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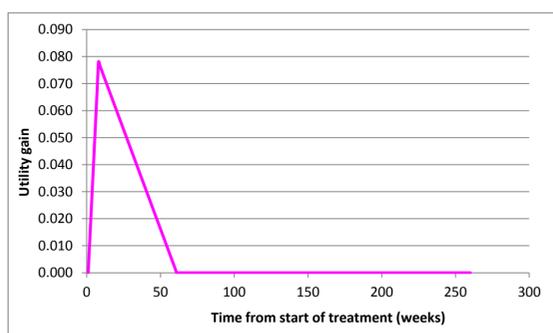
BACKGROUND: The majority of mental health problems are non-psychotic (e.g., depression, anxiety, and phobias). Art therapy is currently being used in the UK for a variety of mental health conditions. This cost-effectiveness analysis formed part of a health technology assessment for the National Institute for Health Research.

OBJECTIVES: To conduct a cost-utility analysis of studies evaluating cost effectiveness of art therapy and identify areas in need of further research.

METHODS: Comprehensive searches to inform a systematic review of the clinical and cost-effectiveness of art therapy were performed. No existing models of art therapy were identified. As such, a *de novo* mathematical model was constructed with data from RCTs identified in the clinical review. An area under the curve model was developed to estimate the gain in utility with the following assumptions in the base case:

1. That the maximum treatment effect would be associated with the time at which treatment ended
2. That there would be a linear increase in treatment effect, from zero at baseline to the maximum at the time at which treatment ended.
3. That there would be a residual effect of treatment with a linear decline in benefit until there was zero benefit at 52 weeks.
4. That given the short assumed duration of benefit, discounting of future costs and benefits was not necessary.

Figure 1: An illustration of the conceptual model of utility



Only the Short Form (36) Health Survey (SF-36) data reported in Monti *et al.*, comparing group art therapy with wait-list control, could be mapped to EuroQoL (EQ-5D) for the primary analysis. No other outcome measures from the RCTs could be directly mapped. The Monti *et al.*, RCT also reported Global Severity Index (GSI) data through which a secondary mapping using GSI data reported in Thyme *et al.*, comparing group art therapy with group verbal therapy could be performed as secondary analyses. Two published SF-36 to EQ-5D mappings were used to assess the sensitivity of the results. Probabilistic sensitivity analyses were performed. Threshold analyses were undertaken to assess the utility gain required to have a cost per QALY of £20,000.

RESULTS:

Table 2: Probabilistic results from the Monti *et al* scenario

Residual benefit duration	Costing Source	Ara & Brazier (2008) mapping			Rowen et al. (2009) mapping		
		Inc Costs (£)	Inc QALY	Cost per QALY (£) (95% CI)	Inc Costs (£)	Inc QALY	Cost per QALY (£) (95% CI)
52 weeks	BAAT	180	0.0447	4031 (2628 – 9202)	180	0.0499	3610 (2477 – 7229)
52 weeks	Curtis	248	0.0447	5542 (3613 – 12,653)	248	0.0499	4963 (3405 – 9940)
104 weeks	BAAT	180	0.0834	2159 (1408 – 4930)	180	0.0931	1934 (1327 – 3873)
104 weeks	Curtis	248	0.0834	2969 (1936 – 6779)	248	0.0931	2659 (1824 – 5325)

CI: Confidence interval; DOM: Dominating; Inc: Incremental

Table 3: Probabilistic results from the Thyme *et al* scenario

Residual benefit duration	Costing Source	Ara & Brazier (2008) mapping			Rowen et al., (2009) mapping		
		Inc Costs (£)	Inc QALY	Cost per QALY (£) (95% CI)	Inc Costs (£)	Inc QALY	Cost per QALY (£)(95% CI)
52 weeks	BAAT	-16	0.0675	DOM (DOM – 183*)	-16	0.0757	DOM (DOM – 99*)
52 weeks	Curtis	-22	0.0675	DOM (DOM – 251*)	-22	0.0757	DOM (DOM – 136*)
104 weeks	BAAT	-16	0.1241	DOM (DOM – 168*)	-16	0.1391	DOM (DOM – 91*)
104 weeks	Curtis	-22	0.1241	DOM (DOM – 230*)	-22	0.1391	DOM (DOM – 125*)

CI: Confidence interval; DOM: Dominating; Inc: Incremental

Table 1: Distributions used in the probabilistic sensitivity analyses

	Mean Value	2.5 th Percentile	97.5 th Percentile
Utility gain in the Monti <i>et al.</i> , RCT of art therapy compared with wait-list control *	0.078	0.034	0.119
Utility gain in the Monti <i>et al.</i> , RCT of art therapy compared with wait-list control †	0.087	0.043	0.126
Relationship between one unit decrease in GSI and utility gain *	0.485	0.212	0.744
Relationship between one unit decrease in GSI and utility gain †	0.542	0.271	0.790
GSI decrease of verbal therapy compared with art therapy in the Thyme <i>et al.</i> , RCT.	0.235 (Verbal therapy more effective)	-0.270 (Art therapy more effective)	0.721 (Verbal therapy more effective)
Derived utility gain in the Thyme <i>et al.</i> , RCT of verbal therapy compared with art therapy *	0.114	-0.145	0.386
Derived utility gain in the Thyme <i>et al.</i> , RCT of verbal therapy compared with art therapy †	0.127	-0.160	0.426

* Having sampled from the SF-36 dimensions and mapped to utility using the Ara & Brazier algorithm
† Having sampled from the SF-36 dimensions and mapped to utility using the Rowen *et al.*, algorithm

Figure 2: Histogram of art therapy utility gain compared with wait list estimated from Monti *et al.*

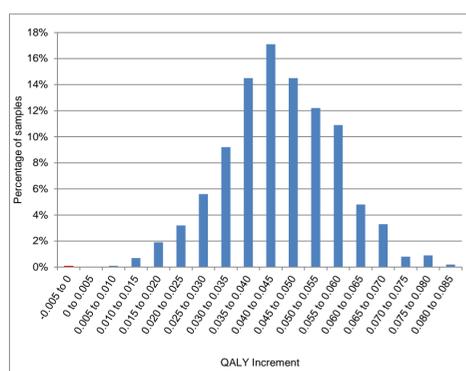


Figure 3: CEAC from Monti *et al.*

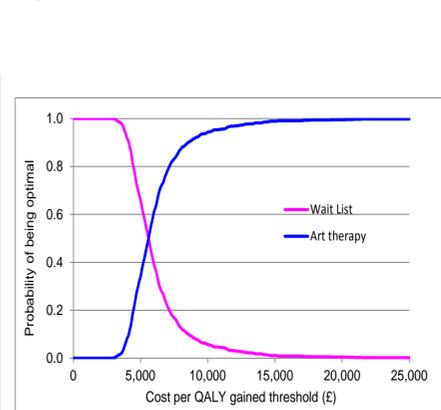


Figure 4: Histogram of verbal therapy utility gain compared with art therapy estimated from Thyme *et al.*

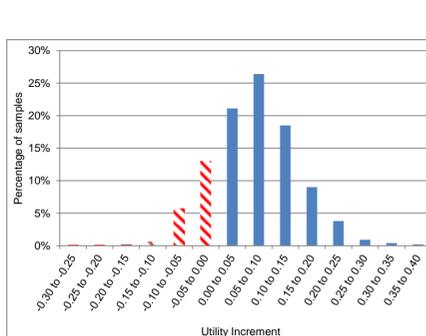
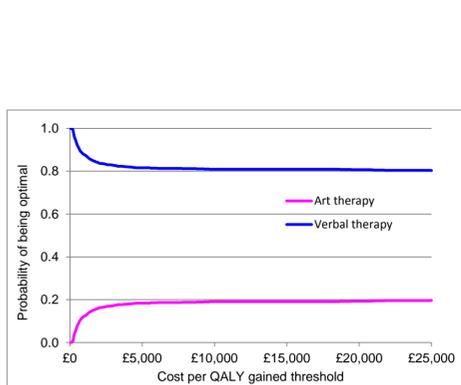


Figure 5: CEAC from Thyme *et al.*, (2007)



Figures 2-5 using mapping from Ara & Brazier (2008), assuming 52 weeks' residual benefit and costs per patient from Curtis (2013)

The threshold analysis showed that even under unfavourable assumptions the utility gain required to be cost effective would be below 0.04. This value is below that mapped from Monti *et al.*, (0.078) indicating that art therapy was likely to be seen as cost effective compared with wait list. There was considerable uncertainty in the results comparing art therapy and verbal therapy.

DISCUSSION: The results are associated with uncertainty due and there is potential confounding in the included RCTs. In neither comparison was the art therapy intervention similar to that employed in England and Wales, and as such, the generalisability of the results to practice in England and Wales is uncertain.

CONCLUSIONS: Art therapy appears cost effective versus wait-list but of uncertain value compared with verbal therapy. Confirmatory studies are required to allow more definitive statements to be made.

REFERENCES: Ara, R., Brazier, J. Deriving an Algorithm to convert the eight mean SF-36 Dimension scores into a mean EQ-5D preference-based score from published studies (where patient level data are not available). *Value in Health* 2008; 11:1131-1143; Monti, D.A., Peterson, C., Kunkel, E.J., Hauck, W.W., Pequignot, E., Rhodes, L. et al. A randomized, controlled trial of mindfulness-based art therapy (MBAT) for women with cancer. *Psycho-Oncology* 2006; 15(5):363-373; Rowen, D., Brazier, J., Roberts, R. Mapping SF-36 onto the EQ-5D index: how reliable is the relationship. *Health and Quality of Life Outcomes* 2009; 7:27; Thyme, K., Sundin, E.C., Stahlberg, G., Lindstrom, B., Eklof, H., Wiberg, B. The outcome of short-term psychodynamic art therapy compared to short-term psychodynamic verbal therapy for depressed women. *Psychoanalytic Psychotherapy* 2007;(3):250-264; Uttley L, Sope A, Stevenson M, Rawdin A, Taylor-Buck E, Sutton A, Stevens J, Kaltenthaler E, Dent-Brown K, Wood C, Systematic review and cost effectiveness evaluation of art therapy for non-psychotic mental disorders. *Health Technology Assessment* (in press).

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