



SESSION I | 8:35AM-9:25AM

NORTHERN CALIFORNIA CHAPTER ACS  
ANNUAL MEETING

**MAY 15-17, 2026**

GRAND HYATT SAN FRANCISCO

[NCCACS.ORG/ANNUAL-MEETING](https://nccacs.org/annual-meeting)

## **Abstract #1 | Clinical Science | Transplant Surgery**

### **High Rate of Transplantation Prior to Review of Status Exception Requests among Adult Heart Transplant Candidates**

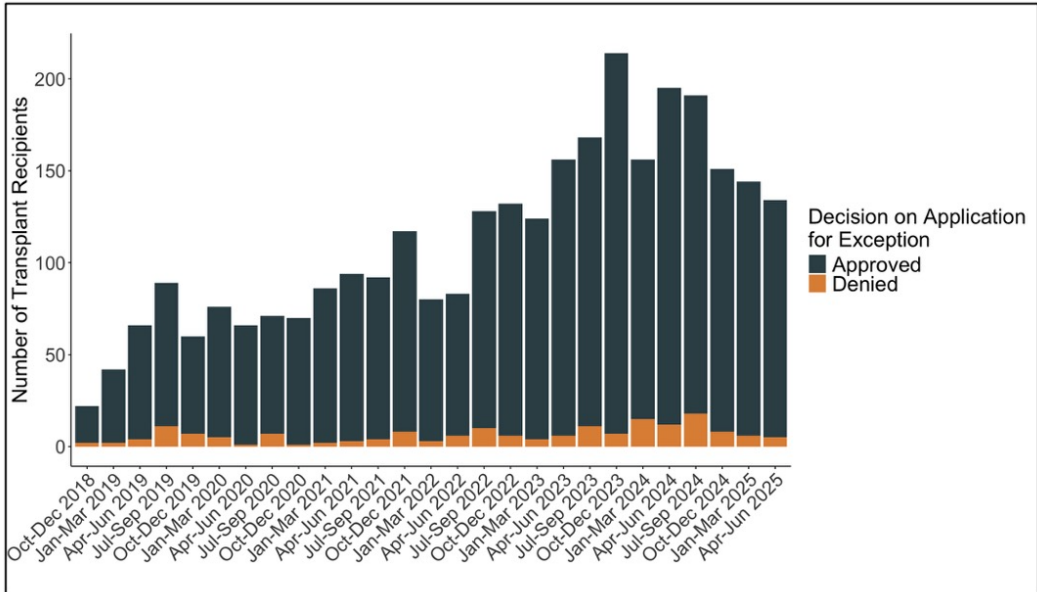
Daniel J Ahn MD, Toshihiro Nakayama MD, Antony Attia MBChB, Molly White MS, Dalin Eap BA, Nikhil Narang MD, Kiran K Khush MD, William Parker MD PhD, Kazunari Sasaki MD - Stanford University

**Background:** In the US heart allocation system, when transplant centers submit applications for status exceptions to increase waitlist priority, patients obtain the requested status upgrades immediately while their applications are sent to the regional review boards (RRBs) and reviewed retrospectively. How often transplants occur during this period is unknown.

**Methods:** Using the Scientific Registry of Transplant Recipients, we identified all adult heart transplant candidates listed between October 18, 2018 and May 31, 2025 with submitted applications for exceptions. We assessed the rate of heart transplantation during the time it takes for the applications to be received by the RRBs, stratified by whether the applications were eventually approved or denied. Additionally, we estimated how many listed patients were skipped by candidates who received transplants with exceptions that were ultimately denied.

**Results:** 138 transplant centers submitted status exception requests on behalf of 11,508 adult candidates during the study period, of whom 913 (7.9%) received a denial at least once. 3,007 out of 11,508 (26.1%) patients received transplants before the RRBs even received their applications, with 174 (19.1%) among 913 with eventual denials and 2,833 (26.7%) among 10,595 with approvals. This rate has increased over the study period (Figure). Candidates who received transplants with denied exceptions bypassed more than eleven thousand potential transplant recipients.

**Conclusions:** More than 25% of patients with status exception requests receive heart transplants before their applications are even received by their RRBs, raising significant concerns about the fairness of retrospective review of exception requests for the allocation of hearts.



**Figure: Trend of Heart Transplants with Exceptions before Application Receipt by the RRBs.** Black refers to transplants before review by regional review boards (RRBs) with exception requests that were approved, and orange refers to those with requests that were eventually denied. The total number of these transplants has increased since the policy change in October 2018 (Trend  $p < 0.001$ ).

## **Abstract #2 | Clinical Science | Transplant Surgery**

### **Machine Perfusion Mitigates Risk in Liver Transplantation Using Donors After Circulatory Death Aged $\geq 60$ Years**

Patrick J. Sur MD MPH, Yvonne Kelly MD, Naeem Goussous MD, Junichiro Sageshima MD, Lea Matsuoka MD, Sophoclis Alexopoulos MD - University of California, Davis

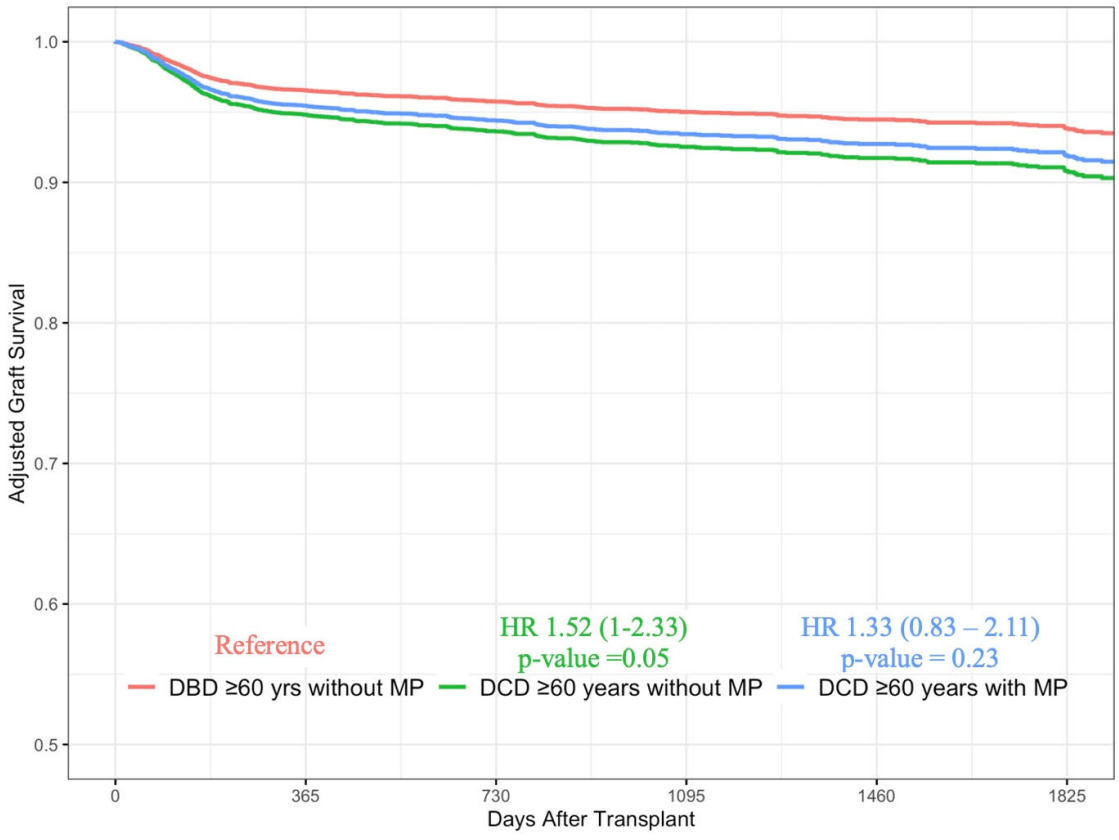
**Background:** Livers donated after circulatory death (DCD) from donors aged  $\geq 60$  years have historically been limited due to concerns of inferior graft survival. Machine perfusion (MP) has been proposed to mitigate ischemic injury and expand safe use of higher-risk grafts.

**Methods:** Adult liver transplant recipients in the UNOS database between 2018 to 2025 were analyzed (N = 8,885). Donors aged  $\geq 60$  years were categorized into three groups: (1) donation after brain death (DBD) without MP, (2) DCD without MP, and (3) DCD with MP. Multivariable Cox proportional hazards modeling adjusted for donor, recipient, and transplant factors. Adjusted graft survival curves were generated from the fitted model.

**Results:** Among older donors, recipients of DCD grafts with MP demonstrated graft survival comparable to recipients of DBD grafts without MP. In adjusted analysis, DCD grafts from donors  $\geq 60$  years that utilized MP were not associated with a meaningful increase in graft failure risk compared to DBD grafts obtained from similarly aged donor that did not utilize MP (adjusted hazard ratio 1.33, 95% CI 0.83 – 2.11, p = 0.23). Historically elevated risk observed in non-perfused DCD grafts was attenuated in the MP group.

**Conclusions:** In the contemporary era, liver transplantation using DCD donors aged  $\geq 60$  years with machine perfusion yields graft survival comparable to similarly aged DBD donors without perfusion. These findings support broader utilization of older DCD grafts with MP to safely expand the donor pool.

**Figure 1. Adjusted Graft Survival Among DCD vs DBD by Utilization of Machine Perfusion**



## Abstract #3 | Basic Science | Trauma/Critical Care

### Machine Learning–Based Correlation of Venous Morphology with Hemorrhagic Shock Stages Using Volumetric M-Mode Ultrasound in a Swine Model

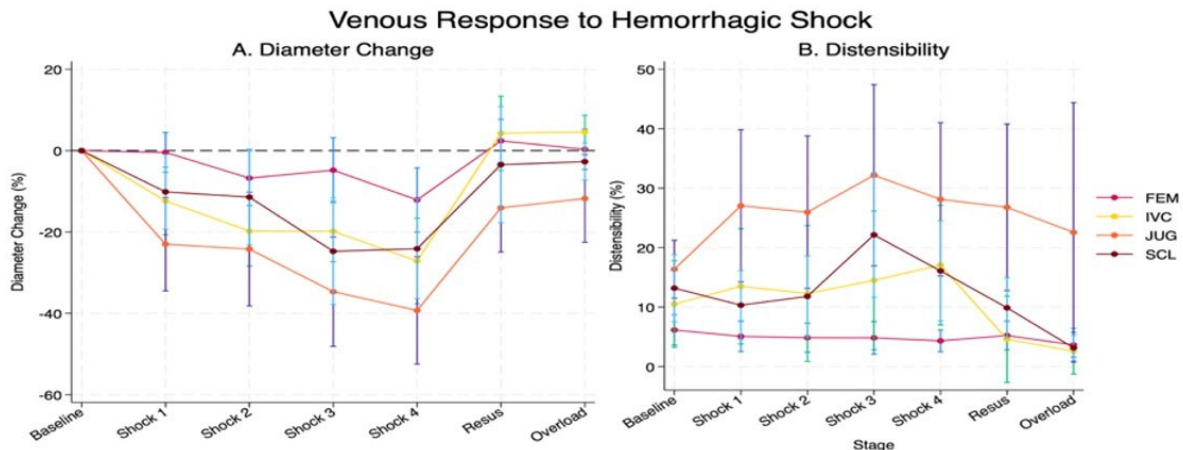
Sahil Patel, Tripti Mathur, Daniel Leotta, Michael Kohn, Lindsay Veazey - University of California, San Francisco

**Introduction:** Hemorrhagic shock remains a leading cause of preventable death, with recognition often delayed until compensatory failure. We sought to define reproducible central venous static and dynamic physiologic signatures of hemorrhage and resuscitation. To enable quantitative multi-vessel assessment, we developed volumetric M-Mode (VMM), a novel ultrasound method generating continuous venous datasets via lateral sweep and tilt.

**Methods:** Thirteen female Yorkshire pigs underwent staged hemorrhage (15%, 30%, 40%, 50% blood loss) followed by crystalloid resuscitation and fluid overload. The subclavian (SV), inferior vena cava (IVC), internal jugular (IJV), and femoral veins (FV) were imaged with VMM at baseline and each stage. Static collapse was defined as percent change in mean diameter from baseline; dynamic compliance as respiratory distensibility. Stage effects were analyzed across vessels.

**Results:** Progressive hemorrhage (Stages 0–4) produced a monotonic decline in venous diameter ( $-6\%$  per stage;  $p < 0.001$ ), with maximal reductions of  $\sim 25\text{--}40\%$  at Stage 4, most pronounced in the IJV and IVC; diameters partially normalized after resuscitation. Respiratory distensibility varied by stage (global  $p = 0.026$ ), increasing during intermediate-to-severe shock in the IJV and IVC, with minimal FV change, and decreasing after resuscitation and fluid overload. VMM datasets also permitted extraction of heart and respiratory rates consistent with intraoperative measurements.

**Conclusion:** Progressive hemorrhage and resuscitation generate reproducible central venous static and dynamic signatures that track shock severity across vessels. VMM provides a volumetric, operator-independent platform to quantify these patterns, supporting its potential for earlier hemorrhage detection and physiologic monitoring in trauma.



## **Abstract #4 | Clinical Science | Pediatric Surgery**

### **Optimizing Pediatric Cholecystectomy Pathways: A Quality Improvement Initiative to Reduce Delays and Imaging Utilization**

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#### **Objective:**

Delays in surgical management of pediatric gallstone disease remain common. This quality improvement initiative evaluated contributors to delayed surgical management and implemented a standardized care protocol to improve hospital length of stay (LOS), time to cholecystectomy (TTC), and imaging utilization.

#### **Methods:**

We conducted a retrospective cohort study of children  $\leq 18$  years old who underwent semi-urgent cholecystectomy during admission for symptomatic cholelithiasis (January 1, 2018, to May 31, 2023) at two pediatric hospitals within the same health system. Associations between hospital LOS and TTC  $> 2$  days and patient demographics, clinical characteristics, and system-level factors were analyzed using multivariable logistic regression. The findings informed a standardized algorithm emphasizing early surgical consultation and risk stratification for choledocholithiasis, which was implemented in July 2023. LOS, TTC, and preoperative magnetic resonance cholangiopancreatography (MRCP) utilization were compared before and after implementation.

#### **Results:**

Among 187 patients, 45% presented to the emergency department (ED) and 55% were transferred. Surgical consultation at presentation occurred in 74% of ED and 27% of transfers. Multivariable analysis demonstrated lower odds of LOS  $> 2$  days (OR 0.29, 95%CI 0.13-0.66) and TTC  $> 2$  days (OR 0.31, 95%CI 0.14-0.69) with early surgical consultation, independent of diagnosis and point of entry. Following protocol implementation, median LOS decreased from 3 to 2 days and median TTC from 2 to 1 day ( $p < 0.001$ ). MRCP utilization decreased from 39% to 24% ( $p = 0.013$ ).

#### **Discussion:**

Standardized, surgery-directed care pathways reduce LOS, TTC, and MRCP utilization, supporting broader implementation and further refinement of pediatric choledocholithiasis risk stratification strategies.

## **Abstract #5 | Basic Science | Plastic Surgery**

### **A Single-Cell Atlas Reveals the Surgical Imperative in Chronic Inflammatory Skin Tunnels: Endotypes with a Molecular Rationale for Excision**

Sekhon, Shaan; Uzoekwe, Miracle; Tompkins-Rhoades, Casey; Rajaii, Ramin; Hansen, Scott L. - UCSF

**Objective:** Hidradenitis suppurativa (HS) tunnels are epithelialized tracts that drive pain, chronic drainage, and scarring and often require wide excision and reconstruction. We built a consensus single-cell tunnel atlas to define recurrent fibro-inflammatory microenvironmental endotypes and resolve the cellular programs that may explain medical recalcitrance and surgical necessity.

**Method:** We constructed a unified single-cell atlas of 46 lesional hidradenitis suppurativa samples drawn from 8 independent cohorts, including whole-skin and enriched epidermal, dermal, immune, keratinocyte, and follicular/tunnel fractions. After standardized quality control, normalization, and highly variable gene selection, Harmony integration generated a shared latent space. We applied unsupervised clustering, cell-type annotation, and gene-set scoring to assign sample-level dominance of inflammatory and fibrotic programs.

**Results:** Integrated embeddings showed appropriate intermixing by study within major lineages, with enriched fractions localizing to expected myeloid, lymphoid, and epithelial neighborhoods, supporting preserved biological structure across platforms. Within tunneled lesions, we identified recurrent endotypes across cohorts: a pyogenic myeloid endotype enriched for IL1B/CXCL8/NLRP3; a Th17/JAK endotype with IL17/IL23/STAT activity; and a fibro-ECM endotype enriched for TGF $\beta$ /PDGF/collagen and Hippo-associated stromal signatures. Pathway scores demonstrated marked inter-patient heterogeneity, with samples dominated by distinct programs despite similar clinical labels.

**Discussion:** As the largest integrated single-cell atlas of HS to date, these data shift care from escalation to mechanism-aligned management. A fibrosis-dominant, low-inflammatory tunnel state explains biologic non-response and supports earlier wide excision and reconstruction as definitive therapy in selected patients. Atlas-informed stratification could guide operative timing, reconstruction planning, and rational perioperative pairing with targeted agents in prospective, endotype-guided studies.

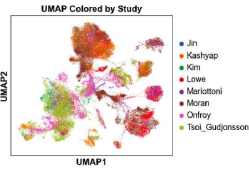


Figure 1: UMAP Colored by Study

UMAP projection colored by Study ID demonstrates effective batch correction, with disparate datasets intermixing to form a unified biological manifold.

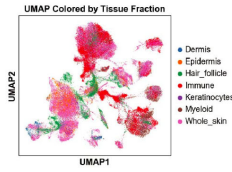


Figure 2: UMAP Colored by Tissue Fraction

UMAP colored by Tissue Fraction confirms biological consistency; "Whole skin" samples span the topology, while sorted compartments (e.g., "Immune") map exclusively to their respective lymphoid and myeloid clusters.

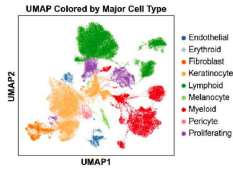


Figure 3: UMAP Colored by Major Cell Type

Resolution of the major cutaneous lineages. We identify discrete, stable clusters representing the core components of the HS tunnel: Keratinocytes (epithelial lining), Fibroblasts (scarring), Endothelial/Pericytes (vasculature), and distinct Lymphoid/Myeloid inflammatory populations.

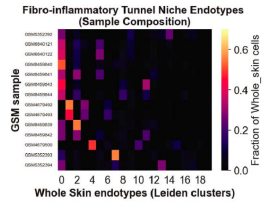


Figure 5: Enrichment of Tunnel Niche Endotypes Across Samples

Heatmap summarizing the sample-level distribution of de novo-defined HS tunnel niche endotypes derived from Leiden clustering of Harmony-integrated whole-skin lesions. Each column represents an individual patient sample and each row corresponds to an endotype, with color intensity reflecting relative enrichment.

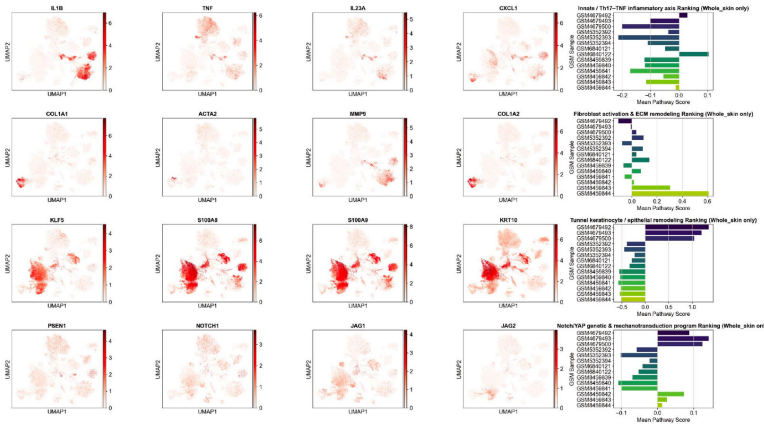


Figure 4: Pathogenic Axes Across the Meta-Integrated HS Atlas

UMAP feature plots depicting the spatial distribution and relative intensity of four HS-relevant pathogenic programs across the Harmony-integrated consensus manifold. Each panel visualizes either representative marker-gene expression or a gene-set/module score (scaled within the atlas) to show where core disease biology concentrates within the cutaneous ecosystem rather than appearing uniformly across all cells.

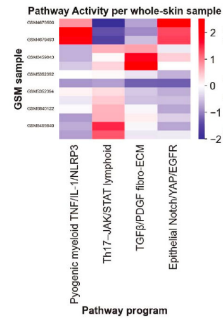


Figure 6: Patient-Specific Stratification via Druggable Pathways

Sample-level scoring of druggable pathways demonstrating significant inter-patient heterogeneity. Each column represents a patient sample, sorted by their dominant pathogenic driver.

## Abstract #6 | Clinical Science | Surgical Oncology

### Rethinking the Staging System for Malignant Peritoneal Mesothelioma: A Data-Driven Survival Tree Algorithm

Laleh Foroutani, MD; Andrew Gonzalez, MD; Sophia Hernandez, MD, MS; Thomas Li, MD; Jane Wang, MD; Lucia Calthorpe, MPhil, MD; Kenzo Hirose, MD; Eric Nakakura, MD, PhD; Carlos Corvera, MD; Adnan Alseidi, MD, EdM; M. Haroon Choudry, MD; Mohamed Abdelgadir Adam, MD - UCSF

**Introduction:** Malignant peritoneal mesothelioma (MPM) is a rare, aggressive malignancy with diffuse peritoneal spread, limiting applicability of conventional TNM staging. Current guidelines rely primarily on Peritoneal Cancer Index (PCI), which provides suboptimal prognostic discrimination. We developed a data-driven staging model integrating PCI with clinicopathologic variables to improve risk stratification.

**Methods:** Patients with MPM undergoing cytoreductive surgery at a single center (2001–2022) were analyzed. Recursive feature elimination identified prognostic variables. Conditional inference survival trees generated hierarchical staging groups maximizing overall survival (OS) separation. Performance was compared against the NCCN-recommended PCI-based staging system proposed by Yan et al.

**Results:** Among 172 patients (63% women), median age was 60 years and median PCI was 17; 86% had epithelioid histology. Higher mitotic rate, biphasic/sarcomatoid histology, higher PCI, and symptom progression independently predicted worse OS (all  $p < 0.05$ ). The algorithm produced four prognostic stages ( $p < 0.01$ ): Stage I [mitotic rate  $\leq 3$ , PCI  $\leq 10$ ]; Stage II [mitotic rate  $\leq 3$ , PCI  $> 10$ ]; Stage III [mitotic rate  $> 3$ , epithelioid]; Stage IV [mitotic rate  $> 3$ , biphasic/sarcomatoid]. Median OS was not reached for Stage I, 42 months for Stage II, 22 months for Stage III, and 5 months for Stage IV. In contrast, the traditional system showed overlapping survival across stages, confirming superior discrimination with the new model.

**Conclusions:** The current PCI-based staging framework for MPM appears to be suboptimal in discriminating risk of OS among disease stage groups. Incorporating mitotic rate and histology significantly improves survival prediction and may inform treatment selection.

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## **Abstract #7 | Clinical Science | Thoracic Surgery**

### **The Role of a Novel Intraoperative Imaging Technique for Ground Glass Opacities (GGO) During Video Assisted Thoracic Surgery (VATS): Findings from an Integrated Health System**

Elaine Liang, Alison S. Baskin, Sabrina K. Zhong, Jingrong Yang, Keza Levine, Jeffrey B. Velotta - Kaiser Permanente Bernard J. Tyson School of Medicine

**Objective:** Intraoperative visualization of ground glass opacities (GGOs) remains challenging, with past techniques limited by safety concerns and poor margin assessment. We evaluate the utility of pafolacianine, an intraoperative molecular imaging (IMI) agent for GGO visualization.

**Methods:** We conducted a prospective study from an integrated health system of patients undergoing video-assisted thoracoscopic surgery (VATS) lung resections for GGOs from 6/1/2025-8/31/2025. Pafolacianine was administered intravenously one hour preoperatively. Lung parenchyma was inspected for fluorescence using Stryker 1788 imaging before resection. Real-time intraoperative and postoperative surveys were completed, and chart review was performed to collect sociodemographic, pathologic, and surgical outcome data.

**Results:** Twenty-one patients (median age 70 years), predominantly female (62%), Asian (48%), and never-smokers (71%), underwent VATS with a median hospital stay of one day. IMI prompted escalation to completion lobectomy in 10% of patients. Among 19 non-metastatic patients, 26 lesions (median diameter 14 mm) were resected, the majority of which were pure GGOs (69%). IMI detected all malignant lesions, with 27% identified exclusively by IMI. Adenocarcinoma accounted for 62% of lesions, while 23% were benign. IMI had a positive predictive value of 0.76 (95% CI, 0.54–0.90) and false discovery rate of 0.24 (95% CI, 0.10–0.46). All margins were negative and no adverse events were reported.

**Discussion:** This exploratory real-world study suggests that pafolacianine facilitates optimal intraoperative visualization of challenging GGO lesions, supporting its potential to improve surgical decision-making, tumor detection, and margin assessment during VATS lung resections.

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## Abstract #8 | Clinical Science | Breast Surgery

### Impact of Guideline Concordant Care and Pathologic Complete Response on Disease-Free Survival in Inflammatory Breast Cancer: A Single-Institution Study

Anna Vertido, Yanying Chen, Astrid Quirarte, Natalie Kim, Jackelyn Moya, Sarah Choi, Elisabeth Abeles, Julia Chandler, Julia Ye, Yunn-Yi Chen, Rita A. Mukhtar - University of California San Francisco

**Objective:** Inflammatory breast cancer (IBC) is traditionally treated with neoadjuvant systemic therapy (NST), modified radical mastectomy (MRM) without immediate reconstruction, and post-mastectomy radiation. Whether this approach can be de-escalated is debated. We evaluated whether non-guideline concordant care (GCC) is associated with worse disease-free survival (DFS) after accounting for pathologic complete response (pCR).

**Methods:** We conducted a single-center retrospective analysis of patients with non-metastatic IBC treated between 1995-2025. Cases were identified by confirming documented diagnosis of IBC in the medical record. Those who received breast conservation, sentinel node surgery alone, or immediate reconstruction were classified as receiving non-GCC. DFS was estimated using Kaplan-Meier methods and compared across four groups: GCC+pCR, GCC+no pCR, non-GCC+pCR, and non-GCC+no pCR. Multivariable Cox models were used to estimate hazard ratios (HRs), adjusting for age, receptor subtype, pathologic T and N stage, and tumor grade.

**Results:** We identified 126 IBC patients with median follow-up of 6.6 years. All patients received NST, with an overall pCR rate of 22.2% and five-year estimated cumulative DFS of 48.6%. On both univariate and multivariate analyses, there was no association between non-GCC and DFS. In contrast, patients with pCR had significantly improved DFS even in the absence of GCC (HR 0.26, 95% CI 0.07-0.96).

**Conclusion:** We found that DFS was determined by response to NST rather than extent of locoregional therapy. These findings question the current treatment paradigm for those with IBC, and support further evaluation of the safety of breast conservation, sentinel node surgery, and immediate reconstruction in those with IBC.

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## **Abstract #9 | Clinical Science | Breast Surgery**

### **The Impact of Race/Ethnicity on Survival in Secondary Triple Negative Breast Cancer**

Ana Isabel Jacinto MD, Theresa Keegan PhD, Qian Li MS, Fran Maguire PhD, Candice Sauder MD - UC Davis Health

**Objective:** Survival in women with secondary breast cancer, and those with triple negative breast cancer (TNBC), is worse for young women, especially non-Hispanic (nH) Black women. We hypothesize this is related to treatment received. We aim to identify if treatments used for secondary triple negative breast cancer are associated with survival differences by race/ethnicity.

**Methods:** Females, aged 15-50 years, diagnosed with a TNBC during 2003-2019 were identified using the California Cancer Registry. Multivariable logistic regression compared characteristics of secondary vs primary TNBC. Multivariable Cox proportional hazards regression models evaluated associations of secondary vs primary TNBC on overall survival (OS) and breast cancer specific survival (BCSS). Analyses were stratified by race/ethnicity.

**Results:** Of 682 women with a secondary TNBC, 48.5% were nH White, 11.3% were nH Black, and 31% were Hispanic. All women with a secondary TNBC (vs primary TNBC) were more likely to receive a mastectomy and non-anthracycline based chemotherapy. nH White women were less likely than women of other races/ethnicities to have axillary lymph node dissections. Hispanic and nH White women with a secondary (vs primary) TNBC experienced worse OS and BCSS, which was not seen in nH Black and Asian/Pacific Islander women (Figure 1).

**Conclusion:** While treatments were similar for secondary vs primary TNBCs by race/ethnicity, Hispanic and nH White women with secondary TNBC experienced worse survival. Our findings suggest that tumor biology, rather than treatment, differs in secondary TNBC, warranting different treatment algorithms to improve outcomes.

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## **Abstract #10 | Clinical Science | Colorectal Surgery**

### **Patterns of Oncologic Management and Survival Outcomes in Rectal and Anal Adenocarcinoma: A National Cancer Database Study**

Hannah Chay BS, Fabian Ramirez, Laleh Foroutani MD, Saffanat Sumra, Mark Zhao MD2 - University of California San Francisco

**Background:** Rectal adenocarcinoma (RA) is a leading cause of cancer-related mortality with rising incidence. While treatment guidelines for RA are established, management of anal adenocarcinoma (AA) remains poorly characterized. This study compares treatment patterns for RA versus AA.

**Methods:** Using the National Cancer Database, adults with non-metastatic RA or AA diagnosed from 2010–2022 were identified. Patients were stratified into five treatment groups: neoadjuvant chemoradiation (CRT) + surgery, total neoadjuvant therapy (TNT) + surgery, TNT + watch-and-wait (WW), upfront surgery + adjuvant therapy, and upfront surgery alone. Kaplan-Meier analysis assessed overall survival (OS), while multivariate Cox regression identified predictors for OS.

**Results:** Of 173,566 patients, 169,754 (97.8%) had RA and 3,812 (2.2%) had AA. The most common approach for RA was CRT + surgery (29.2%), while TNT + WW was the most frequent approach for AA (27.8%). Surgery rates were lower for AA (70.4%) compared to RA (87.6%). OS differed significantly by treatment in both groups with TNT + surgery achieving the longest survival for RA and multimodal approaches yielding comparable outcomes in AA. Non-operative management was associated with poorer OS for both groups. Multivariable analysis showed TNT + surgery improved survival in RA (HR 0.90,  $p < 0.001$ ), while TNT + WW was associated with worse OS in AA (HR 1.68, HR 2.84,  $p < 0.001$ ).

**Conclusion:** AA is more often managed non-operatively, potentially reflecting anatomic constraints or extrapolation from anal squamous cell carcinoma management. However, non-operative treatment was associated with worse survival, emphasizing the need for further research to optimize AA treatment strategies.

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## **Abstract #11 | Clinical Medicine | Colorectal Surgery**

### **Enhancing Watch-and-Wait Rectal Cancer Surveillance: Evaluation of an Automated Informatics-Based “Health Maintenance Plan”**

Jon Freise, Hueylan Chern, Elizabeth Wick, Emily Finlayson, Madhulika G. Varma, Beiqun (Mark) Zhao - UCSF

#### **Objective:**

To evaluate an automated informatics tool designed to centralize surveillance for patients with rectal cancer enrolled in watch-and-wait (WW).

#### **Background:**

Although WW provides an organ-preservation strategy for rectal cancer, up to one-third of patients on WW may experience local regrowth or distant recurrence, necessitating strict surveillance adherence. However, maintaining adherence is challenging for both patients and providers.

#### **Methods:**

To evaluate the impact of a centralized and automated informatics-based “health maintenance plan” (HMP) integrated into the electronic health record designed for WW surveillance, we compared surveillance adherence before and after the HMP activation date using Chi-square testing. The pre-HMP cohort included 12 months prior to activation date while the post-HMP cohort included 7 months following a 3-month implementation phase after HMP activation. Adherence was assessed after patients completed  $\geq 6$  months of active WW surveillance.

#### **Results:**

Table 1 lists the adherence rates by surveillance modality in the pre-HMP and post-HMP cohorts. Endoscopic adherence improved from 75.8% to 86.1% ( $p=0.02$ ) and CEA adherence improved from 52.2% to 68.5% ( $p<0.01$ ). CT and MRI adherence did not differ significantly. 15.6% ( $n=7$ ) of patients in our registry ( $n=45$ ) had regrowth.

#### **Conclusion:**

The automated HMP tool may streamline provider workflow by centralizing WW surveillance and decreasing provider burden. With ongoing training and integration efforts, the HMP has the potential to reduce resource utilization for adherence monitoring while maintaining or improving overall surveillance adherence. Future efforts will focus on continued workflow optimization with the HMP and addressing additional barriers to WW surveillance adherence.

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## **Abstract #12 | Clinical Science | Thoracic Surgery**

### **Prevalence of Lung Cancer in Never-Smoking Asian American Women by Ethnicity and Cancer History: Findings from an Integrated Healthcare System in Northern California**

Bani Kaur, Avinav Biswas, Tyler Chervo, MPH, Woo Jin Ahn, MD, Shangzi Gao, BS, Dang Nguyen, BS, Carissa A. Villanueva, MD, Seth J. Tivakaran, Malathi Srinivisan, MD, Nicholas L. Panyanouvong, MS, Lester Andrew V. Uy, BS, Nitya Rajeshuni, MD, MS, Robert J. Huang, MD, MS, Neil Kamdar, MS, Osamu Yasui, MS, Gloria S. Kim, MD, Latha Palaniappan, MD, MS, Jeffrey B. Velotta, MD, FACS - Stanford University School of Medicine, Palo Alto, CA, USA

#### Objective

Despite declining U.S. lung cancer incidence, rates among never-smoking Asian American (AsA) women are rising. Prior studies often aggregate Asian populations, obscuring subgroup differences. We compared primary lung cancer prevalence across disaggregated AsA subgroups and examined associations with personal and family cancer histories relative to Non-Hispanic Whites (NHW).

#### Methods

Analyzing electronic health records from a large Northern California integrated health system (2010–2022), we stratified 1,843,119 women by smoking status and ethnicity (Chinese, Japanese, Filipino, Korean, Vietnamese, Other Asian). Targeted maximum likelihood estimation (TMLE), a flexible double-robust estimator, calculated adjusted prevalence ratios (aPRs) for never-smoking AsA subgroups relative to NHW, adjusting for sociodemographic and clinical characteristics.

#### Results

Among 2,429 never-smoking cases, aPRs were highest in Chinese (aPR 3.36 [95% CI: 3.20–3.53]) and Filipino women (2.68 [2.55–2.82]), followed by Vietnamese (2.07 [1.96–2.18]), Japanese (1.99 [1.89–2.10]), and Korean (1.90 [1.80–2.00]). Conversely, prevalence was lower in Other Asians (0.35 [0.33–0.37]). Personal cancer history nearly tripled prevalence in Koreans (2.91 [2.76–3.06]), while family cancer history increased prevalence in Chinese women (1.51 [1.42–1.60]). Uterine cancer history also elevated risk in Chinese women (1.91 [1.58–2.31]).

#### Discussion

Never-smoking AsA women exhibit significant heterogeneity in lung cancer prevalence. Markedly elevated risks in specific subgroups, alongside associations with personal and family cancer histories, underscore the urgent need for disaggregated, history-informed screening guidelines to improve early detection and targeted prevention.

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## **Abstract #13 | Advocacy | General Surgery**

### **Exploring Geographic Differences in Minimally Invasive Whipple: A Joinpoint Regression Analysis**

Architha Kannan, Laleh Foroutani, Jane Wang, June Peng, Kimberly Kirkwood, Kenzo Hirose, Eric Nakakura, Carlos Corvera, Ajay Maker, Adnan Alseddi, Mohamed Adam - University of California San Francisco

Minimally invasive pancreaticoduodenectomy (MIPD) is of increasing interest, yet regional and temporal adoption trends remain underexplored. This study examined adjusted adoption patterns of MIPD and open pancreaticoduodenectomy (PD) across the United States.

**Methods:** Adults with non-metastatic pancreatic adenocarcinoma undergoing PD were identified from the National Cancer Database (2010–2021). Descriptive statistics characterized demographic and clinical variables. Joinpoint regression with chi-square and t-tests assessed trends in open, laparoscopic, and robotic PD utilization. Average Annual Percent Change (AAPC) evaluated regional adoption rates.

**Results:** Among 53,704 patients, 77% underwent open, 16.9% laparoscopic, and 5.8% robotic PD. Laparoscopic PD was the predominant MIS approach across all regions. The West and Northeast had the highest laparoscopic proportions (19.38% and 18.32%), while the South had the lowest (15.36%,  $p < 0.001$ ). All regions showed increasing laparoscopic adoption, though the Midwest had the slowest growth (AAPC +2.6%) versus the West (+6.6%), South (+5.0%), and Northeast (+4.7%,  $p < 0.001$ ). For robotic PD, the Northeast had the highest proportion (6.65%), while the South, West, and Midwest showed the steepest growth (AAPC +35.6%, +25.5%, +21.3% vs. Northeast +13.0%,  $p < 0.001$ ). Open PD declined across all regions (AAPCs: West -2.4%, Midwest -1.5%, South -2.4%, Northeast -1.8%,  $p < 0.001$ ).

**Conclusion:** MIPD adoption varies significantly across US regions. Laparoscopic PD remains the dominant MIS approach, while robotic PD is growing fastest in the West and Midwest. These trends have implications for surgical training, resource allocation, and safe implementation of MIPD.

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## **Abstract #14 | Clinical Science | Vascular Surgery**

### **From Prevention to Intervention: A Quality Improvement Program for Peripheral Artery Disease at a Safety Net Hospital**

Tripti Mathur, MBBS, Ariyan Tabesh, MD, Sahil Patel, MD, Britton Hart, NP, Camille Jackson, MD, Shahram Aarabi, MD - UCSF-East Bay Surgery Program

**Objective:** Peripheral Artery Disease (PAD) affects over 12 million Americans, disproportionately impacting underserved populations. Patients at safety-net hospitals (SNHs) frequently present with advanced diseases, including critical limb-threatening ischemia (CLTI), leading to high amputation rates (~25% annually). Despite its prevalence, PAD remains underdiagnosed. We hypothesize that a structured limb-salvage program enabling early identification and intervention reduces adverse limb events at an urban SNH.

**Methods:** In 2019, we launched a vascular surgery program focused on limb salvage, expanding from 0 full-time vascular surgeons pre-2019 to 2.5 by 2023. Program initiatives included multidisciplinary PAD care (2022), full endovascular capabilities (2023), EMR-based PAD registry stratifying patients as “At-Risk for PAD” or “CLTI” (2024). Primary outcomes include amputation and limb-salvage procedure rates.

**Results:** Our registry identified 47,876 At-Risk and 1,301 CLTI patients. Annual CLTI encounters increased from 208 (2021) to 922 (2025). Amputation rates peaked early during program implementation (16% in 2022) and declined to 2.6% by 2024-2025 (Figure 1). Limb-saving interventions increased from 49 (2021) to 111 (2025); the proportional rate declined, reflecting rapid denominator expansion from broader capture of earlier-stage disease rather than reduced limb-salvage delivery. Using registry data, we initiated dedicated CLTI surveillance clinics, community partnerships for at-risk screening, and obtained approval for 1.5 additional FTE-vascular surgeons in 2025.

**Conclusion:** A structured limb salvage program with increased vascular surgeon availability improved access and outcomes for PAD patients at a SNH. Future steps include expanding EMR-based PAD screening, implementing full-time vascular call coverage, and collaborating with other SNHs to enhance outcome tracking and standardize interventions.

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## **Abstract #15 | Clinical Science | Breast Surgery**

### **Upgrade Rates of Fibroepithelial Lesions within a Large, Integrated Healthcare Delivery System**

Wong-On-Wing, Annie, MD; Wade, Elijah, MPH; Dzubnar Barker, Jessica, MD; Kwak, Hyunjee, MD; Ritterman Weintraub, Miranda, PhD, MPH; Shim, Veronica, MD - University of California San Francisco, East Bay

#### **Background**

Fibroepithelial lesions (FEL) diagnosed via core needle biopsy (CNB) may represent benign fibroadenomas or rarely phyllodes tumors. 2025 American Society of Breast Surgeons (ASBrS) and Society of Breast Imaging (SBI) Guidelines do not recommend surgical excision for most FEL, unless there is suspicion for phyllodes, but there is a paucity of data on real-world upgrade rates.

#### **Methods**

This is a retrospective cohort study of 369 patients with an FEL on CNB between January 1, 2022 and December 31, 2022. Adults aged 18 and older with a FEL without atypia and no diagnosis of breast cancer within six months before or after their CNB were included. Pearson's chi-squared or Fisher's exact tests were used for categorical variables, and Wilcoxon-rank sum test or Kruskal-Wallis tests for continuous variables that were not normally distributed.

#### **Results**

A total of 119 of 369 patients (32%) underwent surgical excision of their FEL (Table 1). On CNB, 7 (5.9%) were diagnosed as benign phyllodes, 3 (2.5%) as borderline phyllodes, and 69 (58%) as indeterminate; there were no malignant phyllodes on CNB or final pathology. Among patients with fibroadenoma diagnosed on CNB, only 1 of 40 (2.5%) upgraded to borderline phyllodes on final pathology. In contrast, the 69 patients with indeterminate lesions, 19 (28%) upgraded to benign phyllodes and 8 (12%) upgraded to borderline phyllodes.

#### **Conclusions**

Our findings support the 2025 ASBrS and SBI Guidelines for the Management of Benign FEL recommendation for surgical excision of indeterminate FEL on CNB, while fibroadenomas may be safely observed.

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## **Abstract #16 | Trauma System, Health Economics | Trauma/Critical Care**

### **When Is It Cost-Effective to Implement a Whole Blood Program? A Cost-Effectiveness Analysis for Civilian Trauma Centers**

Meg Quint, Marissa B. Reitsma, Douglas K. Owens, Amogha Paleru, Joseph D. Forrester, Simeng Wang - Stanford University School of Medicine

#### Objectives:

Evidence suggests that integrating whole blood (WB) into massive transfusion protocol (MTP) may reduce mortality compared with component therapy (CT), although the cost-effectiveness of this practice is less clear. We conducted a cost-effectiveness analysis to identify the threshold trauma volume at which implementing a WB program becomes economically justified.

#### Method:

Data for 24-hour mortality and blood utilization, post-trauma quality of life, and healthcare costs were obtained from a published retrospective cohort study on WB, U.S. Life Tables, and Medical Expenditure Panel Survey, respectively. Anticipated costs of blood products, program initiation, and maintenance were obtained from our local blood bank. A Markov cohort model was used to evaluate health and economic consequences of WB program implementation compared to CT only. We performed a probabilistic threshold analysis, considering WB wastage as nonuse in 14 days modeled as a function of trauma volume, to determine minimum annual MTP volume for cost-effectiveness, assuming a willingness-to-pay of \$50,000 per quality-adjusted life-year (QALY).

#### Results:

Based on our institutional parameters (98 MTPs/year, three WB wastage events/year, \$100,000 initiation cost amortized over 5 years, \$20,000 annual program cost), WB is cost-effective compared to CT (incremental cost-effectiveness ratio of \$2345/QALY). Threshold analysis revealed that a minimum of four MTPs per year was required to prefer WB program implementation.

#### Discussion:

A WB program is cost-effective using our institutional parameters and would be so for many large trauma centers. We provide a generalizable modeling tool to evaluate the cost-effectiveness of WB programs using institution-specific parameters.

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## **Abstract #17 | Basic Science | General Surgery**

### **Spheroid size is an important factor in supercooling preservation of hepatic spheroids.**

J.C. Reyna, A. Maida, Y. Weng, B. Rubinsky, and T.T. Chang - University of California San Francisco

**Introduction:** Induced pluripotent stem cell-derived liver organoids are promising as novel tissue-based therapy for severe liver dysfunction. Effective preservation approaches are needed for efficient biomanufacturing and distribution of these high-value biological products. Isochoric (constant volume) supercooling provides stable, non-freezing biopreservation at sub-zero temperatures and extends the duration of preservation compared to 4°C storage. We investigated the use of isochoric supercooling to preserve hepatic spheroids for up to 14 days.

**Methods:** Cells of a human hepatic cell line, HepG2, were cultured into spheroids. The spheroids were then transferred into cryovials containing a commercially available preservation solution and gradually cooled to -60°C in a custom isochoric device. After 5 or 14 days, hepatic spheroids were rewarmed, and viability was evaluated using live/dead staining and digital imaging analysis.

**Results:** After 5 days of isochoric supercooling preservation, hepatic spheroids exhibited viability (median 99%, IQR 100%-92%) comparable to pre-preservation controls (median 98%, IQR 100%-95%). Spheroid median viability decreased to 51% (IQR 86%-22%) at 14 days of preservation. We identified that 150µm spheroid size was a threshold which differentiated high- and low-viability groups at day 0 (98% vs 94%,  $p < 0.0001$ ), day 5 (99% vs 95%,  $p < 0.0001$ ), and at day 14 (69% vs. 21%,  $p < 0.01$ ).

**Conclusion:** Isochoric supercooling results in high viability of hepatic spheroids for up to 5 days of preservation, whereas viability becomes significantly reduced by day 14. Spheroid sizes <150µm is associated with improved viability across all time points, suggesting that controlling spheroid size may be a strategy to optimize supercooling preservation efficiency.

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## **Abstract #18 | Clinical Science | General Surgery**

### **Perioperative Characteristics Associated with No Inpatient Opioid Use Prior to Discharge After Inpatient General Surgery**

Shraddha Pandey, BA; Caroline Erickson, MD; Tasce Bongiovanni, MD; Zhonghui Guan, MD; and Elizabeth C. Wick, MD, FACS - University of California, San Francisco

**Background:** Opioid overprescription is prevalent after surgery and can occur even when patients have tapered off opioids during their post-operative hospitalization. This study aims to identify perioperative factors associated with no opioid use 24 hours before discharge (non-use) to guide future innovations to avoid discharge overprescribing.

**Methods:** Retrospective cohort of adults undergoing general, hepatobiliary, or colorectal surgery with inpatient admission at an urban teaching hospital (January 2022-December 2025). Data were analyzed using Wilcoxon rank sum and Pearson's chi-squared tests.

**Results:** Among 7,183 patients, 2,963(41%) took no opioids 24 hours before discharge. This subgroup had a higher median age (62 years,IQR 46-72, $p<0.001$ ) but similar post-operative length-of-stay compared to the overall cohort(4 days,IQR 2.0-6.9). Opioid non-use before discharge was frequent after colorectal resection(63%), ileostomy/enterostomy(61%), and parathyroidectomy/thyroidectomy(53%)(all  $p<0.05$ ). Among patients discharged post-operative days 1-2, 27-31% discontinued opioids inpatient. Among those discharged days 3-7( $n=2522$ ), non-use rates were 48-53% in minimally invasive cases, compared to 26-32% after open abdominal surgery( $p<0.001$ ). Of these, 30%(877/2,963) were prescribed discharge opioids, with 10% receiving refills within 30 days. Procedures with frequent discharge prescription despite inpatient non-use included breast surgery(78-82%), bariatric surgery(78%), adrenalectomy(52%), and inguinal/femoral hernia repair(51%)( $p<0.01$ ).

**Discussion:** A substantial proportion of patients were discharged with opioids despite non-use inpatient, across a range of procedure types and lengths-of-stay. The electronic health record could potentially enable a patient-centered approach to post-discharge opioid prescribing, where discharge prescriptions are informed by inpatient utilization. Further study is needed to determine whether this approach would benefit these patients by minimizing opioid exposure during post-surgical recovery.

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## Abstract #19 | Clinical Science | General Surgery

### Understanding the Surgical Work Burden: Workload and Perceptions from a National Survey of Surgeons

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**Objective:** To quantify true surgeon workload and evaluate the relationship of workload to perceptions of effort. Surgeons' work involves more than clinical care. Institutional staffing models often underestimate true workload, especially uncompensated after-hours work. No consensus exists on what constitutes a surgical full-time equivalent (FTE), with limited prior research.

#### Methods:

An online, anonymous survey was distributed nationally in 2024. Using univariate, multivariate, and machine learning analyses, clinical and non-clinical cumulative workloads were calculated and analyzed along with perceived workload burden by gender, years in practice, and subspecialty

#### Results:

5,329 surgeons (21.2% response) completed the survey, including 3,330 answering work-effort questions. Median workload was 68.1 hours/week during regular work hours, with additional five days/week during off-time. Among surgeons reporting workload perceptions (N = 1,177), 61% described their workload as "too much." Independent of hours worked, higher odds of perceiving excessive workload were observed among female surgeons, those with 6–10 or 20–29 years in practice, and surgeons in pediatric surgery, urology, and plastic surgery. Decision-tree machine-learning analysis identified career stage as the strongest predictor of perceived overwork, followed by cumulative weekly hours, with thresholds at 66 and 46 hours/week.

#### Conclusions:

Surgical workloads vary widely, but are uniformly high. Specific factors such as gender, years in practice, and being in specific subspecialties independently increased the risk of feeling overworked. Aligning workload with tasks requiring surgical expertise and considering hour-based workload thresholds may reduce perceptions of overwork while potentially necessitating expansion of the surgical workforce.

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## **Abstract #20 | Quality Improvement | General Surgery**

### **Standardizing Night Shift Resident-Nurse Communication**

Dong Hur, Tiffany Yue, Mindy Su, Rachael Stottlemire, Zeyi Zhou, Amin Etemad, Aussama Nassar - Stanford General Surgery

#### **Objective:**

To quantify the communication burden of night surgical residents and evaluate an intervention aimed at reducing nonurgent messaging, improving triage of high-acuity concerns, and enhancing continuity of care.

#### **Methods:**

We implemented a multicomponent protocol including (1) standardization of anticipatory nighttime orders by day teams, (2) structured nurse-to-resident communication framework, and (3) checklist for night resident responsibilities. Voalte messages exchanged between night nurses and residents across multiple general surgery services were collected before and after implementation. Message volume by hour was plotted and mean nightly message volume per resident was compared using an unpaired t test.

#### **Results:**

Mean nightly message volume per resident decreased after implementation but did not reach statistical significance (208 vs 226 messages;  $P = .13$ ). Message distribution was bimodal, peaking at 8–9 PM and 4–5 AM. Response times were longest during peak messaging hours, with variability up to 70 minutes (SD).

#### **Conclusions:**

Night surgical residents manage high volumes of cross-service communication, particularly during early evening hours. Peak messaging periods correlate with delayed response times and may contribute alert fatigue and impaired triage. Standardized anticipatory orders, structured communication, and resident checklists may reduce preventable nighttime interruptions and allow prioritization of high-acuity concerns.

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