# Incorporation and Utilization of an Additional Needs Screener by Surgical Trainees for Comprehensive Care of Underserved and Underinsured Surgical Patients

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**OBJECTIVE:** Comprehensive, socially-minded healthcare has historically been delivered in the primary care setting. For underserved patient populations, however, a surgical care episode may serve as the health care access point. To maximize patient wellbeing during the perioperative period, our surgical center developed the Additional Needs Screener (ANS). Operationalized into practice by GME and UME trainees, this tool screens surgical patients across 3 domains (social, emotional, and immigration needs) and connects patients to partner organizations if appropriate. This study describes the pilot utilization of the ANS among underserved and underinsured surgical patients.

**DESIGN:** Clinical quality improvement and retrospective cohort study of patients completing the ANS from implementation in September 2021 to September 2022.

**SETTING:** The Hospital of the University of Pennsylvania, PA—a tertiary care center.

**PARTICIPANTS:** One hundred and 10 underinsured and/or underserved patients completed at least 1 ANS domain.

**RESULTS:** Patients were majority female (55F, 53M, 2 other) and Hispanic/Latinx (72%) with a median age of 38 (*IQR* = 34-48). Most patients spoke a primary language other than English (77%), and nearly all were either uninsured (82%) or received emergency medical assistance or Medicaid (14%) at referral. Patients demonstrated significant needs; 39% endorsed difficulty affording housing, 32% endorsed difficulty paying for food, 29% endorsed experiencing current life-interfering distress, and 75% had undocumented immigration status. Ultimately, 57% of screened patients accepted referrals to our needs response teams.

**CONCLUSIONS:** Underserved and underinsured patients presenting for surgical care face significant challenges relating to social, emotional, and immigration needs. Through adoption of the ANS, trainees gained competency identifying and addressing these barriers in the perioperative period. Future works will focus on categorizing referral outcomes, developing interventions to increase patient trust, and improving screener dissemination. (J Surg Ed 80:1287−1295. © 2023 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**ABBREVIATIONS:** ANS, additional needs screener CSH, Center for Surgical Health PPN, personal patient navigator HIAS-PA Hebrew Immigrant Aid Society of Pennsylvania

**KEY WORDS:** health barriers, additional needs screener, surgical health equity, surgical education

**COMPETENCIES:** Practice-Based Learning and Improvement, Systems-Based Practice, Interpersonal and Communication Skills, Patient Care

## INTRODUCTION

In the current United States health network paradigm, primary care providers manage long-term patient

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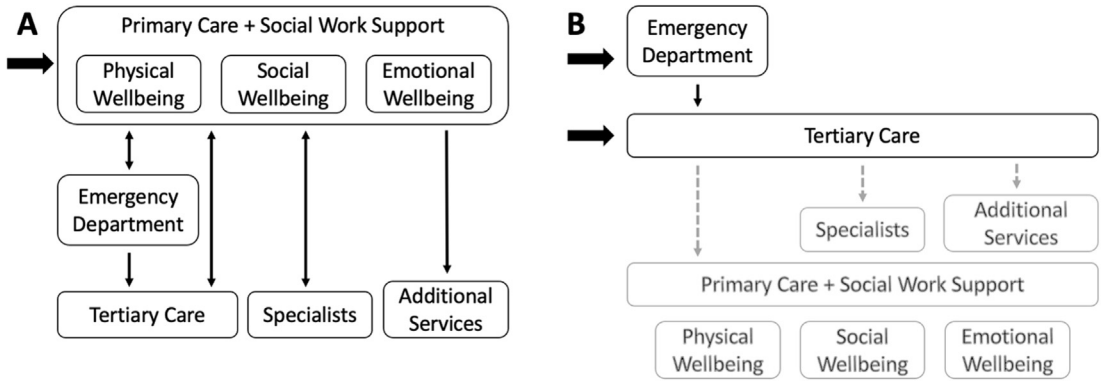


**FIGURE 1.** Healthcare system entry and unmet needs. (A) In a conventional healthcare model, primary care providers and social workers are the entry point (thick black arrow) into the healthcare system and support longitudinal patient wellbeing (physical, social, emotional). These providers are well positioned to refer patients to tertiary care, specialists, and additional services for advanced care needs (thin black arrow). (B) For individuals with barriers to healthcare, the point of entry into the healthcare system (thick black arrows) may be the emergency department or a tertiary care center. Assessment of needs beyond immediate medical stabilization are conventionally limited with a tenuous referral system (dashed grey arrows), and aspects of wellbeing are often missed.

wellbeing and make specialty care referrals as appropriate, while surgical providers rarely screen and refer patients for comprehensive, nonsurgical needs (Fig. 1A). This paradigm, though functional for many, overlooks individuals with significant barriers in accessing healthcare. Twenty-five percent of people living in the United States do not have a primary care provider,[1] 30 million are uninsured, at least 12 million are undocumented,[2] and many patients have social factors that inhibit access to care.[3] As a result, individuals present to specialty care and tertiary health networks without having received longitudinal interventions to improve overall wellbeing and with more advanced disease (Fig. 1B).[4-6]

The Center for Surgical Health (CSH) is a surgical support organization founded in 2020 at the University of Pennsylvania with the mission of improving the surgical health of vulnerable individuals and under-resourced communities.[7] Patients are eligible for CSH services if they are in need of a surgery or surgical consultation and meet one or more of the following criteria: lack of adequate health insurance, limited English proficiency, low health literacy, fear or mistrust of the healthcare system, or difficulty getting to/from appointments. Referrals to CSH come from emergency rooms, inpatient teams, community clinics, local primary care offices, and nonprofit organizations. Most patients referred to CSH support services meet multiple eligibility criteria for referral.

The CSH team includes organizational leadership, 2 full time staff members, and over 385 volunteer Personal Patient Navigators (PPNs), residents, and attending physicians. The PPNs are paired on a 1:1 basis with a patient and provide Navigation, Education and Empowerment, and Access to Surgeons and Health Insurance* throughout the perioperative continuum. PPNs are supported in their work by subspecialty-specific lead residents who review the patient cases within their panel on at least a weekly basis. Lead residents provide mentorship to PPNs by reviewing components of insurance applications, clarifying medical information, guiding PPNs through complexities of care coordination within a large health system, and facilitating connection to attending surgeons. Lead residents can volunteer to participate in CSH starting in their PGY-3 clinical year. Lead residents schedule communication with PPNs as convenient within their clinical or research schedule and attend weekly "run the list" patient meetings as able. The 2 CSH staff members provide administrative oversight throughout the PPN process and ensure compliance in patient progression and tracking. Over time, a need for additional nonmedical assistance among the CSH patient population became clear. To this end, medical students and residents within CSH developed the Additional Needs Screener (ANS), a tool used to screen and refer surgical patients to care services for needed social, emotional, and immigration support. There is a paucity of studies documenting the implementation of such screeners in tertiary care settings.[8-10,12] To our knowledge, the ANS is the first social-emotional-immigration needs screener developed and implemented into surgical standard-of-care by trainees.

In this study, we aimed to 1) describe the development and implementation of the ANS by medical students and residents into CSH surgical practice, 2) report the utilization of the screener over time, and 3) highlight the frequency of additional needs among a sample of underinsured and underserved patients. The incorporation of the ANS at CSH may serve as a model for other surgical and specialty support organizations that seek to address underlying health factors at time of patient presentation and develop socially-minded healthcare professions.

*The NEEAR Framework, Personal Communications, Goldshore MA, Morales CZ, Morris JB. 2022.

## METHODS

### Screener Development

CSH cares for surgical patients located in the Philadelphia metropolitan statistical area. Most of these patients are uninsured or underinsured at initial presentation and face additional barriers to care, including a non-English primary language; low health literacy; financial, food, and/or housing instability; undocumented citizenship status; and limited transportation. To better understand these needs from the patients' perspectives, CSH conducted continuous informal needs assessments of its growing patient population from January 2019 to June 2021.[11] Data were gathered through observation, open-ended questions, and patient-initiated conversations. Through this needs assessment, social needs/public benefits, emotional distress/mental health, and immigration, were identified as the nonmedical areas in which our patients most frequently needed assistance. The 3 domains of the ANS (social, emotional, and immigration) were built from these identified needs.

The social domain was created with a workgroup of CSH and Penn Social Needs Response Team (SNRT) leadership based on patient comments including "I am worried about paying for my electricity bill during the time I am out of work for surgery", "I am having trouble feeding my family this month" "It is hard for me to pay for my antibiotics", "I am staying with a friend but need to find long-term, safe housing." Established during the COVID-19 pandemic, SNRT was identified as a partner in this work based on their experience connecting patients to food, housing, and employment assistance. Referrals were initially made over email, but a more efficient workflow was identified through EPIC messages. Due to the acute nature of some referrals, processes were created to flag referrals as urgent, in need of response within 24 to 48 hours. The Social Domain Workgroup, a group of students, residents, and staff within CSH as well as SNRT leadership, met on a quarterly basis, making continuous improvements to referral flow and inter-team communication. Frequently, CSH and SNRT leadership is involved in navigation and resource allocation to more complex cases.

The emotional domain was based on patient comments including "my anxiety has worsened during the surgical period", "I am feeling sad and depressed dealing with this condition and trying to care for my family." Additionally, as our patient population and volunteer base grew we identified the need to form a clear pathway that students could follow in the event a patient expressed acute suicidal ideation, homicidal ideation, or distress. An Emotional Distress flowsheet was created based on an existing templates used by the SNRT team. Within this flowsheet, patients with nonacute emotional distress are connected to a social worker within the SNRT team. Patients with acute distress (active or passive suicidality or homicidally) are connected to the 24-hour Philadelphia Crisis Hotline. The hotline has the ability to deploy mobile units to check on patients and bring them to local psychiatric centers or hospitals as needed. Emotional Domain Workgroup members trialed the flowsheet, calling the hotlines to introduce our group and ensure successful connection to acute assistance was available. This workgroup similarly met quarterly for feedback and quality improvement initiatives.

The immigration domain was based on questions raised by patients over the period of the needs assessment included variations on "Do I have any pathways to legal immigration status in the US?" "What resources are available for family members contacted by Immigration and Customs Enforcement" "How would 1 apply for asylum?" "How would I find an immigration lawyer?" To provide patients with answers to these and other legal questions, CSH initiated conversations with the probono immigration legal clinic at their affiliated law school, Penn Law Immigrants Right Project (PLIRP).[**] Multiple conversations took place between CSH, PLIRP student leadership, law school faculty, and the legal counsel at Hebrew Immigrant Aid Society of Pennsylvania (HIAS-PA),[***] an organization providing legal assistance to low-income immigrants in the area since the 1970s. This Immigration Working Group compiled questions asked by CSH patients along with previously utilized PLIRP and HIAS screeners to form a streamlined set of questions aimed at capturing patients with both pre-formed immigration questions as well as those who unknowingly could qualify for pathways to legal immigration status. The legal working group met multiple times over the course of 6 months to make changes to questions based on PPN feedback. Referral flow was streamlined over the first 10 referrals with the creation of a template email to be sent to the PLIRP/HIAS team by PPNs and a set of expectations for response times to be communicated to patients. The Immigration Working Group continued to meet on a quarterly basis to provide continuous quality improvement referral flow, quality, and outcomes with open email communication throughout. Through Penn Law administrative channels, legal screener work with CSH was approved for pro-bono legal hours (mandated hours for all Penn Law students), dramatically increasing the pool of volunteers completing CSH legal screeners at PLIRP.

[**] https://www.law.upenn.edu/live/profiles/808-penn-law-immigrant-rights-project-plirp.
[***] https://hiaspa.org/.

### Screener Implementation

The ANS was incorporated into the CSH informed consent process and first used in the clinical setting in September 2021. Prior to implementation, trainings were held on ANS use for all new PPNs, led by CSH and SNRT leadership including a Professor of Medicine with expertise in crisis intervention. The training included the rationale for screener creation, explanation of the components and logistics of use, dedicated discussion of crisis intervention including suicidality homicidally and acute distress, and time for scripted practice. It was communicated to all participants that with new screener usage in a growing patient population, challenges were expected and continuous quality improvement and screener updates would be conducted. The PPNs were empowered to have open communication with the CSH leadership team about any challenges or notable successes during screener implementation. ANS screener training was soon incorporated as a permanent component of CSH PPN training and onboarding and at the time of manuscript drafting had been held 4 additional times. Step-by-step logistics of ANS use as well as annotated screenshots of screener tracking and referral flow were added to the CSH PPN Handbook. Data for the ANS are securely stored and maintained in an IRB-approved CSH patient database using Research Electronic Data Capture (REDCap). Patients are made aware that the ANS is optional, confidential, and open for all CSH patients. The ANS is completed by the PPN paired to each patient.

The ANS was initially conducted once the PPN and patient had established a rapport—often in the lag time between insurance submission and acceptance or after the first postoperative visit. Through continuous quality improvement cycles it was noted by PPNs that this timing, later in the perioperative continuum, limited their ability to follow up the referral. Based on this feedback, the screener is now conducted within the first PPN/Patient meetings with the opportunity to re-screen if additional needs developed over the surgical period. Screeners are conducted both in person and over the phone (phone often elected for ease within patient schedule, improved PPN workflow feasibility, and to protect safety of patients and navigators during the height of COVID-19) in the patient's primary language either directly or through use of an interpreter.

For patients with any identified area of need, PPNs offer referral for those needs at the time of screening and subsequently forward patient contact information to clinical leadership and community partner organizations. PPNs provide information to the patients on the anticipated timing of referral completion and follow up with community partners over email on referral outcomes.

### Screener Utilization and Patient Needs

To understand the initial uptake and results of the ANS, we queried the CSH clinical registry for patients who completed the ANS between September 2021 and September 2022. For each patient, we collected the initial contact date with CSH services and determined the interval length (in days) between contact and ANS completion. Demographic (age, sex, race/ethnicity, country of origin, primary language, and insurance status) and clinical features (department of surgical procedure) of these patients were compared to CSH patients who were eligible but did not complete the ANS in the same time period. We also summarize patient responses to the ANS and subsequent referrals to additional services. Due to the lag time between patient referral and screener completion prior to September 2022 as noted above, utilization and additional need referral rates were calculated and visualized from September 2021 to April 2022; rates from the summer of 2022 underreport screener completion and referral rates and are excluded.

This study was approved by the University of Pennsylvania Institutional Review Board (IRB #851917). All data analyses were performed using R version 4.0.5 and RStudio 1.4.1106.[13,14] Categorical variables were compared with Chi-squared test or 2-tailed Fisher exact test as applicable, and continuous variables were compared with Mann Whitney U tests.

## RESULTS

### Additional Needs Screener Utilization

To date, screening via the ANS has been conducted by 90 medical student patient navigators with the support of 56 surgical resident mentors. Between September 2021 and September 2022, 110 patients completed at least 1 domain of the ANS (34% of eligible CSH patients active after ANS implementation; Table 1). Initial contact dates for these patients ranged from December 2020 to September 2022. Patients presenting after screener implementation completed the ANS an average of 86±79 days (median 71 days [*IQR* = 26-120]) following the initial contact date with CSH services. Figure 2 displays the percent of monthly CSH patients (based on month of initial patient presentation) completing at least 1 domain of the ANS, presenting with an identified need, and requesting an additional needs referral. For instance, 58% of patients presenting to CSH in September 2021− the month of ANS implementation − completed the ANS and demonstrated at least 1 additional need, and 33%

**TABLE 1.** Demographic and Surgical Information

| | CSH Patients w/ ANS N = 110 | CSH Patients w/o ANS N = 214 | p-Value |
|---|---|---|---|
| Age at CSH referral, *median (IQR)* | 38 (34-48) | 41 (32-48) | 0.5455 |
| Sex, *N (%)* | | | |
| Female | 55 (50.0) | 102 (47.7) | 0.7683 |
| Male | 53 (48.2) | 102 (47.7) | |
| Other | 2 (1.8) | 2 (0.9) | |
| UNK | 0 (0.0) | 8 (3.7) | |
| Race and ethnicity, *N (%)* | | | |
| American Indian or Alaska Native | 0 (0.0) | 0 (0.0) | 0.7514 |
| Asian or Pacific Islander | 4 (3.6) | 6 (2.8) | |
| Black or African American | 19 (17.3) | 26 (12.1) | |
| White | 3 (2.7) | 9 (4.2) | |
| Hispanic or Latinx | 79 (71.8) | 112 (52.3) | |
| UNK/NR | 5 (4.5) | 61 (28.5) | |
| Country of origin, *N (%)* | | | |
| USA | 10 (9.1) | 24 (11.2) | 0.1249 |
| Mexico | 33 (30.0) | 51 (23.8) | |
| Guatemala | 18 (16.4) | 13 (6.1) | |
| Honduras | 7 (6.4) | 16 (7.5) | |
| Ecuador | 6 (5.5) | 9 (4.2) | |
| Dominican Republic | 5 (4.5) | 2 (0.9) | |
| *Other/UNK | 31 (28.2) | 99 (46.3) | |
| Primary language, *N (%)* | | | |
| English | 25 (22.7) | 59 (27.6) | 0.2580 |
| Spanish | 76 (69.1) | 126 (58.9) | |
| †Other/UNK | 9 (8.2) | 29 (13.6) | |
| Insurance at time of referral, *N (%)* | | | |
| Medicaid | 12 (10.9) | 17 (7.9) | 0.4103 |
| Emergency medical assistance | 3 (2.7) | 1 (0.5) | |
| Employee sponsored insurance | 4 (3.6) | 9 (4.2) | |
| Medicare | 1 (0.9) | 3 (1.4) | |
| None/NR | 90 (81.8) | 184 (86.0) | |
| ‡Surgical care, *N (%)* | | | |
| General surgery | 48 (43.6) | 46 (21.5) | — |
| Urology | 8 (7.3) | 25 (11.7) | |
| OB/GYN | 22 (20.0) | 32 (15.0) | |
| Orthopedics | 18 (16.4) | 21 (9.8) | |
| Neurosurgery | 2 (1.8) | 2 (0.9) | |
| Plastics/hand | 7 (6.4) | 16 (7.5) | |
| ENT | 4 (3.6) | 22 (10.3) | |
| Vascular | 1 (0.9) | 2 (0.9) | |
| Other/NR | 0 (0.0) | 48 (22.4) | |

Abbreviations: IQR, interquartile range; UNK, unknown; NR, not reported, OB/GYN, obstetrics and gynecology; ENT, otolaryngology.

Comparative statistics demonstrated p > 0.05 for age at referral, sex, race and ethnicity, country of origin, primary language, and insurance status (Other/UNK excluded for each variable except insurance). Surgical care specialty was not statistically compared considering number of specialties against sample size.

*Other countries of origin in Latin America, South America, Europe, Africa, and Asia.

†Other primary languages include Arabic, Portuguese, French, Indonesian, and Russian.

‡Most commonly performed procedures include inguinal/umbilical hernia repair, myomectomy, and fracture reduction/repair.

ultimately accepted a referral. Among patients initially presenting to CSH between ANS implementation in September 2021 and April 2022, 46% completed at least 1 domain of the ANS (Fig. 2). Due to the average interval of 86 days (~3 months) between initial patient contact and ANS completion, we limited analysis of screener incorporation to patients with initial contact in April 2022 or earlier (Fig. 2).

## Patient Characteristics

Of the 110 patients completing the ANS, half were female (55F, 53M, 3 other) with a median age of 38 (*IQR* = 34-48, *range* = 17-68; Table 1). Patients self-identified as Hispanic or Latinx (72%), Black or African American (17%), Asian or Pacific Islander (4%), or White (3%). Most patients identified a country of origin outside the

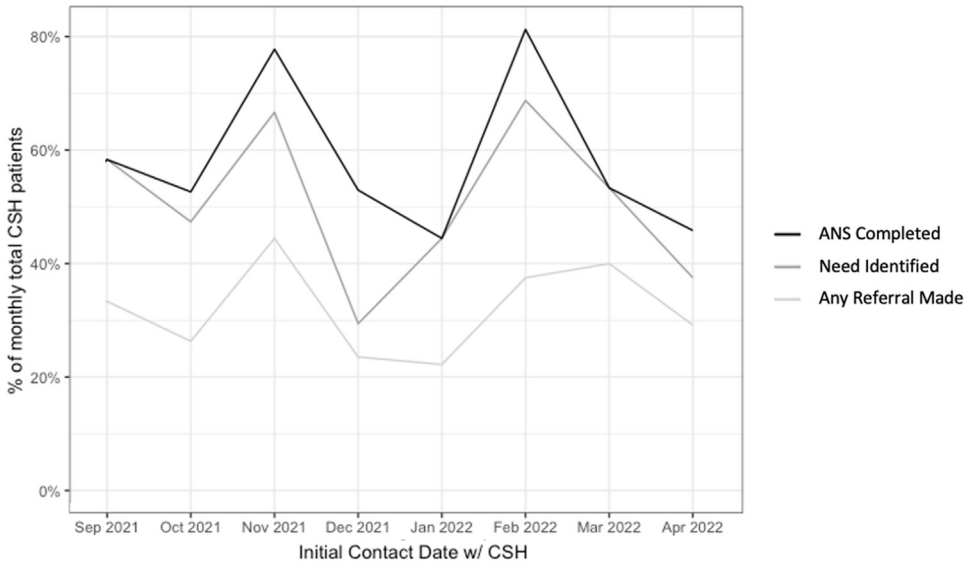


**FIGURE 2.** Utilization of the additional needs screener over time. The x-axis shows month of patient initial contact with CSH services. The black line represents the percent of CSH patients completing at least 1 domain of the ANS. The dark grey line represents the percent of patients with at least 1 identified area of need (emotional, social, or immigration). The light gray line represents the percent of patients referred to at least 1 partner organization for an additional need. Given the average completion duration of 86 days, data are limited to patient contact dates of April 2022 or earlier.

United States, including Mexico (30%), Guatemala (16%), Honduras (6%), Ecuador (6%), Dominican Republic (5%), and other countries throughout the world (28%). Spanish was the most reported primary language (69%), and 77% of patients identified a language other than English as their primary language. Over 95% of patients were uninsured or had Medicaid or Emergency Medical Assistance at time of initial contact with CSH. Patients received care from general surgery (44%), urology (7%), obstetrics and gynecology (20%), orthopedic surgery (16%), neurosurgery (2%), plastic and reconstructive surgery (6%), otolaryngology (4%), and vascular surgery (1%), and 73 patients (66%) ultimately required a surgical procedure. Demographically, CSH patients completing at least 1 domain of the ANS largely resembled CSH patients without any ANS completion (Table 1).

### Screener Results and Referrals

Among patients who completed the ANS, 96 (87%) identified at least 1 area of additional need, and 60 patients (55%) identified needs across 2 or 3 domains (Table 2). One hundred and 10 patients completed the social needs domain, and 67 patients (61%) identified at least 1 need relating to housing or financial instability. Within this domain, difficulty paying for housing (39%), utilities (39%), and medications (40%) were the most frequently voiced needs. One hundred and 3 patients completed the emotional needs domain with 30 patients (29%) endorsing current emotional distress and 4 patients (4%) endorsing passive suicidality. One patient endorsed active thoughts of harming themself or others and was immediately connected to a crisis help line. Ninety-four patients completed the immigration needs domain. Of these, 77 (82%) reported either refugee (3%), temporary visa holder (2%), temporary protected (2%), or undocumented (75%) status.

Overall, 63 patients (57% of ANS respondents) were referred to partner organizations for additional needs support. These included 43 referrals (39%) to the Penn Social Needs Response Team, 14 referrals (13%) to the Penn Emotional Needs Response Team, and 37 referrals (34%) to the Penn Law Immigration Rights Project (Table 2).

## DISCUSSION

In this study, we described the development and implementation of a screener for social, emotional, and immigration patient needs by medical students and residents into surgical practice and highlighted the prevalence of additional needs among underinsured and underserved patients. Despite recognition of the importance of social factors in surgical outcomes and disparities,[15] few surgical groups systematically screen and refer patients for nonsurgical needs. Furthermore, the nonmedical needs of patients in the surgical setting are underreported.[16] Through this work, we hope to build a model for implementation of such tools in other tertiary care systems and surgical centers. Ultimately, the ANS showcases how all providers can be invested and influential in a

**TABLE 2.** Additional Needs Screener Responses and Referrals

| | CSH Patients w/ ANS N = 110 |
|---|---|
| **Screener responses** | |
| Social needs domain (N = 110), *N (%)* | |
| Difficult to pay for housing | 43 (39.0) |
| Danger of eviction | 10 (9.1) |
| Hard to pay for utilities | 43 (39.0) |
| Hard to pay for food | 35 (31.8) |
| Hard to pay for medications | 44 (40.0) |
| Does not feel safe at home | 7 (6.4) |
| Emotional Needs Domain (N = 103), *N (%)* | |
| Experiencing distress | 30 (29.1) |
| Experiencing active thoughts of harming self or others | 1 (1.0) |
| Connected to crisis hotline | 1 (1.0) |
| Experiencing passive suicidality | 4 (3.9) |
| Referral made to Penn emotional response team | 14 (13.6) |
| Immigration needs domain (N = 94), *N (%)* | |
| Immigration status | |
| US citizen | 11 (11.7) |
| Legal permanent resident | 6 (6.4) |
| Asylee/refugee/humanitarian parolee | 3 (3.2) |
| Temporary visa holder | 2 (2.1) |
| Temporary protected status | 2 (2.1) |
| Undocumented/NR | 70 (74.5) |
| Pending immigration application | 22 (23.4) |
| Currently or have worked with human rights lawyer | 25 (26.6) |
| Referral made to Penn law immigration rights project | 37 (39.4) |
| **Aggregate identified needs** | |
| At least 1 identified need | 96 (87.3) |
| Demonstrated need in social needs domain | 67 (60.9) |
| Demonstrated need in emotional needs domain | 30 (27.3) |
| Demonstrated need in immigration needs domain | 78 (70.9) |
| Identified needs across 2 domains | 42 (38.2) |
| Identified needs across 3 domains | 18 (16.4) |
| **Referrals completed** | |
| Number of patients referred to partner organizations | 63 (57.3) |
| Referral made to Penn social needs response team | 43 (39.0) |
| Referral made to Penn emotional response team | 14 (12.7) |
| Referral made to Penn law immigration rights project | 37 (33.6) |

Abbreviations: NR, not reported.

Interval between initial contact with the Center for Surgical Health and Additional Needs Screener completion: median 86 days (interquartile range = 29.5-168), mean 86 days ± 79 standard deviation.

patient's overall wellbeing—not just the primary care team.

Designing an effective screening tool involved balancing instrument sensitivity and sensitivity with brevity to promote utilization. The choice to focus on social, emotional, and immigration-related needs was made to match the ANS items to the demonstrated needs of CSH's unique patient population. As a clinical tool, screener items were oriented around topics with potential for intervention, rather than needs without existing support systems. Thus, screener items were tailored to the available programs within our partner community organizations. The ANS, consistent with the standards of all CSH programing, undergoes continuous quality improvement cycles. CSH leadership and partner organizations have regular "check-in meetings" to assess referral quality, outcomes, and process flow. Feedback from PPNs, patients, and ANS partner organizations is incorporated regularly with the goal of making the screener as useful and as seamlessly incorporated into clinical processes as possible.

The success of implementing the ANS into the CSH workflow depended not only on careful consideration of screener items, but also organizational buy-in. Widespread organizational adoption and utilization is crucial for systematic implementation of clinical tools into standard of

care. Leveraging involvement from individuals throughout the level of an organization—in the case of CSH, from medical students to attendings— creates an environment where everyone is invested in the success of the program and caring holistically for all patients. Involving surgical trainees and young professionals creates education development opportunities and, importantly, effective and longitudinal success of organization programs.

The burden of social, emotional, and immigration needs in this patient population is worrying. Financial and housing instability, emotional distress, and undocumented status influence overall health and surgical outcomes, highlighting the importance of identifying and addressing these needs regardless of entry point into the healthcare system.[17-19] Approximately 38% of patients completing the ANS reported need in multiple domains, suggesting interconnectedness of needs (e.g., housing and financial instability caused by undocumented status triggering emotional distress). These findings bolster the importance of identifying and addressing social determinants of health in surgical care.[16]

Despite the high frequency of additional needs found in this study, one might expect an even higher prevalence of needs among the surveyed patient population. This may reflect a stigma and mistrust in disclosing social, emotional, and immigration-related concerns among these patients. Furthermore, the discrepancy between prevalence of identified needs and accepted referrals supports a potential fear and mistrust of the healthcare or immigration system, leading to overall underreporting of additional needs and hesitation from engaging with offered resources. Alleviating deeply-rooted mistrust is extremely challenging, yet implementation of screeners like the ANS may be 1 step toward open dialogue about such issues. Creating environments at all levels of care where patients are comfortable sharing needs, and where these needs can be addressed, is important in breaking these barriers to health—and especially so for vulnerable populations.

This study is limited by evolving utilization practices over time of a screener designed to be a clinical tool in a specific clinical and organizational context. Thus, screener items are not empirically verified and may not capture all unmet needs of patients. As noted previously, evaluating screener utilization over time is limited by the interval between initial contact and screener completion, so utilization rates for recent months have not yet materialized and cannot be studied. Currently, referral interventions and outcomes are difficult to evaluate and are not currently tracked in the CSH patient database. Future works are underway developing metrics for referral outcomes and tracking effectiveness of the referral system. Additionally, we hope to ensure that all patients entering the CSH pipeline are screened for unmet needs; organizational programs and incentives to increase screener utilization are also currently underway.

## CONCLUSIONS

Underserved and underinsured patients initially presenting to a healthcare system for surgical care face significant unmet social, emotional, and immigration needs. Medical students and surgical residents successfully developed and implemented the Additional Needs Screener (ANS) to identify and address these barriers for surgical patients. The ANS serves as a model for other tertiary care and surgical centers to develop and implement patient population-specific screeners for holistic patient care.

## STATEMENT OF ETHICS

This study was retrospective in nature and was conducted in full accordance with all applicable University of Pennsylvania Institutional human subjects research requirements and all applicable Federal and state laws and regulations including 45 CFR 46. The study was reviewed and approved by the University of Pennsylvania IRB (IRB#851917), and the investigators performed the study in accordance with this protocol. Collection, recording, and reporting of data was accurate and ensured the privacy, health, and welfare of research subjects during and after the study.

## AUTHORSHIP

S.H. contributed to conceptualization, writing – original draft, investigation, formal analysis, and visualization. A.T.C. contributed to conceptualization, writing – original draft, data curation, and investigation. O.I.R contributed to conceptualization, writing – review and editing, and investigation. E.L. contributed to conceptualization, writing – review and editing, and data curation. M.G. contributed to conceptualization, writing – review and editing, investigation, and supervision. J.B.M contributed to conceptualization, writing – review and editing, supervision, and project administration. C.Z.M contributed to conceptualization, investigation, writing – review and editing, supervision, and project administration.

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## SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jsurg.2023.06.009.