Framework for Integrated Care (SECURE STAIRS)

Appendix economics report, May 2022

Contents

Anna Freud National Centre for Children and Families

EBPU Evidence Based Practice Unit
A partnership of
UCL Anna Freud National Centre for Children and Families

CORC Child Outcomes Research Consortium
A project of
Anna Freud National Centre for Children and Families

Appendix A: Peer Power Focus group

Peer Power Youth is a social justice charity that promotes empathy towards under-supported young people, improving their wellbeing, employability and helping them to transform services. Their organisation and holistic model of participatory youth engagement has been co-produced with young people who have lived experience of health, social care and youth justice services.

November 2019

What was discussed:

- What should or has good mental health support look/ed like for you in custody or in the community
- Looking at these two projects, FCAMHS and SECURE STAIRS, what areas do you think sound the most helpful/impactful for a young person?
- what do you think are the benefits of these projects to young people? Is there anything that you feel is missing that could be helpful for a young person at a challenging point in their life?
- What qualities would be helpful for a professional working under one of these services to have when connecting/supporting a young person?
- As tax payers yourselves or in the future what do you think is meant by the phrase value for money? Where would you like your money to be invested into when supporting young people in challenging circumstances?

Notes of the discussion:

The young people's experiences:

Community:

- Needed RELATIONSHIP before any formal, scary and daunting interaction
- Help needed to be more accessible - needed long term support not just short term and crisis support
- Services not being joined up or knowing what the offer is for a young person and therefore duplication of sharing information
- Everything is criteria based & knowing what you match or don't match
- Transitions were challenging when moving back into the community; young people have to fight for the right support
- A system which meant people had to go in and out of crisis to get help

- Inconsistencies in staffing
- Every service has a different care plan with nothing joined up. Leaves people feeling like a tick box exercise
- There was no joint care plan, each service had their own
- The lack of trust made 'me' want to just rebel more

Secure Estate:

- Needed RELATIONSHIP before any formal, scary and daunting interaction with staff
- When you arrive all hope is gone, it's the end, feels like there is no purpose to life
- Insufficient, not enough young men getting the help they needed
- Hard to get help - may only just be able to see a nurse
- Medication was used a lot; blocking how we felt;
- parcetamol given as a quick fix, ignoring the real physical issue that was diagnosed after release
- Specific training was needed for staff
- All I wanted was someone to talk to; some kind of counselling.
- If a shorter sentence this should happen immediately as they will be back in the community sooner and want to stop the cycle.

Secure Stairs Reflections on the service described in the Young Minds leaflet:

- Could make a big difference
- Looks like an empathetic approach
- Good to be working WITH a young person
- Good to consider the young persons story, shows that you care, allows trust to develop
- It can be traumatic to talk, it takes time to open up
- An opportunity to make amends - let no one paint a picture for you
- Allows time to reflect on your own value
- Building connection and being relational is important
- Treats people more like individuals and not just inmates and makes you feel more human
- Allows the power to be more equal
- Helps you to believe that staff believe in you
- Knowing staff have been trained by doing their own story would help
- That its not always your fault
- Takes away the paranoia of the stigma you fear you will face
- Lets people open up
- Needs to be consistent though
- How can this work continue in the community?

Young people as an aside suggested the positive impact peer to peer support could be helpful in the delivery of secure stairs - young people explaining it to other young people and their own personal experiences of how it helped.

FCHAMs reflections on the service model

- Would be really good if the model for secure stairs (particularly the diagram about the stages) could be used for F CHAMS.

- Seemed more about me and not with me so different than the move for secure stairs
- Should also include trust and goal setting
- Who is aware of the service - lots of third sector organisations picking up work around supporting young people; are they aware of the service are they doing certain support work that goes undetected.
- Questions around the size of the service and how it can link to secure stairs when young people re enter the community having experienced secure stairs - what if FCHAMs can't then meet the need?
- Unsure what the professional relationship looks like in this - not as clear
- Would be good to have some literature for young people to know when referred/involved what it is
- Should there be more support in the community?
- Surprised that CAMHS needed help to identify trauma, rather than seeing it as behavior

What does SUCCESS / VALUE for money look like:

- A trusting relationship changes EVERYTHING: what you eat, when you get up, exercise, education, doing the right thing, respect for others, interpersonal skills. All because someone believes in you.
- Small things that show someone cares can make a big difference
- Being reassured its going to be ok
- Equip you with the reassurances and communication and being informed that something is happening
- Leaving the secure estate feeling like you don't want to offend
- Feeling like a programme met your need and worked for you
- Knowing support can still be available and decrease at your own speed/need
- Knowing how to get a job
- A home and knowing that how you behave makes a difference to your credit
- Stopping replication in your own families
- Understanding your own past to inform your future, sometimes things are not all your own fault
- There is a big gap in the community and it didn't look like F-CAMHS filled it enough?

Appendix B: example of staffing levels and structure in own late implementing focus study site

Data source recruitment returns September 2019

Original Structure

Role	AFC Band	WTE	Column1
Psychiatrist x 1 session per month		0.05	
Band 8a Psychologist	8a	0.4	This was 0.6
Team Leader	7	0.5	
LD Nurse	6	0.5	
RMN	6	1	
RMN	5	1	
Psychosocial/Recovery Workers	5	2	
Creative Therapist	6	0.6	This was and is 0.5
Total		**6.05**	

Additional Posts stated in SECURE STAIRS Commissioning Plan

Role	AFC Band	WTE	Column1
Clinical Psychologist (CLINICAL LEAD)	8c	1	
Psychiatrist x 1 Session / Fortnight (Uplift from x 1 session per month)		0.05	
Band 8b Psychologist	8b	1	
Band 8a Psychologist	8a	1	This is 0.4 uplift
Assistant Psychologist	4	1	
Team Leader	7	0.5	
Band 6 RMN/RNLD/SALT	6	0.5	
Band 6 RMN/RNLD/SALT	6	1	
Band 6 RMN/RNLD/SALT	6	1	

Admin	3	1	
Deputy Head of Healthcare / Project Coordinator	8a	1	
Total		**9.05**	

New Structure

Role	AFC Band	WTE	Was this a SECURE STAIRS Post?	If Yes to previous question, how much?	What date was this post recruited to?	What date was individual physically in post?	In Post / Vacant	Has staff been retained in this post?	If no to previous question, why?
Clinical Psychologist (CLINICAL LEAD)	8c	0.9	Yes	0.9 wte	30th April 2019	1st August 2019	In post	yes	
Psychiatrist x 1 Session / Fortnight (Uplift from x 1 session per month)		0.1	Yes	0.05 wte	No official date	Sep-19	In post	yes	
Band 8b Psychologist	8b	1	Yes	1 wte			Vacant		
Band 8a Psychologist	8a	1	Yes	0.4 wte	May-19	3rd October 2019	Vacant		
Assistant Psychologist	4	1	Yes	1 wte	Jan-19	24th February 2019	In post	yes	
Team Leader	7	1	Yes	0.5 wte	Feb-19	Feb-19	In post	yes	
LD Nurse	6	1	Yes	0.5 wte	27th February 2019	9th June 2019	In post	yes	
Band 6 RMN/RNLD/SALT	6	1	No				In post		
Band 6 RMN/RNLD/SALT	6	1	Yes	1 wte	28th February 2019	Apr-19	In post	yes	
RMN	5	1	No				Vacant		
Band 6 RMN/RNLD/SALT	6	1	Yes	1 wte	28th February 2019	28th April 2019	In post	yes	
Psychosocial/Recovery Workers	5	1	No				In post		
Psychosocial/Recovery Workers	5	1	No				In post		
Admin	3	1	Yes	1 wte	25th July 2019		Vacant		
Creative Therapist	6	0.5	No				In post		
Deputy Head of Healthcare/ Project Coordinator	8a	1	Yes			01/09/2018	In Post	Yes	
Total		**14.5**							

Additional Questions

Question	Response
Have any posts been retrospectively changed and If so which ones and why?	
Have you had any issues with Recruitment and if so in what way?	Recruiting to the psychology posts has been challenging. We are about to interview for the vacant 8b post and have two applicants. Recruiting to a band 5 RMN post has been challenging too; the advert has been out once and attracted 3 applicants who all withdrew before the interview date.
What was done to rectify this?	If we recruit to the band 8b psychology post I will then re-advertise the band 5 RMN post. We have considered changing the requirement to 1 wte band 7 SALT and another 1 wte band 6 RMN/RNLD/OT if we are unable to recruit to the band 8b psychology post.
Have any lessons been learned?	

Appendix C: Systematic review – Search strategy

Search strategy for Web of Science

Search run 16.07.18

Search History:

Search History				
Set	**Results**	**Save HistoryOpen Saved History**	**Combine Sets AND OR Combine**	**Delete Sets Select All Delete**
# 11	2,712	#10 AND #9 *Timespan=2000-2018* *Search language=English*		
# 10	3,809,468	TS=(adolescen* OR boy* OR child* OR delinquen* OR girl* OR graders OR infant* OR junior* OR juvenile* OR kindergarten OR minors OR pediatric* OR paediatric* OR postpubert* OR postpubescen* OR preadolescen* OR prepubert* OR prepubescen* OR preschool* OR preteen* OR pubert* OR pubescen* OR school* OR teen* OR toddler* OR "young* people" OR "young person*" OR "young patient*" OR "young population*" OR youngster* OR youth*) *Timespan=2000-2018* *Search language=English*		
# 9	9,954	#8 AND #7 *Timespan=2000-2018* *Search language=English*		
# 8	2,812,046	TS=(budget* OR costs OR "cost analysis" OR economics OR "economic evaluation" OR fee OR funding OR "health care cost*" OR "health economic*" OR pharmacoeconomics OR "resource allocation" OR "value of life" OR "cost containment" OR finance OR "health care economics" OR price* OR pricing OR monetary OR money OR "decision analysis" OR "decision model" OR "decision theory" OR "decision tree" OR "monte carlo method" OR "markov chains" OR "stochastic modelling" OR "quality of life" OR "quality adjusted life" OR "quality adjusted life year*" OR "quality of life index" OR "short form 12" OR "short form 20" OR "short form 36" OR "short form 8" OR "sickness impact profile" OR disutility OR "utility		

		health" OR "utility score*" OR "utility value*" OR "utility weight*" OR "disability adjusted" OR "quality adjusted" OR "health year equivalent" OR hye* OR daly OR qal OR qale OR qaly* OR qwb OR qol OR hq1* OR hqol* OR hrqol* OR "hr ql" OR "h qol" OR hrql OR "standard gamble" OR "time trade" OR tto OR "willingness to pay" OR "discrete choice" OR sf36 OR "short form 36" OR "sf thirty six" OR "short form thirtysix" OR "short form thirty six" OR sf6 OR "sf 6" OR "sf six" OR sfsix OR "short form six" OR "shortform six" OR sf-6d OR “short form six dimension” OR “short form-6 dimension” OR “shortform-6D” OR sf12 OR "sf 12" OR "shortform 12" OR "sf twelve" OR sftwelve OR "shortform twelve" OR "short form twelve" OR sf16 OR "sf 16" OR "shortform 16" OR "sf sixteen" OR "sfsixteen" OR "shortform sixteen" OR "short form sixteen" OR sf20 OR "sf 20" OR "shortform 20" OR "sf twenty" OR "sftwenty" OR "shortform twenty" OR "short form twenty" OR “eq-5d” OR eq5d OR “eq-5d-3l” OR eq5d3l OR “eq-5dy” OR “eq-5d-y” OR “eq-5d-5l” OR eq5d5l OR “general health questionnaire 12” OR “ghq-12” OR ghq12 OR “twelve-item general health questionnaire”) *Timespan=2000-2018* *Search language=English*		
# 7	**96,677**	#6 AND #5 *Timespan=2000-2018* *Search language=English*	☐	☐
# 6	**2,551,598**	TS=("assisted living" OR "breach of bail" OR "combined order" OR convict* OR correction* OR court* OR crime* OR criminal* OR custod* OR detention* OR felon* OR "group home*" OR "high security" OR incarcerat* OR inmate* OR "in* mate*" OR jail* OR justice* OR offenc* OR offender* OR offending OR penal OR prison* OR probation* OR "public order" OR "re offend*" OR recidivi* OR "rehabilitation cent*" OR reincarcerat* OR reoffend* OR revocation OR "secure treatment" OR "secure communit*" OR detain* OR detention* OR refer* OR rehab* OR suspen* order* OR "community order" OR "community service" OR "community sentenc*" OR correction* "secure establishment*" OR "secure facilit*" OR "secure program*" OR "secure setting*" OR "secure unit" OR "locked unit" OR "open unit" OR "unlocked unit*" OR "residential care" OR "residential center*" OR "residential centre*" OR "residential establishment*" OR "residential facility*" OR "residential placement*" OR "residential program*" OR	☐	☐

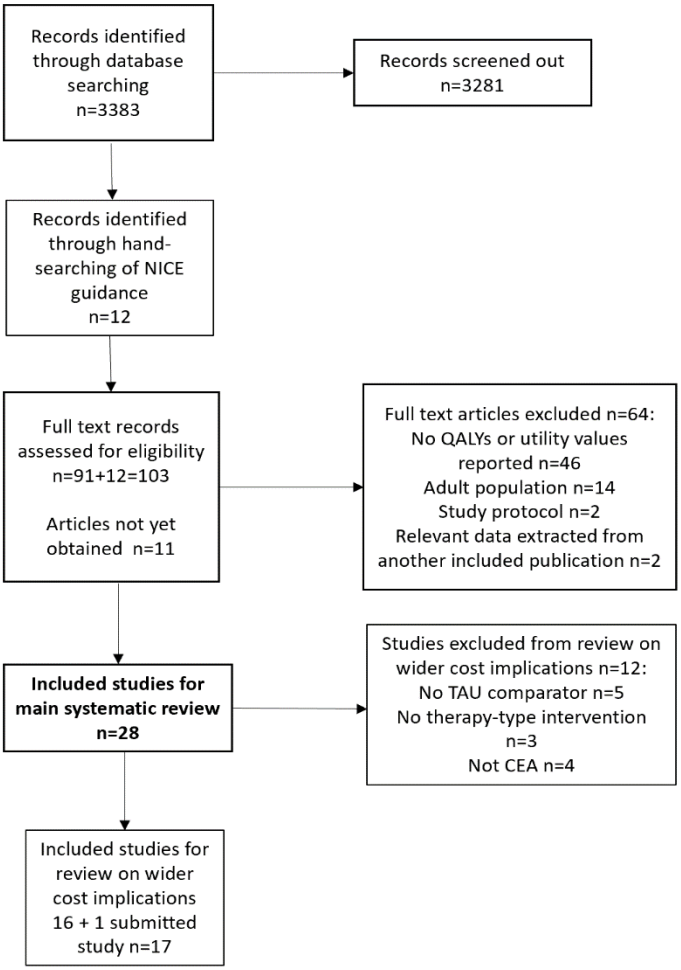
		residential setting* OR "residential treatment*" OR "statutory order") *Timespan=2000-2018* *Search language=English*		
# 5	**533,441**	#4 OR #3 *Timespan=2000-2018* *Search language=English*	☐	☐
# 4	**410,771**	#2 OR #1 *Timespan=2000-2018* *Search language=English*	☐	☐
# 3	**223,755**	TI=(absenteeism OR aggressi* OR arson OR assault OR burglary OR conflict OR crime OR criminal OR "criminal damage" OR "dangerous driving" OR delinquen* OR "domestic burglary" OR "fire-setting" OR forgery OR fraud OR gang OR "juvenile delinquen*" OR psychopath* OR rape OR recumbency OR robbery OR theft OR torture OR violence OR bully* OR cruelty OR homicide OR murder* OR "motoring offences" OR "physical abuse" OR psychopathy OR "racially aggravated" OR rebelliousness OR robbery OR "school violence" OR "sex offences" OR "sexual offence*" OR truancy OR vandalism OR violent OR violence) *Timespan=2000-2018* *Search language=English*	☐	☐
# 2	**393,253**	TI=("affective psychosis" OR anxiet* OR anxious* OR "anxiety disorder" OR "attention deficit disorder" OR adhd OR "attention deficit hyperactivity disorder" OR "mood disorder*" OR neurosis OR neurotic* OR "conduct disorder*" OR "opposition* defiant disorder*" OR aggressi* OR conflict OR "depress*" OR "impulse control disorder*" OR "mental* deficienc" OR "mental disease*" OR "mental disorder*" OR "mental disturbance*" OR "mental dysfunction" OR "mental health" OR "mental illness*" OR "personality disorder*" OR "psychologic* deficienc*" OR "psychologic* disorder*" OR "psychologic* disturbance*" OR "psychologic* disease*" OR "psychologic* dysfunction" OR "psychologic* health" OR "psychologic* illness" OR "psychologic* problem*" OR "schizoaffective disorder*") *Timespan=2000-2018* *Search language=English*	☐	☐
# 1	**223,134**	TI=("agnostic behavior*" OR "challeng* behavior*" OR "dangerous behavior*" OR "destructive behavior*" OR		

		"difficult* behavior*" OR "disrupt* behavior*" OR "disturb* behavior*" OR "externali* behavior" OR "problem* behavior*" OR "agnostic behaviour*" OR "challeng* behaviour*" OR "dangerous behaviour*" OR "destructive behaviour*" OR "difficult* behaviour*" OR "disrupt* behaviour*" OR "disturb* behaviour*" OR "externali* behaviour" OR "problem* behaviour*" OR "compulsive behaviour*" OR "compulsive behavior" OR "behavior disorder*" OR "behaviour disorder" OR "behavior problem*" OR "behaviour problem" OR "antisocial behavior*" OR "antisocial behaviour" OR arson OR assault OR conflict OR "criminal behavior" OR "criminal behaviour" OR delinquen* OR "depress*" OR "disruptive behaviour disorder*" OR "disruptive behavior disorder" OR "runaway behaviour" OR "runaway behavior") *Timespan=2000-2018* *Search language=English*		

Appendix D: Review protocol

PICO and review parameters	Definition	Notes
Population	CYP with conduct problems and/or exhibiting risky behaviour, symptoms of mental disorders CYP in secure institutions	**Include:** any mental illnesses and conduct disorders/oppositional defiant disorders and any degree of severity; risky behaviour where there is risk of harm to themselves, others, property; or criminal activity. Also include CYP in secure institutions or known to any part of the youth justice system (FCAMHS, YOS) or education EBD provision eg PRUs, and welfare homes (regardless of mental health status). CYP aged 10 – 21 years **Exclude**: Mixed populations where mean age is above 21 years.
Interventions	Any intervention, used to improve or prevent deterioration in CYP's mental health or risky behaviour.	**Include:** any intervention including individual, parental/family, group, community, school-based or service interventions as well as indirect case-management/case-co-ordination interventions **Exclude**: No exclusions
Comparators	Any alternative strategy or combinations of strategies No alternative strategy	**Include** any comparator.
Outcomes	QALYs Utility values	**Includes**: Quality-adjusted life years (QALYs) Utility values Incremental cost-effectiveness ratio (ICER) Preference-based outcome measures e.g. EQ-5D-Y, CHU-9D Health-related QoL measured using any scale or proxy including professional report; self-report; family/carer assessment; joint assessment.
Type of study	Economic evaluations RCTs or other clinical trials with economic component	Cost utility analysis (CUA) Cost effectiveness analysis (CEA)
Setting	Any setting	**Include:** Any setting, not just those relating to the youth/criminal justice system.
Other inclusion criteria relating to publication	English language Published: 2000-2018 Include studies from all countries	Electronic search (no hand-searching) Plus – papers submitted by research team Papers identified from NICE guidance

Appendix E: PRISMA flow diagram



Appendix F: Evidence table

QALYs and utility values for CYP with, or at risk of developing, mental health problems who are in, or at risk of entering, the criminal justice system, or who are in secure residential homes

(n=28 studies)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Bodden et al 2008 RCT Economic analysis: Societal perspective ITT analysis Imputed missing values Bootstrap simulations to account for skewed distribution and uncertainty. Bootstrapped ICERs depicted in a cost-effectiveness acceptability curve (CEAC) using a	**Intervention** Individual CBT vs family CBT (12 sessions) **Population** CYP with anxiety Aged 8-18 Inclusion criteria: Primary anxiety disorders IQ≥80 Exclusion criteria: OCD PTSD Current usage of medication for anxiety unless medication stopped or dosage kept	Costings included direct healthcare costs, direct non-healthcare costs, indirect costs and out of pocket costs. "Micro-costing" (detailed bottom up costing) of costs relating to CYP's anxiety. Collected using cost diaries, published medication costs and from Dutch guidelines. Cost price of day treatment: €144 per CYP per day	QALYs Cost per anxiety-free CYP **Clinical outcomes:** Scores on: ADIS-C/P for DSM-IV ADIS-A (child and parents) **For CE analysis**: EQ-5D (completed by parents) Scores recorded pre and post-treatment. Follow up: 3 and 12 months ICER expressed as costs per anxiety free CYP and incremental costs per QALY.	**Clinical findings** **ADIS** Findings directly after treatment Proportion of anxiety-free CYP: Individual CBT: 0.54 Family CBT: 0.28 Findings at 3 months Proportion of anxiety free CYP: Individual CBT: 0.58 Family CBT: 0.47 Findings at 12 months Proportion of anxiety free CYP: Individual CBT: 0.68 Family CBT: 0.53

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td>range of ceiling ratios.

Adjustments made for pre-treatment differences using regression analysis for both EQ-5D scores and cost differences. Variables tested: age, gender, treatment condition, pre-treatment utility value and pre-treatment costs. Final utility value corrected for pre-treatment utility value and pre-treatment costs.

Time horizon: 15 months

Netherlands</td>
<td>constant for duration of study

Substance misuse

Psychoses

ASD

Untreated ADHD

Current attempted suicide

Study sample:

N=128

Mean age 12.3 (range 8-17 years)

62% female

99% Caucasian

46% at primary school

In 41% families at least one parent had primary anxiety disorder

Loss to follow up n=12</td>
<td>Cost of school absence: €8.30 per hour</td>
<td>Also CE per anxiety free family (parents and siblings scores also included)

Corrected utility values per EQ-5D unit used to calculate QALYs.</td>
<td>No signif. diff.

Cost-effectiveness analysis

<table>
<tr><th colspan="3">Mean scores (SD) for EQ-5D for individual CBT (n=59) and family CBT (n=57)</th></tr>
<tr><th></th><th>VAS score</th><th>Utility values</th></tr>
<tr><td>ICBT pre</td><td>77.9 (13.75)</td><td>0.87 (0.13)</td></tr>
<tr><td>FCBT pre</td><td>76.2 (14.99)</td><td>0.83 (0.20)</td></tr>
<tr><td>ICBT post</td><td>85.2 (9.17)</td><td>0.96 (0.08)</td></tr>
<tr><td>FCBT post</td><td>81.7 (11.12)</td><td>0.92 (0.12)</td></tr>
<tr><td>ICBT 3m follow up</td><td>85.4 (8.67)</td><td>0.94 (0.11)</td></tr>
<tr><td>FCBT 3m follow up</td><td>80.7 (10.99)</td><td>0.93 (0.12)</td></tr>
<tr><td>ICBT 1 yr follow up</td><td>85.2 (10.88)</td><td>0.95 (0.11)</td></tr>
<tr><td>FCBT 1 yr follow up</td><td>83.1 (10.03)</td><td>0.94 (0.10)</td></tr>
</table>
QALYs (out of a possible 1.25):

ICBT: 1.18 (SD 0.09)

FCBT: 1.15 (SD 0.11)

EQ-5D scores on each of the 5 sub-scales very similar across all scores, with mean scores ranging from 1.0 to 1.7 (29/40 possible scores 1.0 or 1.1)</td>
</tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Setting Unclear			EQ-5D: Individual vs family CBT - no significant differences across all scores including utility values at both 3 and 12 months. **Costs per anxiety-free CYP:** Main results: Total mean (SD) societal costs for ind. CBT: €2,751 (€4,774) Total societal costs for family CBT: €3,051 (€4,582) Incremental cost difference individual vs family CBT: €300 (family more costly) QALYs gained over 15 months (out of a possible 1.25) (mean (SD)): Individual CBT: 1.18 (0.09) Family CBT: 1.15 (0.11) **Regression corrected data:** Total societal costs for ind. CBT: €1,018 Total societal costs for family CBT: €1,404 Incremental cost difference individual vs family CBT: €386 (family more costly) QALYs gained over 15 months (out of a possible 1.25): Individual CBT: 1.02 Family CBT: 1.01 Family CBT inferior to individual CBT.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Bootstrapping supported this conclusion with 57% of ICERs in northwest quadrant (i.e. family CBT more expensive and less effective than individual CBT). Similar finding for anxiety free family days.
Byford et al 2007 Cost-effectiveness analysis of pragmatic RCT data. Broad service providing perspective including health care, social services, education, voluntary and private sectors. Outcomes and costs assessed at baseline, 12 and 28 weeks. UK	**Intervention** Compares selective serotonin reuptake inhibitors (SSRIs) with SSRIs plus cognitive behavioural therapy (CBT) both provided in addition to routine care. SSRI group: fluoxetine (unless contraindicated) plus 9 out-patient sessions over 28 weeks, increased depending upon need. SSRI+CBT group: As SSRI group plus weekly CBT for 12 weeks, followed by 6 maintenance sessions every 2 weeks and a final session at 28 weeks. **Population** Young people aged 11-17 years meeting DSM-IV	Costed across services plus travel costs to intervention sessions and lost productivity costs of primary carer. Economic information collected at baseline, 12 weeks and 28 weeks using the Child and Adolescent Service Use Schedule (CA-SUS). Data on trial interventions including medication use collected from clinical records. Unit costs are for year 2003-2004. Intervention costs based on salary of the professional involved and included relevant	Cost-effectiveness explored through calculation of ICERs. Non-parametric bootstrapping from costs and effectiveness data used to generate a joint distribution of incremental mean costs and effects from the two intervention groups. This then used to calculate the probability that each is the most cost-effective choice subject to a range of maximum values (ceiling ratio) that a commissioner would be willing to pay for a unit improvement in outcome. QALYs **Health outcomes** HoNOSCA score - global mental health impairment (range 0 – 52, higher	Full economic data available for 188 participants (90%). Length of follow up varied greatly, mean 29 weeks (range 21 – 51 weeks). 2 intervention groups similar with no signif. difference in baseline characteristics: **Baseline values** **Female gender:** CBT+SSRI group: 70 (73%) SSRI group: 66 (72%) **Age (median (range)):** CBT+SSRIs: 14 years (11 – 17) SSRIs: 14 years (11 – 17) **Behavioural disorder:** CBT+SSRIs: 29 (30%) SSRIs: 24 (26%) **HoNOSCA score (mean (SD)):**

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>criteria for major or probably major depression. Recruited June 2000 – November 2004.

2 groups:

SSRI n=103

SSRI + CBT n=105

Setting

2 UK hospital outpatient centres (Cambridge and Manchester)</td><td>on-costs (national insurance and superannuation contributions) and overheads (administrative, managerial and capital).

Intervention time allocated for SSRI+CBT group: 55 minutes; and for SSRI group: 30 min. Includes time spent in supervision.

Intervention costs based on number of sessions attended (not number allocated).

Drug costs from British National Formulary. Hospital contacts costed using NHS Reference Costs (DH 2004).

School costs came from Ofsted reports and published documents. Productivity losses</td><td>scores indicate worse outcomes)

EQ-5D – health-related quality of life</td><td>CBT+SSRIs: 25 (6)

SSRIs: 26 (6)

Mean cost per session:

CBT+SSRI: £67 (range £41 - £216)

SSRI alone: £36 (range £22 - £118)

Health outcome findings:

<table><tr><th></th><th>CBT+SSRIs (mean(SD))</th><th>SSRIs (mean (SD))</th><th>Difference (95% CI)</th></tr><tr><td>EQ-5D VAS</td><td></td><td></td><td></td></tr><tr><td>Baseline</td><td>55 (21)</td><td>59 (21)</td><td>-4 (-10 to 2)</td></tr><tr><td>12 weeks</td><td>65 (18)</td><td>67 (21)</td><td>-3 (-9 to 3)</td></tr><tr><td>28 weeks</td><td>72 (19)</td><td>72 (22)</td><td>0 (-6 to 6)</td></tr><tr><td>EQ-5D utilities</td><td></td><td></td><td></td></tr><tr><td>Baseline</td><td>0.49 (0.30)</td><td>0.50 (0.29)</td><td>-0.02 (-0.10 to 0.06)</td></tr></table></td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td></td>
<td></td>
<td>calculated using the human capital approach.

Estimated costs

Mean cost per session:

CBT+SSRIs: £67 (range £41 - £216 depending upon seniority of health care professional

SSRIs: £36 (£22 - £118)

Cost of full course of CBT+SSRIs: £1273 (£779 – 4104) (assumes full attendance)

Actual cost CBT+SSRIs per study participant: £750 (few completed full course)</td>
<td></td>
<td>
<table>
<tr><td>12 weeks</td><td>0.68 (0.30)</td><td>0.73 (0.25)</td><td>-0.07 (9-0.14 to 0.01)</td></tr>
<tr><td>28 weeks</td><td>0.74 (0.30)</td><td>0.78 (0.26)</td><td>-0.04 (-0.12 to 0.04)</td></tr>
<tr><td>QALYs

28 weeks</td><td>0.36 (0.15)</td><td>0.38 (0.14)</td><td>-0.02 (-0.07 to 0.05)</td></tr>
<tr><td>HoNOSCA 28 weeks</td><td>15.39 (8.58)</td><td>14.52 (8.26)</td><td>1.24 (-1.05 to 3.52)</td></tr>
</table>

Hospital-based health service resource use:

<table>
<tr><th>Area of service</th><th>CBT+SSRIs (n=96)</th><th>SSRIs (n=92)</th><th>Using service (%)</th></tr>
<tr><td>No. intervention sessions</td><td>11.3 (5.8)</td><td>7.0 (4.0)</td><td>98</td></tr>
<tr><td>Inpatient days</td><td>5.8 (24.0)</td><td>0.6 (2.7)</td><td>13</td></tr>
<tr><td>Outpatient contacts</td><td>2.1 (4.6)</td><td>1.7 (3.3)</td><td>38</td></tr>
</table>
</td>
</tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				<table><tr><td>Day patient contacts</td><td>0.1 (0.3)</td><td>0.0 (0.2)</td><td>3</td></tr><tr><td>A&E contacts</td><td>0.5 (1.0)</td><td>0.4 (0.8)</td><td>31</td></tr></table> Young people in SSRI+CBT group attended significantly more sessions and had more in-patient days than young people in the SSRI group. Other services: community health care, social care, education, voluntary sector, private sector services – no signif. diff. in resource use between groups. **Total costs over 28 weeks** CBT+SSRIs: £6940 per participant SSRIs: £4640 per participant p=0.057 Significantly higher costs for CBT+SSRIs group in terms of intervention sessions and secondary health care: Intervention sessions (mean cost (SD)) CBT+SSRIs: £752 (£683) SSRIs: £262 (£196) Mean difference £491 (95% CI £344 to £639) Secondary health care (mean cost (SD)): CBT+SSRIs: £2652 (£9388) SSRIs: £551 (£1109)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				This difference driven mainly by 2 young people in CBT+SSRIs group who were admitted to hospital for long period of time during the trial. Given that there was no difference in effectiveness between the 2 groups and CBT+SSRI was more costly it can be concluded on face value that SSRIs alone is a more cost-effective intervention. This was tested further with plotting of cost-effectiveness acceptability curves which suggested that at best there was a 26% probability that CBT+SSRI is more cost-effective than SSRIs in terms of HoNOSCA scores, and a 4% probability in terms of QALYs. Even when data from the 2 young people who were admitted as in-patients was removed from the analysis there was still <50% probability that CBT+SSRIs was more cost-effective than SSRIs alone. (Note: plot of incremental cost by incremental effect shown graphically but no summary values reported.)
Chong et al 2015 Modelling study. Cost-utility analysis State transition (Markov) decision model from healthcare perspective. Time horizon: 5 years after initial injury	Compares hospital-based violence intervention program (HVIP) vs usual care **Intervention** HVIP ("Caught in the Crossfire"): intensive individual and family case management and support, including access to victim restitution funds, assistance with	Costs derived from hospital's trauma registry. Hospital charges converted into costs using Medicare's annual cost-to-charge ratios. Base case annual recidivism 2.5%	QALYs Effectiveness outcome: probability of violent recurrent injury 3 annual outcomes in model: Well Reinjured Dead	**Clinical findings** From hospital records Annual recidivism: HVIP: 2.5% Standard care: 4% **Cost effectiveness** Utility value for violent injury = 0.70 for the year following injury; 0.84 for subsequent years

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
USA	insurance, help with medical costs and transport to and from medical appointments, help obtaining education or employment support, help obtaining a drivers' license and referral to mental health services. Usual care: standard counselling by injury prevention co-ordinator with no routine follow up. **Population** CYP presenting with a firearm injury due to interpersonal violence Inclusion criteria: Age 12-20 Presented at trauma centre between 2005 and 2008 Exclusion criteria: Self-inflicted injury Injured by police	Hospital costs after recidivism: HVIP: $6,513 (avg) Standard referrals: $18,722 (avg) Cost of HVIP: $2,810 per CYP		1 year cycle time frame used, translating to 5 Markovian cycles in the model. **Base case findings from model over 5 years:** HVIP: Total cost per person: $3,574 Effectiveness: 4.64 QALYs Standard care: Total cost per person: $3,015 Effectiveness: 4.62 QALYs Incremental cost of HVIP: $59 ICER: $2,941 per QALY Authors' conclusion: HVIP similar in cost to usual care and similar QALY gain, however. better to spend money on prevention rather than treatment.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Died prior to discharge from hospital **Base case for HE model** 18 year old patient with firearm injury who survives to hospital discharge. Probabilities of outcome derived from trauma centre's experience (hospital's activity data) and literature **Setting** Hospital-based trauma centre, California			
Creswell et al 2017 RCT Economic analysis: Cost utility analysis ITT analysis Societal perspective on	**Intervention** Brief guided parent-delivered CBT vs solution-focused brief therapy Brief guided parent-delivered CBT: parents given self-help book + up to 8 weekly sessions of therapist-supported brief-guided parent-delivered CBT (4 sessions face to	Parents recorded patient level resource use using diaries. Data included all health and social care, non-NHS (e.g. education) cost-generating services, and lost leisure and productivity time estimates.	QALYs **Primary clinical outcome** Clinician-rated recovery measured using CGI-I - rated as "much" or "very much" improved. The CGI-I established on the basis of child's and	**Clinical findings** Findings after treatment (much or very much improved): Brief guided parent-del CBT: 40 (59%) Solution-focused brief therapy: 47 (69%) Not signif. At 6 months: Brief guided parent-del CBT: 45 (66%) Solution-focused brief therapy: 49 (72%)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
resource use and cost Missing data imputed No discounting applied. UK	face and 4 sessions via telephone). Total contact time approx. 5 hours. Solution-focused therapy: future-focused form of counselling. Initial face to face session with parent and child (1 hour); 4 focused face to face sessions with the child (45 min) and a final session with child and parent (60 min). Total contact time approx. 5 hours. Study therapists = primary health care workers incl. health visitors, nurses, occupational therapists, clinical psychology and psychology graduates. Given 2 hours training + fortnightly supervision. **Population** Children with anxiety associated with clinical impairment Age 5-12		parents' reports on ADIS-c/p Child Health Utility 9D used for cost utility analysis. Scores recorded pre and post-treatment; 6 months follow up. Secondary outcomes: clinical severity ratings for symptoms of anxiety – SCAS-c/p. For CE analysis: CHU-9D (base case analysis carried out using child report version) EQ-5D-Y (for sensitivity analysis)	Not signif. **Cost effectiveness** CHU-9D values (mean (SD)) Brief guided parent del CBT: Baseline: 0.87 (0.09) After treatment: 0.90 (0.10) 6 month follow up: 0.91 (0.08) Solution-focused brief therapy: Baseline: 0.88 (0.09) After treatment: 0.90 (0.09) 6 month follow up: 0.91 (0.08) EQ-5D-Y values (mean (SD)) Brief guided parent del CBT: Baseline: 0.82 (0.15) After treatment: 0.88 (0.21) 6 month follow up: 0.87 (0.19)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Exclusion criteria: Prescribed psychotropic medicine Parents or children with little understanding of English or physical or intellectual impairment that would interfere with ability to take part in study Sample: N=136 (n=68 in each study group) Follow-up: 6 months after treatment completion **Setting** 4 primary CAMHS, Oxfordshire. Setting for therapy sessions not reported.			Solution-focused brief therapy: Baseline: 0.80 (0.20) After treatment: 0.86 (0.21) 6 month follow up: 0.91 (0.16) QALYs gained over trial period in base case analysis: mean 0.006 (95% CI -0.009 to 0.02) Mean (SD) societal cost: Brief guided parent-delivered CBT: £1,494 (£1,107.79) Solution-focused brief therapy: £1,942 (£1,590.91) Mean diff -£448 (95% CI -£934 to £37) Main drivers of lower cost of CBT: Lower treatment costs: -£133 (95% CI -£204 to -£63) Time off school/work/lost leisure time: -£200 (-£386 to -£13) Probability that brief guided parent-delivered CBT is cost effective compared with solution-focused brief therapy is 96% based on NICE thresholds for willingness to pay for an extra QALY (sensitivity analyses ranging from 74% to 99%).
Domino et al 2008 RCT	RCT to compare 4 groups **Intervention**	Costs generated by either study staff or caregivers.	**Health outcome:**	N=351 completed 12 weeks of study, 80% of original sample. Mean age: 14.6 years

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Cost-effectiveness analysis ITT analysis Societal perspective on resource use and cost No discounting applied. Time horizon: 12 weeks USA	3 groups 12 weeks of treatment with: Fluoxetine alone CBT alone Combination therapy **Comparator** Pill placebo **Population** Young people aged 12 to 18 years with primary DSM-IV diagnosis of major depressive disorder (MDD). N=439 recruited **Setting** Academic and community clinics	Cost of fluoxetine from 2003 Medicaid fee-for-service drug claim data: $0.451 per 10mg pill. Cost of one session of CBT: $113.09 Cost of one medication management session: $59.83 - based on 2003 Medicare rate. Costs of out-of-protocol service use e.g. inpatient hospital episodes, school-based counselling also included in the analysis. Time and travel costs for adult caregivers also included. Missing values imputed using national survey data	CDRS-R score converted into depression free days (DFDs) DFDs calculated using the baseline, 6 week and 12 week values on the CDRS-R. Scores based on symptoms for previous week and linearly interpolated between endpoints of each period to obtain a score for each day. Daily score <29 coded as "depression free" Daily score >45 coded as having full depressive symptoms. Daily scores 29 – 45 coded to be proportionately depression free. **HE outcome** QALYs – calculated from DFDs using measures reported in adult-based studies (Pyne et al, 2007;	57% female Overall: CYP experienced on average 22 (SD 20.9) DFDs during the 84-day study period giving a QALY measure of 0.16 (SD 0.023) at 12 weeks. 26% CYP attained remission (CDRS-R score ≤28). Both fluoxetine and combination therapy shown to be effective compared with placebo. CBT alone found to be not effective compared with placebo. (Effectiveness values not reported) No difference found in CBT costs between YP receiving CBT as monotherapy and those receiving CBT in combination therapy (mean level of CBT provision same for 2 trial arms, as per study protocol). Median medication costs signif. higher in fluoxetine treatment arm than in combination therapy arm ($90 vs $74; p<0.01). Costs of adjunctive services and attrition prevention minimal. Overall, total costs for combination therapy significantly higher than other study groups: Combination: $2,832 CBT: $2,287 Fluoxetine: $942 Placebo: $841 p<0.01 **ICER estimates for the 3 outcome measures** **12-week outcomes**

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td>and data from other respondents using the same service type.</td><td>Lave et al, 1998; Lynch et al, 2005).</td><td>
<table>
<tr><th>Treatment comparison</th><th>CDRS-R</th><th>DFDs</th><th>QALYs</th></tr>
<tr><td>Fluoxetine/placebo</td><td>$61</td><td>$26</td><td>$23,737</td></tr>
<tr><td>CBT/placebo</td><td>N/A[a]</td><td>$10,087[b]</td><td>$9,210,622[b]</td></tr>
<tr><td>Combination/placebo</td><td>$249[b]</td><td>$135[b]</td><td>$123,143[b]</td></tr>
<tr><td>Combination/fluoxetine</td><td>$542</td><td>$502</td><td>$458,818</td></tr>
</table>
[a] Cost-effectiveness ratio estimate for CBT negative since average effect on CDRS-R was negative

[b] Bias-corrected 95% CI after 1000 bootstrap replications did not contain 0

Sensitivity analyses performed to explore effect of differences in costs (drug costs and service costs) and efficacy variables (utility loss from depression, and exclusion of participants with missing values). Only notable influence on cost effectiveness was variation in utility loss from depression:

<table>
<tr><th colspan="5">Effects of altering efficacy assumptions for ICER estimates (2003 dollars per QALY)</th></tr>
<tr><td>Variable</td><td>Fluoxetine/ placebo</td><td>CBT/ placebo</td><td>Combination/ placebo</td><td>Combination/ fluoxetine</td></tr>
<tr><td>Utility loss: 0.2</td><td>$47,474</td><td>$18,421,435</td><td>$246,287</td><td>$917,637</td></tr>
<tr><td>Utility loss: 0.6</td><td>$15,825</td><td>$6,140,347</td><td>$82,096</td><td>$305,829</td></tr>
</table>
</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Dretzke et al 2006 SR + cost effectiveness analysis (HTA) Cost effectiveness – review of literature plus decision analytic modelling NHS and societal perspective No discounting applied (N/A) Time horizon: 1 year	Effectiveness SR: N = 37 RCTs For HE literature review: N=7 papers Parent/carer training programmes for treatment of conduct disorder vs control group (range of controls including alternative treatments or wait list controls) **Intervention** A non-structured parent-focused intervention such as a support group or informal home visits; parent training/education programme (with or without children present at some sessions)	Bottom-up approach based on expert opinion and HE literature review: Costs included: staff costs, staff supervision, travelling, crèche, course packs, room hire. Programme assumed to be 2 hours per week for 10 weeks. Costs per family of providing parent training programmes (assuming 8 families per group): Community based group programme £899 Clinic-based group programme £629 Individual programme: £3,839	QALYs (hypothetical) **Clinical outcomes** CYP behaviour measured using: ECBI frequency and intensity scales DP-C ICS CBCL	**From effectiveness SR:** **Clinical effectiveness** Consistent trend seen across studies for improvement in CBCL and ECBI scores for parent training/education compared with control. Meta-analysis: significant improvement in ECBI frequency and intensity subcategories, the CBCL and the DPICS measures. ECBI intensity scores - Intervention vs control (meta-analysis of 15 studies): Weighted mean difference (WMD): -20.44 (95% CI -27.36 to -13.53) Standardised mean difference (SMD): -0.73 (95% CI -0.97 to -0.48) CBCL score - Intervention vs control (meta-analysis of 10 studies): Estimated WMD: -4.36 (95% CI -7.90 to -0.81) SMD: -0.35 (-0.61 to -0.08) assumed to be similar across all 3 types of parent training programme No significant difference in outcome between the three types of parent training/education. **Cost effectiveness** Cost per responder (successfully treated CYP) assuming different "success" rates 50% success rate Group community-based: £1,438

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
UK	3 main types: group community-based; group clinic-based; individual home-based. **Population** Parents/cares of CYP where at least 50% have a behavioural conduct disorder Age up to 18 **Setting** Range of settings including community, clinic and home			Group clinic-based: £1,006 Individual home-based: £6,143 10% success rate Group community-based: £7,192 Group clinic-based: £5,030 Individual home-based: £10,060 QALYs derived from the scores measuring improvements in behaviour (ECBI and CBCL scales), converting the score to a plausible improvement in QoL. QALY gain limited to 1 year. Assuming no cost savings from treatment, incremental cost per QALY for parent training vs no intervention are as follows for different level of QoL improvement: QoL improvement 0.01 Group community-based: £89,898 Group clinic-based: £62, 875 Individual home-based: £383, 925 QoL improvement 0.05 Group community-based: £17,980 Group clinic-based: £12, 575 Individual home-based: £76,785 QoL improvement 0.2

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Group community-based: £4,495 Group clinic-based: £3,144 Individual home-based: £19,196
Eeren et al 2015 Value of information analysis Compares cost effectiveness of 2 interventions aimed at reducing juvenile delinquency. Further analysis using a Markov model then aims to determine the value for money for funding further health economics research on these interventions = value of information	**Interventions** Course House ("Kursushuis"): domestic foster home for several adolescents for approx. 10 months. Professional care "close at hand". Family Functional Therapy (FFT): 4-6 months (no further details reported). **Population** Young people in contact with the criminal justice system (described as "delinquent youth") Age 12-18 **Setting**	Costs included costs of health-care use; other societal costs e.g. costs to criminal justice system; family costs (costs to one parent). Interventions costs per YP: One completed FFT treatment: €10,900 Course House: €37,800	**Clinical and HE outcome**: Criminal activity free years (CAFY) 3 model outcomes: Criminal behaviour No criminal behaviour Dead CAFY based on YP's self-reported contact with police in connection with s/he having committed one or more crimes. No such police contact defined as criminal activity free. One or more police contacts defined as criminally active. Dying as a result of criminal activity not reflected in the CAFY. Instead YP assumed to have risk of death same	**Clinical effectiveness** CAFYs over 20 years: Course House: 12.4 years FFT: 11.7 years **Cost effectiveness** Cost over 20 years: Course House: €249,000 FFT: €222,200 Course House more effective than FFT but also more expensive. ICER of Course House compared with FFT: Course House: €39,000/CAFY Willingness to pay per CAFY: €71,700

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
analysis. Societal perspective taken. Time horizon 20 years with cycle length of 6 months. Costs discounted according to Dutch guidelines on economic analysis. Netherlands	Course House: community-based foster home FFT: multiple sites included in study but settings not reported		as general population of same age. ICER: Calculated as the difference in cost divided by the difference in CAFY's between Course House and FFT. Willingness to pay (WTP): Estimated by taking mean of range of published WTP values calculated for a range of crimes Net monetary benefit (NMB): calculated by multiplying CAFYs by the WTP value per CAFY and subtracting cost.	NMB: Course House: €641,200 FFT: €618,700 Course House seen to be cost-effective compared to FFT (NMB is higher)
Foster et al 2006 Cost effectiveness analysis	**Intervention** The Fast Track project: long-term multi-component project to reduce violence among CYP. Project mainly comprised parent and child group interventions including parenting skills	Costs estimated for study period autumn 1991 – summer 2003. Derived from annual budget records and detailed analysis of project costs.	**Clinical and HE outcomes** Number of cases of conduct disorder averted (assessed using the Diagnostic Interview Schedule for Children)	**Cost effectiveness** For whole study sample ICERs (Standard Error): Cost per case of conduct disorder averted: $3,481,433 ($81,000,000) Cost per (index) crime averted: $423,480 ($11,000,000) Cost per act of interpersonal violence averted: $736,010 ($38,700,000)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Uncertainty explored with bootstrapping Payer perspective (US state departments) Costs adjusted for inflation and discounted back to first year of study at a rate of 5%. Timespan: 9 years USA	training, peer relations, social skills training and academic tutoring. Also included universal classroom-based components (2-3 lessons per week) and one-to-one home visiting. Project lasted from 1st to 10th grade. Group work delivered over 22 2-hour weekly sessions in 1st grade, 14 bi-weekly sessions in 2nd grade, and 9 monthly sessions for 3rd to 6th grade. In addition, mentoring programmes were put in place from 4th grade. From 7th to 10th grade the project introduced targeted workshops and individualized intervention plans for the YP. Weekly consultation with teachers. Control group: 2-3 universal classroom-based components only.	Costings included salary costs for staff delivering the intervention, overhead costs e.g. rent and miscellaneous costs e.g. supplies. Average across sites and study participants: Cost per child: $58,283	Number of (index) crimes averted (assessed using the Self-Report of Delinquency) Number of acts of interpersonal violence averted (assessed using the Self-Report of Delinquency) ICER Calculated as the costs of the program divided by the incremental impact of the program WTP Calculated by updating published data to 2004 US dollars	WTP: Per case of conduct disorder averted: $1 million Index crime averted: $160,000 Act of interpersonal violence averted: $50,000 Fast Track intervention found to be not cost effective for all 3 outcomes i.e. ICER well above societal WTP with high degree of uncertainty within findings. Sub-group analyses by level of risk for developing conduct disorder: CYP at lower risk: ICERs (Standard Error): Cost per case of conduct disorder averted: -$2,059,828 ($75,100,000) Cost per (index) crime averted: -$1,786,032 ($40,400,000) Cost per act of interpersonal violence averted: -$9,046,977 ($12,900,000)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Population Children with classroom conduct problems. Inclusion criteria: Children at kindergarten scoring highly on teacher and parent-rating for conduct problems (high scores defined in comparison with a normative score obtained from representative sample of children from that same school). Exclusion criteria: Child failing to matriculate in 1st grade Girls to accommodate the rule that there would not be a single girl in any given intervention group. Sample: Recruited from kindergartens across 54 schools.			Negative values for ICERs indicate the intervention is not effective (and therefore not cost-effective) for averting conduct disorder, crime and acts of interpersonal violence in CYP at lower risk. CYP at higher risk: ICERs (Standard Error); probably that intervention is cost-effective: Cost per case of conduct disorder averted: $752,103 ($3,588,311); 69% Cost per (index) crime averted: $150,738 ($787,270); 57% Cost per act of interpersonal violence averted: $283,542 ($5,153,761); 0% There is a fair chance that the Fast Track intervention can be considered cost effective for averting cases of conduct disorder and may be cost-effective for averting (index) crimes in CYP at higher risk for developing conduct disorder.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Total screened for inclusion n=3274 Intervention group n=445 Control group n=446 **Setting** Schools			
Foster et al 2007 Cost effectiveness analysis of findings from a 4 arm RCT (the MTA study) Uncertainty explored with bootstrapping Payer perspective on costs Cost effectiveness analysis includes calculation of	**Interventions** Community care: community-based routine care (treatment as usual arm). Medication management: medication carefully titrated, monthly consultations with physician who consulted participant's teacher on classroom behaviour Multicomponent behavioural treatment: included parent training, 2-part school intervention programme, intensive summer treatment programme.	Direct costs of providing therapies calculated using treatment costs of clinical trial (MTA study). Costs assumed as being equal across sites and adjusted for inflation. Family costs assessed using a measure of service use, the Services for Children and Adolescents Parent Interview (SCAPI) – includes medical and school services, medication	**Clinical outcome measures:** Columbia Impairment Scale, CIS – measure of child functioning. Diagnostic Interview Schedule for Children – used to assess diagnoses of ADHD, conduct disorder, depression and anxiety disorders. **HE outcomes:** ICER Willingness to pay Net benefit (NB) CEAC	**Clinical findings** **Standardised CIS scores (mean (95% CI)):** Note: negative scores indicate an improvement in functioning. ADHD only (n=141): Med-man: -0.92 (-1.26 to -0.59) Behavioural: -0.70 (-1.00 to -0.40) Combination: -0.86 (-1.14 to -0.58) Community: -0.60 (-0.87 to -0.34) Significance level across all arms: p=0.40 ADHD+anxiety (n=64): Med-man: -0.77 (-1.26 to -0.27) Behavioural: -1.18 (-1.75 to -0.62) Combination: -0.71 (-1.25 to -0.16)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
ICERs, WTP, net benefit (NB) and CEAC USA	Combination group: combination of behavioural treatments and medication. Each treatment lasted for 14 months. **Population** Children diagnosed with ADHD Age 7 to 9.9 years Sub-group analyses: ADHD alone ADHD + anxiety ADHD + conduct disorder ADHD + anxiety + conduct disorder Sample size	costs, community mental health service use and juvenile justice services. Drug costs obtained from national drug data source. Hourly costs of professional staff based on reported annual salaries. Mean costs (95% CI) for children with ADHD only (no co-morbidities): Medical management: $979 ($807 to $1,151) Behavioural: $6,133 ($5,749 to $6,516) Combination: $7,064 ($6,815 to $7,314)	For each value of WTP the NBs were calculated for each individual = (improvement in functioning x WTP) minus costs. Bootstrapping the used to determine the probability that a given treatment had the highest NB. For CEAC: WTP plotted against probability that a given treatment had the highest NB.	Community: -0.21 (-0.71 to 0.29) Significance level across all arms: p=0.05 ADHD+conduct disorder (n=130): Med-man: -1.14 (-1.56 to -0.73) Behavioural: -0.88 (-1.26 to -0.49) Combination: -1.43 (-1.85 to -1.01) Community: -0.93 (-1.23 to -0.62) Significance level across all arms: p=0.16 ADHD+conduct disorder+anxiety (n=107): Med-man: -1.37 (-1.88 to -0.86) Behavioural: -1.50 (-1.97 to -1.03) Combination: -1.59 (-1.92 to -1.26) Community: -0.78 (-1.17 to -0.39) Significance level across all arms: p=0.03 Practical assessment of treatment outcome: ADHD+conduct disorder:

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	N=579 **Setting** 6 study sites involving primary schools and medical centres/physician's consulting rooms	Community: $975 ($543 to $1,408) Costs did not differ significantly between the 4 population sub-groups		Moving from community care to combination therapy reduces likelihood that "getting into trouble" is a "bad problem" from 19% to 7%. ADHD+anxiety: Moving from community care to any of the other therapies reduces likelihood that "behaviour at school" is a "bad problem" from 50% to 10%. **Cost-effectiveness** Outcome for CE = improvement in functioning. The WTP figures correspond to 1 SD in improvement in functioning measured on the CIS. From CEAC: At modest levels of willingness to pay (up to $50,000) for 1 SD improvement in functioning medical management almost certain to be cost-effective. At higher levels of WTP (above $50,000) combination therapy becomes more likely to be cost-effective. Behaviour therapy is dominated – other treatments are more effective and less costly. Sub-group analyses ADHD+conduct disorder: Medical management cost effective compared with community care but only at low WTP (up to approx. $20,000). Above this level medical management plus behaviour therapy likely to be most cost-effective.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				ADHD+anxiety: Behaviour therapy appears most cost-effective at higher levels of WTP (above $20,000). At levels below this medical management most cost-effective. Similar findings for ADHD+anxiety+conduct disorder, although probability that combination treatment is cost-effective does not rise above 50%. Note: Findings reported here based on figures in paper. Some text in results section contradictory to this thus undermining certainty of findings.
Haby et al 2004 Cost utility analysis Health care perspective Pathway analysis-based health economics model Time horizon: 1 year	Modelling based upon findings from a systematic review and meta-analysis. Compares incremental cost-effectiveness of CBT and SSRIs as fist line treatments vs "usual care". SSRIs as second line treatment also assessed vs no further treatment. **Interventions:** CBT modelled as 12 x 1 hour sessions plus 2	Pathway analysis used to estimate costs. Resource use estimated from published literature and expert opinion. 1 month supply SSRIs Cost to govt: $32.23 Cost to patient: $10.08 1 GP visit <20 mins	**Clinical and HE outcome**: Years lived with disability (YLD) component of disability-adjusted life years (DALYs). YLD=incidence x duration x disability weight (DW) Incidence of MDD calculated from Australian national survey data (1998) Average duration of episode of MDD	**Estimates used for HE model:** 1 year incidence: 1.5%; 48,552 incident episodes MDD Average duration of an episode: Lag from onset to start of treatment: 4 weeks (range 2 – 6 weeks). This means CYP with duration of episode <4 weeks would remit before entering treatment – assessed as 25.5%. Those in treatment thus would all have durations >4 weeks. Average durations: CYP consulting: 34.8 weeks CYP not consulting: 20.8 weeks (Note: wrong way round?)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Health benefits measured for the duration of the episode of MDD. Costs measured for the duration of the intervention. Health sector perspective including government costs and service user costs (drugs and out of pocket costs). Australia	parent/family sessions over 14 weeks. SSRI modelled as 9 months of treatment (3 months acute phase, 6 months continuation treatment – based on clinical expert opinion and practice guidelines). Dose per day modelled: 20mg fluoxetine, citalopram or paroxetine, 50 or 100mg sertraline or 100mg fluvoxamine. Also includes 14 doctor visits - GP, paediatrician or private psychiatrist. Proportion of CYP seeing different types of clinician based on current data. SSRIs also modelled as second line treatment. Assumptions made for this model: SSRIs used second line after 2 weeks	Cost to govt: $21.88 Cost to patient: $2.21 1 GP visit 20-40 mins: Cost to govt: $39.51 Cost to patient: $1.87 1st visit to paediatrician: Cost to govt: $97.92 Cost to patient: $17.79 Subsequent visits to paediatrician: Cost to govt: A$49.06 Cost to patient: A$9.90 1 psychiatrist visit 45-75 mins:	calculated from Oregon Adolescent Depression Project. Severity of MDD: based upon Mental Component Score of the SF-12. Effectiveness of interventions: standardised mean difference calculated from studies included in systematic review meta-analysis. All continuous outcome measures related to depression (including anxiety and mood) and HRQoL included and an average taken. Clinician, CYP and parent measures included. **Second stage filters:** This second stage of analysis Incorporates	DWs for MDD (from Dutch weighting system, Stouthard et al 1997): Mild: 0.14 Moderate: 0.35 Severe: 0.76 Composite DWs calculated for CYP who consulted and received EBM, consulted and received non-EBM and those who did not consult. Calculation based upon severity information from national survey data (extrapolated from young adults aged 18-34 years) and the Mental Component Score of the SF-12. Calculated weighted average DW scores for each treatment group: Did not consult: 0.270 Received EBM: 0.397 Received non-EBM: 0.417 Effect sizes from meta-analysis of 4 RCTs: CBT: 0.41 (95% CI 0.15 to 0.67) SSRIs: 0.29 (95% CI 0.11 to 0.46) Minimum adherence of 50% used in uncertainty analysis to better reflect what could be expected outside of trial conditions.

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>treatment with CBT where non-adherence to CBT, or after 14 weeks of CBT for those who do not remit.

Comparator (usual treatment):

Modelled based upon national survey data (n=88 CYP).

35% CYP had attended a consultation with a health care professional or social worker for “emotional or behavioural problems”. These were divided into those who had received treatment based on evidence (EBM) or those receiving non-EBM. EBM defined as treatment with either SSRIs and/or CBT (defined as “counselling” or at least 4 visits to a private psychiatrist, private psychologist, social worker, hospital psychiatry department or</td><td>Cost to govt: A$117.02

Cost to patient: A$16.47

1 psychiatrist visit 15-30 mins:

Cost to govt: A$56.38

Cost to patient: A$5.95

1 public psychologist visit 60 mins:

Cost to govt: A$47.05

Cost to patient: A$0

1 public psychiatrist visit 60 mins:

Cost to govt: A$129.64

Cost to patient: A$0

Data from Australian Department of Health</td><td>broader aspects that impact upon decision-making. Filters chosen for this study: strength of evidence, equity, feasibility and acceptability to stakeholders.</td><td>For modelling cost of non-adherence assumed to be the same as cost of non-EBM.

Cost-effectiveness results:

Based on assumption that CBT delivered by a psychologist has same efficacy as that delivered by a psychiatrist.

CBT by public psychologist most cost-effective intervention at A$9,000 per DALY saved (95% CI A$3,900 to A$24,000).

Also the second most affordable first line treatment option for govt. at incremental cost of A$3.7 million (95% CI A$1.9 million to A$6.7 million)

CBT by other professionals also likely to have ICERs <A$50,000 per DALY (>80% chance).

SSRIs cost effective both as first line and second line treatment. However, CBT has greater effectiveness and therefore greater total YLD saved.

CBT for MDD in CYP compared with current practice
<table><tr><th></th><th>Public psychologist
Median (95% CI)</th><th>Public psychiatrist
Median (95% CI)</th></tr><tr><td>Health benefit/DALYs</td><td>360 (120 to 920)</td><td>360 (120 to 920)</td></tr></table></td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th colspan="3">Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>mental health clinic in preceding 6 months). 12% of sample had received EBM. 23% received non-EBM defined as care mostly from GP (average 4.4 visits to GP in preceding 6 months) with no SSRIs.

Population:
All CYP seeking care for major depressive disorder (MDD) in year 2000.
Age 6 – 17 years

Setting:
GP surgery, mental health clinic, hospital psychiatry department, private clinic.</td><td>and Ageing Medicare benefits Scheme.

NB. Currency is Australian dollars</td><td></td><td colspan="3">
<table>
<tr><td>Intervention costs/A$ millions</td><td>5.8 (3.3 to 9.4)</td><td>14 (7.6 to 24)</td></tr>
<tr><td>Incremental costs/A$ millions</td><td>3.4 (1.7 to 6.3)</td><td>12 (6.1 to 20)</td></tr>
<tr><td>ICER/A$ thousands per DALY</td><td>9 (3.9 to 24)</td><td>32 (14 to 79)</td></tr>
</table>
<table>
<tr><th colspan="3">SSRIs for MDD in CYP</th></tr>
<tr><td></td><td>As 1st line treatment vs current practice
Median (95% CI)</td><td>As 2nd line treatment vs no further treatment
Median (95% CI)</td></tr>
<tr><td>Health benefit/DALYs</td><td>230 (88 to 510)</td><td>130 (47 to 320)</td></tr>
<tr><td>Intervention costs/A$ millions</td><td>7.85 (4.6 to 12)</td><td>3.1 (1.6 to 5.5)</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Incremental costs/A$ millions</td><td>5.4 (3.1 to 8.6)</td><td>As above</td></tr>
<tr><td>ICER/A$ thousands per DALY</td><td>23 (13 to 53)</td><td>23 (13 to 54)</td></tr>
</table>
Second stage filters

Some concerns about implementation of CBT for MDD in CYP, more so than for SSRI treatment.

<table>
<tr><th colspan="3">Consideration of second stage filters</th></tr>
<tr><th>Filter</th><th>CBT</th><th>SSRIs</th></tr>
<tr><td>Evidence</td><td>Sufficient evidence of adequate quality</td><td>Sufficient evidence of adequate quality</td></tr>
<tr><td>Equity</td><td>Moderate equity concerns</td><td>No important issues</td></tr>
<tr><td>Feasibility</td><td>Possible but challenging</td><td>Feasible within current arrangements</td></tr>
<tr><td>Acceptability</td><td>Some issues require resolution</td><td>Some issues require resolution</td></tr>
</table>
CBT:
</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Equity concerns: appropriateness for minority groups; access for rural/remote families; inequity if "user pays". Feasibility concerns: ensuring adequate workforce; ability of health care funding to provide adequate access via primary care; development of implementation arrangements (cost-effectiveness assumes steady state operation). Acceptability concerns: cost to families if private providers; acceptance of treatment by families and clinicians including shift towards non-pharmacological treatments. **SSRIs**: Acceptability concerns: parental concerns about using drugs in CYP; ethical concerns about using drugs as first-line treatment as they have side-effects whereas an alternative available treatment (CBT) has no side-effects.
Juillard et al 2014 Cost-utility analysis State transition (Markov) decision model from healthcare perspective	Compares hospital-based violence intervention (HVIP) program ("Wraparound Program" - intensive individual case management and support) vs usual care (standard treatment) **Intervention** HVIP ("Wraparound Program") intensive individual case management and	Assessed using hospital financial records. Costs generated from facility and professional fees by converting charges to costs.	QALYs **Clinical outcome:** Probability of violent recurrent injury 3 annual outcomes in model: Well Reinjured Dead	**Clinical effectiveness** (Data from hospital records) Annual recidivism rate: HVIP: 0.9% Standard care: 3.2% Case fatality rate for violent injury: 8.8% **Cost effectiveness**

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Multivariate Monte Carlo simulations Time horizon: 5 years after initial injury USA	support; including including access to victim restitution funds, assistance with insurance, help with medical costs and transport to and from medical appointments, help obtaining education or employment support, help obtaining a drivers' license and referral to mental health services. Usual care: standard counselling with referral to a SW as required. **Population** Intentionally injured by another person Age 10-30 Sample Exclusions: domestic violence, sexual assault, child abuse. **Setting** Hospital based trauma centre, San Francisco	Estimated trauma care cost per patient: $41,757 HVIP-associated cost per patient: $4,150 Costs discounted at 3% per year		Utility value for violent injury = 0.7 for the year following injury Health state after first year of injury: 0.84 (baseline value for healthy individual aged 20-29 in USA) Health states for 1 year cycle summed for the 5 year time horizon. In the final cycle all surviving patients given additional QALYs based on life expectancy to 77 years old. QALYs after 5 year analysis frame: Base case: 21.47 QALY gain (analysis range: 12.56 to 41.49) Total discounted cost per patient: HVIP group: $5,892 Standard group: $5,923 Total QALYS expected: HVIP group: 25.58 Standard group: 25.34 HVIP "dominant" i.e. less expensive and more effective than standard treatment. In sensitivity analysis HVIP superior to standard care in terms of QALYs gained for all circumstances.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Matza et al 2005 SR Cost effectiveness of treatments for ADHD 3 included studies – all using decision analytic modelling techniques	SR: 3 studies of cost effectiveness: **Gilmore and Milne 2001** **Lord and Paisley 2000 reporting data from Novartis** **Zupancic et al 1998** **Intervention** (all 3 studies): Methylphenidate (MPH) **Population** CYP with ADHD **Setting** Not reported	12 studies reported costs for ADHD, 11 included costs for children. 2 most recent studies reported here: **Birnbaum et al 2005**: Annual mean direct treatment costs (USA) were \$674/\$745 for girls/boys with ADHD. Excess population costs \$0.08/\$2.0 billion. **Swenson et al 2004** Mean direct treatment costs for children with ADHD \$1,797 vs \$577 for matched controls ($p<0.05$). \$2,230 for adolescents with ADHD vs \$783 for matched controls.	**Gilmore and Milne 2001** QALYs **Novartis** QALYS **Zupancic 1998** Gains in the CTRS	**Cost effectiveness** **Gilmore and Milne 2001** Cost per QALY ranged from \$15,509 to \$19,281 - short and medium-term benefits of MPH vs no treatment. **Novartis** Cost per QALY \$27, 766 MPH vs no treatment **Zupancic 1998** Costs per each additional point in CTRS - \$93, or \$560 for a 6 point (1 SD) gain vs no treatment

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
NICE Support services for transition to adulthood/leaving care for looked after CYP: health economics report 2010 Markov model to determine costs and benefits of transition services to support transition to adulthood for looked after CYP. Modelled over a lifetime horizon. Perspective: UK public services including health and social care and the criminal justice system.	**Interventions** Support services for transition to adulthood/leaving care **Population** Looked after CYP **Setting** Not reported Inputs to the model based on findings from 7 effectiveness studies (most from USA, 1 UK study). Most common outcome = employment, reported in 5/7 studies (none UK). All 5 studies' findings were modelled separately, the 2 most recent are reported here: **Georgiades 2005** and **Lemon 2005** **Intervention:**	Costs derived from range of sources including official UK government reports and published literature. Costs to social care of planning transition to adulthood (age16-18 years): £1,164 Average estimated total costs of transition services used per young person per year: £24,429 Costs of transition services alone without considering accommodation: £6, 078 Average cost to CJS of immediate custody considering violence against the person, burglary, criminal damage, drug offences and sexual	Outcomes used in model: anxiety/depression, employment, criminal/offending behaviour and mortality. Note: Since model is across a whole lifetime adult outcomes were used. Values used in model: Employment: Job separation 16-24 year olds: 8.5% per year Unemployed for less than 12 months: 16-19 year old males: 88%; 20-29 year old males: 82%; 16-19 year old females: 91%; 20-29 year old females: 88% Male offenders on probation currently employed (all ages): 23% Female offenders on probation currently employed (all ages): 12%	EQ-5D scores used to determine how utility score is affected by age, gender, employment status and depression (using multivariate regression analyses): QoL coefficients Age: -0.00234 (SE=0.000107) Female: 0.004237 (SE=0.003394) Unemployed: -0.08977 (SE=0.003874) Depressed: -0.028679 (SE=0.004344) Constant: 1.061535 (SE=0.005486) **Social outcome – employment** Findings from 2 most recent studies reported here **Georgiades 2005** Employment rate: Transition support group: Employed full-time: 22% Employed part-time: 51% Unemployed: 27% No transition support group: Employed full-time: 8% Employed part-time: 0%

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Intervention to support transition to adult services and/or leaving care. No further details given. **Comparator:** No transition support intervention or usual care **Population:** Looked after young people leaving care. Age: 16 – 24 years	offences per crime (all ages): £12,625 Youth justice costs: Magistrates court (per episode): £584 Secure care (per day): £358 Lawyer (per contact): £50 Youth offending Institution (per day): £45-£91 Youth offending team worker (per hour): £37 Probation officer (per hour: £37 Asylum office (per hour): £37 Police custody (per 15 mins): £13.44 Average service costs for people with depression: £2,085	Re-offending rate (all ages): 39% EQ-5D scores calculated from the Health Survey for England data (2008) for the outcome states used in the health economic model e.g. employed no anxiety/depression; employed with anxiety/depression etc. Utilities then calculated by age, gender, employment and mixed anxiety/depression in order to calculate utility loss associated with crime, unemployment and mental illness (depression). Mortality: Death for prisoners aged 15-24 years (% of total deaths of prisoners): 20.3% Death for offenders aged 15-24 years (post-	Unemployed: 92% Effect size=0.53 **Lemon 2005** Had a job immediately after leaving care: Transition support group: 58.4% (n=45) No transition support group: 73.8% (n=79) P<0.05 NB. The other 3 studies that reported employment as an outcome showed a small benefit in favour of the transition support intervention but none of the findings were statistically significant. **Georgiades 2005** Total QALY: Transition support: 119.15 No transition support: 120.36 Discounted QALY: Transition support: 47.08 No transition support: 46.09 Incremental discounted cost: -£100,371 Incremental QALY: 0.99

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
			custodial supervision as % of total deaths of prisoners): 29.4% **Georgiades 2005** Total costs discounted as 3.5% per year: Transition support: £60,176 No transition support: £160, 547 **Lemon 2005** Total costs discounted as 3.5% per year: Transition support: £79,696 No transition support: £97,472	Incremental cost per QALY (ICER): -£101,292 Results for males: Incremental discounted cost: -£76,546 Incremental QALY: 0.61 Incremental cost per QALY (ICER): -£125,317 Results for females: Incremental discounted cost: -£23,825 Incremental QALY: 0.38 Incremental cost per QALY (ICER): -£62,683 Transition support dominates (costs less, in the long term, and accrues more benefit than no transition support). **Lemon 2005** Total QALY: Transition support: 118.77 No transition support: 121.41 Discounted QALY: Transition support: 46.82 No transition support: 46.91

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Incremental discounted cost: -£17,776 Incremental discounted QALY: -0.09 Incremental cost per QALY (ICER): £204,561 Results for males: Incremental discounted cost: -£29,262 Incremental discounted QALY: -0.01 Incremental cost per QALY (ICER):£2,573,542 Results for females: Incremental discounted cost: £11,486 Incremental discounted QALY: -0.08 Incremental cost per QALY (ICER): -£152,082 The transition support intervention is not cost-effective in this case, the ICER is very high for males and no transition support is dominant over transition support for females. NB. For the other 3 studies modelled transition support was dominant over no transition support, even though the modest benefit in terms of employment rates with transition support was not statistically significant. Uncertainty: Probabilistic sensitivity analyses showed for males that transition support dominated no transition support for 4 of the 5 study

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				results. For Lemon 2005 transition support dominated no transition support for some cases whilst in others the QALYs gained were higher for no transition support than transition support although costs for transition support are smaller. Similarly, for females, where in 4 out of 5 studies transition support dominated no transition support. In Lemon 2005 the sensitivity analysis showed no transition support dominated transition support in all modelled scenarios.
NICE Autism in CYP exhibiting behaviour that challenges guideline 2013 Decision-tree health economics model to assess the cost-effectiveness of antipsychotic drugs for management of behaviour that challenges in CYP with autism. Modelled over 32 week time horizon.	**Interventions** Antipsychotics: risperidone and aripiprazole (drugs identified by related effectiveness SR) **Population** CYP with autism exhibiting behaviour that challenges **Setting** Not reported Model structure: Hypothetical cohorts of CYP received either an antipsychotic drug or a placebo for 8 weeks. At end of 8 weeks CYP either responded to medication	Intervention costs only included in model. Healthcare professional time assumed to be the same for both arms of the model and therefore excluded. Only costs included in model therefore = costs of acquisition of medication (placebo cost assumed to be zero). Daily costs of medication per CYP: Risperidone tablets: £0.06	Response to treatment defined as an improvement of at least 25% on the ABC-irritability scale. Utility scores for different levels of hyperactivity in CYP with autism were used in the model (Tilford 2012). Model assumptions: Start of treatment - HRQoL of CYP corresponded to moderate levels of hyperactivity	**Clinical effectiveness** (from guideline SR meta-analysis) Risk ratio of response: 2.27 Probability of relapse at 24 weeks' follow up: 0.179 Risk ratio of weight gain: 3.80 **Utility values** (from Tilford 2012, reported in NICE 2013) Mild hyperactivity: 0.72 Moderate hyperactivity: 0.66 Weight gain (multiplicative function): 0.959 **Results of economic analysis:** **Mean total QALYs per 100 CYP with autism**

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Perspective: UK NHS and personal social care.	(antipsychotic drug or placebo) or did not respond. CYP who had responded (either to antipsychotic drug or placebo) continued drug therapy for a further 24 weeks. At end of 24 week follow up period CYP who had responded (to either drug treatment or placebo) either relapsed or remained improved. Children who did not respond during first 8 weeks were assumed to retain same levels of challenging behaviour throughout follow-up period. CYP in both arms of the model could experience weight gain as an adverse event effect of treatment (identified through SR as common side effect). This adverse event also incorporated into the HE model. Clinical inputs into model derived from SR of 4 studies (2 risperidone vs	Risperidone oral solution: £0.97 Risperidone oral dispersible tablets: £1.38 Aripiprazole tablets: £3.43 **Mean total costs for 100 CYP with autism** Risperidone tablets: £846 Risperidone oral solution: £14,385 Risperidone oral dispersible tablets: £20,433 Aripiprazole tablets: £50,965 Placebo: £0	Response to treatment - improvement to mild symptoms Relapse - return to moderate symptoms Adverse event of weight gain defined as weight gain of at least 7% Outcome: QALY	Risperidone tablets: 42.20 Risperidone oral solution: 42.20 Risperidone oral dispersible tablets: 42.20 Aripiprazole tablets: 42.20 Placebo: 41.36 **ICER vs placebo per 100 CYP with autism** Risperidone tablets: £1,003/QALY Risperidone oral solution: £17,065/QALY Risperidone oral dispersible tablets: £24,240/QALY Aripiprazole tablets: £60,461/QALY Uncertainty: Probabilities of the 3 formulations of risperidone being cost-effective at £20,000 per QALY (NICE's lower threshold) were 0.63 (tablets), 0.47 (oral solution) and 0.40 (oral dispersible tablets). The probabilities for them being cost effective at £30,000 per QALY (NICE's upper threshold) were 0.64, 0.53 and 0.48 respectively. The probability of aripiprazole being cost effective was 0.10 at the lower threshold and 0.23 at the higher threshold.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	placebo and 2 aripiprazole vs placebo).			
NICE ADHD guideline (update) 2018 Appendix 1: Cost-effectiveness analysis – parent training Cost-effectiveness modelling based on findings from SR of clinical effectiveness studies NHS and personal social services perspective Time horizon: 12 months UK	5 of the 6 included studies reported here. (excluded study had population aged 5-9 years). **Overall intervention** Parent training for parents of CYP with ADHD **Population** CYP with ADHD **Chacko 2009** Intervention 1: Behavioural parent training (2.5 hours per week). Children participated in concurrent social skills training. Group based. 9 weeks programme. n=40	Micro-costing for each study based on staff time - therapist hours spent on intervention, assistant for intervention and admin. time. Clinical psychologist: £62 per hour Assistant: £30 per hour Consultant psychiatrist: £208 per hour of patient contact **Chacko 2009** Total intervention costs: £7,146 (£715 per family) **Handon 2015**	**Chacko 2009** Disruptive Behaviour Disorders (DBD) rating scale (ADHD symptoms) score ≤1 **Handon 2015** ≥30% increase on SNAP and CGI-I ≤2 **Pfiffner 2007** At 12 weeks: CGI-I, based on description of proportion "at least slightly improved" in intervention group and "unchanged or worse" in control group. Slightly improved defined as CGI-I ≤3 and unchanged or worse as >3.	**Clinical outcomes:** Probability of a positive response ("treatment success") **Chacko 2009** DBD rating scale score: Intervention 1: 0.0 Intervention 2: 0.2 Intervention 3: 0.15 Comparator: 0.075 **Handon 2015** SNAP and CGI-I score Intervention: 0.290 Comparator: 0.194 **Pfiffner 2007** CGI-I score At 12 weeks: Intervention: 1 Comparator 0.66 After 3 month follow-up:

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>Intervention 2: Same as Intervention 1 with added motivators for mothers (STEPP program)

n=40

Intervention 3: Behavioural parent training + STEPP (combination of groups 1 and 2)

Comparator: Waitlist control

n=40

Duration: 9 weeks

Population: Children aged 5-12 years and their single mothers. 35% - 40% in each group taking medication.

Handon 2015</td><td>Total intervention costs: £2,475 (£248 per family)

Pfiffner 2007

Total costs for individual components: £1,047 per family

Total group costs: £5,550 per 10 families

Total intervention costs: £1,597 per family

Ostberg 2012

Total intervention costs: 6,048 (£605 per family)

Fabiano 2012

Individual study costs not reported (study</td><td>After 3 month follow-up:

Proportion of children “improved or much improved” defined as CGI-I score ≤2.

Ostberg 2012

Numbers of children who did not meet criteria for diagnosis on the ADHD RS

Fabiano 2012

ECBI intensity score <60</td><td>Intervention: 0.63

Comparator: 0.40

Ostberg 2012

24 weeks:

Intervention:0.667

Comparator: 0.559

Fabiano 2012

ECBI score

Intervention: 0.62

Comparator: 0.48

Utility values

Possible utility values identified from systematic search.

<table><tr><th colspan="3">Utility values for CYP with ADHD identified from literature</th></tr><tr><th>Study</th><th>Detail</th><th>Utilities</th></tr><tr><td>Van der Kolk 2014a

Netherlands</td><td>Survey to collect QoL data for CYP with ADHD on drug treatment, and parents. Used EQ-5D and Kidscreen 10.

Responder: CYP taking prescribed medication and functioning well. (n=428)</td><td>Scores reported (using UK tariffs):

QoL of CYP from parents:

Whole sample: 0.80</td></tr></table></td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness		
	Intervention group: Parent training. Individual meetings of 60-90 mins. n=31 Comparator: placebo n=31 Duration: for 9 weeks. Population: children with ADHD aged 5-14 years. 45.3% total population had received prior parent training intervention for ADHD. **Pfiffner 2007** Intervention: CLAS. 3 group-based components: (a) 30 min teacher meeting followed up with 4-5 30 min meetings of teacher, parent, therapist and child. (b) Parent training: 8-10 90 min sessions and 4-5 family sessions. (c) Child	used in sensitivity analysis)			Non-responder: not using prescribed dose and some problems functioning. (n=190)	Responder: 0.83 Non-responder: 0.74
				Carroll 2009 (country not reported)	Utilities calculated for wide range of health states in CYP, elicited from parents. Elicited using health state descriptions with standard gamble and time trade-off methods. States assessed around 400 times.	SG mean values: Mild ADHD: 0.94 Severe ADHD: 0.92 TTO mean values: Mild ADHD: 0.93 Severe ADHD: 0.90
				Lloyd 2011 UK	Children with ADHD ages 11-16 were used for qualitative interviews to develop the ADHD health states. n=20 These states were then rated by 100 members of the public using TTO method based on CGI-S scores. Responder to treatment defined as having achieved top 2 or 3 scores on the CGI-I at the last visit (CGI-S scores mapped on to CGI-I scale).	TTO scores for CGI-S states: Normal: 0.839 Borderline to moderate: 0.787 Moderate to markedly ill: 0.578 Severe: 0.444 TTO scores by classifying responder as >2 on CGI-I: Last visit responder: 0.82

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness		
	attended child group and parent attended parent group. Duration of intervention: 12 weeks Follow-up: 3 months – included monthly meetings post-intervention. n=36 Comparator: treatment as usual or waitlist n=30 Population: children with ADHD aged 7-11; 2 were taking medication for ADHD when recruited. Predominantly ADHD-I subtype. **Ostberg 2012** Intervention: Parent and teacher training 10 x					Last visit non-responder: 0.70
				Bouwmans 2014 Netherlands	Questionnaire survey of parents of CYP with ADHD, included EQ-5D (Dutch proxy version). N=approx. 740. Utilities broken down by response or not, number of co-morbidities and age.	Overall utility for different age groups: 8-18 years: 0.81 8-11 years: 0.79 12-18 years: 0.83
				Van der Kolk 2013 (abstract only) Netherlands	Questionnaire survey to CYP aged 8-18 years and their parents to study QoL. Focus on compliance. Used EQ-5D. n=618.	EQ-5D: Average: 0.80 Compliant: 0.83 Non-compliant: 0.74
				Van der Kolk 2011 Netherlands	Parent of a CYP aged 6-18 years with ADHD. Comparing QoL in different states of medication compliance, remission after medication use or being naïve to medication. Using EQ-5D proxy version. N=873	Optimal compliance: Proxy EQ-5D: 0.8257 EQ=5D: 0.8331 Suboptimal compliance: Proxy EQ-5D: 0.7321 EQ-5D: 0.8050 Medication use stopped: Proxy EQ-5D: 0.7635 EQ-5D: 0.8169

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	weekly 2 hour sessions. Group based. n=36 Outcomes measured at 3 months following end of intervention. Comparator: waitlist n=34 Population: children with ADHD aged 10 years. 93% diagnosed with ADHD. Most children taking medication for ADHD (Intervention: 86%; Comparator: 77%) **Fabiano 2012** Intervention: COACHES program. Behavioural prgramme, 8 x 2 hour weekly sessions. First hour of each session fathers/male caregivers taught behavioural techniques while children played football with			<table><tr><td></td><td></td><td>Remission after medication: Proxy EQ-5D: 0.8518 EQ-5D: 0.8220 Medication naïve: Proxy EQ-5D: 0.7719, EQ-5D: 0.7899</td></tr><tr><td>Hodgkins 2013</td><td>Objective of the study was to quantify the utility gain using HUI2 following treatment with lisdex in children and adolescents with ADHD. Compared to OROS MPH. Utilities were estimated for responders and non-responders regardless of treatment.</td><td>Utility for response: Based on CGI-I of 1 or 2: 0.896 No response: 0.838 ADHD-RS >25%: 0.899 No response: 0.809 ADHD-RS>30%: 0.902 No response: 0.814</td></tr></table> Utilities from van der Kolk 2014a used for cost-effectiveness modelling as this used a UK tariff and had a large sample size. However, should note that these utilities are based on parent report rather than CYP themselves. Also, responders and non-responders are in relation to medication rather than behavioural therapy. No direct utilities based on

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>counsellors. Second hour parents and children played football together.

n=28

Comparator: waitlist control.

n=27

Population: Children with ADHD aged 6-12 years and their male caregivers. 54% Children in each group taking ADHD medication.</td><td></td><td></td><td>behavioural therapy identified so these drawbacks accepted for modelling purposes.

Cost-effectiveness base-case analyses

Chacko 2009

<table>
<tr><th colspan="3">Base case results (per person)</th></tr>
<tr><th></th><th>Total cost</th><th>Total QALY</th></tr>
<tr><td>Parent training</td><td>£1,478</td><td>0.7547</td></tr>
<tr><td>No parent training</td><td>£800</td><td>0.7474</td></tr>
<tr><td>Incrementals</td><td>£677</td><td>0.0073</td></tr>
<tr><td>ICER</td><td>£92,531</td><td></td></tr>
</table>
Cost of this intervention high as uses parent and child training. Response probabilities are very low therefore unlikely to be cost-effective. Parent training in this case only had a 3% probability of being cost-effective at a threshold of £20,000.

Handen 2015

<table>
<tr><th colspan="3">Base case results (per person)</th></tr>
<tr><th></th><th>Total cost</th><th>Total QALY</th></tr>
<tr><td>Parent training</td><td>£955</td><td>0.7666</td></tr>
<tr><td>No parent training</td><td>£752</td><td>0.7579</td></tr>
<tr><td>Incrementals</td><td>£203</td><td>0.0087</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>ICER</td><td>£23,393</td><td></td></tr>
</table>
Cost of intervention lower as only involves parent training with lower intervention costs (9 sessions of 1.5 hours each). Additional probability of response from intervention arm is approx. 10%. Probability of being cost-effective of 39% at a threshold of £20,000. Intervention would have to cost less than £198 to make it cost-effective.

Pfiffner 2007

<table>
<tr><th colspan="3">Base case results (per person)</th></tr>
<tr><td></td><td>Total cost</td><td>Total QALY</td></tr>
<tr><td>Parent training</td><td>£2,118</td><td>0.7994</td></tr>
<tr><td>No parent training</td><td>£639</td><td>0.7773</td></tr>
<tr><td>Incrementals</td><td>£1,478</td><td>0.0221</td></tr>
<tr><td>ICER</td><td>£66,891</td><td></td></tr>
</table>
Cost if intervention high as includes parent and child training and time with a teacher, plus family sessions. Hence although the incremental QALYs are higher than in other studies (additional response rate is approx. 30%) higher intervention costs cause the ICER to increase. Threshold analysis showed intervention would have to cost £606 or less to be cost-effective. Parent training has 0% probability of being cost-effective in this model.

Ostberg 2012

<table>
<tr><th colspan="3">Base case results (per person)</th></tr>
<tr><td></td><td>Total cost</td><td>Total QALY</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Parent training</td><td>£1,163</td><td>0.7976</td></tr>
<tr><td>No parent training</td><td>£599</td><td>0.7908</td></tr>
<tr><td>Incrementals</td><td>£564</td><td>0.0068</td></tr>
<tr><td>ICER</td><td>£82,915</td><td></td></tr>
</table>
Parent training has a probability of being cost-effective of 2% in this model. Cost of the intervention would have to be below £195 to make it cost-effective at a threshold of £20,000 per QALY.

<u>Sensitivity analysis using studies with behavioural outcomes (rather than total symptoms)</u>

Based on pooling of 2 studies (Chacko 2009 and Fabiano 2012)

<table>
<tr><th colspan="3">Sensitivity analysis (per person) – using behavioural outcomes</th></tr>
<tr><td></td><td>Total cost</td><td>Total QALY</td></tr>
<tr><td>Parent training</td><td>£1,288</td><td>0.7711</td></tr>
<tr><td>Current treatment</td><td>£739</td><td>0.7601</td></tr>
<tr><td>Incrementals</td><td>£549</td><td>0.0110</td></tr>
<tr><td>ICER</td><td>£49,944</td><td></td></tr>
</table>
Sensitivity analyses performed using behavioural outcomes instead of total symptom scores. Relative difference between treatment response approx. 13%, however intervention costs include parent and child training and therefore is more costly than parent training alone hence ICER above £20,000. The intervention cost would need to fall below £276 for it to be considered cost effective.
</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
NICE ADHD guideline – pharmacological treatments 2018 2 HE SRs included: First review: Cost effectiveness review to determine first-line pharmacological treatment for ADHD N=3 included studies: **King 2006**: Decision tree model with 1 year time horizon. Perspective: UK NHS	**Interventions** Pharmacological treatments for ADHD: methylphenidate (MPH; immediate release (IR), modified release (MR) and extended release (XR)); atomoxetine (ATX); dexamfetamine (DEX) **Population** CYP with ADHD Age 5 – 18 **Setting** Not reported First review: SR to determine most cost-effective first-line treatment (interpreted as best treatment to start with before going on to alternative drugs if first one not effective) N=3 included studies: Only relevant sub-groups reported i.e. ones that	**King 2006** Costs from 2003/4 Costs include drug costs and resource use (psychiatrist, paediatrician, GP consultations and blood test). Total costs (mean per CYP) of different strategies ranged from £1,098 to £1,563 across the 19 possible strategies. **Cottrell 2008** Costs from 2004 Drug costs only Mean total cost for treatment ranged from £125.76 (IR-MPH → IR-DEX → NT) to £599.78 (ATX → XR-MPH → IR-DEX → NT)	**King 2006** Effectiveness based on NMA of 6 trials. Clinical effectiveness based on CGI-I scale (not reported here). Uses EQ-5D to calculate QALYs. **Cottrell 2008** Effectiveness based on various RCT evidence but how response was defined in the trials is not reported. Utility values derived from UK study of 83 parents with children with ADHD using standard gamble method. **Hong 2009** Effectiveness based on various RCT evidence (same as used in Cottrell	**King 2006** Utility weights (mean) calculated from EQ-5D data: Responders: 0.837 Non-responders: 0.773 Mean QALY per CYP ranged from 0.7727 to 0.8289. Most cost-effective strategy: DEX – IR-MPH – ATX – NT Dominant strategy (most effective and cheapest strategy) (60% probability that is cost-effective at a £30,000 WTP threshold). Further analysis undertaken using this model but updating cost of drugs used which altered finding of most cost-effective strategy to: IR-MPH – DEX – ATX – NT ICER=£485 vs no treatment **Cottrell 2008** Utility weights: Responder without side effects for ATX: 0.959

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Cottrell 2008 Markov model of 1 year time horizon with monthly cycles. Health states are based on response to treatment and adverse events. Perspective: UK NHS **Hong 2009** Markov model of 1 year time horizon with monthly cycles. Health states are based on response to treatment and adverse events. Based on various RCT evidence. Perspective: Spanish NHS	contribute data to answer the research question. **Intervention details:** **King 2006** Model comparing 37 strategies in total consisting of 19 possible sequences of 3 active treatments (methylphenidate (MPH; immediate release (IR), modified release (MR) and extended release (XR)); atomoxetine (ATX); dexamfetamine (DEX)), and all drug treatments combined with behavioural therapy and no treatment (NT). **Cottrell 2008** Treatments algorithms included different sequences of MPH, ATX and DEX with different release modalities as follows:	Incremental costs: Subgroup 1 (a) (cost of strategy 2 minus cost of strategy 1): £408.34 Subgroup 1 (b) (cost of strategy 2 minus cost of strategy 1): £265.71 Subgroup 2: £480.94 **Hong 2009** Costs from 2008 Drug costs only Mean total cost ranged from £331 (IR-MPH → ATX → NT) to £1,092 (ATX → XR-MPH → NT) Incremental cost:	2008 paper) but how response was defined in the trials is not reported. Utility values derived from same source as used in Cottrell paper.	Responder without side-effects for XR-MPH: 0.930 Responder without side-effects IR-MPH: 0.913 Unmedicated CYP: 0.88 Incremental effects - QALYs: Subgroup 1(a) (includes IR-MPH): 0.0268 Subgroup 1(b) (includes XR-MPH): 0.0201 Subgroup 2: 0.0417 Cost-effectiveness: Subgroup 1(a) (includes IR-MPH): £15,244 per QALY gained Subgroup 1(b) (includes XR-MPH): £13,241 per QALY gained Subgroup 2: £11,523 per QALY gained Uncertainty around findings not reported. Model most sensitive to utility values used. ICER rose to beyond the £30,000 threshold when the difference between utilities for the different treatments was reduced. **Hong 2009** Utility weights – same as for Cottrell 2008 paper.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Subgroup 1(a): Stimulant naïve patients. Strategy 1: IR-MPH → IR-DEX → NT vs Strategy 2: ATX → IR-MPH → IR DEX → NT. Sub-group 1(b): Strategy 1: XR-MPH → IR-DEX → NT vs Strategy 2: ATX → XR-MPH → IR-DEX → NT Subgroup 2: Stimulant contraindicated. Strategy 1: NT vs Strategy 2: ATX → NT **Hong 2009** Models different sequences and patients move to the next treatment if they fail the current one. Subgroup 1(a): Stimulant naïve patients. Strategy 1: IR-MPH → ATX → NT.	Subgroup 1(a) (Strategy 2 minus Strategy 1): £615 Subgroup 1(b) (Strategy 2 minus Strategy 1): £277 Subgroup 2: £876		Incremental effects - QALYs: Subgroup 1(a) (includes IR-MPH): 0.02 Subgroup 1(b) (includes XR-MPH): 0.013 Subgroup 2: 0.042 Cost-effectiveness: Subgroup 1(a) (includes IR-MPH): £31,007 Subgroup 1(b) (includes XR-MPH): £21,971 Subgroup 2: £21,079 Uncertainty around findings not reported. Model most sensitive to utility values used. ICER increased dramatically when the difference between utilities for the different treatments was reduced.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Strategy 2: ATX → IR-MPH → NT Sub-group 1(b): Strategy 1: XR-MPH → ATX → NT Strategy 2: ATX → XR-MPH → NT Subgroup 2: Stimulant contraindicated: Strategy 1: NT Strategy 2: ATX			
NICE ADHD guideline 2018 (cont) Second review: Cost effectiveness review to determine optimal sequencing of pharmacological treatments for ADHD **Cottrell 2008** Markov model of 1 year time horizon with monthly cycles. Health	**Interventions** Pharmacological treatments for ADHD: atomoxetine (ATX) treatment algorithm; extended release methylphenidate (XR-MPH); immediate release methyphenidate (IR-MPH); guanfacine extended release (GXR); lisdexamfetamine (LDX). **Population** CYP with diagnosis of ADHD Age 5 – 18	**Cottrell 2008** Incremental costs Subgroup 1: £448.78 Subgroup 2(a) (includes IR-MPH): £373.79 Subgroup 2(b) (includes XR-MPH): £256.3 Subgroup 3: £395.98	**Cottrell 2008** Effectiveness based on various RCT evidence but how response was defined in the trials is not reported. Utility values derived from UK study of 83 parents with children with ADHD using standard gamble method. **Hong 2009** Effectiveness based on various RCT evidence (same as used in Cottrell 2008 paper) but how	**Cottrell 2008** Incremental effects - QALYs: Subgroup 1: 0.03 Subgroup 2(a) (includes IR-MPH): 0.0235 Subgroup 2(b) (includes XR-MPH): 0.0181 Subgroup 3: 0.0320 Cost effectiveness: Subgroup 1: £14,945 Subgroup 2(a) (includes IR-MPH): £15,878 Subgroup 2(b) (includes XR-MPH): £14,169 Subgroup 3: £12,370 Uncertainty around the ICER not reported. Model most sensitive to the utility values used.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
states are based on response to treatment and adverse events. Models different sequences and patients move to next treatment if they fail the current one. Perspective: UK NHS **Hong 2009** Markov model of 1 year time horizon with monthly cycles. Health states are based on response to treatment and adverse events. Based on various RCT evidence. Models different sequences and patients move to next treatment if	**Setting** Not reported Second review to determine the most cost-effective sequencing of pharmacological treatments where stimulant treatment has not been tolerated, is contra-indicated or has been ineffective. N=7 included studies: Only relevant sub-groups reported i.e. ones that contribute data to answer the research question. **Cottrell 2008** ATX algorithm vs standard treatment algorithm or no treatment Subgroup 1: Stimulant failed patients; Treatment algorithm of ATX→IR-DEX→no treatment. Comparator is the same sequence without ATX.	**Hong 2009** Incremental cost £831 **Faber 2008** Costs include intervention costs, as well as other healthcare costs such as consultation costs. Also includes cost of special education, however as the total costs were broken down with this reported separately; these have been deducted from the incremental costs. Incremental cost £1,321 **Van Der Schans 2015** Costs include intervention costs, as well as other	response was defined in the trials is not reported. Utility values derived from same source as used in Cottrell paper. **Faber 2008** Treatment effect is based on a combination of assumptions from a panel of experts and some literature. **Van Der Schans 2015** Treatment effect is based on a combination of assumptions from a panel of experts and some literature. **Schawo 2015** Treatment effect is based on estimates from a panel of experts.	**Hong 2009** Incremental effects - QALYs: 0.039 Cost-effectiveness: £21,528 Uncertainty around the ICER not reported. Model most sensitive to the utility values used. **Faber 2008** Incremental effects - QALYs: 0.13 Cost-effectiveness: £10,161 Uncertainty: A series of univariate sensitivity analyses were performed on most of the model parameters. The parameters that affected the ICER the most were resource use in the optimal and suboptimal states, and

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
they fail the current one. Perspective: Spanish NHS **Faber 2008** Markov model in children with ADHD, with a 10 year time horizon and cycles of one day. The Markov model is preceded by a 2 month primary phase. Perspective: Dutch health care **Van Der Schans 2015** Markov model in children with ADHD, with 4 states, a 10 year time horizon and cycles of one day. The Markov model is preceded by a 2	Subgroup 2a: Stimulant averse (exposed) patients; Treatment algorithm of ATX→IR-MPH→IR - DEX→no treatment. Comparator is the same sequence without ATX. Subgroup 2b: same as above except IR-MPH is replaced with XR-MPH. Subgroup 3: Stimulant contraindicated (exposed) patients; ATX followed by no treatment if that fails, compared to no treatment alone. **Hong 2009** Only 1 sub-group included: Stimulant failed patients: ATX compared to no treatment **Faber 2008** XR-MPH vs IR-MPH Primary phase comprises youths with sub optimal	healthcare costs such as consultation costs. Also includes cost of special education, and indirect (caregiver) costs, however as the total costs were broken down with this reported separately; these have been deducted from the incremental costs. MPH OROS vs IR-MPH: £597 Medikinet/Equasym vs IR-MPH: -£449 **Schawo 2015** Costs include intervention costs, as well as other healthcare costs such as consultation costs. It also includes cost of special education, and	**Lachaine 2016** Treatment effect based on results of an 8 week trial. Effect outcome is QALYs and also patient weeks with a response. **Zimovetz 2016** Treatment effect based on a single head to head 9 week trial of the 2 drugs.	the probability of stopping treatment. The cost of OROS MPH also had a big impact on the ICER. **Van Der Schans 2015** Incremental effects - QALYs: MPH OROS vs IR-MPH: 0.318 Medikinet/Equasym vs IR-MPH: 0.318 Cost-effectiveness: MPH OROS vs MPH IR: £1,879 Medikinet/ Equasym vs MPH IR: Dominant The Medikinet/Equasym comparator is dominant overall because it is cheaper than MPH OROS and has the same QALYs. Uncertainty: A series of univariate sensitivity analyses were performed on most of the model parameters. The parameter most likely to alter the results was the percentage of patients benefitting from switching from IR-MPH to one of the extended release versions. **Schawo 2015** Incremental effects - QALYs: 0.15

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
month primary phase. Perspective: Dutch health care system **Schawo 2015** Markov model in children with ADHD. The model has 4 states, and a 12 year time horizon with cycles of 1 day. Perspective: Dutch health care system **Lachaine 2016** Two stage Markov model with a 1 year time horizon and weekly cycles. Four health states based on the CGI-S. Perspective: Canadian health care system **Zimovetz 2016**	symptom control from IR-MPH because of incorrect medication intake. Only those who are then responding IR-MPH but the treatment is suboptimal due to inefficient exposure (because of the multiple daily administration required) go into the Markov phase. Staying on IR-MPH is then compared to optimal response with OROS MPH. **Van der Schans 2015** XR-MPH vs IR-MPH Patients treated with IR-MPH identified during 2 month primary phase as being non-responders or sub-optimal responders due to compliance difficulties. The group of potential responders then go on to the Markov phase. Staying on IR-MPH compared with switching	indirect costs (caregiver costs). Indirect costs were deducted in a sensitivity analysis so the incremental cost from this analysis is the one reported here. Incremental cost - £4,231 **Lachaine 2016** Costs include interventions costs and costs in each health state related to managing ADHD. Incremental cost £373 **Zimovetz 2016** Includes healthcare resource use of responders and nonresponders.		(excludes caregiver utility) Cost-effectiveness: MPH OROS dominant Uncertainty: All analyses resulted in cost savings and increased QALYs for MPH OROS, except for when transition rates of OROS were assumed equal to IR-MPH. This analysis also resulted in zero incremental QALYs. **Lachaine 2016** Incremental effects - QALYs: 0.028 Patient weeks with a response=6.57 Cost-effectiveness: £13,321 Uncertainty: Probabilistic sensitivity analysis showed 95% probability of intervention being cost effective. Several one-way sensitivity analyses were performed. The parameters with the greatest impact on base case

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Decision tree model with 1 year time horizon. Perspective: UK NHS	to modified release versions: OROS MPH or Medikinet CR/Equasym XL. **Schawo 2015** XR-MPH vs IR-MPH Sub-optimal responders due to incorrect medication intake. Staying on IR-MPH compared with switching to modified release version of OROS MPH. **Lachaine 2016** Population of children who are partial responders to long acting stimulants. Compares staying on long acting stimulants versus adding GXR as an adjunct. **Zimovetz 2016** LDX vs ATX Population - children who had an inadequate response to MPH.	Incremental cost £20		ICER was (i) the calculation of transition probabilities based on trial data for the first 8 weeks and then LOCF for the remainder of the study period and (ii) the initial health state distribution assuming 100 % of patients started in the severe state. In a sensitivity analysis where patients were maintained on treatment and could transition between heath states during the weeks 9-52 period the ICER increased to almost £27,000. **Zimovetz 2016** Incremental effects - QALYs: 0.011 Cost-effectiveness: £1,586 Uncertainty: Probabilistic sensitivity analysis showed probability intervention cost effective was 86%. Various one-way sensitivity analyses tested as well as two alternative scenarios performed probabilistically using the base case inputs; one using efficacies from the MTC and one using utility weights from the direct trial. For the additional 2 PSA scenarios; LDX was dominant using the MTC effect estimates, and had an ICER of £4,968 when using the head to head trial utilities. LDX remained cost effective in all sensitivity analyses and was dominant in 2 of them; assumptions about drug costs, and using MTC effectiveness.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Children can either tolerate or not tolerate the treatment, and then those who tolerate can either respond or not respond.			
NICE CYP with challenging behaviour and learning disabilities guideline 2015 2 decision tree health economic models based on findings from guideline effectiveness reviews Perspective of NHS and personal social care Time horizons	**Model 1** **Intervention** Group parent training for managing behaviour that challenges. 8x2-hour training sessions over 9 weeks plus 2 booster sessions during 52 week follow up. Each training session included 10 families and run by a clinical psychologist and a mental health nurse. **Population** Parents of CYP with behaviour that challenges and a learning disability. **Setting** Not described **Model 2**	**Model 1 – group parent training** Intervention costs only included in model. Salary cost of psychologist (Band 8a) and mental health nurse (Band 5). Cost of salaries, overheads and capital overheads for 8 sessions: £333 per family. Including 2 booster sessions: £416 per family. Waitlist comparison was costed as zero.	**Model 1 – group parent training** Outcome: Improvement in behaviour defined as clinically significant improvement on either the ECBI-Problem, the CBCL- Externalising Behaviour or the DBC-Total Behaviour Problem. Risk ratio of non-improvement of behaviour following parent training compared with controls was 0.72. One year probability of relapse after improvement of behaviour was estimated to be 0.50 for parent training and 0.60 for waitlist controls.	**Model 1** **Utility scores identified from Tilford 2012 as:** Moderate hyperactivity 0.66 Mild hyperactivity 0.72 (HUI3 scores for hyperactivity used as a proxy utility value for challenging behaviour) **Cost-effectiveness analysis** The health economics model suggested that parent training would result in an additional 1.33 QALYs per 100 CYP compared with waitlist controls. Additional cost: £36,219 ICER of parent training vs waitlist: £27,148 per QALY. From CEAC: the probability of parent training being cost effective compared with waitlist was 0.29 at the lower NICE threshold of £20,000 per QALY and 0.52 at the upper threshold of £30,000 per QALY. **Model 2**

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
1st model: 61 weeks 2nd model: 38 weeks	**Intervention** Model included 3 interventions: Psychosocial intervention – 4 sessions of CBT lasting 50 mins each with a clinicla psychologist. Drug therapy – meltonin (modified release tables; oral solution or oral suspension) Combined therapy – psychosocial intervention plus drug therapy (as above) **Population** CYP with behaviour that challenges and a learning disability with sleep problems. **Setting** Consultant-led out-patient clinic and home setting.	**Model 2 – treatment for sleep problems** Intervention costs only included in model. Estimated cost for psychosocial intervention £447 based on 4 sessions of CBT lasting 50 minutes each with a clinical psychologist (Band 8a). Medication: Melatonin modified-release tablets: £65 over 12 weeks Melatonin oral solution: £211 Melatonin oral suspension: £410 (the latter two include special payments as they do not hold a UK product license).	**Model 2 – treatment for sleep problems** Outcome: improvement in sleep problems (not defined) Improvement for psychosocial intervention vs waitlist: SMD -0.85 Non-improvement for melatonin vs psychosocial intervention: Risk ratio 0.73 Non-improvement for combination therapy vs psychosocial intervention: Risk ratio 0.27. Probability of non-improvement in waitlist controls was estimated and tested at 4 values: 0.900, 0.925, 0.950, 0.975. The 26 week probability of relapse was estimated as 0.40.	**Utility scores identified from Tilford 2012 as:** Mild sleep problems 0.73 Severe sleep problems 0.61. **Cost-effectiveness analysis** At probability of non-improvement under waitlist of 0.950: QALY gain = 0.023 compared with waitlist controls ICER = £17,406 per QALY. Melatonin tablets alone were also found to be cost-effective with a QALY gain of 0.011 compared with waitlist controls with an ICER of £15,496 per QALY. The probability of combination therapy (with melatonin tablets) being cost-effective at the NICE lower threshold of £20,000 per QALY ranged from 0.39 to 0.53 depending upon the baseline probability of non-improvement from waitlist).

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
		Monitoring: one out-patient visit to a consultant-led clinic (unit cost £172) and five home visits by community nurses (£70 per hour including travel time). Combination therapy was costed as the sum of psychosocial therapy plus melatonin therapy. Waitlist comparison was costed as zero.		
NICE Harmful sexual behaviour in CYP Public Health Guideline 2016 **Full economic analysis** Decision analytic model Cost effectiveness estimated using net benefit	Health economic modelling to determine the cost-effectiveness of MST-PSB and CBT based on evidence from 2 US RCTs with cost-benefit analysis. 1**.Borduin and Dopp 2015** **Intervention** Multi-systemic therapy for problem sexual behaviours (MST-PSB).	1**.Borduin and Dopp 2015** Costs of delivering the MST intervention: $12,745 Costs of UCS: $5,561 **2. Carpentier 2006** No cost/economic analysis reported.	For NICE UK model: **Behaviour outcome**: probability of re-offending (sexual and non-sexual offences) **HE outcome**: QALYs Additional data for model assumptions derived from 2 sources: 1. Hackett et al (2013): 75% children with HSB had 3 victims or fewer.	**Effectiveness findings:** 1**.Borduin and Dopp 2015** Percentage of YP who had reoffended at end of follow-up: MST-PSB group: 42% UCS group: 75% Mean re-offending rate for all crimes: MST-PB: 1.38 re-arrests CBT (UCS): 5.04 re=arrests

<table>
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<tr>
<td>Services perspective: health, social care, criminal justice syste (CJS)

Time horizon: 10 years

UK (HE modelling and costs UK, evidence of effectiveness from US studies)</td>
<td>Comparator

Usual community services (UCS) i.e. group or individual CBT.

Length of treatment for both groups: 30.8 weeks

Follow-up: 8.9 years

Population

Young people who had been arrested for a serious sexual offence, living with at least one parent figure, no evidence of psychosis.

Mean age 14 years.

n=48

Setting

Outpatient clinics

2. Carpentier 2006

Interventions (2 groups)

1. CBT – group therapy based on behaviour modification and</td>
<td>NICE UK model:

Cost data for model:

Implementation costs of interventions – mostly local authority costs

Downstream cost benefits: mostly savings to CJS

UK costs:

MST:£122 per session

CBT: £94 per session

(from PSSRU, uprated to 2015/2016)

Cost per hour per CAMHS team member

PT: £49 (from PTUK 2011)

Cost of treatment per young person:

MST: £11,147</td>
<td>66% of children identified as displaying HSB have been victims themselves; 38% had learning disabilities. Interventions to treat HSB likely to result in a QALY gain to children themselves but there is no evidence to support this.

2. QALY loss estimates for adult victims of crime (Dolan et al 2005) based on categories used in the British Crime Survey. Values for QALY loss:

Common assault: 0.007

Rape: 0.561

Sexual assault: 0.16

Model assumptions:

Children’s QALYs same as those for adults

No. of victims per offender is 3</td>
<td>Taxpayer and crime victim benefits: $182,789 for each YP receiving MST

Return on investment: $38.52 per $1 spent

2. Carpentier 2006

Likelihood of being arrested for a sexual offence at end of follow up:

CBT group signif. lower compared with PT group

CBT group vs comparison group – no signif. diff.

Likelihood of being arrested for a non-sexual offence at end of follow up:

CBT group vs PT vs comparison – no signif. diff.

In this study non-sexual offending rate 12x higher than sexual offending rate (this multiplier used in NICE modelling).

Cost-effectiveness

NICE UK model:

N=4,209 young people arrested for serious sexual offence in England and Wales.

<table>
<tr><th colspan="4">Cost-effectiveness calculation for MST-PSB compared with CBT</th></tr>
<tr><th></th><th>MST-PSB</th><th>CBT</th><th>Difference</th></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td></td>
<td>psychoeducational principles.

2. Play therapy (PT) – client-centred, based on psychodynamics with therapists on hand to probe feelings and provide reflections.

Both treatment groups given 12 x one-hour sessions.

Population

n=135

Inclusion: Children with sexual behaviour problems (SBPs) referred to outpatient clinic for CBT or PT.

Age: 5 – 12 years.

Caregiver fluent in English.

Exclusions: Children with IQ score <65; problems judged as being too severe for outpatient treatment; parents</td>
<td>CBT: £5,216

(Borduin and Dopp 2015)

CBT: £2,248

PT: £1,174

(Carpentier 2006)

Costs of crime taken from National Audit Office report 2011. Costs include costs of police, courts, offender management teams and custody. Does not include societal costs.

Average cost of non-sexual crime used for CBT model: £4,512 (NAO 2011)</td>
<td>Cost-effectiveness estimated using net benefit which is calculated as:

(Total costs of comparator – total costs of intervention) + £QALY gains.</td>
<td>
<table>
<tr><th></th><th>(intervention)</th><th>(comparator)</th><th>(MST – CBT)</th></tr>
<tr><td>Cost of intervention (£m)</td><td>£46.9</td><td>£22.0</td><td>£5.0</td></tr>
<tr><td>No. re-offenders post-intervention</td><td>1754</td><td>3157</td><td>-1403</td></tr>
<tr><td>CJS costs (£m)</td><td>£8.9</td><td>£74.0</td><td>£65.1</td></tr>
<tr><td>Total costs (£m)</td><td>£55.8</td><td>£96.0</td><td>£40.2</td></tr>
<tr><td>QALY loss (victims)</td><td>-75</td><td>-331</td><td>255</td></tr>
<tr><td>Net benefit (£m incl. QALYs)</td><td></td><td></td><td>£45.3</td></tr>
</table>
Sensitivity analysis: findings robust to variations in effectiveness values for MST and cost of MST. A two-way sensitivity analysis showed that MST-PSB would no longer be considered cost-effective at a post-intervention rate of, for example, 73% coupled with a cost per young person of £20,271.
<table>
<tr><th colspan="4">Cost-effectiveness calculation for CBT compared with PT – all offences</th></tr>
<tr><th></th><th>CBT (intervention)</th><th>PT (comparator)</th><th>Difference (CBT – PT)</th></tr>
<tr><td>Cost of intervention (£m)</td><td>£9.5</td><td>£4.9</td><td>£4.5</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td></td>
<td>declined participation or withdrew from study.

Comparison group

n=156

Children selected from same outpatient clinic and seen during same timeframe as intervention group.

Age: 5-12 years

No reported history of SBP, autism, pervasive developmental disorder or childhood psychosis.

Follow up: 10 years

Setting

Outpatient clinic

Based on the evidence above and UK national data a health economic model was developed for the UK setting.</td>
<td>Cost of non-sexual crime used in MST-PSB model: £3,245 for MST-PSB and £3662 for CBT

(Borduin and Dopp, 2015 prevalence data mapped onto UK crime categories and applied to associated cost of crime to give weighted unit cost).</td>
<td></td>
<td>
<table>
<tr><td>No. re-offenders post-intervention</td><td>1010</td><td>4209</td><td>-3199</td></tr>
<tr><td>CJS costs (£m)</td><td>£4.8</td><td>£29.8</td><td>-£25.0</td></tr>
<tr><td>Total costs (£m)</td><td>£14.3</td><td>£34.7</td><td>-£20.4</td></tr>
<tr><td>QALY loss (victims)</td><td>-37</td><td>-186</td><td>149</td></tr>
<tr><td>Net benefit (£m incl. QALYs)</td><td></td><td></td><td>£23.4</td></tr>
</table>

<table>
<tr><th colspan="4">Cost-effectiveness calculation for CBT compared with PT – sexual offences</th></tr>
<tr><td></td><td>CBT (intervention)</td><td>PT (comparator)</td><td>Difference (CBT – PT)</td></tr>
<tr><td>Cost of intervention (£m)</td><td>£9.5</td><td>£4.9</td><td>£4.5</td></tr>
<tr><td>No. re-offenders post-intervention</td><td>84</td><td>421</td><td>-337</td></tr>
<tr><td>CJS costs (£m)</td><td>£0.7</td><td>£4.7</td><td>-£4.1</td></tr>
<tr><td>Total costs (£m)</td><td>£10.1</td><td>£9.7</td><td>£0.4</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>UK NICE HE model:

Intervention

MST-PSB

CBT

Comparator

Play therapy

Population

Juvenile sexual offenders

n=4,209</td><td></td><td></td><td>
<table>
<tr><td>QALY loss (victims)</td><td>-37</td><td>-186</td><td>149</td></tr>
<tr><td>Net benefit (£m incl. QALYs)</td><td></td><td></td><td>£2.5</td></tr>
</table>
CBT, although more costly than PT, generates a positive net benefit. Per person this is approx. £600 for sexual offences, rising to £5,600 per person when all offenses are considered.

Sensitivity analysis: The threshold cost at which CBT no longer generates a net benefit compared with PT is £7,812 per YP. Similarly, if the rate for sexual offending post-CBT were to reach 10.5% the intervention would no longer generate a net benefit.</td></tr>
<tr><td>Petrou et al 2010

Economic analysis using descriptive statistics and multiple regression analyses of survey data to develop costs and health utility scores for psychiatric disorders in children.

Some imputation of missing data.</td><td>No specific intervention considered – study uses primary survey data from the EPICure study and published preference weights.

Population

All children born very preterm (20-25 completed weeks' gestation) in UK and Ireland March to December 1995 (n=307) and a matched control</td><td>Children's use of health, social and educational services in the eleventh year of life assessed using questionnaires completed by parents and teachers.

Information collected from main carer included: time spent as a hospital in-patient (days); use of community health services (contact hours); use of social</td><td>Mental health assessed using the Development and Wellbeing Assessment (DAWBA) and the Kaufman Assessment Battery for Children completed by the parent/main carer (semi-structured interview or online) around child's 11th birthday. This information used to assign an ICD-10 and DSM-IV-TR clinical diagnosis.</td><td>Mean multi-attribute utility scores for children with and without psychiatric disorders

<u>Total sample (term + preterm). Calculated using HUI Mark 3 values</u>

Any DSM-IV diagnosis: 0.698 (SD=0.273)

No DSM-IV diagnosis: 0.890 (SD=0.203)

Moderate cognitive impairment: 0.643 (SD=0.329)

No cognitive impairment: 0.916 (SD=0.149)

Severe cognitive impairment: 0.318 (0.390)

No cognitive impairment: 0.889 (0.178)</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Confidence intervals calculated using bootstrapping. Perspective: UK NHS Time horizon: 11 years	group born at full term (n=153). Available study sample size for economic analysis n=331 Median age 10 years 11 months **Setting** Followed up across all settings.	services (contact hours); estimates of education service use (contact hours, type of educational support and educational establishment); medications. Information from teachers: children identified as having special educational needs and additional support received e.g. one-to-one special provision, outreach support, support from speech therapists, educational psychologists etc. UK unit costs applied to resource use using, for example, English DH reference costs; drug costs from British National Formulary. **Public sector costs over 12-month period:**	Children's health status assessed using the Health Utilities Index (HUI) Mark 2 and Mark 3 (15-item postal questionnaire completed by parent). Scores on a 7-item (Mark 2) and an 8-item (Mark 3) scale then used to calculate an overall score. Primary analysis conducted using HUI Mark 3 as this version is recommended by the developers. It comprises 8 domains: cognition, vision, hearing, speech, ambulation, dexterity, emotion and pain. Values obtained from this tool were converted to multi-attribute health utility values using a published utility function developed using a Canadian adult population (n=504) (Feeny et al 2002; Furlong	Any emotional disorder: 0.672 (SD=0.296) No emotional disorder: 0.871 (SD=0.220) Any ADHD diagnosis: 0.629 (SD=0.296) No ADHD diagnosis: 0.879 (SD=0.215) Any conduct disorder: 0.727 (SD=0.260) No conduct disorder: 0.870 (SD=0.221) Any autistic disorder: 0.609 (SD=0.257) No autistic disorder: 0.870 (SD=0.222) Any tic disorder: 0.675 (SD=0.292) No tic disorder: 0.866 (SD=0.224) <u>Total sample (term + pre-term). Calculated using HUI Mark 2 values</u> Any DSM-IV diagnosis: 0.782 (SD=0.149)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
		Children with psychiatric disorder (defined by DSM-IV-TR criteria), n=50: £7,188 (SD=£5,869) Children without psychiatric disorder, n=281: £5,116 (SD=£4370) Mean cost difference: £2,072 (95% CI £349 to £3,795) Moderate cognitive impairment, n=69: £8385 (SD=£6,625) No cognitive impairment, n=262: £4,650 (SD=£3,645) Mean cost difference: £3,735 (95% CI £2,088 to £5,382) Severe cognitive impairment, n=18: £13,443 (SD=£6,725)	et al 1998; reported in Petrou 2010). Secondary analysis was undertaken using the HUI Mark 2 scores, its 7 domains are: sensation, mobility, emotion, cognition, self-care, pain and fertility. This version of the HUI has associated multi-attribute health utility values assigned based on findings from a UK general population preference study (n=198) (McCabe et al, 2005; reported in Petrou 2010). The authors suggest these values are more applicable to UK policy decision-making. Mental health outcomes: Any DSM-IV clinical diagnosis	No DSM-IV diagnosis: 0.901 (SD=0.133) Moderate cognitive impairment: 0.757 (SD=0.185) No cognitive impairment: 0.915 (SD=0.108) Severe cognitive impairment: 0.612 (0.245) No cognitive impairment: 0.898 (0.118) Any emotional disorder: 0.760 (SD=0.161) No emotional disorder: 0.888 (SD=0.139) Any ADHD diagnosis: 0.792 (SD=0.120) No ADHD diagnosis: 0.888 (SD=0.142) Any conduct disorder: 0.802 (SD=0.129) No conduct disorder: 0.888 (SD=0.141) Any autistic disorder: 0.721 (SD=0.157) No autistic disorder: 0.887 (SD=0.140)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
		No cognitive impairment, n=313: £4914 (SD=£4,019) Mean cost difference: £8,530 (95% CI £5,555 to £11,505) Any emotional disorder, n=16: £6,860 (SD=£5,259) Children without emotional disorder, n=315: £5,433 (SD=£4,739) Mean cost difference: £1,427 (95% CI -£1,195 to £4,049) Any ADHD diagnosis, n=17: £5,812 (SD=£3,833) NADHD diagnosis, n=314: £5,551 (SD=£4,852) Mean cost difference: £261 (95% CI -£1,657 to £2,179)	Moderate cognitive impairment Severe cognitive impairment Any emotional disorder Any ADHD diagnosis Any conduct disorder diagnosis Any autistic disorder Any tic disorder	Any tic disorder: 0.801 (SD=0.156) No tic disorder: 0.884 (SD=0.141) **Relationship between psychiatric disorders and health utility scores (Mark 3).** Findings from regression analysis: Any DSM-IV-TR diagnosis (compared with reference – no diagnosis): -0.213 (95% CI -0.302 to -0.124; p<0.0001) Moderate cognitive impairment (compared with reference – no cognitive impairment): -0.198 (95% CI -0.282 to -0.113; p<0.0001) Severe cognitive impairment (compared with reference – no cognitive impairment): -0.324 (95% CI -0.501 to -0.146; p<0.0001) **Relationship between mental health and public sector costs** Linear regression analysis Costs over 12 months up to 11th birthday:

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td>Any conduct disorder, n=17: £7,034 (SD=£5,700)

No conduct disorder, n=314: £5,342 (SD=£5,342)

Mean cost difference: £1,692 (95% CI -£1,006 to £4,389)

Any autistic disorder, n=11: £12,016 (SD=£7,568)

No autistic disorder, n=320: £5,271 (SD=£4,481)

Mean cost difference: £6,745 (95% CI £2,233 to £11,258)</td><td></td><td>DSM-!V-TR diagnosis (compared to reference – no diagnosis): +£1,504.5 (95% CI -£40.3 to £3,049.3)

Moderate cognitive impairment (compared to reference – no cognitive impairment): +£1,401.6 (95% CI -£88.1 to £2,891.2)

Severe cognitive impairment (compared to reference – no cognitive impairment): +£5,662.2 (95% CI £232.8 to £11,086.3)</td></tr>
<tr><td>Petrou and Kupek 2009

Multiple regression analyses of survey data to develop health utility</td><td>No specific intervention considered – study uses primary survey data from the “Disability Survey 2000: Survey of Young People with a Disability and Sport”.</td><td>Costs not applicable for this analysis.

Data collection method: postal questionnaire survey to parents of CYP identified from the</td><td>Health status and HRQoL.

Adjusted health disutilities.

These were calculated using scores reported using the HUI3.

HUI3 comprises 8 domains: cognition,</td><td>Final study sample n=2236 (46% of total number of postal questionnaires sent out)-0.501.

HUI3 multi-attribute utility scores by category of health conditions

<table><tr><th>Health condition</th><th>Mean age (n)</th><th>HUI3 unadjusted</th><th>HUI3 adjusted disutility estimates</th></tr></table></td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td>scores for disorders in CYP.

Some imputation of missing data.

Confidence intervals calculated using bootstrapping.

UK</td>
<td>Population

Children identified from the Family Fund Trust database which contains information on families of CYP in the UK with a disability or illness.

Study sample N=5600.

CYP aged 5-16 years.

Sample weighted to reflect sex, age and regional composition of CYP in the database.</td>
<td>Family Fund Trust database.

Health conditions, medications and disability-related information collected from the Family Fund database.

CYP’s health condition rated by a health professional (usually CYP’s GP) using ICD-9 codes grouped into 47 categories (to reduce number of potential classifications).</td>
<td>vision, hearing, speech, ambulation, dexterity, emotion and pain.

Values obtained from this tool were converted to multi-attribute health utility values using a published utility function developed using a Canadian adult population (n=504) (Feeny et al 2002; Furlong et al 1998; reported in Petrou and Kupek 2009).

Statistical analysis

Regression analysis used to model the relationship between individual childhood conditions and the HUI3 multi-attribute utility scores (dependent variable), with and without adjustment for confounding variables. Covariates for the regression models: age (continuous variable); gender (male, female); presence of siblings in</td>
<td>
<table>
<tr><th></th><th></th><th>scores (mean)</th><th>From perfect health</th><th>From childhood norms</th></tr>
<tr><td>Autistic Spectrum Disorders</td><td>11.0 (105)</td><td>0.433</td><td>-0.569</td><td>-0.494</td></tr>
<tr><td>Behaviour disorders</td><td>10.9 (46)</td><td>0.468</td><td>-0.537</td><td>-0.462</td></tr>
<tr><td>Hyperactivity disorders</td><td>10.9 (50)</td><td>0.432</td><td>-0.575</td><td>-0.501</td></tr>
</table>
</td>
</tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
			household (none, one or more); family type (mother and father in home, one parent in home, other); ethnicity (white, non-white); housing tenure (owner/mortgage, rented). Adjusted health disutilities calculated by subtracting heath utilities from 1 or 2 thresholds (a) a threshold of 1.0 representing perfect health (b) a normative child utility threshold (obtained for the purposes of this study) which reflected the mean HUI3 utility score reflective of a sample of CYP (n=100) of the same as the study population.	
Richardson et al 2015	Clinical SR: Accuracy and validity of screening for psychological and mental health difficulties in young people who offend; and clinical effectiveness	Cost for 16 group CBT sessions lasting 2 hours each: With 1 therapist: £2,054	QALYs **Clinical outcome for HE model**	**Clinical effectiveness** Major depressive disorder recovery rate post treatment: Group CBT based on CWD-A course: 36%

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
SR + cost effectiveness analysis (HTA) Cost effectiveness – review of literature plus decision analytic modelling HE: an exemplar decision model based primarily on costs and health outcomes. Additional analysis included to consider costs and benefits for the youth criminal justice system. Perspective: UK NHS	of treatments for mental health difficulties Diagnostic accuracy review: N=9 included studies Effectiveness review N=10 included studies HE literature review: no relevant studies identified Exemplar HE model: Developed for depression (most common MH condition in this population (15%) and with largest evidence base) **Intervention**	With 2 therapists: £3,910 Ave. cost per individual: With 1 therapist: £197.51 With 2 therapists: 375.97 HE approach: To consider intersectoral implications (across the public sector), the effect of treatment on recidivism rates was incorporated as a cost offset against the cost of the identification (screening) strategy. Costs associated with reoffending by crime type and cost per crime were utilised to	Based on findings from SR: Recovery rate from depression Depression free days (DFDs) – incremental number of days per individual without depression (from Rohde et al, 2004) DFDs indicate the proportion of total time spent in non-depressed and depressed states; they provide the basis for weighting using the identified utility weights for depression. Impact of CBT on recidivism	Life skills course: 19% (Based on Rohde et al 2004) **Cost effectiveness** Using Kaplan-Meier product-limit survival curve, DFDs were calculated. Health-related utility values assigned to DFDs and days depressed for each month. These were then summed over the study period (using area under the curve approach) and QALYs calculated. Revidivism: Impact of CBT on recidivism from meta-analysis of 58 studies reported in reviewed SR: OR: 1.53 ($p<0.001$) i.e. offenders receiving CBT were one and a half times more likely to not reoffend within 12 months post treatment than those not receiving CBT. Probability of reoffending given being depressed and having received CBT was derived as 0.34. This conditional probability is utilized to estimate the expected reduction in recidivism for individuals with depression receiving CBT. Health-related utility weights: Mild depression: 0.685 Moderate: 0.59 Non-depressed: 0.85

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Time horizon: 1 year UK	Group CBT vs life skills course Group CBT: Based on the CWD-A course. Average group size 10.4 YP Course run over 16 sessions Life skills course ("usual care"): YP reviewed recent events, received life skills training and academic tutoring. **Population** CYP aged 10-21 CYP who had offended and were in contact with the criminal justice system	calculate the average cost of crime.		(from Revicki and Wood, 1998) From trial data DFD's over 64 weeks: Group CBT: 23.8 days Life skills course: 21.56 days Health utilities were calculated for the full study period (64 weeks) for both group CBT and the control condition: Group CBT: 23.107 days with full QoL Life skills training: 22.7374 days with full QoL Incremental QALYs of treatment are the differences between the 2 groups averaged over 52 weeks. **Findings from HE model** Treatment with group CBT suggests an individual would gain 0.0113 QALYs compared to the control condition. Cost of CBT per individual: One therapist: £197.51 Two therapists: £357.97

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Setting Not reported			Adopting primarily the health-service perspective on treatment and using the best-case scenario, group CBT would cost: With 1 therapist: £17,542 per QALY With 2 therapists: £33,393 per QALY Only group CBT with 1 therapist comes within NICE's willingness to pay threshold**.** **Screening:** Findings from the HE model developed for MH screening concluded that none of the screening strategies were cost effective.
Sayal et al 2016 3-arm cluster RCT Economic analysis: ITT analysis Missing data imputed No discounting applied	**Intervention** Brief intervention for parents and teachers of children at risk of ADHD. Parent intervention: based on 1-2-3 Magic; delivered to parents in 3 x 2 hour sessions Combined parent and teacher intervention: parent intervention + 1.5 hour group session delivered to teachers outlining the utility of 1-2-	Intervention cost: administration, training, staff time and overheads. Costs to family collected using CSRI (telephone version) Intervention costs: Parent only: £90 Combined: £107	QALYs **Clinical outcomes:** Primary outcome: Parent-rated Conners' ADHD index at 6 months follow up SDQ (parent completion)	**Clinical findings** ADHD index: Parent only: Mean difference -1.1 (95% CI -5.1 to 2.9) Not signif. Combined: Mean difference -2.1 (95% CI -6.4 to 2.1) Not signif. Combined intervention associated with greater reduction in parent-reported hyperactivity symptoms compared to parent only intervention: Mean difference: -5.3 (95% CI -10.5 to -0.01) Health related QoL at 6 month follow up: All 3 groups showed improvements on mean EQ-5D-Y and CHU-9D index values. No signif. difference between allocation groups.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Bootstrapping used to estimate CIs for ICERs Net benefit approach used to estimate the probability of cost-effectiveness at various willingness to pay thresholds. Perspective: UK NHS and personal social services Time horizon: 6 months	3 Magic and including reflection. Compared with a no intervention control group. **Population** Children at risk of ADHD Children aged 3-8 Sample: N=92 parents N=178 teachers N=199 children Schools randomized to combined intervention arm relatively disadvantaged in terms of socio-economic indices and SDQ scores. **Setting** Primary schools (N=12)		Teacher's ratings on Conners' Rating Scale – revised. QoL: EQ-5D-Y CHU-9D -From parents at baseline, 3 and 6 month follow-ups	**Cost effectiveness** Incremental costs of intervention: Parent only: £73 Combined: £123 Mean incremental benefit (parent-rated Conners' ADHD): Parent only: 2 point improvement Combined: 1 point improvement Incremental costs per 1 point improvement in the ADHD index: Parent only: £29 Combined: £134 Above a willingness to pay threshold of £31 per one-point improvement in the parent-rated ADHD index the parent-only programme has the highest probability of being cost-effective. Below this threshold, neither intervention is more likely to be cost-effective than usual care. **ICERs** If only direct costs of the intervention included ICERs are: Parent only: £46 Combined: £77 per one point improvement on the parent-rated ADHD index.

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
Schawo et al, 2012 Economic modelling study Probabilistic Markov model with Monte Carlo simulations to test uncertainty Discounted for future costs and effects Societal perspective Netherlands	Model characteristics derived from literature and ongoing trial data. **Intervention** (for illustration of model): Functional Family Therapy (FFT) vs TAU (e.g. CBT or MST) FFT: systemic approach aimed at improving family functioning (no specific details given) **Population** "Delinquent youth", youth involved in criminal activity Up to age 30 (lower age limit not reported) **Setting** Not reported	Costs derived from trial of FFT. Model included: Direct healthcare and welfare costs to CYP and parents (including healthcare staff costs, medication, foster home costs and residential institution costs) Direct costs outside healthcare and welfare to CYP and parents (including travel costs, time spent on exercises as part of therapy) Indirect costs outside of healthcare and welfare (including criminal justice system costs, productivity losses to parent,	Criminal Activity Free Years ("CAFYs") (similar measure to "days re-incarcerated" as seen in literature) 2 annual outcomes in model: Criminal Not criminal	**Clinical effectiveness for HE model** Based on assumptions and findings derived from literature. CAFY based on adolescent recidivism derived from clinical trial data (Sexton and Alexander, 2000) Annual recidivism: 33% Also from trial data: FFT reduces recidivism and/or the onset of criminal behaviour between 25% and 60% more effectively than other interventions. Average taken i.e. FFT reduced criminal activity by 42.5% Transition (moving from criminal state to non-criminal state or vice-versa) probabilities assumed to be fixed over the years **Base case** Number of CAFYs for FFT exceeds number for TAU by 6.88 Cost savings of FFT compared to TAU: €8,577 ICER: €1.246 per CAFY Model tested using scenario analysis: **Scenario 1: transition rate (from criminal to non-criminal) FFT=TAU** CAFYs: -0.02 Cost savings: -€718 ICER: Zero

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td>informal care for child, informal parent support)</td><td></td><td>Scenario 2: Treatment costs FFT = treatment costs TAU

CAFYs: 6.85

Cost savings: 9,112 Euros

ICER: similar to base case (actual value not reported)

Conclusion: Model sensitive to transition rates, much less sensitive to intervention costs.</td></tr>
<tr><td>Shearer et al 2018

RCT

Clinical and cost effectiveness trial

Markov model

UK NHS and personal social services perspective</td><td>Intervention

Individual weekly sessions of CT-PTSD over 10 weeks delivered by clinical psychologist.

n=14

Comparator

Wait-list control receiving usual NHS care

n=15

Population

CYP who met age-appropriate ICD-10 diagnostic criteria for PTSD 2-6 months</td><td>Micro-costing approach taking into account staff costs multiplied by contact time, service use and medications.

Intervention cost: £138 per hour (including staff cost, overhead cost and non-contact time)

14 CYP in intervention group received an average of 636.25 minutes of contact time (range 195-755 min) and attended an</td><td>Clinical outcome: PTSD or PTSD free (assessed at end of intervention period – 11 weeks)

HRQoL score: CHU-9D score derived from parent reported SDQ score.

CHU-9D score is a validated generic measure of CYP’s health state preferences consisting of 9 dimensions: sad, worried, pain, annoyed, tired, homework or schoolwork, daily routine, activities and sleep.</td><td>4 sets of missing values in each trial group and so findings include imputed data.

Trial outcomes by group
<table>
<tr><th>Outcome</th><th>CT-PTSD</th><th>Usual care</th><th>Difference</th></tr>
<tr><td>Complete case:</td><td>n = 10</td><td>n = 11</td><td></td></tr>
<tr><td>CYP with PTSD (n (%))</td><td>1 (10%)</td><td>9 (82%)</td><td>-72%</td></tr>
<tr><td>QALYs (mean (SD))</td><td>0.1933
(0.0119)</td><td>0.1846
(0.0196)</td><td>0.0087</td></tr>
<tr><td>Imputed data:</td><td>n = 14</td><td>n = 15</td><td></td></tr>
<tr><td>CYP with PTSD (n (%))</td><td>4 (29%)</td><td>11 (73%)</td><td>-44%</td></tr>
<tr><td>QALYs (mean (SD))</td><td>0.1979
(0.0137)</td><td>0.1823
(0.0188)</td><td>0.0156</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr>
<td>Time horizon: 3 years

UK</td>
<td>following a single traumatic event.

Age 8-17 years

Setting

Recruited from emergency departments, CAMHS teams, primary care, schools and health clinics in the east of England.</td>
<td>average of 8.3 sessions.

Mean total cost: £1463 per person.</td>
<td>Considerations for HE model:

PTSD health state value based upon mean costs and QALYs of CYP at baseline (n=29)

PTSD-free health state value based on costs (excluding costs of CT-PTSD) and QALYs for all CYP who were PTSD free at end of 11 week trial period irrespective of group allocation (n=14).

Natural recovery from PTSD simulated based on published trial data and calculated to give a 3 month probability of recovery of 0.129. This was modelled only for the first year following the intervention.</td>
<td>Trial-based cost-utility analysis
<table>
<tr><th></th><th>Complete case</th><th>Imputed</th></tr>
<tr><td>Costs CT-PTSD (mean (SD))</td><td>£1,691 (£532)</td><td>£1,686 (£549)</td></tr>
<tr><td>Costs usual care (mean (SD))</td><td>£351 (£392)</td><td>£307 (£352)</td></tr>
<tr><td>Adjusted difference</td><td>£1,284</td><td>£1,346</td></tr>
<tr><td>QALYs CT-PTSD (mean (SD))</td><td>0.1929 (0.0108)</td><td>0.1979 (0.0137)</td></tr>
<tr><td>QALYs usual care (mean (SD))</td><td>0.1851 (0.0201)</td><td>0.1823 (0.0186)</td></tr>
<tr><td>Adjusted difference</td><td>0.0103</td><td>0.0095</td></tr>
<tr><td>ICER (£ per QALY)</td><td>£124,660</td><td>£141,684</td></tr>
</table>
Based on trial data only both the intervention and usual care are well above the NICE cost-effectiveness threshold of £20,000-£30,000 per QALY. However, this is due to the short trial length and lack of longer term follow-up.

Estimated annual health state values used for model

Values based on imputed trial data and baseline data.
<table>
<tr><th>Health state</th><th>Costs</th><th>QALYs</th></tr>
<tr><td>PTSD free</td><td>£1,114</td><td>0.7725</td></tr>
<tr><td>PTSD</td><td>£2,596</td><td>0.7386</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td></td><td></td><td>
Model based cost utility analysis (imputed model)
<table>
<tr><th></th><th>Year 1*</th><th>Year 2</th><th>Year 3</th></tr>
<tr><td>Costs CT-PTSD (mean (SD))</td><td>£2,598</td><td>£3,752</td><td>£4,865</td></tr>
<tr><td>Costs usual care (mean (SD))</td><td>£1,540</td><td>£3,125</td><td>£4,768</td></tr>
<tr><td>Difference</td><td>£1,058</td><td>£627</td><td>£97</td></tr>
<tr><td>QALYs CT-PTSD (mean (SD))</td><td>0.773</td><td>1.557</td><td>2.370</td></tr>
<tr><td>QALYs usual care (mean (SD))</td><td>0.748</td><td>1.522</td><td>2.324</td></tr>
<tr><td>Difference</td><td>0.0246</td><td>0.0352</td><td>0.0577</td></tr>
<tr><td>ICER (£ per QALY)</td><td>£42,967</td><td>£17,779</td><td>£2,205</td></tr>
<tr><td>CEAC (p)**</td><td>4% - 19%</td><td>31% - 45%</td><td>60% - 69%</td></tr>
</table>
*Includes 3 months trial data and 9 months modelled data

**Probability that CT-PTSD is cost-effective at NICE threshold of £20,000 to £30,000 per QALY

Sensitivity analysis using complete case data showed CT-PTSD had a 69% - 75% probability of being cost-effective at the NICE threshold. Adding
</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				training costs to the model increased the 3 year ICER to £16,187 and reduced probability that CT-PTSD would be cost effective at NICE £20,000 - £30,000 to 51% - 62%.
Stallard et al 2013 (HTA) Cluster RCT Clinical and cost effectiveness trial Fieller's method used to construct CE acceptability curve UK	**Intervention** Classroom-based CBT – the Resourceful Adolescent Programme (RAP). Intervention delivered to whole class. Delivered by 2 trained facilitators external to the school 2 controls: usual personal, social and health education (PSHE) and PSHE with 2 additional support facilitators (attention control) **Population** Children at "high risk" of developing symptoms of depression Age: 12-16	Costs of providing interventions calculated from project records of resource use e.g. paid time of facilitators, cost of training, travel costs, printing costs for course material. Estimated costs of interventions per child: Classroom-based CBT: £41.96 Attention control PSHE: £34.45 Bottom-up costing for health-related costs. Resource-use collected via questionnaire:	QALYs ICERs based on SMFQ score and EQ-5D scores Scores for EQ-5D at baseline, 6 and 12 month follow up EQ-5D completed by CYP themselves **Clinical outcomes**: SMFQ scores (symptoms of depression) at 12 month follow up CSRI – service use questionnaire	**Clinical effectiveness** SMFQ scores decreased for high risk CYP in all 3 trial arms at 12 months, but there was no difference between arms. Adjusted difference in SMFQ score means: Classroom-based CBT vs usual PSHE: 0.97 (95% CI -0.34 to 2.28); p=0.067 Classroom-based CBT vs attention control PSHE: -0.63 (95% CI -1.99 to 0.73); p=0.249 EQ-5D preference-based index (possible range -0.594 to 1.0) (mean (SD)) Classroom-based CBT: Baseline: 0.916 (0.1484) 6 months: 0.921 (0.1578) 12 months: 0.925 (0.1585) Usual PHSE: Baseline: 0.929 (0.1348) 6 months: 0.923 (0.1685)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	N=5030 CYP N=1064 classified as "high risk" of developing depression (elevated symptoms of depression on 2 occasions prior to intervention) **Setting** Secondary school (n=8 schools)	In-patient stays A&E attendances Hospital out-patient clinics Visits to GP Visits to practice nurse Counsellor (per hour) Child mental health service (per hour) Child psychologist (per hour) Social worker (per hour)		12 months: 0.941 (0.1291) Attention control PHSE: Baseline: 0.914 (0.1464) 6 months: 0.912 (0.1632) 12 months: 0.915 (0.1656) **ICERs** Classroom-based CBT: Costs per person: £526 QALYs: 0.90 (SD 0.12) Usual PHSE: Costs per person: £385 QALYs: 0.91 (SD 0.12) Attention control PHSE: Costs per person: £517 QALYs: 0.89 (SD 0.12)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Classroom-based CBT not cost effective compared to either control. Usual PSHE dominated both classroom-based CBT and attention control PSHE (i.e. more effective and less expensive).
Tilford et al 2012 Cross-sectional comparative study including some prospectively collected outcome data Study to compare the validity of 2 preference-based instruments to describe health-related QoL for CYP with ASDs USA	**Intervention** 2 generic preference-based QoL instruments were tested: **HUI-3** Includes 8 health-related attributes: vision, hearing, speech, mobility, dexterity, cognition, emotion and pain/discomfort. Caregivers report health of the CYP over a 3-day period. A multiplicative scoring function is used to calculate an overall score which ranges from -0.36 (some health states are considered to be worse than death) to 1 (perfect health). **QWB-SA** Self-administered preference-weighted measure of functioning (mobility, physical activity, social activity) and a measure of	No costs reported – not relevant to this study	**Clinical outcome measures** All clinical measures obtained at time of CYP's first visit to study clinic. For most this was within 1 year of QoL instrument data collection, approx. 90% collected within 2 years. Diagnosis of ASD using DSM-IV (TR) and confirmed by scores meeting or exceeding threshold on the ADOS. Adaptive skills: Vineland-II Adaptive Behaviour Scales. 4 domains - communication, socialisation, daily living skills and motor skills. Semi-structured caregiver interview scored by the clinician. Higher scores	**HRQoL by diagnosis** Full sample (N=146): HUI-3 mean score 0.66 (SD 0.23); range -0.03 to 1.0 QWB-SA mean score 0.59 (SD 0.16); range 0.18 to 1.0 Autistic disorder (n=110): HUI-3 mean score 0.64 (SD 0.23); range 0.07 to 1.0 QWB-SA mean score 0.58 (SD 0.16); range 0.18 to 1.0 PDD-NOS (n=23): HUI-3 mean score 0.70 (SD 0.24); range -0.03 to 0.93 QWB-SA mean score 0.62 (SD 0.18); range 0.27 to 1.0 Asperger's disorder (n=13): HUI-3 mean score 0.79 (SD 0.16); range 0.57 to 1.0 QWB-SA mean score 0.62 (SD 0.15); range 0.36 to 0.89

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td>symptoms and problems (using 56 of 58 symptom complexes – 2 excluded as considered not applicable to children of all ages, sexuality and hangovers) to produce a point in time expression of wellbeing. Caregivers asked to complete the 4 sub-scales over a period of 3 days to report their child's health.

Population

CYP meeting DSM-IV criteria for an ASD.

Age: 4-17 years.

Sample:

N=150

Mean age 8.6 years (SD 3.3)

Gender: 85.3% male</td><td></td><td>indicate better adaptive functioning.

Cognitive functioning: 1 of 3 tools used chosen depending upon age of CYP – Stanford-Binet Intelligence Scale (5th ed.), the Mullen Scales or the Bayley Scales. All scales yield an overall score expressed as a standard score with a mean of 100 and a SD of 15. Stanford-Binet Scale was used the most often (n=140) and yields an IQ, the Mullen Scale and Bayley Scale produce a cognitive score.

Autism specific behavioural adjustment: Autism Treatment Network assessment battery – includes assessment of social interaction, sensory issues, self-stimulatory and repetitive behaviour,</td><td>HUI-3 scores among CYP with Asperger's disorder were signif. higher than for CYP with autistic disorder (p=0.026). No other signif. diffs.

<u>Clinical characteristics and correlations with HRQoL summary scores:</u>

<table>
<tr><th colspan="4"></th><th>Spearman correlations</th></tr>
<tr><th>Scales</th><th>N</th><th>Mean (SD)</th><th>HUI-3</th><th>QWB-SA</th></tr>
<tr><td>ADOS</td><td>146</td><td>7.2 (1.8)</td><td>-0.143</td><td>0.068</td></tr>
<tr><td>Vineland II ABS</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Communication</td><td>140</td><td>71.1 (15.3)</td><td>0.475**</td><td>0.212**</td></tr>
<tr><td>Daily living skills</td><td>140</td><td>69.7 (12.7)</td><td>0.485**</td><td>0.248**</td></tr>
<tr><td>Socialization</td><td>140</td><td>66.9 (11.3)</td><td>0.373**</td><td>0.200**</td></tr>
<tr><td>Motor skills</td><td>84</td><td>73.9 (11.1)</td><td>0.552**</td><td>0.053</td></tr>
<tr><td>Composite score</td><td>140</td><td>67.4 (11.2)</td><td>0.521**</td><td>0.247**</td></tr>
</table>
</td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	Ethnicity: 78.7% Caucasian **Settings** A developmental centre in Little Rock, Arkansas and an outpatient psychiatric clinic in Columbia University Medical Center, New York. Both part of the Autism treatment Network, USA.		aggression, hyperactivity and sleep disturbances. Parent-report and clinician report components.	<table><tr><td>**Cognitive functioning**</td><td>146</td><td>75.6 (24.4)</td><td>0.359**</td><td>0.166*</td></tr></table> *p<0.05 **p<0.001 **Parent-rated symptom scores in relation to HRQoL scores** (p values correspond to Spearman's correlation coefficients) <u>Language use and understanding problems</u> HUI-3 scores (mean (SD)): No problems: 0.84 (0.09) Mild problems: 0.74 (0.14) Moderate problems: 0.70 (0.19) Severe problems: 0.51 (0.25) p<0.01 QWB-SA scores (mean (SD)): No problems: 0.69 (0.16) Mild problems: 0.60 (0.13) Moderate problems: 0.60 (0.17) Severe problems: 0.51 (0.13)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				p<0.01 <u>Compulsive behaviours</u> HUI-3 scores (mean (SD)): No problems: 0.72 (0.19) Mild problems: 0.69 (0.23) Moderate problems: 0.64 (0.24) Severe problems: 0.61 (0.23) p=0.04 (Not signif. – adjusted for multiple comparisons) QWB-SA scores (mean (SD)): No problems: 0.63 (0.16) Mild problems: 0.58 (0.13) Moderate problems: 0.58 (0.15) Severe problems: 0.53 (0.19) p=0.02 (not signif. – adjusted for multiple comparisons) <u>Anxiety</u> HUI-3 scores (mean (SD)):

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				No problems: 0.72 (0.23) Mild problems: 0.69 (0.21) Moderate problems: 0.65 (0.24) Severe problems: 0.63 (0.19) p=0.01 QWB-SA scores (mean (SD)): No problems: 0.66 (0.15) Mild problems: 0.55 (0.16) Moderate problems: 0.58 (0.15) Severe problems: 0.56 (0.17) p=0.01 <u>Aggression</u> HUI-3 scores (mean (SD)): No problems: 0.69 (0.21) Mild problems: 0.69 (0.22) Moderate problems: 0.50 (0.29) Severe problems: 0.66 (0.22)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				p=0.12 (not signif) QWB-SA scores (mean (SD)): No problems: 0.61 (0.17) Mild problems: 0.57 (0.14) Moderate problems: 0.49 (0.14) Severe problems: 0.55 (0.14) p=0.03 (not signif – adjusted for multiple comparisons) <u>Hyperactivity</u> HUI-3 scores (mean (SD)): No problems: 0.73 (0.26) Mild problems: 0.72 (0.20) Moderate problems: 0.66 (0.21) Severe problems: 0.59 (0.23) p<0.01 QWB-SA scores (mean (SD)): No problems: 0.59 (0.21)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Mild problems: 0.61 (0.15) Moderate problems: 0.61 (0.14) Severe problems: 0.52 (0.15) p=0.03 (not signif – adjusted for multiple comparisons) <u>Mood swings</u> HUI-3 scores (mean (SD)): No problems: 0.69 (0.22) Mild problems: 0.66 (0.24) Moderate problems: 0.65 (0.22) Severe problems: 0.67 (0.21) p=0.31 (not signif) QWB-SA scores (mean (SD)): No problems: 0.62 (0.14) Mild problems: 0.58 (0.18) Moderate problems: 0.54 (0.14) Severe problems: 0.57 (0.17) p=0.03 (not signif – adjusted for multiple comparisons)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				<u>Social interaction</u> HUI-3 scores (mean (SD)): No problems: 0.71 (0.26) Mild problems: 0.67 (0.26) Moderate problems: 0.68 (0.21) Severe problems: 0.64 (0.19) p=0.03 (not signif – adjusted for multiple comparisons) QWB-SA scores (mean (SD)): No problems: 0.62 (0.12) Mild problems: 0.56 (0.17) Moderate problems: 0.60 (0.18) Severe problems: 0.57 (0.14) p=0.23 (not signif) <u>Self-injurious behaviour</u> HUI-3 scores (mean (SD)): No problems: 0.71 (0.21)

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				Mild problems: 0.61 (0.25) Moderate problems: 0.57 (0.20) Severe problems: 0.62 (0.21) p<0.01 QWB-SA scores (mean (SD)): No problems: 0.61 (0.17) Mild problems: 0.56 (0.12) Moderate problems: 0.58 (0.14) Severe problems: 0.49 (0.14) p=0.07 (not signif) <u>Has lost or seems to be losing skills s/he had previously</u> HUI-3 scores (mean (SD)): No problems: 0.70 (0.21) Mild problems: 0.64 (0.19) Moderate problems: 0.43 (0.26) Severe problems: 0.49 (0.26) p<0.01

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
				QWB-SA scores (mean (SD)): No problems: 0.61 (0.16) Mild problems: 0.55 (0.15) Moderate problems: 0.47 (0.20) Severe problems: 0.46 (0.10) p<0.01 **Clinician ratings of presence vs absence of problems in relation to HRQoL scores** Of 12 items analysed the pattern of change in scores on the HUI-3 and QWB-SA were similar when comparing YP with and without ASD symptoms. However, for the QWB-SA there were no signif. diffs. in HRQoL scores among the clinician-rated ASD symptoms i.e. it was not sensitive in detecting CYP with vs without ASD symptoms. The HUI-3 faired better, there were 5 clinician-rated symptoms where the HUI-3 scores were signif. different between CYP with vs without symptoms: lacking spontaneity in seeking enjoyment, delay/lack of spoken language, lack of play for developmental level, repetitive motor mannerisms, persistent preoccupation with objects/parts of objects. Changes in HUI-3 scores tended to be larger than changes in QWB-SA scores. Regression analysis showed that the HUI-3 had better explanatory powers than the QWB-SA across all explanatory models of analysis based on adjusted R^2 values.

<table>
<tr><th>Study details inc. economic analysis</th><th>Intervention, population and setting</th><th>Costs</th><th>Effectiveness outcomes</th><th>Clinical and cost-effectiveness</th></tr>
<tr><td></td><td></td><td></td><td></td><td>R^2 for the regression analysis using the Vineland composite had the highest adjusted R^2 value.</td></tr>
<tr><td>Wright et al 2016

RCT

Cost-utility analysis

Costs from perspective of the payer

Time horizon: 12 months

USA</td><td>Intervention
Collaborative care depression treatment programme comprising: initial face-to-face engagement meeting, delivery of evidence-based treatments, follow up by masters level clinicians.
Comparator:
Usual care comprising receipt of depression screening results and access to mental health services and medications via usual routes.
Population
Young people with depression enrolled in primary care at 9 integrate health care clinics. Depression defined by PHQ-9 score of</td><td>Microcosting approach, multiplying resource use by unit costs.

Estimated costs:
60-minute therapy session (plus 45 min administrative time: $96
Face-to-face visit without therapy (30 min plus 30 min admin. time): $55
Telephone check-in (15 min. plus 20 mins. Admin. time): $32
Other costs included coverage of user expenditure related to outpatient visits, inpatient visits, ED</td><td>QALYs from baseline to 12 months

Depression outcome:
Depression severity calculated using baseline, 6 month and 12 month CDRS=R scores, linearly interpolated between time points to obtain a daily CDRS-R score.
CDRS-R score ≤23: not depressed
Score 24-42: mildly depressed
Score >42: moderately to severely depressed

Statistical analysis:
Missing values imputed: 18% of CDRS-R results at</td><td>Final sample n=101
Daily utility values for depression:
No depression: 1.0
Mild: 0.8
Moderate to severe: 0.6
(Note: adult values)
Cost effectiveness
<table>
<tr><th colspan="3">Intervention costs and cost-effectiveness ratios</th></tr>
<tr><td></td><td>Usual care (n=51)</td><td>Intervention (n=50)</td></tr>
<tr><td>Cost per YP</td><td>$5752 (95% CI $3814 to $7952)</td><td>$6636 (95% CI $5013 to $8852)</td></tr>
<tr><td>Mean daily utility value</td><td>0.73 (95% CI 0.71 to 0.76)</td><td>0.78 (95% CI 0.75 to 0.80)</td></tr>
<tr><td>Net mean cost ($)</td><td>NA</td><td>$883 (95% CI -$920 to $3759)</td></tr>
<tr><td>Net mean QALY</td><td>NA</td><td>0.04 (95% CI 0.02 to 0.09)</td></tr>
<tr><td>ICER
$ per QALY gained</td><td>NA</td><td>$18,239
Dominant to $24,408</td></tr>
</table></td></tr>
</table>

Study details inc. economic analysis	Intervention, population and setting	Costs	Effectiveness outcomes	Clinical and cost-effectiveness
	≥10 or CDRS-R score of ≥42. Age: 13 – 17 years **Setting** Health clinics (Washington State)	visits, prescription drugs and laboratory tests. Costs based on reimbursement data from Group Health (US integrated health care system).	6 months and 20% at 12 months. Uncertainty analysis carried out using bootstrapping techniques (1000 imputations) to ascertain 95% confidence intervals around point estimates.	Uncertainty testing: In 25.9% of bootstrapped cases the intervention was both less expensive and more effective than usual care.

Abbreviations:

ADHD Attention deficit hyperactivity disorder
ADIS-C/P Anxiety Disorder Interview Schedule for Children and Parents
ADOS Autism Diagnostic Observation Schedule
ASD Autistic spectrum disorder
ASID-A Anxiety Disorder Interview Schedule for adults
CBCL Child Behaviour Check List
CBT Cognitive behavioural therapy
CDRS-R Child Depression Rating Scale revised version
CE cost effectiveness
CEAC Cost effectiveness acceptability curve
CGI-I Clinical Global Impressions of Improvement
CHU-9D Child Health Utility 9D (ref Canaway and Frew 2013)
CI Confidence interval
CJS Criminal justice system
CLAS Child Life and Attention Skills
CSRI Client Services Receipt Inventory
CT-PTSD Cognitive treatment for post-traumatic stress disorder
CTRS Conners Teacher Rating Scale

DALY Disability adjusted life year
DP-CICS Dyadic Parent-Child Interaction Coding System
DSM-IV (TR) Diagnostic and Statistical Manual of Mental Disorders 4th edition (text revision)
DW Disability weight
HTA Health Technology Appraisal (UK)
HUI2 and HUI3 The Health Utility Index Mark 2 and Mark 3
ICD-9 and ICD-10 International Classification of Diseases 9th and 10th revision
ICER Incremental cost-effectiveness ratio
ECBI Eyberg Child Behaviour Inventory
EQ-5D-Y (ref: Ravens-Sieberer et al 2010 – validation in children over 8)
MDD Major depressive disorder
MH Mental health
MST Multisystemic therapy
OCD Obsessive-compulsive disorder
PDD-NOS Pervasive developmental disorder not otherwise specified
PHQ-9 9-item Patient Health Questionnaire
PTSD Post-traumatic stress disorder
QALY Quality-adjusted life year
QoL Quality of life
QWB-SA The Quality of Wellbeing Self-Administered Scale
SCAS-c/p Spence Children's Anxiety Scale – child and parent version
SD Standard deviation
SDQ Strengths and Difficulties Questionnaire
SMFQ Short Mood and Feelings Questionnaire
SR Systematic review
SSRIs Selective serotonin re-uptake inhibitors
STEPP Strategies for Enhanced Positive Parenting
SW Social worker
TAU Treatment as usual
Vineland II ABS Vineland II Adaptive Behaviour Scale
YLD Years lived with disability

Appendix G: GRADE table

Review aim: **To identify relevant and credible values for health utility weights and Quality Adjusted Life Years (QALYs) for use in the health economics modelling for the SECURE STAIRS national evaluation**

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
Bodden 2008 - CYP free from anxiety (follow up: 12 months; assessed with: ADIS-C/P)												
1	randomised trials	serious [a]	not serious	very serious [b,c]	not serious	none	Individual CBT: 40/59 (67.8%)	Family group CBT: 30/57 (52.6%)	Adjusted QALY gain per year: Individual CBT: 0.816	Adjusted QALY gain per year: Family CBT: 0.808	⨁◯◯◯ VERY LOW	
Byford 2007 - Global mental health (depression) score (follow up: 28 weeks; assessed with: HoNOSCA)												
1	randomised trials	not serious	not serious	serious [d]	serious [e]	none	Mental health improvement: no significant difference between groups: 1.24 (95% CI -1.05 to 3.52)		QALY gain: CBT+SSRI: 0.36	QALY gain: SSRI: 0.38	⨁⨁◯◯ LOW	
Chong 2015 – Annual recidivism (violent injury (follow up: 5 years; assessed with: Probability of recurrent violent injury)												
1	observational studies	serious [f]	not serious	serious [g,h]	not serious	none	Annual recidivism: 2.5%	Annual recidivism: 4%	QALY gain: HVIP: 4.64	QALY gain: Standard care: 4.62	⨁◯◯◯ VERY LOW	
Creswell 2017 - "Much" or "very much" improved anxiety (follow up: 6 months; assessed with: CGI-I score)												
1	randomised trials	serious [a]	not serious	very serious [b,c]	not serious	none	Brief, guided, parent-delivered CBT: 45/68 (66.2%)	Solution-focused brief therapy: 47/68 (69.1%)	Incremental QALY gain for intervention : 0.006 (95% CI -0.009 to 0.02)		⨁◯◯◯ VERY LOW	
Domino 2008 - Recovery from depression - "depression free days" (follow up: 12 weeks; assessed with: CDRS-R score)												

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
1	randomised trials	serious [i]	not serious	serious [d]	very serious [j,k]	none	3 treatment groups: fluoxetine alone, CBT alone, combination therapy. Across all treatment groups: 22/84 DFDs		Average QALY gain across treatment groups: 0.16		⨁◯◯◯ VERY LOW	

Dretzke 2006 - Degree of conduct disorder based on one point improvement on behaviour scale (follow up: 12 months; assessed with: ECBI (intensity or frequency) or CBCL scales)

15	randomised trials	serious [l]	not serious	serious [b]	not serious	none	Estimated WMD 04.36 (95% CI -7.90 to -0.81) favouring parent education/training vs control. Assumed to be similar across all 3 types of parent training.		Based on £20,000 WTP threshold QALY gain required for intervention to be cost-effective: Group community-based parent training: 0.0069 QALYs Group clinic-based training: 0.0048 Individual home-based training: 0.0300		⨁⨁◯◯ LOW	

Eeren 2015 - Criminal activity free years (CAFYs) (follow up: 20 years; assessed with: Self-reported contact with police)

1	observational studies	serious [m]	not serious	not serious	not serious	none	- (WTP analysis)	- (WTP analysis)	CAFY gain over 20 years: 12.4	CAFY gain over 20 years: 11.7	⨁◯◯◯ VERY LOW	

Foster 2006 - No. of cases of crime averted (follow up: 9 years; assessed with: Self-report of Delinquency scale))

1	observational studies	not serious	not serious	very serious [b,n]	serious [i]	none	- (WTP analysis)	- (WTP analysis)	For CYP at higher risk: ICERs (Standard Error); probability of school-based programme being cost-effective (%) Cost per case of conduct disorder averted: $752,103 ($3,588,311); 69% Cost per (index) crime averted: $150,738 ($787,270); 57% Cost per act of interpersonal violence averted: $283,542 ($5,153,761); 0%		⨁◯◯◯ VERY LOW	

Foster 2007 - Response to treatment for conduct disorder – likelihood that "getting onto trouble" is a "bad problem" (follow up: 14 months; assessed with: CIS)

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
1	randomised trials	not serious	not serious	very serious [b,o]	not serious	none	Combination therapy: 7%	Community care: 19%	At modest levels of willingness to pay (up to $50,000) for 1 SD improvement in functioning medical management was almost certain to be cost-effective. At higher levels of WTP (above $50,000) combination therapy became more likely to be cost-effective.		⊕⊕◯◯ LOW	

Haby 2004 - Composite score relating to depression, anxiety, low mood and HRQoL (follow up: 12 months; assessed with: Various scales across studies - continuous outcome measures)

10	randomised trials	not serious	serious [p]	very serious [b,d]	not serious	none	CBT vs usual care SMD 0.41 (95% CI 0.15 to 0.67)	SSRIs vs usual care 0.29 (95% CI 0.11 to 0.46)	DALY gain for sample of 10,952 CYP: CBT: 360	DALY gain for sample of 10,952 CYP: SSRIs: 230	⊕◯◯◯ VERY LOW	

Juillard 2014 - Recurrence of violent injury (follow up: 5 years; assessed with: Probability of recurrence)

1	observational studies	serious [f]	not serious	serious [g,h]	serious [e]	none	Annual recidivism HVIP: 0.9%	Annual recidivism Standard care: 3.2%	QALY gain over 5 years: HVIP: 25.58	QALY gain over 5 years: Standard care: 25.34	⊕◯◯◯ VERY LOW	

Matza 2005 - Severity of ADHD (follow up: Not reported; assessed with: CTRS score)

2	observational studies	serious [q]	not serious	serious [o]	not serious	none	NR	NR	For medical management the cost per QALY gained ranged from $15,509 to $27,766 in the 2 studies.		⊕◯◯◯ VERY LOW	

NICE 2010 Support services for transition to adult services/leaving care - Employment (follow up: Lifetime; assessed with: Employment rate)

5	observational studies	not serious	not serious	serious [r]	not serious	none	92%	27%	Incremental QALY gain over a lifetime: 0.99 QALYs		⊕◯◯◯ VERY LOW	

NICE 2013 Autism and behaviour that challenges in CYP - Response to treatment (improvement of at least 25%) (follow up: 32 weeks; assessed with: ABC irritability scale)

4	randomised trials	serious [s]	not serious	serious [t]	not serious	none	Probability of a positive response to treatment: 0.239 (over 8 weeks)		Total QALY gain over 32 weeks: 0.84 QALYs per 100 CYP		⊕⊕◯◯ LOW	

NICE 2018 CYP with ADHD: Parent training - Number of CYP responding to treatment (follow up: 3 months; assessed with: Described by parents as taking medication and "functioning well")

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
2	randomised trials	not serious	not serious	serious [o]	not serious	none	Relative difference in response: 13% (from sensitivity analysis)		QALY gain for intervention group: 0.0110		⨁⨁⨁◯ MODERATE	

NICE 2018 CYP with ADHD - Pharmacological treatment - Response to treatment (follow up: 12 months; assessed with: CGI-I)

3	randomised trials	not serious	not serious	very serious [b,o]	not serious	none	NR	NR	QALY: 0.837	QALY: 0.773	⨁⨁◯◯ LOW	

NICE 2018 CYP with ADHD: sequencing of pharmacological treatment - Response to treatment (follow up: 12 months; assessed with: Not reported)

2	randomised trials	not serious	not serious	very serious [b,o]	not serious	none	NR	NR	QALY gain for 4 drug sequences investigated: 0.03, 0.0235, 0.0181, 0.0320		⨁⨁◯◯ LOW	

NICE 2015 Attachment difficulties - Non-secure attachment (follow up: 11 years; assessed with: SSP)

3	randomised trials	not serious	not serious	serious [b]	serious [u]	none	Risk ratio for insecure attachment: Video feedback: 0.750 Parent training: 0.690 Home visiting plus psychotherapy: 0.580		QALY gain per 100 CYP Video feedback vs standard care: 3.91 Parent training vs video feedback: 1.39 Home visiting plus psychotherapy vs parent training: 9.45		⨁⨁◯◯ LOW	

NICE 2016 Harmful sexual behaviour - Re-offending rate (follow up: 10 years; assessed with: Arrest for sexual offence)

2	randomised trials	not serious	not serious	very serious [b,v]	not serious	none	41.67%	75.10%	QALY gain to victims over 8.9 years: 255 QALYs		⨁⨁◯◯ LOW	

Petrou 2010 - Development of multi-attribute utility scores (timing of exposure: 11 years; assessed with: DAWBA and Kaufman Assessment Battery for Children)

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
1	observational studies	not serious	not serious	not serious	not serious	none	NR (N=331. Primary research to develop range of utility values for CYP)		HUI-3 values: Any emotional disorder: 0.672 No emotional disorder: 0.871 Any conduct disorder: 0.727 No conduct disorder: 0.870	HUI-2 values: Any emotional disorder: 0.760 No emotional disorder: 0.888 Any conduct disorder: 0.802 No conduct disorder: 0.888	⨁⨁◯◯ LOW	

Petrou and Kupek 2009 - Development of disutility scores (assessed with: HUI-3)

1	observational studies	not serious	not serious	serious [n,o,t]	not serious	none	NR (N=2236. Primary research to develop range of utility values for CYP)	Adjusted HUI-3 values from childhood norms: ASD: -0.569 Behaviour disorders: -0.537 Hyperactivity: -0.575	⨁◯◯◯ VERY LOW	

Richardson 2015 - recovery from depression - "depression-free days" (no. of studies includes SRs) (follow up: 12 months; assessed with: Variety of psychometric scales)

10	observational studies	not serious	serious [w]	not serious	not serious	none	Group CBT: 23.8	Life skills training: 21.56	23.107 days with full QoL Incremental QALYs of intervention: 0.0113 over 1 year vs comparison	22.7374 days with full QoL	⨁◯◯◯ VERY LOW	

NICE 2015 CYP with challenging behaviour and a learning disability - Non-improvement in behaviour (follow up: 61 weeks; assessed with: ECBI-Problem, CBCL - Externalising behaviour or DBC - Total behaviour problems)

1	randomised trials	not serious	not serious	serious [x]	not serious	none	Risk ratio of non-improvement: 0.72	QALY gain per 100 CYP 1.33	⨁⨁⨁◯ MODERATE	

NICE 2015 CYP with challenging behaviour and a learning disability - Non-improvement in sleep problems (follow up: 38 weeks; assessed with: Not reported)

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
1	observational studies	not serious	not serious	serious [x]	not serious	none	Psychosocial intervention vs control: -0.85 Melatonin vs psychosocial intervention: 0.73 Combination therapy vs psychosocial intervention: 0.27		QALY gain vs controls Combination therapy: 0.27 Melatonin tablets: 0.011		⊕◯◯◯ VERY LOW	

Sayal 2016 - Severity of ADHD (follow up: 6 months; assessed with: Parent-rated Connor's ADHD Index)

1	randomised trials	not serious	not serious	serious [b,o]	serious [j]	none	Parent intervention vs control: mean difference -1.1 (95% CI -5.1 to 2.9) Parent+teacher intervention: mean difference -2.1 (95% CI -6.4 to 2.1)		All 3 groups showed improvement in EQ-5D-Y scores: Controls: 0.0007 Parent only group: 0.100 Parent+teacher group: 0.019		⊕⊕◯◯ LOW	

Schawo 2012 - Annual recidivism and/or onset of criminal behaviour (follow up: Lifetime time horizon for model; assessed with: Based on clinical trial data)

1	observational studies	not serious	not serious	serious [h]	serious [y]	none	FFT 42.5% more effective than TAU		Incremental gain in CAFYs compared with TAU FFT 6.88		⊕◯◯◯ VERY LOW	

Shearer 2018 - presence of PTSD (follow up: 11 weeks; assessed with: ICD-10)

1	randomised trials	not serious	not serious	very serious [b,z]	not serious	none	4/14 (29%)	11/15 (73%)	QALYs (adjusted) 0.1979	QALYs (adjusted) 0.1823	⊕⊕◯◯ LOW	

Stallard 2013 - Symptoms of depression (follow up: 12 months; assessed with: SMFQ)

1	randomised trials	not serious	not serious	not serious	not serious	none	Classroom-based CBT vs usual PHSE: difference in mean 0.97 (adjusted) Classroom-based CBT vs attention control PHSE: difference in mean -0.63 (adjusted)		Incremental QALY gain vs usual PHSE Classroom-based CBT: 0.009 Attention control: 0.016		⊕⊕⊕⊕ HIGH	

Tilford 2012 - HRQoL in CYP with ASD (follow up: 90% within 2 years; assessed with: HUI-3 and QWB-SA)

Certainty assessment							Effect		Health utility values		Certainty	Relevance/Applicability
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	[intervention]	[comparison]	[intervention]	[comparison]		
1	observational studies	serious [aa]	not serious	serious [t]	not serious	none	NR (Study to compare 2 HRQoL instruments)	NR (Study to compare 2 HRQoL instruments)	HUI-3 HRQoL mean scores: e.g. Aggression No 0.69 Mild: 0.69 Severe: 0.66 e.g. Self-injury No: 0.71 Mild: 0.61 Severe: 0.62	QWB-SA HRQoL mean scores: e.g. Aggression No: 0.61 Mild: 0.57 Severe: 0.55 e.g. Self-injury No: 0.61 Mild: 0.56 Severe: 0.58	⨁◯◯◯ VERY LOW	

Wright 2016 - Depression (follow up: 12 months; assessed with: CDRS-R)

1	randomised trials	not serious	not serious	serious [d]	serious [a]	none	NR	NR	Net QALY gain for intervention group vs usual care: 0.04 (95% CI 0.02 to 0.09)	⨁⨁◯◯ LOW	

Abbreviations

CAFY Criminal activity free year

CBT Cognitive behaviour therapy

CI: Confidence interval

DALY Disability adjusted life year

HRQoL: Health-related quality of life

QALY Quality adjusted life year

NR Not reported

Explanations

a. Missing values - imputation of data for modelling

b. Age range includes children under 10 years

c. CYP with anxiety disorders

d. CYP with depression

e. Wide confidence interval

f. Retrospective data collected from hospital records

g. CYP with violent injury

h. Includes young people over 21 years

i. No or short follow up

j. Wide standard deviation or standard error

k. Effect sizes for study groups not reported separately

l. Outcome assessed using different scales within study groups

m. Self-report outcome data

n. CYP with conduct disorder

o. CYP with ADHD

p. Unexplained heterogeneity in SR

q. Very few study details reported

r. Looked after CYP

s. Utility values for hyperactivity used for CYP with autism and challenging behaviour

t. CYP with autism

u. Indirect comparisons performed and absolute risks estimated

v. CYP arrested for a sexual offence

w. Includes range of different interventions and intervention durations

x. CYP with challenging behaviour and a learning disability

y. Model based on assumptions

z. CYP with PTSD

aa. Wide range of times between assessments,

Appendix H: Excluded studies table

N=64 publications

Reference	Reason for exclusion
Abright, A Reese 2012 Estimating the Costs of Attention-Deficit/Hyperactivity Disorder J.*Am.Acad.Child Adolesc.Psychiatry* 51 (10): 987-989	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Barrett,Barbara; Byford,Sarah; Chitsabesan,Prathiba; Kenning,Cassandra 2006 Mental health provision for young offenders: service use and cost *British Journal of Psychiatry* 2006 188: 541-546	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Beecham,Jennifer 2014 Annual Research Review: Child and adolescent mental health interventions: a review of progress in economic studies across different disorders *Journal of Child Psychology and Psychiatry* 55(6): 714-732	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Bonin, Eva-Maria; Stevens, Beecham, Jennifer; Byford, Sarah; Parsonage, Michael 2011 Costs and longer-term savings of parenting programmes for the prevention of persistent conduct disorder: a modelling study *BMC Public Health* 11: 803	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Borduin C and Dopp A 2015 Economic impact of multisystemic therapy with juvenile sex offenders *Journal of Family Psychology* 29(5): 687-696	No cost effectiveness outcomes reported. Cost and effectiveness data presented as a cost-benefit analysis
Carroll AE and Downs SM 2009 Improving decision analyses: parent preferences (utility values) for pediatric health outcomes. *Journal of Pediatrics* 155(1):21-25	Only relevant utility values reported for ADHD – already included from NICE ADHD guideline (update) 2018
Cary, Maria; Butler, Stephen; Baruch, Geoffrey; Hicket, Nicole; Byford, Sarah 2013 Economic Evaluation of Multisystemic Therapy for Young People at Risk for Continuing Criminal Activity in the UK *Plos One* 8(4): e61070	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost-offset analysis of multisystemic therapy for antisocial behaviour
Cohen,Mark A.; Piquero,Alex R.; Jennings,Wesley G. 2010 Studying the costs of crime across offender trajectories *Criminology & Public Policy* 9(2): 279-30	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Cohen,Edward; Pfeifer,Jane 2011 Mental Health Services for Incarcerated Youth: Report from a Statewide Survey *Juvenile and Family Court Journal* 62(2): 22-34	No cost effectiveness outcomes reported, QALYs or cost-utilities. Cost data only
Coulton, Simon; Stockdale, Kelly; Marchand, Catherine; Hendrie, Nadine et al 2017 Pragmatic randomised controlled trial to evaluate the effectiveness and cost effectiveness of a multi-component intervention to reduce substance use and risk-taking behaviour in adolescents involved in the criminal justice system: A trial protocol (RISKIT-CJS) *BMC Public Health* 17: 246	Study protocol. No outcomes reported

Reference	Reason for exclusion
Crane,D.Russell; Christenson,Jacob D.; Dobbs,Sareta; Schaalje, G Bruce; Moore, Adam M et al 2013 Costs of Treating Depression with Individual Versus Family Therapy *Journal of Marital Family Therapy* 39(4): 457-469	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Cuellar A and Dhaval MD 2016 Causal effects of mental health treatment on education outcomes for youth in the justice system *Economics of Education Review* 54: 321-339	No cost effectiveness outcomes, QALYs or cost-utilities reported. Costs and societal savings only.
Cuijpers,P.; Smit,F.; Oostenbrink,J.; de Graaf,R.; ten Have, M; Beekman A. 2007 Economic costs of minor depression: a population-based study *Acta Psychiatr.Scand*. 115(3): 229-236	No cost effectiveness outcomes, QALYs or cost-utilities reported. Population study with cost data only
Cuijpers,Pim; Smit,Flip; Penninx,Brenda W.J.H.; de Graaf,Ron; ten Have,Margreet; Beekman,Aartjan T.F. 2010 Economic Costs of Neuroticism A Population-Based Study *Archives of General Psychiatry* 67(10): 1086-1093	No cost effectiveness outcomes, QALYs or cost-utilities reported. Population study with cost data only
Dams,Judith; Koenig,Hans-Helmut; Bleibler, Florian; Hoyer, Juergen; Wiltink,Joerg; et al 2017 Excess costs of social anxiety disorder in Germany *Journal of Affective Disorders* 213: 23-29	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only. Adult population
De Villiers, Pierre; Nel, Soon 2010 The Opportunity Cost of the Upkeep of the Criminal Justice System in South Africa from 1980 to 2006 *South African Journal of Economic and Management Sciences* 13(4): 407-423	No cost effectiveness outcomes, QALYs or cost-utilities reported
DeLisi,Matt; Kosloski,Anna; Sween,Molly; Hachmeister,Emily; Moore,Matt; Drury,Alan 2010 Murder by numbers: monetary costs imposed by a sample of homicide offenders *Journal of Forensic Psychiatry & Psychology* 21(4): 501-513	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Doessel D, Williams R and Robertson J 2011 Changes in the inequality of mental health: suicide in Australia 1907-2003 *Health Economics, Policy and Law* 6: 23-42	No cost effectiveness outcomes, QALYs or cost-utilities reported
Fass S.M.; Pi C.R. 2002 Getting tough on juvenile crime: An analysis of costs and benefits *J.Res.Crime Delinquenc*y 39(4): 363-399	No cost effectiveness outcomes reported
Fattore,G.; Percudani,M.; Pugnoli,C.; Contini,A.; Beecham,J. 2000 Mental health care in Italy: Organisational structure, routine clinical activity and costs of a community psychiatric service in Lombardy region *Int.J.Soc.Psychiatry* 46(4): 250-265	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only. Adult population
Fernandez,Anna; Bellon Saameno,Juan Angel; Pinto-Meza,Alejandra; Vicente Luciano,Juan et al: DASMAP Investigators 2010 Burden of chronic physical conditions and mental disorders in primary care *British Journal of Psychiatry* 196(4): 302-309	Adult population
Fletcher,Jason; Wolfe,Barbara 2009 Long-term Consequences of Childhood ADHD on Criminal Activities *Journal of Mental Health Policy and Economics* 12(3): 119-138	No cost effectiveness outcomes, QALYs or cost-utilities reported
Fonagy, P; Butler, S; Cottrell, D; Scott, S; Pilling, S; Eisler I et al 2018 Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): a pragmatic, randomized controlled, superiority trial *The Lancet Psychiatry* 5(2): 119-133	No QALYs or cost-utilities reported

Reference	Reason for exclusion
Fortune, Zoe; Barrett, Barbara; Armstrong, David; Coid, Jeremy; Crawford, Mike et al 2011 Clinical and economic outcomes from the UK pilot psychiatric services for personality-disordered offenders International *Review of Psychiatry* 23(1): 61-69	Adult population
Foster,E.M.; Connor,T. 2005 Public costs of better mental health services for children and adolescents *Psychiatric Services* 56(1): 50-55	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Foster E. Michael 2010 Costs and Effectiveness of the Fast Track Intervention for Antisocial Behavior *Journal of Mental Health Policy and Economics* 13(3): 101-119	No cost effectiveness outcomes, QALYs or cost-utilities reported
Garascia, J.A. 2005 The price we are willing to pay for punitive justice in the juvenile detention system: Mentally ill delinquents and their disproportionate share of the burden *Indiana Law Journal* 80(2): 489-515	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Greenhalgh,J.; Knight,C.; Hind,D.; Beverley,C.; Walters,S. 2005 Clinical and cost-effectiveness of electroconvulsive therapy for depressive illness, schizophrenia, catatonia and mania: systematic reviews and economic modelling studies *Health Technology Assessment* 9(9)1-	Adult population
Griffin S, Weatherly H et al 2008 Methodological issues in undertaking independent cost-effectiveness analysis for NICE: the case of therapies for ADHD	No cost-effectiveness outcomes, QALYs or cost-utilities reported.
Grimes,Katherine E.; Schulz,Margaret F.; Cohen,Steven A.; Mullin,Brian O.; Lehar,Sophie E.; Tien,Shelly 2011 Pursuing Cost-Effectiveness in Mental Health Service Delivery for Youth with Complex Needs *Journal of Mental Health Policy and Economics* 14(2): 73-86	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Guevara,James P.; Mandell,David S. 2003 Costs associated with attention deficit hyperactivity disorder: overview and future projections. *Expert review of pharmacoeconomics & outcomes research* 3(2): 201-10	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Holden,Sarah E.; Jenkins-Jones,Sara; Poole,Chris D.; Morgan,Christopher L.L.; Coghill,David; Currie,Craig J. 2013 The prevalence and incidence, resource use and financial costs of treating people with attention deficit/hyperactivity disorder (ADHD) in the United Kingdom (1998 to 2010) *Child and Adolescent Psychiatry and Mental Health* 7: 34	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Hollinghurst, Sarah E.; Carroll,Fran; Abel,Anna; Campbell,John; Garland,Anne; Jerrom,Bill et al 2014 Cost-effectiveness of cognitive behavioural therapy as an adjunct to pharmacotherapy for treatment-resistant depression in primary care: economic evaluation of the CoBalT Trial *British Journal of Psychiatry* 204(1): 69-76	Adult population
Hussey,David L.; Drinkard,Allyson M.; Falletta,Lynn; Flannery,Daniel J. 2008 Understanding clinical complexity in delinquent youth: Comorbidities, service utilization, cost, and outcomes *J.Psychoactive Drugs* 40(1): 85-95	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Jones,Craig G.A>; Weatherburn,Don J. 2011 Willingness to Pay for Rehabilitation Versus Punishment to Reduce Adult and Juvenile Crime Australian Journal of Social Issues 46(1): 9-27	No cost effectiveness outcomes, QALYs or cost-utilities reported. Willingness to pay and cost data only

Reference	Reason for exclusion
Kendrick,T.; Chatwin,J.; Dowrick,C.; Tylee,A.; Morriss,R.; 2009 Randomised controlled trial to determine the clinical effectiveness and cost-effectiveness of selective serotonin reuptake inhibitors plus supportive care, versus supportive care alone, for mild to moderate depression with somatic symptoms in primary care: the THREAD (THREshold for AntiDepressant response) study *Health Technology Assessment* 13(22): 1-+	Adult population
Kendrick,T.; Simons,L.; Mynors-Wallis,L.; Gray,A.; Lathlean,J.; Pickering,R.2006 Cost-effectiveness of referral for generic care or problem-solving treatment from community mental health nurses, compared with usual general practitioner care for common mental disorders - Randomised controlled trial *British Journal of Psychiatry* 189: 50-59	Adult population
Kiehl,Kent A.; Hoffman,Morris B. 2011 The Criminal Psychopath: History, Neuroscience, Treatment, and Economics *Jurimetrics* 51: 355-397	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only. Adult population
Klietz, Stephanie J.; Borduin, Charles M.; Schaeffer, Cindy M. 2010 Cost-Benefit Analysis of Multisystemic Therapy with Serious and Violent Juvenile Offenders *Journal of Family Psychology* 24(5): 657-666	No cost effectiveness outcomes, QALYs or cost-utilities reported
Koenig, Hans-Helmut; Born, Anja; Heider, Dirk; et al 2009 Cost-effectiveness of a primary care model for anxiety disorders *British Journal of Psychiatry* 195(4): 308-317	Adult population
Krebs, Emanuel; Urada, Darren; Evans, Elizabeth; et al. 2017 The costs of crime during and after publicly funded treatment for opioid use disorders: a population-level study for the state of California *Addiction* 112(5): 838-851	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Kuklinski, Margaret R.; Fagan, Abigail A.; Hawkins, J. David; et al. 2015 Benefit-cost analysis of a randomized evaluation of Communities That Care: monetizing intervention effects on the initiation of delinquency and substance use through grade 12 *Journal of Experimental Criminology* 11(2): 165-192	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Lawson C and Katz J 2004 Restorative justice: an alternative approach to juvenile crime *Journal of Socio-economics* 33: 175-188	No cost effectiveness outcomes, QALYs or cost-utilities reported
LeBel J and Goldstein R 2005 The economic cost of using restraint and the value added by restraint reduction or elimination Psychiatric Services 56: 1109-1114	No cost effectiveness outcomes, QALYs or cost-utilities reported
Logan, T. K.; Walker, Robert; Hoyt, William 2011 The Economic Costs of Partner Violence and the Cost-Benefit of Civil Protective Orders *Journal of Interpersonal Violence* 27(6): 1137-1154	Adult population
McCollister, Kathryn E.; French, Michael T.; Sheidow, Ashli J.; et al 2015 Estimating the Differential Costs of Criminal Activity for Juvenile Drug Court Participants: Challenges and Recommendations *Journal of Behavioral Health Services and Research* 42(4): 554	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only

Reference	Reason for exclusion
Moran V, Jacobs R 2018 Investigating the relationship between costs and outcomes for English mental health providers: A bi-variate multi-level regression analysis *European Journal of Health Economics* 19(5): 709-718	Adult population
Muser, Erik; Kozma, Chris M.; Benson, Carmela J.; et al. 2015 Cost effectiveness of paliperidone palmitate versus oral antipsychotics in patients with schizophrenia and a history of criminal justice involvement *Journal of Medical Economics* 18(8): 637-645	Adult population
NICE 2017 (updated from 2013) Antisocial behaviour and conduct disorders in children and young people: recognition and management *NICE Guideline CG158*	No QALYs or cost utilities reported other than Dretzke 2005 which is included in this review. (HE analysis based on CEAC and WTP)
NICE 2017 Child abuse and neglect Appendix 3C – New economic modelling *NICE NG76*	No QALYs or cost-utilities reported. HE analysis based on CEAC and WTP
NICE 2019 (updated from 2005) Depression in children and young people: identification and management *NICE Guideline NG134*	No QALYs or cost-utilities reported.
NICE 2016 (updated from 2013) Psychosis and schizophrenia in children and young people: recognition and management *NICE CG155*	No cost effectiveness outcomes, QALYs or cost-utilities reported
NICE 2015 Violence and aggression: short-term management in mental health, health and community settings *NICE NG10*	No relevant cost effectiveness outcomes, QALYs or cost-utilities reported
Olsson, Tina M. 2010 Intervening in youth problem behavior in Sweden: a pragmatic cost analysis of MST from a randomized trial with conduct disordered youth *International Journal of Social Welfare* 19(2): 194-205	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only
Osterman, Michael; Matejkowski, Jason 2014 Estimating the impact of mental illness on costs of crimes A matched samples comparison *Criminal Justice and Behavior* 41(1): 20-40	No cost effectiveness outcomes, QALYs or cost-utilities reported. Cost data only. Adult population
Paracchini E and Zenou Y 2009 Juvenile delinquency and conformism *The Journal of Law, Economics and Organization I28(1): doi: 10.1093/jleo/ewp038*	No cost effectiveness outcomes, QALYs or cost-utilities reported
Proctor, M.; Carter, N.; Barker, P. 2009 Community assault - the cost of rough justice *South African Medical Journal* 99(3): 160-161	No cost effectiveness outcomes, QALYs or cost-utilities reported
Schawo, S.; Bouwmans, C.; van der Schee, E.; et al. 2017 The search for relevant outcome measures for cost-utility analysis of systemic family interventions in adolescents with substance use disorder and delinquent behavior: a systematic literature review *Health and Quality of Life Outcomes* 15: 179	No cost effectiveness outcomes, QALYs or cost-utilities reported
Stant, A. D.; Ten Vergert, E. M.; den Boer, P. C. A. M.; et al. 2008 Cost-effectiveness of cognitive self-therapy in patients with depression and anxiety disorders *Acta Psychiatrica Scandinavica* 117(1): 57-66	Adult population

Reference	Reason for exclusion
Stikkelbroek, Yvonne; Bodden, Denise H. M.; Dekovic, Maja; et al. 2013 Effectiveness and cost effectiveness of cognitive behavioral therapy (CBT) in clinically depressed adolescents: individual CBT versus treatment as usual (TAU) *BMC Psychiatry* 13 Article number 314	Protocol only – no outcomes reported
Sussman, Matthew; Yu, Jeffrey; Kamat, Siddhesh A.; et al. 2017 Cost-effectiveness of brexpiprazole adjunctive treatment for major depressive disorder *Journal of Affective Disorders* 207: 54-62	Adult population
Weaver, Marcia R.; Conover, Christopher J.; Proescholdbell, Rae Jean; et al. 2009 Cost-effectiveness Analysis of Integrated Care for People with HIV, Chronic Mental Illness and Substance Abuse Disorders *Journal of Mental Health Policy and Economics* 12(1): 33-46	Adult population
Wiles, Nicola J.; Thomas, Laura; Turner, Nicholas; et al. 2016 Long-term effectiveness and cost-effectiveness of cognitive behavioural therapy as an adjunct to pharmacotherapy for treatment-resistant depression in primary care: follow-up of the CoBalT randomised controlled trial *Lancet Psychiatry* 3(2): 137-144	Adult population
Zagar A, Zagar R, Bartikowski B et al 2009 Cost comparisons of raising a child from birth to 17 years among samples of abused, delinquent, violent and homicidal youth using victimization and justice system estimates *Psychological Reports* 104(1): 309-338	No cost effectiveness outcomes, QALYs or cost-utilities reported

Appendix I: Excluded studies table - wider cost implications

Excluded studies - wider cost implications					
	First author	**Year**	**Reason for exclusion**		
			No TAU group	**No therapy-type intervention**	**Not CEA**
1	Bodden	2008	√	N/A	N/A
2	Byford	2007	√	√	N/A
3	Creswell	2017	√	N/A	N/A
4	Eeren	2015	√	N/A	N/A
5	Matza	2005	N/A	√	N/A
6	NICE Transition from children's to adults' services for young people using health or social care	2016	N/A	N/A	√
7	NICE Autism	2013	N/A	√	N/A
8	NICE ADHD pharmacological interventions	2018	N/A	√	N/A
9	NICE Harmful sexual behaviour	2016	√	N/A	N/A
10	Petrou	2010	N/A	N/A	√
11	Petrou and Kupek	2009	N/A	N/A	√
12	Tilford	2012	N/A	N/A	√

Appendix J: Benefits, harms, costs and cost savings of using interventions for CYP

References	Country	Population	Intervention & comparator	Impacts of using interventions considered in the study			
				Societal benefits	Societal harms	Costs	Cost savings
Model-based economic evaluations (n=12)							
Chong et al 2015	**USA**	CYP presenting with a firearm injury due to interpersonal violence	Hospital-based violence intervention program vs usual care	Improved utility for CYP due to prevented violent injury (healthcare)	Not reported	Cost of providing intervention (healthcare)	Prevented recurrent violent injury (healthcare)
Dretzke et al 2005	UK	Parents/cares of CYP where at least 50% have a behavioural conduct disorder	Parent/carer training programmes vs control group	Improved utility due to prevented antisocial behavior (healthcare)	Not reported	Cost of providing intervention (healthcare)	Not reported
Foster et al 2006	USA	Children with classroom conduct problems.	The Fast Track project vs control group	• avoided conduct disorder (healthcare) • Avoided criminal offense (CJS) • Avoided act of interpersonal violence (CJS)	Not reported	Cost of providing intervention (healthcare)	Not reported
Foster et al 2007	USA	Children diagnosed with ADHD	Intensive medication management, multicomponent behavioral treatment, and multicomponent behavioral treatment+medication vs TAU	Improved functioning for CYP (healthcare)	Not reported	Cost of providing intervention (healthcare and education)	Not reported

References	Country	Population	Intervention & comparator	Impacts of using interventions considered in the study			
				Societal benefits	Societal harms	Costs	Cost savings
Haby et al 2004	Australia	All CYP seeking care for major depressive disorder (MDD) in year 2000. Age 6 – 17 years	CBT, selective serotonin reuptake inhibitors and TAU	Prevented major depressive disorder (healthcare)	Not reported	Cost of providing intervention (healthcare)	Not reported
Juillard et al 2014	USA	Intentionally injured by another person Age 10-30	Hospital-based violence intervention program vs TAU	Improved mortality and utility due to prevented injury recidivism (healthcare)	Not reported	Cost of providing intervention (healthcare)	Saving in cost associated with injury (healthcare)
NICE Attachment Difficulties guideline 2015	UK	Children on the edge of care	1. Standard care; 2. Video feedback added to standard care; 3. Parental sensitivity and behaviour training added to standard care; 4. home visiting and parent–child psychotherapy added to standard care	Improved utility due to development of secure attachment (healthcare)	Not reported	Cost of providing intervention (healthcare and PSS)	Not considered
NICE ADHD guideline (update) 2018	UK	CYP with ADHD	Parent training vs no treatment	Improved response rate compared to no treatment (healthcare)	Not reported	Cost of providing intervention (healthcare)	Excess cost of treating non-responders (compared to responders)
NICE transition	UK	Looked after young people	Support services for transition to	• Improved utility due to improved	Not reported	Cost of providing intervention	• Reduced cost of

References	Country	Population	Intervention & comparator	Impacts of using interventions considered in the study			
				Societal benefits	Societal harms	Costs	Cost savings
to adults' services guideline 2016		and/or adults who were previously looked after as children and/or young people	adulthood/leaving care vs no usual care/no intervention	employment status (healthcare) • Improved anxiety/depression symptoms (healthcare)		(healthcare and social care)	managing depression (healthcare) Avoided crimes and prison custody (CJS)
Richardson et al 2015	UK	CYP aged 10-21 CYP who had offended and were in contact with the criminal justice system	CBT vs nothing	Improved utility due to increased recovery rate for major depressive disorder (healthcare)	Not reported	Cost of providing intervention (healthcare)	Savings in averted crime
Schawo et al 2012	Netherland	"Delinquent youth", youth involved in criminal activity Up to age 30 (lower age limit not reported)	Functional Family Therapy (FFT) vs TAU	Prevent crime (CJS)	Not reported	• Cost of providing intervention (healthcare and social care) • Productivity losses for parent and children (societal) • Travel expenses for people attending therapy (patient expense)	• prevented medical and mental health care and addiction treatment (healthcare) • Saved informal care/ support parent, saved foster home, residential institution, social worker (social care) • Saved cost for youth welfare agency (welfare)

References	Country	Population	Intervention & comparator	Impacts of using interventions considered in the study			
				Societal benefits	Societal harms	Costs	Cost savings
							• Saved cost for CJS (CJS)
Shearer et al 2018	UK	CYP who met age-appropriate ICD-10 diagnostic criteria for PTSD 2-6 months following a single traumatic event.	Individual weekly sessions of CT-PTSD vs usual care	(1) short-term: improved HRQoL due to controlled symptom (healthcare); (2) long-term: improved recovery rate (healthare)	Not reported	Cost of providing intervention (healthcare)	Reduced hospital service and community service for managing PTSD (healthcare)
Trial-based economic evaluations (n=5)							
Domino et al 2008	USA	Young people aged 12 to 18 years with primary DSM-IV diagnosis of major depressive disorder	CBT alone vs Placebo (pharmacological interventions were also assessed but were not reported here as they are not relevant to the aim of this review)	Improved utility due to increase in number of depression-free days	Not reported	Cost of providing intervention (healthcare)	Not reported (differences in resource use not statistically significant)
Fonagy et al 2018	UK	Participants aged 11–17 years with moderate-to-severe antisocial behaviour	3–5 months of multisystemic therapy followed by management as usual vs management as usual alone	Not reported (proportion of participants in out-of-home placement not statistically significant)	Not reported	Cost of providing intervention (healthcare, social and education service)	Not reported (differences in resource use not statistically significant)

References	Country	Population	Intervention & comparator	Impacts of using interventions considered in the study			
				Societal benefits	Societal harms	Costs	Cost savings
Sayal et al 2016	UK	Children at risk of ADHD aged 3-8	Parent-only and combined (parent+teacher) intervention vs TAU	Not reported (differences in QALY not statistically significant)	Not reported	Cost of providing intervention (healthcare)	Not reported (differences in resource use not statistically significant)
Stallard et al 2013	UK	Children at "high risk" of developing symptoms of depression	Classroom-based CBT vs control	Not reported (differences in QALY not statistically significant)	Not reported	Cost of providing intervention (healthcare)	Not reported (differences in resource use not statistically significant)
Wright et al 2016	USA	Young people with depression enrolled in primary care at 9 integrate health care clinics.	Collaborative care depression treatment programme vs usual care	Improved utility due to depressive symptom relief	Not reported	Cost of providing intervention (healthcare)	Not reported (differences in resource use not statistically significant)

Abbreviations:

CBT: cognitive-behavior therapy; CT: Cognitive therapy; PSS: personal social service; PTSD: post-traumatic stress disorder; TAU: treatment-as-usual.

Appendix K: Breakdown of cost and cost savings for use of interventions (for UK studies only)

Reference	Perspective of cost	Additional cost	Cost savings	Cost impacts
Model-based economic evaluations (n=6)				
Dretzke et al 2005	NHS and societal	Cost of providing parent training/education programme (healthcare): • Clinic-based group programme: £629 per family; • Community based group programme: £899 per family • Individual programme: £3,839 per family	£0	All parent training/education programme resulted in additional cost compared to standard care
NICE Attachment Difficulties guideline 2015	NHS and PSS	Cost of providing intervention (healthcare and PSS) • Video feedback: £760 • Parental training: £1,140 • Home visiting and psychotherapy: £6,687	£0	All interventions resulted in additional cost compared to standard care
NICE ADHD guideline (update) 2018	NHS and PSS	Cost of providing parent training (healthcare): ranging from £248 to 1,597 per family	6-month healthcare cost savings for responders (compared to non-responders): £208 per patient	All modes of parent training assessed resulted in additional cost compared to no parent training
NICE transition to adults' services guideline 2016	Public sector, including criminal justice services (CJS), education, housing, NHS and PSS perspective	Cost of providing intervention excluding accommodation (healthcare): £6,078	• Annual cost of treating depression (£2,210) • Average cost per crime (CJS): £12,625 Annual cost per person in prison (CJS): £27,275 (male) and £42,477 (female)	Use of intervention resulted in cost savings.

Richardson et al 2015	NHS	Cost of providing group CBT (healthcare): ranging from £197.51 (1 therapist) to £375.97 (2 therapists per session)	£3,617 per crime prevented*	Use of group CBT resulted in additional cost compared to no CBT
Shearer et al 2018	NHS and PSS	Cost of providing individual weekly sessions of CT-PTSD (healthcare): £227 per patient	3-month healthcare cost savings for managing PTSD-free patients (compared to patients with PTSD): £313 per patient	Use of CT-PTSD resulted in additional cost compared to usual care
Trial-based economic evaluation (n=3)				
Fonagy et al 2018	Societal perspective, including all health, social, education, and non-statutory sector services and CJS	Cost of providing intervention: £2,116.17 per person	• Reduced accommodation cost (£614) • Reduced secondary care cost (£298) • Reduced community service use (£547) • Reduced CJS cost (4,173) However, the confidence interval for the above cost savings across over the 18 months follow-up.	Use of intervention resulted in marginal cost savings (not statistically significant)
Sayal et al 2016	NHS and PSS	Cost of providing intervention for parents and teachers of children at risk of ADHD: • Parent only: £89.52 • Combined parent and teacher intervention: £106.81	No significant differences in resource use between groups were observed	Use of intervention for parents and teachers resulted in additional

			over the 6 months follow-up. Cost of service use by treatment group was not reported.	cost compared to no intervention
Stallard et al 2013	NHS and PSS	Cost of providing intervention: • Classroom-based CBT: £41.96 per child • attention control PSHE (usual personal, social and health education): £34.45 per child	No significant differences in resource use between groups were observed over the 18 months follow-up. Cost per person for each treatment arm: • classroom-based CBT: £484 (SD £1,294) • usual PSHE: £385 (SD £1,169) • attention control PSHE: £483 (SD £1,294)	Use of classroom-based CBT resulted in additional cost compared to control group

Abbreviations:

CBT: cognitive-behavior therapy; CT: Cognitive therapy; PSS: personal social service; PTSD: post-traumatic stress disorder.

Notes:

*: Calculated by HJ based on reported raw data.

Appendix L: Narrative summary, evidence statements for studies to develop or test the validity of health utility values

Study 1: A range of psychiatric disorders (Petrou et al 2010) includes: any emotional disorder; any ADHD diagnosis; any autistic disorder; moderate cognitive impairment; and severe cognitive impairment

An economic analysis by based on primary survey data was undertaken to develop health utility scores for a range of psychiatric disorders in children. The survey data was taken from a whole-population longitudinal study of babies born very pre-term in the UK and Ireland from March to December 1995 and a matched control group of term babies (the EPICure study). The mental health of the children was assessed on or near their 11th birthday using the Development and Wellbeing Assessment (DAWBA) and the Kaufman Assessment Battery for Children (K-ABC) completed by the child's main carer (usually mother).

These assessment scores were then reviewed by two child and adolescent psychiatrists and used to assign mental health diagnoses based upon the International Classification of Diseases 10th revision (ICD-10) and Diagnostic and Statistical Manual of Mental Disorders 4th edition (text revision) (DSM-IV-TR). Children's health status was also assessed using two versions of the Health Utilities Index - Mark 2 and Mark 3 (HUI2 and HUI3), administered as a postal questionnaire completed by the main carer. The HUI classifies the child's health status and each classification response pattern has an associated preference weight assigned to it developed from primary research conducted with a Canadian adult population (n=504). A multiplication-based algorithm was then used to calculate a health utility score for each of the 5 psychiatric disorders identified by the DSM-IV-TR, an overall diagnosis of any psychiatric disorder as defined by the DSM-IV-TR, plus 2 levels of cognitive impairment (moderate and severe) as identified by the K-ABC.

The resultant health utility scores based on findings from the HUI3 (primary analysis for this study) were calculated for children with and without a clinical psychiatric diagnosis or cognitive impairment with the following mean utility decrements being of note: any DSM-IV-TR diagnosis 0.192 ($p<0.0001$); any emotional disorder 0.198 ($p=0.027$); any ADHD diagnosis 0.250 ($p=0.003$); any autistic disorder 0.261 ($p=0.011$); moderate cognitive impairment 0.273 ($p<0.0001$); severe cognitive impairment 0.571 ($p<0.0001$).

Similar scores were obtained using values from the HUI2 which has preference weights assigned based on a UK general population study (n=198). Separate regression analyses were conducted to control for clinical and sociodemographic confounders which found that statistically significant differences remained in utility score decrements for any DSM-IV-TR diagnosis (0.213, $p<0.0001$); moderate cognitive impairment (0.198, $p<0.0001$ and severe cognitive impairment (0.324, $p<0.0001$) (findings generated using HUI3 values; similar findings obtained using HUI2 values). The authors note that the difference in mean HUI3 utility scores between children with and without a diagnosis of a psychiatric disorder can be interpreted as a difference between being in a state of severe disability compared with being in a state of mild disability according to the classification published by the HUI developers.

In addition to the health utility score analyses, (Petrou et al 2010) obtained costs associated with each child's use of social, health and educational services were estimated based upon the main carer's and teacher's reports of service use in the 12-month period leading up to the child's 11th birthday. Cost data are not the focus of this review but are reported in the evidence table for completeness. [EL: LOW]

Study 2: A range of childhood conditions (Petrou and Kupek 2009) including: ASD; behavioural disorder; and hyperactivity disorder

The authors used multiple regression analyses of survey data to develop health utility scores for a range of childhood conditions including ASD, behavioural disorder and hyperactivity disorder. Health status and HRQoL were derived from data collected from the Family Fund Trust (UK) database supplemented by questionnaire survey responses from parents identified from the database for children and young people with an illness or disability aged 5 – 16 years (n=2236). Health status information was classified by health care professionals using ICD-9 codes grouped into 47 categories. HRQoL was assessed using the HUI3 completed by the child's parent(s).

Regression analysis was used to model the relationship between individual childhood conditions and the HUI3 multi-attribute utility scores (dependent variable), with and without adjustment for confounding variables (e.g. child's age, gender, presence of siblings in the household and ethnicity). The study also included a survey of 100 children and young people, weighted to be a match by age for the study sample, to ascertain a normative HRQoL using the HUI3 for children without a disability or illness.

The study data was then used to calculate, through multiple regression analyses, HUI3 multi-attribute utility scores for a wide range of childhood conditions and disabilities, including three relevant to the current review. The unadjusted scores utility scores for ASD, behaviour disorders and hyperactivity disorders were reported as 0.433, 0.468 and 0.432 respectively. Expressed as disutility estimates from childhood norms the values were: ASD -0.494; behaviour disorders -0.462 and hyperactivity disorders -0.501. [EL: VERY LOW]

Study 3: Autism symptoms (Tilford et al 2012)

A US study by was undertaken to compare the construct validity of two preference-based instruments to describe health-related quality of life (HRQoL) of children and young people with autistic spectrum disorders (ASDs). The study compared the HUI-3 and the Quality of Wellbeing Self-Administered scale (QWB-SA). The HUI-3 Includes eight health-related attributes: vision, hearing, speech, mobility, dexterity, cognition, emotion and pain/discomfort. A multiplicative scoring function is used to calculate an overall score which ranges from -0.36 (some health states are considered to be worse than death) to 1 (perfect health). The QWB-SA is a self-administered preference-weighted measure of functioning (mobility, physical activity, social activity) and a measure of symptoms and problems (56 symptom complexes included).

A range of utility values are reported in the paper for a number of conditions (see evidence table). For both scales, caregivers were asked to report the health of the child or young person over a 3-day period. Clinical outcome measures were obtained for each child or young person at their first visit to the study clinic. For most this was done within one year of the HRQoL data

collection, with 90% being collected within two years. Clinical data included adaptive skills, cognitive functioning and autism-specific behavioural adjustment. Correlations were used to determine the sensitivity of each HRQoL scale compared with clinical criteria and to then determine which scale would be more appropriate for use with children and young people with ASD. For caregiver ratings both HRQoL self-assessment scales were found to correlate with a number of domains used in the clinical assessment, with correlations being higher for the HUI-3 compared with the QWB-SA in four areas: motor skills, cognitive functioning, hyperactivity and self-injurious behaviour. On clinician-ratings, of 12 items analysed the pattern of change in scores on the HUI-3 and QWB-SA were similar when comparing young people with and without ASD symptoms. However, for the QWB-SA there were no significant differences in HRQoL scores among the clinician-rated ASD symptoms i.e. it was not sensitive in detecting children and young people with vs without ASD symptoms. For the HUI-3 there were 5 clinician-rated symptoms where the HUI-3 scores were significantly different between children and young people with vs without symptoms: lacking spontaneity in seeking enjoyment, delay/lack of spoken language, lack of play for developmental level, repetitive motor mannerisms, persistent preoccupation with objects/parts of objects. Changes in HUI-3 scores tended to be larger than changes in QWB-SA scores. It was concluded that the HUI-3 was the more appropriate HRQoL scale to use with children and young people with ASDs. [EL: VERY LOW]

Evidence statements: SCOREs -Evidence statement for health-related utility values:

Three studies were identified that developed health-related utility values for mental health conditions in children and young people.

Study 1: A range of psychiatric disorders (Petrou et al 2010) includes: any emotional disorder; any ADHD diagnosis; any autistic disorder; moderate cognitive impairment; and severe cognitive impairment

An economic analysis based on primary survey data was undertaken to develop health utility scores for a range of psychiatric disorders in children. [EL: LOW]

- Health utility scores based on findings from the HUI3 were calculated for children with and without a clinical psychiatric diagnosis or cognitive impairment with the following mean utility decrements calculated compared with no disorder: any DSM-IV-TR diagnosis 0.192; any emotional disorder 0.198; study any ADHD diagnosis 0.250; any autistic disorder 0.261; moderate cognitive impairment 0.273; severe cognitive impairment 0.571.

Study 2: A range of childhood conditions (Petrou and Kupek 2009) including: ASD; behavioural disorder; and hyperactivity disorder

A similar earlier study used multiple regression analyses of survey data to develop health utility scores for a range of childhood conditions. [EL: VERY LOW]

- Health utility scores based on findings from the HUI3 were calculated for children and young people with and without a condition/disorder including the following mean utility decrements calculated compared with no disorder: ASD -0.494; behaviour disorders -0.462; hyperactivity disorders 0.501.

Study 3: Autism symptoms (Tilford et al 2012)

- A study comparing the appropriateness of two HRQoL scales for use with children and young people with ASD (Tilford et al, 2012), the HUI3, has reported a range of utility values for mental-health related problems defined as no problem, mild, moderate, severe problems. These include HUI3-based values for
    - Language and understanding (no problem 0.84, mild 0.74, moderate 0.70, severe problem 0.51);
    - Anxiety (no problem 0.72, mild 0.69, moderate 0.65, severe problem 0.63);
    - Sleep disturbance (no problem 0.71, mild 0.73, moderate 0.55, severe problem 0.61);
    - Hyperactivity (no problem 0.73, mild 0.72, moderate 0.66, severe 0.59).
    - Attention span (no problem 0.82, mild 0.72, moderate 0.69, severe 0.60).
    - Eating habits (no problem 0.70, mild 0.72, moderate 0.68, severe 0.59).
    - Self-stimulatory and repetitive behavious ((no problem 0.78, mild 0.75, moderate 0.58, severe 0.57).
    - Self-injurious behaviour (no problem 0.71, mild 0.61, moderate 0.57, severe 0.62)
    - Had lost or seems to be loosing skills that he/she previously had (no problem 0.70, mild 0.64, moderate 0.43, severe 0.49).

  [EL: VERY LOW]

Appendix M: Summary review findings - potential utility values for the economic analysis

Continuation of Table 5 Summary QALYs for children and young people at risk of developing, mental health problems who are in, or at risk of entering, the criminal justice system, or who are in secure residential homes				
Reference	**Population, Intervention and Comparison**	**Clinical / behaviour outcome and findings**	**Utility values and QALYs**	**DRAFT potential applicability** Key: Good, quite good, less good, not a good match
Studies to develop or test the validity of health utility values (n=3 included studies of which n=2 used by NICE guidelines) *Narrative summary in Appendix F - summarised here to inform discussion on application of QALYs from NICE guidelines above*				
Petrou et al, 2010	CYP CYP with vs without condition/cognitive impairment Utility scores developed for CYP with or without a psychiatric condition or cognitive impairment.	**Outcome: A range of psychiatric disorders includes: any emotional disorder; any ADHD diagnosis; any autistic disorder; moderate cognitive impairment; and severe cognitive impairment** Mental health assessed using ICD-10 classification of mental health diagnoses and DSM-IV-TR. Cognitive impairment assessed using K-ABC CYP's health status assessed using the HUI2 and HUI3. Health utility score calculated for each psychiatric disorder or moderate or severe cognitive impairment.	**Utility values (from HUI3)** Authors note these can be interpreted as a difference between being in a state of severe disability compared with being in a state of mild disability Any DSM-IV diagnosis: 0.698 (SD=0.273) No DSM-IV diagnosis: 0.890 (SD=0.203) Moderate cognitive impairment: 0.643 (SD=0.329) No cognitive impairment: 0.916 (SD=0.149) Severe cognitive impairment: 0.318 (0.390) No cognitive impairment: 0.889 (0.178) Any emotional disorder: 0.672 (SD=0.296) No emotional disorder: 0.871 (SD=0.220) Any ADHD diagnosis: 0.629 (SD=0.296) No ADHD diagnosis: 0.879 (SD=0.215) Any conduct disorder: 0.727 (SD=0.260) No conduct disorder: 0.870 (SD=0.221) Any autistic disorder: 0.609 (SD=0.257) No autistic disorder: 0.870 (SD=0.222) Any tic disorder: 0.675 (SD=0.292) No tic disorder: 0.866 (SD=0.224)	Use in F-CAMHS AND SECURE STAIRS Note utility values of Petrou 2010 used in NICE attachment guideline above
Petrou and Kupek, 2009	CYP with and without a disability Utility scores developed for a range of childhood conditions	**Outcome: A range of childhood conditions including: ASD; behavioural disorder; and hyperactivity disorder** Mental health assessed using ICD-9. CYP's HRQoL assessed using the HUI3. Health utility scores then calculated for a wide range of childhood conditions and disabilities.	**3 utility values** relevant to current review reported here. **HUI3 adjusted disutility estimates from childhood norms:** • ASD: -0.494 • Behaviour disorders: -0.462 Hyperactivity disorders: -0.501	Use in F-CAMHS AND SECURE STAIRS Note utility values of Petrou 2010 used in NICE attachment guideline above

Tilford et al, 2012	CYP with ASD Comparison of HUI3 with QWB-SA HRQoL scales to determine which was most appropriate for use with CYP with ASD.	**Outcome: Autism symptoms** No problem vs mild vs moderate vs severe problem for each potential identified HRQoL problem area List of utility values from each scale. HUI3 values reported here (scale found to be most appropriate for use with CYP with ASD and scale most commonly used in economic analyses reported in this SR).	**HUI3 based utility values (mean (SD)) where p≤0.01** Language and understanding • No problem 0.84, • Mild 0.74, • Moderate 0.70, • Severe problem 0.51 Anxiety • No problems: 0.72 (0.23) • Mild problems: 0.69 (0.21) • Moderate problems: 0.65 (0.24) • Severe problems: 0.63 (0.19) Sleep disturbance • No problem 0.71, • Mild 0.73, • Moderate 0.55, • Severe problem 0.61 Hyperactivity • No problems: 0.73 (0.26) • Mild problems: 0.72 (0.20) • Moderate problems: 0.66 (0.21) • Severe problems: 0.59 (0.23) Attention span • No problems: 0.82 (0.14) • Mild problems: 0.72 (0.19) • Moderate problems: 0.69 (0.24) • Severe problems: 0.60 (0.22) Eating habits • No problem 0.70, • Mild 0.72, • Moderate 0.68, • Severe 0.59). Self-stimulatory and repetitive behaviours • No problem 0.78, • Mild 0.75, • Moderate 0.58, • Severe 0.57). Self-injurious behaviour • No problems: 0.71 (0.21)	Use in F-CAMHS and SECURE STAIRS Note applied in NICE Autism guideline

			• Mild problems: 0.61 (0.25) • Moderate problems: 0.57 (0.20) • Severe problems: 0.62 (0.21) Has lost or seems to be losing skills s/he had previously • No problems: 0.70 (0.21) • Mild problems: 0.64 (0.19) • Moderate problems: 0.43 (0.26) Severe problems: 0.49 (0.26)	

Appendix N: Summary table for narrative review - wider implications for society

Table for section 5.1.5: Wider implications for young people and society			
Reference	**Pop, Intervention and Comparison**	**Clinical / behaviour outcome and findings**	**Wider benefits to society**
Children and young people involved with the criminal justice system (n=2 studies)			
Schawo et al, 2012	Youth engaged in criminal activity Functional Family Therapy (FFT) vs TAU (CBT or MST)	**Outcome: Criminal Activity Free Years (CAFYs) in offending youth. Annual recidivism** Annual recidivism rate assumed to be 33% FFT assumed to reduce recidivism and/or the onset of criminal behaviour by 42.5% FFT dominant	**Base case: CAFYs** Number of criminal activity free years (CAFYs) for FFT exceeds number for TAU by 6.88
Eeren et al, 2015	Young people in domestic foster home in contact with the criminal justice system FFT compared to Course House	**Outcome: Criminal activity free years (CAFYs) for young people in family foster home in contact with the criminal justice system** NMB analysis Course House was found to be more cost-effective than FFT	**CAFYs** • The Course House12.4 CAFYs over 20 years • compared with 11.7 CAFYs for FFT.
Children and young people with, or at risk of developing, conduct disorder or ADHD (n= 3 publications)			
Foster et al,2006	CYP at risk of developing the disorder Extensive school-based programme (Fast Track project) delivered over 9 years	**Outcome: Averting risk of conduct disorder, school based programme**	**Society's willingness to pay** Sub group analysis for those at higher risk: the ICER was calculated as $752,103 per case of conduct disorder averted. There was a high degree of uncertainty (SE $3,588,311) 69% probability that the intervention could be considered cost effective

Foster et al, 2007	CYP with conduct disorder 14 month therapy and medication-based programme for children with conduct disorder	**Outcome: ADHD: getting into trouble and behaviour at school** Columbia Impairment Scale (CIS). children with ADHD plus conduct disorder moving from community care to combination therapy reduced the likelihood that "getting into trouble" is a "bad problem" from 19% to 7%; Children with ADHD plus anxiety moving from community care to any of the other therapies reduced the likelihood that "behaviour at school" is a "bad problem" from 50% to 10%.	**Society's willingness to pay** At higher levels of WTP (above $50,000) combination therapy became more likely to be cost-effective. Behaviour therapy was dominated, other treatments were found to be more effective and less costly. Findings varied for population sub-groups. Medical management was cost-effective across all sub-groups but at a lower WTP threshold (approx. $20,000), for children with ADHD plus anxiety behaviour therapy was more cost effective above this threshold. Whilst for children with ADHD plus anxiety and conduct disorder combined therapy was likely to be the most cost-effective treatment above a WTP threshold of around $20,000.
Matza et al, 2005		Outcome: Economic burden of ADHD Additional information: Children diagnosed with ADHD between 6-12 years of age, had significantly higher juvenile arrest rates, 46%, compared to 'normal control subjects', 11% (Los Angeles) (Statterfield et al, 1997). Children with ADHD were more likely than controls group to be: arrested 39% vs 20%; convicted 28% vs 11%; incarcerated 9% vs 1% (New York) (Mannuzza et al, 1989).	**Criminal costs** were greater for people with ADHD £$12,868 versus $498.(mean) Authors conclude a significant burden

Appendix Q: Estimates of cost of staff turnover

Item	Evidence based assumption/calculation	Theoretical staff size in a site		Ref
staff turnover				
Number of workers per site		200	500	
Hourly rate of pay	£17.67			as above
Turn over rate pa [Werrington 40% of staff had less than a years experience]	40%	80	200	https://www.justiceinspectorates.gov.uk/hmiprisons/wp-content/uploads/sites/4/2019/06/HMYOI-Werrington-Web-2019.pdf
Turnover rate all staff groups (adults and CYP)	10%	20	50	Prison service pay review 2019 e
Estimate cost to employer of staff turn over if cover = salary cost of the post vacant				
IF assume half of turnover is due to stress, depression or anxiety for lower turn over rate (10%) *f*	(half of leavers per site)	10	25	*For illustration only*
IF assume half of turnover is due to stress, depression or anxiety for higher turn over rate (40%) *f*	(half of leavers per site)	40	100	
Cost of 2 months cover for vacancy (cost of post / 2/12) *g*	£5,667.57			as above
Minimum cost 10% turnover		£56,675.67	£141,689.17	
Maximum cost 40% turnover		£226,702.67	£566,756.67	
Impact of intervention *g*				
improved retention 10% less people leave	10% intervention efficacy	1	2.5	
Improved retention 40%		4	10	
improved retention 10%	25% intervention efficacy	2.5	6.25	
Improved retention 40%		10	25	
improved retention 10%	50% intervention efficacy	5	12.5	
Improved retention 40%		20	50	
Min cost saving 10% turnover	**10%**	**£5,667.57**	**£14,168.92**	
Max cost saving 140 turnover		**£22,670.27**	**£56,675.67**	
Min cost saving 10% turnover	**25%**	**£14,168.92**	**£35,422.29**	
Max cost saving 40%% turnover		**£56,675.67**	**£141,689.17**	
Min cost saving 10% turnover	**50%**	**£28,337.83**	**£70,844.58**	
Max cost saving 40% turnover		**£113,351.33**	**£283,378.33**	

Conclusion: suggest range of saving per worker (divided by total staff establishment) £28.34 - £566.76