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## Supplementary Methods

### Statistical methods

Time to progression and response related to ASCT (i.e. after randomisation) were analysed in all patients who were randomly assigned to that treatment group. Toxicity and safety were assessed in the safety population, which consisted of all patients who received at least one dose of study treatment.

Cox regression was used to analyse time to progression, accounting for stratification factors (length of first remission or plateau and response to PAD re-induction therapy). The proportional hazards assumption was assessed by plotting the hazards over time for each group. Response rates were compared with ordinal logistic regression accounting for the stratification factors. Continuous variables relating to baseline characteristics and ASCT procedure characteristics were compared using the Kruskal-Wallis test. Similar analysis of categorical variables was undertaken using Fisher's exact test.

The cut-off date for the final analysis was July 9<sup>th</sup>, 2013. All statistical tests were two-sided and called significant at the 5% level. Statistical analyses were performed with SAS version 9.2 (SAS Institute, Cary, NC).

## Supplementary Tables

Regimen	n	Yield /x10 <sup>6</sup> CD34 <sup>+</sup> cells/kg: median (range)	Yield unknown, n	Percentage successful* (95% CI)	Days of collection: median (range)
<b>First attempt</b>	<b>110</b>	<b>1.6 (0-19)</b>	<b>23</b>	<b>47% (37-58)</b>	<b>1 (0-5)</b>
Cyclophosphamide & G-CSF	82	1.6 (0-19)	16	45% (33-57)	1 (0-4)
G-CSF	9	1.4 (0-3.3)	0	33% (3-64)	2 (0-5)
Cyclophosphamide, G-CSF & Plerixafor	8	1.3 (0-2.8)	4	50% (1-99)	2 (0-4)
Plerixafor & G-CSF	4	3.3 (0.6-4)	1	67% (13-100)	1.5 (1-2)
ESHAP	4	2.3 (0-3.9)	1	67% (13-100)	0.5 (0-1)
Cytarabine & G-CSF	1	5.3	0	100%	2
Unknown regimen	2	2.1	1	100%	0.5 (0-1)
<b>Second attempt</b>	<b>32</b>	<b>1.6 (0-20)</b>	<b>6</b>	<b>38% (20-57)</b>	<b>2 (0-4)</b>
Cyclophosphamide & G-CSF	5	0 (0-2.9)	2	33% (0-87)	2 (0-2)
G-CSF	10	0.9 (0-4.1)	2	25% (0-55)	0.5 (0-4)
Cyclophosphamide, G-CSF & Plerixafor	2	1.9	1	0%	2 (2-2)
Plerixafor & G-CSF	12	2 (0.5-20)	0	50% (22-78)	2 (1-4)
ESHAP	2	1.7	1	0%	2 (2-2)
Cytarabine & G-CSF	1	3.5	0	100%	1
<b>Third attempt</b>	<b>4</b>	<b>2.2 (0-2.7)</b>	<b>0</b>	<b>75% (33-100)</b>	<b>1.5 (0-2)</b>
Plerixafor & G-CSF	3	2.1 (0-2.7)	0	67% (13-100)	2 (0-2)
Unknown regimen	1	2.3	0	100%	1

Supplementary Table 1: Mobilisation regimens and stem cell harvest outcomes.

Abbreviations: G-CSF: granulocyte colony stimulating factor, ESHAP: etoposide,

methylprednisolone, cytarabine and cisplatin. \* Percentage of collections where the yield is known and is  $>2 \times 10^6$  CD34<sup>+</sup> /kg.

		Sensory neuropathy at end of PAD					Total
		None	Grade 1	Grade 2	Grade 3	Missing Data	
Sensory neuropathy at end of PBSC harvesting	None	38 (79.2%)	21 (72.4%)	10 (52.6%)	4 (40.0%)	3 (75.0%)	76 (69.1%)
	Grade 1	4 (8.3%)	6 (20.7%)	3 (15.8%)	0 (0.0%)	0 (0.0%)	13 (11.8%)
	Grade 2	4 (8.3%)	1 (3.4%)	5 (26.3%)	1 (10.0%)	1 (25.0%)	12 (10.9%)
	Grade 3	2 (4.2%)	0 (0.0%)	1 (5.3%)	4 (40.0%)	0 (0.0%)	7 (6.4%)
	Missing Data	0 (0.0%)	1 (3.4%)	0 (0.0%)	1 (10.0%)	0 (0.0%)	2 (1.8%)
Total		48 (43.6%)	29 (26.4%)	19 (17.3%)	10 (9.1%)	4 (3.6%)	<b>110</b>

Supplementary Table 2: Sensory neuropathy (CTCAE grade) for patients at the end of PAD and then at the end of mobilisation.

Toxicity	All grades, n (%)				Grades 3-4, n (%)				p
	PBSC1 (n=42)	PBSC2 (n=29)	PBSCMix (n=11)	Total (n=82)	PBSC1 (n=42)	PBSC2 (n=29)	PBSCMix (n=11)	Total (n=82)	
Anaemia	33 (78.6)	24 (82.8)	9 (81.8)	65 (78.3)	9 (21.4)	8 (27.6)	2 (18.2)	19 (22.9)	0.748
Thrombocytopenia	31 (73.8)	24 (82.8)	8 (72.7)	63 (76.0)	29 (69.0)	23 (79.3)	8 (72.7)	60 (72.3)	0.971
Neutropenia	36 (85.7)	26 (90.0)	9 (81.8)	71 (85.5)	31 (73.8)	24 (82.8)	8 (72.7)	63 (75.9)	0.492
Diarrhoea	31 (73.8)	21 (72.4)	6 (54.5)	58 (69.9)	7 (16.7)	3 (10.3)	1 (9.1)	11 (13.3)	0.328
Nausea	29 (40.3)	16 (55.2)	8 (72.7)	53 (63.9)	4 (9.5)	3 (10.3)	0	7 (8.4)	0.620
Vomiting	16 (38.1)	13 (44.8)	9 (81.8)	38 (45.8)	1 (2.4)	1 (3.4)	1 (9.1)	3 (3.6)	0.170
Infection	2 (4.8)	2 (6.9)	0	4 (4.8)	2 (4.8)	1 (3.4)	0	3 (3.6)	0.864
Cystitis	1 (2.4)	0	0	1 (1.2)	0	0	0	0	1
Other	34 (81.0)	22 (75.9)	7 (63.6)	63 (75.9)	-	-	-	-	0.497
Data missing	1 (2.4)	1 (3.4)	0	2 (2.4)	1 (2.4)	1 (3.4)	0	2 (2.4)	

Supplementary Table 3: Frequency of toxicities reported during high dose melphalan and ASCT. P values are for Fisher's exact test comparing all-grades of toxicity across groups defined by the source of stem cells (PBSC1, PBSC2, PBSCMix).

Response	PBSC1: n (%), (95% CI)	PBSC2: n (%), (95% CI)	PBSCMix: n (%), (95% CI)	All HDT+ASCT: n (%), (95% CI)
sCR	8 (19.0) (8.6-34.1)	9 (31.0) (15.3-50.9)	3 (27.3) (6.0-61.0)	20 (22.5) (14.3-32.6)
CR	9 (21.4) (10.3-36.8)	4 (13.8) (3.9-31.7)	2 (18.2) (2.3-51.8)	15 (16.9) (9.8-26.3)
VGPR	12 (28.6) (15.7-44.6)	5 (17.2) (5.9-35.8)	1 (9.1) (0.2-41.3)	18 (20.2) (12.5-30.1)
PR	10 (23.8) (12.1-39.5)	7 (24.1) (10.3-43.5)	4 (36.4) (10.9-69.2)	21 (23.6) (15.2-33.8)
SD	2 (4.8) (0.6-16.2)	1 (3.4) (0.1-17.8)	1 (9.1) (0.2-41.3)	4 (4.5) (1.2-11.1)
PD	1 (2.4) (0.1-12.6)	1 (3.4) (0.1-17.8)	0	2 (2.2) (0.3-7.9)
Death within 100 days				1 (1.1) (0.1-6.1)
Did not receive ASCT				6 (6.7) (2.5-14.1)
Missing	0	2 (6.9) (0.9-22.8)	0	2 (2.2) (0.3-7.9)

Supplementary Table 4: Maximal responses to stem cell transplant. 1 patient died within 100 days of ASCT – the stem cell source used for this patient is not known. 6 patients who were randomised to ASCT did not undergo the procedure.

Nottingham University Hospital	Dr Cathy Williams	Ninewells Hospital, Dundee	Dr Duncan Gowans
UCLH	Dr Kwee Yong	Bradford Royal Infirmary	Dr Samuel Ackroyd
Royal Hallamshire Hospital	Dr John Snowden	Crosshouse and Ayr Hospitals	Dr Julie Gillies
Derriford Hospital	Dr Hannah Hunter	Norfolk University Hospital NHS Trust	Dr Martin Auger
Christie Hospital	Dr Jim Cavet	Diana Princess of Wales Hospital	Dr Susan Levison-Keating
St. Bartholomew's Hospital	Dr Heather Oakervee	Raigmore Hospital	Dr Peter Forsyth
Bristol Haematology & Oncology Centre	Dr Jenny Bird	Royal Devon & Exeter Hospital	Dr Malcolm Hamilton
Birmingham Heartlands	Dr Guy Pratt	Sandwell and West Birmingham Hospitals NHS Trust	Dr Farooq Wandroo
Gloucester Hospitals NHS Foundation Trust	Dr Sally Chown	University Hospital of Wales	Dr Keith Wilson
Glan Clwyd	Dr Earnest Heartin	Dorset County Hospital	Dr Akeel Moosa
Manchester Royal Infirmary	Dr Eleni Tholouli	Queens Hospital, Burton	Dr Humayun Ahmed
Addenbrookes Hospital	Dr Jenny Craig	Torbay Hospital	Dr Deborah Turner
Ipswich Hospital	Dr A J Ademokun	University Hospital Coventry	Dr Syed Bokhari
Royal Derby Hospital	Dr David Allotey	Cheltenham General Hospital	Dr Sally Chown
Hull (Castle Hill)	Dr Haz Sayala	The Great Western Hospital	Dr Norbert Blesing
Medway Maritime Hospital	Dr Vivienne Andrews	United Lincolnshire Hospitals	Dr K Saravanamuttu
Southampton University Hospital	Dr Matthew Jenner	Peterborough District Hospital	Dr S Kumar Nagumantry
Guy's & St Thomas' NHS Foundation Trust	Dr Majid Kazmi	Salisbury NHS Foundation Trust	Dr Jonathan Cullis
North Bristol NHS Trust	Dr Alastair Whiteway	Mid Yorkshire Hospitals NHS Trust	Dr John Ashcroft
Singleton Hospital (Swansea)	Dr Hamdi Sati	Russells Hall Hospital	Dr Savio Fernandes
Kings College Hospital	Prof Steve Schey	Countess of Chester	Dr Salaheddin Tueger
Leicester Royal Infirmary	Dr Claire Chapman	Royal Oldham	Dr Vivek Sen
The James Cook University Hospital	Dr Angela Wood	Warwick Hospital	Dr Anton Borg
St Helier Hospital	Dr Simon Stern	Royal Bournemouth	Dr Helen McCarthy
St Georges Hospital	Dr Fenella Willis	St Richards Hospital, Chichester	Dr Philip Bevan
Queen Elizabeth Hospital (Birmingham)	Dr Mark Cook	Wirral University Teaching Hospital	Dr Ranjit Dasgupta
Aberdeen Royal Infirmary	Dr Jane Tighe	Royal Liverpool University Hospital	Dr Stephen Hawkins
Colchester Hospital University NHS Foundation Trust	Dr Gavin Campbell	Hampshire Hospitals NHS FT	Dr Sylwia Simpson
Rotherham General Hospital	Dr Helen Barker	Royal Marsden Hospital	Prof Gareth Morgan
Beatson WOS Cancer Centre	Dr Grant McQuaker	Newcastle NHS Foundation Trust	Prof Graham Jackson
Belfast City Hospital	Dr Mary Drake	University Hospital Aintree	Dr Lynny Yung
Ysbyty Gwynedd, Bangor	Dr Melinda Hamilton	Barnet and Chase Farm Hospitals	Dr Andres Virchis
Stafford Hospital	Dr Paul Revell	Sunderland Royal Hospital	Dr Simon Lyons
Royal Berkshire NHS FT	Dr Henri Grech	Poole General Hospital	Dr Fergus Jack
Doncaster Royal Infirmary	Dr Youssef Sorour	Kettering General Hospital	Dr Mark Kwan
Chesterfield Royal Hospital	Dr Emma Welch		

Supplementary Table 5: Co-investigators contributing to this study.