malignancy, of these 3 were receiving ongoing chemotherapy. 9/10 patients were recipients of stem cell (2) or solid-organ transplants (7). 7/10 patients were also on some form of immunosuppressive medications. Most common virus isolated was Norovirus (7/10). All patients received a standard dose of 500mg twice daily NTZ. The median duration of therapy was 7 days (range: 3–21). 6/10 patients had documented improvement in diarrhea at the end of treatment. 1/10 patients died within 30 days of diagnosis from causes unrelated to diarrheal illness (Table 1).

Conclusion: Our limited data set presents interesting insights into treatment of viral gastroenteritis in immunocompromised hosts, in particular transplant recipients. All of the cases identified were treated in second half of study period after January 1, 2015, signaling an increasing interest in this therapy, especially in cases with prolonged symptoms or viral shedding. Our observations indicate a need for larger studies into this application of NTZ in adult immunocompromised hosts.

Table 1: Patient Characteristics

Age (Years)/ Gender*	LOS: Hospital/ ICU (Days)	Death at 30 days	Therapy Duration † (Days)	Diarrhea Improved	Non-Infectious Causes of Diarrhea	Primary Service/ ID Team	Organism (s)	Malignancy	Transplant	Immuno-suppressant Medications‡	Hba1c, if Diabetes	Chemotherapy Regimen	Anti-microbial Prophylaxis	Other Antibiotics Used
60/ M [2017]	7/ 0	N	4	Y	N	Medicine/ General ID	Adenovirus EPEC	Multiple Myeloma	Autologous SCT	Prednisone 5			Acyclovir Doxycycline	
48/ F [2017]	11/ 0	N	3	Y	N	Transplant/ Transplant ID	Norovirus		Heart Lung	Prednisone 5			Posaconazole Azithromycin	Cefepime
58/ M [2018]	391/ 391	N	5	Y	N	Transplant/ Transplant ID	Norovirus		Heart	Prednisone 5, MMF, Tacrolimus 1	6.2		Valganciclovir	
69/ M [2017]	8/ 0	N	7	Y	N	Transplant/ None	Norovirus		Heart	Tacrolimus 1.5, Prednisone 2			TMP/SMX	
70/ F [2016]	47/ 0	Y	7	Y	N	BMT/ None	Norovirus Norwalk	CMML	Allogeneic SCT	Prednisone 70			Acyclovir Fluconazole Penicillin VK TMP/SMX	
71/ F [2017]	6/ 0	N	7	Y	MMF	Transplant/ None	Norovirus Crypto-sporidium	Bladder	Heart	Prednisone 2, Tacrolimus 2	4.8	Mitomycin x 6 weeks	TMP/SMX	
47/ M [2016]	12/ 0	N	7	N	N	BMT/ None	Norovirus		Kidney, Autologous SCT			ABVD	Voriconazole Valganciclovir Levofloxacin Penicillin VK TMP/SMX	Piperacillin-Tazobactam
63/ M [2017]	8/ 0	N	5	N	MMF	Transplant/ None	Sapovirus		Liver, Kidney	Tacrolimus 2, MMF			Inhaled Pentamidine	
33/ M [2015]	40/ 0	N	7	N	Urso-deoxycholic acid	Medicine/ General ID	Rotavirus	Precursor T-Cell ALL				Augmented hyper-CVAD	Fluconazole, Acyclovir	PO Vancomycin
57/ F [2019]	2/ 0	N	21	N	N	Transplant/ Transplant ID	Norovirus		Kidney	Prednisone 5, Tacrolimus 0.5				

*Year of diagnosis in ( )
†All patients received Oral Nitazoxanide 500 mg twice daily
‡Doses of Prednisone and Tacrolimus expressed in mg/day
LOS = Length of Stay, ID = Infectious Diseases, Y = Yes, N = No, M = Male, F = Female, PO = oral, CMML = Chronic Metamyelocytic Leukemia, ALL = Acute Lymphocytic Pneumonia, MMF = Mycophenolate mofetil, HbA1c = Hemoglobin A1c, SCT = Stem Cell Transplant, ABVD = Adriamycin + Bleomycin + Vinblastine + Decarbazine, Augmented hyper-CVAD = up to 8 cycles of Fractionated Cyclophosphamide + Vincristine + Doxorubicin + Dexamethasone alternating with high-dose Methotrexate + Cytarabine followed by maintenance therapy, TMP/SMX = Trimethoprim/ Sulfamethoxazole

Disclosures. **All authors:** No reported disclosures.

2644. Evaluation of Clinical Course and Heath-Related Quality-of-Life Following Treatment with Oseltamivir, Laninamivir, and Baloxavir Marboxil in Adult Patients with Seasonal Influenza: Prospective Observational Study

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Background: Influenza is currently being treated in Japan with 4 types of neuraminidase inhibitors and the cap-dependent endonuclease inhibitor baloxavir marboxil. Among these, baloxavir marboxil is the newest agent and currently available in limited countries, while the clinical efficacy of this drug in the real world remains to be determined.

Methods: Adult patients with seasonal influenza during the 2018–2019 winter season, who received either oseltamivir (75 mg twice daily for 5 days), laninamivir (40 mg once), or baloxavir marboxil (40 or 80 mg once) at their physician's discretion in one hospital, were enrolled. The course of the symptoms including fever were surveyed by questionnaire. Health-related quality-of-life (HRQOL) was also examined by using Short Form-8 before and 7 days after admission. The main study endpoints were the time to defervescence and the extent of improvement of HRQOL after treatment initiation. Welch's t-test and Fisher exact test were used for statistical analysis.

Results: Forty-two patients (oseltamivir group; n = 12, laninamivir group; n = 16, baloxavir group; n = 14) could be followed up. There were no significant differences in clinical backgrounds of all groups. Although there were no significant differences between the oseltamivir and each other groups with the time of defervescence, the average time to defervescence in the baloxavir group was shorter than that in the oseltamivir group (average ± standard deviation; 1.57 ± 0.76 vs. 2.33 ± 1.23 days, P = 0.0853). There were significant differences between the baloxavir and laninamivir groups (2.50 ± 1.26 days, P = 0.0231). There were no significant differences between each group with respect to the change of HRQOL and the time of clearing of other symptoms.

Conclusion: Regarding the antipyretic effect, baloxavir marboxil is clinically superior to laninamivir. Although there was no significant difference between the baloxavir group and the oseltamivir group with respect to the time to defervescence, baloxiavir marboxil also might be clinically superior to oseltamivir because baloxavir marboxil has an advantage over oseltamivir with respect to medication adherence.

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2645. Clinical Outcomes of Oseltamivir vs. Baloxavir in Patients Hospitalized with Influenza A

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Background: Baloxavir marboxil is a new antiviral agent for the treatment of acute uncomplicated influenza in patients > 12 years of age who have been symptomatic for no more than 48 hours. However, clinical trials to date have excluded patients hospitalized with influenza infection.

Methods: This study was a multi-center, retrospective chart review of adult patients admitted to the hospital who received oseltamivir or baloxavir for the treatment of influenza A. Patients were screened for inclusion between January 2018 and February 2018 in the oseltamivir group while patients in the baloxavir group were screened for inclusion between January 2019 and February 2019. Patients who had influenza diagnosed after 48 hours from hospital admission, were not admitted to the hospital, received baloxavir and > 2 doses of oseltamivir during their hospital stay, received > 1 dose of baloxavir during admission for influenza, received influenza therapy prior to admission, died within 48 hours of presentation to the hospital, were asymptomatic at the time of antiviral therapy, or who had left the hospital against medical advice were excluded. Influenza A diagnosis was confirmed by RT–PCR using a nasopharyngeal swab specimen. The primary outcome was hospital length of stay (LOS).

Results: Of the 699 patients reviewed, 359 met inclusion criteria. There were 221 patients who received baloxavir and 138 patients who received oseltamivir. Patients who received oseltamivir were older (65 years [55–78] vs. 82 years [69–88], P < 0.01) and were less likely to have a Body Mass Index > 40 kg/m^2 (26 [12%] vs. 7 [5%], P = 0.03) compared with the baloxavir group. For the primary outcome of LOS, the baloxavir group had a shorter LOS compared with oseltamivir (4 days [3–6] vs. 5 days [3–8], P = 0.02). Of the 272 patients who were hypoxic at the time of antiviral administration, the baloxavir group was more likely to resolve their hypoxia (145 [88%] vs. 84 [79%], P = 0.04) and had a shorter time to resolution of hypoxia (43 hours [22–78] vs. 81 hours [33–135], P < 0.001) compared with oseltamivir.

Conclusion: This study supports the use of baloxavir for the treatment of influenza A in hospitalized patients with possible benefits of reduced length of stay and faster time to resolution of hypoxia compared with oseltamivir.

	Baloxavir (n=221)	Oseltamivir (n=138)	P-value
Demographics			
Age, median (IQR)	65 (55-78)	82 (69-88)	< 0.01
Female Sex, n (%)	109 (49)	73 (53)	0.51
Active smoker, n (%)	35 (16)	15 (11)	0.19
Body Mass Index 30-40 Kg/m^2, n (%)	64 (29)	32 (23)	0.23
Heart failure, n (%)	40 (18)	37 (27)	0.05
Diabetes, n (%)	76 (34)	36 (26)	0.10
Chronic respiratory disease, n (%)	97 (44)	53 (38)	0.31
Chronic kidney disease, n (%)	45 (20)	28 (20)	0.99
Dialysis, n (%)	16 (7)	7 (5)	0.41
End stage liver disease, n (%)	2 (1)	2 (1)	0.64
Immunosuppression*, n (%)	39 (18)	19 (14)	0.33
Days from symptom onset to drug receipt, median (IQR)	2 (1-4)	2 (1-3)	0.02
Clinical Outcomes			
LOS (Days), median (IQR)	4 (3-6)	5 (3-8)	0.02
Hypoxia resolution, n (%)	n=165 145 (88)	n=107 84 (79)	0.04
Hours from antiviral to hypoxia resolution, median (IQR)	n=165 43 (22-78)	n=107 81 (32-135)	<0.01
Hours from antiviral to fever resolution, median (IQR)	n=163 27 (11-40)	n=98 29 (12-46)	0.38
All-cause 30-day mortality, n (%)	37 (17)	14 (10)	0.08

*Immunosuppressive medications, receipt of chemotherapy within the past year, bone marrow transplant recipient, human immunodeficiency virus, leukemia, lymphoma, solid organ transplant recipient, lupus erythematosus & vasculitis

Disclosures. **All authors:** No reported disclosures.

2646. Incidence of Myelosuppression Related to Valganciclovir Prophylaxis in Solid-Organ Transplant Recipients at High Risk of CMV Disease

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Background: Valganciclovir (VGCV) prophylaxis in solid-organ transplant patients (SOT) is limited by myelotoxicity. We aimed to analyze the impact of VGCV prophylaxis on myelotoxicity and risk factors for its occurrence.

Methods: Retrospective single-center cohort study of adult CMV-seronegative recipients transplanted between July 2005 and November 2017. CMV D+/R– recipients received 3 to 6 months of VGCV prophylaxis whereas CMV D-/R- received no VGCV. Definitions: leukopenia < 3.5 × 10^9/L, significant neutropenia < 1.0 × 10^9/L and significant thrombocytopenia < 50 × 10^9/L.

Results: A total of 363 SOT recipients were included, 169 (47%) CMV D+/R– and 194 (53%) CMV D–/R–, with a mean age of 49.5 years and 275 (76%) males; types of organ transplant: 133 (37%) liver, 181 (50%) kidney, 37 (10%) simultaneous kidney-pancreas and 12 (3%) other. Although there was no difference in the incidence of significant neutropenia or thrombocytopenia per transplant type, leukopenia in the first year was more common in liver transplant patients (P < 0.001). New onset leukopenia post-SOT, significant neutropenia (Figure 1) and significant thrombocytopenia in the first year were more common in patients receiving VGCV: 116 D+/R– (69%) vs. 52 D–/R– (31%), P < 0.001; 86 (91%) vs. 9 (9%), P < 0.001; 8 (80%) vs. 2 (20%),

$P = 0.050$; respectively. G-CSF was used more frequently in patients receiving prophylaxis (60% CMV D+/R– vs. 10% CMV D–/R–, $P < 0.001$). Significant neutropenia had no impact on long-term mortality adjusted by age and transplant type (HR 1.1, 95% CI 0.6–2.1, $P = 0.709$). Significant neutropenia led to decrease immunosuppression in 90% of patients (vs. 46%, $P < 0.001$) and was associated with increased risk of rejection (HR 8.5, $P < 0.001$). In multivariate analysis for significant neutropenia in the first year, VGCV prophylaxis was the only predictor of this outcome after adjusting for confounders (HR 15.1, 95% CI 7.5–30.1, $P < 0.001$).

Conclusion: VGCV prophylaxis increased the risk of significant neutropenia by 15-fold post-SOT. No other clinical variables were useful to predict this complication. Therefore, complete blood count monitoring is still needed for all SOT recipients receiving VGCV prophylaxis.

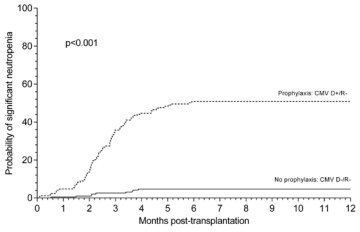

Figure 1. Cumulative incidence of significant neutropenia according to VGCV prophylaxis.

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2647. Influenza Treatment Rates in UK Primary Care Settings: Real-World Data Analysis of the CPRD, 2003–2018

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Background: Influenza remains a significant public health burden, resulting in serious morbidity and mortality globally. The National Institute for Health and Care Excellence (NICE) recommends treatment with antivirals for a broad range of high-risk influenza cases; however, anecdotal reports suggest treatment rates in the United Kingdom remain low. Real-world evidence on influenza treatment patterns in this region is limited. We therefore sought to investigate the proportion of influenza cases presenting to UK primary care facilities that receive antiviral treatment.

Methods: Data were obtained from the Clinical Practice Research Datalink (CPRD), a database of medical records from 674 primary care facilities in the UK. Cases were eligible for study inclusion if a diagnosis code for influenza or influenza-like illness (ILI) occurred between 1 January 2003 and 31 December 2018, and the medical record had sufficient data quality. Treatment was defined as prescription of an antiviral (oseltamivir, zanamivir, peramivir, or amantadine) within ±10 days of diagnosis. We examined (1) treatment rates, overall and by study year to understand time trends, (2) distribution of antiviral types prescribed, and (3) patient characteristics across treatment status.

Results: Of the 116,923 cases of influenza that met study inclusion criteria, 10,923 (9.3%) were treated with an antiviral. Treatment rates varied by study year, ranging from <1.0% in 2004 to 24.0% in 2009. The most recent study year (2018) had a treatment rate of 11.2%. Oseltamivir was the most frequent antiviral prescribed, followed by zanamivir. Treated cases of influenza were younger and more likely to be female compared with untreated cases.

Conclusion: We evaluated real-world estimates of influenza treatment rates over a 16-year period in UK primary care settings, where anecdotal reports suggested low treatment rates. Consistent with these reports, we observed low treatment rates, likely due in part to inclusion criteria and clinical guidelines specifying treatment only for high-risk cases. Subsequent analyses will investigate treatment patterns and patient characteristics in high-risk vs. low-risk cases to provide additional context for observed treatment rates.

Figure 1. Distribution of antiviral treatment status for influenza cases in CPRD, by study year (N=116,923)

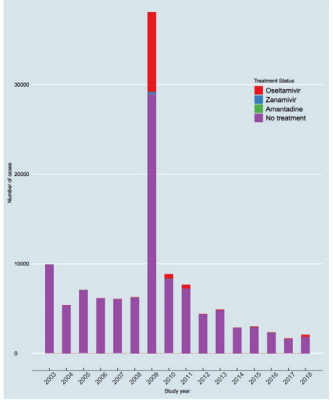

Figure 2. Total number of patients with at least 1 clinical record in CPRD, by study year

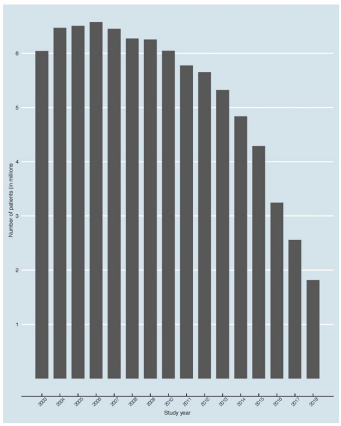

Table 1. Patient characteristics of influenza cases in CPRD stratified by antiviral treatment status (N=116,923)

	Treated (n=10923)	Untreated (n=106000)	Overall (n=116923)
Gender			
Female	6,373 (58.3%)	57,361 (54.1%)	63,734 (54.5%)
Male	4,550 (41.7%)	48,633 (45.9%)	53,183 (45.5%)
Indeterminate	0 (0%)	6 (0.0%)	6 (0.0%)
Age			
<1	71 (0.7%)	663 (0.6%)	734 (0.6%)
1-12	2,852 (26.1%)	13,112 (12.4%)	15,964 (13.7%)
13-17	755 (6.9%)	4,751 (4.5%)	5,506 (4.7%)
18-64	6,414 (58.7%)	64,947 (61.3%)	71,361 (61.0%)
65+	831 (7.6%)	22,527 (21.3%)	23,358 (20.0%)
Region			
East Midlands	164 (1.5%)	2,412 (2.3%)	2,576 (2.2%)
East of England	528 (4.8%)	7,703 (7.3%)	8,231 (7.0%)
London	1,345 (12.3%)	11,158 (10.5%)	12,503 (10.7%)
North East	168 (1.5%)	2,337 (2.2%)	2,505 (2.1%)
North West	551 (5.0%)	9,048 (8.5%)	9,599 (8.2%)
Northern Ireland	192 (1.8%)	2,217 (2.1%)	2,409 (2.1%)
Scotland	2,417 (22.1%)	17,585 (16.6%)	20,002 (17.1%)
South Central	952 (8.7%)	7,808 (7.4%)	8,760 (7.5%)
South East Coast	516 (4.7%)	9,544 (9.0%)	10,060 (8.6%)
South West	1,224 (11.2%)	12,791 (12.1%)	14,015 (12.0%)
Wales	1,937 (17.7%)	13,573 (12.8%)	15,510 (13.3%)
West Midlands	810 (7.4%)	7,709 (7.3%)	8,519 (7.3%)
Yorkshire & The Humber	119 (1.1%)	2,115 (2.0%)	2,234 (1.9%)
Influenza-like Illness			
0	7,987 (73.1%)	81,969 (77.3%)	89,956 (76.9%)
1	2,936 (26.9%)	24,031 (22.7%)	26,967 (23.1%)

Table 2. Distribution of type of antiviral treatment in CPRD (N=116,923)

	Treatment type
2003 (n=9945)	Oseltamivir: 17 (0.2%) Zanamivir: 10 (0.1%) Amantadine: 9 (0.1%) No treatment: 9,909 (99.6%)
2004 (n=5380)	Oseltamivir: 2 (0.0%) Zanamivir: 0 (0%) Amantadine: 3 (0.1%) No treatment: 5,375 (99.9%)
2005 (n=7074)	Oseltamivir: 19 (0.3%) Zanamivir: 2 (0.0%) Amantadine: 3 (0.0%) No treatment: 7,050 (99.7%)
2006 (n=6159)	Oseltamivir: 12 (0.2%) Zanamivir: 0 (0%) Amantadine: 3 (0.0%) No treatment: 6,144 (99.8%)
2007 (n=6092)	Oseltamivir: 20 (0.3%) Zanamivir: 0 (0%) Amantadine: 0 (0%) No treatment: 6,072 (99.7%)
2008 (n=6277)	Oseltamivir: 45 (0.7%) Zanamivir: 8 (0.1%) Amantadine: 0 (0%) No treatment: 6,224 (99.2%)
2009 (n=38084)	Oseltamivir: 8,889 (23.3%) Zanamivir: 242 (0.6%) Amantadine: 3 (0.0%) No treatment: 28,950 (76.0%)
2010 (n=8844)	Oseltamivir: 518 (5.9%) Zanamivir: 42 (0.5%) Amantadine: 4 (0.0%) No treatment: 8,280 (93.6%)
2011 (n=7686)	Oseltamivir: 444 (5.8%) Zanamivir: 5 (0.1%) Amantadine: 3 (0.0%) No treatment: 7,234 (94.1%)
2012 (n=4417)	Oseltamivir: 44 (1.0%) Zanamivir: 1 (0.0%) Amantadine: 0 (0%) No treatment: 4,372 (99.0%)
2013 (n=4913)	Oseltamivir: 84 (1.7%) Zanamivir: 3 (0.1%) Amantadine: 1 (0.0%) No treatment: 4,825 (98.2%)
2014 (n=2887)	Oseltamivir: 45 (1.6%) Zanamivir: 2 (0.1%) Amantadine: 1 (0.0%) No treatment: 2,839 (98.3%)
2015 (n=3010)	Oseltamivir: 78 (2.6%) Zanamivir: 2 (0.1%) Amantadine: 0 (0%) No treatment: 2,930 (97.3%)
2016 (n=2352)	Oseltamivir: 53 (2.3%) Zanamivir: 0 (0%) Amantadine: 0 (0%) No treatment: 2,299 (97.7%)
2017 (n=1701)	Oseltamivir: 69 (4.1%) Zanamivir: 1 (0.1%) Amantadine: 0 (0%) No treatment: 1,631 (95.9%)
2018 (n=2102)	Oseltamivir: 235 (11.2%) Zanamivir: 0 (0%) Amantadine: 1 (0.0%) No treatment: 1,866 (88.8%)
Overall (n=116923)	Oseltamivir: 10,574 (9.0%) Zanamivir: 318 (0.3%) Amantadine: 31 (0.0%) No treatment: 106,000 (90.7%)

Disclosures. **All authors:** No reported disclosures.