CHEATA Health Economics Evaluation

CAMHS-Adapted Markov Model (Version 2, April 2026)

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Overview

This document summarises the results of an independent health economics evaluation comparing treatment with XR Therapeutics (XRT) to standard of care (SOC) for children and young people with a range of anxiety-related disorders within a CAMHS context. The model is adapted from the adult Talking Therapies evaluation (Version 2) using CAMHS-specific cost data from the Bolton Phase I trial (Greater Manchester Mental Health NHS Foundation Trust).

The evaluation uses a patient-level Markov model with 8-week cycles, tracking a cohort of 100 initial patients through treatment states including anxious/not on treatment, start treatment, continue treatment, recovered, and relapse. The model runs for 39 cycles (approximately 7 years) with results reported at 1-year and 5-year time horizons.

Model Structure

The Markov model tracks patients through five health states. In the SOC arm, patients move through multiple 8-week treatment cycles (retention rate 55%), with each cycle incurring a cost of £1,170 (Band 7, 18 hours per course, split over two 4-week cycles). In the XRT arm, patients bypass the 'continue treatment' state entirely because treatment length is only one 8-week cycle at a cost of £1,340 per course (Band 7 for 8 hours at £130/hour plus XRT scenario access costs).

The model accounts for re-presentation: patients who recover can relapse and re-enter treatment. This is a critical feature, as it captures the system-level cost of treating the same patients repeatedly over time. Costs and outcomes are discounted at 3.5% per annum per the NICE reference case.

Key Parameters

Parameter	Value	Source
Recruitment rate (referral to access)	70%	NHS TT Annual Report 2022-23
Retention rate (start to complete)	55%	NHS TT Annual Report 2022-23
Recovery rate after CBT	52.6%	NHS TT Annual Report 2022-23
Relapse rate per 8-week cycle	1.8%	Lorimer et al, 2021
Spontaneous recovery rate	3.8%	Mekonen et al, 2020
SOC cost per 4-week cycle	£1,170	Band 7, PSSRU
XRT cost per course (incl. access)	£1,340	Band 7, 8hrs + scenario access
Utility: anxious state	0.516	Morriss et al, 2019
Utility: recovered state	0.855	McNamara et al, 2023
Discount rate (costs and outcomes)	**3.5%**	**NICE reference case**

Note: All impact parameters for XRT (recruitment, retention, recovery, relapse) are set to 1.0. The model assumes no improvement in these rates from XRT. The only mechanism of benefit is reduced treatment duration (fewer sessions per course).

Results: 1-Year Time Horizon

At one year, the model shows a cost saving of £102,539 per 100 initial patients with XRT compared to SOC, driven primarily by fewer treatment courses (153 vs 266) and lower per-course costs. QALYs are lower in the XRT arm at 1 year because SOC patients accumulate more time in the treatment and recovered states during the first year (the benefit of faster recovery has not yet compounded).

	Treatment courses	QALYs	Costs (discounted)	NMB	NMB per patient
SOC + XRT	153	7.00	£198,162		
SOC	266	54.74	£300,702		
Difference	**-113**	**-47.74**	**-£102,539**	**-£852,286**	**-£8,523**

Note: Negative cost difference indicates XRT is less costly than SOC. The negative QALY difference at 1 year reflects the shorter follow-up period; the quality of life benefit from faster recovery has not yet accumulated sufficiently to offset the QALYs generated by SOC patients who remain in treatment states for longer.

Results: 5-Year Time Horizon

At five years, XRT dominates SOC: it is both less costly and more effective. The cost saving increases to £266,085 per 100 initial patients, and the QALY difference becomes positive (+20.35), producing a net monetary benefit of £25,681 per patient. The reversal in QALYs occurs because patients who recovered faster with XRT spend more cumulative time in the recovered state, generating more quality-adjusted life years over the longer time horizon.

	Treatment courses	QALYs	Costs (discounted)	NMB	NMB per patient
SOC + XRT	224	277.79	£299,680		
SOC	516	257.43	£565,765		
Difference	**-293**	**+20.35**	**-£266,085**	**£673,152**	**£25,681**

At the 5-year horizon, XRT dominates SOC across all metrics. The intervention is both cheaper and more clinically effective, producing positive net monetary benefit at the NICE willingness-to-pay threshold of £20,000 per QALY.

Cost Structure

The table below details the per-course cost structure for both arms. SOC costs reflect a blended rate assuming 80% Step 2 therapies (Band 6, 30-minute sessions) and 20% Step 3 therapies (Band 7, 50-minute sessions), totalling 18 hours and £2,340 per course split across two 4-week cycles. XRT costs include Band 7 therapist time for 8 hours plus scenario access charges.

Cost item	SOC	XRT
Therapist time (Band 7, 8 hours)		£1,040
XRT scenario access (8 hours)		£267
XRT per-patient access fee		£33
XRT total per course		£1,340
SOC total per course (18 hours)	£2,340	
SOC cost per 4-week cycle	**£1,170**	

Sensitivity to XRT Access Costs

The model was tested across a range of XRT scenario access price points. The table below shows the net saving per 100 patients at the 1-year time horizon for different access cost levels. The base case uses £5,000 per 150 hours of scenario access.

XRT access cost	Net saving per 100 (1 year)
£0 (headroom)	£28,430
£5,000 / 150 hours	£26,011
£10,000 / 150 hours	£23,592
£14,500 / 150 hours	£21,416
£25,000 / 150 hours	£16,336
£50,000 / 150 hours	£4,242
£75,000 / 150 hours	**-£7,852**

The intervention remains cost-saving up to an access cost of approximately £58,000 per 150 hours. Above this threshold, the additional cost of XRT scenario access exceeds the therapist time savings.

Treatment Course Dynamics

The model tracks the number of 8-week treatment courses generated by the initial cohort of 100 patients over time. In the SOC arm, patients frequently re-present for additional treatment courses due to incomplete recovery and relapse. In the XRT arm, faster initial recovery reduces re-presentation rates, resulting in fewer total treatment courses over time.

Arm	1-year courses	5-year courses
SOC	266	516
SOC + XRT	153	224
Difference	**-113**	**-293**

Note: 'Treatment courses' refers to 8-week treatment cycles, not individual sessions. A single patient may generate multiple treatment courses if they relapse and re-present.

Limitations and Assumptions

The model assumes that XRT does not improve recruitment, retention, recovery, or relapse rates compared to SOC. All impact parameters are set to 1.0. The only mechanism of benefit is reduced treatment duration. If XRT were shown to improve any of these parameters, the cost-effectiveness results would be more favourable.

Transition probabilities are derived from NHS Talking Therapies Annual Report 2022-23 data and published literature. Costs use PSSRU unit costs for Band 6 and Band 7 staff. Utility values are from Morriss et al (2019) and McNamara et al (2023). The model structure and parameterisation follow NICE reference case methodology.

This CAMHS-adapted version uses the same model structure as the adult evaluation but with CAMHS-specific cost inputs from the Bolton Phase I trial. Session counts and recovery rates are from the adult NHS Talking Therapies dataset and may differ from CAMHS-specific populations.

Prepared by the Centre for Healthcare Equipment and Technology Adoption (CHEATA), Nottingham University Hospitals NHS Trust. Model Version 2, adapted for CAMHS, April 2026. This evaluation was commissioned by XR Therapeutics Ltd. CHEATA is responsible for the methodology and results. This document should be read in conjunction with the full model and accompanying technical report.