

12TH ANNUAL HARVARD SURGERY RESEARCH DAY

HOSTED BY BOSTON CHILDREN'S HOSPITAL

SATURDAY, MARCH 25, 2023
7:30AM TO 3:00PM

JOSEPH B. MARTIN CONFERENCE CENTER
HARVARD MEDICAL SCHOOL
77 AVENUE LOUIS PASTEUR
BOSTON, MA 02115



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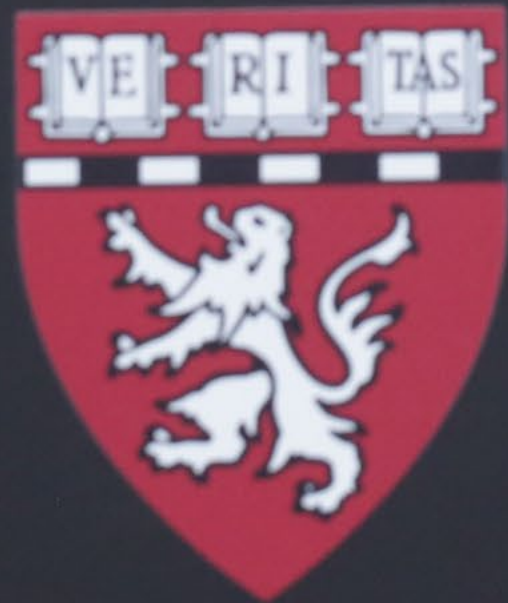
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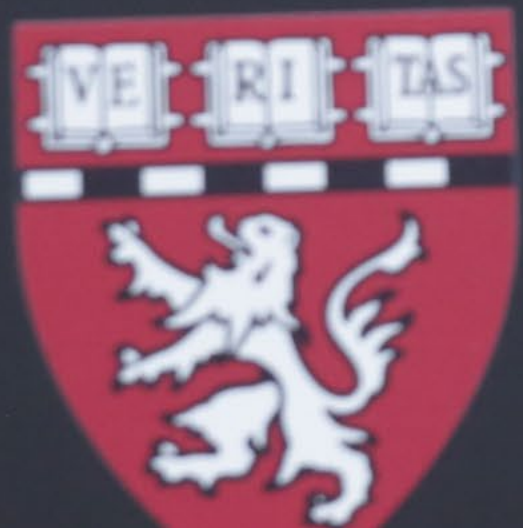
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ORAL ABSTRACT PRESENTATIONS:
BASIC SCIENCE





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12th Annual Harvard Surgery Research Day
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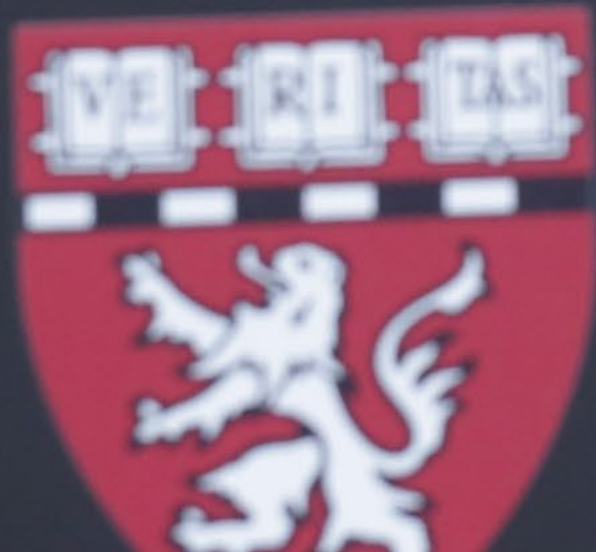




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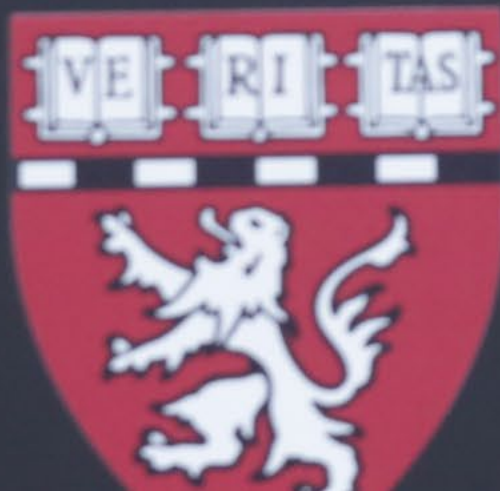


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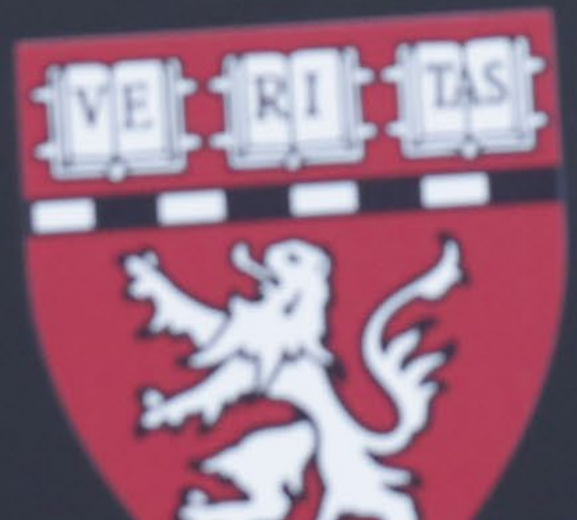






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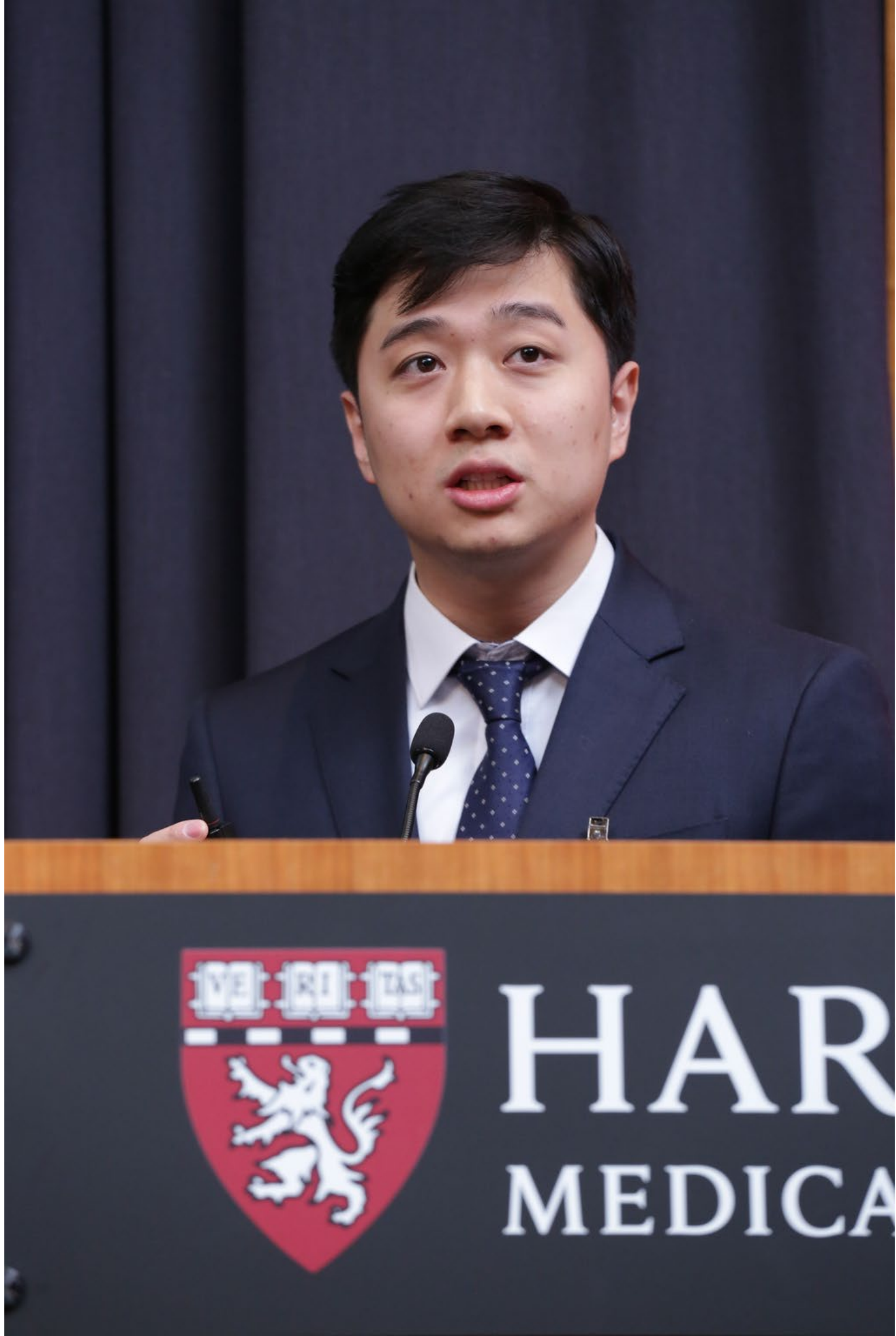
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POSTER PRESENTATIONS



Examining the Mindsets of Surgical Residents and Faculty

MD, Deanna Palenzuela, MD Emil Pe

Surgical Mindsets Research Team, Roy Phitayakorn, MD

PRELIMINARY RESULTS*

- Response rate was 169/602 (n=83 residents and 86 attendings; 38% and 23% respectively)
- The survey had high internal consistency ($\alpha=0.87$)
- Average resident and attending mindset scores were identical (5.7 ± 0.9)
- There was a statistically significant difference in average mindset scores of different programs (5.3 to 6.0, $p<0.001$)
- Within individual programs, there was no statistically significant difference between mindset score of attendings and that of residents
- Linear regression of mindset subgroups demonstrated a significant contribution to general mindset score from the mindset score for surgical skill ($p<0.001$), but patient care skill was not statistically significant ($p=0.07$)
- Differences between sub-group mindsets scores were also statistically significant (5.2 to 6.2, $p<0.001$)
- Multivariable linear regression demonstrated significantly more growth mindset in residents and attendings that self-identify as male versus female (5.6 vs 5.9, $p=0.019$)
- There was no significant difference in mindset scores by race ($p=0.662$)
- *. Survey and interview data are still being gathered, as more institutions have been enrolled since the preliminary analysis.

For our quantitative stage, we used a modified version of the Implicit Theories of Intelligence Scale (ITIS) to survey four general surgery programs. This was six item survey on a seven-point Likert scale.

We surveyed categorical general surgery residents (n=83) and surgical attendings (n=86). From these programs, ITIS data was gathered along with demographic data (e.g., residency year, gender, race). At the end of the survey, we asked participants to volunteer for a follow-up interview.

We completed a preliminary analysis (reported here) to inform the creation of an interview guide. This guide was then piloted and still being used to obtain qualitative data.

CONCLUSIONS

- On average, surgical residents and attendings demonstrate similarly high growth mindset scores as opposed to a balance of fixed versus growth noted in other learners
- Mindset tended to vary significantly by residency program, but not within program
- There was a small, but statistically significant difference in mindset score by gender
- We are continuing our investigation to shed light on the reasons behind these statistical findings

LITERATURE CITED

Dweck CS, Leggett EL. A Social-Cognitive Approach to Motivation and Personality. *Psychological review* 295X.95.2.256. DOI: 10.1037/0033-1988.95.2.256-273.

Yeager DS, Dweck CS. Mindsets That Promote Resilience: When Students Believe That Personal Characteristics Can Be Developed. *Educational Psychologist* 2012;47(4):302-314. DOI: 10.1080/00461520.2012.722805.

Dweck CS. *Self-theories: their role in motivation, personality, and development*. Philadelphia: Psychology Press, 1999.

INTRODUCTION

Current guidelines advocate open repair for blunt thoracic aortic injury (BTAI) in the pediatric population, whereas the standard of treatment in adult patients is thoracic endovascular aortic repair (TEVAR) [1][2].

Studies regarding the utilization of TEVAR for BTAI have mainly been performed in the adult population and data regarding outcomes in the pediatric population remain scarce.

Recent studies have brought into question if TEVAR is possible in the pediatric population as well, but have not looked closely into in-hospital outcomes.

AIM

Examine the outcomes of the pediatric population undergoing TEVAR for BTAI compared with adult counterparts.

METHODS

Design and data source

We performed a retrospective cohort study using the American College of Surgeons Trauma Quality Improvement Program (ACS-TQIP) 2010 - 2019 database.

Patient population

We included patients with BTAI undergoing TEVAR. Pediatric patients were divided into three groups:

- 1) children (0-11 years old)
- 2) adolescent patients (12-17 years old)
- 3) mature patients (18-21 years old)

Adult patients were defined as >21 years old.

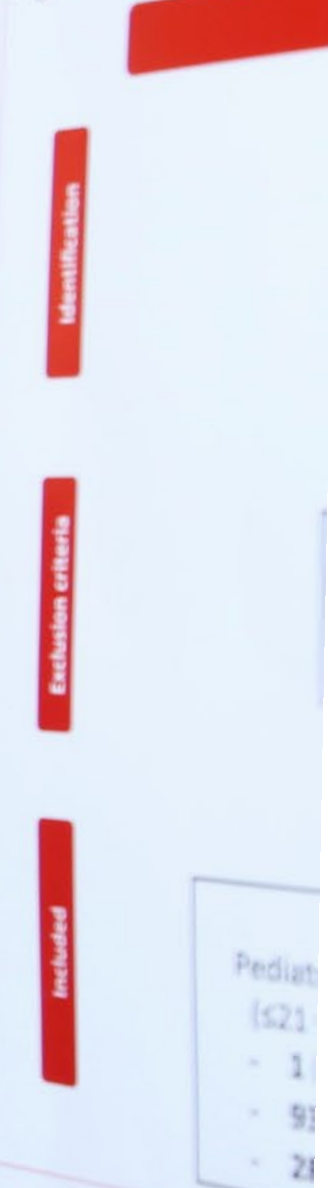
Statistical analysis

Multivariable logistic regression was performed to examine the in-hospital mortality and complications after TEVAR in the pediatric and adult populations.

RESULTS

Patient population
We included a total of 100 patients (children [N=1], adolescents [N=9], and adults [N=90]).

Figure 1. Inclusion flowchart



CONCLUSION

The results of this study demonstrate that the outcomes of pediatric and mature patients undergoing TEVAR for BTAI are similar to those of adolescent patients. Future studies should focus on the long-term outcomes of TEVAR in the pediatric population.

INTRODUCTION

- Artificial intelligence (AI) has emerged as a tool to potentially increase efficiency and efficacy of healthcare and improve clinical outcomes.
- The growing body of knowledge of artificial intelligence was used to examine performance, clinical outcomes, and patient outcomes.

RESULTS

- A total of 41 studies were included in the analysis.
- In terms of embolic volume, 23 studies reported the performance of AI in terms of embolic volume, and 2 studies reported clinical outcomes.
- Mean (SD) of the embolic volume reported by AI was 1.8 (1.2) mL, which was significantly lower than the mean (SD) of the embolic volume reported by the reference standard of 2.5 (1.5) mL.
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CONCLUSION

- The application of artificial intelligence in cardiac surgery may improve clinical outcomes and patient outcomes.
- AI may help reduce the risk of embolic volume and improve clinical outcomes.

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EXIT

Conclusion

Patients older than 80 years present less frequently as clinical stage IA and more frequently with advanced stage disease. They are less commonly offered surgical intervention and are more frequently diagnosed via less invasive measures which can often also be less accurate (i.e. radiographically).

Continuing lung cancer screening beyond 80 years may identify patients with earlier stage of disease, improve outcomes in this population and address disparities related to age.

References

1. National Lung Screening Trial Research Team, Aberle DR, Adams AM, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med.* 2011;365(5):395-409. doi:10.1056/NEJMoa1102873
2. van Iersel CA, de Koning HJ, Draisma G, et al. Risk-based selection from the general population in a screening trial: selection criteria, recruitment and power for the Dutch-Belgian randomised lung cancer multi-slice CT screening trial (NELSON). *Int J Cancer.* 2007;120(4):868-874. doi:10.1002/ijc.22134

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TESTOSTERONE-AFFIRMING MASTECTOMY

(1) Division of Plastic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA
 (2) Departments of Plastic and Reconstructive Surgery and Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Background

Chest masculinization surgery (CMS) can lead to hypertrophic scarring, the most common cause for surgical revision. Effects of testosterone on human scarring have not been well characterized. Based on years of clinical observation that scarring appeared to be abnormal, we hypothesized that testosterone is associated with more severe scarring after CMS.

Results

Table 1. Demographics and outcomes of the overall cohort and scar-scored patients, stratified by testosterone treatment.

No. of Patients	All Patients (N=146)		p-value	Scar-Scored Patients (N=92)		
	Patients on T	Non-T Patients		Patients on T	Non-T Patients	p-value
Age, yr	132	14		86	6	
Mean	26.6	29.3	0.18	27.1	25.45	0.60
Median	26.7	26.9	0.49	27.4	24.6	0.24
BMI (kg/m²)						
White	64.4	71.4		66.3	66.7	
Black	20.5	7.1		19.8	16.7	
Asian	5.3	21.4	0.11	3.5	16.7	0.58
Multiple	6.8	0		7	0	
Other	3	0		3.5	0	
Ethnicity, %						
NOT Hispanic or Latino	96.2	92.9	< 0.001	98.8	100	0.79
Hispanic or Latino	3.8	7.1		1.2	0	
Complications, %						
Revision	3.8	0	0.46	5.8	0	0.54
Steroid use	2.3	0	0.57	3.5	0	0.64

Conclusion

Testosterone therapy correlates with hypertrophic scarring after CMS in a dose-dependent fashion, potentially explaining the high scar revision rates for this procedure.

Current testosterone dosing regimens that emphasize subjective patient response may lead to unanticipated off-target effects.

Consideration of hormone repair may alter perioperative managing hormone therapy.

The development of a block androgen receptor may avoid deleterious hormone dependent side effects as an avenue of clinical research.

146 chest masculinization surgeries

Standardized photographs taken preoperatively and validated by a plastic surgeon (S...)

Multivariate model of scar score against weekly T dose.

Variable	p-value
Age	0.016
BMI	0.60
Race	0.52
Ethnicity	0.020
Testosterone dose	0.040
Time to surgery	0.024
Preoperative BMI	0.63
Preoperative age	0.16
Preoperative BMI	0.06
Preoperative age	0.036

Low SCAR score

High SCAR score



Conclusion

Patients older than 80 years are not less frequently as clinical IA and more frequently with advanced stage disease. They are commonly offered surgical resection and are more frequently diagnosed via less invasive measures which can also be less accurate (i.e. graphically).

Continuing lung cancer screening and 80 years may identify patients with earlier stage of disease, improve outcomes in this population and address disparities related to age.

References

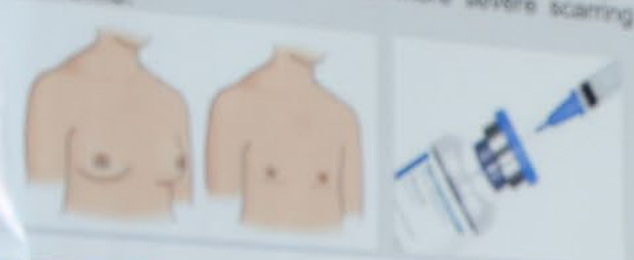
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Background

Chest masculinization surgery (CMS) can lead to hypertrophic scarring, the most common cause for surgical revision. Effects of testosterone on human scarring have not been well characterized. Based on years of clinical observation that scarring appeared to be abnormal, we hypothesized that testosterone is associated with more severe scarring after CMS.



Methods

- 146 chest masculinization surgeries
- Demographics
- Scarring comorbidities
- Procedure
- Exogenous hormone regimen

Standardized scar photos (anteroposterior/lateral) were taken and assessed by four blinded clinicians using validated metrics Manchester Scar Scale (MSS) and Scar Cosmesis Assessment and Rating Scale (SCARS).

Multivariate mixed-effects linear regression models were used to assess the relationship between exogenous testosterone and scar outcomes.


Results

Table 1. Demographics and outcomes of the overall cohort and scar-scored patients, stratified by testosterone treatment.

	All Patients (N=146)			Scar-Scored Patients (N=42)		
	Patients on T	Non-T Patients	p-value	Patients on T	Non-T Patients	p-value
No. of Patients	132	14		36	6	
Age, yr						
Mean	26.6	29.3	0.18	27.1	25.40	0.80
Median	26.7	26.9	0.40	27.4	24.6	0.24
Race, %						
White	64.4	71.4		66.3	66.7	
Black	20.5	7.1	0.11	19.8	16.7	
Asian	5.3	21.4		3.5	16.7	0.58
Multiple	6.8	0		7	0	
Other	3	0		3.5	0	
Ethnicity, %						
NOT Hispanic or Latino	95.2	92.9	< 0.001	95.8	100	0.79
Hispanic or Latino	3.8	7.1		1.2	0	
Complications, %						
Scar revision	3.8	0	0.48	5.8	0	0.54
Corticosteroid use	2.3	0	0.57	2.5	0	0.54

Table 2. Multivariate model of scale/subscale against weekly T dose

Scale/subscale	p-value
MSS color	0.016
MSS finish	0.60
MSS contour	0.52
MSS distortion	0.020
MSS total	0.040
SCAR erythema	0.024
SCAR dyspigmentation	0.63
SCAR palpability	0.16
SCAR overall impression	0.06
SCAR total	0.036






Abstract

Introduction

Methods

Results

	95% CI	p-value
...
...
...

Discussion

Conclusions

References



Positive nipple margins in nipple sparing mastectomy:
Management of cancer and atypia at the margin



Background

- Nipple sparing mastectomy (NSM) is an oncologically safe approach for breast cancer treatment and prevention.
- Nipple areolar complex (NAC) preservation provides improved cosmesis and patient satisfaction compared to other mastectomy techniques.
- Lack of long-term data on management and outcomes when nipple margins contain tumor or atypia may limit uptake of NSM.

Methods

- NSM patients with tumor or atypia in the nipple margin were identified from a prospectively maintained database of consecutive NSM at a single institution.
- Patient and tumor characteristics, nipple margin pathology, treatments received, recurrence, and survival were assessed.



Figure 1: Procedure for obtaining nipple margin



(A) Sharp dissection under NAC



(B) Nipple margin specimen

(C) Underneath of NAC, with fat, parenchyma, and duct tissue removed

Table 1. Patient and tumor characteristics

	Nipple margin contained tumor (112 women, 112 breasts)	Nipple margin contained atypia (120 women, 120 breasts)
Age (years), median (range)		
Overall breast findings, n (%) per breast		
Invasive ductal carcinoma ± DCIS	58 (51.8%)	27 (22.5%)
Invasive lobular carcinoma ± DCIS	21 (18.8%)	44 (36.7%)
Invasive carcinoma with ductal and lobular features ± DCIS	4 (3.5%)	4 (3.3%)
DCIS with microcalcification	1 (0.9%)	2 (1.7%)
DCIS only	24 (21.4%)	21 (17.5%)
No evidence of malignancy	-	42 (35.0%)
Nipple margin findings, n (%)		
Invasive ductal carcinoma ± DCIS	7 (6.2%)	-
Invasive lobular carcinoma ± DCIS	24 (21.4%)	-
Other invasive carcinoma	2 (1.8%)	-
DCIS only	77 (68.6%)	-
Lymphatic vessel invasion only	2 (1.8%)	-
Atypia only*	-	124 (102.5%)
Invasive tumor size (cm), mean (range)	2.7 (0.2-4.8)	1.4 (0.2-4.4)
Tumor grade, n (%)		
1	4 (3.5%)	27 (22.5%)
2	54 (47.7%)	77 (63.3%)
3	47 (41.8%)	27 (22.2%)
Not reported or no cancer	5	46
Positive lymph nodes, n (%)	34 (30.4%)	14 (11.7%)
Invasive cancer receptors, n (%)		
ER+ / HER2-	22 (19.6%)	41 (33.3%)
ER+ / HER2+	32 (28.6%)	4 (3.3%)
ER- / HER2+	4 (3.5%)	1 (0.8%)
ER- / HER2-	3 (2.7%)	4 (3.3%)
Not reported	1	2
DCIS receptors, n (%)		
ER+	21 (18.8%)	17 (14.2%)
ER-	3 (2.7%)	2 (1.7%)
Not reported	53 (46.8%)	108 (89.8%)
Any systemic therapy, n (%)	42 (37.5%)	17 (14.2%)
Post-mastectomy radiation therapy, n (%)	42 (37.5%)	17 (14.2%)

*Nipple types: atypical ductal hyperplasia, lobular carcinoma in situ, atypical lobular hyperplasia, flat epithelial atypia, or type not specified
Abbreviations: DCIS = ductal carcinoma in situ; ER = estrogen receptor; HER2 = human epidermal growth factor receptor 2

Results

- 204 (83%) invasive atypia, 124 (50%) invasive cancer
- Tumor was found in nipple margin of 102 (91%) NSM patients with cancer and 4 (3.3%) noncancerous NSM
- 46 (27%) invasive nipple margin cancer treated with mastectomy and 21 (20%) contained residual carcinoma
- 47 (27%) nipple margin atypia, 12 (10%) contained invasive carcinoma, the majority of patients with nipple margin cancer for positive nipple margins

Table 2. Recurrence and survival

	Nipple margin contained tumor (112 women, 112 breasts)	Nipple margin contained atypia (120 women, 120 breasts)
Overall survival, n (%)	100 (89.3%)	113 (93.3%)
Breast cancer-specific survival, n (%)	100 (89.3%)	113 (93.3%)
Any recurrence, n (%)	41 (36.6%)	11 (9.2%)
ER+, HER2- breast region	11 (9.8%)	1 (0.8%)
Lumpectomy breast region	1 (0.9%)	1 (0.8%)
ER-, HER2+ breast region	2 (1.8%)	1 (0.8%)
Overall	16 (14.5%)	4 (3.3%)

*These patients with nipple margin containing cancer had breast-conserving breast recurrences

- 104 (92%) nipple margin contained tumor without cancer, 11 (10%) cancer, with tumor and 1 (1%) noncancerous, nonrecurrent tumor
- 104 (92%) of these nipple margin without cancer
- 47 (42%) nipple margin atypia, 12 (10%) contained invasive carcinoma, the majority of patients with nipple margin cancer for positive nipple margins

Conclusions

- Nipple margin is a critical management point
- No intervention is reported for nipple margin cancer
- These results support breast-sparing management



The Significance of N1 Lymph Node Involvement By Direct Extension for Non-Small Cell Lung Cancer

Grigory A. Manyak, BA¹, Lisa P. Harr, MD PhD², Hugh G. Auchincloss, MD MPH³
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Introduction



- N1 Spread:** Nodal involvement by lymphatic metastasis spread in the lung
- N1 Direct:** Nodal involvement by direct, contiguous tumor extension from the primary mass

Figure 1: Nodal Involvement in NSCLC Staging

- Adjuvant chemotherapy is considered as the tumor's resectability criteria, and typically recommended for patients with N1 disease (1).
- Current staging and treatment practices for NSCLC do not discriminate between N1 Direct and N1 Spread tumors (2).
- Chemotherapy may impact patients with N1 Direct NSCLC to greater, adverse side effects without the benefit of improved survival (3).
- Objective:** To examine differences in long-term survival and response to adjuvant chemotherapy of patients characterized with N1 Direct versus N1 Spread NSCLC.

Study Cohort and Methods

- Study Cohort:** 127 patients with N1 nodal NSCLC who underwent complete resected resection for NSCLC between 2010 and 2012 at Massachusetts General Hospital, Harvard Medical Hospital, and South Shore Medical Center.
- Survival analysis was performed using Kaplan-Meier survival curves with log-rank test, and Cox regression.
- Significance of clinical and molecular characteristics was assessed using Fisher's exact test for categorical variables, Wilcoxon rank-sum test for nonparametric variables, and Pearson's χ^2 test for categorical variables.
- Statistical analysis was performed using STATA 16 (College Station, TX).



Figure 2: Flowchart of Inclusion and Exclusion Criteria

Results

- Cohort had an average age of 74.5 ± 8.7 years (mean ± SD), was 48.2% male, and predominantly white (88.7%).
- N1 Direct vs N1 Spread nodal involvement: 47 patients (34.6%) vs 274 patients (21.4%).
- N1 Direct and N1 Spread cohorts were similar, except for prevalence of adenocarcinoma (44.7% vs 45.7%), and squamous cell carcinoma (32.8% vs 27.4%) ($p < 0.005$).

Table 1: Clinical Characteristics of Lung Cancer Patients Undergoing Surgical Resection Stratified by Adjuvant Chemotherapy Status

Characteristic	No Chemotherapy (n=274)	Chemotherapy (n=47)	P-value
Demographic/Clinical Characteristics			
Age, median (SD)	71 (11.4)	71 (8.7)	<0.001
% Male	20 (7.3)	20 (42.1)	0.20
% White	241 (87.6)	20 (42.6)	0.001
Pathologic			
Adenocarcinoma	122 (44.5)	21 (44.7)	0.92
Squamous cell carcinoma	91 (33.2)	16 (34.1)	0.88
Other	161 (58.3)	10 (21.3)	0.001
Stage			
Stage I	11 (4.0)	1 (2.1)	0.80
Stage II	111 (40.5)	10 (21.3)	0.001
Stage III	152 (55.5)	36 (76.6)	0.001
Stage IV	10 (3.6)	0 (0.0)	0.001
Unknown	10 (3.6)	0 (0.0)	0.001

Kaplan-Meier

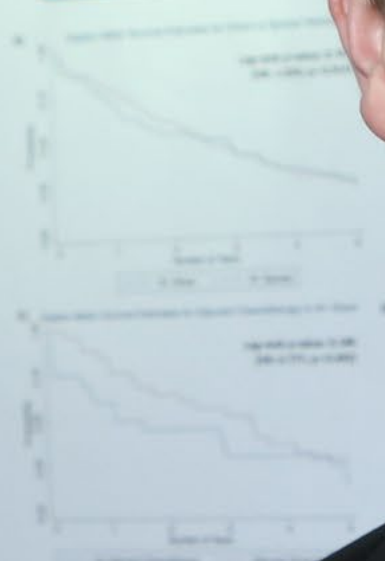


Figure 2: Kaplan-Meier Survival Curves

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Utilization of Endoscopic and Exoscopic Assistance during Temporomandibular Joint Pathologies with Skull Base Extension

Review of Six Cases from Massachusetts General Hospital

Briana June Burris, DDS; Daniel Choi DDS, MD; Joseph McCain DMD, FACS

INTRODUCTION

Temporomandibular joint (TMJ) pathologies, despite complex regional anatomy surrounding the joint, have been treated with open arthroplasties to treat various lesions of the TMJ were performed without the use of endoscopic assistance. There is increasing popularity of use of endoscopic assistance, to provide a magnified illuminated view of the joint structures, access surgical blind-spots; and improve surgical findings. Emerging technology of extracorporeal assistance, exoscopes, have shown efficacious results for surgeons in neurosurgery, otolaryngology, and orthopedic surgery. This study reports our preliminary experience at MGH, utilizing a combined method of endoscopic and exoscopic assistance, during open TMJ surgery to treat pathology with skull base involvement.



Figure 2. View of a left glenoid fossa defect under 26x Magnification using the Olympus OrbEYE Exoscope



Figure 3. Exoscopic view of right TMJ Pseudogout lesion (white arrow)

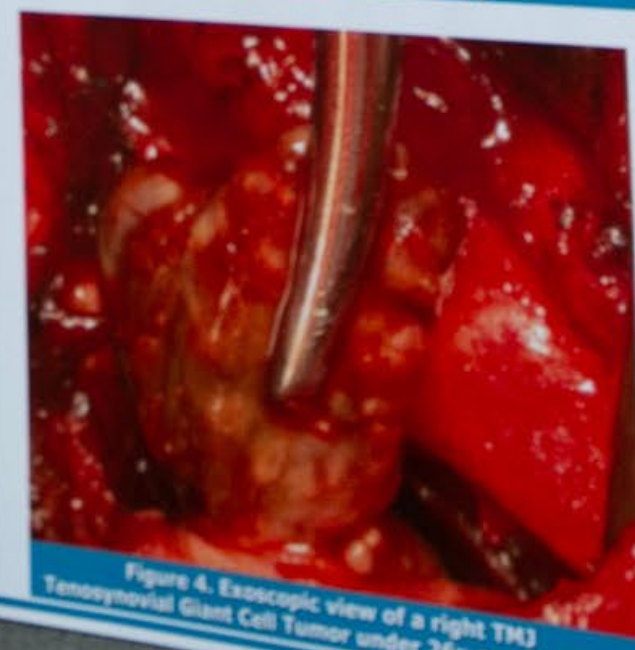


Figure 4. Exoscopic view of a right TMJ Tenosynovial Giant Cell Tumor under 26x magnification

RESULTS

Mean age was 52. Most patients were males (n=4). All cases had unilateral pathology and right TMJ was more frequently involved (n=4). Intra-op, none of the cases had dural tear nor CSF leaks. Skull base defect repair was completed with alloplastic materials. The histopathologic diagnoses included: Calcified chondroid mesenchymal neoplasm (n=1), Synovial Chondromatosis (n=2), Tenosynovial Giant Cell Tumor (n=2), Osteoarthritis otherwise unspecified (n=1). Residual lesions have been seen in four cases. No recurrence has been diagnosed to date.



Figures 5 & 6 View of endoscopic-assisted TMJ surgery (left photo) and endoscopic-view of skull base defect (white arrow)

DISCUSSION

In all six cases, histopathology was benign, however, rates of residual lesions were high. Thus, efforts should be made to embrace, learn, adapt, and optimize emerging technologies towards the surgical approach to TMJ pathology with skull base involvement. Preliminary experiences demonstrate that endoscopic and exoscopic assistance is beneficial in providing enhanced visualization, access to surgical blind-spots, improved depth perception, and wider color variations to help distinguish lesion from unaffected tissue. Exoscopic challenges include insufficient luminescence and inadequate camera focus at working-distances.

Comparison of patient characteristics and measures of disease severity in empiric antibiotic duration groups before and after propensity score matching.

Patient Characteristics	Pre-Matching		P-Value	Post-Matching		P-Value
	Short Duration ≤5 Days N=356	Long Duration 6-14 Days N=924		Short Duration ≤5 Days N=311	Long Duration 6-14 Days N=311	
Male Sex	10 (7-13)	9.5 (7-12)	0.04	10 (7-13)	10 (7-13)	0.48
White	38.8%	37.9%	0.77	38.9%	41.5%	0.77
Black	39.3%	26.1%		37.6%	33.4%	
Hispanic	5.3%	5.4%		5.5%	4.5%	0.58
Other	16.0%	27.2%	<0.001	16.7%	15.6%	
Other	39.4%	41.3%		40.2%	42.5%	
Disease Severity Measures	N=356	N=924		N=311	N=311	
Top Length of Stay (days)	3 (2-4)	4 (3-5)	<0.001	3 (2-4)	3 (2-4)	0.46
High Severity Disease	43.0%	52.4%	0.49	45.30%	44.4%	0.81

Conclusions

- Wide variation exists in the empiric postoperative antibiotic duration used in children with complicated appendicitis
- Empiric treatment exceeding 5 postoperative days was not associated with lower rates of organ space infection or resource utilization

Postoperative antibiotic use beyond 5 days may not be necessary to optimize outcomes in children with complicated appendicitis.

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¹ Laboratory of Surgical and Me... ² Brigham and Women's Hospital

FUNCTIONS AND PATIENT OUTCOMES ASSOCIATED WITH LONGITUDINAL IMPROVEMENTS IN LUNG FUNCTION

BACKGROUND

- Obesity exerts negative effects on lung function
- Multi-center study suggest that bariatric surgery...

Fig 1. S...
Fig 3. Longitudinal decrease in...

Variable	N (%) or Mean (SD)
Age in years	68.4 (12.28)
Sex	
Male	9 (22)
Female	14 (33)
Race	
White	14 (33)
Non-White	9 (20)
Smoking status	
Never	14 (33)
Ever	7 (16)
Self-reported asthma	
Yes	9 (20)
No	17 (39)



Comparison of patient characteristics and measures of disease severity in empiric duration groups before and after propensity score matching.

Characteristics	Pre-Matching		P-Value	Post-Matching		P-Value
	Short Duration ≤5 Days	Long Duration 6-14 Days		Short Duration ≤5 Days	Long Duration 6-14 Days	
Sex	N=356 10 (7-13) 38.8%	N=924 9.5 (7-12) 37.9%	0.04	N=311 10 (7-13) 38.9%	N=311 10 (7-13) 41.5%	0.48
Age	39.3%	26.1%	<0.001	37.6%	33.4%	0.58
Chronic	5.3%	5.4%		5.5%	4.5%	
Ever	16.0%	27.2%		16.7%	19.6%	
Self-reported	39.4%	41.3%		40.2%	42.5%	
Disease Severity Measures	N=356	N=924		N=311	N=311	
Top Length of Stay (days)	3 (2-4)	4 (3-5)	<0.001	3 (2-4)	3 (2-4)	0.46
Severity Disease	43.0%	52.4%	0.49	45.30%	44.4%	0.81

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Bariatric Surgery is Associated with Longitudinal Improvements in Lung Functions and Patient-Reported Respiratory Outcomes
 Vasundhara Mathur MD¹, Mehran Karvar MD¹, Tammy Lo MD¹, Ali Tavakkoli MD¹, Eric Sheu MD PhD¹
¹ Laboratory of Surgical and Metabolic Research, Harvard Medical School, Brigham and Women's Hospital

BACKGROUND

- Obesity exerts negative effects on lung function
- Multiple studies suggest that bariatric surgery improves lung function
- However, the timing of bariatric surgery's effects on lung function as well as patient-reported outcomes are unclear



Table 1. Characteristics of the cohort

Variable	N (%) or Mean (SD)
Age in years	48.6 (12.28)
Sex	
Male	5 (22)
Female	18 (78)
Race	
White	14 (61)
Non-white	9 (39)
Smoking status	
Never	16 (70)
Ever	7 (30)
Self-reported asthma	
Yes	6 (26)
No	17 (74)

① Participants
 ② Await





A woman with long dark hair, wearing a dark blue blazer and a dark blue button-down shirt, is pointing at the poster with her right hand. She is looking towards the poster and speaking. She has a name tag on her chest.

A man in a dark pinstriped suit, white shirt, and blue tie is looking at the poster. He is holding a blue clipboard with a white sheet of paper. He has glasses and a name tag. He is looking towards the poster and listening.

A woman with dark hair pulled back, wearing a black and white striped shirt under a dark blazer, is looking at the poster. She is holding a blue clipboard. She has a name tag and is looking towards the poster and listening.

A man with dark hair and a beard, wearing a dark shirt, is looking at the poster. He is partially visible on the right side of the frame.

...% (668/991) of program directors (PD) were men

74.49% (17275/23191) of surgical residents were men

12.41% (140) publicly advertised parental leave policies



4.79% (54) advertised paternal leave policies
19.41% (219) of affiliated GME websites had paternal leave policies available



4.61% (52) advertised non-birthing parent leave policies

CONCLUSION

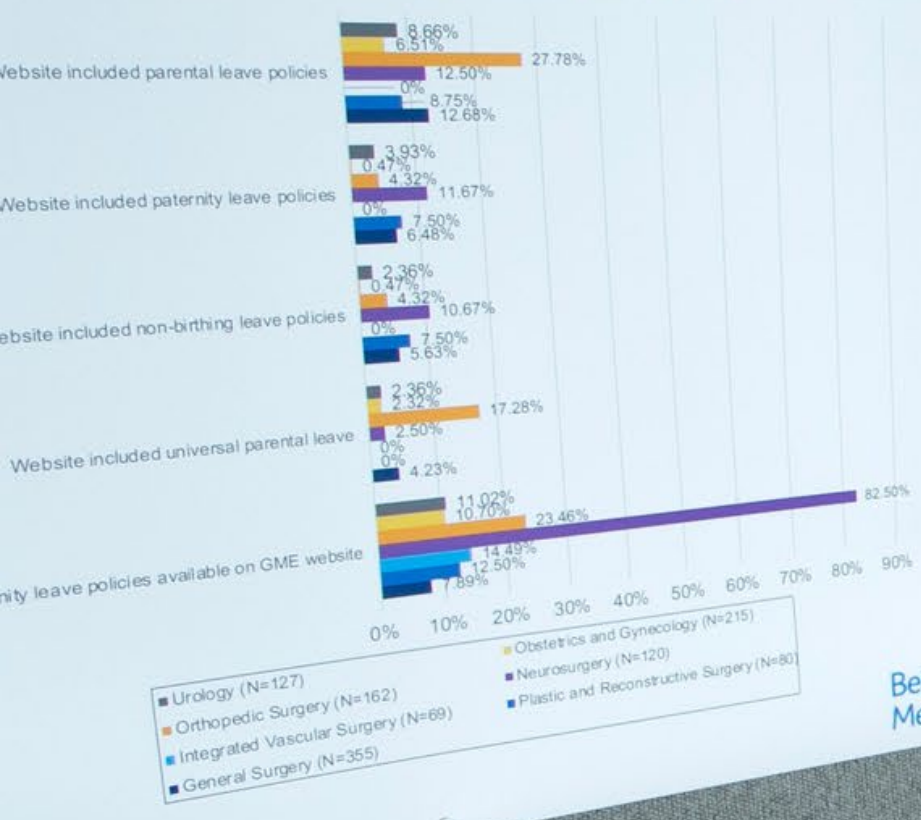
- Few surgical training programs have publicly available paternal non-birthing parental leave policies.
- Publicly available non-birthing parent leave policies support men and women attempting to balance a surgical career with family obligations and promotes gender parity both in the workplace and at home.
- The lack of publicly available data may impact family planning for current residents.
- Incoming residents may value transparent programs
- Engaging fathers early translates to longitudinal involvement and promotes equality amongst all family types



NEXT STEPS

Publicly available policies for surgical residents who hope to be a parent would foster increased equity in parental responsibilities, family planning, and training program selection.

Breakdown of parental leave policy availability on residency program or GME websites by surgical specialty training program

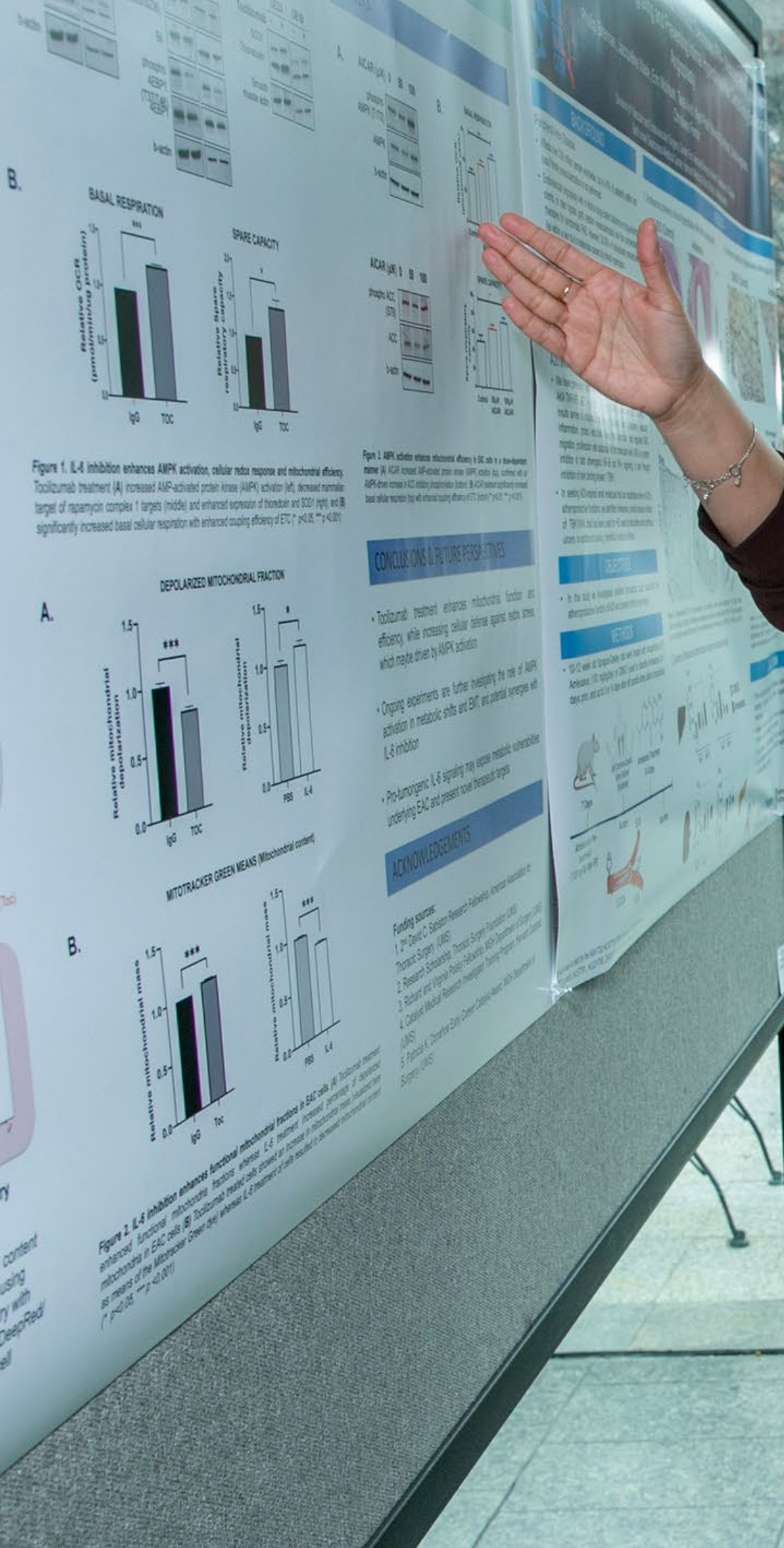


Beth Israel Deaconess Medical Center

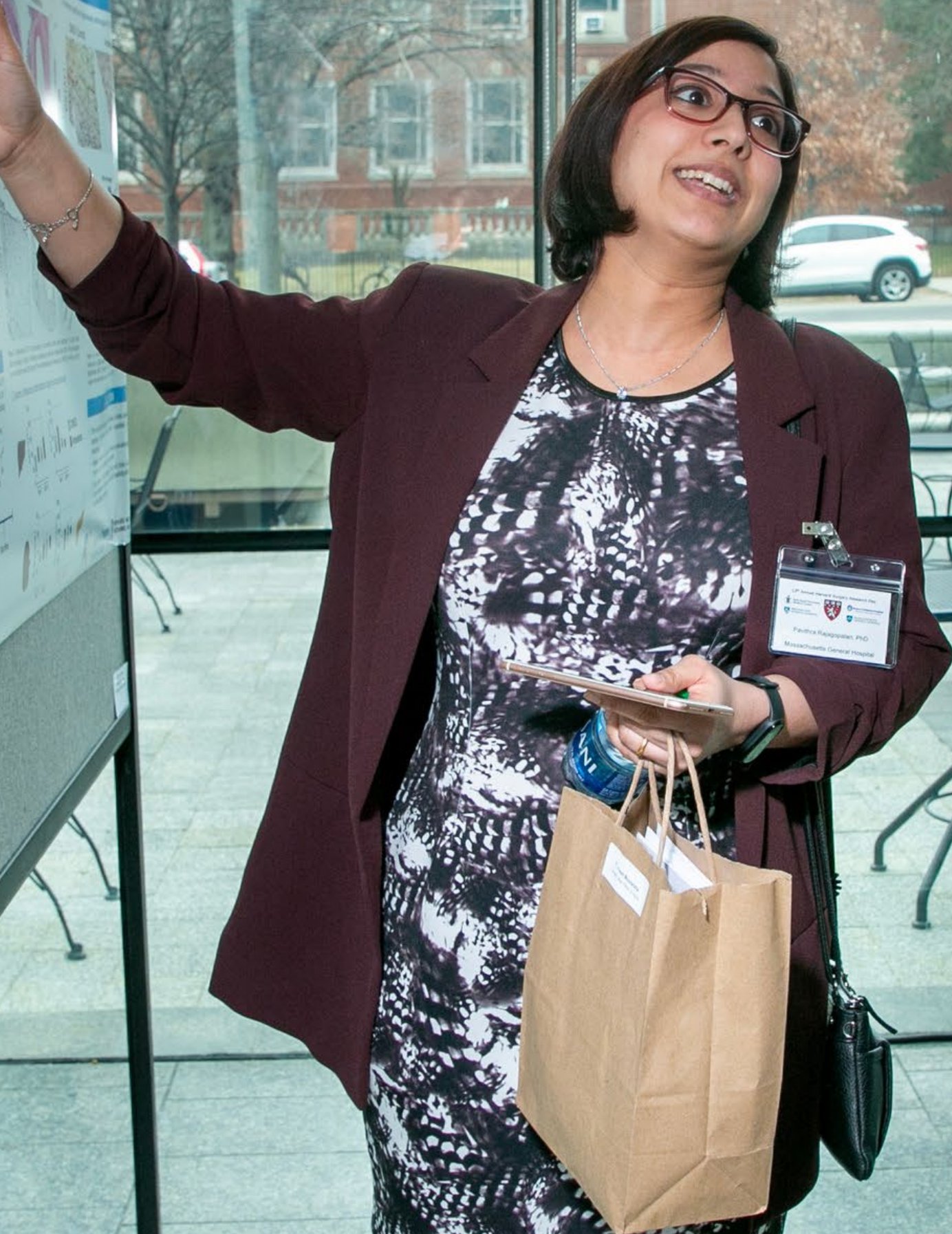


ANISHA JAYARAM MD
Doctor
She. Her. Hers





Hand gesture pointing to the poster.



SRD5A2 Expression is a Predictor of Response to 5ARI

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Division of Urologic Surgery, Department of Urology
Beth Israel Deaconess Medical Center

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Introduction

The Medical Therapy Of Prostatic Symptoms (MTOPS) study was a multi-center, RCT (1995-2001) aiming to evaluate the effect of finasteride, doxazosin, or a combination of both drugs on the progression of urinary symptoms in men with benign prostatic hyperplasia (BPH). Despite the introduction of steroid 5 α -reductase inhibitors (5ARI) for BPH, the progression of lower urinary tract symptoms (LUTS) is only slowed by 34% with 5ARI-response. Little is known why patients with BPH do not uniformly respond to 5ARI therapy. We have demonstrated that 30% of adult prostates do not express SRD5A2 through epigenetic regulation, enabling us to postulate that expression of SRD5A2 may be related to response to finasteride. It is postulated that the lack of expression of SRD5A2 is responsible for 5ARI resistance, although that has never been tested.

Methods

Prostate biopsies and clinical data from 82 MTOPS trial participants were obtained to test the correlation between baseline expression of SRD5A2 and the response to medical treatment with finasteride. We classified men based on changing their AUA symptom score (AUASS) into **good responders** (change of AUASS \leq -12) and **poor responders** (change of AUASS \geq -2). Using immunoreactive score system (IRS score), we quantified the expression of SRD5A2 in the biopsies. We compared baseline age, demographics, AUASS, BMI, serum dihydrotestosterone (DHT) between men in the two groups.

Results

Men in the 5ARI good response group had higher expression of SRD5A2 compared to men in the 5ARI poor response group (p -value < 0.007). SRD5A2 expression correlated with the 5-year change in AUASS ($r: -0.518, p$ -value: 0.004). In a multiple linear regression model that adjusted for baseline AUASS, baseline total prostate volume, baseline serum DHT level, age, and BMI, men with higher expression of SRD5A2 still had better response to finasteride with better improvement of LUTS on AUASS.

Conclusion

Higher expression of SRD5A2 in the prostate was associated with a better response to finasteride as measured by improvement in AUASS. This may contribute to precision medicine by predicting men that are most likely to benefit from tailored therapy by 5ARI.

Funding

NIH: R01DK124502; X01DK131477

High expression

Low expression

Figure 1: IHC

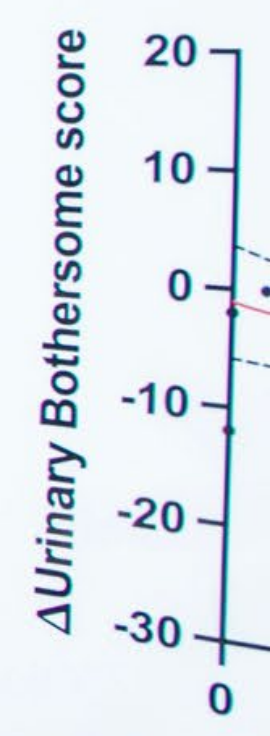


Figure 3: Higher SRD5A2 Expression Predicts Better Response to Finasteride

Comparative early histology healing quality of magnetic versus bowel anastomosis

Estimated 1.6 million adults in the US identify as transgender, most as those who experience gender dysphoria—the psychological distress caused by an incongruity between assigned sex at birth and internal sense of self. For example, transgender men are people assigned female at birth but who identify as male. Treatment to relieve gender dysphoria consists of hormone replacement therapy and/or surgery, and the number of transgender people seeking treatment is rising¹. For most transgender men, taking exogenous testosterone to gain the desired characteristics (such as deepened voice and hair growth) is a major source of morbidity, and increased quality of life.

Wounds were harvested on post-op day 42 for histology (H&E and Masson's Trichrome), mass spectrometry, RNAseq, and tensile strength testing.

Results

Histology: At post-op day 42, samples from XX-T swine showed decreased mean fibrosis area and thickness (0.157 cm² and 2455.82 μm respectively; p = 0.007) compared to XX+T and XY+T (0.290 cm² and 3893.20 μm; 0.268 cm² and 4232.07 μm respectively; p = 0.011) (Figure 3). Chronic post-op wounds showed decreased fibrosis area in the XX-T group compared to the XY+T group (0.157 cm² and 0.878 cm², p = 0.039).

Mass Spectrometry: Scar tissue analyzed with mass spectrometry showed that samples from -T swine had lower testosterone levels compared to +T swine (p < 0.001).

Figure 2: (a) experimental groups, (b) dorsal wound creation, (c) MTS Criterion™ Model 43 tensile testing force-displacement apparatus

Figure 3: Masson's Trichrome staining for (a) XX-T, (b) XX+T, and (c) XY+T

Figure 4: Tensile burst strength plotted by (a) experimental group and (b) hormone regimen.

12th Annual Harvard Surgery Research Day
 Jessica Mroueh, MD
 Brigham and Women's Hospital

Tensile Strength Testing: Scars in XX+T and XY+T pigs had greater tensile burst strength than XX-T pigs (p < 0.01) (Figure 4)

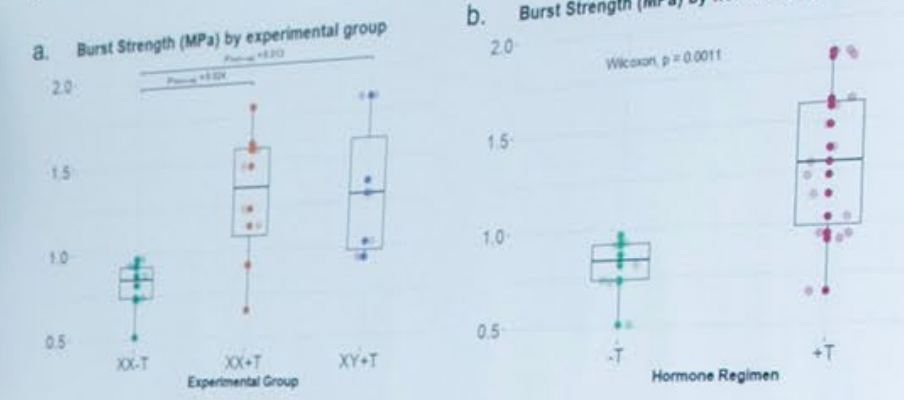


Figure 4: Tensile burst strength plotted by (a) experimental group and (b) hormone regimen.

Conclusions

We developed a novel preclinical model to study the effects of sex hormones on scarring. Testosterone induces early proliferation of excessive granulation tissue which eventually leads to increased scar tissue. T appears to increase the physical strength of scars via supraphysiologic deposition of collagen and other extracellular matrix factors. Local, anti-androgen topical therapies are a promising future area of wound healing research for not only the transgender population but also the general public.

Acknowledgements

Coon lab members:
 Devin Coon, MD, MSE, Erik Reiche, MD, Vanessa Mroueh, MD, Vance Soares, MS, Calvin R Schuster, BA, Patrick R Keller, MD, Yu Tan, PhD

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BACKGROUND

• Infants with congenital diaphragmatic hernia (CDH) may require cardiopulmonary bypass (ECMO) and systemic anticoagulation. Survival while on ECMO depends on expeditious lung growth

• Heparin impairs lung growth in a murine model of compensatory lung growth (CLG), while the direct thrombin inhibitors (DTIs) bivalirudin and argatroban preserved growth

• While DTIs are increasingly used for anticoagulation clinically, CDH patients may still receive subtherapeutic heparin

• We investigate the pulmonary and molecular effects of subtherapeutic heparin with or without DTIs in the CLG model

METHODS

• Lung endothelial cell proliferation assays were assessed in vitro after treatment with heparin alone (0.5 U/mL) or mixed with increasing concentrations of bivalirudin or argatroban

• C57BL/6J mice underwent left pneumectomy and subcutaneous osmotic pump implantation for constant anticoagulation

• Outcomes evaluated in vivo on post-operative day 8

- Anticoagulation assessment
- Lung growth and function
- Lung histology & morphometrics
- Treadmill exercise tolerance testing (TET)

• Comparisons between groups were done using a one-way analysis of variance (ANOVA) with Dunnett's adjustment

with HSCR exhibit colitis mimicking HAEC. Histological colitis from 3-week-old Edrb-null mice (A-B) demonstrated inflammation (C, $p < 0.001$, $** p < 0.01$). Scale bars: 50µm

Proximal (ganglionic)

distal colon

MIB-1 score

WT Edrb-null

with HSCR exhibit colitis mimicking HAEC. Histological colitis from 3-week-old Edrb-null mice (A-B) demonstrated inflammation (C, $p < 0.001$, $** p < 0.01$). Scale bars: 50µm

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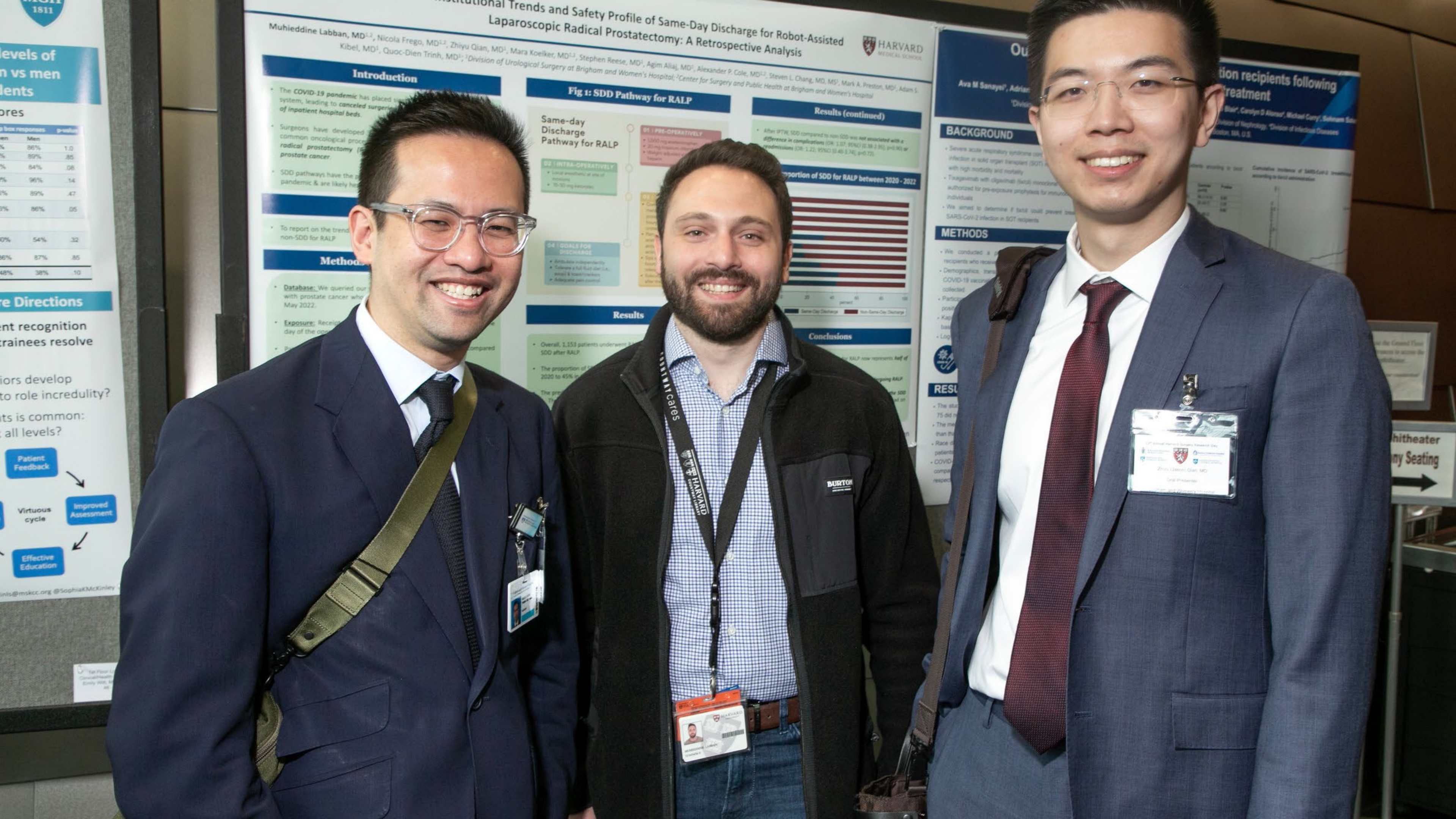
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Stakenborg N., Gomez-Piella J., et al. 2021. Vasoactive intestinal peptide stimulation in a rat model of inflammatory bowel disease. *Journal of Neurogastroenterology and Motility*, 23(4): 452-455

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Constitutional Trends and Safety Profile of Same-Day Discharge for Robot-Assisted Laparoscopic Radical Prostatectomy: A Retrospective Analysis

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Introduction

- The COVID-19 pandemic has placed strain on the healthcare system, leading to canceled surgeries and a shortage of inpatient hospital beds.
- Surgeons have developed a same-day discharge (SDD) pathway for robot-assisted laparoscopic radical prostatectomy (RALP) for prostate cancer.
- SDD pathways have the potential to reduce hospital stays during the pandemic & are likely here to stay.
- To report on the trends in SDD for RALP.

Methods

- Database:** We queried our database for patients with prostate cancer who underwent RALP from May 2020 to May 2022.
- Exposure:** Receipt of SDD on the day of the operation.
- Outcomes:** We compared SDD vs non-SDD for RALP.

Fig 1: SDD Pathway for RALP

Same-day Discharge Pathway for RALP

D1 | PRE-OPERATIVELY

- 1500 mg amoxicillin
- 20 mg tramadol
- 10 mg gabapentin
- 10 mg hydromorphone

D2 | INTRA-OPERATIVELY

- Local anesthetic at site of incisions
- 10-20 mg ketorolac

D3 | POST-OPERATIVELY

- 10 mg hydromorphone
- 10 mg gabapentin
- 10 mg tramadol
- 10 mg acetaminophen
- 10 mg ibuprofen
- 10 mg naproxen
- 10 mg celecoxib
- 10 mg celebrex
- 10 mg celestrol
- 10 mg celestrol

D4 | GOALS FOR DISCHARGE

- Ambulate independently
- Tolerate a full fluid diet (i.e., avoid NPO status)
- Adequate pain control

Results (continued)

After PTK, SDD compared to non-SDD was not associated with a difference in complications (OR: 1.07, 95% CI: 0.58-2.00), and 90% or more admissions (OR: 1.22, 95% CI: 0.40-3.74), p=0.72.

Proportion of SDD for RALP between 2020 - 2022

Results

- Overall, 1,153 patients underwent RALP, with 45% (520) receiving SDD after RALP.
- The proportion of SDD for RALP increased from 2020 to 45% in 2022.

Conclusions

- The proportion of SDD for RALP has increased from 2020 to 45% in 2022.
- RALP now represents half of all RALP procedures.
- The SDD pathway is safe and effective.

Outcomes

Ava M Sanayel¹, Adrian...
 'Division of...'
 'Division of...'
 'Division of...'

BACKGROUND

- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in solid organ transplant (SOT) recipients is associated with high mortality and morbidity.
- Tocilizumab with oligonectin (Acto) monoclonal antibody is authorized for pre-exposure prophylaxis for immunocompromised individuals.
- We aimed to determine if Acto could prevent SARS-CoV-2 infection in SOT recipients.

METHODS

- We conducted a retrospective analysis of SOT recipients who received Acto.
- Demographics, transplant type, COVID-19 vaccination status, and Acto use were collected.
- Participants were followed up for 30 days post-Acto administration.
- Kaplan-Meier survival analysis was performed to assess the impact of Acto on COVID-19 infection.
- Logistic regression was used to identify factors associated with COVID-19 infection.

RESULTS

- The study included 75 SOT recipients.
- The median age was 65 years.
- Race of participants was 60% White, 30% Black, and 10% Other.
- COVID-19 infection was observed in 10% of participants.
- Acto use was associated with a lower risk of COVID-19 infection (OR: 0.5, 95% CI: 0.1-2.0, p=0.3).

Levels of... vs men... ents

Response	Men	p-value
...	86%	1.0
...	89%	.85
...	84%	.06
...	95%	.14
...	89%	.47
...	86%	.05
...	54%	.32
...	87%	.85
...	38%	.10

Directions

ent recognition... trainees resolve

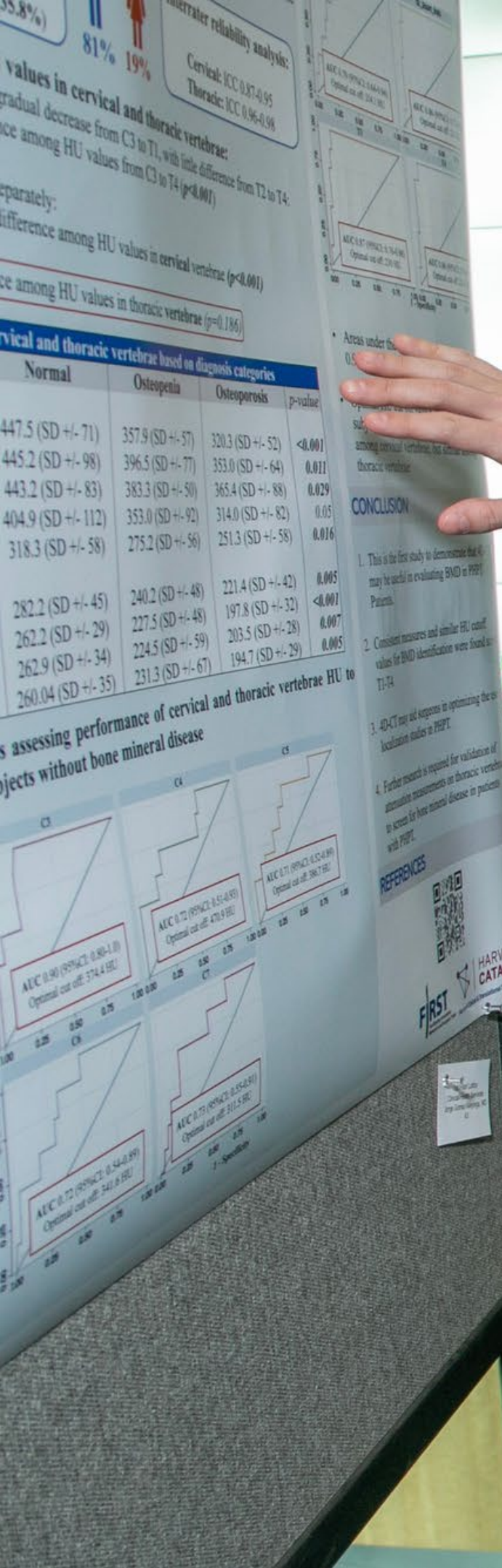
ors develop... to role incredulity?

is common:... all levels?

Patient Feedback → Improved Assessment → Effective Education → Virtuous cycle

inls@mskcc.org @SophiaMcKinley

Whitewater... Seating



Dr. [Name] is pointing to the data on the poster, explaining the findings to Dr. [Name].

Dr. [Name] is listening to the presentation and looking at the poster.

EXIT

2023 Annual Harvard Surgical Research Day
 Ali Basal Ali, MD
 Brigham and Women's Hospital

Ali Basal Ali, MD
 Brigham and Women's Hospital

Outcomes of solid organ transplantation recipients following tixagevimab/cilgavimab treatment

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 Beth Israel Deaconess Medical Center, Boston, MA, U.S.

BACKGROUND

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in solid organ transplant (SOT) recipients is associated with high morbidity and mortality. Tixagevimab with cilgavimab (tix/cil) monoclonal antibodies were authorized for pre-exposure prophylaxis for immunocompromised individuals. We aimed to determine if tix/cil could prevent breakthrough SARS-CoV-2 infection in SOT recipients.

METHODS

- We conducted a prospective single-center study of SOT recipients who received tix/cil compared to those who did not.
- Demographics, transplant type, immunosuppression regimen, COVID-19 vaccination status, and tix/cil administration data were collected.
- Participants were interviewed for six months or until they tested positive for SARS-CoV-2, whichever came first.
- Kaplan-Meier SARS-CoV-2-free survival curves were created based on tix/cil administration and SARS-CoV-2 infection dates.
- Log-rank test was used for comparison.

Diagnosis of a SARS-CoV-2 infection was defined as a positive (RT-PCR) or rapid antigen test, including home tests.

RESULTS

- The study cohort included 323 patients, 248 received tix/cil and 75 did not (control).
- The mean age of the non-tix/cil group (56.3±14.3 years) was less than that of the tix/cil group (61.5±10.5; p=0.03).
- Race differed significantly between groups, with more non-white patients in the control group (p<0.02).
- COVID-19 vaccination rate was higher in the tix/cil group compared to controls, 90.6% (n=247) and 92% (n=69), respectively (p<0.001).

Table 1. Baseline characteristics of patients according to tix/cil administration.

Variable	Tix/cil (n=248)	Control (n=75)	P-value
Age, mean (SD)	61.5 (10.5)	56.3 (14.3)	0.03
Female Sex, n (%)	94 (38.3)	30 (40.7)	0.38
Race, n (%)			0.02
White	197 (79.4)	50 (66.7)	
Asian	17 (6.8)	2 (2.7)	
Black	14 (5.7)	12 (16.0)	
Other	20 (8.1)	11 (14.7)	
Transplant Type, n (%)			0.46
Liver Only	153 (61.7)	49 (65.3)	
Liver/Kidney	27 (10.9)	7 (9.3)	
Kidney Only	73 (29.4)	16 (21.3)	
Pancreas	19 (7.6)	4 (5.3)	
Number of IS medications, n (%)			0.07
1	95 (38.3)	40 (53.3)	
2	115 (46.4)	29 (38.7)	
3+	38 (15.3)	6 (8.0)	
Years post-transplant, mean (SD)	7.1 (6.3)	8.1 (6.6)	0.26
History of COVID-19 in prior 6 months, n (%)	30 (12.1)	10 (13.3)	0.78
COVID vaccinated, n (%)	247 (99.6)	69 (92.0)	<0.001
Number of COVID vaccines, n (%)			<0.001
0	1 (0.4)	8 (10.7)	
1	9 (3.6)	1 (1.3)	
2	9 (3.6)	8 (10.7)	
3	93 (37.4)	39 (52.0)	
4	107 (43.2)	28 (37.3)	
≥4	38 (15.3)	3 (4.0)	

Cumulative incidence of SARS-CoV-2 breakthrough according to tix/cil administration.



CONCLUSIONS

- SOT recipients who received tix/cil were significantly less likely to develop a SARS-CoV-2 infection when compared to the control group (p<0.001).
- Current SARS-CoV-2-free survival curves were created based on tix/cil administration and SARS-CoV-2 infection dates.
- Our results suggest that tix/cil may be a useful prophylactic agent for SOT recipients.

n=26 10.5% vs. n=23 30.7%

Table 2. COVID-19 positivity rate and clinical characteristics according to tix/cil administration.

Variable	Tix/cil (n=248)	Control (n=75)	P-value
SARS-CoV-2 Positivity, n (%)	26 (10.5)	23 (30.7)	<0.001
Median time from enrollment to infection, days (IQR)	13.2 (8-14)	30 (20-174)	0.46
Symptoms in those with SARS-CoV-2, n (%)	25 (94.2)	20 (87.0)	0.07
Hospitalizations in those with SARS-CoV-2, n (%)	2 (8.7)	1 (4.3)	0.24
Treatment in those with SARS-CoV-2, n (%)	16 (61.5)	11 (47.8)	0.34





SOCIAL VULNERABILITY AND TIME TO SURGEON EVALUATION

Reagan A. Collins, BA, Jordan M. Broekhuis, MD, MPH, Maria P. Cole, MD, MPH, Mayorga MD, Natalia Chavez MD, MPH, Benjamin C. James, MD, MS, PhD
Department of Surgery, Beth Israel Deaconess Medical Center, Boston, MA

RESULTS I

BACKGROUND

- PHPT patients have higher rates of PHPT, osteoporosis, and cardiovascular disease
- PHPT patients have higher rates of PHPT, osteoporosis, and cardiovascular disease
- PHPT patients have higher rates of PHPT, osteoporosis, and cardiovascular disease

RESULTS I

- 1082 Patients were included
- No difference was found in age, sex, Ca, PTH, nephrolithiasis or medical history by SVI quartiles
- Lower SVI patients were more likely to:
 - Have private insurance ($p < 0.001$)
 - Be married or have a life partner ($p < 0.001$)
 - Have osteoporosis ($p = 0.005$)
- Higher SVI patients were more likely to:
 - Be Black or African American ($p < 0.001$)
 - Have ≥ 7 Elixhauser comorbidities ($p < 0.001$)

Figure 1. Kaplan-Meier Curve of Time to Surgeon Evaluation

SVI Quartile	hHR	p-value
Q1 Reference	-	-
Q2	1.18	$p < 0.024$
Q3	0.73	$p < 0.090$
Q4	2.67	$p < 0.002$

RESULTS II

Figure 2. Geospatial representation of SVI subthemes in MA by zip code areas *Darker colors correspond to higher levels of vulnerability

Table 1. Odds of Surgeon Evaluation by SVI subtheme (Q1 as Ref)

Characteristic	SVI quartile	aHR	CI	P-value
Socioeconomic status	Q2	1.20	0.86-1.66	0.281
	Q3	0.93	0.66-1.31	0.67
	Q4	0.65	0.45-0.94	0.024
	Q4	0.65	0.45-0.94	0.024
Household Characteristics	Q2	1.25	0.91-1.72	0.164
	Q3	0.84	0.60-1.19	0.332
	Q4	0.77	0.53-1.12	0.176
	Q4	0.77	0.53-1.12	0.176
Racial/Ethnic Minority Status	Q2	1.09	0.76-1.56	0.65
	Q3	0.78	0.54-1.12	0.174
	Q4	0.64	0.43-0.96	0.031
	Q4	0.64	0.43-0.96	0.031
Housing Type/Transportation	Q2	0.65	0.46-0.93	0.019
	Q3	0.63	0.44-0.89	0.01
	Q4	0.66	0.57-0.93	0.017
	Q4	0.66	0.57-0.93	0.017

CONCLUSION

- Highly vulnerable PHPT patient populations are at greater risk for under-evaluation by a surgeon
- Targeted interventions should focus on the barriers to access care for PHPT patients

REFERENCES

Presented at Harvard Surgery Research Day - March 2023



CONCLUSIONS

- The average surgical residents and attendings demonstrate similarly high growth mindset scores as opposed to a balance of fixed versus growth mindset in other learners
- Mindset tended to vary significantly by residency program, but not within program
- There was a small, but statistically significant difference in mindset score by gender
- We are continuing our investigation to shed light on the reasons behind these statistical findings

LITERATURE CITED

Dworkin, S.J., et al. (2018). Mindset and Residency Program Satisfaction. *Journal of Surgical Education*, 83(4), 412-418.

Yager, K.S., et al. (2018). Mindset and Residency Program Satisfaction. *Journal of Surgical Education*, 83(4), 412-418.

There was a statistically significant difference in average mindset scores between different programs (5.3 to 6.0, p<0.001).

Within individual programs, there was no statistically significant difference between mindset score of attendings and that of residents.

Linear regression of mindset subgroups demonstrated a significant contribution to general mindset score from the mindset score for surgical skill (p<0.001), but patient care skill was not statistically significant (p=0.07).

Differences between sub-group mindsets scores were also statistically significant (5.2 to 6.2, p<0.001).

Multivariable linear regression demonstrated significantly more growth mindset in residents and attendings that self-identify as male versus female (5.6 vs 5.9, p=0.019).

There was no significant difference in mindset scores by race (p=0.162).

*. Survey and interview data are still being gathered, as more institutions have been enrolled since the preliminary analysis.

12% of residents

Residency

Program	Residency	Attendings
Program A	5.3	6.0
Program B	5.5	5.8
Program C	5.7	5.6
Program D	5.9	5.4

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Optimizing Platelet Inhibition in Peripheral Artery Disease: A Comparison of Mono-Antiplatelet Therapy and Dual-Antiplatelet Therapy Using Thromboelastography

Dr. [Name], [Institution]

ARTIFICIAL INTELLIGENCE IN CARDIAC SURGERY: A SYSTEMATIC REVIEW

Ralf Martz Sulague MD¹, Sharina Macapagal MD², Francis Joshua Belay MD MBA³, Jilian Reeze Medina MD⁴, Thea Danielle Cartojano MD⁵, Edward Daniel Mortalla MD⁶, Jacques Kpodonu MD⁷

¹Graduate School of Arts and Sciences, Georgetown University, Washington, DC, United States of America; ²Mayo Clinic, Rochester, MN; ³Karmanos School of Medicine and Public Health, Peking University, Beijing, China; ⁴St. Louis University School of Medicine, St. Louis, MO; ⁵University of the Philippines, Manila; ⁶University of California, San Diego, CA; ⁷Harvard Medical School, Boston, MA



INTRODUCTION

- Artificial intelligence (AI) has emerged as a tool to potentially increase the accuracy and efficacy of healthcare.
- The growing application of AI in the evaluation of patient outcomes and prediction of clinical outcomes.
- AI can also improve clinician's medical decision by providing better preoperative risk assessment, stratification, and prognostication.
- Of the 42 studies, only 13 studies were conducted in Lower- and Middle-income Countries.

What are the current applications of artificial intelligence in cardiac surgery?

Current AI studies focused on examining performance, clinician outcomes, and patient outcomes

Artificial intelligence was used to predict mortality, postoperative length of stay, and complications following cardiac surgeries.

It can also improve clinician's medical decision by providing better preoperative risk assessment, stratification, and prognostication.

Of the 42 studies, only 13 studies were conducted in Lower- and Middle-income Countries.

RESULTS

- A total of 42 studies found on artificial intelligence application in cardiac surgery
- In terms of evaluation outcomes, 26 studies examined the performance, 32 studies examined clinician outcomes, and 2 studies examined patient outcomes
- Nine (21.43%) of the studies measured different parameters regarding cardiac surgeries in general.
- Meanwhile, 6 (14.29%) studies focused on Heart Transplantation (HT), 4 (9.52%) on Transcatheter Aortic Valve Replacement (TAVR), 3 (7.14%) on Aortic Stenosis, and another 3 (7.14%) on Perioperative Complications.
- Three topics had 2 (4.76%) studies dedicated to them, namely Coronary Artery Bypass Graft, Postoperative Atrial Fibrillation, and Kidney Injury.

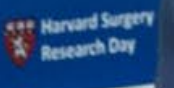
Conclusion: A Large Single Surgeon Experience



Jilian Reeze Medina, MD
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Francis Joshua Belay, MD, MBA
Beth Israel Deaconess Medical Center



adder cancer from 1990 until 2018

ere analyzed: overall survival (OS),
ic resection vs. no hepatic resection,

ed. There were 115 (78%) incidental
(67%) patients were female.

Five-year OS was 69% and 5-year DFS was 55%
There was no difference in 5-year OS or DFS among patients who underwent hepatic resection compared with patients who did not (OS 76% vs. 58%, $p=0.42$ and DFS 51% vs. 70%, $p=0.23$)
Peritoneal tumors had a 5-year OS of 83% vs. 40% for hepatic tumors ($p=0.002$) and 5-year DFS of 76% vs. 30% ($p<0.001$)

Incidental Gallbladder Cancer OS

OS	Median (mo)	5-year %	p-value (compared to T1)
T1	196	87.4	
T2	NR	77	0.52
T3	45.3	34	0.015
T4	NR	0	1.00

Incidental Gallbladder Cancer DFS

DFS	Median (mo)	5-year %	p-value (compared to T1)
T1	NR	100	
T2	NR	100	
T3	16.8	22	<0.001
T4	13.2	0	<0.001

Non-incidental Cases:

- Five-year OS was 50% and 5-year DFS was 29%.
- There was no difference in 5-year OS among patients who underwent hepatic resection (58% vs. 38%, $p=0.53$). Five-year DFS was higher among patients who underwent hepatic resection (32% vs. 15%, $p=0.02$).
- There was no difference in 5-year OS (52% vs. 45%, $p=0.65$) or in 5-year DFS (27% vs. 38%, $p=0.65$) in patients with peritoneal facing tumors compared with hepatic facing tumors.

Non-incidental Gallbladder Cancer OS

OS	Median (mo)	5-year %	p-value (compared to T1)
T1	NR	100	
T2	18	21	<0.001
T3	19.2	17	<0.001
T4	NR	0	1.0

Non-incidental Gallbladder Cancer DFS

DFS	Median (mo)	5-year %	p-value (compared to T1)
T1	NR	100	
T2	11.2	40	<0.001
T3	6.96	20	<0.001
T4	1.2	0	

Conclusions

- Incidental GB cancer was associated with higher OS and DFS rates when compared to non-incidental GB cancer.
- For both incidental and non-incidental cases, greater T stages were associated with lower DFS and OS.
- Hepatectomy was not significantly associated with improved OS for incidental and non-incidental disease. Among non-incidental cases, hepatectomy was associated with improved DFS.
- Tumor sidedness was only pertinent in incidental disease: peritoneal located tumors were associated with improved OS and DFS when compared to hepatic located tumors.

16 with jaundice at first presentation

12 non-incidental cases

12 did not undergo hepatic resection

4 received neoadjuvant therapy



VISITOR
Quart Ewing

DISASTER PASS
Name: [unreadable]
ID: [unreadable]

Statistics for Observed Cases

TIME OUT	Percent People	Percent Paused	Percent Reviewed	Engage Score	DEBTS Score
7243	71.27 (50.46)	75.5% (25.1%)	77.6% (21.7%)	0.88 (0.13)	4510 (62.3%)
46-3702	80.3-100%	46.9-89.7%	57.1-87.4%	0.73-0.95	22.9-41.4

Frequency of Observed Checklist Items

Observed	Frequency % (N)
Procedure confirmed	98.4 (7015)
Patient ID confirmed	97.0 (6915)
Antibiotic prophylaxis verbalized	95.1 (6775)
Other	86.9 (6192)
Allergies	83.1 (5923)
DVT prophylaxis	63.7 (4538)
Fire risk assessment	47.9 (3413)
Expected blood loss	45.6 (3252)
Administration of beta blocker	44.3 (3156)
Consents verified	40.0 (2848)
Site confirmed	38.8 (2765)
Patient positioning confirmed	35.1 (2499)
Essential relevant imaging discussed	34.5 (2456)
Team introduction performed	34.1 (2428)
Required blood products	32.4 (2306)
Expected duration	28.5 (2033)
Patient disposition	28.4 (2027)
Site marked	27.9 (1988)
Patient warming acknowledged	24.8 (1769)
Potential risks (Any team member)	18.8 (1337)
Antibiotic redosing plan	18.1 (1289)
Patient specific concerns (Anes.)	16.6 (1182)
Prep dry confirmed	12.6 (896)
Indication confirmed	12.1 (861)
Nursing equipment check	11.3 (805)
Other	10.0 (714)

Figure 1. Aggregate Pause Performance Over Time

Figure 2. Aggregate Engagement Score Over Time

CONCLUSIONS

Assessment of surgical safety checklist performance using the OR Black Box tool is feasible.

Many items included in the time out checklist were not routinely discussed.

Significant changes in checklist completion and engagement measures were observed over time.

Completion of a pre-incisional team introduction was associated with improved time out performance.

There is potential to use OR Black Box metrics to improve intraoperative process measures, including the quality of checklist performance.

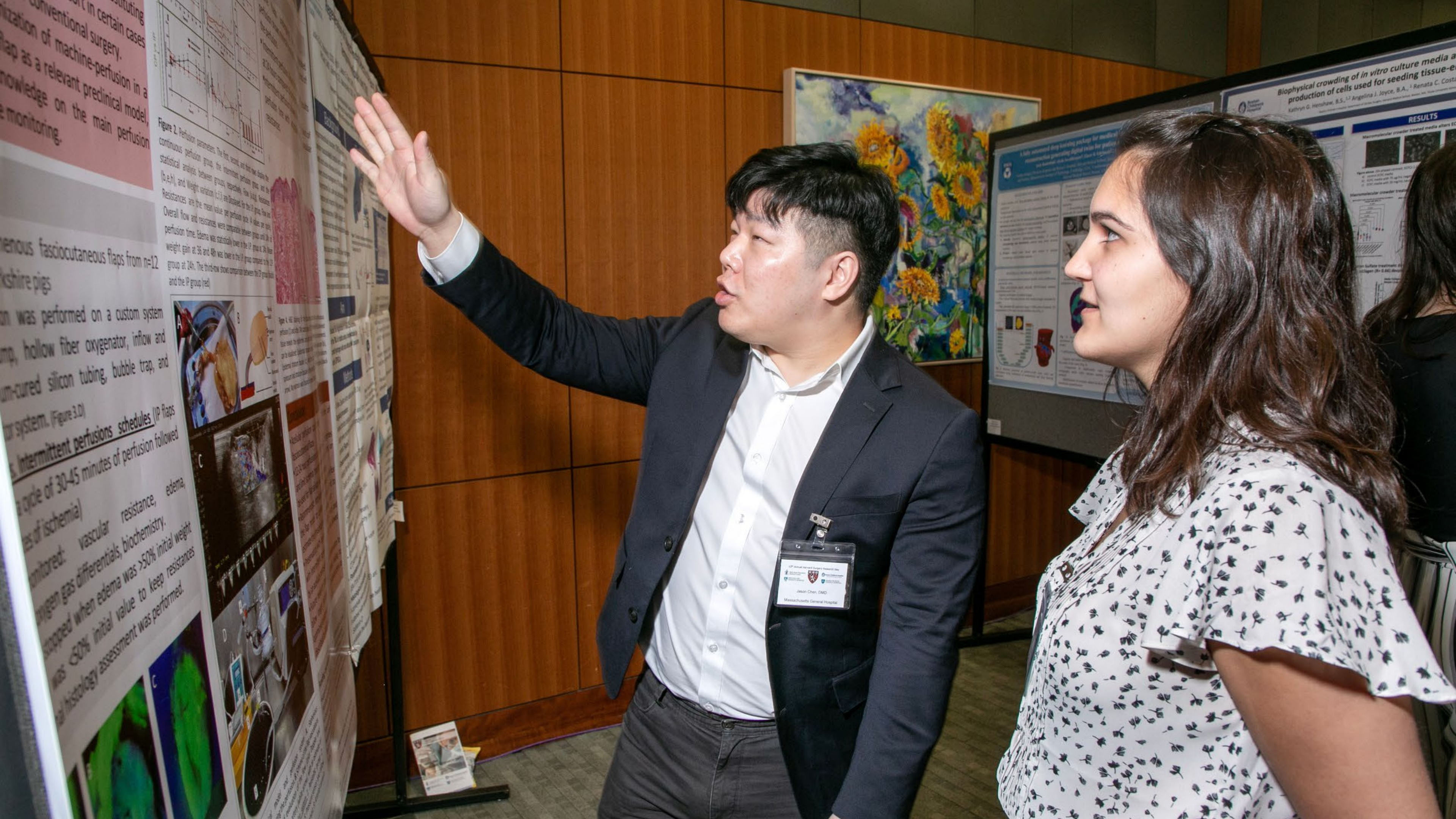


The Significance of N1 Lymph Node Involvement by Direct Extension for Non-Small Cell Lung Cancer

Dr. [Name]

Abstract text describing the study on N1 lymph node involvement in non-small cell lung cancer, including objectives, methods, results, and conclusions.





...in certain cases
...of machine-perfusion in a
...as a relevant preclinical model,
...knowledge on the main perfusion
...monitoring.

...fasciocutaneous flaps from n=12
...shshire pigs

...was performed on a custom system
...mp, hollow fiber oxygenator, inflow and
...um-cured silicon tubing, bubble trap, and
...system. (Figure 3.D)

...Intermittent perfusions schedules (IP flaps
...a cycle of 30-45 minutes of perfusion followed
...es of ischemia)

...monitored: vascular resistance, edema,
...xygen gas differentials, biochemistry.
...stopped when edema was >50% initial weight
...was <50% initial value to keep resistances
...histology assessment was performed.

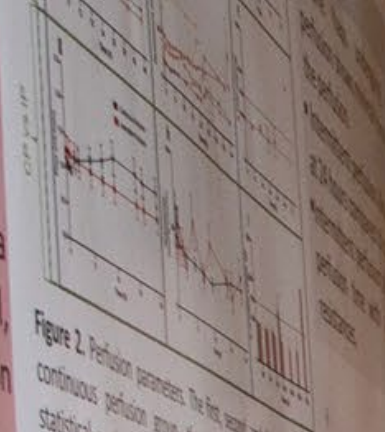


Figure 2. Perfusion parameters. The first, second, and third rows display the continuous perfusion group, the intermittent perfusion group and the statistical analysis between groups, respectively. Flow (ml/min), resistances (b.e.h), and Weight variation (L.U) are illustrated for the IP group. Flow and Resistances are the mean value per perfusion cycle. Wt variation is the mean weight gain at 36 and 48h was lower in the IP group at 36h perfusion time. Edema was statistically lower in the IP group at 24h weight gain at 36 and 48h was lower in the IP group compared to the IP group at 24h. The third-row shows comparison between the IP group and the IP group (red).

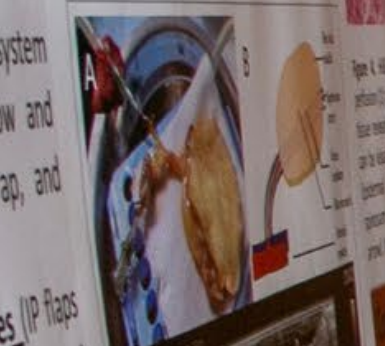


Figure 4. Histology of fasciocutaneous flaps. (A) Overall view of the flap, (B) Higher magnification of the vascular bed, (C) Higher magnification of the vascular bed, (D) Higher magnification of the vascular bed.



Figure 5. Fluorescence microscopy images of tissue. (A) Overall view of the flap, (B) Higher magnification of the vascular bed, (C) Higher magnification of the vascular bed, (D) Higher magnification of the vascular bed.

Biophysical crowding of *in vitro* culture media and production of cells used for seeding tissue-engineered constructs
Kathryn G. Henshaw, B.S.,^{1,2} Angelina J. Joyce, B.A.,¹ Renata C. Costa,¹ ...

RESULTS
Macromolecular crowder treated media alters EC morphology
Figure 1. ECs cultured in control media (left) and in media with 0.2% (middle) and 0.4% (right) crowder. Scale bars: 100 μm.

MGH Annual Research Symposium
Jason Chen, DMD
Massachusetts General Hospital




The Influence of Abdominal Enlargement for the Assessment of Airway Collapse: A Pilot Study

Jorge Ruiz de Somoza, MD, Adnan Majid, MD, Mibir Parikh, MD, Michael Kent, MD, Jennifer L. Wilson, MD, Sidhu P. Gangadharan, MD, MHC
Division of Thoracic Surgery and Interventional Pulmonology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston



Figure 1. Collection of data. Top left: Superficial EMG showing abdominal muscle contraction. Top right: Bronchoscopic view during forced expiration. Bottom: Chart presenting correlation of exhalation force and luminal collapse (x axis is time).

Video link


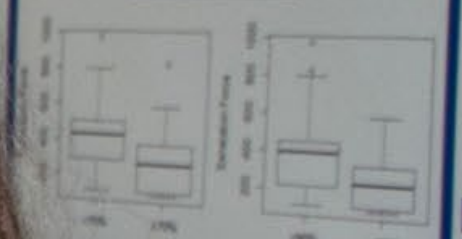


Figure 2. Distribution of airway levels by luminal collapse and correlated exhalation force.

- Exhalation >90% correlated with luminal collapse (W=484)
 - Less exhalation force associated with luminal collapse pathologic
 - The timing of exhalation effort (exhalation force) could be used to predict luminal collapse
 - Determine the order to stop exhalation effort
 - Assess airway level at high exhalation force threshold
 - Determine the impact of luminal collapse on volunteers
- 1) Butrago DM, et al. Current concepts in the evaluation and management of Marfan syndrome. *Chest*. 2010;137(4):1085-1095.
2) Barlow R, et al. In different positions of the thorax. *Respir Physiol Neurobiol*. 2010;170(1-2):10-15.



A man with a beard, wearing a dark blue suit, white shirt, and brown patterned tie, is looking towards the right. He is engaged in conversation with another man.

A woman with long dark hair in a ponytail, wearing a light blue button-down shirt and dark trousers, is standing with her back to the camera, looking at a poster.

A man with a beard and glasses, wearing a dark blue suit, white shirt, and green patterned tie, is smiling and looking towards the left. He has a name tag on his lapel. He is engaged in conversation with the man on the left.

Integrating spatial and single-nuclei transcriptomics
Lucas Wasi, Maria Michalek, William Pichon, Gabriela Contreras, Leena Pradhan
Department of Biology, Division of Molecular Biology and Biotechnology, MGH

Anti-coagulant antibodies in transplantation of kidney xenografts with triple knock-out with or without multiple human transgenes in nonhuman primates
Mauricio

Effect of in vitro culture media on the growth rate and collagen content of seeded tissue-engineered heart valves (TEHV)
Mauricio



• We sought to determine if airway collapse was correlated with the collapse.

Method

• Prospective cohort of patients undergoing DFB to diagnose airway collapse at BIDMC (2021-2022).

• To estimate the force of expiration against abdominal muscle contraction in hertz using superficial electromyography (sEMG).

• Airway collapse was assessed by a bronchoscopist at the following locations:

- Proximal trachea, mid-trachea, right mainstem bronchus, right intermediate bronchus, and left mainstem bronchus.

• Wilcoxon Rank Sum test was used to compare exhalation force against the percentage of airway collapse ($\geq 70\%$).

Results

• We studied 8 patients, obtaining a total of 53 airway segments.

• Exhalation force in airway segments with $\geq 70\%$ collapse was significantly lower than segments with $< 70\%$ collapse.

- $W = 388$; $P < 0.001$.

es Following Breast Cancer Surgery
MD, Shreya Bhasin MS, Ted A. James MD MChC
University of Rochester, Rochester, NY, USA

METHODS
All patients diagnosed with primary breast cancer (Q1) treated at BICMC.
Patients > 18 years old
Lungectomy or mastectomy
ACT-S surveys sent via REDCap at 6 and 18 months post-surgery.

RESULTS
The mean patient age was 62.5 years (range 45-85).
All patients were female.
The majority of patients (75%) were diagnosed with ductal carcinoma in situ (DCIS) or early-stage invasive breast cancer (stage I-II).
The majority of patients (75%) were treated with mastectomy.

CONCLUSIONS
Breast cancer patients have a significantly higher rate of lung cancer compared to the general population.
The majority of patients were treated with mastectomy.

KEYWORDS
Breast cancer, lung cancer, mastectomy, ACT-S surveys, REDCap.

REFERENCES
1. American Cancer Society. Breast Cancer Facts and Figures 2018-2019. Atlanta, GA: American Cancer Society; 2018.

CONTACT
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ACKNOWLEDGMENTS
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DISCLOSURES
The authors have nothing to disclose.

FOOTNOTES
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Abstract

Background: The goal of this study was to evaluate the relationship between the degree of airway collapse and the severity of luminal collapse in patients with obstructive pulmonary disease (OPD). The patient is coached to perform forced exhalations while the degree of airway collapse is measured.

Methods: Prospective cohort of adult patients undergoing OPD to diagnose airway collapse. A 3DMD (3D) (3D) was used to measure the force of exhalation. Abdominal muscle contraction was measured using surface electromyography (EMG). Airway collapse was assessed by the bronchoscopist at the following segments: -Proximal trachea, mid-trachea, distal trachea, right mainstem bronchus, bronchus intermedius, and left mainstem bronchus. Wilson Park Sum test was used to compare exhalation force against the degree of cross-sectional airway collapse (>70% and >80%).

Results: We studied 1 patient, obtaining data on a total of 21 airway segments. Exhalation force in airway segments with >70% collapse was significantly lower than in airway segments with <70% collapse. In fact, $p < 0.001$.




Conclusions: Exhalation force is significantly lower in airway segments with >70% collapse compared to segments with <70% collapse.

Keywords: Airway collapse, luminal collapse, exhalation force.

Figure 1. Collection of data: Top left: Superficial abdominal muscle contraction. Top right: Bronchoscopic view of airway collapse during forced expiration. Bottom: Chart presenting exhalation force and luminal collapse (x axis is trachea).

Figure 2. Distribution of airway levels by luminal collapse severity and correlated exhalation force.

Video link





Background

MM (Multiple Myeloma) arises from the malignant transformation of plasma cells in the bone marrow. It is characterized by the presence of monoclonal immunoglobulin (Ig) and associated with bone disease, anemia, renal insufficiency, and hypercalcemia. MM is a hematologic malignancy with a poor prognosis and a median survival of approximately 18 months. The disease is characterized by the presence of clonal plasma cells in the bone marrow, which produce monoclonal immunoglobulin (Ig) and associated with bone disease, anemia, renal insufficiency, and hypercalcemia. MM is a hematologic malignancy with a poor prognosis and a median survival of approximately 18 months. The disease is characterized by the presence of clonal plasma cells in the bone marrow, which produce monoclonal immunoglobulin (Ig) and associated with bone disease, anemia, renal insufficiency, and hypercalcemia.

Figure 3: Methods (sequencing and imaging)

Whole transcriptome sequencing (WTS) and single-cell RNA sequencing (scRNA-seq) were used to analyze the transcriptomic profiles of MM cells. Flow cytometry and immunofluorescence were used for cell characterization and imaging. Spatial transcriptomics (ST) was used to map gene expression in the tumor microenvironment.

Figure 6: Imaging of brain and LN mets, pt 656

Immunofluorescence images showing SOX10 (green), CD4 (red), and CD30 (blue) expression in brain and lymph node (LN) metastases. Scale bar: 100 μm.

Figure 7: Imaging of penile melanoma, pt 509 (right) and MΦ distribution in prim vs mets (left)

Immunofluorescence images showing SOX10 (green), CD11b (red), and CD8 (blue) expression in penile melanoma and macrophage (MΦ) distribution in primary (prim) and metastatic (mets) sites. Scale bar: 100 μm.

Methods

Whole transcriptome sequencing (WTS) and single-cell RNA sequencing (scRNA-seq) were used to analyze the transcriptomic profiles of MM cells. Flow cytometry and immunofluorescence were used for cell characterization and imaging. Spatial transcriptomics (ST) was used to map gene expression in the tumor microenvironment.

Disclosures

The authors have nothing to disclose.

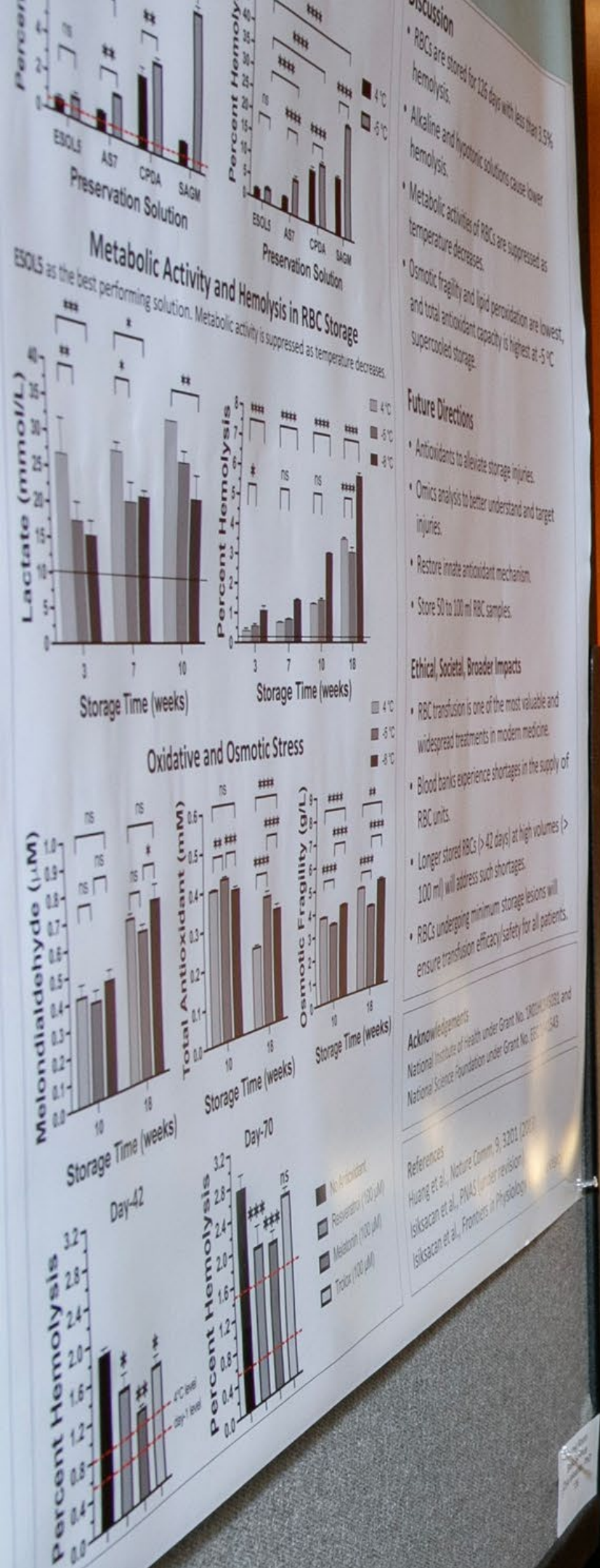
Conclusion

This work provides a highly detailed view of the tumor microenvironment and the role of macrophages in MM. The findings suggest that macrophages play a significant role in the progression of MM and may be a potential target for therapy.

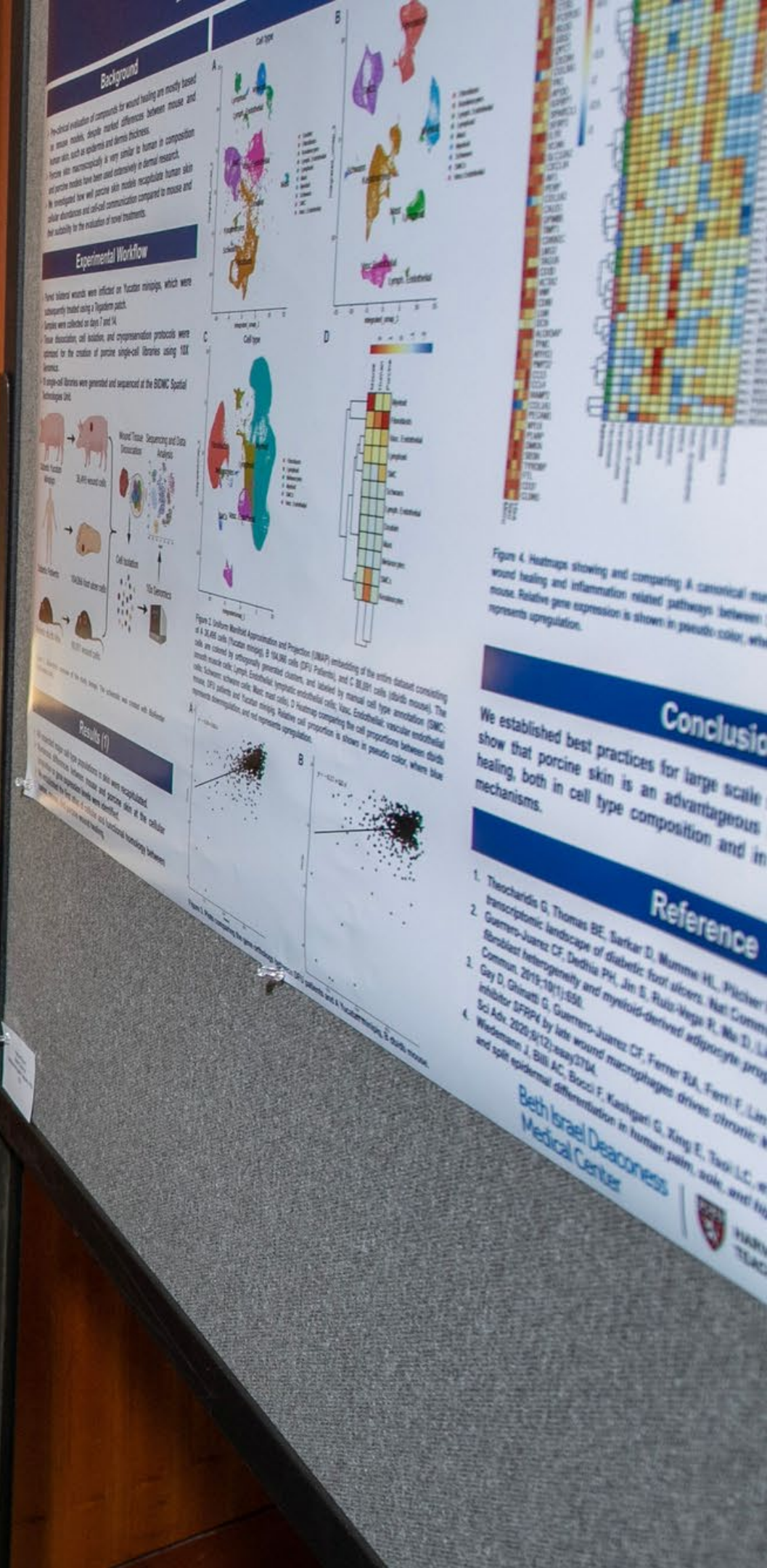
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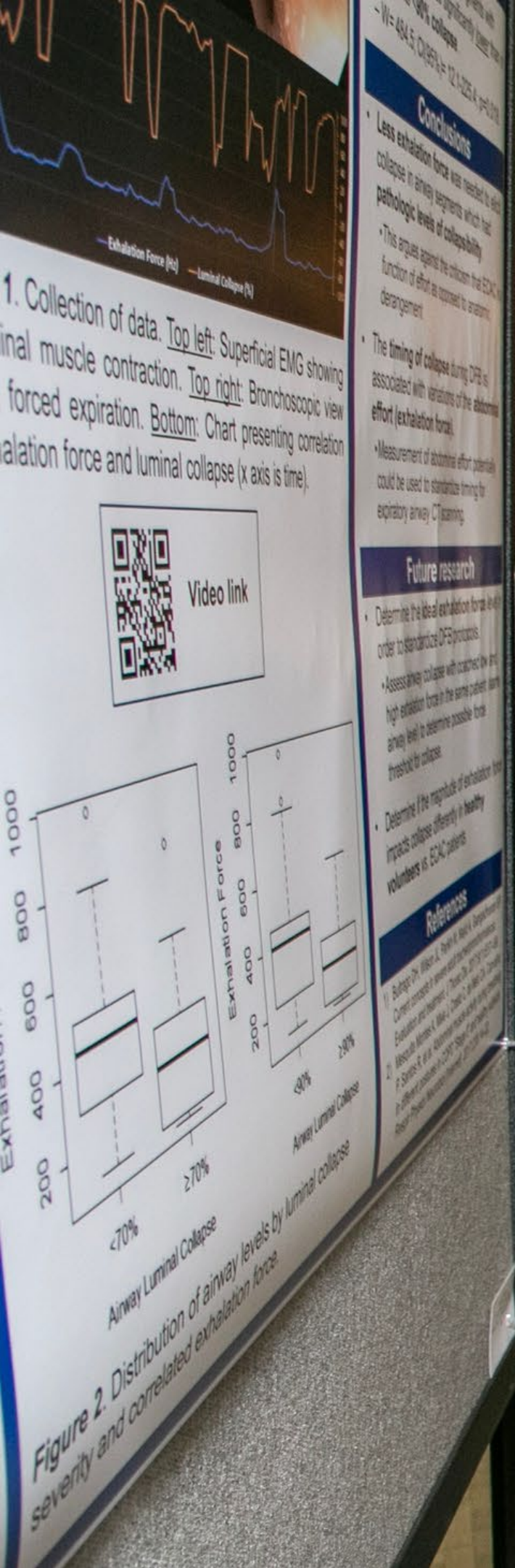
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2. Gahrton G, Nilsson-Lind T, Nilsson-Lind M, et al. (1990) Multiple myeloma: a clinical study of 100 patients. *Acta Oncol* 29:1-10.









...men with benign prostatic hyperplasia (BPH) or a combination of both drugs on the symptoms (LUTS) is only slowed by 34% with 5ARI therapy. It is known why patients do not uniformly respond to 5ARI therapy. 30% of adult prostates do not express SRD5A2 through epigenetic mechanisms. We compared baseline age, demographics, AUASS, BMI, serum dihydrotestosterone (DHT) level, age, and BMI, men with higher expression of SRD5A2 still had better response to finasteride with better improvement of LUTS on AUASS.

Conclusion
Higher expression of SRD5A2 in the prostate was associated with a better response to finasteride as measured by improvement in AUASS. This finding has implications for precision medicine by predicting men that are most likely to benefit from tailored

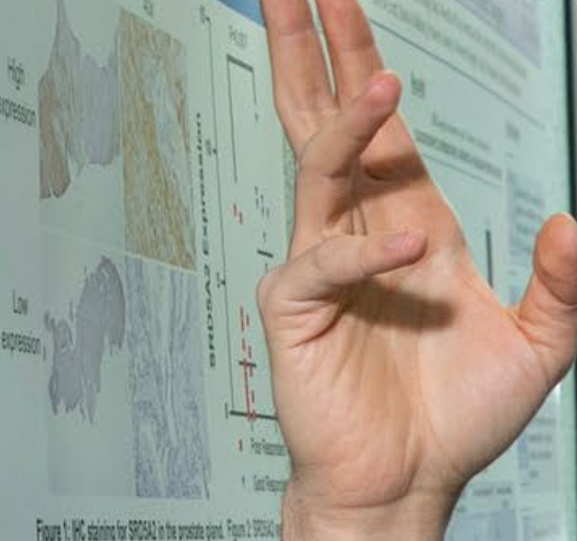


Figure 1. IHC staining for SRD5A2 in the prostate gland. Figure 2. SRD5A2 expression in the prostate gland.

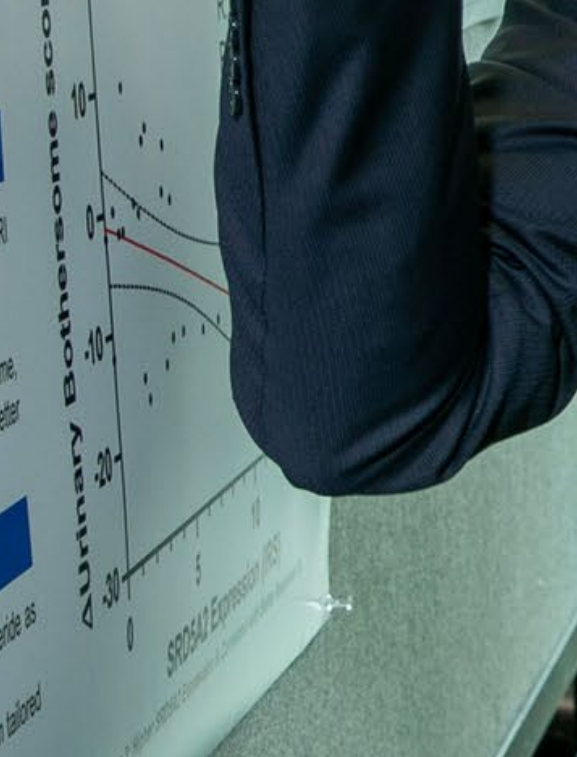
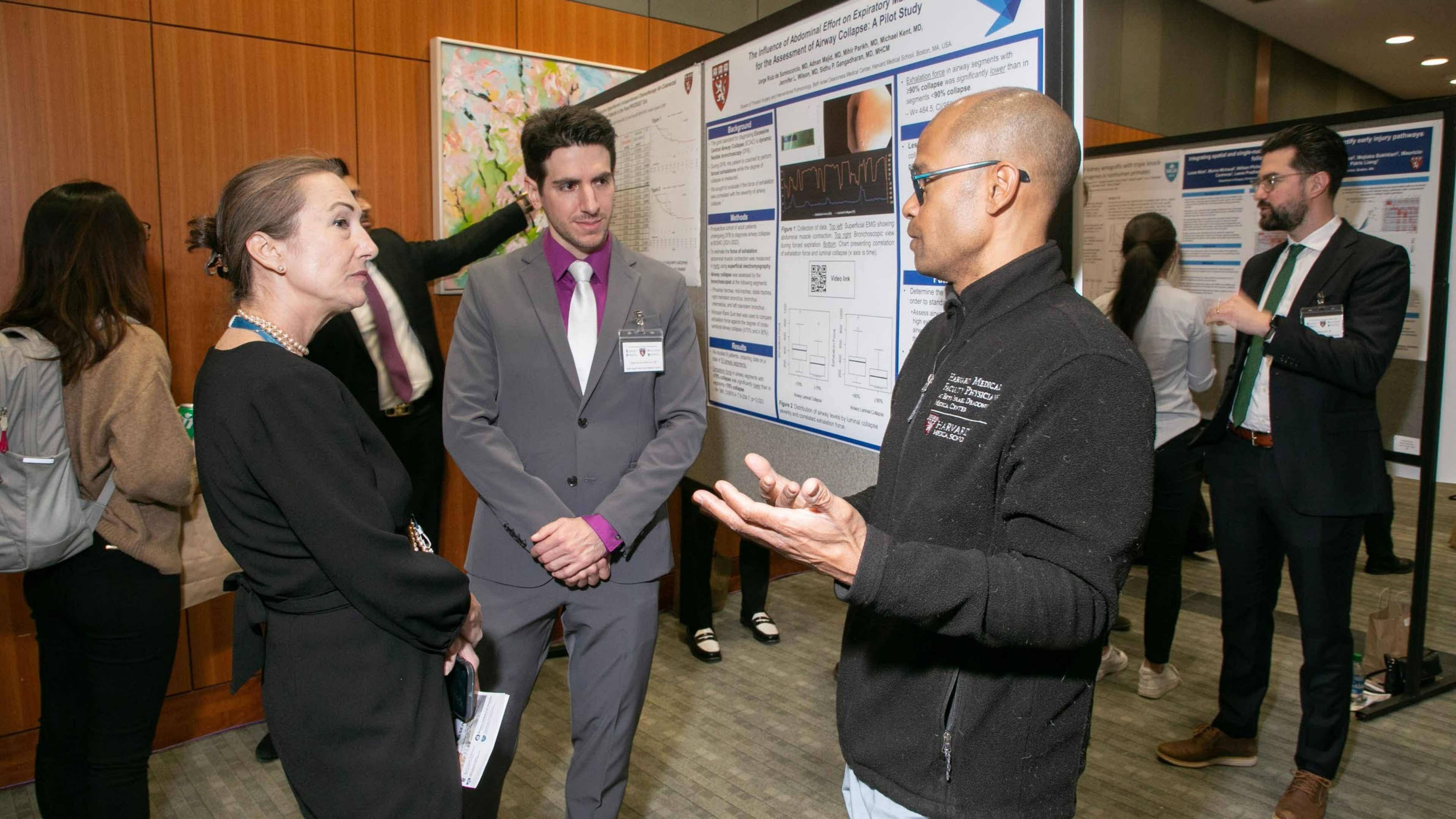


Figure 2. AU urinary bothersome score versus SRD5A2 Expression (log).





The Influence of Abdominal Effort on Expiratory Flow for the Assessment of Airway Collapse: A Pilot Study

Jorge Ruiz de Sotomayor, MD, Adnan Majid, MD, Mihir Parikh, MD, Michael Kent, MD, Jennifer L. Wilson, MD, Sidhu P. Gangadharan, MD, MHCM
 Division of Thoracic Surgery and Interventional Pulmonology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

Background
 The gold standard for diagnosing Expiratory Central Airway Collapse (ECAC) is dynamic Flexible Bronchoscopy (DFB). During DFB, the patient is coached to perform forced exhalations while the degree of collapse is measured. We sought to evaluate if the force of exhalation was correlated with the severity of airway collapse.

Methods
 Prospective cohort of adult patients undergoing DFB to diagnose airway collapse at BIDMC (2011-2022). To measure the force of exhalation, abdominal muscle contraction was measured at 100% using superficial electromyography. Airway collapse was assessed by the bronchoscopist at the following segments: Proximal trachea, mid-trachea, distal trachea, right mainstem bronchus, bronchus intermedius, and left mainstem bronchus. Wilson Park-Gun test was used to compare exhalation force against the degree of obstructive airway collapse (0-70% and >90%).

Results
 We studied 5 patients, obtaining data on a total of 14 airway segments. Collapsed force in airway segments with ≥90% collapse was significantly lower than in segments <90% collapse. (p=0.001, Wilcoxon T & Z= 1.94, p=0.022).

Figure 1: Collection of data. Top left: Superficial EMG showing abdominal muscle contraction. Top right: Bronchoscopic view during forced expiration. Bottom: Chart presenting correlation of exhalation force and luminal collapse (x axis is time).

Figure 2: Distribution of airway levels by luminal collapse severity and correlated exhalation force.

Video link

Conclusions:
 • Exhalation force in airway segments with ≥90% collapse was significantly lower than in segments <90% collapse.
 • W= 484.5; CI(95%)

Future:
 • Determine the order to standardize.
 • Assess airway high exhalation force in airway segments.

A woman with brown hair pulled back, wearing a black long-sleeved dress and a pearl necklace, is engaged in conversation with a man in a grey suit. She is looking towards the man and has a slight smile.

A man with dark hair, wearing a grey suit, a purple shirt, and a white tie, stands with his hands clasped in front of him. He is looking towards the woman on his left and appears to be listening or responding to her.

A man with a shaved head and glasses, wearing a dark grey zip-up jacket with 'HARVARD MEDICAL SCHOOL PHYSICIAN & SURGEON DEACONESS MEDICAL CENTER' and 'HARVARD MEDICAL SCHOOL' printed on it, is gesturing with his hands as he speaks to the man in the grey suit. He is looking towards the man in the suit.

In the background, another man with a beard and glasses, wearing a dark suit and a green tie, is talking to a woman with long dark hair. They are standing near another poster. The setting is a well-lit conference room with wood-paneled walls.



to no previous tissue level

The heart undergoes a complex morphogenesis during looping, where it begins as a straight tube and during development begins to loop and form into the complex adult four chambered structure

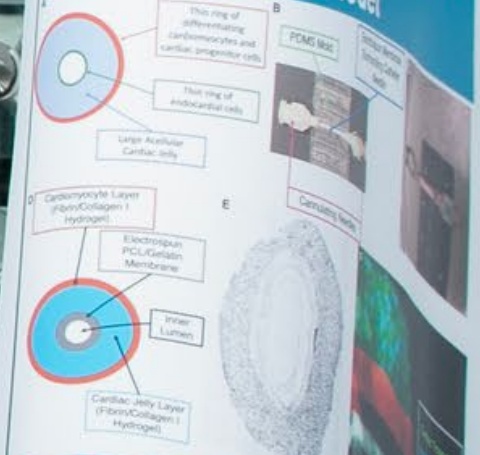
Looping is initiated through the rotation of the heart tube and results in rightward rotation at the cranial end of the embryo and a dorsal deflection at the caudal end

Proper looping aligns the heart in a way that helps initiate segmentation of the heart resulting in development of complex structures such as the atrias, electrical conduction system and valves

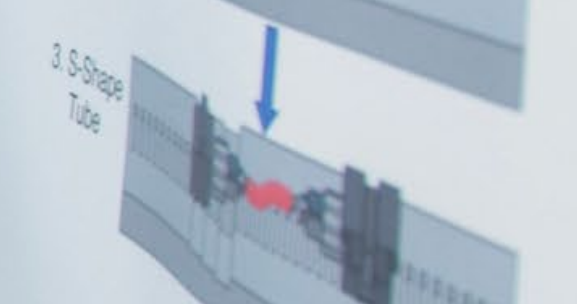
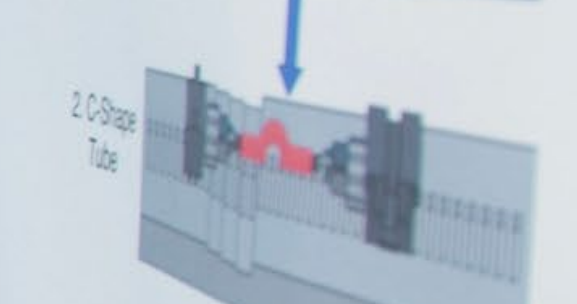
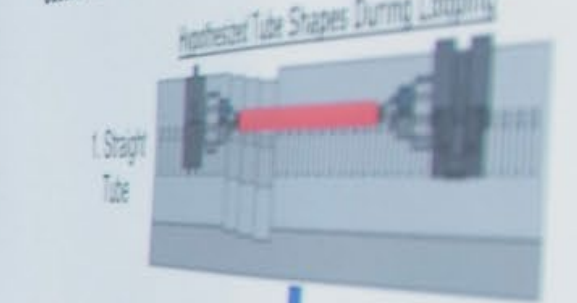
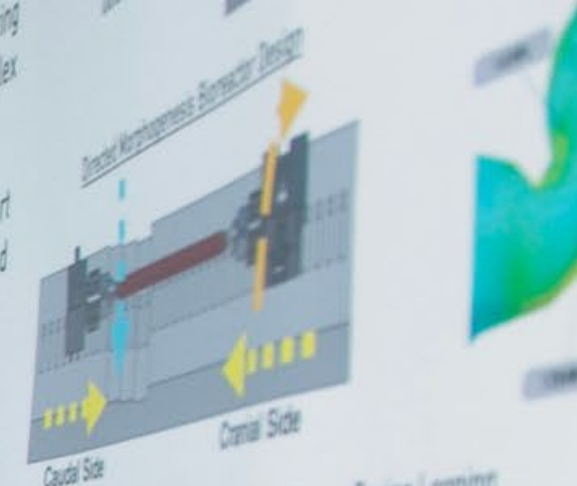
Incomplete looping can develop congenital heart defects (CHDs) such as leaky valves, atrial septal defects, and hypoplastic left heart syndrome

We have generated a tissue model of cardiac looping through the combination of developmental biology and tissue engineering design principles in a process we have entitled, *engineered development*.

Engineered Heart Tube Tissue Model



Heart Tube Compaction And Function



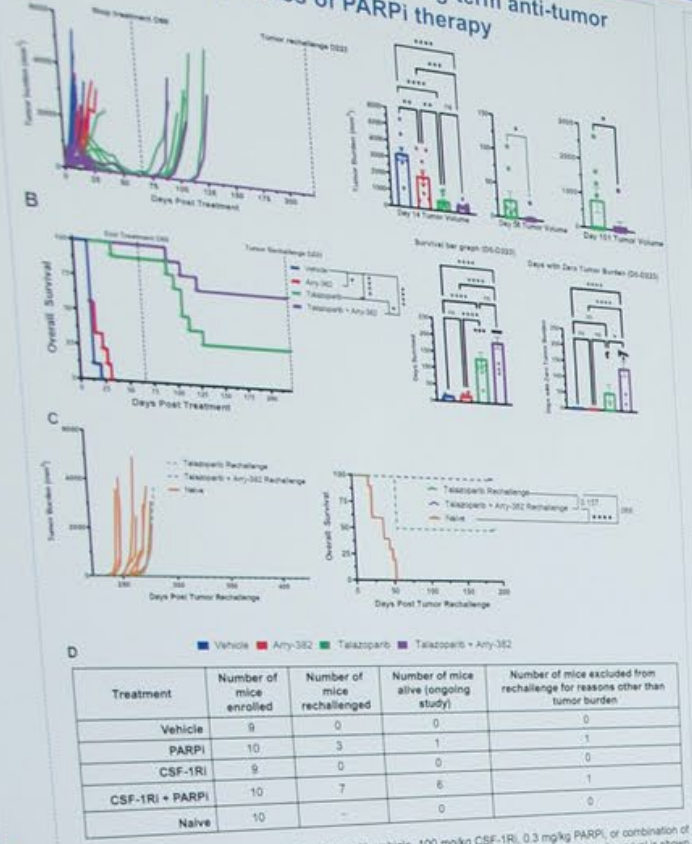


Figure 2. (A, B) Mice were treated daily either with vehicle, 100 mg/kg CSF-1Ri, 0.3 mg/kg PARPi, or combination of CSF-1Ri and PARPi for 66 days. Tumors were measured twice per week until endpoint. (B) Overall survival is shown as a Kaplan-Meier plot and bar graph. The last graph in subplot B represents the number of days mice had cleared their tumor, with black dots indicating mice still on study. (C) Tumor free mice at Day 233 were rechallenged along with 10 naive mice as a control. Error bars represent \pm S.E.M. Statistical analyses were performed comparing each group using one-way ANOVA with multiple comparisons. Survival analysis was done using the survR2 package in R. (D) Summary table of study design for (A-C).

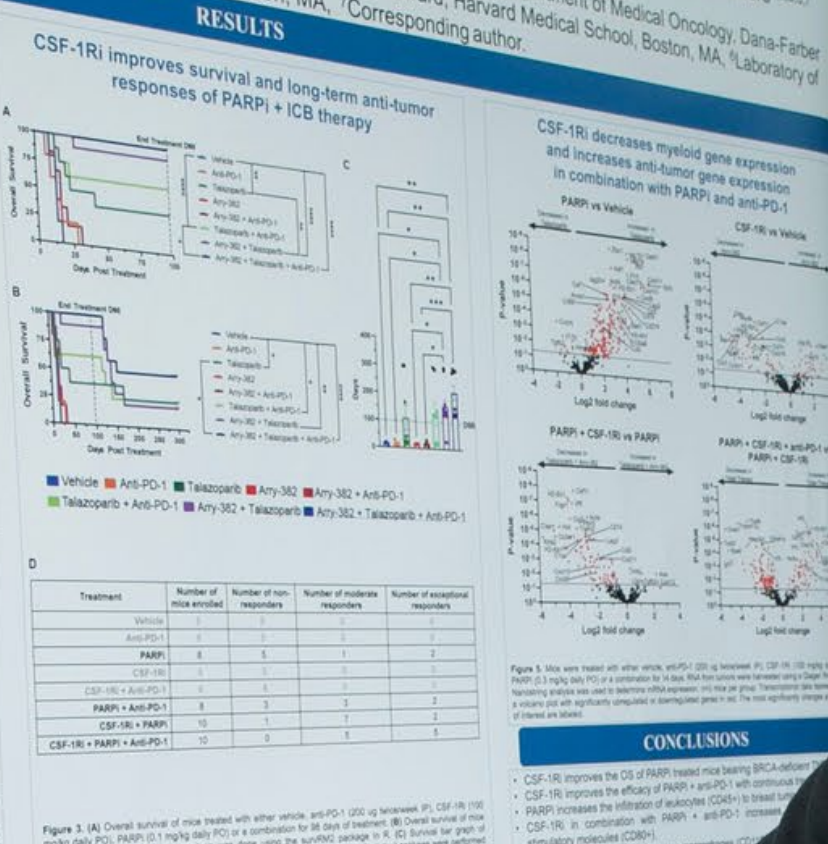


Figure 3. (A) Overall survival of mice treated with either vehicle, anti-PD-1 (200 μ g biweekly IP), CSF-1Ri (100 mg/kg daily IP), PARPi (0.3 mg/kg daily IP) or a combination for 66 days of treatment. (B) Overall survival of mice after treatment ended. Survival analysis was done using the survR2 package in R. (C) Survival bar graph of ongoing study with black dots indicating live mice. Error bars represent \pm S.E.M. Statistical analyses were performed comparing each group using one-way ANOVA with multiple comparisons. (D) Supporting table shows contributions of treatment response. Non-responders are defined as reaching endpoint within 90 days in treatment, moderate responders died within 70 days after the end of treatment, and exceptional responders remain alive.

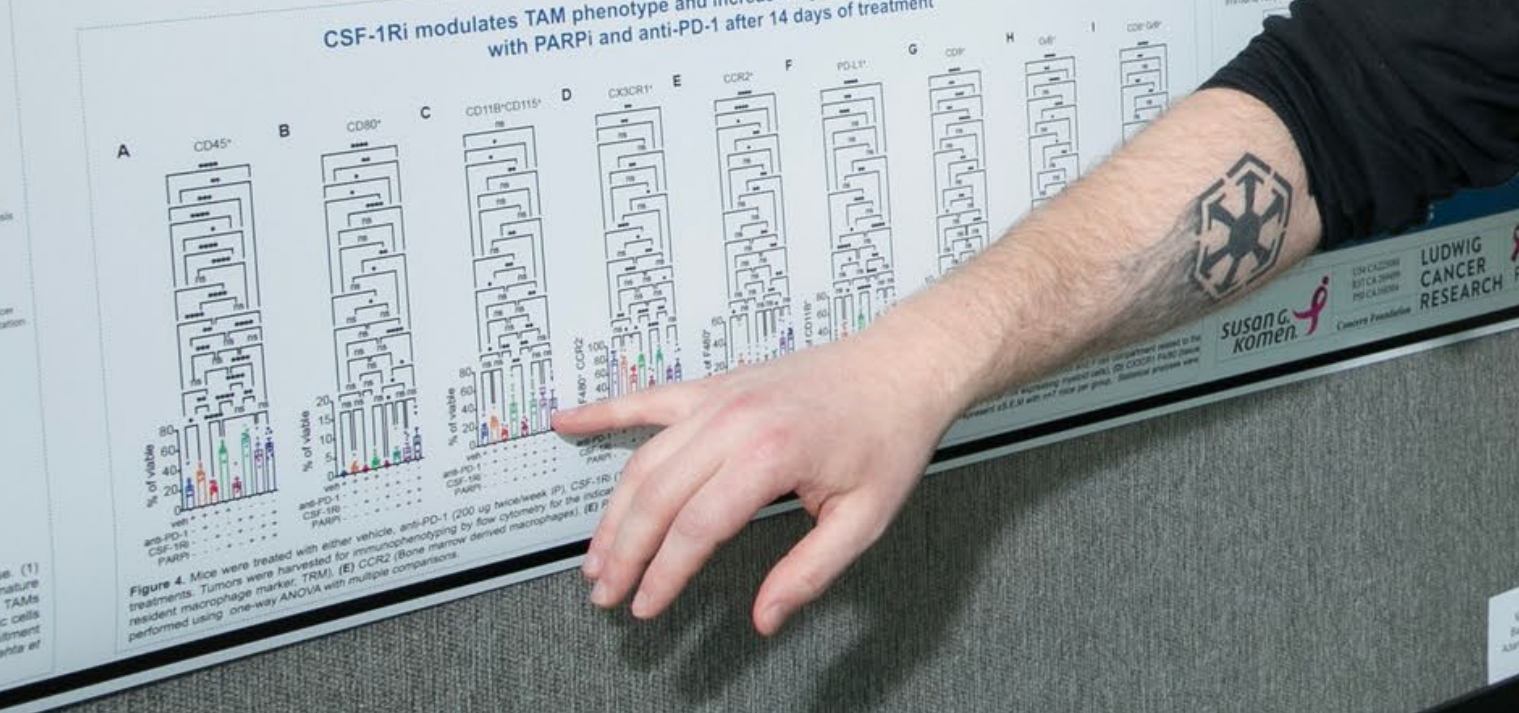


Figure 4. Mice were treated with either vehicle, anti-PD-1 (200 μ g biweekly IP), CSF-1Ri (100 mg/kg daily IP), PARPi (0.3 mg/kg daily IP) or a combination for 66 days of treatment. Tumors were harvested for immunophenotyping by flow cytometry for the indicated resident macrophage marker (TRM). (E) CCR2 (bone marrow derived macrophages). (E) χ^2 test was performed using one-way ANOVA with multiple comparisons.



susan k. ludwig
LUDWIG CANCER RESEARCH
PILZER





HARVARD
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Figure 1: Lung Node Involvement in NSCLC Stage I

Figure 2: Kaplan-Meier Survival Estimations of Cohort with Multivariate Cox Regressions

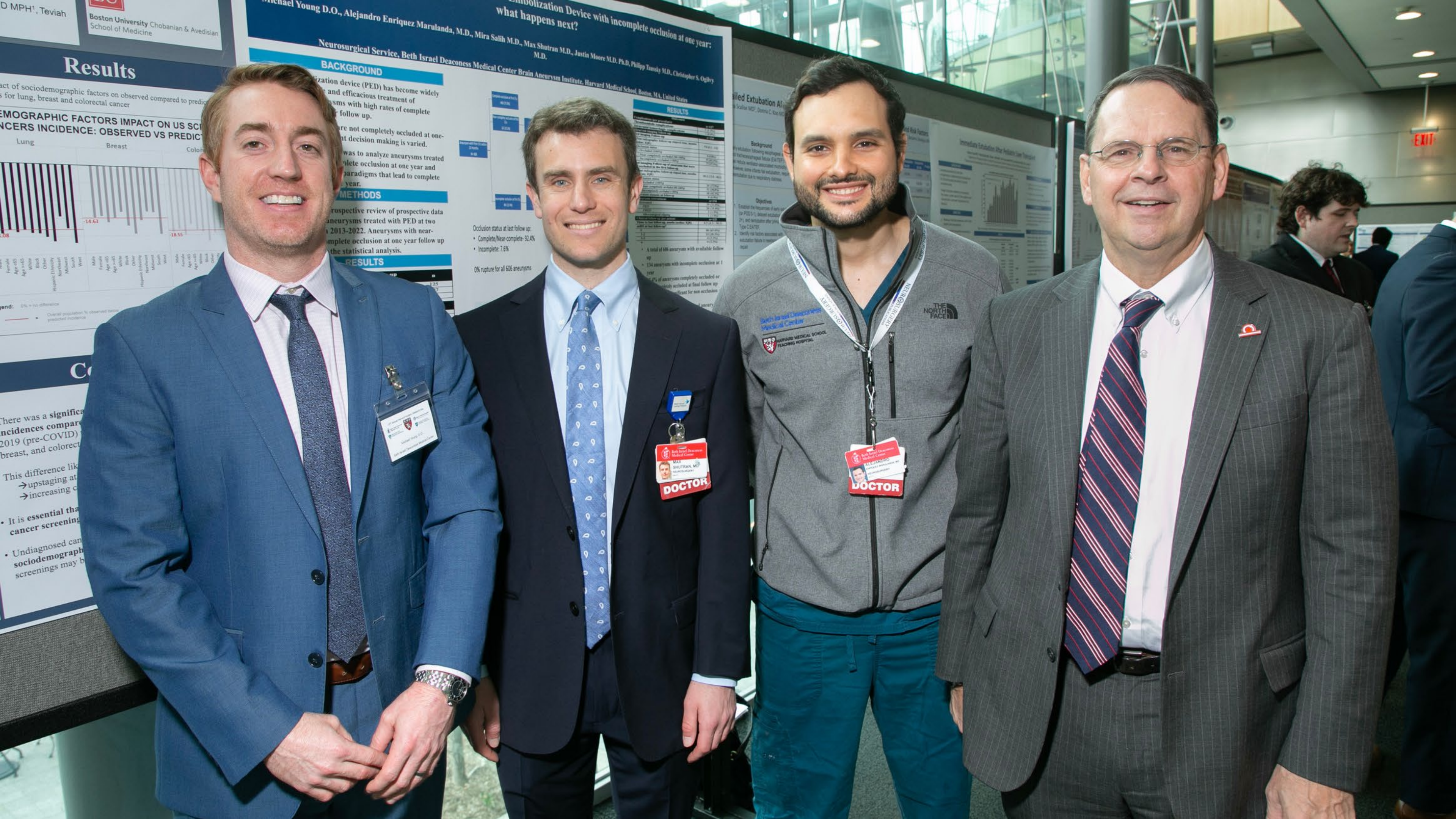
Conclusions

While N1 Direct and Spread cohorts are similar, including overall survival at all time points, the benefit of adjuvant chemotherapy is not demonstrated in patients with N1 Direct and nodal involvement must be considered when evaluating the risks and benefit of chemotherapy in this cohort.

Larger scale studies are needed to support this conclusion and to further describe patterns of behavior in the unusual NSCLC presentation.

Acknowledgements and References

Characteristic	No Chemotherapy (n=104)	Chemotherapy (n=128)	P-value
Age (mean ± SD)	61.7 (11.1)	61.6 (11.0)	0.98
Sex			
Male	57 (54.8%)	65 (50.8%)	0.62
Female	47 (45.2%)	63 (49.2%)	
Race			
White	70 (67.3%)	78 (60.9%)	0.001
Black	14 (13.4%)	17 (13.3%)	
Hispanic	10 (9.6%)	12 (9.4%)	
Other	10 (9.6%)	11 (8.6%)	
Stage			
Ia	34 (32.7%)	38 (29.7%)	0.81
Ib	30 (28.8%)	35 (27.3%)	
Ic	40 (38.5%)	55 (43.0%)	
IIa	0	1 (0.8%)	
IIb	0	1 (0.8%)	
IIIa	0	1 (0.8%)	
IIIb	0	1 (0.8%)	
IIIc	0	1 (0.8%)	
IV	0	1 (0.8%)	
Unknown	0	1 (0.8%)	



Embolization Device with incomplete occlusion at one year: what happens next?

Neurosurgical Service, Beth Israel Deaconess Medical Center Brain Aneurysm Institute, Harvard Medical School, Boston, MA, United States

BACKGROUND
Embolization device (PED) has become widely used for treatment of intracranial aneurysms with high rates of complete occlusion at one year follow up. However, aneurysms are not completely occluded at one year in 20-30% of cases and decision making is varied. We sought to analyze aneurysms treated with PED that were not completely occluded at one year and to identify paradigms that lead to complete occlusion at one year follow up.

METHODS
Retrospective review of prospective data on aneurysms treated with PED at two centers from 2013-2022. Aneurysms with near-complete occlusion at one year follow up were included in the statistical analysis.

RESULTS
Occlusion status at last follow up:
• Complete/Near-complete: 52.4%
• Incomplete: 7.6%
0% rupture for all 606 aneurysms

Results

Impact of sociodemographic factors on observed compared to predicted incidence for lung, breast and colorectal cancer

DEMOGRAPHIC FACTORS IMPACT ON US SCREENING INCIDENCE: OBSERVED VS PREDICTED



Legend: 0% = no difference
Overall population: No observed below predicted incidence

There was a significant difference in incidences compared to 2019 (pre-COVID) for breast, and colorectal cancer.

This difference likely represents upstaging at diagnosis and increasing cancer incidence.

It is essential that cancer screening programs be tailored to sociodemographic factors.

Undiagnosed cancer and sociodemographic factors may be related.

Abstracts

Demographics

Scar types

Procedure

Exogenous immune response

Scar photos (interposterior/lateral) were assessed by four blinded clinicians using the Manchester Scar Scale (MSS) and the Scar Assessment and Rating Scale (SARS).

A mixed-effects linear regression model was used to assess the relationship between the MSS and SARS scores.

Scale/subscale	p-value
MSS color	0.16
MSS finish	0.61
MSS contour	0.52
MSS distortion	0.02
MSS total	0.04
SCAR erythema	0.63
SCAR pigmentation	0.16
SCAR papularity	0.06
SCAR overall impression	0.06



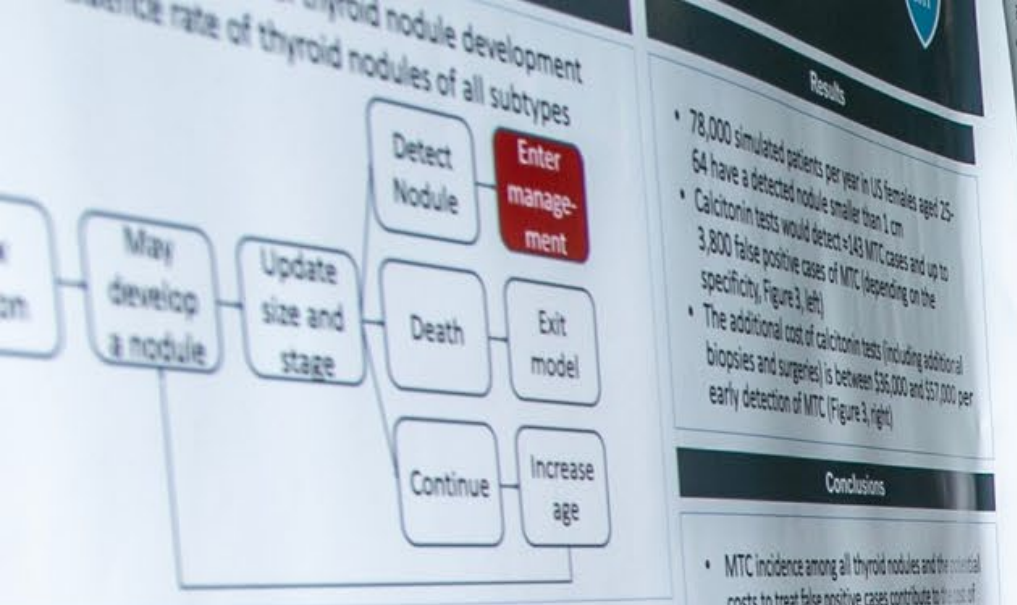
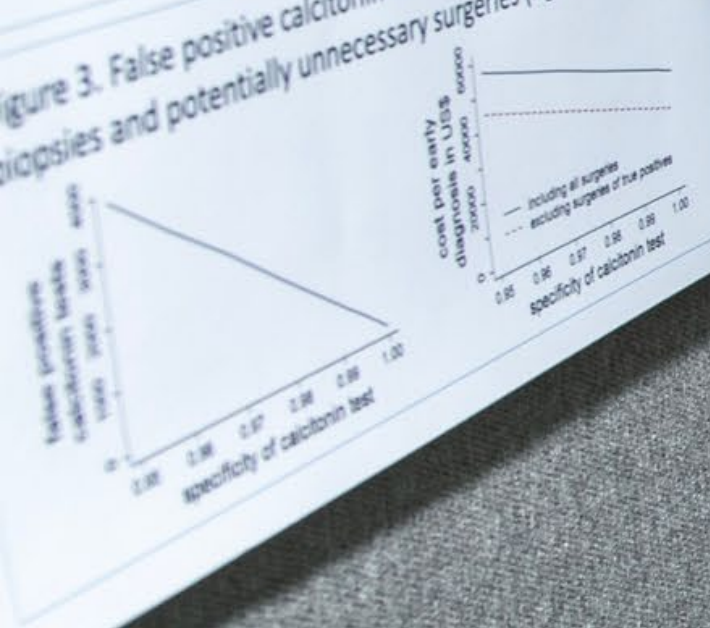


Figure 2. Management of thyroid nodules with and without blood tests or calcitonin



Figure 3. False positive calcitonin tests (left) lead to excess costs in biopsies and potentially unnecessary surgeries (right)



Results

- 78,000 simulated patients per year in US females aged 25-64 have a detected nodule smaller than 1 cm
- Calcitonin tests would detect ~143 MTC cases and up to 3,800 false positive cases of MTC (depending on the specificity, Figure 3, left)
- The additional cost of calcitonin tests (including additional biopsies and surgeries) is between \$96,000 and \$57,000 per early detection of MTC (Figure 3, right)

Conclusions

- MTC incidence among all thyroid nodules and the associated costs to treat false positive cases contribute to the cost of calcitonin screening above \$30,000 for each early detection
- Future work should evaluate the cost-effectiveness of calcitonin screening including the down the line costs of treatment and health benefits in terms of survival from MTC and quality-adjusted life years

References

- [1] Haugen, B. R. et al. (2016). 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*, 26(1), 1-33.
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 Carrie Cunningham (ubio) - cubio@mcg.harvard.edu

Funding

This work is supported by the NCI/NIH (R01CA232127-01A1)

Methods

Design: retrospective cohort study

Setting: Patients with PM who underwent surgical resection between 2006-2015

Data collected:

- Preoperative labs, surgery type, lower extremity noninvasive ultrasound results, VTE diagnosis, tumor histological subtype, and tumor volume

RESULTS

Thromboses were more likely in patients with PM (p=0.02)

Thromboses were more likely in patients with larger tumors (p=0.001)

There was no significant difference in tumor histological subtypes of VTE (p=0.237)

CONCLUSIONS

Patients with PM have higher rates of thromboses

Thromboses were more likely in patients with larger tumors



Sifaram M. Emani, Pedro J. del Nido, James D. McCully, Department of Cardiac Surgery, Boston Children's Hospital, Boston, Massachusetts, USA.



Results

4 hours of perfusion, neonatal and pediatric DCD hearts receiving VEH showed significantly decreased myocardial function compared to Sham non-ischemic control hearts. In neonatal and pediatric DCD hearts receiving MT, myocardial function was significantly increased (LVDP, dP/dt max, and fractional shortening were significantly increased in Sham compared to DCD hearts receiving MT as compared to Sham ($p < 0.001$ for each), equal or better than that observed in Sham non-ischemic hearts. Infarct size was significantly decreased in neonatal and pediatric DCD hearts receiving MT as compared to Sham ($p < 0.001$) indicating preserved myocardial viability.

Conclusions

Mitochondrial transplantation provides for significantly enhanced preservation of myocardial function and viability in neonatal and pediatric DCD hearts that is equivalent to or better than that observed in DCD hearts. Mitochondrial transplantation provides a possible option to expand the pediatric and neonatal heart donor pool.





Introduction

There is an increasing prevalence as well as operative burden for elderly patients with IBD.
Historically, concerns about higher operative morbidity in elderly patients with IBD have discouraged referral to surgery.
There is growing literature that suggest other factors, such as frailty, are more strongly associated with outcomes however this is not well defined, especially within the current era of biologics for the treatment of IBD.
The IBD-NSQIP collaborative was created to collect IBD specific data in addition to standard NSQIP data for 14 high-volume IBD centers.

Aim

To examine outcomes for elderly patients undergoing IBD surgery and to assess whether age, or other factors were associated with significant perioperative morbidity.

Methodology

Cohort: Patients with Crohn's disease (CD) undergoing small bowel resection or ileocectomy and patient's with ulcerative colitis (UC) undergoing total abdominal colectomy or proctocolectomy.
Exposure: Elderly patients defined as ≥ 80 years of age at time of surgery.
Primary outcome: Major morbidity defined as death within 30 days, organ space infection, unplanned intubation, pulmonary embolism/prolonged intubation, acute renal failure, stroke, cardiac arrest, septic shock.
Secondary outcomes include minor complications, length of stay, and readmission rate.
Multivariable analysis was used to identify factors associated with major perioperative morbidity.

Conclusions

Elderly patients with CD had significantly higher rates of major morbidity, minor complications, and readmission rates.

In patient with CD, age, frailty, preoperative anemia, and open surgery were associated with increased major morbidity.

In contrast, elderly patient's with UC had similar rates of major morbidity although they did have significantly higher rates of minor complications and total length of stay.

In patients with UC, frailty and case urgency were associated with increased major morbidity but age was not.

References

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3. Wolf J, Hwang T, Williams D, et al. Frailty in an emergency presentation from acute colitis. *Colorectal Dis*. 2017;19(1):108-115.
4. Eisenstein S, Hwang T, Hwang A, et al. The IBD-NSQIP Collaborative: Design, Implementation, and Validation of a Large-Scale, Multi-Center, Multi-Site Cohort Study. *Colorectal Dis*. 2017;19(1):173-178.

Characteristic	Value
Median age (yr)	68
Median length of stay (LOS)	10.5
Median LOS (ICU)	3.5
Median LOS (OR)	7.0
Median LOS (Home)	3.5
Median LOS (Readmission)	1.5

Table 1: Patient Characteristics, outcomes, and correlation of morbidity in patients with Crohn's disease (CD) or ulcerative colitis (UC) undergoing surgery (n = 1,000).

Characteristic	Value
Median age (yr)	68
Median LOS	10.5
Median LOS (ICU)	3.5
Median LOS (OR)	7.0
Median LOS (Home)	3.5
Median LOS (Readmission)	1.5

Table 2: Multivariable model including preoperative albumin, weight loss within 6 months of surgery, and frailty score.

Characteristic	Value
Median age (yr)	68
Median LOS	10.5
Median LOS (ICU)	3.5
Median LOS (OR)	7.0
Median LOS (Home)	3.5
Median LOS (Readmission)	1.5

ing of 2.5-dimensional fitness. Single-cell RNA s of the ISC and their om murine colitis models *in vivo*.



vivo gut epithelium.

ntly reduced the population ls expressing the stem cell ts and pervaded the villus- o preferentially differentiate from murine colitis models nt of those observed *in vitro*.

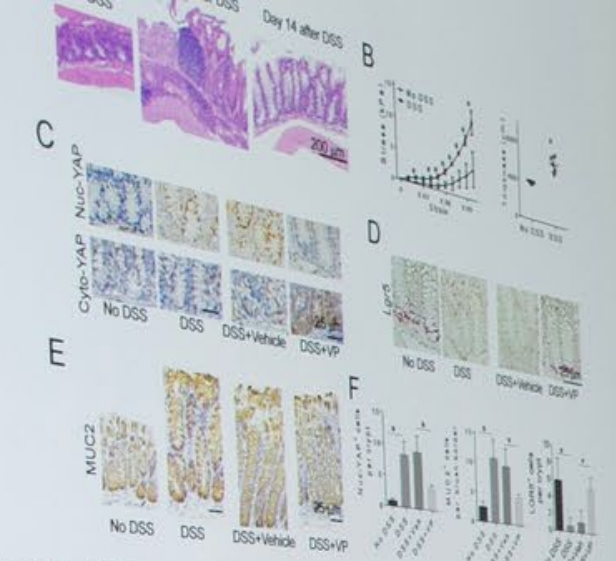
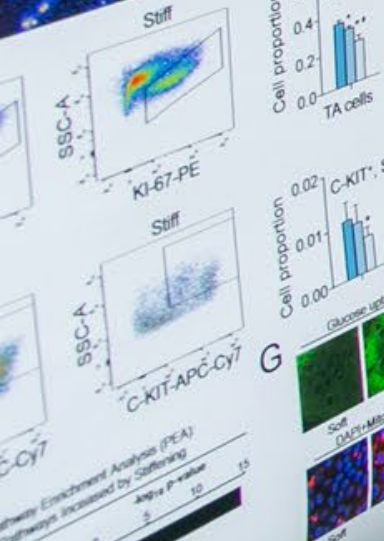


Figure 3. Stiffness regulates the fate of ISCs in colitis mouse model.

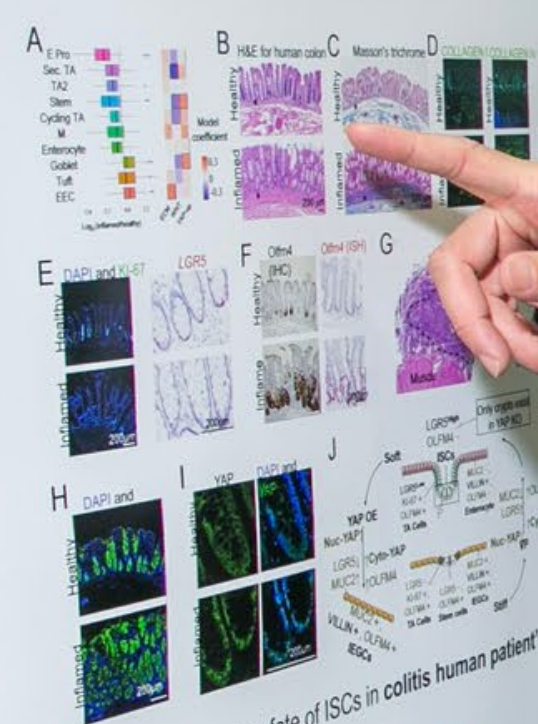


Figure 4. Stiffness regulates the fate of ISCs in colitis human patient's samples

Conclusions: Healthy Fibrosis & Stiffening

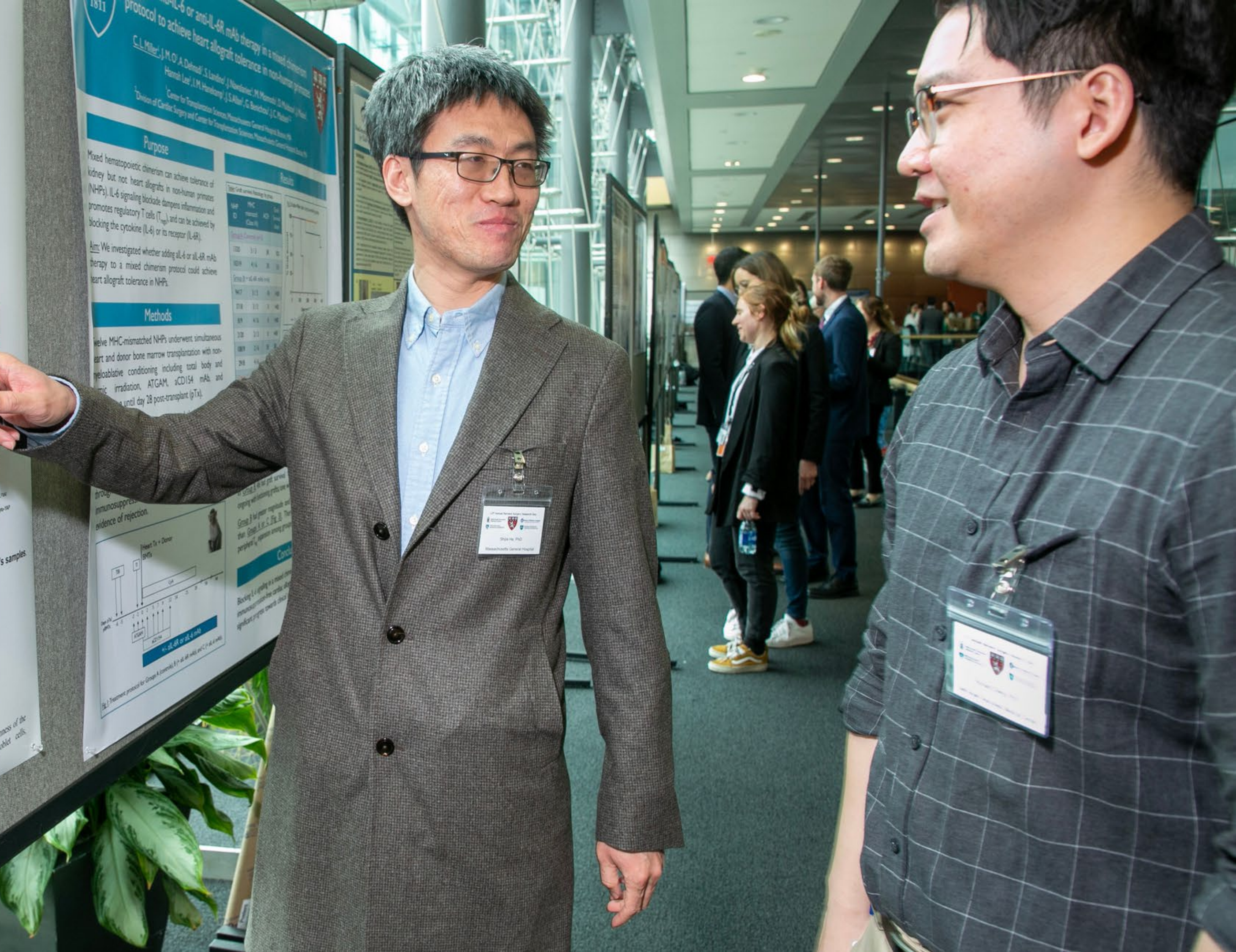
Gut Stiffening *in vivo*
Reference: S. He¹, P. Lei¹, N. Sacidi¹ et al. Stiffness restricts the stemness of the intestinal stem cells and Skews their differentiation towards goblet cells. *Gastroenterology*. In press

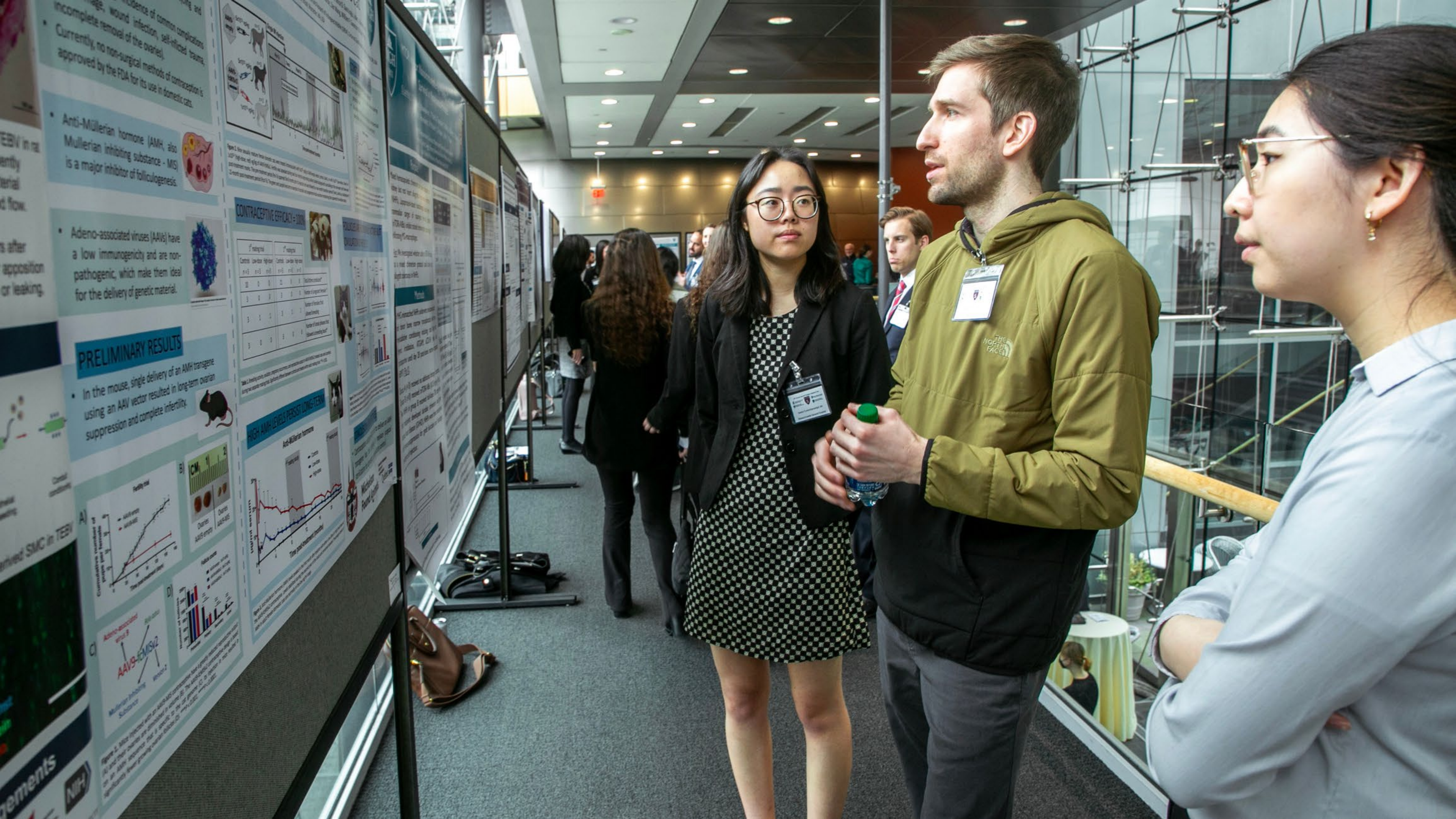
1811 protocol to achieve heart allograft tolerance in non-human primates
 C.L. Miller, J.M.O. A. Dehodi, S. Lindoff, J. Nandorff, M. Ponnala, G. Hoshino, J. Hoshino, H. Hoshino, J. S. Alter, G. Banerjee, J. C. Miller
 Center for Translational Science, Massachusetts General Hospital, Boston, MA
 Division of Cardiac Surgery and Center for Translational Science, Massachusetts General Hospital, Boston, MA

Purpose
 Mixed hematopoietic dimerism can achieve tolerance of kidney but not heart allografts in non-human primates (NHPs). IL-6 signaling blockade dampens inflammation and promotes regulatory T cells (T_{reg}) and can be achieved by blocking the cytokine (IL-6) or its receptor (IL-6R).
Aim: We investigated whether adding anti-IL-6 or anti-IL-6R mAb therapy to a mixed chimerism protocol could achieve heart allograft tolerance in NHPs.

Methods
 Twelve MHC-mismatched NHPs underwent simultaneous heart and donor bone marrow transplantation with non-myeloablative conditioning including total body and pelvic irradiation, ATGAM, aCD154 mAb, and cyclosporine until day 28 post-transplant (pTx).

Results
 (Table with columns: Group, MHC, Cyclo, ATGAM, aCD154, IL-6, IL-6R, Survival, etc.)





Anti-Müllerian hormone (AMH, also Mullerian inhibiting substance - MIS) is a major inhibitor of folliculogenesis.

Adeno-associated viruses (AAVs) have a low immunogenicity and are non-pathogenic, which make them ideal for the delivery of genetic material.

PRELIMINARY RESULTS

In the mouse, single delivery of an AMH transgene using an AAV vector resulted in long-term ovarian suppression and complete infertility.

CONTRACEPTIVE EFFICACY = 100%

1 st pregnancy		2 nd pregnancy		3 rd pregnancy	
Control	AAV-AMH	Control	AAV-AMH	Control	AAV-AMH
10	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

HIGH AMH LEVELS PERSIST LONG-TERM

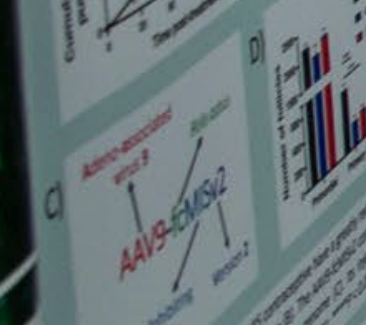
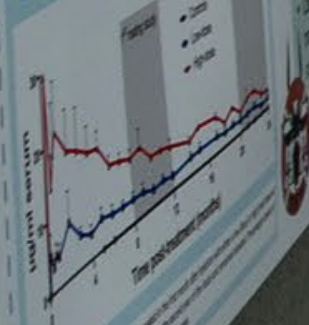
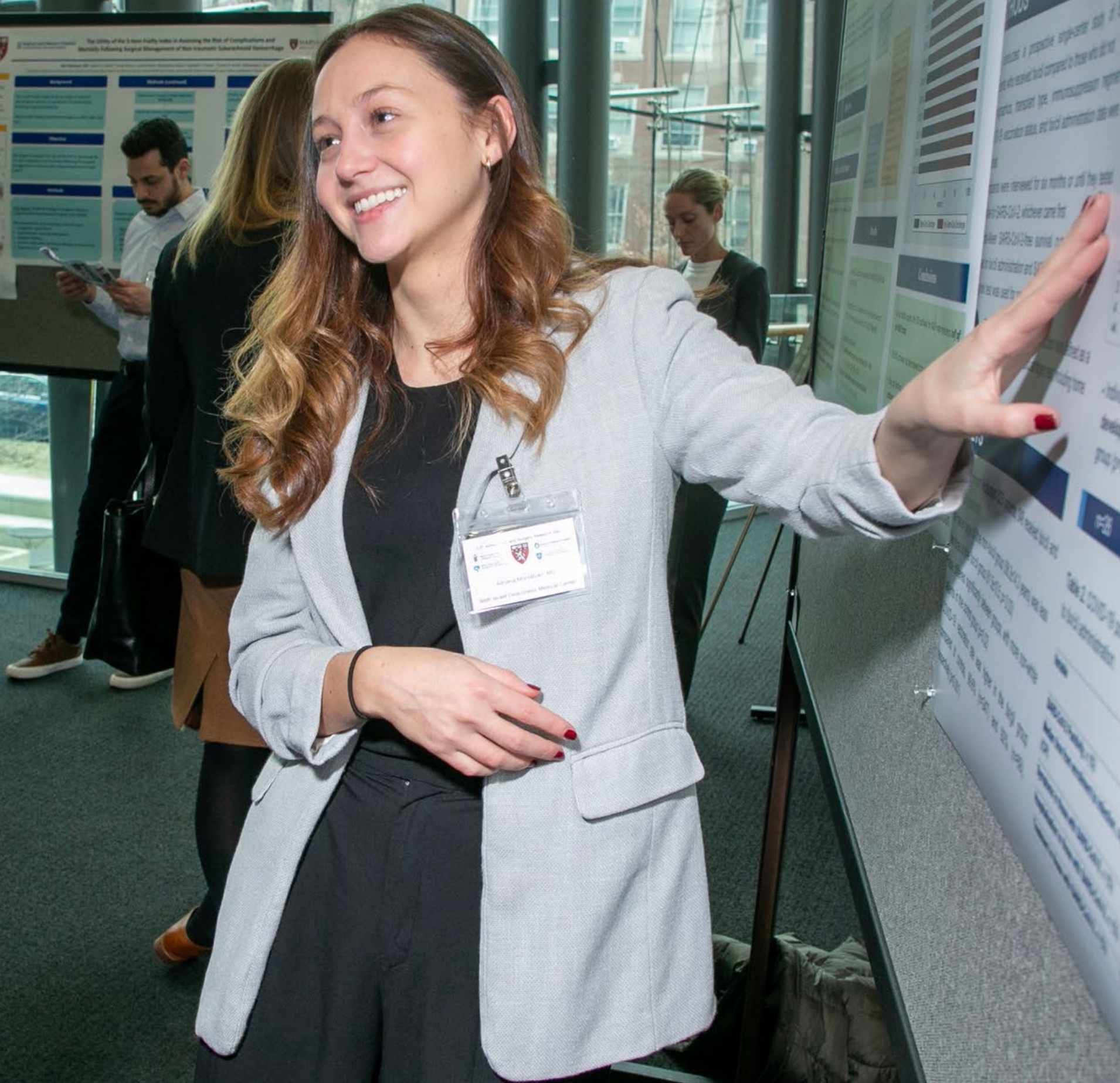


Figure 2. Mice injected with an AAV-AMH construct have a significantly lower number of pups per female compared to control mice. The AAV-AMH construct significantly reduced the number of pups per female in a dose-dependent manner. *p < 0.05, **p < 0.01, ***p < 0.001.



MScPH, Vanessa Welten, MD, MPH, Nelya Melnitchouk, MD, MSc^{1,2}
 Surgery and Public Health?

Results

- 2050 physicians joined HealUA from May 2022 to February 2023.
- 95% users were from Ukraine and 5% from other countries.
- 27.46% internal medicine, family medicine and pediatricians; 17.95% anesthesiologists; 12% surgeons; 7.80% Ob/Gyn; 7.75% neurologists, 4.29% dermatologists; 3.80% oncologists and 18.95% other sub-specialists.
- 97 cases were submitted (88-Ukrainian, 9-English) and 97.93% received responses.
- Specialties consulted included dermatology (n=19), internal medicine (n=13), surgery (n=11), pediatrics (n=11) oncology (n=7), other (n=36).

Number of users by country



Time of receiving a consultation on request

86.31% cases	Within 1st day
5.26% cases	Within 1-2 days
8.42% cases	Within 3-24 days

Conclusions

• HealUA is a promising platform for improving access to peer-to-peer consultations in Ukraine during armed conflict. Additional efforts needed to disseminate the application and to evaluate its long-term impact.

@AliDzhemiliev @NelyaMel @CSPH_BWH @gmka_org

The Availability of Paternal Leave Policies Among US Surgical Residency Programs

**Anusha Jayaram MD MBA¹, **Coral Kalave, BA¹, Noelle Thompson, BS¹, Ranaak Goyal¹, Jonathan F. Gong, BS¹, Sarah Z. Alshamsan, MD¹, Catherine A. Wu, MD¹, Kavitha Ranganathan, MD^{1,2}

¹ Department of Surgery, Beth Israel Deaconess Medical Center ² Department of Surgery, Brigham and Women's Hospital ³ Harvard Medical School ⁴ Harvard School of Public Health ⁵ Harvard School of Dental Medicine ⁶ Harvard School of Public Health ⁷ Harvard School of Public Health ⁸ Harvard School of Public Health ⁹ Harvard School of Public Health ¹⁰ Harvard School of Public Health

BACKGROUND

- For many surgical trainees, residency is a key time to start or expand families
- Several studies have focused on the development of maternal leave policies
- Few studies characterize program-specific paternal leave policies
- This can perpetuate the idea that only women surgeons prioritize parenthood or that women are primarily responsible for parenting

RESULTS

A total of 1128 training programs were evaluated

- 67.41% (688/991) of program directors (PD) were men
- 74.49% (1727/2319) of affiliated GME websites had paternal leave policies available
- 12.41% (148) publicly advertised parental leave policies
- 4.61% (52) advertised non-birthing parent leave policies

CONCLUSION

- Few surgical training programs have publicly available non-birthing parental leave policies.
- Publicly available non-birthing parent leave policies may be an important step in supporting a surgical career with family obligations and promoting parity both in the workplace and at home.
- The lack of publicly available non-birthing parent leave policies may impact family formation among current residents.
- Becoming residents through transparent programs
- Engaging fathers in family formation to long-standing programs
- Promoting equitable family formation

METHODS

We acquired program lists for surgery, integrated vascular surgery, integrated plastic surgery, neurosurgery, orthopedic surgery, urology, and obstetrics and gynecology using either ACGME or surgical professional societies.

Each residency program and corresponding Graduate Medical Education (GME) website was reviewed for:

- resident and leadership demographics
- availability of maternal leave, paternal leave, non-birthing parent leave, or the presence of universal leave policies

Descriptive statistics were performed in Microsoft Excel.

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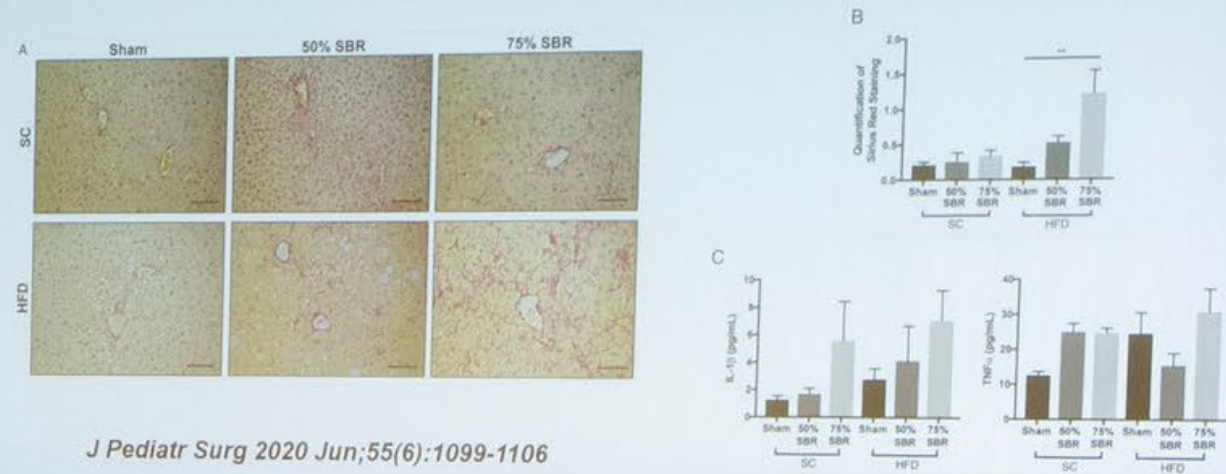


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PN-independent liver damage – enteral fat matters





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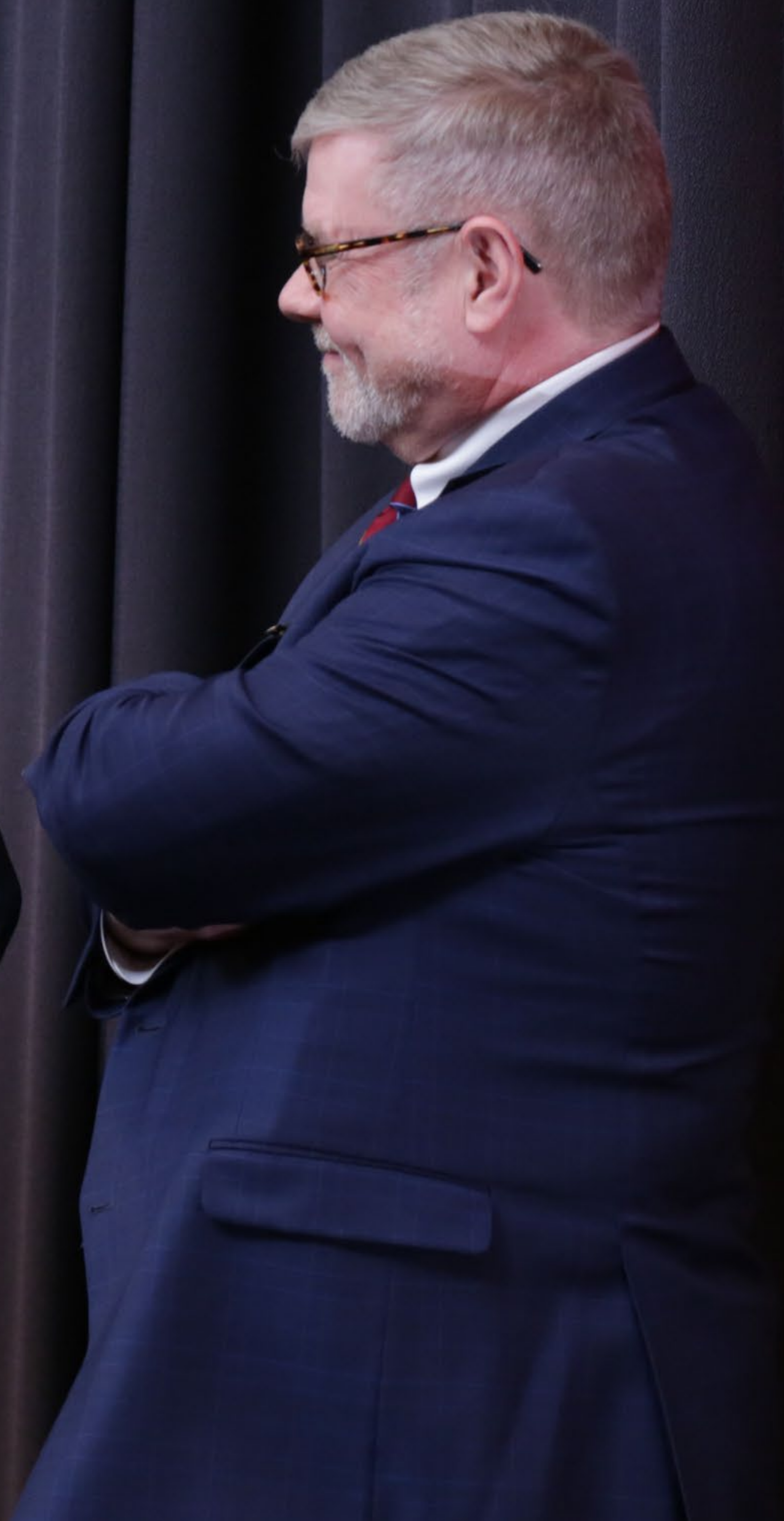


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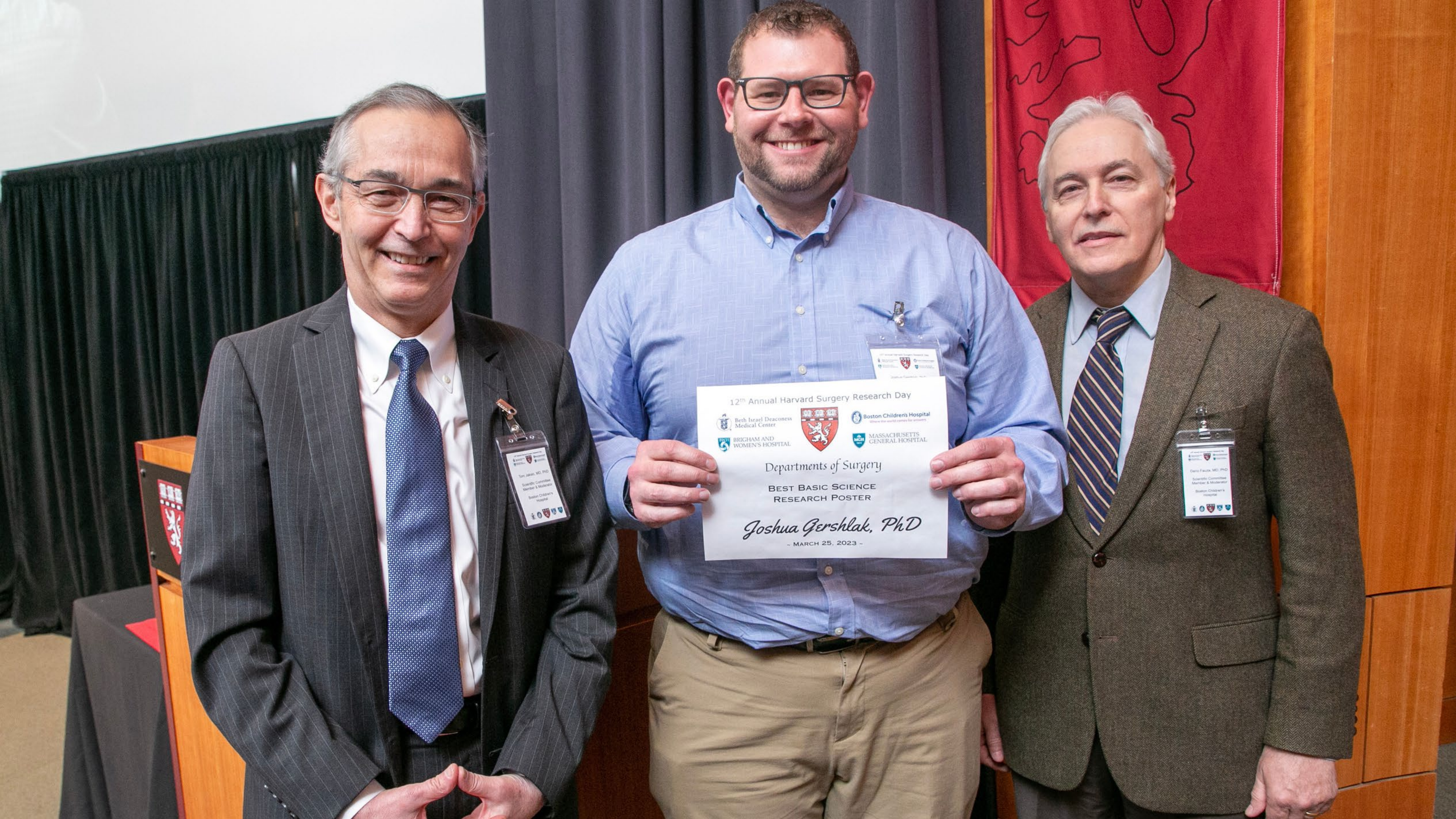


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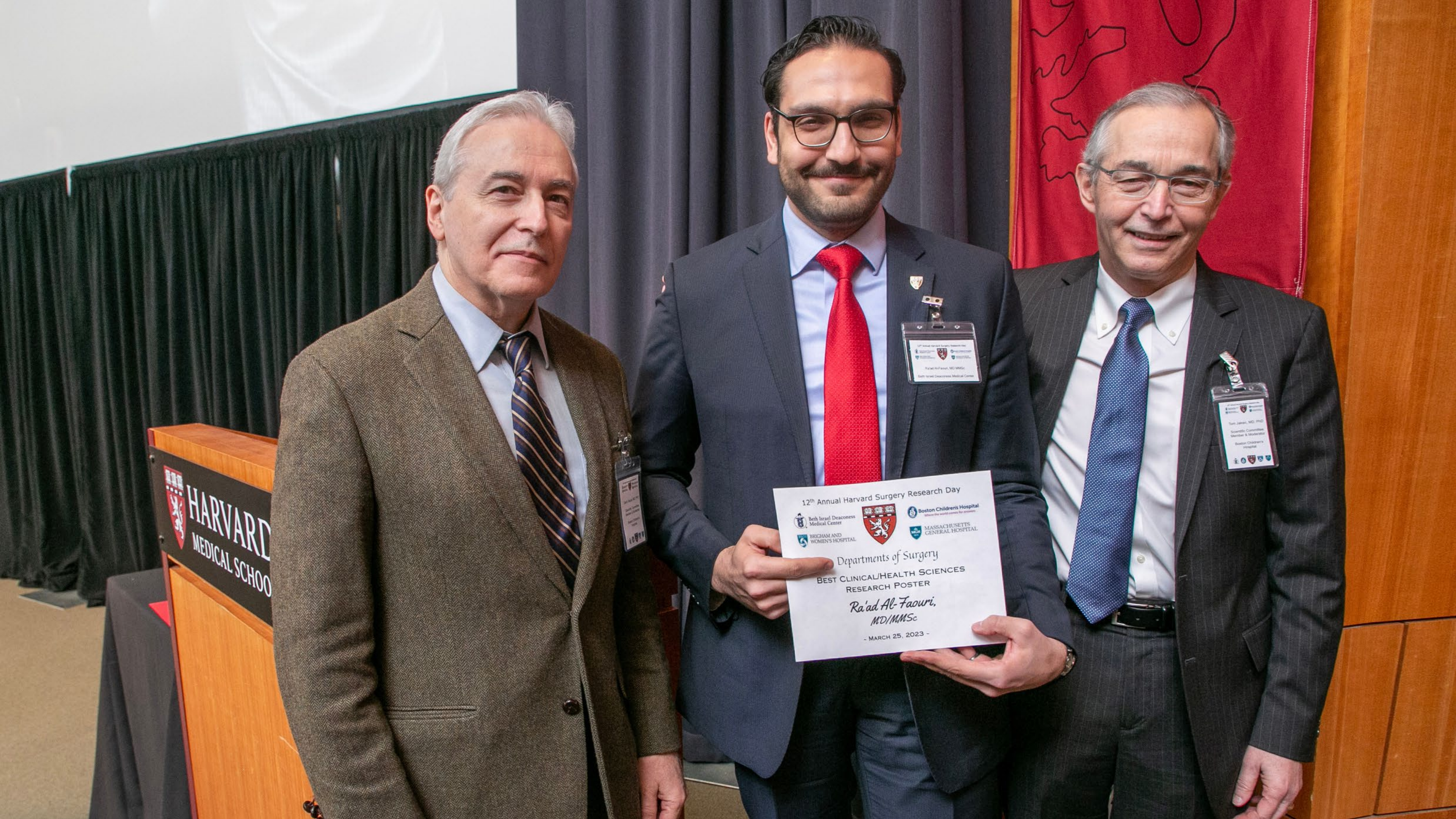
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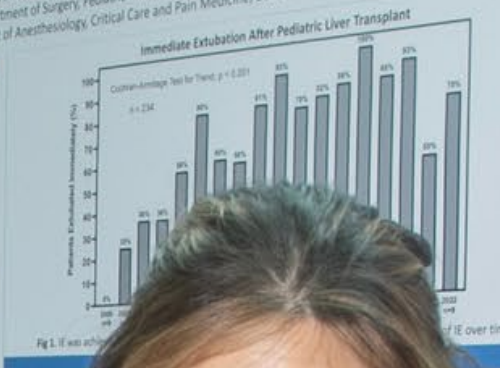






Immediate Extubation After Pediatric Liver Transplant

Doona C Koo MD¹, P Nina Scalise MD¹, Steven J Staffa MS², Alex G Cuenca MD PhD¹, Heung Bae Kim MD¹, Eliza J Lee MD¹
¹Department of Surgery, Pediatric Transplant Center, Boston Children's Hospital and Harvard Medical School, Boston, MA
²Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children's Hospital and Harvard Medical School, Boston, MA



CONCLUSIONS

- IE does not increase postoperative rates of reintubation
- IE with DOAC and TEG-PM can accurately detect coagulopathy

OBJECT

- Thromboelastography with Platelet Mapping (TEG-PM) provides real-time coagulation pathway metrics to provide customized profiles.
- We evaluated the effects of direct oral anticoagulants (DOAC) on coagulation and platelet function profiles. We correlated these data with post-operative Major Adverse Events (MAE) and Major Bleeding Events (MALE) in patients with PAD.

	DOAC	No DOAC	P
No. of Patients	(139)	(132)	
TEG Parameters			
Reaction Time (R) in min	7.8(±2.8)	6.9(±4.0)	0.01
K-Time (min)	2.0(±1.5)	1.8(±1.3)	0.1
CK Angle(deg)	68.0(±11.0)	69.3(±10.6)	0.20
Max amplitude (MA)	64.3(±7.3)	64.4(±14.9)	0.99
Lysis at 30 min (%)	1.0(±2.0)	0.8(±1.4)	0.37
Platelet Mapping Parameters			
ADP MA(mm)	46.2(±17.1)	42.7(±18.4)	0.06
AA MA(mm)	39.1(±18.6)	31.4(±18.0)	0.0001
ADP % Aggregation	74.0(±27.1)	65.4(±29.7)	0.02
AA Inhibition	26.0(±27.1)	34.6(±29.7)	0.02
ADP Aggregation	51.8(±35.9)	32.0(±33.4)	<0.0001
AA Inhibition	48.3(±35.9)	68.0(±33.4)	<0.0001

TEG-PM can accurately detect coagulopathy in patients on DOAC therapy and predict increased R-time.







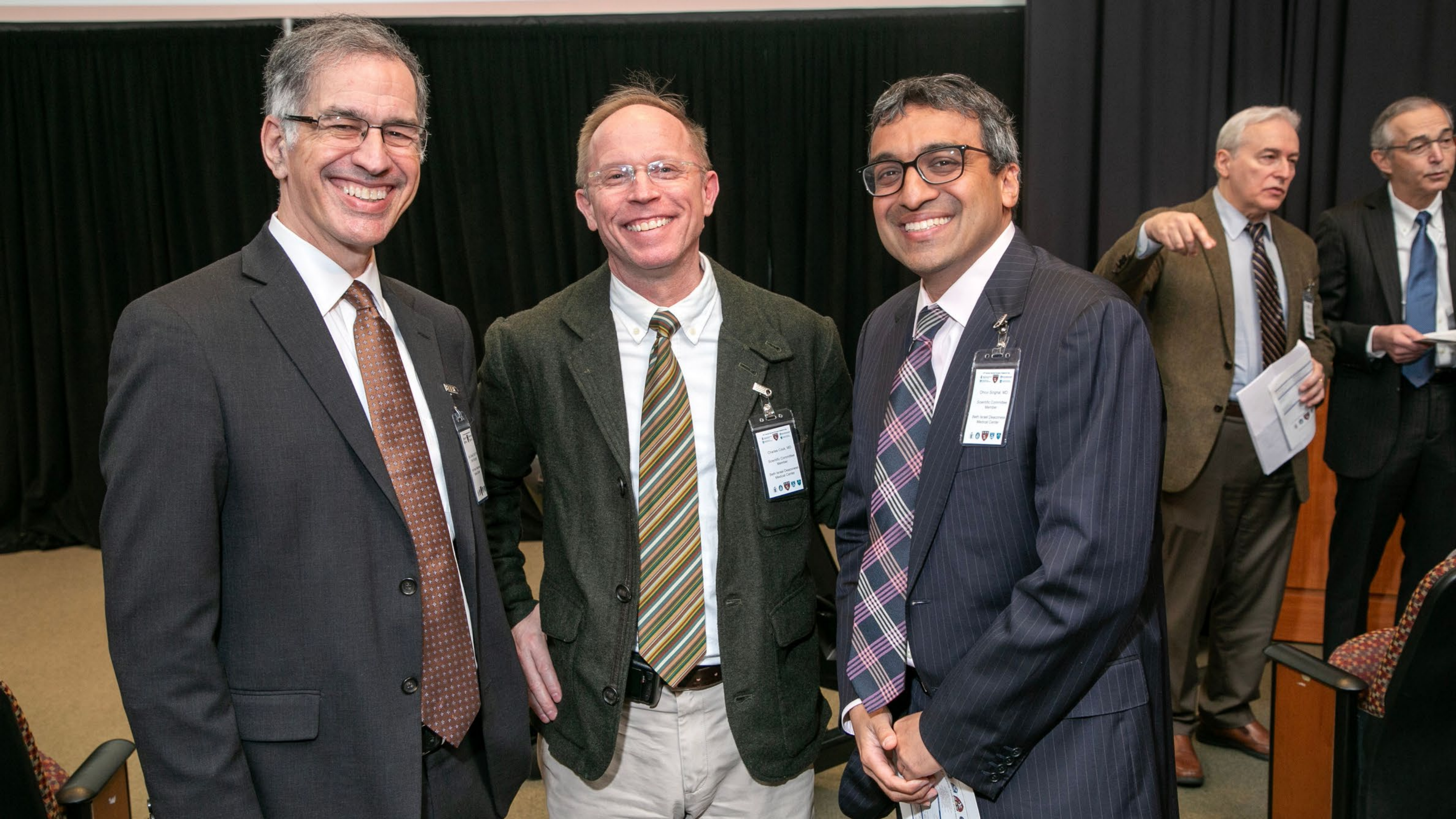




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...ostatic Symptoms (MTOPS) study was a multi-center, RCT (1...
 ...ect of **finasteride**, doxazosin, or a combination of both dru...
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 ...steroid 5 α -reductase inhibitors (**5ARI**) for BPH, the progression
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Response to Finasteride in the MTOPS Trial
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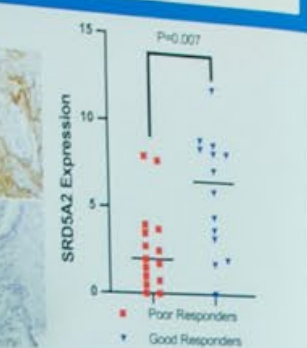


Figure 2: SRD5A2 expression in poor vs good responders.



Comparing Financial Hardship to Catastrophic Expenditure as Measures of Financial Toxicity after Surgery

Introduction

- Financial toxicity is the detrimental health expenditure.
- Catastrophic Expenditure (CE) is 10% of annual household income.
- Financial Hardship (FH) is inability to afford basic needs of life.

Results

800 surgical patients across 2 tertiary care hospitals

CATASTROPHIC EXPENDITURE IS HIGHEST IN VARIABLE PRIORITY SYSTEMS

FINANCIAL HARDSHIP HAS A DOSE-DEPENDENT RELATIONSHIP WITH CLINICAL PREDICTORS

Clinical Variables	Catastrophic Expenditure	Financial Hardship (FH)	Financial Toxicity (FT)
Length of stay	Yes	Yes	Yes
30-day readmission	Yes	Yes	Yes
30-day mortality	Yes	Yes	Yes
Emergency department visits	Yes	Yes	Yes
Unplanned hospitalizations	Yes	Yes	Yes
Healthcare costs	Yes	Yes	Yes
Quality of life	Yes	Yes	Yes
Health-related quality of life	Yes	Yes	Yes
Functional status	Yes	Yes	Yes
Depression	Yes	Yes	Yes
Healthcare utilization	Yes	Yes	Yes
Healthcare costs	Yes	Yes	Yes

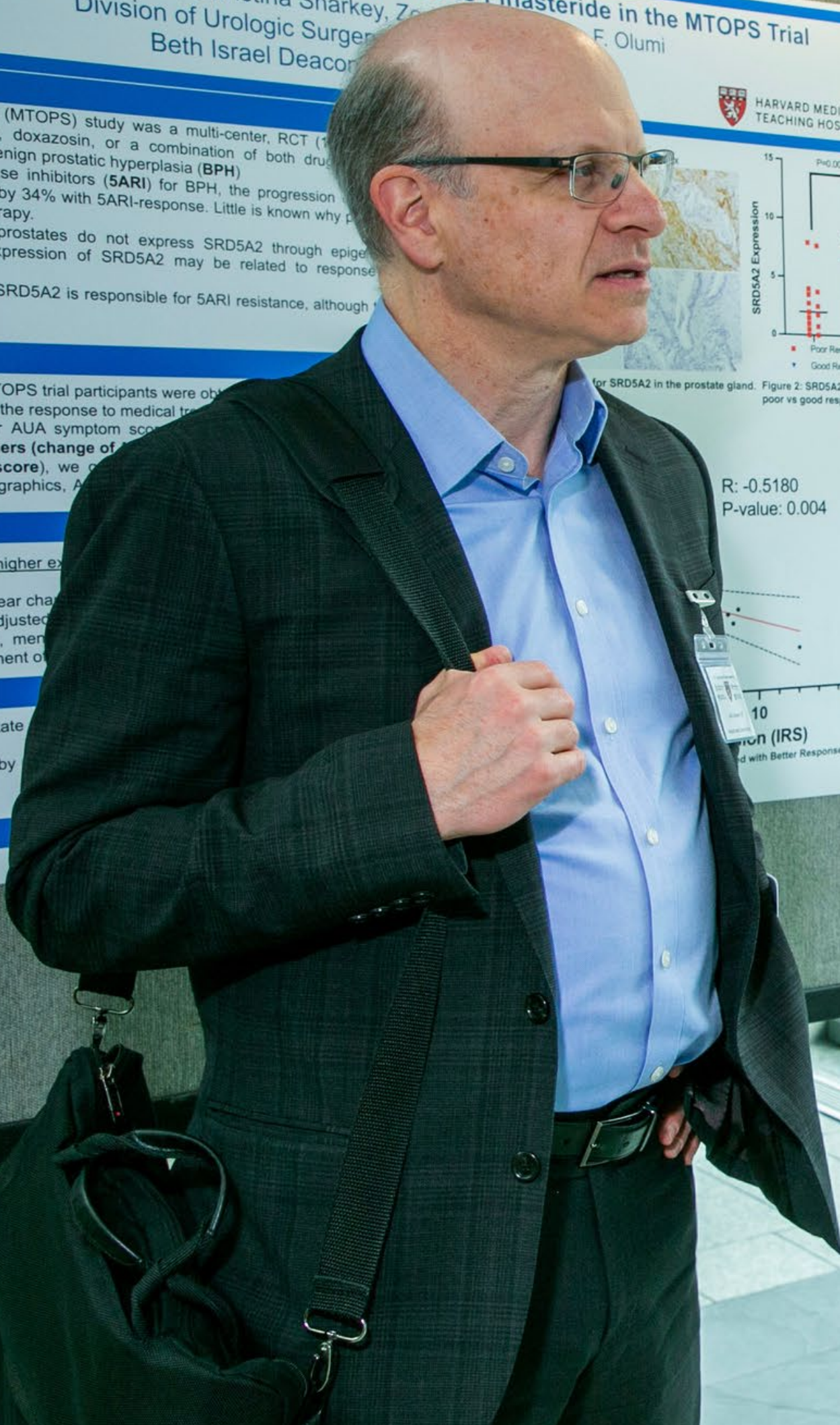
Conclusions

- Catastrophic Expenditure (CE) is the best measure of financial toxicity in surgical patients.
- Financial Hardship (FH) is a dose-dependent predictor of clinical outcomes.
- CE and FH together give a better representation of financial toxicity across healthcare settings.
- Characterization of FT through the use of FH is critical to improve patient surgical outcomes.

Methods

- Study Type:** Prospective multi-center, longitudinal study in 2 tertiary care hospitals in India.
- Study Setting:** Representation of public, private and variable priority healthcare centers.
- Statistical Analysis:** Multivariate logistic regression model with CE or FH as outcomes.

Contact: olumi@hs-n.harvard.edu









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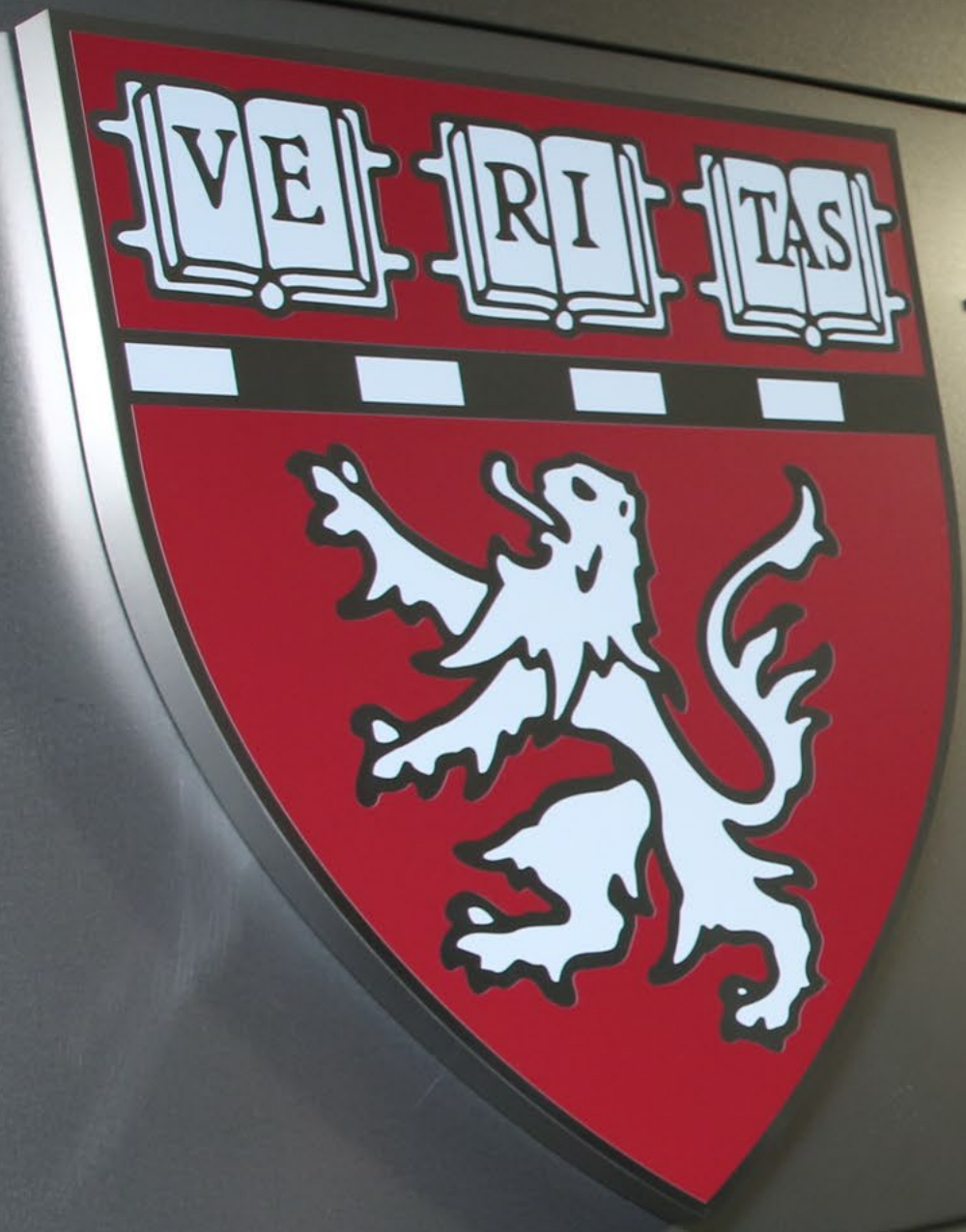
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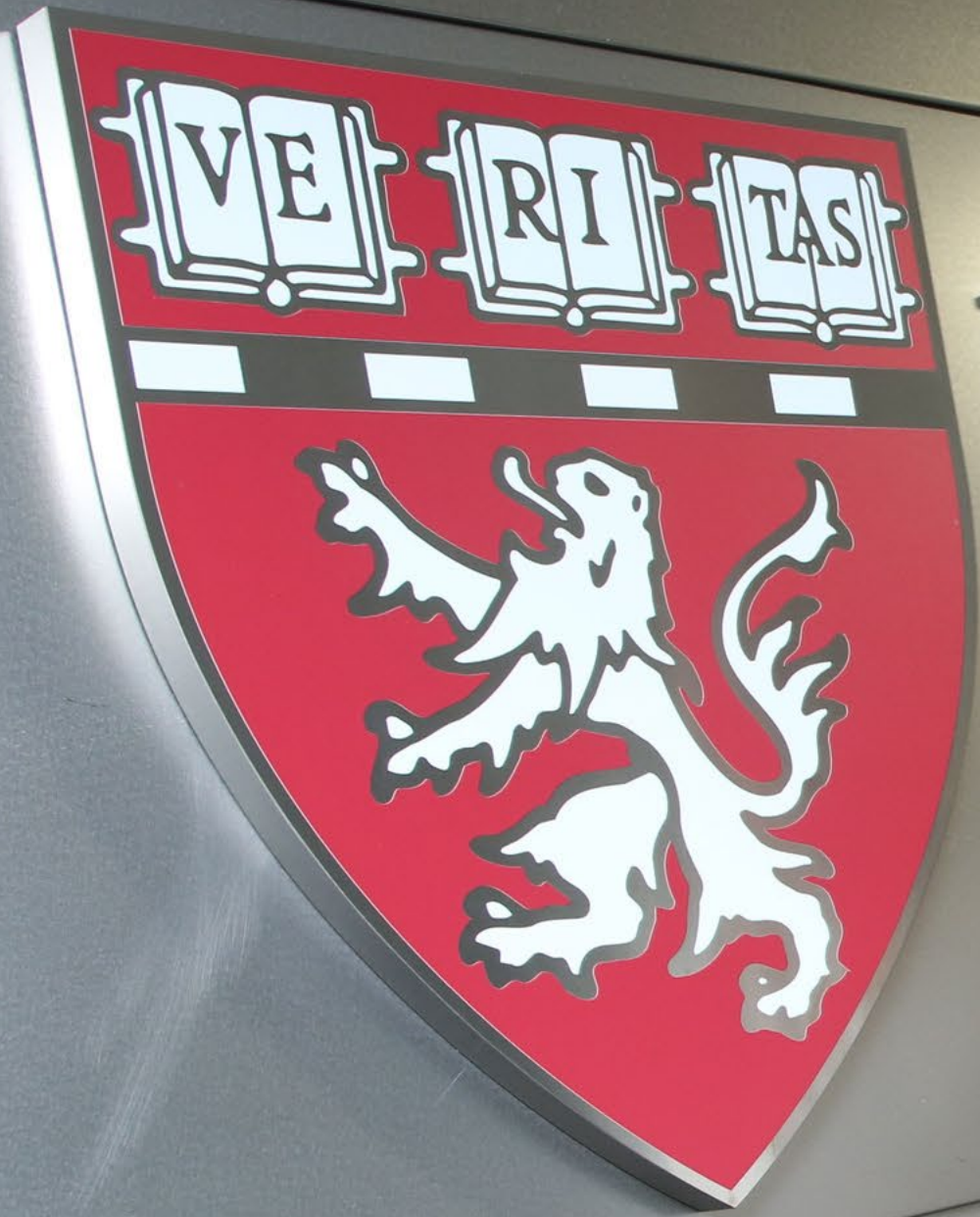




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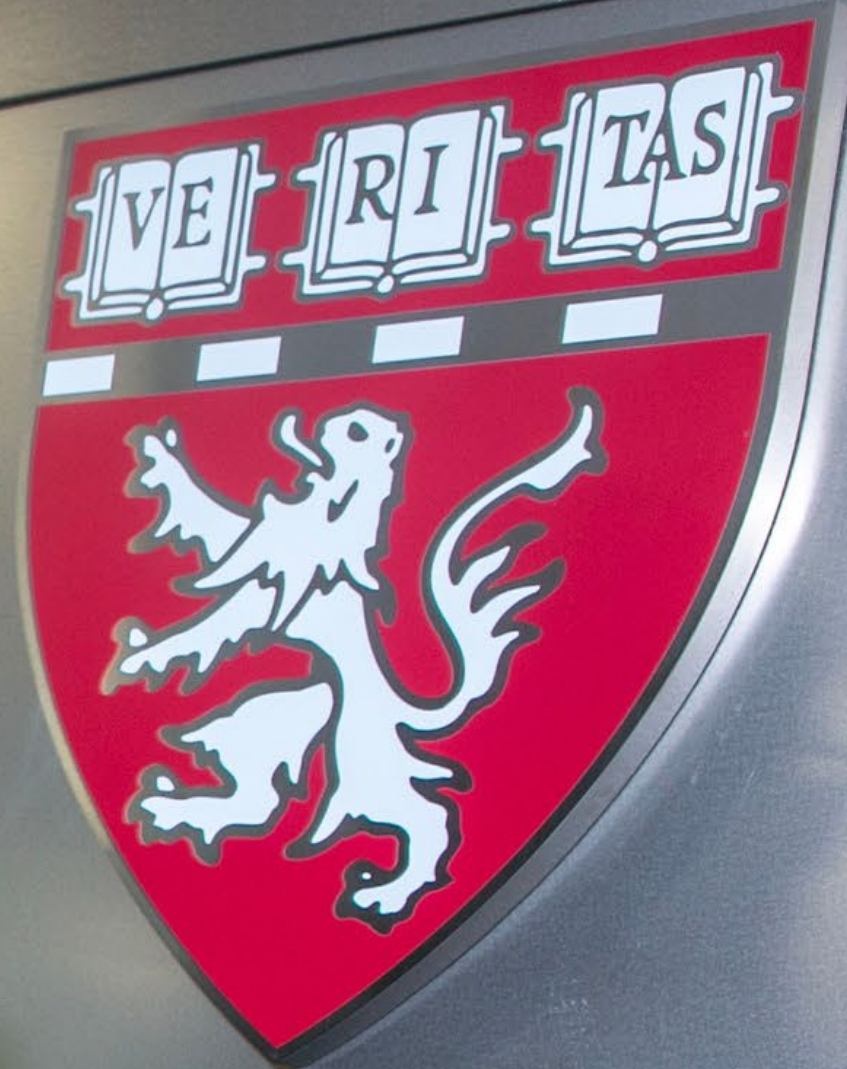


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Man in blue suit and glasses, holding a black folder.

Man in grey pinstriped suit and glasses, holding a blue folder with a flyer. Name tag: Tom Jasic, MD, PhD, Scientific Committee Member & Moderator, Boston Children's Hospital.

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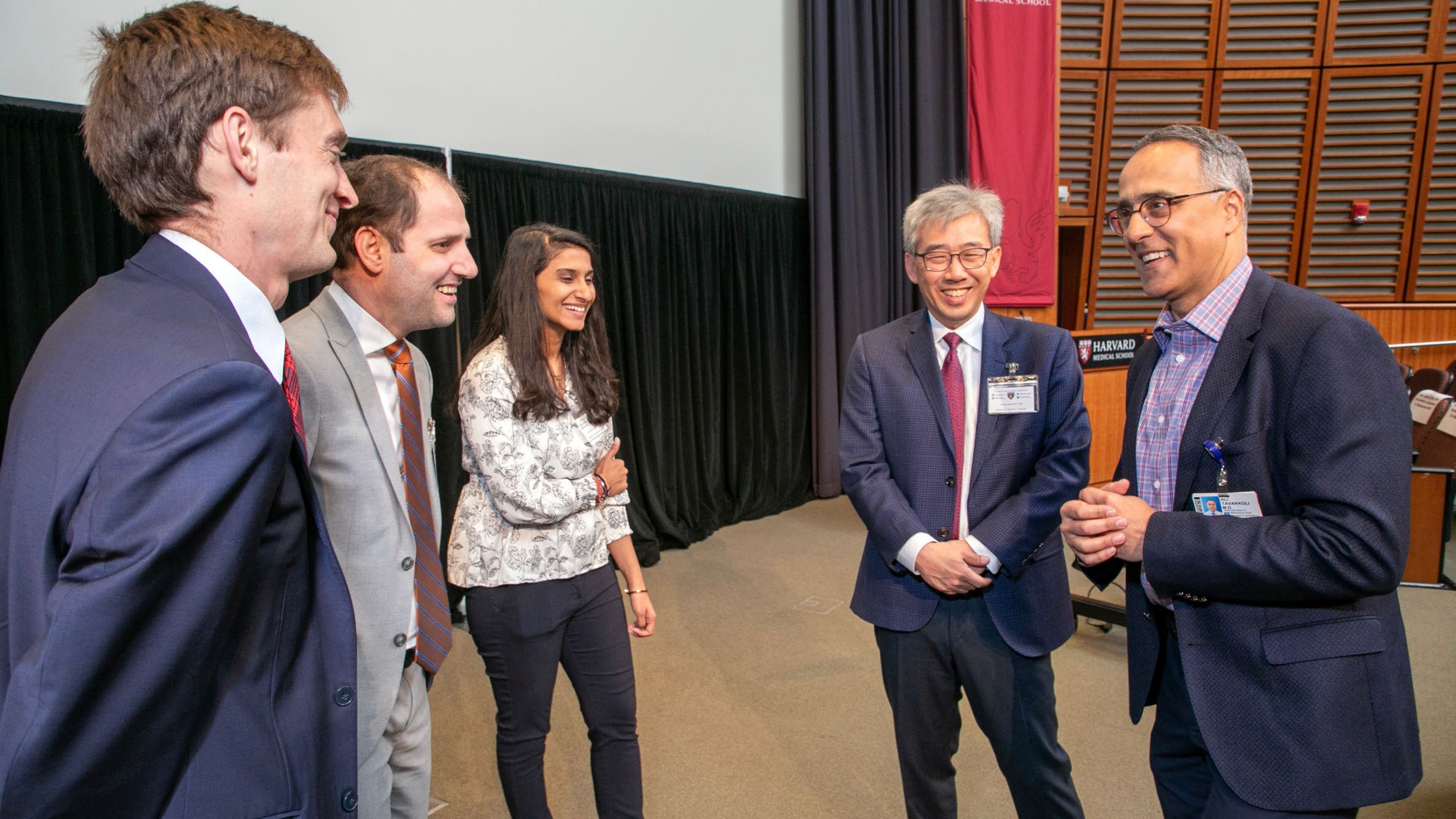


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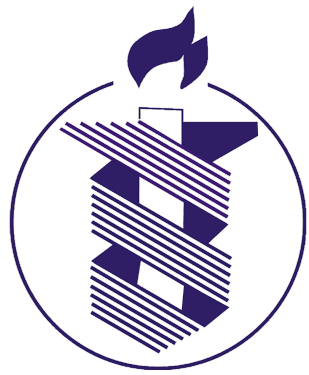
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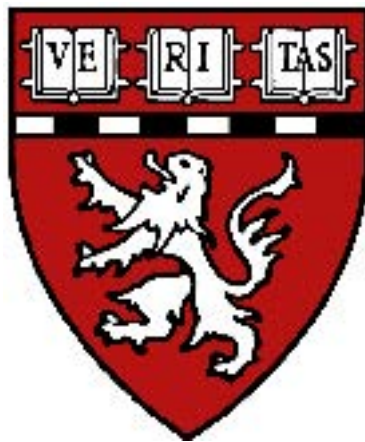




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