Heart, Vascular and Thoracic Institute Opioid Use Disorder Patient Tracking

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Executive Summary

In 2020, during the COVID epidemic, drug overdose deaths rose to almost 92,000, a new high according to data released by the CDC. The misuse of and addiction to opioids—including prescription pain relievers, heroin and synthetic opioids such as fentanyl—remains a serious national crisis that affects public health as well as social and economic welfare. The CDC estimates that the total economic burden of prescription opioid misuse alone in the United States is $78.5 billion a year, including the costs of healthcare, lost productivity, addiction treatment, and criminal justice involvement.

Injection drug use associated endocarditis cases have increased significantly in the past years, paralleling the rise in opioid use occurrence. Endocarditis is a life-threatening infection of the heart. "Without valve surgery, patients can suffer a variety of symptoms related to damaged heart tissue, including fatigue, shortness of breath and an increased risk of other cardiovascular problems such as heart failure, stroke and death" (Kadri et al., 2019).

In addition, drug abuse relapse is a leading cause of death and reoperation in those who have undergone prior heart valve surgery.

As a leading referral center, Cleveland Clinic has seen these same trends:

- Surgery for injection drug use infective endocarditis has increased dramatically over the past 10 years
- Relapse of drug use leads to reoperation and/or death

This highlights the need to address substance use disorder during valve surgery hospitalization, to include clinical interventions, education, support, transition of care and patient follow-up to improve short- and long-term outcomes.

As Dr. Gosta Pettersson states, "We would not operate without antimicrobials, so why would we operate if the addiction is not treated and associated with such high risk of relapse and death?"

Based on the Endocarditis Center team's review of outcomes data and team discussions, it was determined the Management of Substance Use Disorder and Heart Infections in Cardiovascular Patients (MOSAIC) program should be implemented.

A real-time list in Cleveland Clinic's electronic medical record (EMR) was created to look at patients' inpatient (IP) problem list. This real-time logic uses a predefined list of ICD-10 codes for the purpose of scanning the problem list for those patients admitted to the hospital. Consult teams use the real-time list for the purpose of identifying patients with substance use disorder (SUD). Once the clinical determination has been made that the patient has infective endocarditis (IE), the patient is evaluated by a multidisciplinary team for appropriate treatment (including cardiac surgery, intervention or medical management).
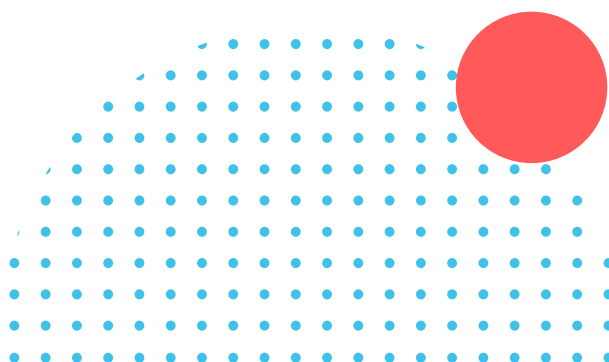
The EMR tools allow for:
- A real-time list for consult teams to follow inpatients.
- A link from the 72-hour snapshot within the EMR to the list of protocols for care of patients with IE and SUD.
- Reminder cues to know what discharged patients need to be called each week, as well as program summaries to highlight patients enrolled, completed, and those with specific factors for outcomes tracking.

Definition of terms:
- DC = Discharge
- IE = Infective endocarditis
- IOP = Intensive outpatient program
- LTAC = Long term acute care (hospital or facility)
- MOSAIC - Management of substance use disorder heart infections in cardiovascular patients
- MAT = Medication assisted therapy
- OUD = Opioid use disorder
- PAC = Post-acute care
- SNF = Skilled nursing facility
- SOAR = Supporting opioid addiction recovery (peer support)*
- SUD = Substance use disorder
- EMR = Electronic medical record

Project SOAR is a peer support group that offers OUD patients support throughout their hospital stay.

Peer support specialists:
- Are Specially trained and peer support certified individuals
- Have an average of four years of recovery experience
- Undergo 30 hours of CE credits every year
- Are funded by Ohio's State Opioid Response Fund, which is managed by the Ohio Mental Health and Addiction Services as part of the Substance Abuse and Mental Health Services Administration

Patients may enter this process via several methods, including:
- ICU transfer
- Hospital transfer
- Direct admit
- Emergency
- TCI (planned) surgery

Cleveland Clinic's MOSAIC program is designed to address the needs of patients who are admitted with infective endocarditis and have a SUD, such as opioid use or intravenous drug use. The main goals of the program (during patient admission) are to initiate addiction management measures, optimize pain control post-surgery, and provide early discharge planning. This can be done using methods that include MAT, social work assessment and interventions and the introduction to the peer support program SOAR, which are important steps prior to the patient having cardiac surgery.

As most patients with IE require post-discharge intravenous (IV) antibiotics after cardiac surgery, social workers and case managers provide choices for post-acute care, which must include LTACs, acute rehabilitation or SNFs offering MAT and IV antibiotics; facilities that also include IOP are recommended. They also collaborate with teams to offer MOSIAC services, including physical therapy, cardiac rehabilitation, art and music therapy, and SOAR during their hospital stay. In addition, the patient is regularly contacted after discharge by the patient outreach team to confirm the patient is following their medical plan and to determine if they need additional support.

Cleveland Clinic case managers, social workers and the patients may ask for SOAR to follow the patient at the post-acute care facility. This is a significant benefit for patients as a bridge to the community and necessary resources and support the patient requires. Case managers will follow up with discharged patients on request from MOSIAC team members.

Cleveland Clinic attempts to contact all MOSAIC patients at one week, one month, three months, six months and one year post-discharge. If a patient requires contact at other times for a follow-up appointment or other needs, the team will reach out to the patient. A challenge to this patient population is accurate and reliable contact information. The nurse attempts to call each patient at least twice. If the patient is unable to be reached at the phone numbers listed, there will be an attempt to contact their alternate contact listed in the EMR. In addition, if the patient is residing at a SNF or LTAC, the registered nurse, case manager or nursing director is asked the scripted questions. During the call, reminders of the patient's upcoming appointments are shared with the patient and/or caregiver.

If a patient has not made follow-up appointments and plans to return to Cleveland Clinic, the specific department schedulers (i.e. cardiology, infectious disease and/ or behavioral health) are notified. If a patient requests psychiatry or SOAR, these services will be coordinated as well.

Several measurements are tracked within the program, including initiation of MAT, MOSAIC program completion, readmissions and deceased patients—the goal is improvement in these quality metrics.

The Clinical Problem and Pre-implementation Performance

The Endocarditis Center team's review of statistics and programming identified the need to ensure we are treating the patient's substance use as well as the infection and formulate a plan.

The Endocarditis Center identified three main problems to be addressed:

- **Care team required education and standardized protocols to care for this patient population** (heart + opioid/substance use) are needed to provide consistency in perioperative management (especially in regard to pain management, anesthesia, initiation of medication assisted therapy/MAT).

  Research has shown that MAT treatment works. In 2015, the psychiatry/behavioral health department adopted the use of suboxone to treat opioid addiction in the acute setting due to ease of use in this setting and success in preventing relapse (Lee et al., 2018). Unfortunately, the lack of protocols, led to inconsistencies in care. Consults for MAT therapy was sporadic and those who were admitted on MAT therapy often had their doses lowered or discontinued due to lack of education regarding the effects of MAT on anesthesia and pain management.

  Clinicians required guidance on how to utilize MAT through the surgical process, its interactions with anesthesia and post-operative pain management. In addition, as the focus of care was on the valve and infection diagnoses, there was not a clear pathway as to when behavioral health, social work and supportive therapies should be consulted.

- **Lack of patient identification methods led to late discharge planning and prolonged hospitalizations.**
  Lack of easy identification caused delays in:
  ○ Appropriate teams evaluating patients for surgery or intervention.
  ○ Hospital discharge due to need for early discharge planning in these complex patients.
  ○ Initiation of patients into MOSAIC resources.

Due to the size and distributed nature of Cleveland Clinic main campus, identifying this patient population was challenging. Original methods of patient identification included:

  ○ Doctor-to-doctor consult, eventually to care management.

  ○ Word of mouth identification to care management.

  ○ Use of tools at hand–search method created by care management team (not universal to other departments).

- **Patient death after discharge or return with relapse, requiring lifesaving redo surgeries.** Pre-implementation, clinical outcomes noted that relapse is high, especially in the first year after surgery. For those who relapse, the incidence of reoperation and death is high. Therefore, discharge planning including ongoing support and follow-up is required in this patient population to address the underlying cause of substance use disorder. Early patient tracking was guided by an Excel spreadsheet. This was a manual process and did not allow easy visualization of follow-up schedules or program growth over time.

To address these issues, the team focused on four areas to implement change:
1. Multidisciplinary approach with **standardized protocols** for pre-op, peri-op and post-operative care, including:

- Timely consults to appropriate services
- Education of patients, family and caregivers on diagnosis and treatment plan
- Early discharge planning

2. **Early identification of patients** and care coordination from admission to discharge.

3. Support and resources throughout hospitalization and post discharge through **regular follow-up involving standardized documentation** and scheduling of follow-up calls.

4. **Track outcomes** and modify program based on data.

Care team involvement:

- Clinical teams: Infectious disease, thoracic and cardiovascular surgery; cardiovascular medicine; cardiothoracic anesthesia
- Behavioral health: Assessment of psychological factors, support of MAT and behavioral health
- Care management: Assessment to include social determinants, local PCP and MAT providers, options for post-discharge care, insurance for care post-discharge
- Nursing: Support education, peer support efforts
- Art and music therapy clinicians
- Other multidisciplinary teams involved in care of patient for medical and surgical management
- Project SOAR peer support team

Outcome measures are provided by Cleveland Clinic hospital EMR and admission data. However, valve surgery statistics and outcomes data are also reported to the Society of Thoracic Surgery (STS) registry and reported in the Cleveland Clinic outcomes available online.

Valve surgery outcomes are reported on Cleveland Clinic's website. In 2021, Cleveland Clinic surgeons performed 3,459 valve surgeries. In 2020, 63 patients were operated on with active infective endocarditis and 88 patients total were operated on who were re-do patients with history of infective endocarditis (Cleveland Clinic, 2021).
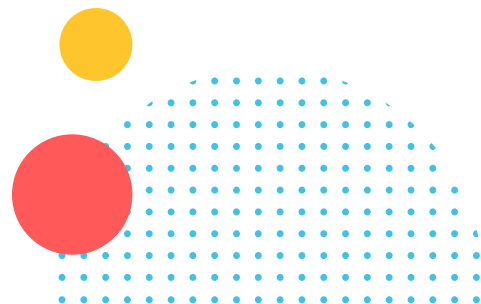
The MOSAIC program started in 2019. All patients admitted to the hospital and diagnosed with endocarditis have an early evaluation. A multi-disciplinary team evaluates each patient. At this point, the medical team initiates appropriate treatment and MAT. If surgery is indicated at time of this hospitalization, a surgery plan is developed along with perioperative strategies to improve patient safety, anesthesia and pain management. Patients diagnosed with endocarditis have the option to participate in the SOAR peer support group.

While all patients who have a substance use disorder in the Heart, Vascular and Thoracic Institute surgery program are identified and evaluated by the MOSAIC team, patients are also offered the opportunity to participate in the supportive aspects of the MOSAIC program. Exemption criteria to the follow-up program may include:

- Patient is deceased

- Patient is too ill to participate

- Patient refusal

The discharged patient is contacted at specific time intervals for the MOSAIC program. The regular contact with the patient is the connectivity of the outreach program and the ability to stay connected to the patient.

The patient outreach call will be attempted twice. If the patient cannot be reached after the second outreach call, the call will be attempted at the next time interval. At this point, patients are included in the cohort, but would not have information included regarding outcomes measures.

A goal is to discharge the patient with ongoing care, including antibiotic treatment, medical assisted addiction treatment and substance abuse counseling.

Outreach is vital to monitoring the patient to avoid relapse. During the patient outreach encounter, the patient can accept or decline participation in the program. Not all patients accept ongoing participation in the program. During outreach phone calls, the patient care plan is reinforced, the need for follow-up appointments or ongoing support is assessed and appropriate care teams are notified as needed.

A challenge for this patient population is the inability to contact patients, patient homelessness or relapse opioid usage.

- Several quality measures are used to determine adherence and impact:
- Readmission rates
- Opioid use disorder dashboard
- Ability to reach/contact patient post-discharge
- Mortality
- Self/significant other reported adherence to treatment plan and sobriety
- Peer SOAR program data provided by Project Soar Ohio.

Design, Implementation and Governance

The involvement of the teams below includes directors of the multidisciplinary Endocarditis Center, department and institute directors, as well as front line clinicians. Care team participants in the design and implementation of the workflow described in this case study include:

- Clinical teams: Infectious disease, thoracic and cardiovascular surgery, cardiovascular medicine, cardiothoracic anesthesia
- Behavioral health: Assessment of psychological factors, initiation and/or support of MAT and behavioral health
- Care management: Assessment to include social determinants, local PCP and MAT providers, options for post discharge care, insurance for care post discharge
- Nursing: Support education and peer support efforts
- Art and music therapy clinicians
- Other multidisciplinary teams involved in care of patient for medical and surgical management

The program involved several teams working under the direction of the multidisciplinary Endocarditis Center. All teams were involved in the optimal evaluation of this patient population and strategies to implement. The director of alcohol and drug recovery, as well as additional behavioral health experts and clinical team members worked with information technology (IT) to come up with a list of ICD codes that fit the criteria and are used by clinicians.

#1 Development of Substance Use Disorder Protocol of Patient Management

An operational protocol was created to define the steps to engage the support team. This protocol is used in the decision-making process to determine when to involve the care teams. Additionally, it is in a readily available location that was linked to from the patient's EMR.

Endocarditis team worked together. Teams in cardiac surgery, cardiovascular medicine, behavioral health and anesthesiology worked on the perioperative evaluation and care plan protocols of patients with OUD. The protocol includes:

- Early consults to behavioral health for MAT & ongoing care
- Appropriate MAT use with anesthesia and pain management
- Consults to care management for early planning and peer support
- Peer support–Project SOAR notification

FIGURE 1
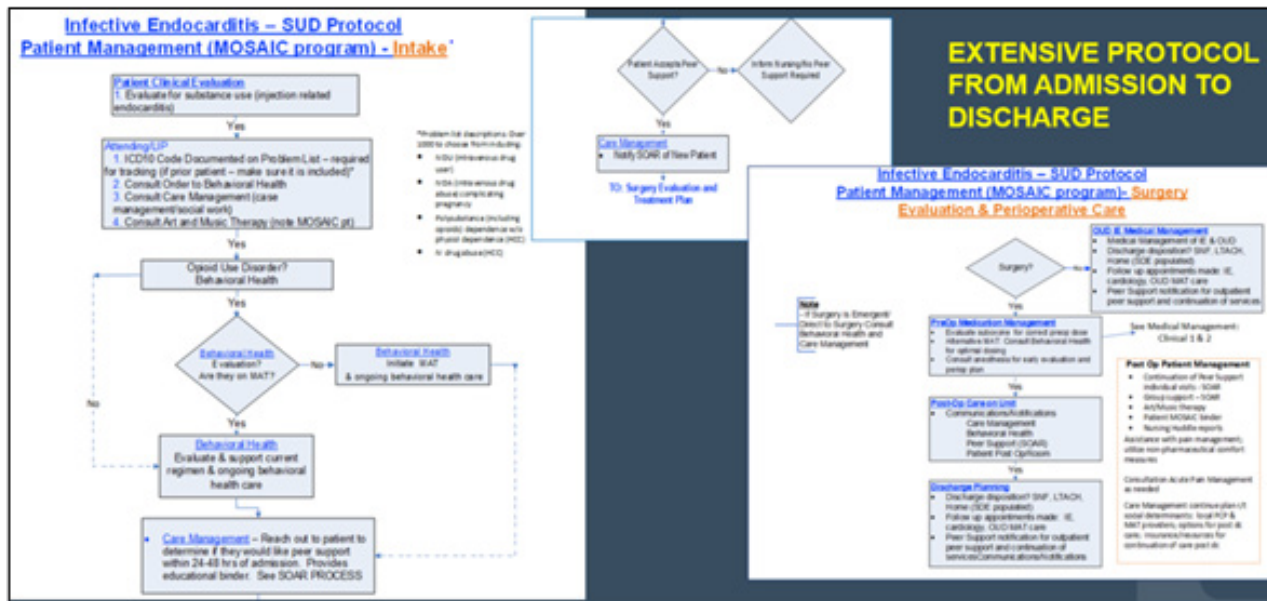
A link to the protocol was added to the 72-hour snapshot in Epic via the IT team, which provided clinical teams easy access to the protocols.
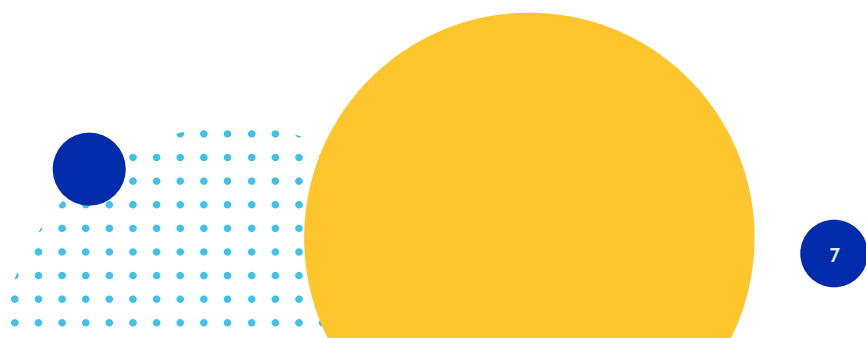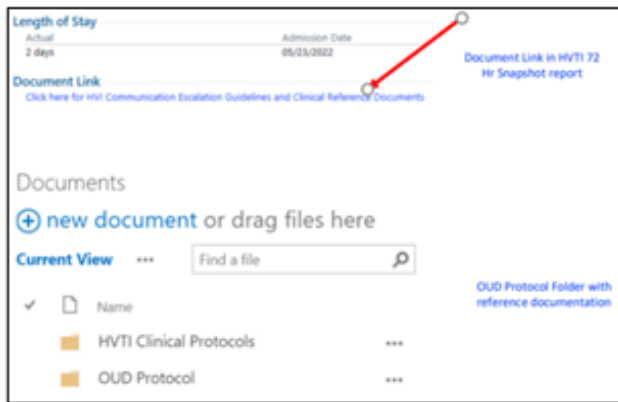
The protocols allow for consistency in care, efficiency and more rapid consults to the appropriate teams. In addition, the protocol provides a tool for education of clinical teams regarding standards or care for the SUD populations.

The new protocols and its location in the Epic snapshot were communicated through the Endocarditis Center team meetings and minutes and HVTI newsletters. Members of the Endocarditis Center presented the protocols at clinical team meetings throughout the HVTI.

#2 Early identification of patients: EMR Dashboard

Early identification of patients is essential for the MOSAIC program goals. The EMR visualization tools use was an excellent resource to provide functionality to detect patients who have been diagnosed with OUD.

Problem list is a standard function of the EMR that allows the provider to document clinical conditions of patients admitted to the hospital. The problem list uses standardized ICD-10 codes to document those problems managed by the hospital care team.

- ICD-10 codes, listed in the problem list were selected by the behavioral health team and approved by Dr. Streem, medical director of the Alcohol and Drug Recovery Center.
- Clinical team worked with the IT EMR team to create the SUD dashboard.
  - The list/report is created based on main campus location and the approved ICD-10 codes on the patient problem list.
  - Listing is real-time and the ability to sort by diagnosis, hospital location and clinician finds patients within HVTI with the diagnosis of endocarditis.
  - From the listing, the clinician can see the patient snapshot and go directly to the chart for more information and documentation.

To ensure that the listing was correct, real-time testing of the patient list was used to see if correct patients were identified. Refinements to the ICD-10 codes were made to make sure the correct patients are identified. Education regarding this new listing was provided in the same manner as previously described. Post go-live audits continue to occur. If patients are identified on the nursing unit that were not listed in the patient dashboard, a review is conducted to determine why. Direct feedback is provided to the medical team if the problem list was not completed correctly. For the dashboard to load correctly, it is imperative that the problem list is completed.

Name	MRN	Bed Location	Accept/ Decline
Patient #1	xxxxxxx	J81-07	Accepted
Patient #2	xxxxxxx	J31-23	Accepted
Patient #3	xxxxxxx	J72-14	Accepted
Patient #4	xxxxxxx	J51-22	Accepted
Patient #5	xxxxxxx	J52-22	TBD
Patient #6	xxxxxxx	J73-16	TBD
Patient #7		J53-16	TBD

The patient listing is distributed daily by social work to case managers, social workers and nursing for early discharge planning and admission to admit to MOSAIC follow-up program, and the medical team to see currently admitted patients.

#3 Standardized documentation and scheduling of follow-up calls: Intake and follow-up notes and dashboard

The clinical team worked with the EMR IT team to:

- Create a standardized documentation intake template in Epic with standardized data elements, including discharge date
- Based on discharge date, patients are listed for follow-up "today, soon (within the week), or overdue"
- Links to patient list and chart for easy and standard documentation
- Provides consistent data collection for this population of patients
- Dashboard also highlights those patients enrolled in MOSAIC program and important outcomes of the program such as those discharged on medical therapy or a treatment plan

Standard documentation templates

A standardized intake template (noted below) and follow-up call template is used with discrete data to develop dashboard and outcomes reporting.
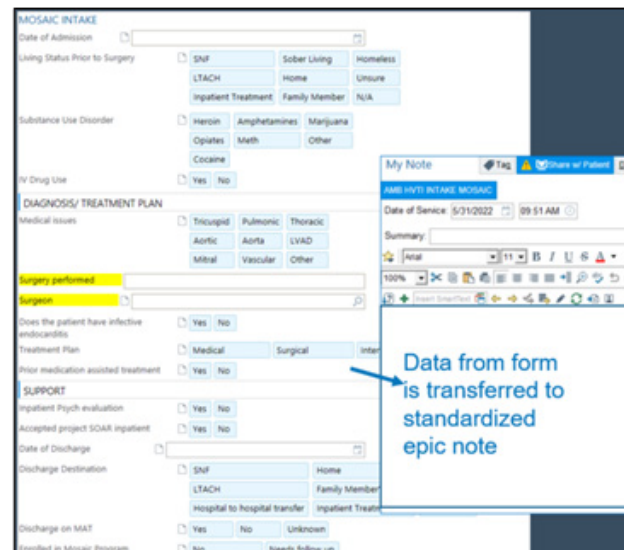
Based on timing of contact and date of discharge, patient follow-up call is scheduled and noted on dashboard

The MOSAIC Dashboard
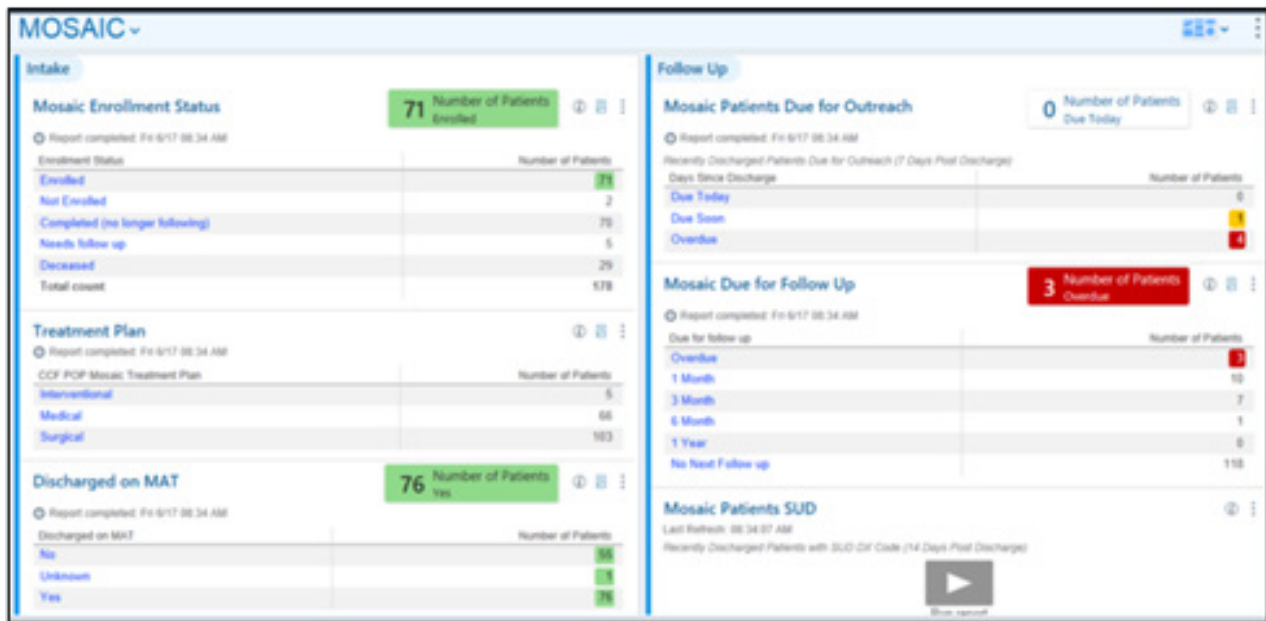
The dashboard uses discrete data capture from the templates to create a listing for easy identification of patients ready for follow-up. It also allows the Endocarditis Team a broad view of outcomes related to the MOSAIC population (such as data on treatment plans and patients discharged on MAT). One resource nurse calls all the patients, documents and reaches out to the MOSAIC care teams as needed (for follow up appointments or issues). The nurse looks at the dashboard each week to see who requires a call. Late calls (highlighted in red in the image) may be due to the inability to reach the patient at the prior call. All text in blue are hyperlinks directly to the patient chart—which makes contact information and documentation readily accessible.

Discussions with the clinical team and the nurse helped to refine the actual questions asked and the discrete data elements that are required for documentation. Review of reports and workflow with the resource nurse occurred over several sessions to make sure that data was being collected correctly and that the questions asked were obtaining the desired information to measure outcomes.

#4 Track outcomes: Quality outcome measures

It is important to track outcomes to look at program success and adjust accordingly. The endocarditis team determined the quality metrics to track. The enterprise analytics IT team created the report by pulling in data elements to create a monthly report. This data is reported to the endocarditis team via a secure internal portal.

Additional communication regarding the data is provided to the endocarditis team members via email and at Center team meetings. The review of real-time data collection and reporting led to refinements in the data collected and the report. One-on-one training of the registered nurse and communication through small group meetings as well as through regular multi-disciplinary team meetings have led to better data collection.

Cleveland Clinic's reputation as the top cardiology and cardiac surgery health system in the United States results in challenges identifying and maintaining with a patient population across a significantly wider geographic landscape than a typical health system. Patients come from all over the world to Cleveland Clinic for cardiac care. It was critical to design population health management tools to accurately visualize admitted patients and indicate potential substance dependency.

Challenges continue to arise, but as data is available we continue to target pain points. The data shows that Cleveland Clinic is doing better with patients through hospitalization.

MAT

Cleveland Clinic would like to see MAT and psychiatric/behavioral health evaluations increased for patients when MAT is appropriate; however, this is much improved from baseline.

56% had SOAR

85% had psych eval

80% had MAT at discharge

SOAR

SOAR program participation continues to increase. COVID and other issues did affect participation; however, Cleveland Clinic continues to work on strategies related to awareness (regular grand rounds and team meetings) to improve usage.

Reason for No MAT
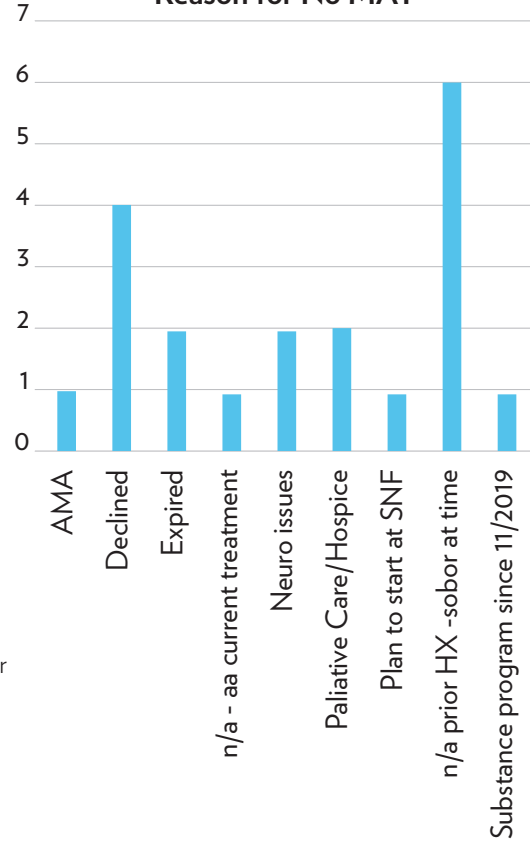
SOAR Patients 2020 - June 14, 2022

Legend: Accepted (blue), Declined (red)
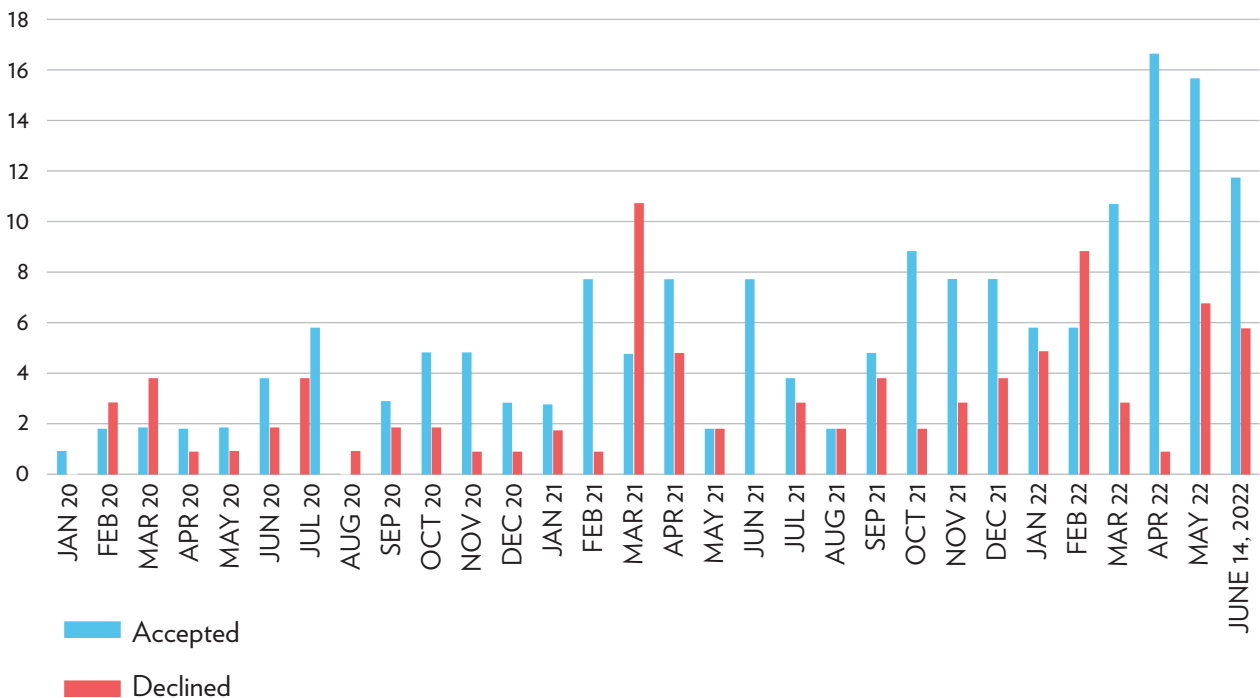
Cleveland Clinic is working toward better support with skilled nursing options that provide outpatient intensive addiction treatment to bridge the gap back to the community.

Clinical Transformation Enabled Through Information and Technology

IT Lessons learned include:

- IT expertise, EMR capabilities and clinical teamwork has made this program possible
- Work in progress:
    - As teams worked with the system, changes needed to be made with templates
    - As data was generated, changes needed to be made in data collection

The use of readily available inpatient visualization tools through the EMR allowed for:

- A more efficient and consistent program
- Data collection to review outcomes and to make changes to the program to better help patients

The first step was using the predefined list used in the ICD-10 standard for identifying patients with endocarditis and SUD on the patient problem list. Experts in the field of addiction management worked alongside clinical experts in infectious disease and cardiovascular care to identify the appropriate at risk ICD-10 codes. Assumptions for this logic is that the inpatient clinical team uses the problem list to document endocarditis and SUD; and that the correct ICD-10 code is required to document these problems. Problem list usage and the ICD-10 standard were well established prior to the implementation of these technology tools.

Creating the protocols were a necessary second step for consistency in care, but the addition of a link to the protocols in identified patient EMRs allows for easy access by clinical team members.

Use of discrete data elements and standardized documentation templates provided the necessary components to develop the dashboard for clinical follow-up as well as the tracking spreadsheets to evaluate outcomes.

Improving Patient Outcomes

There were many lessons learned from this program.

- We need to address the three problems of IE: endocarditis, drug addiction and psychiatric illness!
- Protocols including use of perioperative planning provide a more consistent plan of care for these patients. Easy access to protocols by clinicians through the EMR is helpful.
- Early identification of patients through the Epic dashboard helps to bring on appropriate services to this patient population in a timelier manner. Early discharge planning is critical.
- Continue to look at process and outcomes (pre-op, peri-op, postoperatively) to ensure protocols and care maximize long-term success.
- Look at risk factors and timing of relapse and design treatment/support around these factors.
    - Coordination of care from hospital–to SNF/LTAC–to community. Better options for discharge with intensive outpatient programming for SUD.
    - Close follow-up program (MOSAIC) and peer support is needed to help support this patient population and connect them to needed services long after discharge. Automatic scheduling of calls through Epic allows for program growth and timely contacts over time.

Overall patients enrolled in the MOSAIC program increased as the program matured. A decreased number of deceased patients were identified, suggesting the patient outreach that was completed positively impacted survival.
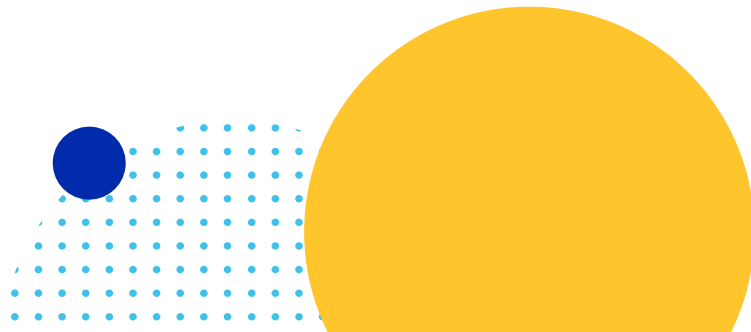
HVTI Opioid Use Disorder Patient Tracking
Unique Patients By Discharge Month

Legend: Total Patients — Alive — Deceased — Alive Count Cumulative
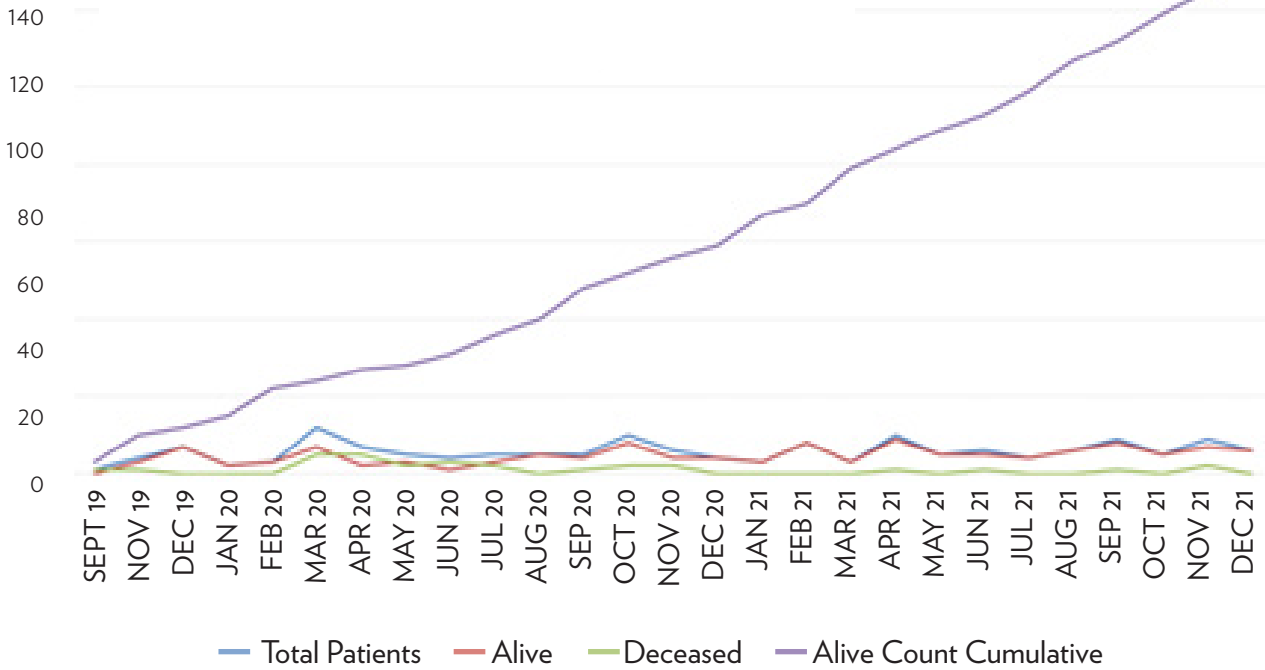
HVTI Opioid Use Disorder Patient Tracking
Unique Patients By Follow-Up Program Month

1/20/20
First US reported
COVID case

3/11/20
WHO Declared
COVID Pandemic

3/13/20
US Declares
Nationwide
Emergency

Legend: Total Patients — Alive — Deceased — Alive Count Cumulative
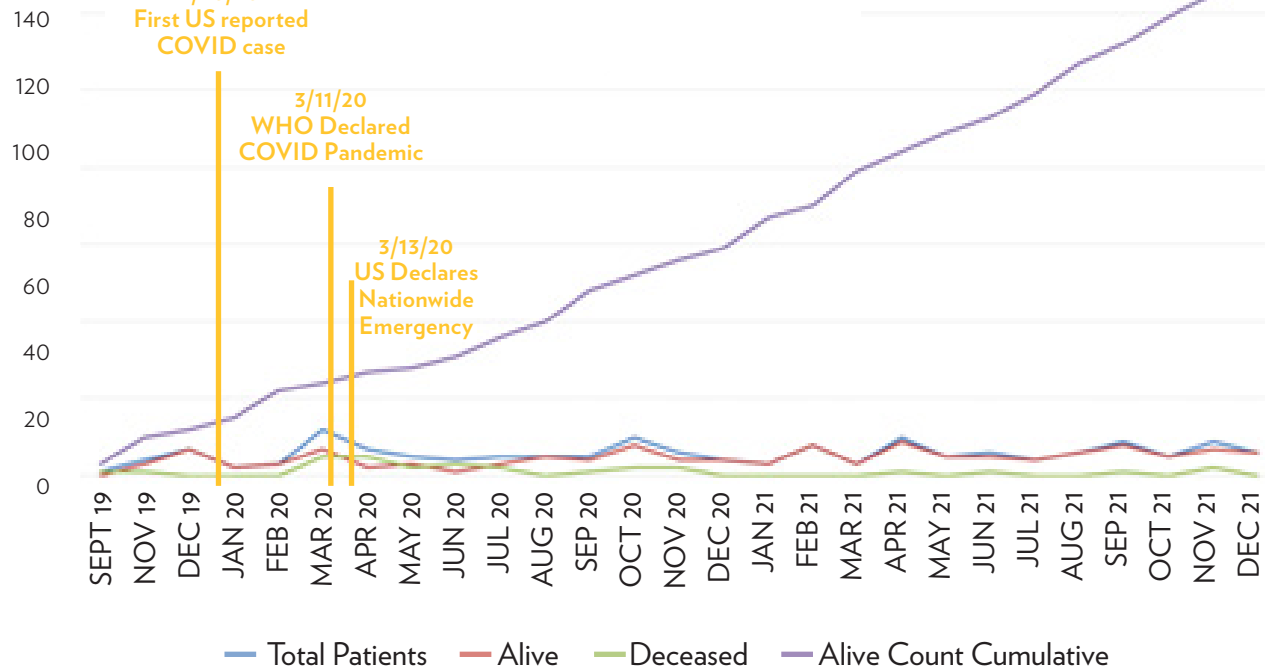
Increased number of deceased patients were identified during the global pandemic, suggesting the pandemic and subsequent lock down of this population impacted survival of patients enrolled in the program.

Accountability and Driving Resilient Care Redesign

The program tracking has led to identifying needed improvements in care.

Cleveland Clinic has improved in:

- Rapid diagnosis of SUD-endocarditis.
- Initiation of MAT at inpatient.
- Prescribing MAT at discharge.
- Connection to peer support and follow-up phone calls have provided more support during admission and at follow-up.

In addition, anecdotally, Cleveland Clinic sees that the protocols and documentation while the patient is admitted has led to improvements in standards of care and caregivers report more confidence in caring for this challenging patient population–as they also have more supportive resources available.

Data collection and automatic scheduling of calls through Epic allows for program growth and timely contacts over time. However, we know through data collection, patient relapse is highest during the first year and many patients are lost to follow-up. Cleveland Clinic needs to improve on:

- Continued MAT after discharge
- Continued support with either inpatient or intensive outpatient (IOP) for addiction and co-existing psych diagnoses
- Improve link to community resources
- Continued follow-up support well after discharge with reliable contact information

We have found that when patients leave the setting of the hospital, the care received at SNFs can be challenging. Lack of insurance, out of state patients, lack of family support, and varying capabilities of the SNF make this a challenging transition of care. In addition, those who have poor social support and refuse a SNF setting, are often lost to follow-up. Ideally, the best placement is a SNF that has the capabilities of delivering IV antibiotics, with the programming available for addiction management/counseling–and with shared communication through the EMR for better patient tracking, clinical communication, and transition of care to community documentation for improved follow-up.

Cleveland Clinic is currently working on a process to improve the transition of care with facilities that can manage these objectives, utilizing shared technology to manage the patients for improved clinical outcomes.

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