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**Analyses of the cost-effectiveness of pooled alendronate and risedronate, compared with strontium ranelate, raloxifene, etidronate and teriparatide. Updated following change in price of generic alendronate.**

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## Introduction

This report is an update of a similar report (compiled in July 2006) that takes the price change of generic alendronate into account. The previous report used a cost of £264 per annum for alendronate and risedronate treatment. This price used in the analyses has been reduced to £173, the price of generic alendronate.<sup>1</sup> Additionally for sensitivity analyses the price of proton pump inhibitors to counter side effects have been reduced to £6 per compliant patient. Excluding these change, the methodology and parameter values are identical in both reports.

### The base-case scenario

The base-case is assumed to be that described in Table 1.

Table 1: The base-case scenario.

Parameter	Value	Source
Persistence at 5-years	50%	Estimated from the results of the accompanying literature review
The assumed relative risk of bisphosphonates on osteoporotic fractures.	0.71 – ‘hip’ 0.58 – ‘spine’ 0.78 – ‘prox hum’ 0.78 – ‘wrist’	Systematic Review and meta-analysis of alendronate and risedronate data. See Appendix 1.
Costs set to those used in the initial report	Age dependent, see previous report	Updated costs used in previous NICE assessments of osteoporosis interventions.
Utility multiplier associated with vertebral fracture.	Year 1 0.626 Year 2+ 0.909	Kanis et al. <i>Osteoporosis International</i> 2004; 15 20-26. This source was used for all fracture types
Costs incurred over 5-years via side effects associated with bisphosphonate	£4.50 per patient that is compliant (costs for non-compliant patients are included in our analyses)	See earlier text
Utility multiplier associated with bisphosphonate related GI symptoms	0.91 (utility losses for non-compliant patients are included in our analyses)	Groeneveld et al <sup>2</sup>
Cost of bisphosphonate	£173 per annum	Price of alendronate.

<sup>1</sup> [http://www.ppa.org.uk/edt/September\\_2006/mindex.htm](http://www.ppa.org.uk/edt/September_2006/mindex.htm). Accessed 01/09/06.

<sup>2</sup> Groeneveld PW, Lieu TA, Fendrick M, Hurley LB, Ackerson LM, Levin TR and Allison JE. “Quality of life measurements clarifies the cost-effectiveness of Helicobacter Pylori eradication in peptic ulcer disease and uninvestigated dyspepsia” *The American Journal of Gastroenterology*. 2001 96 (2) 338 - 347

*Summarised results for women identified through opportunistic assessment)*

	How scenario is different from the base-case.	Identification strategies potentially <sup>3</sup> cost-effective from what age (years)?	Percentage of women age 50 or older that were opportunistically assessed that would be offered a BMD scan (%) <sup>∇</sup>	Percentage of women age 50 or older that were opportunistically assessed that would be treated (%) <sup>∇ψ</sup>
Base-case	-	70	25.7	4.6
1	Persistence set to 25%	70	25.7	2.3
2	Persistence set to 75%	65	26.7	8.1
3	Efficacy assumed to be different in the osteoporotic, osteopenic and normal women, and equal to that from the FIT trial.	65	38.5	4.7
4	Efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.	70	25.7	4.3
5	Efficacy of bisphosphonate set to 0% for clinical risk factor other than BMD and fracture status. Questions are not asked in this scenario.	75	22.2	3.2
6	The costs calculated by Stevenson et al <sup>4</sup> to be used instead of the older costs, including potential home help costs.	65	34.8	7.8
7	The costs calculated by Stevenson et al to be used instead of the older costs, excluded potential home help costs.	65	26.7	5.4
8	HRG costs to be used, including potential home help costs.	70	26.7	5.3
9	HRG costs to be used, excluding potential home help costs.	70	25.7	4.5
10	Vertebral disutility to be set to equal that associated with a hip fracture.	70	25.7	4.5
11	The costs and disutility from side effects to be double that estimated	70	25.7	4.5
12	The costs and disutility from side effects to be half that estimated	70	25.7	5.3
13	The costs and disutility from side effects to be set to zero	65	26.7	5.4
14	The disutility from side effects to be set to ten times that of the base-case	70	25.7	1.3
15	The costs from side effects increased where proton pump inhibitors are prescribed instead of H2 receptor antagonists.	70	25.7	4.6

<sup>3</sup> Assuming a cost per QALY of £20,000

<sup>4</sup> Stevenson MD, Davis SE, Kanis JA. "The hospitalisation costs and out-patient costs of fragility fractures". Women's Health Medicine. In Press.

*Summarised results for self-identifying women*

	How scenario is different from the base-case.	Identification strategies potentially <sup>5</sup> cost-effective from what age (years)?	Percentage of women age 50 or older that were opportunistically assessed that would be offered a BMD scan (%) <sup>∇</sup>	Percentage of women age 50 or older that were opportunistically assessed that would be treated (%) <sup>∇ψ</sup>
Base-case	-	50	64.4	19.3
1	Persistence set to 25%	55	55.5	9.1
2	Persistence set to 75%	50	64.4	30.1
3	Efficacy assumed to be different in the osteoporotic, osteopenic and normal women, and equal to that from the FIT trial.	50	100	11.6
4	Efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.	60	60.1	18.3
5	Efficacy of bisphosphonate set to 0% for clinical risk factor other than BMD and fracture status.	65	59.3	15.8
6	The costs calculated by Stevenson et al <sup>6</sup> to be used instead of the older costs, including potential home help costs.	50	67.9	21.9
7	The costs calculated by Stevenson et al to be used instead of the older costs, excluded potential home help costs.	55	64.4	19.9
8	HRG costs to be used, including potential home help costs.	55	64.4	19.4
9	HRG costs to be used, excluding potential home help costs.	55	55.5	18.9
10	Vertebral disutility to be set to equal that associated with a hip fracture.	55	55.5	14.9
11	The costs and disutility from side effects to be double that estimated	55	55.5	18.3
12	The costs and disutility from side effects to be half that estimated	50	64.4	19.4
13	The costs and disutility from side effects to be set to zero	50	64.4	19.4
14	The disutility from side effects to be set to ten times that of the base-case	55	52.4	13.9
15	The costs from side effects increased where proton pump inhibitors are prescribed instead of H2 receptor antagonists.	50	55.9	18.9

<sup>5</sup> Assuming a cost per QALY of £20,000

<sup>6</sup> Stevenson MD, Davis SE, Kanis JA. "The hospitalisation costs and out-patient costs of fragility fractures". *Women's Health Medicine*. In Press.

*Detailed results for women found through opportunistic assessment.*

**Scenario Base-case 1**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,259
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5SD	£8,774

**Sensitivity Analysis 1-1: Base-case, bar persistence set to 25%**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£12,053
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.0 SD	£10,177

**Sensitivity Analysis 2-1: Base-case, bar persistence set to 75%**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£18,829
70-74 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,482
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£8,451

**Sensitivity Analysis 3-1: Base-case, bar efficacy assumed to be different in the osteoporotic, osteopenic and normal women, and equal to that from the FIT trial.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£12,169
70-74 years	BMD and treat where T-Score <-2.5 SD	£7,246			
75 years and over	BMD and treat where T-Score <-2.5 SD	£969			

**Sensitivity Analysis 4-1: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£15,357
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£11,344

**Sensitivity Analysis 5-1: Base-case, bar efficacy of bisphosphonate set to 0% for clinical risk factor other than BMD and fracture status. Questions on clinical risk factors are assumed not to be asked.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
75 years and over	BMD and treat where T-Score <-2.5 SD				£13,248

**Sensitivity Analysis 6-1: Base-case, bar using the costs calculated by Stevenson et al to be used instead of the older costs, including potential home help costs**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£16,732
70-74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£13,340
75 years and over	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <0.0 SD	BMD and treat where T-Score <0.5 SD	£7,848

**Sensitivity Analysis 7-1: Base-case, bar using the costs calculated by Stevenson et al to be used instead of the older costs, excluding potential home help costs**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£17,956
70-74 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£10,001
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£7,097

**Sensitivity Analysis 8-1: Base-case, bar using HRG costs including potential home help costs**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,218
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£8,823

**Sensitivity Analysis 9-1: Base-case, bar using HRG costs excluding potential home help costs**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£11,430
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£10,171

**Sensitivity Analysis 10-1: Base-case, bar vertebral fracture disutility reduced to that of hip fracture**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£12,434
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£10,178

**Sensitivity Analysis 11-1: Base-case, bar disutility and costs associated with side effects are doubled.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£11,281
75 years and over	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.0 SD	£9,207

**Sensitivity Analysis 12-1: Base-case, bar disutility and costs associated with side effects are halved.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,311
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£11,860

**Sensitivity Analysis 13-1: Base-case, bar disutility and costs associated with side effects are set to zero.**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£19,977
70-74 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,417
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <0.0 SD	BMD and treat where T-Score <0.5 SD	£8,550

**Sensitivity Analysis 14-1: Base-case, bar disutility from bisphosphonate side effects set to 10 times that of the base-case**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£11,449
75 years and over	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	£7,886

**Sensitivity Analysis 15-1: Base-case, bar costs associated with side effects increased to £6 per patient due to the assumption that proton pump inhibitors are prescribed instead of H2 receptor agonists**

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,293
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£8,854

*Detailed results for self-identifying women*

**Scenario Base-case 2**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,818
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,414
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,321
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£15,087
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£10,028
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£6,373

**Sensitivity Analysis 1-2: Base-case, bar persistence set to 25%**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£15,043
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,830
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£13,881
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£11,171
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.5 SD	£7,628

**Sensitivity Analysis 2-2: Base-case, bar persistence set to 75%**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50 - 54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,229
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,674
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,804
65 - 69 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£15,170
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£9,533
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£5,970

**Sensitivity Analysis 3-2: Base-case, bar efficacy assumed to be different in the osteoporotic, osteopenic and normal women, and equal to that from the FIT trial.**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£13,314
55 - 59 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£7,589
60-64 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£6,084
65 - 69 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£4,320
70-74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	£202
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	Dominating

**Sensitivity Analysis 4-2: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
60 - 64 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	£15,667
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£17,440
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£11,320
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£8,007

**Sensitivity Analysis 5-2: Base-case, bar efficacy of bisphosphonate set to 0% for clinical risk factor other than BMD and fracture status. Questions on clinical risk factors are assumed not to be asked.**

Age (years)		CPQ of strategy
65 - 69 years	BMD and treat where T-Score <-3.0 SD	£19,992
70-74 years	BMD and treat where T-Score <-2.0 SD	£12,234
75 years and over	BMD and treat where T-Score <-1.5 SD	£9,507

**Sensitivity Analysis 6-2: Base-case, bar using the costs calculated by Stevenson et al to be used instead of the older costs, including potential home help costs**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£16,954
55 - 59 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.0 SD	£16,462
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£13,225
65 - 69 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£7,414
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£7,414
75 years and over	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <1.0 SD	£4,571

**Sensitivity Analysis 7-2: Base-case, bar using the costs calculated by Stevenson et al to be used instead of the older costs, excluding potential home help costs**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£17,888
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£13,594
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£13,349
65 - 69 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,161
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£8,424
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£4,755

**Sensitivity Analysis 8-2: Base-case, bar using HRG costs including potential home help costs**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,430
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,497
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,652
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,121
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£9,211
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£6,103

**Sensitivity Analysis 9-2: Base-case, bar using HRG costs excluding potential home help costs**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,663
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£14,991
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£12,188
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£10,455
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£7,437

**Sensitivity Analysis 10-2: Base-case, bar vertebral fracture disutility reduced to that of hip fracture**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55-59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£15,817
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£16,143
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£13,038
70-74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	£9,546
75 years and over	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£8,896

**Sensitivity Analysis 11-2: Base-case, bar disutility and costs associated with side effects are doubled.**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,683
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,632
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£12,147
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£10,286
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.5 SD	£6,776

**Sensitivity Analysis 12-2: Base-case, bar disutility and costs associated with side effects are halved.**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,319
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,850
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,968
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,715
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£9,752
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£6,210

**Sensitivity Analysis 13-2: Base-case, bar disutility and costs associated with side effects are set to zero.**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£18,825
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,667
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,609
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£14,372
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£9,631
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£5,995

**Sensitivity Analysis 14-2: Base-case, bar disutility from bisphosphonate side effects set to 10 times that of the base-case**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55-59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	£16,856
60-64 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£12,607
65 - 69 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.0 SD	£11,339
70-74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	£9,319
75 years and over	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.0 SD	£5,683

**Sensitivity Analysis 15-2: Base-case, bar costs associated with side effects increased to £6 per patient due to the assumption that proton pump inhibitors are prescribed instead of H2 receptor agonists**

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,908
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,500
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,412
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£11,881
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£10,105
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£6,443

#### **4.1 Detailed analysis for each intervention following opportunistic assessment of clinical risk factors.**

Summarised results are given in Table 4 followed by the individual results for each intervention. (Tables 5 to 9)

Table 4. Summarised strategies for each intervention for women *identified through opportunistic assessment* (base-case scenario).

Intervention analysed	Identification strategies cost-effective from what age (years)?	Percentage of women age 50 or older that would be offered a BMD scan (%) <sup>∇</sup>	Percentage of women age 50 or older that would be treated (%) <sup>∇ψ</sup>
Pooled alendronate and risedronate	70	25.7	4.6
Strontium ranelate	75	5.7	0.2
Raloxifene	None	0.0	0.0
Etidronate	70	25.7	9.1
Teriparatide	75	1.2	0.0

<sup>∇</sup> These are the BMD Scans and people treated assuming that all women with a prior fracture were opportunistically screened immediately. Once this had been achieved, the numbers will be significantly reduced, assuming that opportunistic assessment regarding clinical risk factors would be undertaken once every 5 years, and that people on treatment would not be re-assessed.

<sup>ψ</sup> These numbers have taken persistence into account. Thus, where persistence is 50%, double this number would be offered treatment.

Table 5. The base-case results for pooled alendronate and risedronate in women identified by opportunistic assessment. (same as matrix ‘base-case 1’)

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,259
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5SD	£8,774

Table 6. The base-case results for strontium ranelate in women identified by opportunistic assessment.

Age (years)	0 Clinical Risk Factor	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
75 years and over	Do not BMD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,848

Table 7. The base-case results for raloxifene in women identified by opportunistic assessment.

Opportunistic assessment strategies have cost per QALYs of >£20,000 at all ages.

Table 8. The base-case results for etidronate in women identified by opportunistic assessment.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <1.0 SD	£17,064
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	BMD and treat where T-Score <1.0 SD	£16,490

Table 9. The base-case results for teriparatide in women identified by opportunistic assessment.

Age (years)	0 Clinical Risk Factor	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
75 years and over	Do not BMD	Do not BMD	BMD and treat where T-Score <-4.0 SD	BMD and treat where T-Score <-3.0 SD	£16,830

Illustrative cost per QALY values for each intervention compared with no treatment are given in Table 10 for women of different ages, at a T-Score in the range  $-2.5$  to  $-3.0$  SD, assuming that they have no clinical risk factors. These values include neither the costs of assessment nor the costs of BMD scanning.

Table 10. Cost per QALY values for each intervention compared with no treatment. For women with a T-Score in the range  $-2.5$  to  $-3.0$  SD and no clinical risk factors.

	50	60	70	75
Pooled alendronate and risedronate	£71,344	£48,900	£21,213	£14,893
Strontium ranelate	£218,040	£140,125	£57,939	£47,144
Raloxifene	£788,772	£312,558	£83,367	£70,977
Etidronate	£124,373	£59,866	£17,243	£13,744
Teriparatide	£522,441	£369,429	£179,154	£148,713

Table 11 gives the incremental cost-effectiveness of moving from each intervention to pooled alendronate and risedronate. Pooled alendronate and risedronate is considered more cost-effective than both strontium ranelate and raloxifene. However because of the lower price of etidronate a move from etidronate to pooled alendronate and risedronate would not be considered cost-effective as the cost per QALY ratio is greater than £60,000 in the examples provided.

Table 11. Cost per QALY values for pooled alendronate and risedronate compared with each intervention. For women with a T-Score in the range  $-2.5$  to  $-3.0$  SD and no clinical risk factors.

	50	60	70	75
Strontium ranelate	Pooled alendronate and risedronate dominates strontium ranelate			
Raloxifene	Pooled alendronate and risedronate dominates raloxifene			
Etidronate	£42,686	£37,708	£37,659	£18,689
Teriparatide *	£5.1 m	£4.2 m	£2.7 m	£2.2 m

\* Teriparatide provides more QALYs than pooled alendronate and risedronate, but costs more. In this circumstance cost per QALY ratios greater than £20,000 are desirable.

Thus, given our current efficacy and pricing assumptions that etidronate could be considered the most cost-effective treatment for younger women with a BMD of  $-2.5$  to  $-3.0$  SD.

The strategy for opportunistically assessing women and subsequently providing BMD scans for women with a self-identifying fracture is however unaffected by the choice of bisphosphonate, i.e. it is identical for the pooled alendronate and risedronate and for etidronate and is thus unaffected by whichever intervention was chosen as first line treatment. From our data, etidronate could be cost-effectively prescribed to women at less severe T-Score thresholds than pooled alendronate and risedronate. However for more severe patients (particular at risk of hip fracture) the pooled alendronate and risedronate treatment option becomes more cost-effective.

#### **4.2 Detailed analysis for each intervention for women presenting with a self-identifying risk factor.**

Summarised results are given in Table 12 followed by the individual results for each intervention. (Tables 13 to 17)

Table 12. Summarised strategies for each intervention for women presenting with a self- identifying risk factor (base-case scenario)

Intervention analysed	BMD scanning strategies cost-effective from what age (years)?	Percentage of women age 50 or older that would be offered a BMD scan (%) <sup>∇</sup>	Percentage of women age 50 or older that would be successfully treated (%) <sup>∇ψ</sup>
Pooled alendronate and risedronate	50	64.4	19.3
Strontium ranelate	65	44.1	3.5
Raloxifene	None	0.0	0.0
Etidronate	55	58.2	27.5
Teriparatide	70	2.5	0.1

<sup>∇</sup> These are the BMD Scans and people treated assuming that all women with a prior fracture were opportunistically screened immediately. Once this had been achieved, the numbers will be significantly reduced, assuming that opportunistic assessment regarding clinical risk factors would be undertaken once every 5 years, and that people on treatment would not be re-assessed.

<sup>ψ</sup> These numbers have taken persistence into account. Thus, where persistence is 50%, double this number would be offered treatment.

Table 13. The base-case results for pooled alendronate and risedronate in women with a one self-identifying risk factor (same as matrix 'base-case 2')

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
50-54 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£19,818
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.0 SD	£14,414
60-64 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£15,321
65 - 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£15,087
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <0.0 SD	£10,028
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score <0.5 SD	£6,373

Table 14. The base-case results for strontium ranelate in women with one self-identifying risk factor.

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
65 - 69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.0 SD	£19,623
70-74 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.0 SD	£14,816
75 years and over	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-1.5 SD	£12,660

Table 15. The base-case results for raloxifene in women with one self-identifying risk factor.

Opportunistic assessment strategies have cost per QALYs of >£20,000 at all ages.

Table 16. The base-case results for etidronate in women with one self-identifying risk factor.

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
55 - 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-1.5 SD	£16,858
60-64 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-1.5 SD	£16,960
65 - 69 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-0.5 SD	£16,281
70-74 years	BMD and treat where T-Score <-0.0 SD	BMD and treat where T-Score <1.0 SD	BMD and treat where T-Score <1.0 SD	£12,629
75 years and over	BMD and treat where T-Score <0.5 SD	BMD and treat where T-Score <1.0 SD	BMD and treat where T-Score <1.0 SD	£9,869

Table 17. The base-case results for teriparatide in women with one self-identifying risk factor.

Age (years)	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	CPQ of strategy
70-74 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.5 SD	£14,051
75 years and over	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.5 SD	£11,280

Illustrative cost per QALY values for each intervention compared with no treatment are given in Table 18 for women of different ages, at a T-Score in the range  $-2.5$  to  $-3.0$  SD, assuming that they have one self-identifying risk factor. These values include neither the costs of assessment nor the costs of BMD scanning.

Table 18. Cost per QALY values for each intervention compared with no treatment. For women with a T-Score in the range  $-2.5$  to  $-3.0$  SD and one self-identifying risk factor.

	50	60	70	75
Pooled alendronate and risedronate	£30,710	£24,465	£11,421	£7,998
Strontium ranelate	£99,056	£73,776	£33,971	£28,791
Raloxifene	£289,465	£153,113	£48,583	£42,883
Etidronate	£55,787	£31,173	£9,834	£8,039
Teriparatide	£246,896	£201,238	£109,130	£95,397

Table 19 gives the incremental cost-effectiveness of moving from each intervention to pooled alendronate and risedronate. Pooled alendronate and risedronate is considered more cost-effective than both strontium ranelate and raloxifene. However because of the lower price of etidronate a move from etidronate to pooled alendronate and risedronate would not be considered cost-effective as the cost per QALY ratio is greater than £30,000 in the examples provided.

Table 19. Cost per QALY values for pooled alendronate and risedronate compared with each intervention. For women with a T-Score in the range  $-2.5$  to  $-3.0$  SD and one self-identifying risk factor.

	50	60	70	75
Strontium ranelate	Pooled alendronate and risedronate dominates strontium ranelate			
Raloxifene	Pooled alendronate and risedronate dominates raloxifene			
Etidronate	£16,030	£17,084	£19,216	£7,827
Teriparatide *	£2.5 m	£2.4 m	£1.8 m	£1.5 m

\* Teriparatide provides more QALYs than pooled alendronate and risedronate, but costs more. In this circumstance cost per QALY ratios greater than £20,000 are desirable.

Although pooled alendronate and risedronate are more cost-effective at a T-Score of  $-2.5$ SD to  $-3.0$  SD, etidronate could be cost-effectively prescribed to women at less

severe T-Score thresholds than pooled alendronate and risedronate. This arises as these women have a relatively higher risk of vertebral fracture (where we have assumed that etidronate has the greater effect) and because etidronate is cheaper than alendronate.

### **5. Estimating the cost-effectiveness of potential second line interventions**

Based on the current guidance for the secondary prevention of osteoporotic fracture<sup>7</sup> and previous appraisal consultation documents<sup>8,9</sup>, it is conceivable that an analysis for second-line interventions is required. For women who have been identified, the number of risk factors summated, a BMD scan performed and begun treatment on alendronate or risedronate but cannot tolerate this intervention, the T-Score threshold at which other interventions become cost-effective has therefore been calculated. In this circumstance no additional assessment or BMD scanning costs are incurred as these costs have already been accounted for, i.e. that the risk factors and BMD of women considered for pooled alendronate and risedronate treatment are already known. In this instance only the cost-effectiveness of treatment itself is relevant.

As an example, in isolation strontium ranelate is cost effective for women aged 70 years with 3 clinical risk factors (none of which were self-identifying). However if strontium was considered as the first line therapy these patients would not be treated as the costs of opportunistically assessing and then providing BMD scans to women with 3 clinical risk factors were prohibitive. Where pooled alendronate and risedronate were assumed first line therapy, women can be cost-effectively assessed and those with 3 clinical risk factors provided with BMD scans. If women with T-scores <-2.5 SD could not tolerate bisphosphonates then strontium ranelate could be cost-effectively initiated.

The T-Score thresholds may differ between women previous identified by opportunistic screening and those presenting with a self-identifying risk factor as the coefficient of increased risk for future fractures is different between clinical risk factors. As such the T-Score thresholds are presented separately for women who were identified by opportunistic assessment and for those with self-identifying risk factors.

For comparative purposes the T-Score threshold at which pooled alendronate and risedronate is considered a cost-effective treatment is provided in italics in the tables.

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<sup>7</sup> <http://www.nice.org.uk/page.aspx?o=TA087>

<sup>8</sup> <http://www.nice.org.uk/page.aspx?o=273457>

<sup>9</sup> <http://www.nice.org.uk/page.aspx?o=273846>

**5.1 T-Score threshold analysis for each intervention for women who had previously been identified by opportunistic assessment.**

Using pooled alendronate and risedronate as a first-line treatment, at a cost per QALY of £20,000 it was considered cost-effective to opportunistically assess all women aged 70 years and over and to BMD scan all these women bar those aged 70-74 years and without a clinical risk factor. Using this strategy as a base-case the T-Score thresholds at which women that had previously been identified by opportunistic assessment could be cost effectively treated with an alternative intervention is given in Tables 20 and 21.

The most negative T-Score that was analysed was women in the group  $-5.0$  to  $-5.5SD$  since very few women have T-Scores more severe than this. Where the cost per QALY of an intervention was greater than £20,000 for women with T-Scores of  $-4.75$  to  $-5.25SD$ , the phrase “Cost per QALY >£20,000 for all T-Scores” has been used in the tables.

Table 20. Treatment thresholds for which each intervention can be considered cost-effective in women aged 70-74 years of age who had previously been identified by opportunistic assessment.

	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.5 SD</i>	<i>Treat where T-Score &lt;1.0 SD</i>	<i>Treat where T-Score &lt;-0.5 SD</i>
Strontium ranelate	Treat where T-Score <-4.0 SD	Treat where T-Score <-3.0 SD	Treat where T-Score <-2.5 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD
Etidronate	Treat where T-Score <-1.5 SD	Treat where T-Score <-0.5 SD	Treat where T-Score <1.0 SD
Teriparatide	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD	Treat where T-Score <-3.5 SD

Table 21. Treatment thresholds for which each intervention can be considered cost-effective in women aged 75-79 years of age who had previously been identified by opportunistic assessment.

	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.5 SD</i>	<i>Treat where T-Score &lt;-2.0 SD</i>	<i>Treat where T-Score &lt;-0.5 SD</i>	<i>Treat where T-Score &lt;0.5 SD</i>
Strontium ranelate	Treat where T-Score <-4.0 SD	Treat where T-Score <-3.5 SD	Treat where T-Score <-2.5 SD	Treat where T-Score <-2.0 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores	Cost per QALY >£20,000 for all T-Scores	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.0 SD
Etidronate	Treat where T-Score <-1.5 SD	Treat where T-Score <-1.0 SD	Treat where T-Score <0.0 SD	Treat where T-Score <1.0 SD
Teriparatide	Cost per QALY >£20,000 for all T-Scores	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.0 SD	Treat where T-Score <-3.0 SD

**5.2 T-Score threshold analysis for each intervention for women who had previously presented with a self-identifying risk factor.**

Assuming pooled alendronate and risedronate as a first-line treatment, at a cost per QALY threshold of £20,000 it was considered cost-effective to selectively BMD scan all women aged 55 years and over. As age increased the number of clinical risk factors required to receive a BMD scan decreased. Using this strategy as a base-case the T-Score thresholds at which women that had previously been identified by opportunistic assessment could be cost effectively treated with an alternative intervention is given in Tables 22 and 26.

Table 22. Treatment thresholds for which each intervention can be considered cost-effective in women aged 50-54 years of age who had previously presented with a self-identifying risk factor.

	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.0 SD</i>
Strontium ranelate	Treat where T-Score <-3.5 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores
Etidronate	Treat where T-Score <-3.5 SD
Teriparatide	Treat where T-Score <-4.0 SD

Table 23. Treatment thresholds for which each intervention can be considered cost-effective in women aged 55-59 years of age who had previously presented with a self-identifying risk factor.

	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.0 SD</i>
Strontium ranelate	Treat where T-Score <-3.5 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores
Etidronate	Treat where T-Score <-1.5 SD
Teriparatide	Treat where T-Score <-4.0 SD

Table 24. Treatment thresholds for which each intervention can be considered cost-effective in women aged 60-64 years of age who had previously presented with a self-identifying risk factor.

	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.5 SD</i>	<i>Treat where T-Score &lt;-2.0 SD</i>
Strontium ranelate	Treat where T-Score <-4.0 SD	Treat where T-Score <-3.5 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores	Cost per QALY >£20,000 for all T-Scores
Etidronate	Treat where T-Score <-3.0 SD	Treat where T-Score <-1.5 SD
Teriparatide	Treat where T-Score <-4.5 SD	Treat where T-Score <-4.0 SD

Table 25. Treatment thresholds for which each intervention can be considered cost-effective in women aged 65-69 years of age who had previously presented with a self-identifying risk factor.

	1 Clinical Risk Factors	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-3.0 SD</i>	<i>Treat where T-Score &lt;-2.5 SD</i>	<i>Treat where T-Score &lt;-1.5 SD</i>
Strontium ranelate	Treat where T-Score <-4.5 SD	Treat where T-Score <-4.0 SD	Treat where T-Score <-3.0 SD
Raloxifene	Cost per QALY >£20,000 for all T-Scores	Cost per QALY >£20,000 for all T-Scores	Cost per QALY >£20,000 for all T-Scores
Etidronate	Treat where T-Score <-2.0 SD	Treat where T-Score <-2.0 SD	Treat where T-Score <-0.5 SD
Teriparatide	Treat where T-Score <-5.0 SD	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD

Table 26. Treatment thresholds for which each intervention can be considered cost-effective in women aged 70-74 years of age who had previously presented with a self-identifying risk factor.

	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-2.0 SD</i>	<i>Treat where T-Score &lt;-1.0 SD</i>	<i>Treat where T-Score &lt;-0.0 SD</i>
Strontium ranelate	Treat where T-Score <-3.5 SD	Treat where T-Score <-3.0 SD	Treat where T-Score <-2.0 SD
Raloxifene	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD	Treat where T-Score <-4.0 SD
Etidronate	Treat where T-Score <0.0 SD	Treat where T-Score <1.0 SD	Treat where T-Score <1.0 SD
Teriparatide	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD	Treat where T-Score <-3.5 SD

Table 27. Treatment thresholds for which each intervention can be considered cost-effective in women aged 75 years of age and older who had previously presented with a self-identifying risk factor.

	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
<i>Pooled alendronate and risedronate</i>	<i>Treat where T-Score &lt;-1.5 SD</i>	<i>Treat where T-Score &lt;-0.5 SD</i>	<i>Treat where T-Score &lt;-0.5 SD</i>
Strontium ranelate	Treat where T-Score <-3.5 SD	Treat where T-Score <-3.0 SD	Treat where T-Score <-1.5 SD
Raloxifene	Treat where T-Score <-4.5 SD	Treat where T-Score <-4.5 SD	Treat where T-Score <-3.5 SD
Etidronate	Treat where T-Score <0.5 SD	Treat where T-Score <1.0 SD	Treat where T-Score <1.0 SD
Teriparatide	Treat where T-Score <-5.0 SD	Treat where T-Score <-4.5 SD	Treat where T-Score <-3.5 SD