Supplemental Table 1

Sociodemographic and Clinical Characteristics of Patients with Stage IV Non-Small Cell Lung Cancer Stratified by Current Immunotherapy vs. Chemo-immunotherapy (N = 60)

	Immunotherapy	Chemo-immunotherapy
Sociodemographics	n (%)/Mean (SD)	n (%)/Mean (SD)
Age – mean (sd)	63.9 (8.9)	60.7 (9.9)
Age ≥70 y.o.[a] –n (%)	11 (35.5)	4 (14.3)
Female – n (%)	16 (51.6)	19 (67.9)
Race – n (%)		
White	23 (74.2)	20 (71.4)
Black	4 (12.9)	7 (25.0)
Asian	1 (3.2)	0 (0)
Other	1 (3.2)	0 (0)
Declined to answer	2 (6.5)	0 (0)
Missing	0 (0)	1 (3.6)
Hispanic – n (%)	0 (0)	2 (7.1)
Rural[b] – n (%)	11 (35.5)	10 (35.7)
Education – n (%)		
Some HS or less	5 (16.1)	4 (14.3)
HS diploma	10 (32.3)	6 (21.4)
Some college	14 (45.2)	10 (35.7)
College graduate or more	2 (6.5)	7 (25.0)
Missing	0 (0)	1 (3.6)
Household income--n (%)		
<$25K	13 (41.9)	9 (32.1)
$25K – 49,999	9 (29.0)	3 (10.7)
$50K – 99,999	5 (16.1)	2 (7.1)
≥$100K	2 (6.5)	5 (17.9)
Missing	2 (6.5)	9 (32.1)
Clinical		
Cigarette pack years—mean (sd)	36.7 (20.6)	27.3 (21.5)
Currently smoking[c]--n (%)	9 (29.0)	6 (21.4)
ECOG PS--n (%)		
0	2 (6.5)	2 (7.1)
1	19 (61.3)	18 (64.3)
2	9 (29.0)	7 (25.0)
3	1 (3.2)	1 (3.6)
De novo stage IV NSCLC--n (%)	24 (77.4)	22 (78.6)
Current immunotherapy agent--n (%)		

Pembrolizumab		
Pembro alone --n	17 (54.8)	1 (3.6)
Carboplatin-Pemetrexed--n	0 (0)	12 (42.9)
Pemetrexed-Pembrolizumab--n	0 (0)	13 (46.4)
Pembrolizumab-carboplatin--n	0 (0)	1 (3.6)
Nivolumab	13 (41.9)	0 (0)
Atezolizumab	1 (3.2)	1 (3.6)
Weeks on immunotherapy—mean (sd)	34.9 (32.6)	24.6 (29.4)
Other treatments received to date*--n (%)		
Chemotherapy	24 (77.4)	24 (85.7)
Radiation	10 (32.3)	10 (35.7)
Concurrent chemo-radiotherapy	2 (6.5)	1 (3.6)
Targeted therapy	3 (9.7)	1 (3.6)
Gamma knife	11 (35.5)	11 (39.3)
Surgery	9 (29.0)	8 (28.6)
Whole brain radiotherapy	1 (3.2)	1 (3.6)
Stereotactic body radiation therapy	2 (6.5)	3 (10.7)
Craniotomy	7 (22.6)	4 (14.3)
At least 1 non-cancer comorbidity – n (%)	16 (51.6)	14 (50.0)
Reimaged for response**--n (%)		
Not yet reimaged	12 (38.7)	11 (39.3)
Reimaged: Partial/Complete response	6 (19.4)	5 (17.9)
Reimaged: Stable disease	12 (38.7)	11 (39.3)
Reimaged: Progressive disease	1 (3.2)	1 (3.6)

Note. HS = high school; ECOG PS = Eastern Cooperative Oncology Group Performance Status

[a] $p = .078$

[b]Rural: Federal Office of Rural Health Policy's eligible ZIP codes (ZIP code with more than 50% of the population residing in a non-metro county or rural census tract included as rural).

[c]Currently smoking = reported smoking a cigarette within the past 7 days.

*Patients could have multiple prior treatments more so percents total to more than 100

**We intentionally sampled patients who had not yet been reimaged to evaluate treatment response to obtain a sample of patients who were earlier vs. later into treatment.

Supplemental Table 2.

Health-Related Global Quality of Life, Function, and Symptom Scores on the EORTC-QLQ-C30 in Patients with Stage IV Non-Small Cell Lung Cancer receiving Immunotherapy or Chemo-Immunotherapy, Overall and by Current Immunotherapy vs. Chemo-immunotherapy

	Overall Sample (N = 60)	**Current Treatment**		
Scale	**Mean (SD)**	**Immunotherapy (n = 31)[a]**	**Chemo-immunotherapy (n = 28)**	***p***
Global Health	62.6 (21.5)	58.3 (23.1)	68.2 (18.6)	.08
Function Subscales				
Cognitive Function	81.7 (21.0)	79.0 (21.5)	85.7 (19.6)	.22
Emotional Function	79.7 (20.1)	79.6 (22.0)	80.4 (18.3)	.88
Physical Function	74.5 (20.7)	71.6 (20.3)	78.0 (21.3)	.24
Social Function	73.6 (26.3)	76.3 (21.4)	71.4 (31.1)	.49
Role Function	70.0 (32.3)	66.7 (33.3)	74.4 (31.6)	.36
Symptom Subscales				
Fatigue	39.6 (28.5)	42.7 (30.6)	35.7 (26.4)	.36
Insomnia	37.9 (36.6)	40.2 (40.2)	34.5 (33.3)	.56
Dyspnea	35.0 (29.7)	38.7 (31.1)	31.0 (28.6)	.32
Financial	32.8 (36.0)	37.6 (36.3)	28.6 (36.0)	.34
Pain	28.1 (30.3)	31.7 (33.7)	23.2 (26.2)	.29
Appetite	23.3 (31.5)	33.3 (36.5)	11.9 (20.7)	.007
Constipation	18.3 (24.9)	17.2 (22.6)	20.2 (27.7)	.65
Nausea	11.4 (18.3)	14.5 (22.3)	7.1 (11.5)	.11
Diarrhea	8.3 (20.0)	8.6 (17.1)	8.3 (23.4)	.96

Note. EORTC-QLQ-C30 = European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30. ECOG = Eastern Cooperative Oncology Group. Statistical significance was tested with independent samples t-tests.

[a]Excluded one patient who was on two immunotherapy agents.

Supplemental Table 3

Means, Standard Deviations, and Observed Range for each NCI-PRO-CTCAE™ Item and Follow-up Items

NCI-PRO-CTCAE™	**Mean (SD)**	**Observed Range**
Constipation severity (n = 60)	0.7 (1.00)	0-4
Diarrhea frequency (n = 60)	0.5 (0.9)	0-3
Bowel incontinence frequency (n = 60)	0.1 (0.4)	0-2
Bowel incontinence interference (n = 5)	1.4 (0.9)	0-2
Abdominal pain frequency (n = 60)	0.5 (0.9)	0-3
Abdominal pain severity (n = 19)	1.4 (0.9)	0-4
Abdominal pain interference (n = 19)	0.9 (1.2)	0-4
Fatigue severity (n = 60)	1.6 (1.0)	0-4
Fatigue interference (n = 52)	1.5 (1.1)	0-4
Pain frequency (n = 60)	1.5 (1.2)	0-4
Pain severity (n = 44)	1.8 (1.0)	0-4
Pain interference (n = 44)	1.1 (1.2)	0-4
Cough severity (n = 60)	1.1 (1.0)	0-4
Cough interference (n = 41)	0.7 (0.8)	0-3
Wheezing (n = 60)	0.6 (0.9)	0-4
Shortness of breath severity (n = 60)	1.0 (1.0)	0-4
Shortness of breath interference (n = 41)	1.3 (1.2)	0-4
Dry skin severity (n = 58)	1.0 (0.8)	0-4
Itchy skin severity (n = 58)	0.8 (0.9)	0-4
Muscle ache frequency (n = 60)	1.1 (1.1)	0-3
Muscle ache severity (n = 36)	1.5 (0.7)	0-3
Muscle ache interference (n = 36)	0.9 (1.0)	0-3
Joint pain frequency (n = 60)	1.0 (1.2)	0-4
Joint pain severity (n = 31)	1.6 (0.8)	0-4

Joint pain interference (n = 31)	1.2 (1.1)	0-4
Decreased appetite severity (n=60)	0.8 (1.1)	0-4
Decreased appetite interference (n=28)	0.9 (1.2)	0-4
Arm or leg swelling frequency (n = 60)	0.4 (0.9)	0-4
Arm or leg swelling severity (n = 15)	1.1 (0.8)	0-3
Arm or leg swelling interference (n = 15)	0.5 (1.1)	0-4
Nausea frequency (n=60)	0.6 (1.0)	0-4
Nausea severity (n=20)	1.5 (0.8)	1-4

Note. Note. NCI-PRO-CTCAE™ = National Cancer Institute Patient Reported Outcomes version of the Common Terminology Criteria for Adverse Events.™

Items were scored such that follow-up questions were marked as missing if the initial question was marked as “0” (e.g., a patient could not rate interference if they did not indicate presence of a symptom on a prior question). Other symptoms reported by patients on the free response PRO item included: dry eyes, dry mouth, and loss of taste (n = 1), stiffness/numbness in jaw (n = 1), hot flashes (n = 1), left hip/leg soreness (n = 1), and sadness and anxiety (n = 1).

Supplemental Table 4.
Number and Proportion of Patients with Stage IV Non-Small Cell Lung Cancer receiving Immunotherapy or Chemo-immunotherapy Reporting at Least Moderate/Occasional Past Week Symptoms on the NCI-PRO-CTCAE™, Overall and by Current Immunotherapy vs. Chemo-immunotherapy

	Overall Sample (N = 60)	**Current Treatment**		
Past Week Symptoms – NCI PRO-CTCAE™	**n (%) At Least Moderate/Occasional Symptom**	**Immunotherapy (n = 31)[a]** n (%)	**Chemo-immunotherapy (n = 28)** n (%)	***p***
Constipation severity	13 (21.7)	8 (25.8)	5 (17.9)	.46
Diarrhea frequency	11 (18.3)	5 (16.1)	6 (21.4)	.60
Bowel incontinence frequency	2 (3.3)	1 (3.2)	1 (3.6)	1.0
Abdominal pain frequency	7 (11.7)	7 (22.6)	0 (0)	.01
Fatigue severity	30 (50.0)	18 (58.1)	11 (39.3)	.15
Pain frequency	25 (41.7)	15 (48.4)	9 (32.1)	.20
Cough severity	15 (25.0)	9 (29.0)	6 (21.4)	.50
Wheezing severity	7 (11.7)	4 (12.9)	3 (10.7)	1.0
Shortness of breath severity	14 (23.3)	10 (32.3)	4 (14.3)	.11
Rash (yes/no)	16 (26.7)	7 (22.3)	8 (28.6)	.60
Dry skin severity	12 (20.7)	7 (24.1)	4 (14.3)	.35
Itchy skin severity	13 (22.4)	8 (26.7)	4 (14.8)	.27
Muscle ache frequency	24 (40.0)	14 (45.2)	10 (35.7)	.46
Joint pain frequency	20 (33.3)	12 (38.7)	7 (25.0)	.26
Decreased appetite severity	14 (23.3)	11 (35.5)	3 (10.7)	.03
Arm or leg swelling severity	7 (11.7)	1 (3.2)	6 (21.4)	.045
Nausea frequency	10 (16.7)	7 (22.6)	2 (7.1)	.15

Note. NCI-PRO-CTCAE™ = National Cancer Institute Patient Reported Outcomes version of the Common Terminology Criteria for Adverse Events™. Statistical significance was tested with chi-square or Fisher's exact tests.

Supplemental Table 5

Number and Proportion of Patients Reporting High Levels of Past Week Symptoms on the NCI-PRO-CTCAE™ in the Overall Sample (N = 60)

Past Week Symptoms – NCI-PRO-CTCAE™	**n (%) Endorsing at severe/frequently to very severe/almost constantly**
Constipation severity	3 (5.0)
Diarrhea frequency	3 (5.0)
Bowel incontinence frequency	0 (0)
Abdominal pain frequency	4 (6.7)
Fatigue severity	8 (13.3)
Pain frequency	16 (26.7)
Cough severity	4 (6.7)
Wheezing	2 (3.3)
Shortness of breath severity	4 (6.7)
Dry skin severity	2 (3.3)
Itchy skin severity	2 (3.3)
Muscle ache frequency	8 (13.3)
Joint pain frequency	9 (15.0)
Decreased appetite severity	5 (8.3)
Arm or leg swelling frequency	3 (5.0)
Nausea frequency	4 (6.7)

Note. NCI-PRO-CTCAE™ = National Cancer Institute Patient Reported Outcomes version of the Common Terminology Criteria for Adverse Events™