



The importance of facilitating goal-concordant care (GCC) in a pandemic: the MD Anderson Experience with hospitalized COVID-19-positive patients

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Abstract

Purpose Provider-patient communication (PPC) about goals of care (GOC) facilitates goal-concordant care (GCC) delivery. Hospital resource limitations imposed during the pandemic made it vital to deliver GCC to a patient cohort with COVID-19 and cancer. We aimed to evaluate the implementation of a real-time goals of care intervention and to make recommendations for future pandemics with similar clinical scenarios.

Methods This is a retrospective cohort study, of all COVID-19 positive patients admitted to The University of Texas MD Anderson Cancer Center between March of 2020 and January of 2021. The cohort included the following: (1) patients 18 years of age or older; (2) positive COVID-19 infection; (3) requiring hospitalization. Medical records were reviewed and all patient data including demographics, comorbidities, and outcomes were collected and analyzed in the Syntropy platform, Palantir Foundry, as part of the institutional Data-Driven Determinants of COVID-19 Oncology Discovery Effort (D3CODE) protocol. A multidisciplinary GOC task force developed processes for ease of conducting GOC-PPC and implemented structured documentation. We looked at ACP documentation pre- and post-implementation alongside demographics, length of stay (LOS), 30-day readmission rate and mortality.

Results There were 494 unique patients identified, 53% male, 61.5% Caucasian, 16.8% African American, and 3.2% Asian. Active cancer was identified in 84.6% patients, of which 65.6% were solid tumors and 34.4% hematologic malignancies. LOS was 9 days with a 30-day readmission rate of 15% and inpatient mortality of 14%. Inpatient ACP note documentation was significantly higher post-implementation as compared to pre-implementation (90% vs 8%, $P < 0.05$). We saw sustained ACP documentation throughout the pandemic suggesting effective processes.

Conclusions The implementation of institutional structured processes for GOC-PPC resulted in rapid sustainable adoption of ACP documentation for COVID-19-positive cancer patients. This was highly beneficial for this population during the pandemic, as it demonstrated the role of agile processes in care delivery models, which will be beneficial in the future when rapid implementation is needed.

Keywords Goals of care · Goal concordant care · Advance care planning · COVID-19 · Coronavirus

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Background

The COVID-19 pandemic presented an opportunity of paramount importance to prioritize timely goals of care (GOC) conversations. The gravity of the pandemic along with hospitals facing resource challenges (low bed capacity, ventilator shortages, staffing inadequacies, etc.) along with the known futility of resuscitation in this setting, placed further urgency on timely delivery of goal concordant care for our unique population of patients with cancer plus COVID-19. Effective and empathetic communication about disease prognosis, patient values and preferences, and treatment options is vital in delivering goal-concordant care (GCC). It has been found that there is futility in cardiopulmonary resuscitation in the COVID-19 patient population, with one retrospective multi-hospital study showing that patients with COVID-19 who suffered from in-hospital cardiac arrest had 100% mortality regardless of their baseline comorbidities, illness severity, and location of arrest, with 81% of these patients being on a mechanical ventilator prior to arrest and a majority of the cardiac arrests (84.1%) occurring in the ICU setting [1].

While appropriate discussions about advance care planning (ACP) are best initiated in the outpatient setting by primary oncologists, an admission to the hospital presents an important opportunity to re-evaluate and continue GOC discussions, as it signals a change in the trajectory of the patient's illness, giving increased relevance to these conversations. It is recorded that 99% of clinicians believe that GCC discussions are important [2]; however, only 29% of clinicians report having such conversations [3]. It is also worthwhile to note that only roughly 11% of patients report having GOC conversations with their providers [4], though 92% of Americans indicated they would be comfortable having GOC and End-of-Life (EoL) discussions with their provider [3]. Inconsistencies with care preferences has been associated with higher medical costs and lower quality of care for the patient [4, 5]. Literature indicates that timely GOC contributes to better care experience by the patient [6, 7], longer survival [8], better quality of life [8–10], and fewer depressive symptoms by patients [8, 11]. Now, more than ever, prioritizing timely GOC conversations and ensuring delivery of goal-concordant care is important, as we strive to respect the wishes of patients who do not prefer higher levels of care at EoL, while efficiently navigating potential shortages in resources and effectively steering resource allocation. Our primary aim is thus to give a global overview of our experience in delivering goal concordant care to the COVID-19 patient population within a cancer institution.

Methods

Under an IRB approved protocol, we conducted a retrospective cohort study, of all COVID-19-positive patients admitted to our institution, The University of Texas MD Anderson Cancer Center, between March 24, 2020 through January 24, 2021. The cohort included the following: (1) patients 18 years of age or older; (2) positive COVID-19 infection laboratory; (3) requiring hospitalization and admitted to the COVID-19 hospital unit. Medical records were reviewed and all patient's data including demographics, comorbidities and outcomes were collected and analyzed in the Syntropy platform, Palantir Foundry, as part of the institutional Data-Driven Determinants of COVID-19 Oncology Discovery Effort (D3CODE) protocol. We looked at PPC and ACP documentation pre and post implementation alongside demographics, length of stay (LOS), 30-day readmission rate and mortality.

Data were obtained from structured and unstructured electronic medical record elements, clinical note text, and ACP note documentation. Each source was identified, data integrated and analyzed using the Palantir Foundry platform (Syntropy), part of the Context Engine Data Management System at the MD Anderson Cancer Center (MDACC). Additionally, for some areas of our research, which required manual data analysis, we utilized data that were collected and managed using REDCap (Research Electronic Data Capture) hosted at MDACC [12, 13]. REDCap is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

Design and implementation of GOC task force

At the direction of institutional leadership, a multidisciplinary GOC task force was created to accelerate the ongoing work of engaging patients with timely GOC conversations on March 17, 2020. This taskforce included medical oncologists, intensivists, ethicists, palliative care physicians, internal medicine hospitalists, nursing, case managers, and social workers. The task force convened daily to create appropriate criteria and workflow for the inpatient cancer population, to develop virtual training and allocating resources to support primary oncologists in initiating these sensitive yet essential conversations. Additionally, the task force was responsible for creation of standardized ACP note templates, to capture essential information related to goal-concordant care.

A day later, March 18, 2020, a national emergency was announced due to the rapid spread of COVID-19. The institution set up a designated COVID-19 unit and our first COVID-19 positive patient was admitted on March 24, 2020. This unique turn of global events prompted the initiation of a separate work stream for GOC on the COVID-19 unit.

Evaluation and optimization of GOC task force

Following initial review, the COVID-19 GOC team assessed challenges in the current process, strategized and proposed an updated workflow to tailor delivery of GCC to our distinctive population of COVID-19 patients with cancer. This new workflow included daily multidisciplinary virtual rounds/discussions with team members including nurses, oncologists, hospitalists, ethicist, physical therapist/occupational therapist, social worker and case manager. This multidisciplinary method was taken to ensure that a holistic approach was utilized in determining each patient's clinical condition, performance status, and severity of cancer and COVID-19 illness, and urgency for GOC conversation.








Goals of care conversations models

A workflow process included a 3-tiered model for GOC conversations in the COVID-19 unit (Table 1), which included the new GOC-Rapid Response Team (RRT). The RRT included the attending physician, palliative care physician and an ethicist, with the ability to respond within 30 min, if needed.

COVID-19 unit goals of care team

On April 24, 2020, the GOC team for the COVID-19 unit was formalized. All patients admitted to the COVID-19 unit were required to have a GOC conversation documented at some point during hospital admission, with preference given to documentation within the first 24 h of admission to the COVID-19 unit. After the initial GOC conversation, any acute change in condition would appropriately necessitate a follow-up GOC conversation with either the patient or family members (medical Power of Attorney [mPOA]/surrogate/legal next of kin). We instituted this workflow during a pilot period from April 24, 2020 through May 24, 2020 and continued the efforts from May 25, 2020 onwards to present day,

Table 1 GOC conversations models

	Primary Oncologist led GOC	Co-managed GOC	Rapid Response Team
	Patients admitted to inpatient floor with a Risk of Escalation score of 2 or 3, to establish clear GoC	Patients with complex clinical or psychological needs	Patients acutely declining with no clear GoC planning
	Same day	1-2 days	Urgent/Same day
	Primary oncologist	Primary oncologist, Palliative Care physician, Social work	Primary oncologist, primary attending, Palliative Care physician, Social work, Ethicist
	Elicit patient's value and wishes. Share potential treatment plans. Align wishes with medically appropriate option. Re-evaluate periodically.	Elicit patient's value and wishes. Share potential treatment plans. Align wishes with medically appropriate option given complex ongoing issues. Re-evaluate periodically.	Give rapid, coordinated, clear information and clarify patient's wishes, anticipating imminent decline. Re-evaluate periodically.
	Self-directed with conversation guide	Self-directed with support of briefing and debriefing	Ethics facilitated
	Primary oncologist documents in ACP note	Primary oncologist documents in ACP note	Primary oncologist documents in ACP note
	Inpatient medical director	Inpatient medical director Palliative care leader	Inpatient medical director Palliative care leader Clinical Ethics

making efforts to measure sustainability of this care model through January 24, 2021 (Fig. 1).

Results

In our cancer institution, 494 unique patients who required hospitalization to the COVID-19 unit were identified from March 24, 2020, through January 24, 2021. 81% of patients admitted had an active cancer diagnosis, while the other 19% either had non-active cancer or cancer of indeterminate/unspecified origin. Of the 84.6% active cancers, 34.4% of patients had underlying active hematologic malignancies, and 65.6% had active solid tumor malignancies. 4.5% of total admitted patients were identified as having a cancer involving the respiratory tract.

Other high-risk comorbidities identified included hypertension (72%), chronic kidney disease/end-stage renal disease (45%), diabetes mellitus (44%), chronic obstructive pulmonary disease (17%), congestive heart failure (16%), asthma (13%), venous thromboembolism (12%) and obesity (12%). Mean patient age was 59, with median being 61. Gender distribution showed 52% of patients being male and 48% of patients being female. Race and ethnicity demographics showed 61.5% of patients identified as Caucasian, 16.8% as African American and 3.2% as Asian, 17.2% as Other, and 1.2% as Unknown/Declined to answer (Table 2).

Inpatient average length of stay (LOS) was 9 days, and 30-day readmission rate was 15%. Inpatient COVID-19 mortality during this time was 14%. Of the patients that expired during their hospitalization for COVID-19 in this timeframe, 90.4% were Do Not Resuscitate (DNR), 82.2% opted for comfort care, and 9.6% remained full code status, expiring after a terminal code blue event (Fig. 2). Referral to social worker was 53.4%, supportive care service was 15.4%, to spiritual services it was 12.6%, and to psychiatry it was 0.6% (Fig. 3).

During the timeframe of our study, a mean of 90% of patient encounters had ACP note documentation, with 5 out of 11 of the study period months having greater than 90% ACP note documentation (Fig. 4). We noted that this practice sustained even past our pilot period and through

Table 2 Descriptive statistics table of demographics and high-risk comorbidities

High-risk comorbidities		
Hypertension	358	(72%)
Chronic kidney disease/end-stage renal disease	224	(45%)
Diabetes mellitus	218	(44%)
Chronic obstructive pulmonary disease	86	(17%)
Congestive heart failure	80	(16%)
Asthma	64	(13%)
Venous thromboembolism	61	(12%)
Obesity	60	(12%)
Gender: n=494 (100%)		
Male	260	(53%)
Female	234	(48%)
Race: n=494 (100%)		
Caucasian	304	(61.5%)
African American	83	(16.8%)
Other	85	(17.2%)
Asian	16	(3.2%)
Unknown / Declined to Answer	6	(1.2%)
Age: n=494 (100%)		
Age at admission (mean +/- SD)	59/16.2	
Active cancer diagnosis: n=418 (84.6%)		
Hematologic malignancies	144	(34.4%)
Solid tumor malignancies	274	(65.6%)
Non-active cancer diagnosis or cancer of indeterminate origin: n=76 (15.3%)		

our peak census times. During the pre-implementation period (March 24, 2020, to April 23, 2020), only 8% of COVID-19 patient encounters had ACP note documentation. Comparatively, on non-COVID hospitalized patients within our institution, ACP note documentation was recorded to be a mean of 58% for the same post-implementation time-period (Fig. 5).

We also found that there was a correlation between age of patient and provider ACP note documentation within the first 24 hours of hospitalization of the COVID Unit, with the highest ACP note documentation rate being in patients greater than or equal to 81 years of age (51.85%) and the lowest ACP note documentation rate being in

Fig. 1 Timeline of GOC implementation

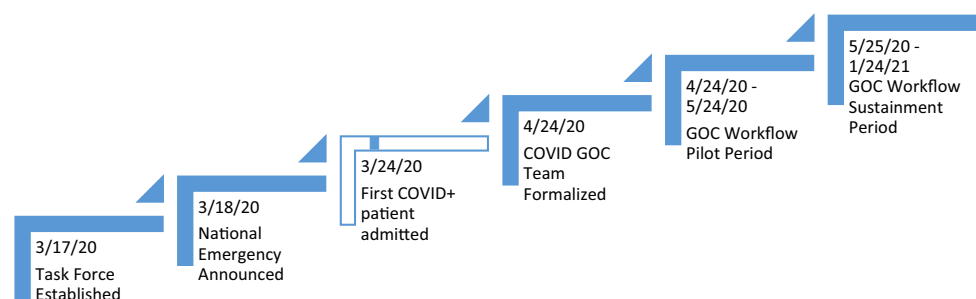


Fig. 2 Code status in the deceased cohort of hospitalized COVID patients in a cancer institution

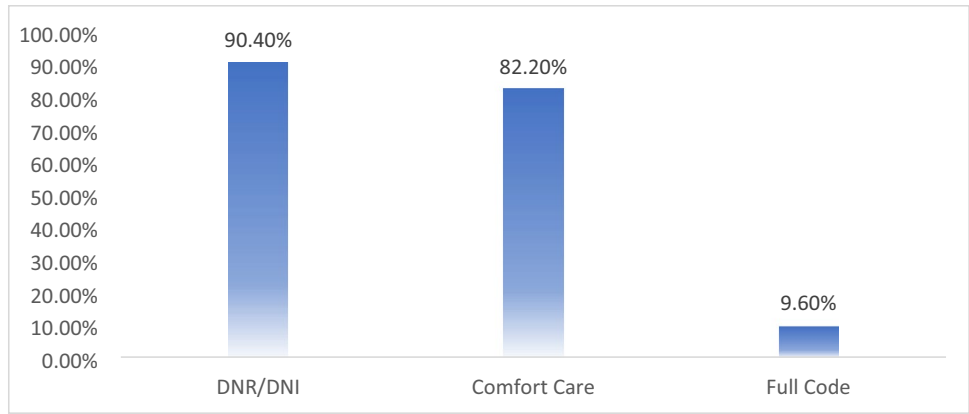


Fig. 3 Percentage of COVID-19 patients referred to supportive services in a cancer institution

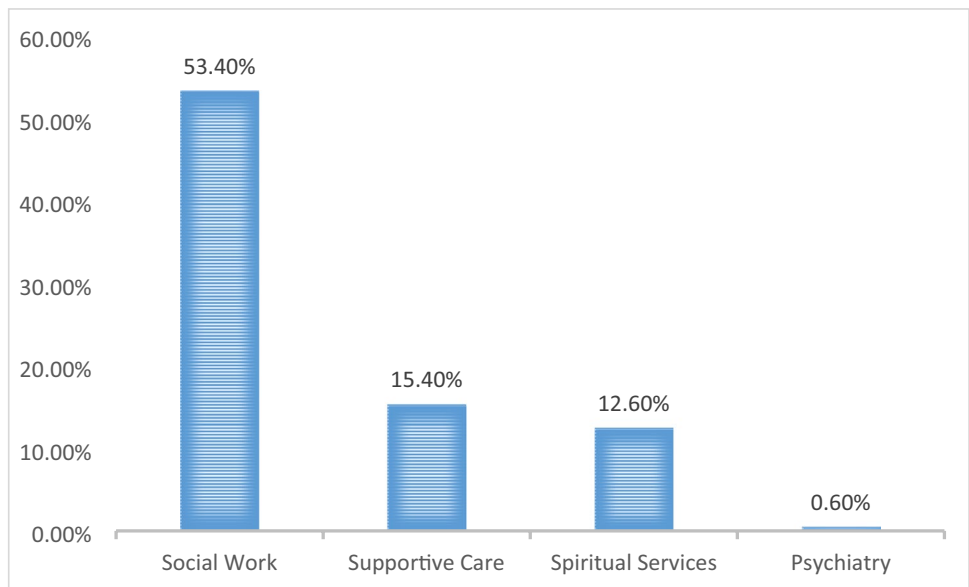


Fig. 4 Provider ACP note documentation rate on the COVID unit in a cancer institution

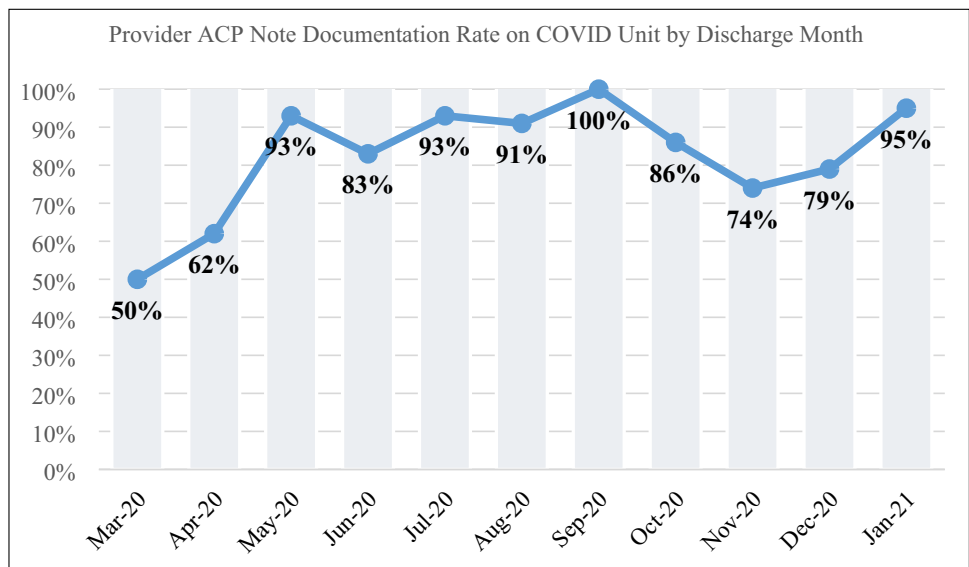
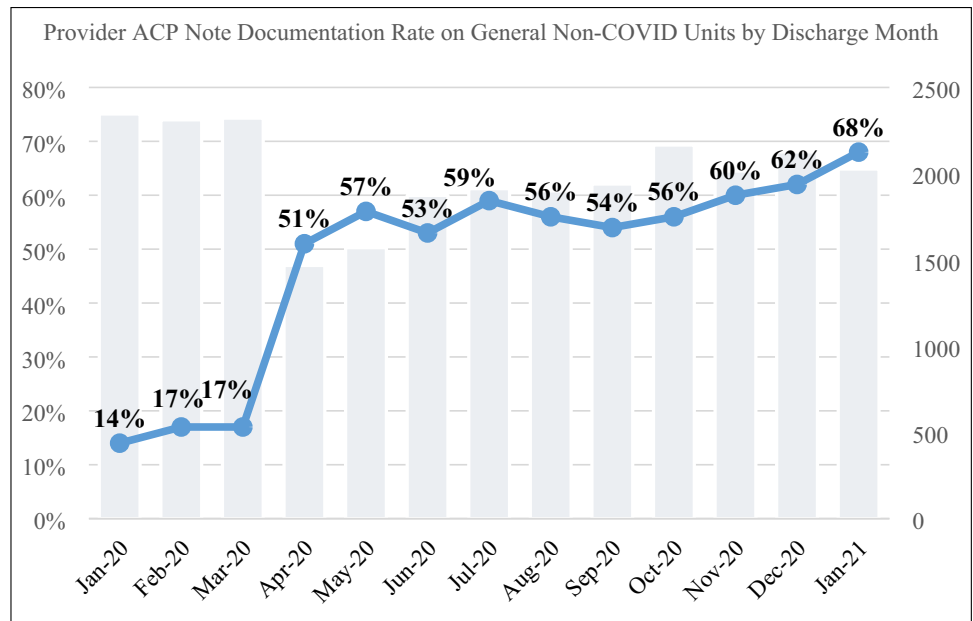


Fig. 5 Provider ACP note documentation rate on the general inpatient units in a cancer institution



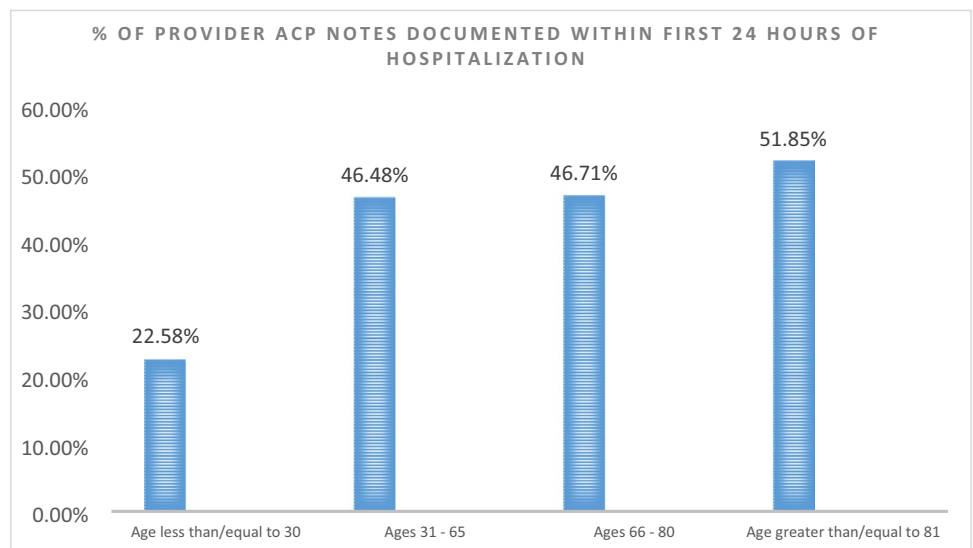
patients less than or equal to 30 years of age (22.58%) (Fig. 6).

Discussion

It is challenging to make conclusive statements regarding pre- and post-GOC algorithm implementation outcomes for the COVID-19 patients, given that pre-implementation patient cohort consisted of patients ($n = 29$) admitted from March 24, 2020, to April 23, 2020 and post-implementation cohort included patients admitted from April 24, 2020 through January 24, 2021 ($n = 465$). However, our experience showed that with implementation of a

daily multidisciplinary goal-concordant approach on the COVID-19 unit, a significant proportion of physicians had routine GOC conversations with patients and/or caregivers and documented their outcomes in the format of a templated ACP note (90%), which identified goals of cancer care as well as goals of COVID-19 care specifically (Fig. 7). Our benchmark goal for ACP note documentation during this study period was 70%. Our benchmark goal as well as achieved ACP documentation rate of 90% substantially exceeds the 11% of patients reported as having GOC conversations with their providers in literature [4]. This is further highlighted by our analysis showing 90.4% of those patients (or caregivers of patients) who expired opted for

Fig. 6 Provider ACP note documentation rate (by age group) on the COVID unit in a cancer institution



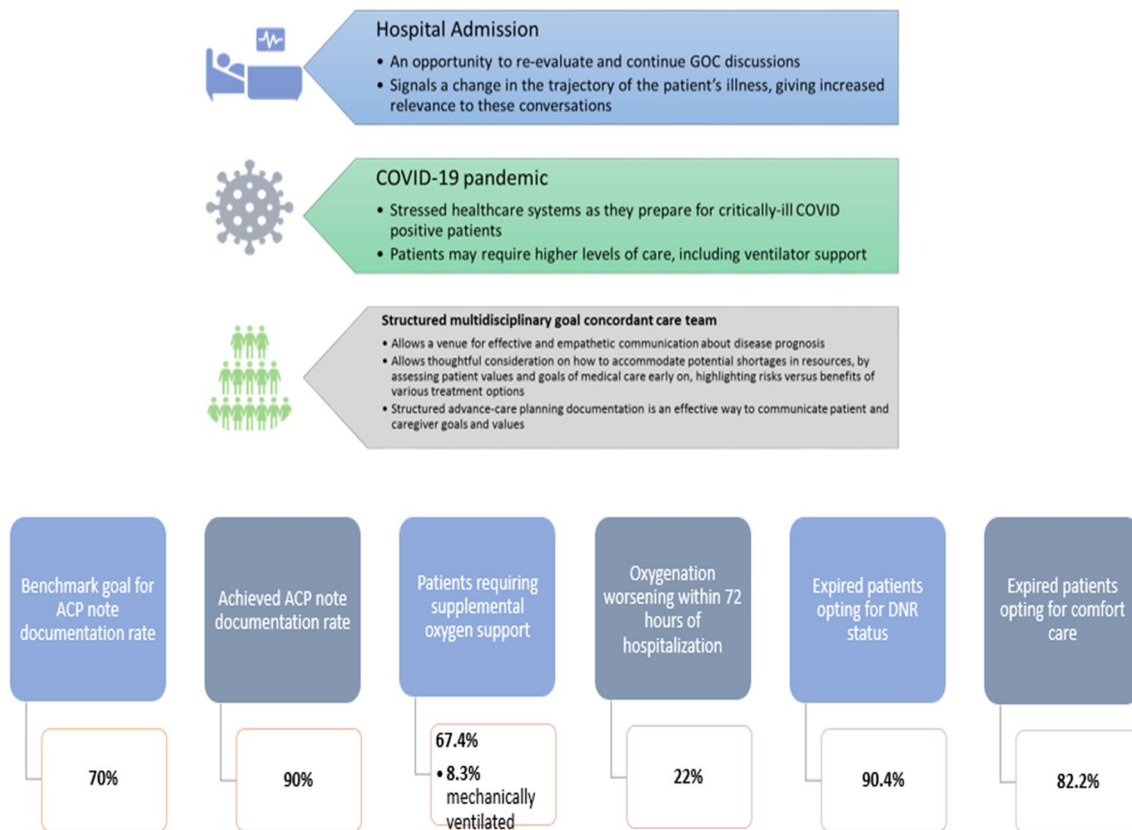


Fig. 7 Overall outcomes demonstrating importance of GOC workflow implementation

DNR status leading up to EoL, along with 82.2% of those patients electing to go the comfort care route (Fig. 7).

Additionally, we found through literature search [14–17] that our inpatient mortality rate of 14% was among the lowest published hospitalized COVID-19 overall patient mortality rate, during a time when COVID-19 vaccination was not yet widely available or robustly implemented. We were able to extract data on illness severity for our COVID-19 cancer patient population during the study time period and found that 67.4% of patients required some degree of supplemental oxygen support, while 19.8% of patients required higher levels of non-invasive oxygen support (i.e., high-flow nasal cannula, non-rebreather mask, or non-invasive positive pressure ventilation), and 8.3% of patients ultimately required mechanical ventilation (Fig. 8). Additionally, 22% of these patients were noted to have worsening oxygen requirements within the first seventy-two hours of hospital admission (Fig. 9). Maintaining a low inpatient mortality rate in patients with such high illness severity furthermore emphasizes the vital significance of utilizing an adept multidisciplinary care team for complex patient populations. While we do not surmise that goals of care discussions and advance care planning documentation specifically impacted the mortality rate, we can infer from these findings that a

multidisciplinary, team-based approach to higher complexity patients could lead to improved overall clinical outcomes.

These figures demonstrate that early initiation of conversations regarding goal concordant care between patients, caregivers and providers have significant impact on EoL outcomes. The more traditional model of care in cancer medicine previously has been dichotomous, with curative or disease-modifying treatment offered primarily and palliative options only being discussed later in disease course. Including a selected team of experts in having these discussions, not only lowers the burden of responsibility of the primary treating physician, but also increases the support system for the patient/family/caregiver. Within our COVID-19 patient cohort for the study period, we found that 53.4% of patients were referred to social work for either medical power of attorney identification, living will documentation, hospice education, out-of-hospital DNR documentation, or other social/financial issues. 15.4% of patients were referred to our supportive/palliative care consultants for either pain/symptom management, assistance with GOC, or psychologic services. 12.6% of patients were referred to spiritual services (Fig. 2). Other consulting services such as critical care, infectious disease, oncologic subspecialties, pulmonology, among others were also heavily involved in multidisciplinary

Fig. 8 Illness severity (by O₂ status) on the COVID unit in a cancer institution

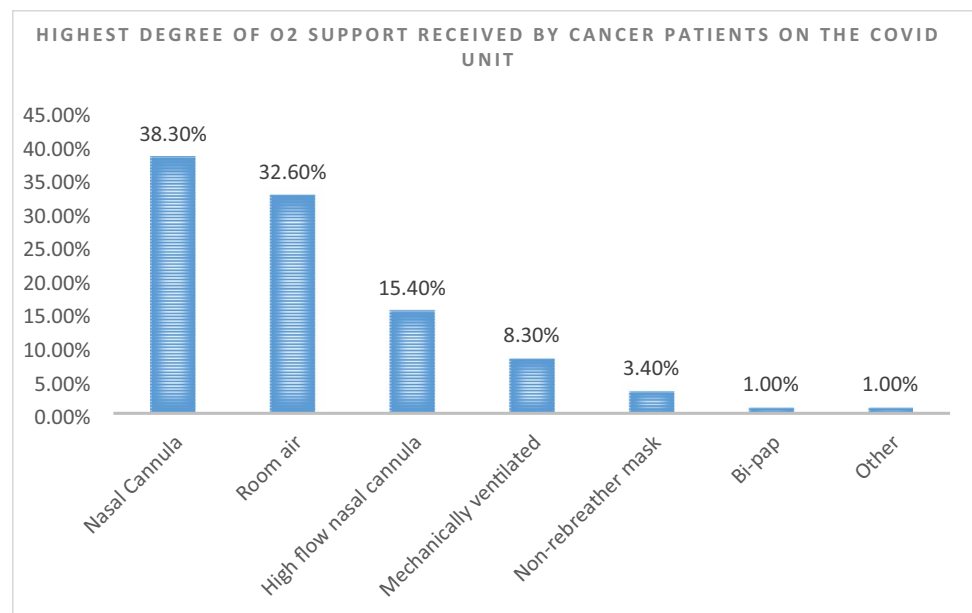
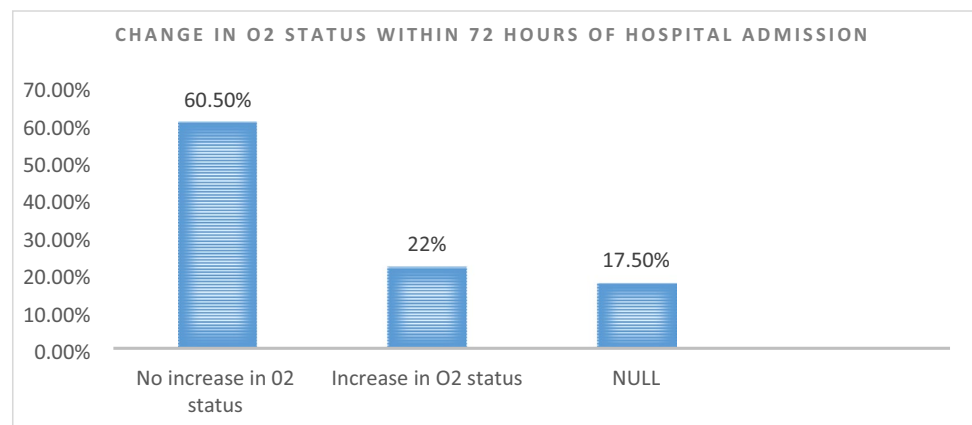


Fig. 9 Illness Severity by Deterioration Index on the COVID unit in a cancer institution.
*NULL = if length of stay is less than 72 h or if O₂ status was not consistently recorded within 72 h



patient care, though for the purposes of our study, all consultation data was not extracted.

This type of multidisciplinary approach affords patients/family/caregivers the opportunity to look at their current situation from more than just the medical perspective. Palliative care specialists are skilled in EoL issues and questions, while ethicists are skilled in the methodology of facilitated conversations. Ethicists also ensure that different value systems are respected and integrated into the conversation. Thus, integrating these specialists into GOC conversations, along with the primary inpatient teams and oncologists, provides greater value for patients/caregivers, whose decision-making is optimized when they are presented with a global view of their treatment options and overall prognosis.

Our model suggests more compassionate outcomes when utilizing a goal-concordant approach to those patients with cancer plus multiple comorbidities including COVID-19, so that they are educated early in the disease process on the

option of a palliative approach and thus, may receive timely and high-quality palliative care when appropriate. Accordingly, we conclude that there is notable utility in implementing a multidisciplinary approach to goal concordant care in the hospitalized cancer population with COVID-19 illness. This concept likely has broader benefit in fundamental application to all hospitalized cancer patients. COVID-19 will likely continue its significant impact on our vulnerable immunocompromised community of patients, thus as clinicians, it is our ethical responsibility to provide patients and caregivers with the tools and education to make informed decisions regarding end-of-life care.

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Author contribution The listed authors have made substantial contribution to various aspects of this article, including its concept and design, as well as the acquisition, analysis, and interpretation of data for the article. The listed authors have either drafted the article or helped revise it for important intellectual content and approved the final version for manuscript submission.

Concept and design: MM, SD, MG, CS, CL, NN
 Collection and assembly of data: MM, SD, CL, NN
 Data analysis and interpretation: MM, SD, CL, NN
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 Final approval of manuscript: MM, SD, MG, CS, CL, NN

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Declarations

Ethics approval Approval was obtained from the institutional review board / ethics committee of The University of Texas MD Anderson Cancer Center, IRB-approved protocol 2020-0348. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to participate Not applicable. A waiver of informed consent has been granted by the institutional review board at The University of Texas MD Anderson Cancer Center.

Consent for publication Not applicable. There is no patient identifiable data in this publication.

Competing interests The authors declare no competing interests.

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