Supplementary material for Ojerholm E. et al. Pencil-beam scanning proton therapy for anal cancer: a dosimetric comparison with intensity-modulated radiotherapy, Acta Oncologica, 2015, doi:10.3109/0284186X.2014.1002570.

Supplementary Table I. Target and organ at risk volumes in cubic centimeters.

Pt No.	CTV (Gy: cm ³)	PTV (Gy: cm ³)	Small bowel	External genitalia	Femoral heads (combined)	Bladder	Total pelvic BM	Iliac BM	Lower pelvic BM	Lumbosacral BM
1	45: 888 54: 144	45: 1476 54: 268	832	276	205	71	841	330	411	91
2	45: 1200 54: 515	45: 1869 54: 804	596	82	215	26	1023	377	429	209
3	36: 1685 45: 859 50: 54	36: 2733 45: 1201 50: 108	719	675	436	138	1746	641	821	273
4	39.5: 1170 45: 765 54: 67	39.5: 1857 45: 1087 54: 128	612	99	277	88	1245	463	531	243
5	36: 823 45: 692 54: 20	36: 1314 45: 1113 54: 45	218	41	236	52	992	356	433	196
6	36: 1438 45: 1208 54: 142	36: 2064 45: 1745 54: 245	692	127	285	34	1274	466	547	253
7	45: 880 54: 397	45: 1427 54: 593	498	95	170	63	811	285	359	161
8	36: 1302 45: 1072 54: 192	36: 1945 45: 1615 54: 336	305	74	238	207	1113	385	480	241

BM, bone marrow; CTV, clinical target volume; Gy, gray; No., number; Pt, patient; PTV, planning target volume.

Supplementary Table II. Beam angles and energies for IMRT plans.

Beam	Pt 1 (°, MV)	Pt 2 (°, MV)	Pt 3 (°, MV)	Pt 4 (°, MV)	Pt 5 (°, MV)	Pt 6 (°, MV)	Pt 7 (°, MV)	Pt 8 (°, MV)
1	0, 15	40, 6	30, 15	0, 6	0, 6	0, 6	0, 6	0, 6
2	72, 15	85, 15	70, 15	50, 6	35, 6	40, 15	40, 6	35, 6
3	120, 15	145, 15	140, 6	120, 15	120, 15	110, 15	120, 15	130, 15
4	156, 6	180, 6	180, 6	160, 15	160, 6	150, 6	150, 15	160, 15
5	204, 6	215, 15	220, 6	200, 15	200, 6	210, 6	210, 15	200, 15
6	234, 15	275, 15	290, 15	240, 15	240, 15	250, 15	240, 15	230, 15
7	288, 15	320, 6	330, 15	310, 6	325, 6	320, 15	320, 6	325, 6

°, beam angle in degrees; MV, megavoltage; Pt, patient.

Supplementary Table III. Target and organ at risk clinical objectives.

Target/ structure	Max Dose (Gy)	Volume (%)		Dose (Gy)
CTV		98	at least	98% prescribed dose
PTV		95	at least	95% prescribed dose
Genitalia	36	50	less than	20
		35	less than	30
Small bowel	54	120 ^a	less than	15
Bladder		50	less than	35
		35	less than	40
		5	less than	50
Femoral heads	50	50	less than	30
		35	less than	40
		5	less than	44

^aabsolute volume in cubic centimeters. CTV, clinical target volume; Gy, gray; PTV, planning target volume.

Supplementary Table IV. Dose-volume histogram data for pelvic organs at risk.

		Small bowel		External genitalia		Femoral heads (combined)		Bladder	
		IMRT	PBT	IMRT	PBT	IMRT	PBT	IMRT	PBT
V5	mean	187	100	94	29	100	81	100	78
	median	156	102	100	29	100	84	100	78
V10	mean	170	89	84	22	99	72	100	70
	median	139	94	94	20	100	73	100	65
V15	mean	151	81	62	17	90	57	97	64
	median	134	88	73	14	95	58	100	56
V20	mean	134	75	40	14	74	33	86	59
	median	124	82	46	11	74	34	91	49
V25	mean	105	69	26	11	49	20	74	55
	median	109	77	29	8	45	21	74	45
V30	mean	83	63	16	9	28	13	63	50
	median	87	70	15	7	22	13	61	41
V35	mean	66	56	9	7	13	7	51	46
	median	66	61	9	5	6	6	47	36

IMRT, intensity-modulated radiotherapy; PBT, proton beam therapy; VX, volume receiving at least X Gy.

Supplementary Table V. Dose-volume histogram data for bone marrow compartments.

		Total pelvic BM		Iliac BM		Lower pelvic BM		Lumbosacral BM	
		IMRT	PBT	IMRT	PBT	IMRT	PBT	IMRT	PBT
V5	mean	94	77	86	57	100	85	96	95
	median	96	79	89	60	100	88	100	100
V10	mean	89	72	74	52	99	79	93	93
	median	90	74	74	55	100	80	100	100
V15	mean	83	66	66	46	94	70	90	91
	median	84	64	65	48	96	68	98	99
V20	mean	75	54	57	35	83	54	86	89
	median	74	51	57	36	83	53	93	97
V25	mean	61	45	44	27	65	43	80	86
	median	59	44	43	28	68	45	85	91
V30	mean	46	39	30	21	49	36	68	79
	median	42	37	29	22	48	37	70	80
V35	mean	31	31	18	16	33	28	51	64
	median	27	29	15	17	31	30	50	64

BM, bone marrow; IMRT, intensity-modulated radiotherapy; PBT, proton beam therapy; VX, volume receiving at least X Gy.