

Supplemental online content for:

Telemedicine Adoption in an NCI-Designated Cancer Center During the COVID-19 Pandemic: A Report on Patient Experience of Care

Krupal B. Patel, MD, MSc; Amir Alishahi Tabriz, MD, PhD, MPH; Kea Turner, PhD, MPH;
Brian D. Gonzalez, PhD; Laura B. Oswald, PhD; Heather S.L. Jim, PhD; Oliver T. Nguyen, MSHI;
Young-Rock Hong, PhD, MPH; Nasrin Aldawoodi, MD; Biwei Cao, MS; Xuefeng Wang, PhD;
Dana E. Rollison, PhD; Edmondo J. Robinson, MD, MBA; Cristina Naso, MEd;
and Philippe E. Spiess, MD, MS

J Natl Compr Canc Netw 2023;21(5):496–502.e6

eAppendix 1: Telemedicine and Outpatient Questions in Key Categories of Access and Care Provider

eAppendix 2: Telemedicine Experience Press Ganey Questions

eAppendix 3: Patient Characteristics Over Different Time Intervals

eAppendix 4: Comparison of Access and Care Provider Concern Between In-Person Versus Telemedicine

eAppendix 5: Telemedicine Versus In-Person Adjusted Mean Score Differences in Access and Care Provider Concern Over Different Time intervals

eAppendix 6: Telemedicine Scores Over Time for Access, Care Provider, Telemedicine Technology, and Overall Assessment Categories

eAppendix 7: Adjusted Mean Score Differences in Access, Care Provider Concern, Telemedicine Technology, and Overall Assessment Over Different Time Intervals

eAppendix 8: Difference Between Time Intervals for Telemedicine Access, Care Provider Concern, Telemedicine Technology, and Overall Assessment

eAppendix 1. Telemedicine and Outpatient Questions in Key Categories of Access and Care Provider

	Telemedicine	In-Person
Access	Ease of scheduling appointment	Wait time between calling and first scheduled appointment
	Ease of contacting	Courtesy/Concern of staff who made appointment
		Reach office staff on phone with ease
Care provider	Care provider concern for questions/worries	Doctor's concern for questions and worries

eAppendix 2. Telemedicine Experience Press Ganey Questions

Category	Questions
Access	1. Ease of arranging your virtual visit
	2. Ease of contacting us (eg, email, telephone, web portal)
Care provider	1. Concern the care provider showed for your questions or worries
	2. Explanations the care provider gave you about your problem or condition
	3. Care provider's efforts to include you in decisions about your care
	4. Care provider's discussion of any proposed treatment (eg, options, risks, benefits)
	5. Your confidence in this care provider
	6. Likelihood of your recommending this care provider to others
Telemedicine technology	1. Ease of talking with the care provider over the virtual connection
	2. How well the video connection worked during your virtual visit
	3. How well the audio connection worked during your virtual visit
Overall assessment	1. How well the virtual visit staff (including the care provider) worked together to care for you
	2. Likelihood of your recommending our virtual visit service to others

eAppendix 3. Patient Characteristics Over Different Time Intervals								
Characteristic	April 2020–June 2020		July 2020–October 2020		November 2020–February 2021		March 2021–June 2021	
	In-Person n (%)	Telemedicine n (%)	In-Person n (%)	Telemedicine n (%)	In-Person n (%)	Telemedicine n (%)	In-Person n (%)	Telemedicine n (%)
Total patient visits	88,932	13,390	145,608	13,337	145,519	11,600	160,125	12,618
Surveys sent out	27,530	4,227	43,243	3,675	44,363	5,641	48,714	9,445
Respondents	5,507 (20.0)	1,020 (24.1)	8,377 (19.4)	845 (23.0)	9,816 (22.1)	1,649 (29.2)	9,618 (19.7)	2,436 (25.8)
Median age (range), y	68.0 (18.0–94.0)	69.0 (18.0–92.0)	68.0 (18.0–99.0)	69.0 (19.0–96.0)	69.0 (18.0–98.0)	69.0 (20.0–97.0)	68.0 (18.0–101)	69.0 (18.0–98.0)
Sex								
Female	2,655 (48.2)	492 (48.2)	4,092 (48.9)	415 (49.1)	4,748 (48.4)	834 (50.6)	4,641 (48.3)	1,246 (51.1)
Male	2,850 (51.8)	528 (51.8)	4,284 (51.1)	430 (50.9)	5,068 (51.6)	815 (49.4)	4,977 (51.7)	1,190 (48.9)
Race/Ethnicity								
White non-Hispanic	4,582 (83.2)	817 (84.8)	6,925 (82.7)	635 (87.0)	8,053 (82.0)	1,319 (84.6)	7,954 (82.7)	2,001 (85.6)
White Hispanic	273 (4.96)	41 (4.26)	403 (4.81)	29 (3.97)	450 (4.58)	72 (4.62)	424 (4.41)	75 (3.21)
Black	242 (4.39)	47 (4.88)	422 (5.04)	26 (3.56)	447 (4.55)	59 (3.78)	463 (4.81)	90 (3.85)
Other	410 (7.45)	58 (6.02)	627 (7.48)	40 (5.48)	865 (8.81)	110 (7.05)	777 (8.08)	172 (7.36)
Insurance								
Private	1,643 (29.8)	301 (29.5)	2,566 (30.6)	241 (28.5)	2,874 (29.3)	476 (28.9)	2,928 (30.4)	709 (29.1)
Medicare	3,462 (62.9)	660 (64.7)	5,212 (62.2)	562 (66.5)	6,348 (64.7)	1,083 (65.7)	6,043 (62.8)	1,600 (65.7)
Medicaid	79 (1.43)	6 (0.59)	129 (1.54)	1 (0.12)	125 (1.27)	26 (1.58)	130 (1.35)	23 (0.94)
Other	323 (5.87)	53 (5.20)	470 (5.61)	41 (4.85)	469 (4.78)	64 (3.88)	517 (5.38)	104 (4.27)
Visit type								
NP/EP	1,386 (25.21)	238 (23.4)	2,424 (28.96)	224 (26.54)	2,733 (27.84)	342 (20.69)	2,666 (27.75)	466 (19.11)
FU	4,121 (74.78)	782 (76.7)	5,953 (71.07)	621 (73.5)	7,083 (72.15)	1,307 (79.3)	6,952 (72.26)	1,970 (80.9)
Clinic type								
Blood and marrow transplant	136 (2.47)	57 (5.59)	186 (2.22)	39 (4.62)	183 (1.86)	62 (3.76)	178 (1.85)	41 (1.68)
Breast	765 (13.9)	51 (5.00)	1,160 (13.8)	44 (5.21)	1,285 (13.1)	85 (5.15)	1,210 (12.6)	150 (6.16)
Cutaneous	769 (14.0)	37 (3.63)	1,072 (12.8)	23 (2.72)	1,259 (12.8)	30 (1.82)	1,199 (12.5)	55 (2.26)
Endocrine	114 (2.07)	76 (7.45)	284 (3.39)	62 (7.34)	403 (4.11)	102 (6.19)	410 (4.26)	171 (7.02)
Gastroenterology	618 (11.2)	131 (12.8)	961 (11.5)	99 (11.7)	1,078 (11.0)	173 (10.5)	1,044 (10.9)	257 (10.6)
Genitourinary	690 (12.5)	141 (13.8)	1,144 (13.7)	112 (13.3)	1,274 (13.0)	229 (13.9)	1,236 (12.9)	312 (12.8)
Hematology	897 (16.3)	152 (14.9)	1,381 (16.5)	166 (19.6)	1,572 (16.0)	264 (16.0)	1,584 (16.5)	312 (12.8)
Radiation therapy	591 (10.7)	89 (8.73)	796 (9.50)	70 (8.28)	1,203 (12.3)	137 (8.31)	1,198 (12.5)	276 (11.3)
Sarcoma	241 (4.38)	37 (3.63)	348 (4.15)	30 (3.55)	365 (3.72)	78 (4.73)	368 (3.83)	105 (4.31)
Thoracic	400 (7.26)	90 (8.82)	538 (6.42)	88 (10.4)	686 (6.99)	103 (6.25)	650 (6.76)	150 (6.16)
Other	286 (5.19)	159 (15.63)	507 (6.05)	112 (13.24)	508 (5.18)	386 (23.38)	541 (5.62)	607 (24.93)

Abbreviations: EP, existing patients; FU, follow-up patients; NP, new patients.

eAppendix 4. Comparison of Access and Care Provider Concern

Score	In-Person n (%)	Telemedicine n (%)	P Value
Access	32,808	5,910	<.001
1–2	61 (0.19)	13 (0.22)	
2–3	289 (0.88)	41 (0.69)	
3–4	1,863 (5.68)	245 (4.15)	
4–5	10,080 (30.7)	1,131 (19.1)	
5	20,515 (62.5)	4,480 (75.8)	
Care provider concern	21,610	5,846	<.001
1–2	295 (1.37)	17 (0.29)	
2–3	219 (1.01)	21 (0.36)	
3–4	609 (2.82)	71 (1.21)	
4–5	2,284 (10.6)	436 (7.46)	
5	18,203 (84.2)	5,301 (90.7)	

eAppendix 5. Telemedicine Versus In-Person Adjusted Mean Score Differences in Access and Care Provider Concern

Time Interval	Telemedicine Mean Score (lower limit–upper limit)	In-Person Mean Score (lower limit–upper limit)	P Value
Access			
April 2020–June 2020	4.73 (4.69–4.79)	4.66 (4.64–4.68)	<.001
July 2020–October 2020	4.73 (4.69–4.78)	4.64 (4.62–4.66)	<.001
November 2020–February 2021	4.75 (4.69–4.78)	4.65 (4.63–4.67)	<.001
March 2020–June 2021	4.71 (4.69–4.78)	4.64 (4.62–4.66)	<.001
Care provider concern			
April 2020–June 2020	4.86 (4.82–4.90)	4.78 (4.75–4.80)	<.001
July 2020–October 2020	4.88 (4.82–4.90)	4.77 (4.75–4.80)	<.001
November 2020–February 2021	4.87 (4.82–4.92)	4.71 (4.68–4.75)	<.001
March 2021–June 2021	4.85 (4.80–4.90)	4.70 (4.67–4.74)	<.05

Mean scores were adjusted for age, sex, race/ethnicity, insurance, clinic type, and visit type.

eAppendix 6. Telemedicine Scores Over Time for Access, Care Provider, Telemedicine Technology, and Overall Assessment Categories				
Score	April 2020–June 2020	July 2020–October 2020	November 2020–February 2021	March 2021–June 2021
Access				
1–2	0 (0.00)	4 (0.48)	3 (0.18)	6 (0.25)
2–3	12 (1.19)	5 (0.60)	12 (0.73)	12 (0.50)
3–4	58 (5.73)	25 (2.98)	64 (3.91)	98 (4.05)
4–5	228 (22.5)	186 (22.1)	307 (18.7)	410 (16.9)
5	714 (70.6)	620 (73.8)	1,252 (76.4)	1,894 (78.3)
Care provider concern				
1–2	1 (0.10)	4 (0.48)	2 (0.12)	6 (0.25)
2–3	5 (0.49)	0 (0.00)	9 (0.55)	13 (0.54)
3–4	17 (1.68)	16 (1.90)	28 (1.72)	40 (1.65)
4–5	130 (12.9)	111 (13.2)	182 (11.2)	307 (12.7)
5	858 (84.9)	710 (84.4)	1,410 (86.5)	2,051 (84.9)
Telemedicine technology				
1–2	5 (0.49)	6 (0.72)	7 (0.43)	10 (0.41)
2–3	13 (1.28)	9 (1.07)	22 (1.34)	18 (0.74)
3–4	59 (5.82)	34 (4.05)	63 (3.85)	75 (3.10)
4–5	161 (15.9)	134 (16.0)	219 (13.4)	355 (14.7)
5	775 (76.5)	656 (78.2)	1,325 (81.0)	1,959 (81.1)
Overall assessment				
1–2	0 (0.00)	5 (0.60)	0 (0.00)	4 (0.17)
2–3	5 (0.50)	3 (0.36)	6 (0.37)	16 (0.67)
3–4	36 (3.56)	22 (2.64)	35 (2.15)	47 (1.95)
4–5	154 (15.2)	108 (12.9)	187 (11.5)	280 (11.6)
5	815 (80.7)	696 (83.5)	1,398 (86.0)	2,059 (85.6)

eAppendix 7. Adjusted Mean Score Differences in Access, Care Provider Concern, Telemedicine Technology, and Overall Assessment Over Different Time Intervals

Time Interval	Adjusted Mean Score	Lower Limit	Upper Limit
Access			
April 2020–June 2020	4.74	4.69	4.79
July 2020–October 2020	4.73	4.69	4.78
November 2020–February 2021	4.75	4.69	4.80
March 2021–June 2021	4.71	4.64	4.77
Care provider concern			
April 2020–June 2020	4.84	4.80	4.87
July 2020–October 2020	4.84	4.80	4.87
November 2020–February 2021	4.85	4.81	4.89
March 2021–June 2021	4.83	4.78	4.87
Telemedicine technology			
April 2020–June 2020	4.79	4.74	4.84
July 2020–October 2020	4.77	4.72	4.82
November 2020–February 2021	4.80	4.74	4.86
March 2021–June 2021	4.74	4.68	4.81
Overall assessment			
April 2020–June 2020	4.84	4.80	4.88
July 2020–October 2020	4.82	4.78	4.86
November 2020–February 2021	4.84	4.79	4.89
March 2021–June 2021	4.80	4.75	4.84

Mean scores were adjusted for age, sex, race/ethnicity, insurance, clinic type, and visit type.

Appendix 8. Difference Between Time Intervals for Telemedicine Access, Care Provider Concern, Telemedicine Technology, and Overall Assessment				
Time Interval	Difference	Lower Limit	Upper Limit	Adjusted P Value
Access				
July 2020–October 2020:April 2020–June 2020	–0.001279	–0.008485	0.005926	0.968407
November 2020–February 2021:April 2020–June 2020	0.005082	–0.000941	0.011104	0.132253
March 2021–June 2021:April 2020–June 2020	0.004863	–0.000764	0.010490	0.117672
November 2020–February 2021:July 2020–October 2020	0.006361	–0.000220	0.012942	0.062520
March 2021–June 2021:July 2020–October 2020	0.006143	–0.000078	0.012364	0.054454
March 2021–June 2021:November 2020–February 2021	–0.000219	–0.005021	0.004583	0.999427
Care provider concern				
July 2020–October 2020:April 2020–June 2020	0.002294	–0.003603	0.008191	0.749627
November 2020–February 2021:April 2020–June 2020	–0.000027	–0.004961	0.004907	0.999999
March 2021–June 2021:April 2020–June 2020	0.000114	–0.004493	0.004721	0.999908
November 2020–February 2021:July 2020–October 2020	–0.002321	–0.007710	0.003068	0.685372
March 2021–June 2021:July 2020–October 2020	–0.002180	–0.007271	0.002911	0.689344
March 2021–June 2021:November 2020–February 2021	0.000141	–0.003795	0.004077	0.999721
Telemedicine technology				
July 2020–October 2020:April 2020–June 2020	–0.000474	–0.007952	0.007005	0.998468
November 2020–February 2021:April 2020–June 2020	0.003036	–0.003213	0.009286	0.595834
March 2021–June 2021:April 2020–June 2020	0.001122	–0.004715	0.006960	0.960424
November 2020–February 2021:July 2020–October 2020	0.003510	–0.003324	0.010344	0.550217
March 2021–June 2021:July 2020–October 2020	0.001596	–0.004864	0.008056	0.920768
March 2021–June 2021:November 2020–February 2021	–0.001914	–0.006900	0.003072	0.757168
Overall assessment				
July 2020–October 2020:April 2020–June 2020	0.001255	–0.005723	0.008233	0.967223
November 2020–February 2021:April 2020–June 2020	0.001824	–0.004001	0.007650	0.852177
March 2021–June 2021:April 2020–June 2020	0.001414	–0.004025	0.006854	0.909077
November 2020–February 2021:July 2020–October 2020	0.000569	–0.005815	0.006954	0.995764
March 2021–June 2021:July 2020–October 2020	0.000159	–0.005875	0.006194	0.999889
March 2021–June 2021:November 2020–February 2021	–0.000410	–0.005064	0.004244	0.995908

Mean scores were adjusted for age, sex, race/ethnicity, insurance, clinic type, and visit type.