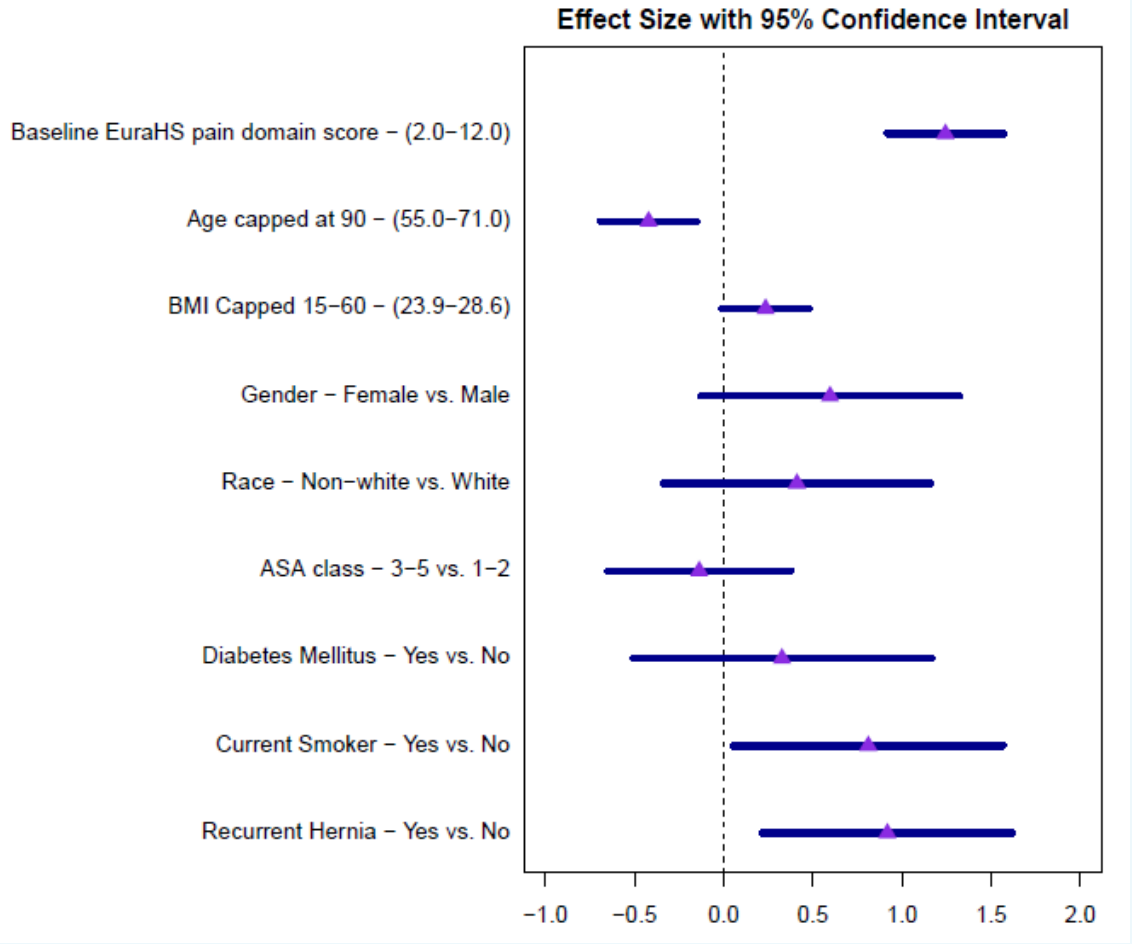
Variables associated with reporting better outcomes

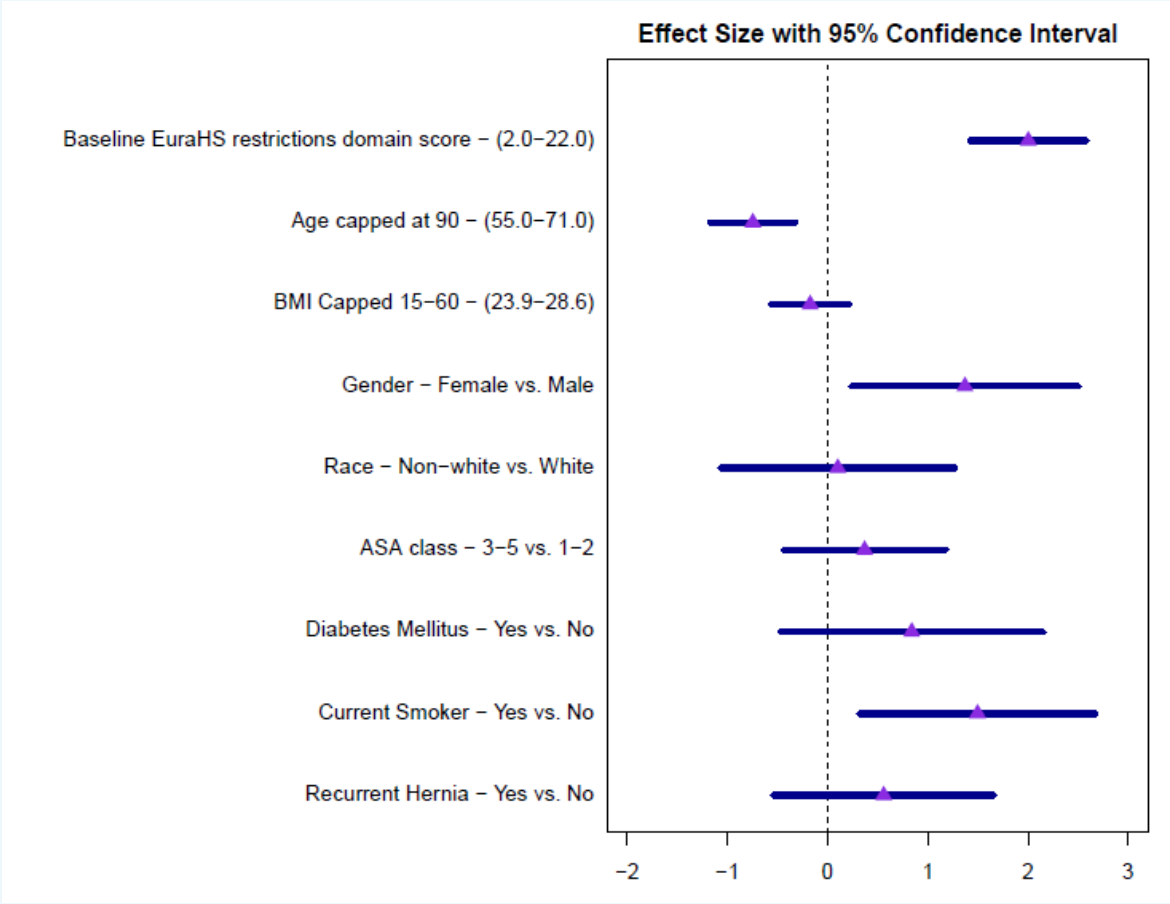
	P	R	C	Overall
Age	-	-	-	-

Subgroup analysis - MIS

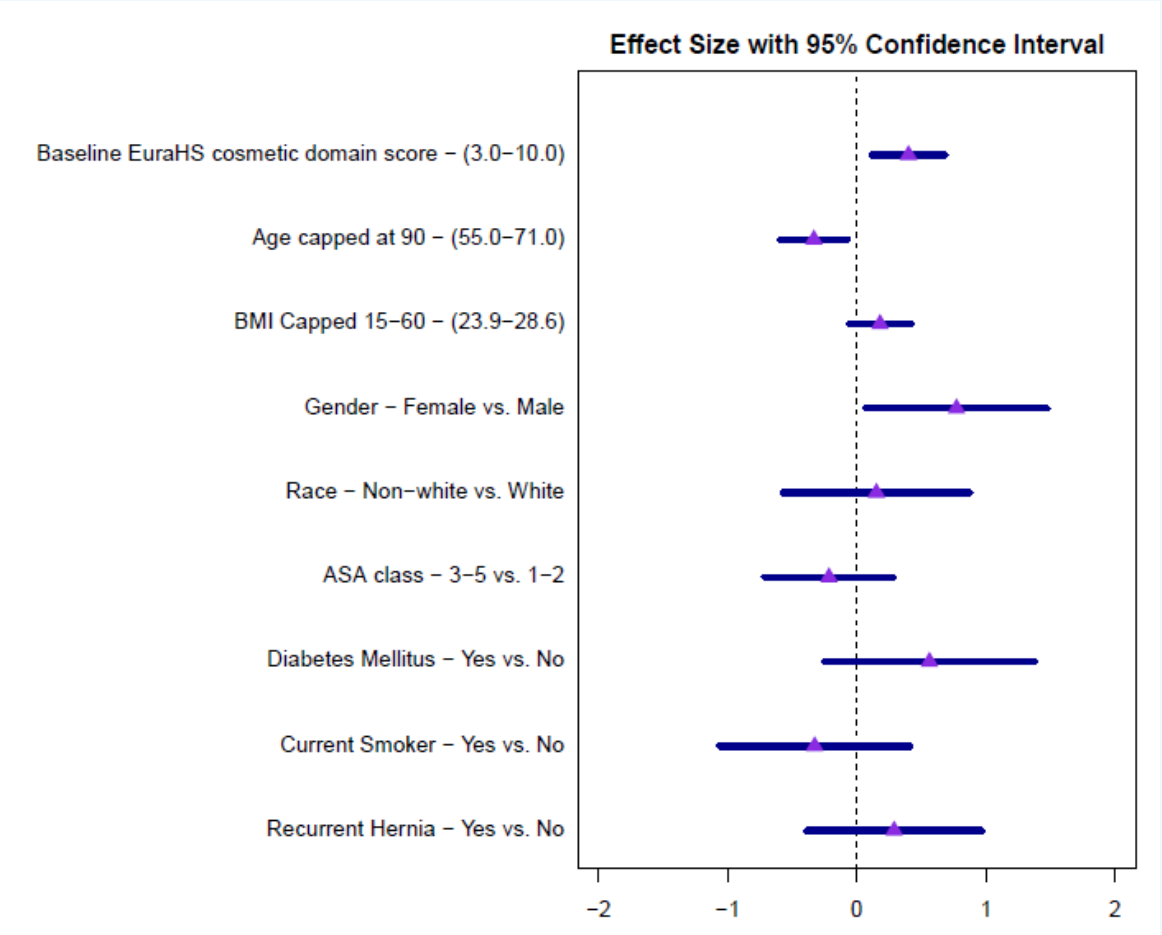
- Male: 853 Female: 87
- No difference in primary insurance
- Distress score not SS different
- BMI SS different (median 26 vs 24)
- Again more Femoral hernia in the Female group
- Mesh size similar in between groups
- More self fixating mesh in the female group
  18% vs 31%
- No nerve excision in either group
- Pragmatic recurrence 4% (37) vs 7% (6) at 1 yr
- Pragmatic recurrence 6% (22) vs 7% (3) at 2 yr
- Neither SS

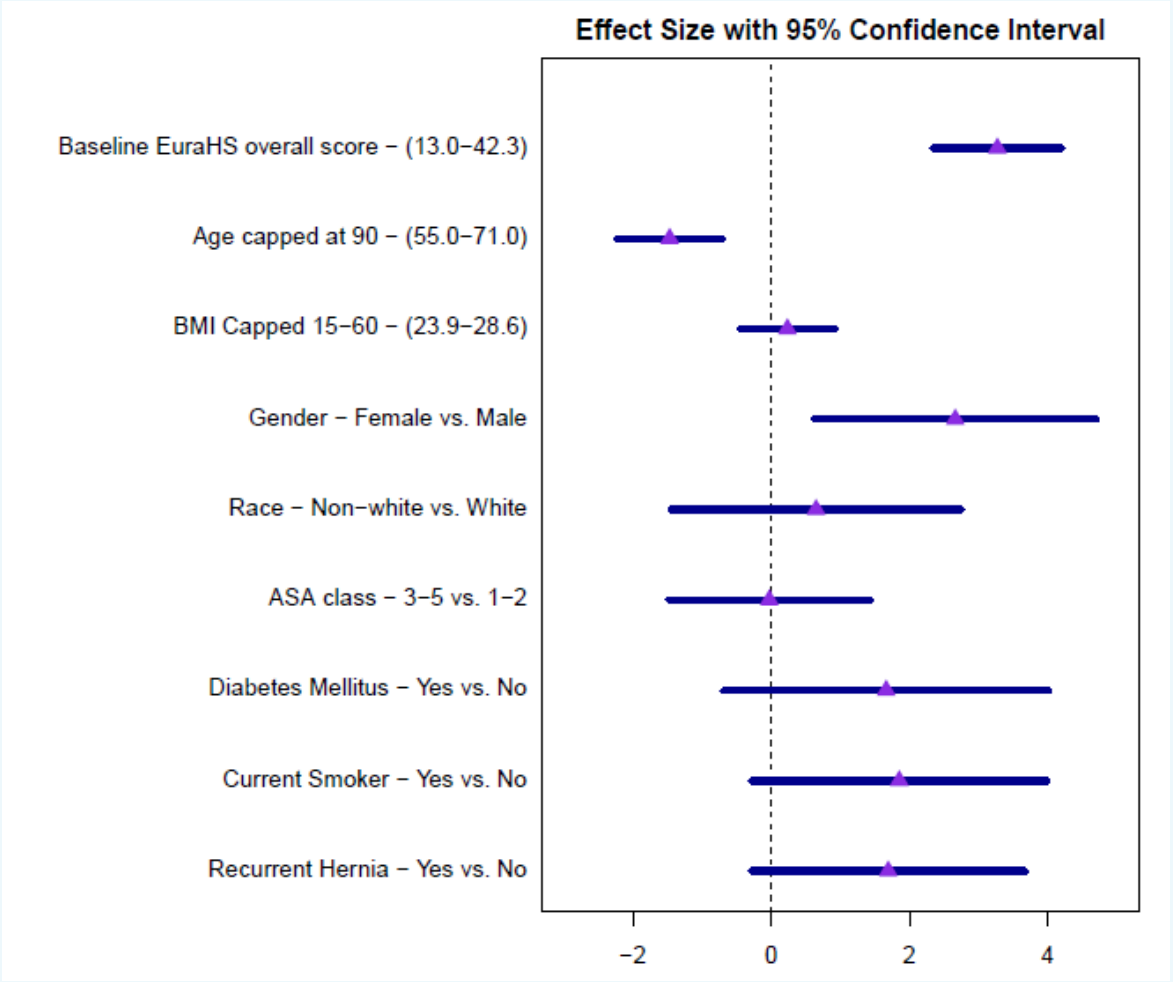
Subgroup analysis – MIS PROs (Pain and Restriction)





Subgroup analysis – MIS PROs (Cosmesis & Overall)





Snapshot from the Linear Regression – PROs MIS

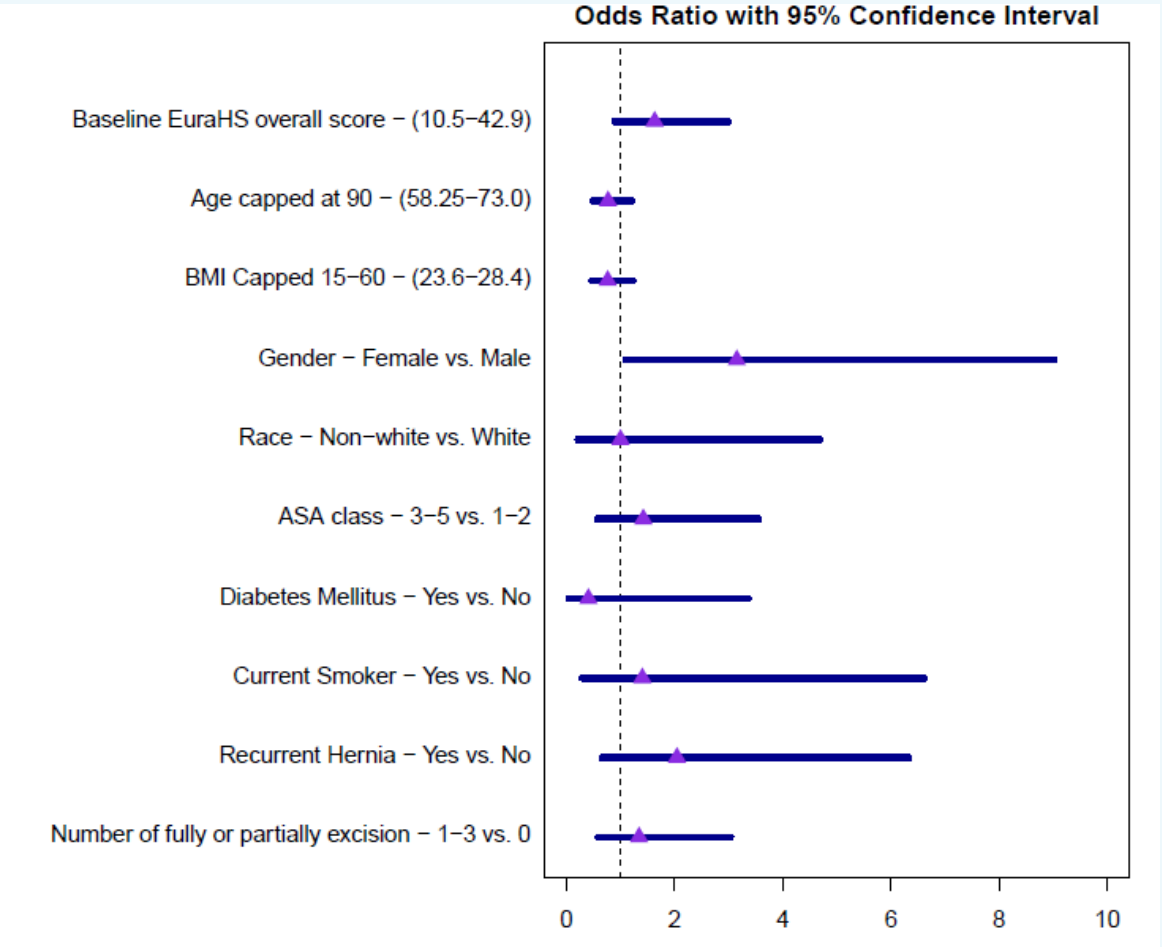
Variables associated with reporting worse outcomes

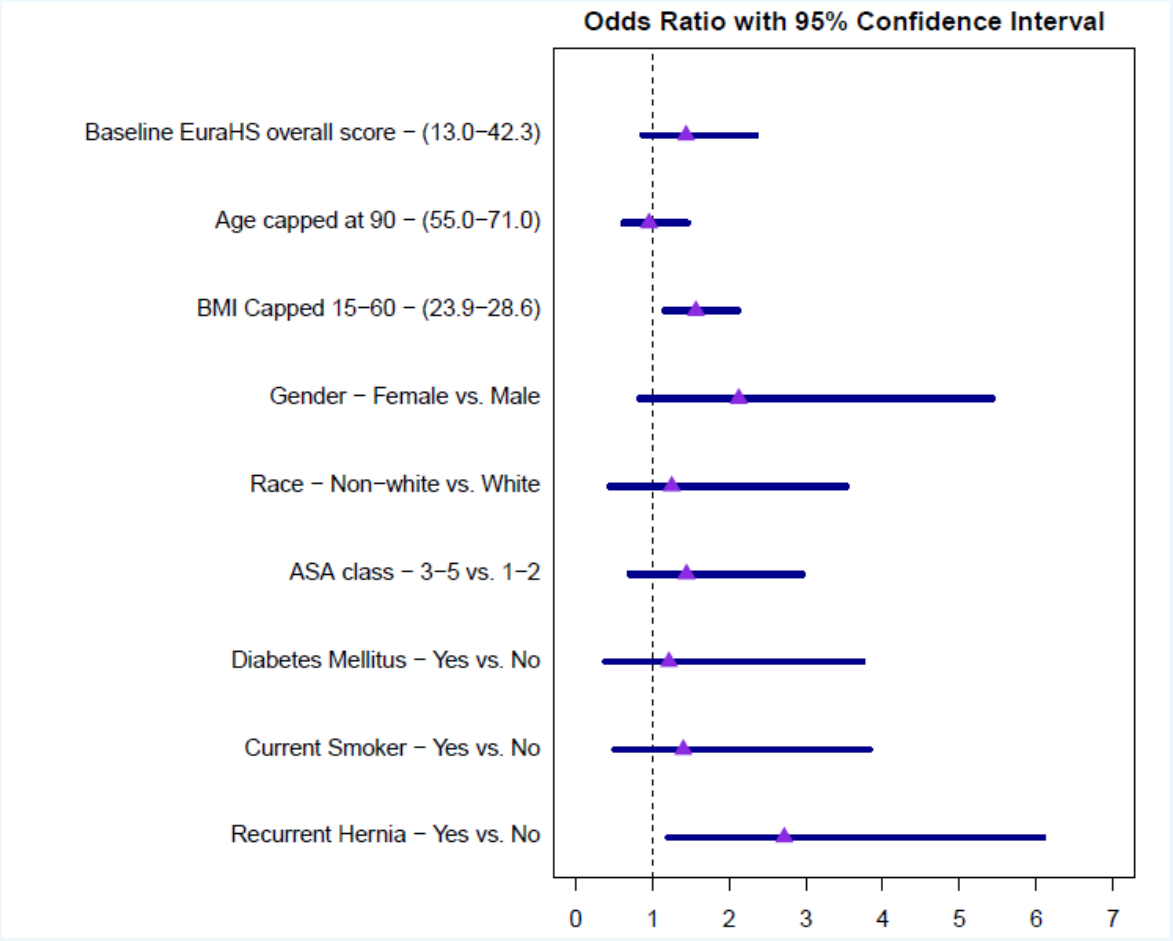
	P	R	C	Overall
Baseline score	✓	✓	✓	✓
Female Gender	-	✓	✓	✓
Smoker	✓	✓	-	-
Recurrent hernia	✓	-	-	-

Variables associated with reporting better outcomes

	P	R	C	Overall
Age	✓	✓	✓	✓

Pragmatic Recurrence – Open & MIS Logistic regression





Conclusions / Next steps

- Majority of Unilateral inguinal hernias completed via MIS approach
- PROs are different at baseline and 1 yr
- Associated with reporting of worse scores:
  - High baseline EuraHS score
  - Female Gender
  - Recurrent hernia
- Associated with reporting of better outcomes:
  - Age
- Recurrences are higher in the female group at 1 year in the open cohort (Female/recurrent hernia)

- Next steps:
- Use these data to inform preoperative discussion
- Expand the analysis to all inguinal hernia repairs
- Answer to the why?
- Technical differences
- Mesh size (open)/Mesh Type ?
- Nerve handling/resection (open)
- ELSE? (!!)

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open

	N	Male N = 595	Female N = 47	Combined N = 642	P-value
Year of Operation	642				0.48[1]
2017		8% (50)	11% (5)	9% (55)	
2018		11% (67)	15% (7)	12% (74)	
2019		21% (126)	26% (12)	21% (138)	
2020		18% (110)	15% (7)	18% (117)	
2021		29% (171)	17% (8)	28% (179)	
2022		12% (71)	17% (8)	12% (79)	

MIS

	N	Male N = 853	Female N = 87	Combined N = 940	P-value
Year of Operation	940				0.13[1]
2017		8% (69)	7% (6)	8% (75)	
2018		17% (146)	6% (5)	16% (151)	
2019		22% (184)	25% (22)	22% (206)	
2020		19% (161)	20% (17)	19% (178)	
2021		21% (181)	25% (22)	22% (203)	
2022		13% (112)	17% (15)	14% (127)	
BMI Capped 15-60	935	24 26 29	21 24 28	24 26 29	<0.001[2]

demographics

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