

SUPPLEMENTRY MATERIAL

Comparative Effectiveness of Ciltacabtagene Autoleucel in CARTITUDE-4 Versus Real-World Physician's Choice of Therapy From the Flatiron Registry in Lenalidomide-Refractory Multiple Myeloma

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¹Service d'Hématologie, Centre Hospitalier Universitaire (CHU) Hotel Dieu, Nantes, France;

²Centre de Recherche en Cancérologie et Immunologie Intégrée Nantes Angers, INSERM, Centre National de la Recherche Scientifique, Université d'Angers, Université de Nantes, Nantes, France;

³Site de Recherche Intégrée sur le Cancer, Imaging and Longitudinal Investigations to Ameliorate Decision-making (ILIAD), French National Cancer Institute–French Ministry of Health–INSERM 12558, Nantes, France;

⁴University of Rochester Medical Center, Rochester, NY, USA;

⁵The Ohio State University Comprehensive Cancer Center, Columbus, OH, USA;

⁶Medical College of Wisconsin, Milwaukee, WI, USA;

⁷Johnson & Johnson, Beerse, Belgium;

⁸Johnson & Johnson, Raritan, NJ, USA;

⁹Johnson & Johnson Research & Development, Buenos Aires, Argentina;

¹⁰Johnson & Johnson, Zug, Switzerland;

¹¹Johnson & Johnson, Shanghai, China;

¹²IQVIA, Shanghai, China;

¹³CHU Poitiers, Poitiers, France;

¹⁴Hospital Universitario de Salamanca, Instituto de Investigacion Biomedica de Salamanca, Centro de Investigación del Cancer, Salamanca, Spain;

¹⁵Poznan University of Medical Sciences, Poznań, Poland;

¹⁶University of Bologna, Bologna, Italy;

¹⁷University Medical Center Hamburg-Eppendorf, Hamburg, Germany;

¹⁸Centre Hospitalier Lyon Sud, Pierre-Bénite, France;

¹⁹University of Leuven, Leuven, Belgium;

²⁰Divisione di Ematologia, Fondazione IRCCS Istituto Nazionale dei Tumori, Università di Milano, Milan, Italy;

²¹The Division of Hematology, AOU Citt. della Salute e della Scienza di Torino (F.G., R.M.), and the Department of Molecular Biotechnology and Health Sciences, University of Turin, Turin, Italy;

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Table S1 List of institutional review boards and ethics committees

Country	Institutional review board/ethics committee address	Site	Approval date
Austria	Med.Universität Wien, Borschkegasse 8b/E 06, Vienna, 1090	O30-AT10001	Site, Central: 22-Jun-21
Australia	Metro North Hospital and Health Service Governance Office, Royal Brisbane and Women's Hospital, Lower Ground Floor, Executive Offices, James Mayne Building, HERSTON, QLD, 4029	O30-AU10001	Site, Central: 6-Feb-20 Site, Local: 21-Dec-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10001	Site, Central: 6-Feb-20 Site, Local: 21-Dec-20
Australia	Peter MacCallum Cancer Centre Regulatory Governance Office, VCCC Building, Level 10, 305 Grattan Street, Melbourne, VIC, 3000	O30-AU10002	Site, Central: 6-Feb-20 Site, Local: 2-Apr-20
Australia	Sydney Local Health District (RPAH Zone), Research Ethics and Governance Office, Royal Prince Alfred Hospital, Missenden Rd, Camperdown, NSW, 2050	O30-AU10003	Site, Central: 6-Feb-20 Site, Local: 28-Jul-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10003	Site, Central: 6-Feb-20 Site, Local: 28-Jul-20
Australia	Central Adelaide Local Health Network Research Governance, Level 4 Women's Health Centre, Royal Adelaide Hospital, Adelaide, South Australia, 5000	O30-AU10004	Site, Central: 6-Feb-20 Site, Local: 18-Dec-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10004	Site, Central: 6-Feb-20 Site, Local: 18-Dec-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10005	Site, Central: 6-Feb-20 Site, Local: 10-Aug-20
Australia	Alfred Health Human Ethics Committee, Office of Ethics & Research Governance, Ground Floor, Linay Pavilion, The Alfred, 55 Commercial Road, Melbourne, VIC, 3004	O30-AU10005	Site, Central: 6-Feb-20 Site, Local: 10-Aug-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10006	Site, Central: 6-Feb-20 Site, Local: 15-Oct-20

Australia	Fiona Stanley Hospital Research Governance Office, Fiona Stanley Hospital, 11 Robin Warren Drive, Murdoch WA, 6150	O30-AU10006	Site, Central: 6-Feb-20 Site, Local: 15-Oct-20
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10007	Site, Central: 15-Apr-21
Australia	Calvary Mater Newcastle Research Governance Office, Corner Edith and Platt Streets, Waratah, New South Wales, 2298	O30-AU10007	Site, Central: 15-Apr-21
Australia	Peter MacCallum Cancer Centre Ethics Committee, Level 4, 10 St Andrews Place, East Melbourne, VIC, 8006	O30-AU10008	NA*
Australia	X- Western Sydney Local Health District, Westmead Hospital, Level 2, Research and Education Network Building, Westmead, NSW, 2145	O30-AU10008	NA
Belgium	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-BE10001	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	Ethisch Comité a UZ Gent, C. Heymanslaan 10, Gent, 9000	O30-BE10001	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	Comité voor Medische Ethiek UZA, Wilrijkstraat 10, Edegem, 2650	O30-BE10001	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	Commissie medische ethiek UZ Leuven, Herestraat 49, UZ Leuven, Leuven, 3000	O30-BE10002	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	Ethisch Comité a UZ Gent, C. Heymanslaan 10, Gent, 9000	O30-BE10002	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-BE10002	Site, Region: 20-Feb-20 Site, Local: 25-Feb-20
Belgium	Comité d'Ethique Institut Jules Bordet, Boulevard De Waterloo 121, Brussel, BRUSSEL-HOOFDSTAD, 1000	O30-BE10003	Site, Region: 25-Feb-20 Site, Local: 25-Feb-20
Belgium	Ethisch Comité a UZ Gent, C. Heymanslaan 10, Gent, 9000	O30-BE10003	Site, Region: 25-Feb-20 Site, Local: 25-Feb-20

Belgium	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlatti laan 6, Amsterdam, 1083 HS	O30-BE10004	Site, Region: 20-Feb-20 Site, Local: 20-Feb-20
Belgium	Ethisch Comité a UZ Gent, C. Heymanslaan 10, Gent, 9000	O30-BE10004	Site, Region: 20-Feb-20 Site, Local: 20-Feb-20
Belgium	Comité d'éthique CHU de Liège, Domaine Universitaire du Sart-Tilman, Comité d'Ethique, Bâtiment B35, Liège, 4000	O30-BE10005	Site, Region: 10-Mar-21 Site, Local: 10-Mar-21
Belgium	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlatti laan 6, Amsterdam, 1083 HS	O30-BE10005	Site, Region: 10-Mar-21 Site, Local: 10-Mar-21
Belgium	Ethisch Comité d UZ Gent, C. Heymanslaan 10, Gent, 9000	O30-BE10005	Site, Region: 10-Mar-21 Site, Local: 10-Mar-21
Germany	Ethik-Kommission an der Medizinischen Fakultät der Eberhard-Karls-Universität und am Universitätsklinikum Tübingen, Gartenstraße 47, Tübingen, 72074	O30-DE10001	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10001	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethik-Kommission der Universitaet Wuerzburg, Josef-Schneider-Str. 4, Bau C15, Wuerzburg, 97080	O30-DE10002	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10002	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10003	Site, Region: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10004	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethik-Kommission der Medizinischen Fakultät der Universität zu Köln, Kerpener Str.62, Gebäude 5, Köln, 50937	O30-DE10004	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20

Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10005	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Geschäftsstelle der Ethik-Kommission an der Medizinischen Fakultät der Universität Leipzig, Käthe-Kollwitz-Str. 82, Leipzig, 04109	O30-DE10005	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10006	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Ärztekammer Hamburg; Körperschaft des öffentlichen Rechts, Weidestr. 122b, Hamburg, HH, 22083	O30-DE10006	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethik-Kommission der Medizinischen Fakultät Carl Gustav Carus der TU Dresden, Fetscherstraße 74, Dresden, 1307	O30-DE10007	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Germany	Ethikkommission der Medizinischen Fakultät der Universität Heidelberg, Alte Glockengießerei 11/1, Heidelberg, BW, 69115	O30-DE10007	Site, Region: 11-Nov-20 Site, Local: 11-Nov-20
Denmark	De Videnskabsetiske Komiteer i Region Hovedstaden, Kongens Vaenge 2, Hillerød, 3400	O30-DK10001	Site, Region: 22-Apr-20
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10001	Site, Region: 16-Jan-20
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10002	Site, Region: 16-Jan-20
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10003	Site, Region: 16-Jan-20
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10004	Site, Region: 16-Jan-20

Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10005	Site, Region: 16-Jan-20
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10007	Site, Region: 22-Mar-21
Spain	Comité Ético de Investigación Clínica de Navarra, Departamento de Salud. Pabellón de Docencia, C/ Irunlarrea, 3, Pamplona, 31008	O30-ES10009	Site, Region: 22-Mar-21
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10001	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10002	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10003	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10004	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10005	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10006	Site, Region: 6-Mar-20
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10007	NA
France	CPP EST-IV, 1 Place de l'Hôpital, Strasbourg, 67091	O30-FR10008	Site, Region: 3-May-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10001	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 3-Aug-21
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10001	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 3-Aug-21
United Kingdom of Great Britain and Northern Ireland	The Christie NHS Foundation Trust IRB/IEC, Wilmslow Road, Withington, MANCHESTER, M20 4BX	O30-GB10001	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 3-Aug-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10003	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 18-Jun-21
United Kingdom of Great Britain and Northern Ireland	UHB Research Governance Office, Education Centre 1st floor, Queen Elizabeth hospital Birmingham, Mindelsohn Way, Birmingham, B15 2WB	O30-GB10003	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 18-Jun-21

United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10003	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 18-Jun-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10004	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 26-Apr-21
United Kingdom of Great Britain and Northern Ireland	The Newcastle upon Tyne Hospitals NHS Foundation Trust, Joint Research Office, Gosforth, Newcastle upon Tyne, NE3 3HD	O30-GB10004	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 26-Apr-21
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10004	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 26-Apr-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10005	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 1-Dec-20
United Kingdom of Great Britain and Northern Ireland	University College London Hospitals NHS Foundation Trust, Joint Research Office, 1st Floor, Maple House, 149 Tottenham Court Road, LONDON, W1T 7DN	O30-GB10005	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 1-Dec-20
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10005	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 1-Dec-20
United Kingdom of Great Britain and Northern Ireland	GBR - R&D - KINGS COLLEGE HOSPITAL NHS FOUNDATION TRUST, DENMARK HILL, LONDON, SE5 9RS	O30-GB10006	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 11-Jun-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10006	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 11-Jun-21
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10006	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 11-Jun-21
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS	O30-GB10007	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 19-Jan-21

United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, 2 Redman Place, Stratford, London, E20 1JQ	O30-GB10007	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 19-Jan-21
United Kingdom of Great Britain and Northern Ireland	Research and Innovation, Research and Innovation, University Hospitals Bristol NHS Foundation Trust, Level 3, Education and Research Centre, Upper Maudlin Street, Bristol, BS2 8AE	O30-GB10007	Site, Region: 14-May-20 Site, Central: 2-Jun-20 Site, Local: 19-Jan-21
United Kingdom of Great Britain and Northern Ireland	Cardiff and Vale University Health Board, University Hospital of Wales, Heath Park, Cardiff, CF14 4XW	O30-GB10008	Site, Region: 9-Mar-21 Site, Central: 9-Mar-21 Site, Local: 7-Jul-21
United Kingdom of Great Britain and Northern Ireland	London – West London & GTAC Health Research Authority, National Research Ethics Service, Boardroom, Commonwealth Building, Hammersmith Hospital, London, London, W12 0NN	O30-GB10008	Site, Region: 9-Mar-21 Site, Central: 9-Mar-21 Site, Local: 7-Jul-21
United Kingdom of Great Britain and Northern Ireland	Health Research Authority IRB/EC, Skipton House, 80 London Rd, Ground Floor, London, Central Region, SE1 6LH	O30-GB10008	Site, Region: 9-Mar-21 Site, Central: 9-Mar-21 Site, Local: 7-Jul-21
Greece	National Ethics Committee - Greece, 284, Mesogion Avenue, Holargos, Athens, 15562	O30-GR10001	NA
Greece	National Ethics Committee - Greece, 284, Mesogion Avenue, Holargos, Athens, 15562	O30-GR10002	Site, Central: 15-Apr-21
Israel	Helsinki Committee - Sourasky Medical Center, 6 Weitzman Street, Tel Aviv, 6423906	O30-IL10001	Site, Local: 9-Mar-20
Israel	IEC-Sheba Medical Centre Helsinki Committee, Sheba Medical Centre, Tel Hashomer, Ramat Gan, 52621	O30-IL10002	Site, Local: 16-Jul-20
Israel	Helsinki Committee (IRB) of Hadassah Medical Organization, Kiryat Hadassah Jerusalem	O30-IL10003	Site, Local: 4-May-21
Italy	COMITATO ETICO INTERAZIENDALE AOU CITTA' DELLA SALUTE E DELLA SCIENZA DI TORINO, Corso Bramante 88/90, Dipartimento di Oncologia Medica, Torino, TO, 10126	O30-IT10001	Site, Local: 5-Oct-20
Italy	Comitato Etico Indipendente di Area Vasta Emilia Centro (CE-AVEC) - Segreteria Locale CE-AVEC Azienda	O30-IT10002	Site, Region: 23-Jan-20

	Ospedaliero Universitaria Policlinico S. Orsola Malpighi, Via Albertoni, 15, Bologna, 40138		
Italy	COMITATO ETICO INDIPENDENTE DELLA FONDAZIONE IRCCS ISTITUTO NAZIONALE DEI TUMORI DI MILANO, Via Giacomo Venezian, 1, Milano, 20133	O30-IT10003	Site, Local: 13-Mar-20
Italy	COMITATO ETICO DELL UNIVERSITÀ CATTOLICA DEL S. CUORE - POLICLINICO GEMELLI, Largo Gemelli, 8, N/A, N/A, ROMA, N/A, 00168	O30-IT10004	Site, Local: 30-Jan-20
Italy	Comitato Etico Ospedale San Raffaele, Via Olgettina, 60, Milano, 20132	O30-IT10005	Site, Local: 3-May-21
Japan	Nagoya City University Hospital Institutional Review Board, 1 Kawasumi, Mizuho Cho Mizuho Ku, Nagoya, Aichi, 467 8602	O30-JP10001	Site, Local: 13-Apr-20
Japan	Nagoya City University Graduate School of Medical Sciences and Nagoya City University Hospital Institutional Review Board, 1 Kawasumi, Mizuho-cho, Mizuho-ku, Nagoya-City, Aichi, 467-8602	O30-JP10001	Site, Local: 13-Apr-20
Japan	University Hospital, Kyoto Prefectural University of Medicine Institutional Review Board, 465 Kawaramachi-Dori, Kamigyou-ku, Kyoto-City, Kyoto, Kyoto, 602-8566	O30-JP10002	Site, Local: 21-May-20
Japan	Japanese Red Cross Medical Center IRB, 4-1-22 Hiroo, Shibuya, Tokyo, 150-8935	O30-JP10003	Site, Local: 11-Aug-20
Japan	Kanazawa University Hospital Institutional Review Board, 13-1 Takara-Machi, Kanazawa, Ishikawa, 920-8641	O30-JP10004	Site, Local: 9-Jul-20
Japan	Hokkaido University Hospital Institutional Review Board, Kita 14, Nishi 5, Kita-Ku, Sapporo-shi, Hokkaido, 060-8648	O30-JP10005	Site, Local: 28-Apr-20
Japan	Tohoku University Hospital Institutional Review Board, 1 1 Seiryomachi, Aoba ku, Sendai, Miyagi, 980 8574	O30-JP10006	Site, Local: 27-Apr-20
Japan	Okayama University Hospital Institutional Review Board, 2-5-1 Shikata-Cho, Kita-Ku, Okayama, Okayama, 700-8558	O30-JP10007	Site, Local: 5-Aug-20

Japan	Kyushu University Hospital IRB, 3-1-1 Maidashi, Higashi-ku, Fukuoka-City, Fukuoka, Fukuoka, 812-8582	O30-JP10008	Site, Local: 8-Sep-20
Korea, Republic of	Samsung Medical Center IRB, 81 Irwon-Ro Gangnam-gu, Seoul, 06351	O30-KR10001	Site, Local: 17-Jun-20
Korea, Republic of	Institutional Review Board of Seoul St. Mary's Hospital, the Catholic University of Korea, 222 Banpo Daero Seocho Gu, Seoul, Seoul, 06591	O30-KR10002	Site, Local: 30-Jun-20
Korea, Republic of	Seoul National University Hospital IRB, 101 DAEHAK-RO JONGNO-GU, Seoul, 03080	O30-KR10003	Site, Local: 20-Aug-20
Netherlands, Kingdom of the	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-NL10001	Site, Region: 11-May-20 Site, Local: 1-Sep-20
Netherlands, Kingdom of the	Central Committee on Research Involving Human Subjects (CCMO), Parnassusplein 5, The Hague, 2511 VX	O30-NL10001	Site, Region: 11-May-20 Site, Local: 1-Sep-20
Netherlands, Kingdom of the	Raad van Bestuur Erasmus MC, Dr. Molewaterplein 40, Rotterdam, GD, 3015	O30-NL10001	Site, Region: 11-May-20 Site, Local: 1-Sep-20
Netherlands, Kingdom of the	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-NL10002	Site, Region: 11-May-20 Site, Local: 17-Sep-20
Netherlands, Kingdom of the	Raad van Bestuur UMCG, Hanzeplein 1, Groningen, 9700 RB	O30-NL10002	Site, Region: 11-May-20 Site, Local: 17-Sep-20
Netherlands, Kingdom of the	Central Committee on Research Involving Human Subjects (CCMO), Parnassusplein 5, The Hague, 2511 VX	O30-NL10002	Site, Region: 11-May-20 Site, Local: 17-Sep-20
Netherlands, Kingdom of the	Central Committee on Research Involving Human Subjects (CCMO), Parnassusplein 5, The Hague, 2511 VX	O30-NL10003	Site, Region: 11-May-20 Site, Local: 16-Sep-20
Netherlands, Kingdom of the	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-NL10003	Site, Region: 11-May-20 Site, Local: 16-Sep-20
Netherlands, Kingdom of the	Raad van Bestuur Vrije Universiteit Medisch Centrum, De Boelelaan 1118, Amsterdam, 1081 HZ	O30-NL10003	Site, Region: 11-May-20 Site, Local: 16-Sep-20

Netherlands, Kingdom of the	Raad van Bestuur UMC Utrecht, Heidelberglaan 100, Utrecht, 3584 CX	O30-NL10004	Site, Region: 11-May-20 Site, Local: 1-Feb-21
Netherlands, Kingdom of the	EU CTR EC - Submission Date Collection Only - when EC Unknown, Domenico Scarlattilaan 6, Amsterdam, 1083 HS	O30-NL10004	Site, Region: 11-May-20 Site, Local: 1-Feb-21
Netherlands, Kingdom of the	Central Committee on Research Involving Human Subjects (CCMO), Parnassusplein 5, The Hague, 2511 VX	O30-NL10004	Site, Region: 11-May-20 Site, Local: 1-Feb-21
Poland	Komisja Bioetyczna przy Uniwersytecie Medycznym im. Karola Marcinkowskiego w Poznaniu, ul. Bukowska 70, pok. A204, Poznan, 60-812	O30-PL10001	Site, Central: 16-Sep-20
Poland	Komisja Bioetyczna przy Uniwersytecie Medycznym im. Karola Marcinkowskiego w Poznaniu, ul. Bukowska 70, pok. A204, Poznan, 60-812	O30-PL10002	Site, Central: 2-Apr-21
Poland	Komisja Bioetyczna przy Uniwersytecie Medycznym im. Karola Marcinkowskiego w Poznaniu, ul. Bukowska 70, pok. A204, Poznan, 60-812	O30-PL10003	Site, Central: 16-Sep-20
Poland	Komisja Bioetyczna przy Uniwersytecie Medycznym im. Karola Marcinkowskiego w Poznaniu, ul. Bukowska 70, pok. A204, Poznan, 60-812	O30-PL10004	Site, Central: 21-Dec-20
Sweden	Etikprovningssmyndigheten, Box 2110, Uppsala, 75002	O30-SE10001	Site, Region: 26-Oct-20
Sweden	Etikprovningssmyndigheten, Box 2110, Uppsala, 75002	O30-SE10002	Site, Region: 25-May-21
Sweden	Etikprovningssmyndigheten, Box 2110, Uppsala, 75002	O30-SE10003	Site, Region: 22-Apr-21
United States of America	University of Alabama, 701 20th Street South, Room 470Administration Building, Birmingham, AL, 35294	O30-US10003	Site, Local: 14-May-20
United States of America	OSU IRB, 1960 Kenny Road, Columbus, OH, 43210	O30-US10004	Site, Local: 20-Jul-20
United States of America	University of Kansas Medical Center Human Research Protection Program, 3901 Rainbow Boulevard Mailstop 1032, Kansas City, KS, 66160	O30-US10005	Site, Local: 4-Mar-21
United States of America	Duke University Health System Institutional Review Board, 2424 Erwin Rd Suite 405, Durham, NC, 27705	O30-US10006	Site, Local: 17-Jun-20

United States of America	University of Iowa Institutional Review Board, 300 College of Medicine Building, Iowa City, IA, 52242	O30-US10007	Site, Local: 3-Jul-20
United States of America	University of Miami Hospital, 1120 NW 14th Street, Room 969, Miami, FL, 33136	O30-US10010	Site, Local: 12-May-20
United States of America	IRBMED, University of Michigan, 2800 Plymouth Rd, Building 200, Room 2086, Ann Arbor, MI, 48109	O30-US10011	Site, Local: 19-Mar-21
United States of America	Institutional Review Board University of Utah, 75 South 2000 East RAB #111, Salt Lake City, UT, 84112-8930	O30-US10018	Site, Local: 13-May-20
United States of America	WIRB, 1019 39th Ave SE #120, Puyallup, WA, 98374	O30-US10019	Site, Local: 10-Jun-20
United States of America	Stanford Univ IRB, 3000 El Camino Real, Five Palo Alto Sq, 4th Floor, Palo Alto, CA, 93406	O30-US10021	Site, Local: 1-Sep-20
United States of America	Sterling Institutional Review Board, 5500 Interstate North Parkway, Suite 515, Atlanta, GA, 30328	O30-US10022	Site, Central: 22-Mar-21
United States of America	WIRB, 1019 39th Ave SE #120, Puyallup, WA, 98374	O30-US10023	Site, Local: 26-Mar-20
United States of America	Northside Hospital Institutional Review Board, 1000 Johnson Ferry Road, Atlanta, GA, 30342	O30-US10024	Site, Local: 18-Mar-20
United States of America	WCG IRB, 1019 39th Avenue SE, Suite 120, Puyallup, WA, 98374	O30-US10025	Site, Local: 11-Oct-20
United States of America	University of Minnesota Human Research Protection Program, 420 Delaware St SE, MMC 820, Minneapolis, MN, 55455	O30-US10027	N/A
United States of America	Medical College of Wisconsin/Froedtert Hospital Institutional Review Board-Human Research Protection Program, 8701 Watertown Plank Road HRC-MACC FUND 3040, Milwaukee WI, 53226	O30-US10028	Site, Local: 9-Sep-20
United States of America	Mayo Clinic IRB, 200 First St. SW, 201 Building, Room 4-60, Rochester, MN, 55905	O30-US10029	Site, Local: 19-Feb-21
United States of America	WIRB, 1019 39th Ave SE #120, Puyallup, WA, 98374	O30-US10030	Site, Local: 3-May-21
United States of America	Western Institutional Review Board, 1019 39th Avenue SE, Suite 120, Puyallup, WA, 98374	O30-US10035	Site, Local: 8-Jan-21

United States of America	Advarra, 6100 Merriweather Dr., Suite 600, Columbia, MD, 21044	O30-US10036	Site, Local: 9-Dec-20
United States of America	IntegReview Ethical Review Board, 3815 S. Capital of Texas Highway, Suite 320, Austin, TX, 78704	O30-US10036	Site, Local: 9-Dec-20
United States of America	IntegReview Ethical Review Board, 3815 S. Capital of Texas Highway, Suite 320, Austin, TX, 78704	O30-US10037	Site, Local: 2-Dec-20
United States of America	Mayo Clinic IRB, 200 First St. SW, 201 Building, Room 4-60, Rochester, MN, 55905	O30-US10038	Site, Local: 19-Feb-21
United States of America	Sterling Institutional Review Board, 5500 Interstate North Parkway, Suite 515, Atlanta, GA, 30328	O30-US10041	Site, Central: 3-Mar-21
United States of America	Cleveland Clinic IRB, 9500 Euclid Avenue, OS-1, Cleveland, OH, 44195	O30-US10042	N/A
United States of America	WCG IRB, 1019 39th Avenue SE, Puyallup, WA, 98374	O30-US10043	Site, Local: 15-Jul-21
United States of America	Emory University Institutional Review Board 1599 Clifton Road NE, 5th Floor, Atlanta, GA, 30322	O30-US10043	Site, Local: 15-Jul-21

Table S2 Weight distribution

	Mean	SD	Median	Q25	Q75	Min	Max
Overall base case analysis							
Weights	0.25	0.34	0.09	0.04	0.25	0.00	3.43
Rescaled weights	1.00	1.36	0.67	0.30	1.00	0.03	24.93
Overall fully adjusted analysis							
Weights	0.24	0.40	0.05	0.02	0.25	0	5.60
Rescaled weights	1.00	2.05	0.36	0.12	1.00	0	41.96
RW base case analysis							
Weights	0.14	0.20	0.07	0.03	0.15	0.00	3.43
Rescaled weights	1.00	1.46	0.54	0.25	1.13	0.03	24.93
RW full adjusted analysis							
Weights	0.13	0.29	0.04	0.01	0.12	0	5.60
Rescaled weights	1.00	2.19	0.27	0.10	0.89	0	41.96

The base case analysis adjusted for refractory status, time to progression on last regimen, cytogenetic risk, ISS stage, number of prior LOT, years since MM diagnosis, age, and hemoglobin. The fully adjusted analysis adjusted for all variables in the base case, plus prior stem cell transplant, ECOG PS, race, sex, and type of MM.

ECOG PS Eastern Cooperative Oncology Group performance status, *ISS* International Staging System, *LOT*, *MM* multiple myeloma, *Q25* 25th percentile, *Q75* 75th percentile, *RW* real-world, *SD*, standard deviation.

Table S3 Doubly robust and multivariable regression base case analysis and fully adjusted sensitivity analysis results

Outcome/Analysis	CARTITUDE-4 vs RW Cohorts			
	Doubly robust		Multivariable regression	
	HR (95% CI)	P value	HR (95% CI)	P value
PFS				
Unadjusted	0.32 (0.25–0.40)	<0.001	0.32 (0.25–0.40)	<0.001
Base case analysis	0.27 (0.21–0.34)	<0.001	0.29 (0.23–0.37)	<0.001
Fully adjusted analysis	0.26 (0.20–0.33)	<0.001	0.32 (0.25–0.41)	<0.001
RW-PFS				
Unadjusted	0.32 (0.26–0.40)	<0.001	0.32 (0.26–0.40)	<0.001
Base case analysis	0.27 (0.21–0.34)	<0.001	0.30 (0.23–0.38)	<0.001
Fully adjusted analysis	0.26 (0.20–0.33)	<0.001	0.32 (0.25–0.41)	<0.001
TTNT				
Unadjusted	0.35 (0.28–0.43)	<0.001	0.35 (0.28–0.43)	<0.001
Base case analysis	0.30 (0.24–0.39)	<0.001	0.33 (0.26–0.42)	<0.001
Fully adjusted analysis	0.27 (0.21–0.35)	<0.001	0.34 (0.27–0.44)	<0.001
OS				
Unadjusted	0.60 (0.43–0.82)	0.001	0.60 (0.43–0.82)	0.001
Base case analysis	0.57 (0.39–0.83)	0.003	0.58 (0.40–0.83)	0.003
Fully adjusted analysis	0.77 (0.52–1.16)	0.217	0.68 (0.46–0.99)	0.045

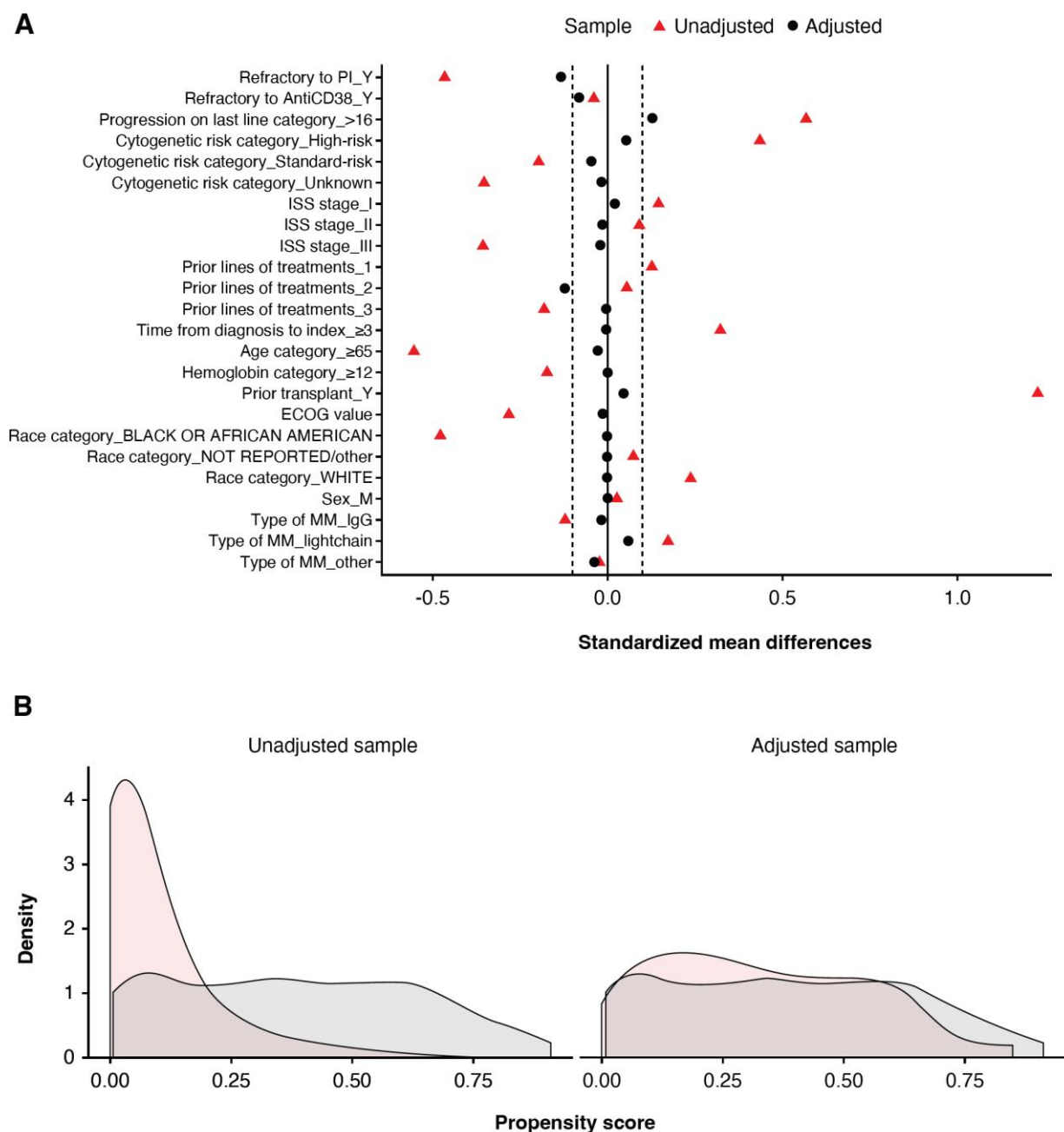
CI confidence interval, HR hazard ratio, OS overall survival, PFS progression-free survival, RW real-world, TTNT time to next treatment.

Table S4 IPTW with first patient weighting base case analysis and fully adjusted analysis results

	CARTITUDE-4 vs RW Cohort						
Outcome/Analysis		IPTW		Doubly robust		Multivariable regression	
	Median, mo	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
PFS							
Unadjusted	NR vs 8.2	0.32 (0.26–0.41)	<0.001	0.32 (0.26–0.41)	<0.001	0.32 (0.26–0.41)	<0.001
Base case analysis	NR vs 8.3	0.28 (0.22–0.36)	<0.001	0.26 (0.20–0.33)	<0.001	0.28 (0.22–0.36)	<0.001
Fully adjusted analysis	NR vs 8.5	0.28 (0.21–0.38)	<0.001	0.23 (0.18–0.31)	<0.001	0.31 (0.24–0.40)	<0.001
RW-PFS							
Unadjusted	NR vs 8.2	0.33 (0.26–0.41)	<0.001	0.33 (0.26–0.41)	<0.001	0.33 (0.26–0.41)	<0.01
Base case analysis	NR vs 8.3	0.29 (0.22–0.37)	<0.001	0.26 (0.20–0.34)	<0.001	0.29 (0.22–0.37)	<0.001
Fully adjusted analysis	NR vs 8.5	0.28 (0.21–0.38)	<0.001	0.24 (0.18–0.32)	<0.001	0.31 (0.24–0.40)	<0.001
TTNT							
Unadjusted	NR vs 9.7	0.35 (0.28–0.44)	<0.001	0.35 (0.28–0.44)	<0.001	0.35 (0.28–0.44)	<0.001
Base case analysis	NR vs 9.9	0.32 (0.25–0.42)	<0.001	0.30 (0.23–0.39)	<0.001	0.32 (0.25–0.41)	<0.001
Fully adjusted analysis	NR vs 9.9	0.30 (0.22–0.40)	<0.001	0.24 (0.18–0.33)	<0.001	0.33 (0.25–0.43)	<0.001
OS							
Unadjusted	NR vs 49.0	0.65 (0.47–0.89)	0.008	0.65 (0.47–0.89)	0.008	0.65 (0.47–0.89)	0.008
Base case analysis	NR vs NR	0.66 (0.46–0.96)	0.028	0.63 (0.43–0.92)	0.016	0.61 (0.42–0.87)	0.007
Fully adjusted analysis	NR vs NR	0.89 (0.58–1.35)	0.571	0.86 (0.56–1.31)	0.482	0.77 (0.52–1.13)	0.175

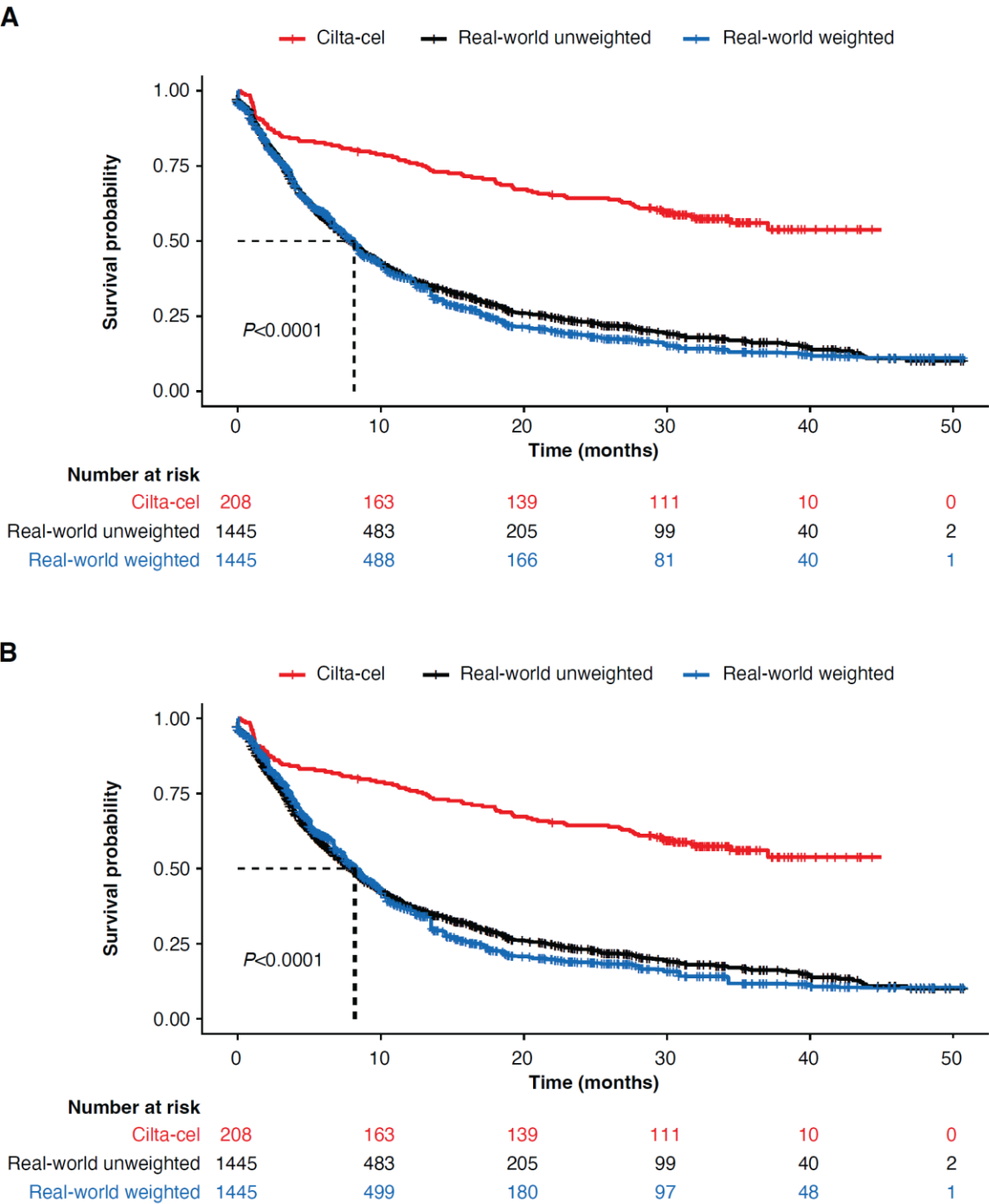
CI confidence interval, HR hazard ratio, IPTW inverse probability of treatment weighting, NR not reached, OS overall survival, PFS progression-free survival, RW-PFS real-world progression-free survival, TTNT time to next treatment.

Fig. S1 (A) Standardized mean difference plots before and after weighting and (B) propensity score distributions for unadjusted and adjusted analysis



ECOG PS Eastern Cooperative Oncology Group performance status, IgG immunoglobulin G, ISS International Staging System, M male, MM multiple myeloma, PI proteasome inhibitor, Y yes.

Fig. S2 Adjusted (ATT-weighted) Kaplan-Meier plots of progression-free survival for (A) base case analysis and (B) fully adjusted analysis



ATT average treatment effect in the treated; *cilta-cel* ciltacabtagene autoleucel.