Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

compared to their economically advantaged counterparts. Results suggest involvement alone is insufficient for an informed TDM experience, and highlight a need for additional resources (e.g., TDM guides, in-person counseling) to enhance HCT communication surrounding TDM for individuals with lung cancer, particularly for economically disadvantaged individuals. Such efforts may provide patients better knowledge about treatment options, thus enhancing their preparation to discuss and select the appropriate treatment pathway. **Keywords:** treatment decision-making, treatment knowledge, education

FP06.03
Treatment Past Progression with Second Line Nivolumab in Advanced Stage NSCLC

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Introduction: Nivolumab is an accepted second line therapy in NSCLC regardless of PDL1 status. This retrospective study aims at evaluating the outcome of patients who were treated past progression with second line nivolumab in advanced NSCLC in British Columbia. **Methods:** All patients with metastatic NSCLC referred to BC Cancer who received nivolumab in the second line setting were included in the study. Baseline characteristics, treatments and outcomes were collected retrospectively. Treatment response was assessed using RECIST 1.1.Treatment Past Progression (TPP) was defined as patients who had RECIST 1.1 radiological progression but continued on therapy. Pseudo-progression was defined as patients who experienced a response after progression. OS was calculated from the start of nivolumab therapy using the Kaplan-Meier method and compared using the log-rank test. Multivariate and univariate analysis for OS conducted using Cox regression. **Results:** 138 patients were treated with second line nivolumab. Baseline characteristics: median age 66 years, 52% male, 54% ECOG of 0-1, 62% non-squamous histology, 24% PD-L1<1%/24% PD-L1≥1%/52% unknown. Best response: CR 1%, PR 13%, SD 26%, 36% PD and 24% unknown. 29/138 (21%) were treated past progression of which 4/21 (3%) had pseudo-progression, 14/21 (10%) had oligo-progression and 11/21 (8%) were treated for other resasons as per physician discretion. OS in patients who had TPP and received >5 cycles prior to progression had superior survival (20.5 months , HR 0.37) compared to patients who had TPP and received ≤5 prior to progression (6.0 months, HR 0.9) and to patients who did not have TPP 4.8 months (reference). In the univariate analysis, ECOG, best response, treatment past progression (TPP) and pattern of progression had a significant impact on OS (Table 1). On multivariate analysis, poor ECOG and SD or PD compared to CR/PR and pattern of progression were associated with a higher risk of death. **Conclusion:** In this cohort of second line NSCLC treated with nivolumab 21% of patients were treated past radiographic progression: 3% appropriately for pseudo-progression, 10% was for oligopregression. In patients who demonstrate early progression and receive ongoing nivolumab OS outcomes are similar to patients who are not treated past progression. In patients who demonstrate late progression and receive ongoing nivolumab OS outcomes are superior to patients who are not treated past progression. Given the rarity of pseudoprogression across tumor types (< 10%), continuation of treatment past progression (TPP) should be considered only in carefully selected patients whose clinical conditions have improved and who have not experienced severe toxicities.

FP06.04
Psychological Distress in Outpatients with Lymphoma, Lung and Breast Cancer during COVID-19 pandemic

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Introduction: The psychological impact of the lockdown experienced during the COVID-19 pandemic has been found detrimental for the general population, but it has still not been evaluated in cancer patients. We have investigated the psychological status of outpatients receiving anti-neoplastic treatmentduring the lockdown in a non-COVID Cancer Center, with the following aims: to measure the levels of post-traumatic stress symptoms, depression and anxiety, to compare patients with different diagnosis. A further objective was to compare the anxiety and depression levels between cancer patients before and after the emergency assuming an increase in distress in cancer patients in this period due to the health emergency. **Methods:** Outpatients attending the IRCCS "Giovanni Paolo II" in Bari for their therapy were asked to complete these questionnaires: The Hospital Anxiety and Depression Scale (HADs) and the Impact of Event Scale-Revised (IES-r).Worries regarding the COVID-19 on patients' lives, socio-demographic and clinical details were investigated using a brief structured questionnaire. **Results:** One-hundred seventy-six outpatients (n.59 with lung cancer, n.40 with breast cancer, n.77 with lymphoma) were enrolled. Mean age was 57.9 y.o. (SD ±14); 48% were male. We found that 54,4% of patients were above the cut-off (score≥16) for HADS general scale. The mean-IES-R score of patients was 25 (SD±17), with 22.8% indicating severe level of PTDS. The HADS-D has been found significantly correlated with IES-R (r= 0.35; p<0.005). The 70% of patients declared that their worries have increased during the

	Univariate analysis		Multivariate analysis	
Variables	HR (95% CI)	*p* value	HR (95% CI)	*p* value
Age	0.98 (0.96-1.01)	0.34		
Sex Female vs male	1.47 (0.99-2.20)	0.53		
Histology (vs non-squamous) Squamous NOS	1.02 (0.63-1.65) 0.83 (0.47-1.46)	0.93 0.52		
ECOG PS (vs 0-1) ≥ 2 Unknown	4.86 (3.11-7.59) 2.4 (1.31-4.42)	<0.001 0.05	2.77 (1.68-4.58) 1.88 (0.99-3.57)	**<0.001** 0.052
PD-L1 status (vs <1%) >1% Unknown	0.69 (0.39-1.21) 0.72 (0.45-1.16)	0.20 0.18		
Best response (vs CR/PR) SD PD Unknown	5.79 (1.34-24.95) 26.43 (6.33-110.34) 72.61 (16.98-310.84)	**0.02 <0.001 <0.001**	4.88 (1.08-22.11) 12.73 (2.51-64.62) 9.43 (1.53-58.26)	**0.04 0.002 0.02**
Pattern of progression (vs no PD) Oligo-progression	2.51 (0.82-7.66) 9.67 (3.80-24.61)	0.11 **<0.001**	3.08 (0.87-10.87) 3.71 (1.15-11.97)	0.08 **0.03**
Multi-site progression New lesions only Unknown	25.16 (9.59-66.04) 8.56 (2.29-31.93)	**<0.001 0.001**	10.31 (1.97-54.00) 6.37 (1.30-31.21)	**0.01 0.02**
Treatment past progression (vs no treatment past progression)	0.53 (0.32-0.87)	0.010	0.56 (0.29-1.08)	0.08

pandemic; their bigger concerns were: the risk of getting infected while at hospital (51.4%); the risk of infecting relatives coming back home (38.7%), andthe risk of delaying therapy (35.3%).When comparing the level of anxiety and depression in different diagnosis it has been found that patients with lung cancer have higher distress(HADs-general scale) than patients with lymphoma ($F=17.3$, $p<0.005$) and breast cancer ($F=8.86$, $p<0.005$). Finally, cancer patients who experienced the health emergency showed higher levels of anxiety Hads-A, $t(237) = 3.73$ $p<0.001$), and general distress (Hads-G, $t(237) = 2.51$) than those measured 2 years ago (fig 1). **Conclusion:** This study focused on the psychological aspects of cancer patients during the COVID-19 pandemic, finding that one quarter of patients has severe post-traumatic stress symptoms, and has psychological distress. Patients with lung cancer have higher distress compared to the other groups. This condition risks being overlooked by clinical concerns, so we underline the importance to place even more attention to the psychological needs of patients. **Keywords:** cancer, COVID, Psychological distress

FP07 PATHOLOGY THURSDAY, JANUARY 28, 2021 - 00:00-23:59

FP07.01
Dysbiosis of Gut Microbiota Suppress the Brain Metastasis of Non-Small Cell Lung Cancer

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Introduction: Brain metastasis (BM) is associated with poor prognosis in patients with advanced non-small cell lung cancer (NSCLC), gut microbiota have been reported involved in the development of NSCLC. However, the impact of the gut microbiota on BM of NSCLC is still vague to date. This study aimed to explore the potential mechanism of gut microbiota dysbiosis on BM of NSCLC. **Methods:** We collected 85 fecal samples from NSCLC patients with or without BM, and performed 16S rRNA gene sequencing. Conventional C57BL/6 mice were treated with an antibiotic cocktail to deplete the gut microbiota. The effects of gut microbiota dysbiosis was investigated *in vivo* by using NSCLC BM mouse models. **Results:** There are no obvious difference in the microbial diversity and composition between NSCLC patients with BM (BM+, n=25) and without BM group (BM-, n=60). However, several differentially abundant genera were identified between subject groups by LEfSe analysis and Wilcoxon rank-sum test. Blautia, the genus implicated in central nervous system disorder, significantly decreased in BM+ group comparing to BM- group. Furthermore, the tumor burden significantly reduced in antibiotics-treated BM mice model, along with increased microglia cells by flow cytometry analysis. Remarkably, fecal bacteria transplantation (FMT) reduced gut microbial dysbiosis, partially attenuate the antibiotic-mediated tumor inhibition. **Conclusion:** These results indicate that gut microbiota dysbiosis modulate BM of NSCLC, and Blautia, was putative microbial biomarkers that exclusively associated with BM. Mice experiments suggest that gut microbial dysbiosis inhibit BM by increasing the number of microglia. FMT suggest that BM inhibition mediated by gut microbial disorder is weakened by restoring normal microbiota, and warrant further research on the function of microglia. **Keywords:** non-small cell lung cancer (NSCLC), Brain metastasis, gut microbiota

FP07.02
Deep Learning Based Analysis of Multiplex IHC Accurately Interprets PD-L1 and Provides Prognostic Information in NSCLC

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Introduction: Most assessment of PD-L1 expression by immunochemistry to guide immuno-modulatory (IM) therapy in non-small cell lung cancer (NSCLC) requires only tumour cells to be scored, the so-called 'tumour proportion score' (TPS). This narrow approach ignores what is almost certainly crucial information within the tumour microenvironment (TME), particularly the nature and distribution of tumour infiltrating lymphocytes (TILs). Such features of the TME are underutilised in the clinical setting and are strong candidates for improving the predictive power of PD-L1 assessment alone. We describe a novel approach to analysing the TME in this context. **Methods:** Consecutive whole slide sections from 92 resected NSCLCs were stained with H&E and immunolabelled for PD-L1 alone using the SP263 clone (*monoplex*), PD-L1 using the SP142 clone, CD68 and CD3 (*triplex*), and FoxP3, PD-1 and CD8 (*triplex).* Monoplex PD-L1 expression was scored by two pathologists to generate a consensus TPS score and categorised as negative, weak or strong expression; <1%, 1-49% and ≥50% TPS respectively. An existing deep-learning based PD-L1 solution was used to automatically score PD-L1 TPS. For the triplex images, densities of 'positive' cells were computed automatically using assay-specific deep learning algorithms, with a separate deep learning algorithm used to segment epithelial regions. The density of PD-L1+ve/CD3-ve/CD68-ve cells was used as a surrogate PD-L1 TPS with 33rd and 66th quartiles defining clinical group categorisation. Survival data were used in Kaplan-Meier survival analysis of groups divided by PD-L1 expression and immune cell densities. **Results:** TPS scores as a continuous variable correlated well between pathologist assessment and both monoplex (Pearson correlation coefficient 0.977) and triplex (Pearson CC 0.849) assessments. Automated interpretation via triplex was similar to monoplex for grouping samples by dichotomous division at a 50% cut-off (91.2% vs. 94.6% of cases) and for placement into clinically relevant categories (79.1%, Cohen's kappa coefficient K = 0.687 vs. 85.9%, K = 0.786). Sub-group analysis of tumours divided by the median for each variable into 'high' or 'low' revealed no significant difference in overall survival (OS) when stratified by CD3, FoxP3, PD-1 or CD68. However, high CD8+ve TIL densities and strong PD-L1 expression both correlated with improved OS (56 vs. 39 months, p=0.028; 60 vs. 41 months, p=0.035 respectively). In addition, tumours with a PD-L1 high/CD8+ve high profile showed significantly better OS than those assessed as PD-L1 low/CD8+ve (57 vs. 36 months, p=0.019). **Conclusion:** Automated, deep-learning based, algorithmic scoring of PD-L1 expression is a valid and accurate approach to its assessment, and utilising triplex data provides important prognostic information. Discrepancies between monoplex and triplex assessment might be attributed to the different anti-PD-L1 antibody clones used, but the automated nature of triplex that excludes macrophages and TILs still performs very well. Our study shows the power of using this approach to augment the power of PD-L1 expression alone as a predictor of response to IM therapy and to provide prognostic information. **Keywords:** digital pathology, Machine learning automated algorithms, PD-L1

FP07.03
Landscape Heterogeneity of PD-L1 Expression and Immune Cells Predicts Prognosis of Metastatic Non-Small Cell Lung Cancer

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