

Body mass index during and early after therapy for pediatric acute lymphoblastic leukemia is associated with obesity in survivors

Authors

Kunanya Suwannaying,^{1,2} Grace C. Zhou,³ Nawachai Lertvivatpong,^{1,4} Achal Neupane,⁵ Kateryna Petrykey,⁵ Tomoko Yoshida,⁵ Jessica L. Baedke,⁶ Piya Rujkijyanont,⁴ Carmen L. Wilson,⁵ Stephanie B. Dixon,¹ Angela Delaney,⁷ Yadav Sapkota,⁵ Sue C. Kaste,^{1,8,9} Gregory T. Armstrong,⁵ Ching-Hon Pui,^{1,10} Melissa M. Hudson,^{1,5} Deokumar Srivastava,³ Kirsten K. Ness^{5#} and Hiroto Inaba^{1,10#}

¹Department of Oncology, St. Jude Children’s Research Hospital, Memphis, TN, USA; ²Department of Pediatrics, Khon Kaen University, Khon Kaen, Thailand; ³Department of Biostatistics, St. Jude Children’s Research Hospital, Memphis, TN, USA; ⁴Division of Hematology-Oncology, Department of Pediatrics, Phramongkutklao Hospital and Phramongkutklao College of Medicine, Bangkok, Thailand; ⁵Department of Epidemiology and Cancer Control, St. Jude Children’s Research Hospital, Memphis, TN, USA; ⁶School of Public Health, University of Alberta, Edmonton, Alberta, Canada; ⁷Department of Pediatric Medicine, St. Jude Children’s Research Hospital, Memphis, TN, USA; ⁸Department of Radiology, St. Jude

Children’s Research Hospital, Memphis, TN, USA; ⁹Department of Radiology, University of Tennessee Health Science Center, Memphis, TN, USA and ¹⁰Department of Pediatrics, University of Tennessee Health Science Center, Memphis, TN, USA

#KKN and HI contributed equally as senior authors.

Correspondence:
H. INABA - hiroto.inaba@stjude.org
K. NESS - kiri.ness@stjude.org

<https://doi.org/10.3324/haematol.2025.288529>

Received: September 17, 2025.
Accepted: February 3, 2026.
Early view: February 12, 2026.

©2026 Ferrata Storti Foundation
Published under a CC BY-NC license 

Body mass index during and early after therapy for pediatric acute lymphoblastic leukemia is associated with obesity in survivors

Kunanya Suwannaying,^{1,2} Grace C. Zhou,³ Nawachai Lertvivatpong,^{1,4} Achal Neupane,⁵ Kateryna Petrykey,⁵ Tomoko Yoshida,⁵ Jessica L. Baedke,⁶ Piya Rujkijyanont,⁴ Carmen L. Wilson,⁵ Stephanie B. Dixon,¹ Angela Delaney,⁷ Yadav Sapkota,⁵ Sue C. Kaste,^{1,8,9} Gregory T. Armstrong,⁵ Ching-Hon Pui,^{1,10} Melissa M. Hudson,^{1,5} Deokumar Srivastava,³ Kirsten K. Ness,^{5*} Hiroto Inaba^{1,10*}

¹Department of Oncology, St. Jude Children's Research Hospital, Memphis, TN, USA

²Department of Pediatrics, Khon Kaen university, Khon Kaen, Thailand.

³Department of Biostatistics, St. Jude Children's Research Hospital, Memphis, TN, USA

⁴Division of Hematology-Oncology, Department of Pediatrics, Phramongkutklao Hospital and Phramongkutklao College of Medicine, Bangkok, Thailand

⁵Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital, Memphis, TN, USA

⁶School of Public Health, University of Alberta, Edmonton, Alberta, Canada

⁷Department of Pediatric Medicine, St. Jude Children's Research Hospital, Memphis, TN, USA

⁸Department of Radiology, St. Jude Children's Research Hospital, Memphis, TN, USA

⁹Department of Radiology, University of Tennessee Health Science Center, Memphis, TN, USA

¹⁰Department of Pediatrics, University of Tennessee Health Science Center, Memphis, TN, USA

*Contributed equally

Corresponding author: Hiroto Inaba, MD, PhD, Department of Oncology, St. Jude Children's Research Hospital, 262 Danny Thomas Place, Mail Stop 260, Memphis, TN, 38105-2794, USA. Tel: +1-901-595-3144; Fax: +1-901-521-9005

Supplemental Table 1. Clinical characteristics of survivor participants for the overall group and for each BMI category at the first SJLIFE visit

Clinical Characteristic	Overall N = 678	Normal/Underweight N = 249	Overweight N = 183	Obesity N = 246
Age at diagnosis in years, median (IQR)	6.1 (3.6, 10.5)	5.7 (3.5, 10.2)	7.2 (3.5, 10.4)	6.0 (3.9, 11.5)
Age at assessment in years, median (IQR)	26.9 (22.9, 31.4)	24.9 (21.4, 28.5)	27.2 (23.0, 32.4)	28.8 (25.1, 32.4)
Time since diagnosis in years, median (IQR)	20.0 (15.2, 24.9)	17.7 (14.6, 22.4)	20.9 (15.4, 25.8)	22.7 (16.3, 26.1)
Sex				
Male, No. (%)	339 (50.0)	112 (45.0)	105 (57.4)	122 (49.6)
Female, No. (%)	339 (50.0)	137 (55.0)	78 (42.6)	124 (50.4)
Race				
Non-Hispanic White, No. (%)	566 (83.5)	210 (84.3)	150 (82.0)	206 (83.7)
Non-Hispanic Black, No. (%)	77 (11.4)	20 (8.0)	21 (11.5)	36 (14.6)
Other, No. (%)	35 (5.1)	19 (7.7)	12 (6.4)	4 (1.7)
Risk classification				
Standard risk	378 (55.8)	146 (58.6)	97 (53.0)	135 (54.9)
High risk	300 (44.2)	103 (41.4)	86 (47.0)	111 (45.1)
Corticosteroids, No. (%)	676 (99.7)	248 (99.6)	183 (100)	245 (100)
Median (prednisolone equivalent dose), mg/m ² , (IQR)	9651 (2240, 11,986)	10,441 (9556, 12,010)	9656 (2240, 11,992)	9616 (2240, 10,922)
Corticosteroid types and cumulative dosage according to treatment protocol				
Total therapy X				
Standard risk	Prednisolone 1120 mg/m ²			
High risk	Prednisolone 1120 mg/m ²			
Total therapy XI				
Lower risk	Prednisolone 9520 mg/m ²			
Higher risk	Prednisolone 9520 mg/m ²			
Total therapy XII	Prednisolone 1120 mg/m ²			
Total therapy XIII				
Low risk	Prednisolone 9560 mg/m ²			
High risk	Prednisolone 9560 mg/m ²			
Total therapy XIII B				
Low risk	Prednisolone 1120 mg/m ² , dexamethasone 1680 mg/m ²			
High risk	Prednisolone 1160 mg/m ² , dexamethasone 1680 mg/m ²			
Total therapy XIV				
Low risk	Prednisolone 1120 mg/m ² , dexamethasone 2016 mg/m ² (girl) or 2520 mg/m ² (boy)			
Standard/high risk	Prednisolone 1120 mg/m ² , dexamethasone 2464 mg/m ² (girl) or 3080 mg/m ² (boy)			
Total therapy XV				
Low risk	Prednisolone 1120 mg/m ² , dexamethasone 2160 mg/m ² (girl) or 2600 mg/m ² (boy)			
Standard/high risk	Prednisolone 1120 mg/m ² , dexamethasone 2520 mg/m ² (girl) or 3060 mg/m ² (boy)			
Cytarabine, No. (%)	627 (92.4)	232 (93.2)	171 (93.4)	224 (91.1)
Median dose, mg/m ² (IQR)	5147 (2200, 10,379)	4,807 (1812, 10,237)	5136 (2510, 10,372)	7029 (2709, 10,554)
Epipodophyllotoxins, No. (%)	506 (74.6)	177 (71.1)	138 (75.4)	191 (77.6)
Median dose, mg/m ² (IQR)	6589 (1353, 14,853)	4,258 (1231, 14,752)	6800 (1371, 14,955)	9978 (1378, 15,060)
Alkylating agents, No. (%)	434 (64.0)	148 (59.4)	125 (30.6)	161 (65.4)
Median dose (cyclophosphamide equivalent dose), mg/m ² (IQR)	7970 (4508, 9500)	7841 (4208, 9406)	7398 (4327, 9462)	8219 (4764, 9632)
Asparaginase, No. (%)	678 (100.0)	249 (100.0)	183 (100.0)	246 (100.0)
Median dose, mg/m ² (IQR)	4553 (2969, 10,123)	5988 (3000, 11,196)	4510 (2955, 10,485)	4337 (2932, 7916)
Anthracyclines, No. (%)	559 (82.4)	219 (88.0)	147 (80.3)	193 (78.5)
Median dose (doxorubicin equivalent dose), mg/m ² (IQR)	52 (26, 87)	51 (26, 85)	52 (36, 89)	52 (25, 109)
Methotrexate, No. (%)	67 (100.0)	249 (100.0)	183 (100.0)	246 (100.0)

Clinical Characteristic	Overall N = 678	Normal/Underweight N = 249	Overweight N = 183	Obesity N = 246
Median dose, mg/m ² (IQR)	17,174 (4110, 22,575)	18,827 (7992, 23,048)	15,748 (4,040, 22,914)	14,005 (4000, 21,524)
Vincristine, No. (%)	678 (100)	249 (100)	183 (100)	246 (100)
Median dose, mg/m ² (IQR)	52 (7, 59)	55 (37, 60)	52 (8, 59)	44 (6, 57)
Cranial radiotherapy	213 (31.4)	44 (17.7)	66 (36.1)	103 (41.9)
None	465 (68.6)	205 (82.3)	117 (63.9)	143 (58.1)
≤18 Gy, No. (%)	168 (24.8)	33 (13.3)	52 (28.4)	83 (33.7)
>18 Gy, No. (%)	45 (6.6)	11 (4.4)	14 (7.7)	20 (8.2)
Physical activity, No. (%)	655 (96.6)	241 (96.8)	175 (95.6)	239 (97.2)
Active	384 (58.6)	143 (59.3)	116 (66.3)	125 (52.3)
Inactive	271 (41.4)	98 (40.7)	59 (34.7)	114 (47.7)
History of smoking, No. (%)	643 (94.8)	235 (94.4)	171 (93.4)	237 (96.3)
Current	126 (19.6)	45 (19.1)	40 (23.4)	41 (17.3)
Past	79 (12.3)	26 (11.1)	26 (15.2)	27 (11.4)
Never	438 (68.1)	164 (69.8)	105 (61.4)	169 (71.3)
BMI Z-score at diagnosis, median (IQR)	-0.15 (-0.95, 0.57)	-0.47 (-1.46, 0.11)	-0.23 (-0.89, 0.39)	0.34 (-0.45, 1.20)
BMI Z-score at end of induction, median (IQR)	0.21 (-0.67, 0.98)	-0.32 (-1.05, 0.49)	0.08 (-0.73, 0.86)	0.78 (0.05, 1.52)
BMI Z-score at off-therapy, median (IQR)	0.63 (-0.06, 1.43)	0.27 (-0.56, 0.77)	0.48 (-0.06, 1.30)	1.12 (0.51, 1.94)
BMI Z-score at 5 years off-therapy, median (IQR)	0.82 (-0.01, 1.58)	-0.02 (-0.79, 0.50)	0.82 (0.18, 1.27)	1.63 (1.08, 1.99)

Abbreviations: BMI, body mass index; Gy, Gray; IQR, interquartile range

Supplemental Table 2. BMI, weight, and height Z-scores at each timepoint

	Dx (N=678)	EOI (N=678)	Mo 6 (N=678)	Mo 12 (N=677)	Mo 18 (N=675)	Mo 24 (N=674)	Off (N=673)	1y off (N=658)	2y off (N=633)	3y off (N=630)	4y off (N=602)	5y off (N=657)	Survivors (N=678)
Age (years)													
Mean (SD)	7.46 (4.51)	7.58 (4.51)	7.95 (4.51)	8.45 (4.51)	8.95 (4.52)	9.45 (4.51)	10.0 (4.56)	11.0 (4.57)	12.0 (4.54)	13.0 (4.58)	14.0 (4.55)	15.0 (4.57)	27.6 (5.85)
Median [min, max]	6.07 [2.01, 18.8]	6.18 [2.13, 18.9]	6.56 [2.49, 19.3]	7.06 [2.97, 19.8]	7.58 [3.34, 20.4]	8.07 [4.00, 20.8]	8.57 [4.47, 21.7]	9.54 [5.15, 22.7]	10.5 [6.31, 23.7]	11.5 [7.18, 24.8]	12.6 [8.18, 25.8]	13.6 [8.36, 27.0]	26.9 [18.3, 44.9]
Weight Z-score													
Mean (SD)	0.08 (1.09)	0.18 (1.14)	0.14 (1.11)	0.35 (1.10)	0.31 (1.12)	0.34 (1.09)	0.30 (1.12)	0.46 (1.10)	0.52 (1.13)	0.55 (1.14)	0.59 (1.15)	0.60 (1.15)	0.95 (1.21)
Median [min, max]	0.04 [-3.20, 3.52]	0.23 [-3.81, 3.59]	0.08 [-3.71, 3.67]	0.35 [-3.34, 3.75]	0.28 [-2.69, 3.75]	0.29 [-3.10, 3.52]	0.24 [-3.03, 3.37]	0.46 [-3.66, 3.52]	0.52 [-3.37, 3.62]	0.55 [-4.35, 3.54]	0.59 [-4.66, 3.65]	0.62 [-3.45, 3.72]	1.08 [-3.81, 3.99]
Weight Z-score (male)													
Mean (SD)	0.19 (1.08)	0.30 (1.16)	0.28 (1.08)	0.48 (1.10)	0.41 (1.10)	0.43 (1.07)	0.36 (1.10)	0.51 (1.08)	0.55 (1.15)	0.60 (1.16)	0.62 (1.19)	0.66 (1.18)	1.01 (1.21)
Median [min, max]	0.091 [-2.91, 3.52]	0.37 [-3.81, 3.32]	0.24 [-2.21, 3.32]	0.43 [-2.52, 3.35]	0.35 [-2.37, 3.23]	0.37 [-2.29, 3.35]	0.26 [-2.54, 3.32]	0.49 [-2.16, 3.52]	0.50 [-3.11, 3.62]	0.56 [-3.13, 3.54]	0.60 [-3.33, 3.65]	0.68 [-3.26, 3.72]	1.06 [-2.17, 3.99]
Weight Z-score (female)													
Mean (SD)	-0.03 (1.08)	0.06 (1.11)	-0.00 (1.12)	0.23 (1.09)	0.21 (1.12)	0.25 (1.11)	0.24 (1.13)	0.40 (1.12)	0.48 (1.11)	0.50 (1.11)	0.56 (1.12)	0.54 (1.12)	0.89 (1.21)
Median min, max]	-0.02 [-3.20, 3.46]	0.08 [-3.36, 3.59]	-0.02 [-3.71, 3.67]	0.24 [-3.34, 3.75]	0.21 [-2.69, 3.75]	0.25 [-3.10, 3.52]	0.18 [-3.03, 3.37]	0.39 [-3.66, 3.41]	0.52 [-3.37, 3.29]	0.54 [-4.35, 3.19]	0.58 [-4.66, 3.22]	0.58 [-3.45, 3.28]	1.10 [-3.81, 3.22]
Height Z-score													
Mean (SD)	0.32 (0.98)	0.20 (0.96)	0.06 (0.96)	-0.08 (0.97)	-0.12 (0.98)	-0.23 (0.98)	-0.31 (0.99)	-0.10 (1.01)	-0.15 (1.02)	-0.11 (1.03)	-0.09 (1.02)	-0.05 (1.01)	-0.17 (1.09)
Median [min, max]	0.27 [-2.97, 3.40]	0.15 [-3.10, 3.14]	0.03 [-3.10, 2.97]	-0.09 [-2.97, 2.84]	-0.21 [-3.26, 2.83]	-0.27 [-3.43, 3.10]	-0.36 [-3.63, 3.30]	-0.24 [-3.34, 3.92]	-0.21 [-3.75, 3.86]	-0.13 [-3.38, 3.85]	-0.13 [-3.46, 3.99]	-0.08 [-2.97, 3.99]	-0.18 [-4.36, 5.15]

	Dx (N=678)	EOI (N=678)	Mo 6 (N=678)	Mo 12 (N=677)	Mo 18 (N=675)	Mo 24 (N=674)	Off (N=673)	1y off (N=658)	2y off (N=633)	3y off (N=630)	4y off (N=602)	5y off (N=657)	Survivors (N=678)
Height Z-score (male)													
Mean (SD)	0.32 (0.97)	0.20 (0.96)	0.08 (0.97)	-0.02 (0.96)	-0.08 (0.96)	-0.16 (0.97)	-0.24 (0.99)	-0.14 (1.02)	-0.13 (1.01)	-0.11 (1.06)	-0.13 (1.04)	-0.06 (1.03)	-0.07 (1.06)
Median [min, max]	0.25 [-2.51, 3.13]	0.18 [-2.51, 3.12]	0.04 [-2.76, 2.97]	-0.12 [-2.56, 2.84]	-0.25 [-2.54, 2.58]	-0.27 [-2.57, 3.10]	-0.37 [-2.83, 3.30]	-0.26 [-2.78, 3.92]	-0.25 [-2.60, 3.86]	-0.18 [-2.63, 3.85]	-0.19 [-3.46, 3.99]	-0.14 [-2.57, 3.99]	-0.12 [-3.22, 5.15]
Height Z-score (female)													
Mean (SD)	0.32 (0.99)	0.20 (0.96)	0.04 (0.95)	-0.10 (0.97)	-0.17 (0.99)	-0.30 (0.99)	-0.38 (1.00)	-0.24 (0.99)	-0.16 (1.03)	-0.11 (0.99)	-0.05 (1.00)	-0.05 (1.00)	-0.26 (1.10)
Median [min, max]	0.29 [-2.97, 3.40]	0.12 [-3.10, 3.14]	0.03 [-3.10, 2.75]	-0.07 [-2.97, 2.73]	-0.14 [-3.26, 2.83]	-0.27 [-3.43, 2.75]	-0.36 [-3.63, 2.62]	-0.18 [-3.34, 2.46]	-0.19 [-3.75, 3.15]	-0.09 [-3.38, 2.81]	-0.06 [-2.98, 2.90]	-0.04[-2.97, 2.88]	-0.19 [-4.36, 3.21]
BMI Z-score													
Mean (SD)	-0.22 (1.29)	0.07 (1.34)	0.12 (1.18)	0.50 (1.14)	0.49 (1.16)	0.61 (1.09)	0.60 (1.11)	0.68 (1.05)	0.69 (1.07)	0.70 (1.07)	0.72 (1.09)	0.70 (1.10)	0.96 (1.09)
Median [min, max]	-0.15 [-7.18, 3.10]	0.21 [-6.07, 3.00]	0.11 [-3.84, 3.02]	0.56 [-3.29, 3.35]	0.48 [-3.08, 2.96]	0.67 [-4.82, 3.11]	0.63 [-4.28, 3.06]	0.74 [-3.13, 2.87]	0.75 [-2.85, 2.93]	0.72 [-2.80, 2.95]	0.84 [-3.55, 2.88]	0.82 [-2.85, 2.80]	1.09 [-3.51, 3.26]
BMI Z-score (male)													
Mean (SD)	-0.11 (1.32)	0.20 (1.36)	0.24 (1.19)	0.58 (1.19)	0.55 (1.19)	0.65 (1.10)	0.62 (1.12)	0.71 (1.05)	0.70 (1.14)	0.72 (1.12)	0.73 (1.16)	0.74 (1.16)	0.97 (1.18)
Median [min, max]	-0.07 [-7.18, 2.92]	0.42 [-5.78, 2.77]	0.25 [-3.84, 3.02]	0.66 [-3.29, 3.35]	0.58 [-3.06, 2.96]	0.72 [-2.97, 3.11]	0.64 [-2.59, 3.06]	0.78 [-2.39, 2.84]	0.77 [-2.85, 2.93]	0.73 [-2.80, 2.95]	0.88 [-3.55, 2.88]	0.84 [-2.85, 2.80]	1.10 [-3.51, 3.26]
BMI Z-score (female)													
Mean (SD)	-0.33 (1.25)	-0.06 (1.31)	-0.01 (1.17)	0.42 (1.09)	0.43 (1.13)	0.58 (1.08)	0.59 (1.11)	0.65 (1.05)	0.69 (1.01)	0.68 (1.01)	0.71 (1.01)	0.66 (1.03)	0.96 (0.99)
Median [min, max]	-0.30 [-5.32, 3.10]	0.05 [-6.07, 3.00]	-0.03 [-3.78, 2.98]	0.46 [-2.90, 3.00]	0.42 [-3.08, 2.94]	0.60 [-4.82, 2.91]	0.61 [-4.28, 2.97]	0.69 [-3.13, 2.87]	0.72 [-2.21, 2.92]	0.71 [-2.61, 2.88]	0.78 [-3.06, 2.81]	0.74 [-2.34, 2.72]	1.07 [-2.52, 2.54]
BMI category													
Underweight	88 (13.0)	68 (10.0)	49 (7.2)	31 (4.6)	32 (4.7)	19 (2.8)	23 (3.4)	13 (2.0)	13 (2.0)	13 (2.1)	13 (2.1)	17 (2.6)	18 (2.7)

	Dx (N=678)	EOI (N=678)	Mo 6 (N=678)	Mo 12 (N=677)	Mo 18 (N=675)	Mo 24 (N=674)	Off (N=673)	1y off (N=658)	2y off (N=633)	3y off (N=630)	4y off (N=602)	5y off (N=657)	Survivors (N=678)
Normal weight	479 (70.6)	453 (66.8)	485 (71.6)	428 (63.2)	410 (60.7)	414 (61.4)	413 (61.4)	388 (58.9)	360 (56.9)	354 (56.2)	323 (53.7)	347 (52.8)	231 (34.1)
Overweight	60 (8.9)	91 (13.4)	72 (10.6)	107 (15.8)	120 (17.8)	116 (17.2)	112 (16.7)	131 (19.9)	131 (20.7)	127 (20.1)	119 (19.8)	141 (21.4)	183 (27.0)
Obesity	51 (7.5)	66 (9.8)	72 (10.6)	111 (16.4)	113 (16.8)	125 (18.6)	125 (18.5)	126 (19.2)	129 (20.4)	136 (21.6)	147 (24.4)	152 (23.2)	246 (36.3)

Abbreviations: BMI, body mass index; Dx, diagnosis; EOI, end of induction; Mo, month; off, off-therapy; SD, standard deviation; y, years

Supplemental Table 3. Association of BMI trajectory pattern, overweight/obesity AUC, and host, genetic, and treatment factors with overweight/obesity in survivors

		Overweight			Obesity		
Factor	N	OR	95% CI	P	OR	95% CI	P
BMI trajectory from diagnosis to 5 years off-therapy							
Sex							
Female	304	—	—		—	—	
Male	295	1.41	0.90, 2.18	0.130	1.01	0.63, 1.62	>0.900
Attained age	599	1.07	1.03, 1.12	0.001	1.15	1.10, 1.21	<0.001
Genetic admixture							
EAS	599	0.85	0.08, 8.70	0.900	0.03	0.00, 4.47	0.200
AMR	599	0.97	0.26, 3.56	>0.900	0.18	0.04, 0.90	0.037
SAS	599	0.14	0.00, 18.40	0.400	0.00	0.00, 35.00	0.200
AFR	599	0.53	0.18, 1.59	0.300	0.23	0.08, 0.70	0.010
BMI-PRS	599	1.17	1.05, 1.30	0.004	1.37	1.22, 1.54	<0.001
Cranial radiotherapy							
No	403	—	—		—	—	
Yes	196	2.23	1.30, 3.80	0.003	2.77	1.57, 4.88	<0.001
Latent class profile							
Low-slow	367	—	—		—	—	
Medium-slow	151	2.26	1.27, 4.00	0.005	9.81	5.50, 17.50	<0.001
Low-fast	59	5.78	1.95, 17.10	0.002	34.40	11.90, 99.30	<0.001
High-slow	22	6.59	0.66, 65.60	0.110	81.40	10.10, 653.00	<0.001
BMI trajectory from diagnosis to 1 year post-diagnosis							
Sex							
Female	304	—	—		—	—	
Male	295	1.47	0.94, 2.29	0.088	1.10	0.70, 1.74	0.700
Attained age	599	1.09	1.04, 1.14	<0.001	1.15	1.10, 1.21	<0.001

Genetic admixture							
EAS	599	1.05	0.11, 9.60	>0.900	0.07	0.00, 5.22	0.200
AMR	599	0.87	0.24, 3.13	0.800	0.14	0.03, 0.66	0.013
SAS	599	0.16	0.00, 42.30	0.500	0.00	0.00, 4.66	0.083
AFR	599	0.60	0.20, 1.80	0.400	0.27	0.09, 0.80	0.018
BMI-PRS	599	1.17	1.05, 1.30	0.004	1.38	1.24, 1.54	<0.001
Cranial radiotherapy							
No	403	—	—		—	—	
Yes	196	2.38	1.39, 4.08	0.002	3.10	1.80, 5.34	<0.001
Latent class profile							
Normal	356	—	—		—	—	
Low	95	0.36	0.19, 0.65	<0.001	0.14	0.07, 0.30	<0.001
Medium	127	1.90	1.06, 3.44	0.032	3.27	1.83, 5.86	<0.001
High	21	840.00	301.00, 2347.00	<0.001	17,298.00	6186.00, 48,371.00	<0.001
Area under the curve (at diagnosis, end of induction, off-therapy, and 5 years off-therapy)							
Sex							
Female	295	—	—		—	—	
Male	287	1.25	0.80, 1.95	0.300	0.83	0.51, 1.34	0.400
Attained age	582	1.08	1.03, 1.12	0.002	1.15	1.09, 1.20	<0.001
Genetic admixture							
EAS	582	1.00	0.11, 9.13	>0.900	0.04	0.00, 8.13	0.200
AMR	582	0.86	0.23, 3.27	0.800	0.11	0.02, 0.66	0.016
SAS	582	0.09	0.00, 15.30	0.400	0.00	0.00, 54.60	0.200
AFR	582	0.51	0.16, 1.58	0.200	0.22	0.07, 0.68	0.009
BMI-PRS	582	1.16	1.04, 1.29	0.007	1.36	1.21, 1.53	<0.001
Cranial radiotherapy							
No	393	—	—		—	—	

Yes	189	2.47	1.44, 4.23	0.001	3.66	2.09, 6.40	<0.001
Overweight/obesity AUC	582	1.24	1.10, 1.39	<0.001	1.58	1.41, 1.78	<0.001
Area under the curve (at diagnosis, end of induction, off-therapy, and 1 year post-diagnosis)							
Sex							
Female	303	—	—		—	—	
Male	295	1.31	0.85, 2.03	0.200	0.86	0.55, 1.35	0.500
Attained age	598	1.07	1.02, 1.12	0.003	1.11	1.06, 1.16	<0.001
Genetic admixture							
EAS	598	1.11	0.13, 9.69	>0.900	0.05	0.00, 6.43	0.200
AMR	598	0.84	0.23, 3.02	0.800	0.12	0.02, 0.57	0.008
SAS	598	0.09	0.00, 14.60	0.400	0.00	0.00, 6.71	0.092
AFR	598	0.51	0.17, 1.50	0.200	0.21	0.07, 0.60	0.004
BMI-PRS	598	1.17	1.06, 1.30	0.003	1.39	1.25, 1.55	<0.001
Cranial radiotherapy							
No	402	—	—		—	—	
Yes	196	2.45	1.44, 4.16	<0.001	3.64	2.14, 6.18	<0.001
Overweight/obesity AUC	598	2.71	1.53, 4.80	<0.001	5.16	2.95, 9.04	<0.001
Area under the curve (at diagnosis and end of induction)							
Sex							
Female	304	—	—		—	—	
Male	295	1.38	0.90, 2.13	0.140	0.93	0.59, 1.44	0.700
Attained age	599	1.06	1.02, 1.11	0.008	1.10	1.05, 1.14	<0.001
Genetic admixture							
EAS	599	1.01	0.12, 8.70	>0.900	0.04	0.00, 5.62	0.200
AMR	599	0.91	0.26, 3.23	0.900	0.13	0.03, 0.62	0.011
SAS	599	0.09	0.00, 14.70	0.400	0.00	0.00, 11.20	0.110
AFR	599	0.57	0.19, 1.66	0.300	0.27	0.10, 0.76	0.013

BMI-PRS	599	1.17	1.06, 1.30	0.002	1.38	1.24, 1.54	<0.001
Cranial radiotherapy							
No	403	—	—		—	—	
Yes	196	2.37	1.40, 4.00	0.001	3.37	2.00, 5.67	<0.001
Overweight/obesity AUC × 10	599	1.26	1.03, 1.53	0.024	1.54	1.28, 1.86	<0.001

Abbreviations: AMR, admixed American; AFR, African; BMI, body mass index; BMI-PRS, body mass index polygenic risk score; CI, confidence interval; EAS, East Asian; OR, odds ratio; SAS, South Asian

*Because AUCs during induction were small, they were multiplied by 10 for analysis.

Footnotes:

The total cohort comprised 678 patients. Analyses including genetic admixture and BMI-PRS were limited to those patients with genotype data (n = 599). Sample sizes varied because of missing BMI or genetic data: for the AUC model from diagnosis to 5 years off-therapy (with BMI measured at diagnosis, end of induction, off-therapy, and 5 years off-therapy), n = 582; for the AUC model from diagnosis to 1 year post-diagnosis (with BMI measured at diagnosis, end of induction, and 1 year post-diagnosis), n = 598; and for the AUC model from diagnosis to end of induction therapy (with BMI measured at diagnosis and end of induction), n = 599.