

Appendix: Custom-made vs. Prefabricated splints vs. none (Economic evaluation results), including VOI results

(This appendix is self-contained; tables and figures are not referred to within the main report)

Table 1: Mean differences in current pain and CPI used to populate the economic model

Time point	Current pain Mean difference (95% CI)	CPI Mean difference (95% CI)
Custom-made splints		
3 months	-2.41 (-4.65, -0.17)	-0.252 (-1.176, 0.672)
6 months	No data	No data
12 months	No data	-0.24 (-1.176 to 0.696)
Prefabricated		
3 months	-1.08 (-3.597, 1.437)	0.023 (-0.895, 0.941)
6 months	No data	No data
12 months	No data	0.264 (-0.695 to 1.223)

The mean differences in the table above are based on two studies only. For current pain, the MD values are based on the study by Giannakopoulos 2016 (77), and for CPI the MD were based on the study by Truelove 2006 (104). Therefore, due to this lack of data, a few assumptions were made. For current pain, it was assumed that at 6 and 12 months, the MD from the splints group at 6 months (MD=0.448(-1.159, 0.264)) was taken. For CPI, the MD at 6 months was assumed to be the same as the MD at 12 months.

Base case results

Table 2 Base case cost-effectiveness results for custom-made vs. prefabricated vs. no splints

Intervention	Total costs	Incremental costs	Total QALYs	Incremental QALYs	ICER	Probability of cost-effectiveness		
						at £0	at £20,000	at £30,000
Base-case								
Current pain								
No splints	£6,375		17.9991	0.0000		53%	29%	28%
Prefabricated splints	£6,573	£198	18.0578	0.0587	£3,374	42%	38%	32%
Custom-made splints	£7,446	£873	18.1398	0.0819	£10,650	5%	34%	40%
CPI								
No splints	£5,681		18.5753			80%	37%	34%
Prefabricated splints	£6,257	£576	18.2827	-0.2925	Dominated	13%	26%	26%
Custom-made splints	£6,777	£1,096	18.6632	0.0879	£12,465	8%	37%	40%

For current pain, the base-case cost-effectiveness results show that both prefabricated and custom-made splints are cost-effective compared to no splints, with custom-made splints being the most cost-effective option. For CPI, prefabricated was dominated (more costly and less effective), which is driven by the MD at 12 months which is not in favour of prefabricated splints. The cost-effective strategy is custom-made splints. However, the MD inputs are based on very little data, and the uncertainty surrounding the point estimate of the ICER is very high, with about an equal chance of any of the three options being cost-effective. This uncertainty is illustrated on the cost-effectiveness acceptability curves, see Figure 1 and Figure 2 below.

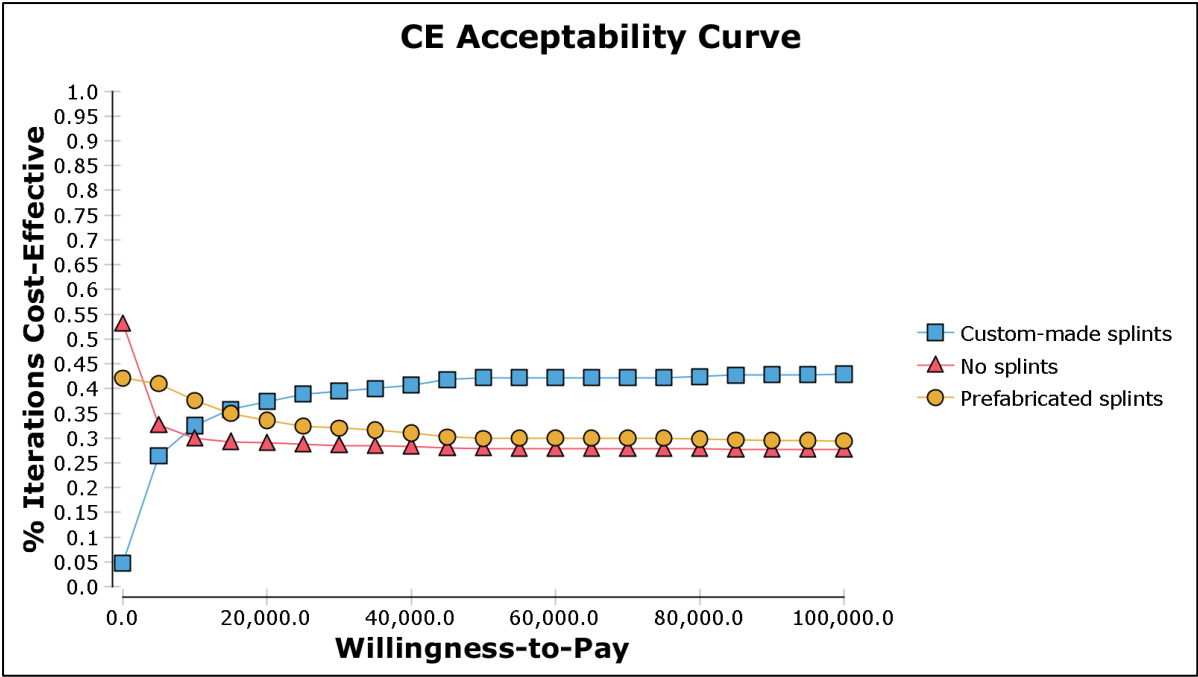


Figure 1: Cost-effectiveness Acceptability curve (CEAC) for current pain specification

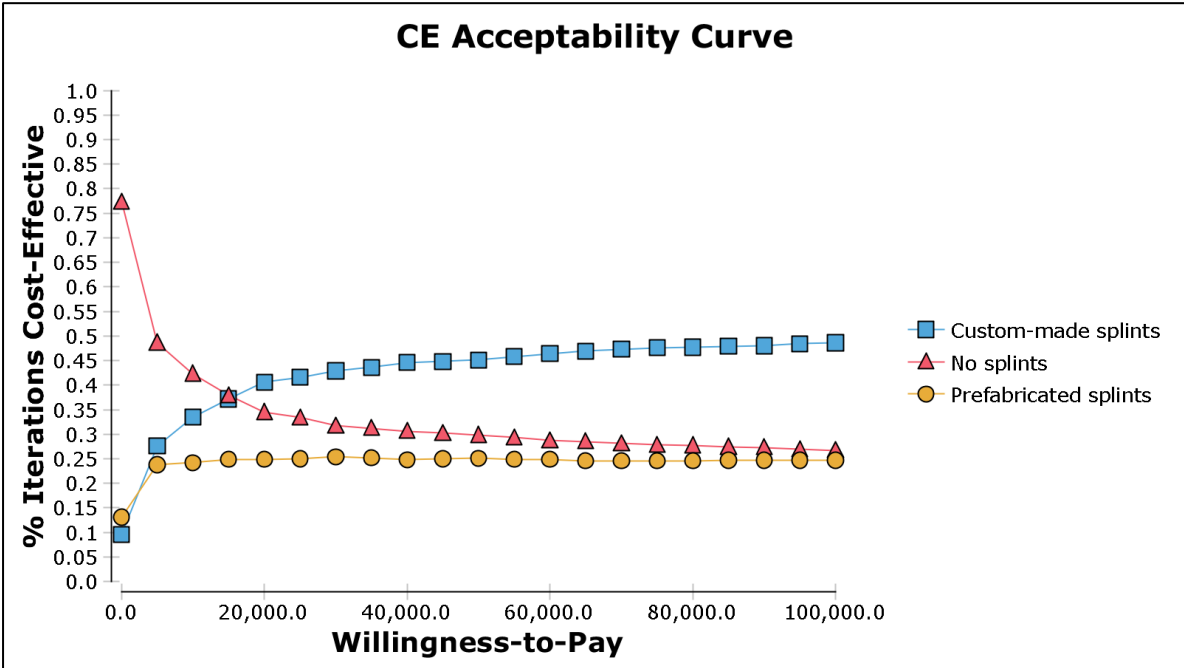


Figure 2: Cost-effectiveness Acceptability curve (CEAC) for CPI specification

Scenario and sensitivity analyses

Table 3 Sensitivity and scenario analyses for custom-made vs. prefabricated vs. no splints

Intervention	Total costs	Incremental costs	Total QAL Ys	Incremental QALYs	ICER	Probability of cost-effectiveness		
						at £0	at £20,000	at £30,000
Base-case								
Current pain								
No splints	£6,375		17.9991			53.1%	29.0%	28.5%
Prefabricated splints	£6,573	£198	18.0580	0.0589	£3,359	42.1%	33.6%	39.5%
Custom-made splints	£7,448	£875	18.1375	0.0795	£11,006	4.8%	37.4%	32.0%
CPI								
No splints	£5,681		18.5753			77.3%	34.5%	31.7%
Prefabricated splints	£6,263	£583	18.2770	-0.2983	Dominated	13.1%	24.9%	25.4%
Custom-made splints	£6,789	£1,109	18.6510	0.0758	£14,631	9.6%	40.6%	42.9%
Assume long term MD beyond 12 months = 0 & long term transition probabilities continue as per DEEP study.								
Current pain								
No splints	£6,088		18.3104			100.0%	100.0%	100.0%
Prefabricated splints	£6,976	£887	17.6270	-0.6833	Dominated			
Custom-made splints	£7,902	£1,814	17.6511	-0.6592	Dominated	0.0%	0.0%	0.0%
CPI								
No splints	£5,054		19.1145			97.3%	43.8%	37.2%
Prefabricated splints	£5,307	£253	19.1116	-0.0029	Dominated	2.7%	28.1%	28.8%
Custom-made splints	£6,226	£1,172	19.1381	0.0236	£49,723	0.0%	28.1%	34.0%
Assume long term MD beyond 12 months = MD at 12m & long term transition probabilities continue as per DEEP study.								
Current pain								
Prefabricated splints	£6,020		18.6576			77.2%	54.2%	49.1%

No splints	£6,088	£69	18.3104	-0.3472	Domina ted	22.8 %	0.0%	0.0%
Custom- made splints	£6,946	£926	18.6820	0.0244	£37,962	0.0 %	45.8 %	50.9 %
CPI								
No splints	£5,054		19.1145			85.3 %	38.8 %	34.8 %
Custom- made splints	£6,336	£1,282	19.0366	-0.0779	Domina ted	7.4 %	38.9 %	42.5 %
Prefabricated splints	£6,344	£1,290	18.1826	-0.9319	Domina ted	7.3 %	22.3 %	22.7 %
Assume long term MD beyond 12 months = MD at 12m & long term transition probabilities equal 0.								
Current pain								
Prefabricated splints	£6,477		18.1617			60.6 %	43.1 %	42.4 %
No splints	£6,626	£149	17.7280	-0.4337	Domina ted	28.0 %	2.9%	2.6%
Custom- made splints	£7,316	£840	18.2796	0.1179	£7,122	11.4 %	54.0 %	55.0 %
CPI								
No splints	£6,243		18.0916			61.2 %	29.2 %	28.3 %
Prefabricated splints	£6,856	£613	17.7593	-0.3323	Domina ted	19.3 %	22.1 %	22.1 %
Custom- made splints	£7,176	£933	18.3206	0.2290	£4,074	19.5 %	48.7 %	49.6 %
Assume long term MD beyond 12 months = 0 & long term transition probabilities equal 0.								
Current pain								
No splints	£6,626		17.7280			66.7 %	21.1 %	19.7 %
Prefabricated splints	£6,821	£195	17.7905	0.0625	£3,124	29.1 %	33.4 %	32.3 %
Custom- made splints	£7,670	£849	17.8977	0.1072	£7,922	4.2 %	45.5 %	48.0 %
CPI								
No splints	£6,243		18.0916			71.0 %	28.6 %	27.6 %
Prefabricated splints	£6,521	£278	18.0657	-0.0259	Domina ted	22.2 %	25.4 %	25.4 %
Custom- made splints	£7,284	£1,041	18.2281	0.1365	£7,624	6.8 %	46.0 %	47.0 %
Starting age of cohort set to 40								
Current pain								
No splints	£5,670		15.2472			53.6 %	28.9 %	28.4 %

Prefabricated splints	£5,846	£177	15.3019	0.0548	£3,226	42.1%	33.7%	32.0%
Custom-made splints	£6,640	£794	15.3712	0.0693	£11,463	4.3%	37.4%	39.6%
CPI								
No splints	£5,059		15.7311			78.0%	34.7%	32.3%
Prefabricated splints	£5,577	£518	15.4827	-0.2484	Domina ted	12.9%	24.9%	24.8%
Custom-made splints	£6,065	£1,006	15.7977	0.0666	£15,102	9.1%	40.4%	42.9%
Starting age of cohort set to 56								
Current pain								
No splints	£4,524	£0	11.3939	0.0000	£0	54.3%	28.7%	28.3%
Prefabricated splints	£4,666	£142	11.4424	0.0485	£2,935	42.1%	33.6%	31.4%
Custom-made splints	£5,330	£664	11.4972	0.0548	£12,121	3.6%	37.7%	40.3%
CPI								
No splints	£4,049		11.7490			79.9%	34.4%	31.6%
Prefabricated splints	£4,462	£413	11.5699	-0.1791	Domina ted	12.5%	25.3%	25.2%
Custom-made splints	£4,889	£840	11.8025	0.0535	£15,694	7.6%	40.3%	43.2%
Discount rate 0%								
Current pain								
No splints	£14,658		39.7331			50.5%	29.5%	29.2%
Prefabricated splints	£15,105	£447	39.8126	0.0795	£5,629	42.6%	34.9%	33.5%
Custom-made splints	£16,927	£1,822	39.9678	0.1553	£11,737	6.9%	35.9%	37.3%
CPI								
No splints	£12,982		41.0478			74.6%	37.9%	35.1%
Prefabricated splints	£14,323	£1,341	40.3458	-0.7020	Domina ted	13.2%	24.2%	24.1%
Custom-made splints	£15,296	£2,314	41.1900	0.1421	£16,281	12.2%	37.9%	40.8%
Discount rate 6%								
Current pain								
No splints	£4,289		12.2914			54.8%	28.6%	28.2%
Prefabricated splints	£4,426	£136	12.3443	0.0528	£2,583	42.1%	33.2%	30.8%

Custom-made splints	£5,065	£639	12.4036	0.0593	£10,777	0.3%	38.2%	41.0%
CPI								
No splints	£3,840		12.6745			80.8%	33.6%	30.9%
Prefabricated splints	£4,234	£394	12.4812	-0.1933	Domina ted	12.3%	25.4%	25.1%
Custom-made splints	£4,649	£809	12.7323	0.0578	£13,997	6.9%	41.0%	44.0%
Time horizon 2 years								
Current pain								
No splints	£539		1.4593			90.4%	2.9%	2.2%
Prefabricated splints	£578	£38	1.4942	0.0349	£1,099	9.6%	43.1%	38.5%
Custom-made splints	£822	£245	1.5114	0.0172	£14,237	0.0%	54.0%	59.3%
CPI								
No splints	£513		1.4902			97.4%	37.6%	32.1%
Prefabricated splints	£587	£74	1.4848	-0.0054	Domina ted	2.6%	26.0%	25.3%
Custom-made splints	£824	£311	1.5064	0.0162	£19,137	0.0%	36.6%	42.6%
Time horizon 10 years								
Current pain								
No splints	£2,222		6.4820			63.0%	27.1%	26.4%
Prefabricated splints	£2,292	£71	6.5319	0.0499	£1,419	35.9%	33.7%	32.4%
Custom-made splints	£2,697	£404	6.5660	0.0341	£11,857	1.1%	39.2%	41.2%
CPI								
No splints	£2,021		6.6650			86.0%	31.7%	28.4%
Prefabricated splints	£2,223	£201	6.5820	-0.0830	Domina ted	10.3%	24.8%	24.1%
Custom-made splints	£2,521	£500	6.7087	0.0437	£11,443	3.7%	43.5%	47.5%
Time horizon 20 years								
Current pain								
No splints	£3,748		10.9630			57.6%	28.8%	28.3%
Prefabricated splints	£3,860	£112	11.0217	0.0587	£1,905	40.0%	31.9%	30.7%
Custom-made splints	£4,438	£579	11.0677	0.0460	£12,592	2.4%	39.3%	41.0%
CPI								

No splints	£3,366		11.2992			81.2%	34.4%	30.6%
Prefabricated splints	£3,708	£342	11.1303	-0.1690	Domina ted	11.3%	21.8%	21.8%
Custom-made splints	£4,082	£716	11.3593	0.0601	£11,917	7.5%	43.8%	47.6%
Time horizon 30 years								
Current pain								
No splints	£4,813		13.9785			56.0%	28.6%	28.2%
Prefabricated splints	£4,959	£147	14.0376	0.0591	£2,480	40.5%	32.5%	30.4%
Custom-made splints	£5,662	£703	14.0944	0.0568	£12,366	3.5%	38.9%	41.4%
CPI								
No splints	£4,304		14.4177			80.5%	34.4%	31.0%
Prefabricated splints	£4,746	£441	14.1921	-0.2255	Domina ted	12.0%	23.7%	23.6%
Custom-made splints	£5,181	£877	14.4836	0.0659	£13,299	7.5%	41.9%	45.4%
Cost of custom made and pre-fabricated splints and replacement set at band 2 charge								
Current pain								
No splints	£6,375		17.9991			43.2%	27.8%	27.7%
Custom-made splints	£6,501	£125	18.1375	0.1384	£906	35.8%	44.1%	44.2%
Prefabricated splints	£6,573	£73	18.0580	-0.0795	Domina ted	21.0%	28.1%	28.1%
CPI								
No splints	£5,681		18.5753			62.8%	28.2%	27.4%
Custom-made splints	£5,842	£161	18.6510	0.0758	£2,126	28.1%	49.9%	50.2%
Prefabricated splints	£6,263	£422	18.2770	-0.3740	Domina ted	9.1%	21.9%	22.4%
Cost of prefabricated splints and replacement set at band 1 charge								
Current pain								
No splints	£6,375		17.9991			39.9%	28.9%	28.4%
Prefabricated splints	£6,385	£10	18.0580	0.0589	£164	56.5%	34.8%	32.5%
Custom-made splints	£7,448	£1,063	18.1375	0.0795	£13,374	3.6%	36.3%	39.1%
CPI								
No splints	£5,681		18.5753			64.4%	32.5%	30.6%

Prefabricated splints	£6,075	£395	18.2770	-0.2983	Dominated	26.9%	27.3%	26.7%
Custom-made splints	£6,789	£1,109	18.6510	0.0758	£14,631	8.7%	40.2%	42.7%
Replacing splints every 2 years								
Current pain								
No splints	£6,375		17.9991			91.1%	30.2%	29.4%
Prefabricated splints	£6,897	£522	18.0580	0.0589	£8,851	8.9%	41.8%	36.7%
Custom-made splints	£8,998	£2,102	18.1375	0.0795	£26,438	0.0%	28.0%	33.9%
CPI								
No splints	£5,681		18.5753			96.9%	46.1%	41.4%
Prefabricated splints	£6,587	£906	18.2770	-0.2983	Dominated	3.1%	25.4%	25.9%
Custom-made splints	£8,340	£2,659	18.6510	0.0758	£35,094	0.0%	28.5%	32.7%
Replacing splints every 5 years								
Current pain								
No splints	£6,375	£0	17.9991	0.0000	£0	57.1%	28.9%	28.3%
Prefabricated splints	£6,579	£204	18.0580	0.0589	£3,459	42.7%	33.4%	31.7%
Custom-made splints	£7,476	£897	18.1375	0.0795	£11,285	0.2%	37.7%	40.0%
CPI								
No splints	£5,681		18.5753			87.5%	36.3%	32.5%
Prefabricated splints	£6,269	£589	18.2770	-0.2983	Dominated	9.7%	25.9%	25.9%
Custom-made splints	£6,817	£1,137	18.6510	0.0758	£15,002	2.8%	37.8%	41.6%
Replacing splints every 20 years								
Current pain								
No splints	£6,375	£0	17.9991	0.0000	£0	38.3%	27.7%	27.7%
Prefabricated splints	£6,422	£47	18.0580	0.0589	£793	53.2%	30.6%	29.6%
Custom-made splints	£6,723	£301	18.1375	0.0795	£3,791	8.5%	41.7%	42.7%
CPI								
No splints	£5,681		18.5753			67.4%	28.7%	27.2%
Custom-made splints	£6,064	£384	18.6510	0.0758	£5,065	16.7%	46.0%	48.2%

Prefabricated splints	£6,112	£48	18.2770	-0.3740	Dominated	15.9%	25.3%	24.6%
Cost of replacing splints set to zero								
<i>Current pain</i>								
Prefabricated splints	£6,366		18.0580			47.3%	29.1%	28.9%
No splints	£6,375	£9	17.9991	-0.0589	Dominated	32.7%	27.6%	27.6%
Custom-made splints	£6,457	£91	18.1375	0.0795	£1,142	20.0%	43.3%	43.5%
<i>CPI</i>								
No splints	£5,681		18.5753			51.6%	26.4%	25.8%
Custom-made splints	£5,798	£118	18.6510	0.0758	£1,552	25.4%	49.3%	50.1%
Prefabricated splints	£6,057	£258	18.2770	-0.3740	Dominated	23.0%	24.3%	24.1%

The cost-effectiveness results from the sensitivity and scenario analyses show that the model is very sensitive to the structural assumptions made in the model regarding the long term MD values and long term transition probabilities. The splints groups are not cost-effective when assuming that there is no long term effect of splints (in terms of mean differences in pain). However, when assuming there is a long term effect, both custom-made and prefabricated splints generate additional QALYs, and custom-made splints is the cost-effective option (for current pain). In this scenario, however, for the CPI specification, prefabricated splints is dominated. This is because of the MD at 12 months that did not benefit the prefabricated splints group. The sensitivity of these cost-effectiveness results exploring the long term impact of different types of splints highlight the need for more robust data for MD in pain in TMD patients.

The model is also sensitive to the band charge. A lower band charge improves the cost-effectiveness of splints, with custom-made still being the cost-effective option when basing the model on current pain. For CPI, prefabricated splints is still not cost-effective because of lesser QALYs generated than both of the comparators.

The model is less sensitive to the time horizon, discount rate and the starting age of the modelled cohort.

Value of information results

Table 4: Value of information (EVPI and EVPPI) results: custom-made vs. prefabricated vs. no splints

	Current pain	CPI
EVPI		
EVPI per person	£5,269	£3,922
Population EVPI over 10 years	£121.80bn	£90.65bn
Group EVPPIs		
Transition probabilities		
EVPI per person	£3,582	£1,937
Population EVPI over 10 years	£82.79bn	£44.78bn
MD		
EVPI per person	£2,455	£3,344
Population EVPI over 10 years	£56.74bn	£77.30bn
Costs		
EVPI per person	£109	£603
Population EVPI over 10 years	£2.51bn	£13.94bn
Utilities		
EVPI per person	£5	£340
Population EVPI over 10 years	£120m	£7.86bn

The value of information analysis gives an indication of the decision uncertainty, and identifies the parameters that contribute to that decision uncertainty. The high EVPI values suggest that further research is worthwhile. The high EVPPI values point out that further research should focus on the impact of both custom-made splints and prefabricated splints on pain, including in the long term.