Abstract #896

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Cost-Avoidance Associated with Active Stewardship of Remdesivir

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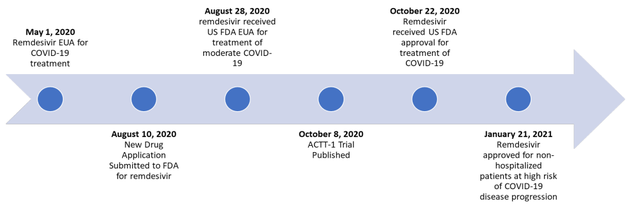
Background

- The COVID-19 pandemic shifted 62% of routine stewardship work within DASON to other areas in 2020. As of May 2021, 54% of this diverted effort had not returned. Pharmacist staff reductions impacted UNC Health Southeastern (UNC HSE), as well as 58.8% of DASON hospitals surveyed. [1]
- Despite limited resources, stewardship programs were often tasked with distribution of novel agents for COVID-19 and managing emergency use authorization (EUA) requirements in addition to normal workloads. [1]
- Remdesivir received initial EUA approval in May 2020 for the treatment of adult and pediatric patients with suspected and confirmed COVID-19 infection and severe disease, defined as SpO2≤94% on room air, requiring supplemental oxygen, mechanical ventilation (MV), or extracorporeal membrane oxygenation (ECMO). Remdesivir availability and guideline-approved criteria for use changed throughout the study period and has now expanded to include outpatients; hospitalized patients at high risk of progression on no supplemental oxygen; hospitalized patients requiring conventional oxygen; select patients on high flow nasal canula, and non-invasive oxygen. Remdesivir is no longer recommended in hospitalized patients who require MV or ECMO (Figure 1).[2,3]
- DASON hospitals handled the remdesivir approval process via criteria based pharmacist review, ID physician consult, telephone approval, or other approval council. From the time of first EUA to FDA approval, there was a shift in the network to less ID consultation and more pharmacist-based review.[1] UNC HSE maintained a strict approval process of pharmacy-director review of patients to ensure they met EUA and guideline-based appropriateness criteria with the ID physician resolving any disputes throughout 2021.
- The goal of remdesivir stewardship at UNC HSE was to optimize care; however, the shift in workflow presented an unrecognized opportunity for stewards to reduce remdesivir costs.

Figure 1. Remdesivir Approval Timeline



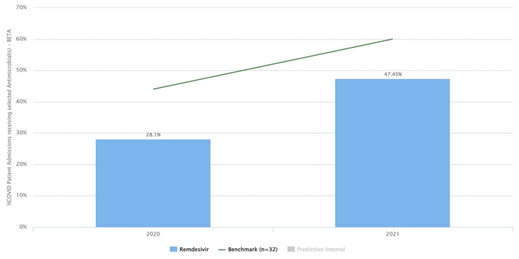
Methods

- The percentage of COVID patient admissions receiving remdesivir at UNC HSE for calendar years 2020 and 2021 was benchmarked against 32 community hospitals in the Duke Antimicrobial Stewardship Outreach Network (DASON) (Figure 1). UNC HSE remdesivir purchasing data were used to calculate the actual expenditures for remdesivir in 2020 and 2021.
- We calculated the anticipated expenditures if the DASON mean % of COVID admissions had received remdesivir.
- Cost-avoidance was calculated based on the difference of these two values.

Results/Discussion

- At UNC HSE, 28.1% of COVID admissions received remdesivir in 2020 and annual remdesivir expenditures were $693,680. In 2021, 47.45% of COVID-19 admissions received remdesivir and drug expenditures were $1,248,000. The DASON mean % of COVID admissions receiving remdesivir in 2020 was 44.08% and 60.07% in 2021. A total cost avoidance of $726,407 was calculated based on the hospital's below-benchmark use of remdesivir (Table 1).

Figure 1. Percentage of COVID Admissions Receiving Remdesivir by Year with the DASON Benchmark (2020-2021)



Results/Discussion continued

- UNC HSE had below-benchmark use of remdesivir and above-benchmark durations of therapy in 2020 and 2021 (Table 2). They also prescribed remdesivir to a lower percentage of COVID admissions. These metrics reflect the hospital's careful selection of patients who were appropriate candidates to receive the drug.
- UNC HSE did not experience any remdesivir shortages and shortages were reported by <5% of hospitals within the DASON network[1] and are not anticipated to have impacted our results.
- Some limitations of this analysis are that we did not include patient outcomes or review the appropriateness of remdesivir use. Remdesivir was not available in early 2020.

Table 1. Estimated Cost Avoidance for UNC HSE Compared to DASON Mean

Year	Anticipated Expenditures if DASON Mean % of COVID Admissions Received Remdesivir	UNC Health Southeastern Actual Remdesivir Expenditures	Cost Avoidance
2020	$1,088,164	$693,680	$394,484
2021	$1,579,923	$1,248,000	$331,923
TOTAL	$2,668,087	$1,941,680	$726,407

Remdesivir cost per 100mg vial = $520

Table 2. Remdesivir Use at UNC HSE Compared to the DASON Mean Rates

2020			2021		
Metric	UNC HSE Rate	DASON Mean Rate (95% Prediction Interval)	Metric	UNC HSE Rate	DASON Mean Rate (95% Prediction Interval)
Days of Therapy/Thousand Patient Days	19.57	28.14 (1.45-54.83)	Days of Therapy/Thousand Patient Days	33.68	51.04 (7.46-94.62)
Length of Therapy/Targeted Antimicrobial Use Admissions	4.47	4.17 (3.46 -4.88)	Length of Therapy/Targeted Antimicrobial Use Admissions	4.03	4.00 (3.01-4.99)
%Patient Admissions Receiving Remdesivir	1.7%	2.91% (0.39% - 5.43%)	%Patient Admissions Receiving Remdesivir	3.82%	5.94% (0.75% - 11.12%)

Conclusions

- UNC HSE achieved over $700,000 in cost-savings in 2020 and 2021 due to active remdesivir stewardship by the pharmacy director and ID physician.
- Dedicating hospital resources to consistently steward high-cost agents can result in significant cost-savings for an organization while ensuring patients receive appropriate, guideline-directed care.

References: 1. Dodds Ashley E, Dyer A, Jones T, et. al. 106. Pandemic Pinch: The Impact of COVID Response on Antimicrobial Stewardship (ASP) Resource Allocation. *Open Forum Infect Dis*. 2021;8(Suppl 1):S167-S168. Published 2021 Nov. doi.org/10.1093/ofid/ofab466.308. 2. Food and Drug Administration. Emergency Use Authorization for remdesivir, an unapproved product. Center for Drug Evaluation and Research Review. Available at: https://files.covid19treatmentguidelines.nih.gov/guidelines/covid19treatmentguidelines.pdf Accessed 5 October 2022. 3. COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. National Institutes of Health. Available at https://www.covid19treatmentguidelines.nih.gov/. Accessed 5 October 2022.