

AHRQ Comparative Effectiveness Review Surveillance Program

CER #65: Interventions for Adolescents and Young Adults
With Autism Spectrum Disorders

Original Release Date: August, 2012

Surveillance Report: August, 2014

Summary of Key Findings:

- For Key Questions 1, 2, 3, 4 and 6, a few studies were identified that may meet the inclusion criteria of the original review. However, the limited new evidence is unlikely to change the conclusions of the original report.
- For Key Question 5, no new evidence was identified.
- The original report conclusions for all Key Questions in this report are still valid.

Signal Assessment: The signals examined in this surveillance assessment suggest that the original CER is likely current.

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Conflict of Interest:

None of the investigators has any affiliations or financial involvement that conflicts with the material presented in this report.

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Introduction

The purpose of the surveillance process for the EPC Program is to decide if the findings of a systematic review are current. Approximately 25 systematic reviews are selected for surveillance annually based on popularity, use in obtaining continuing medical education certificates, potential impact for changing the field, and use in clinical practice guidelines.

Comparative Effectiveness Review (CER) #65 titled “Interventions for Adolescents and Young Adults with Autism Spectrum Disorders” was originally released in August, 2012.¹ This CER was selected for surveillance assessment based on popularity, potential impact, and other measures of use collected as of June, 2013.²

The key questions for the original CER were as follows:

- **Key Question 1:** Among adolescents and young adults with ASD, what are the effects of available interventions on the core symptoms of ASD?
- **Key Question 2:** Among adolescents and young adults with ASD, what are the effects of available interventions on common medical and mental health comorbidities (e.g., epilepsy, sleep disorders, motor impairments, obesity, depression, anxiety, acute and episodic aggression, attention deficit hyperactivity disorder, etc.)?
- **Key Question 3:** Among adolescents and young adults with ASD, what are the effects of available interventions on functional behavior, attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?
- **Key Question 4:** Among adolescents and young adults with ASD, what is the effectiveness of interventions designed to support the transitioning process, specifically to affect attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?
- **Key Question 5:** Among adolescents and young adults with ASD, what harms are associated with available interventions?
- **Key Question 6:** What are the effects of interventions on family outcomes?

Our surveillance assessment began in May, 2014. We conducted an electronic search for literature published since the original CER search date. After completing a scan of this literature to identify evidence potentially related to the key questions in this CER, we contacted experts involved in the original CER to request their opinions as to whether the conclusions had changed.

Methods

Literature Searches

We conducted a limited literature search covering December 2011 to June 2014, using the identical search strategy used for the original report and searching for studies since the original CER.¹

The search was conducted to assess the currency of conclusions. This process included selecting journals from among the top 10 journals from relevant specialty subject areas (Appendix A) and among those

most highly represented among the references for the original report (Appendix B). The included journals were five high-profile general medical interest journals (New England Journal of Medicine, Lancet, Journal of the American Medical Association, British Medical Journal, and Cochrane Database of Systematic Reviews), and six specialty journals (Autism Research, Autism, Journal of Autism Developmental Disorders, Pediatrics, Arch Gen Psychiatry, and American Journal of Psychiatry). The search strategy is reported in Appendix C.

Study selection

Using the same inclusion and exclusion criteria as the original CER (see Appendix D), one investigator reviewed the titles and abstracts of the 11 high-impact journal search results (Appendix E).

Expert Opinion

We shared the conclusions of the original report, findings from the literature analysis, and the newly identified studies with eleven experts in the field (original peer reviewers, technical expert panel [TEP] members, and a local expert) to request their assessment of the currency of report conclusions and their recommendations of any relevant new studies. Appendix F shows the form experts were asked to complete.

Horizon Scanning High-Impact Potential

The AHRQ Healthcare Horizon Scanning System identifies emerging health care technologies and innovations with the potential to impact health care for AHRQ's 14 priority conditions.³ We reviewed the Developmental Delays, ADHD, and Autism section to identify new potentially high-impact interventions related to the key questions in this CER. Potentially high impact interventions were considered in the final assessment.

FDA Black Box Warnings

We searched the FDA MedWatch online database website for black box warnings relevant to the key questions in this CER.

Check for Qualitative Signals

The authors of the original CER conducted qualitative synthesis of data on outcomes, comorbidities, harms and family outcomes of interventions for adolescents and young adults with autism spectrum disorders (ASD). We compared the conclusions of the included abstracts to the conclusions of the original CER and assessed expert opinions to identify qualitative signals about the currency of conclusions.

Compilation of Findings and Conclusions

For this assessment we constructed a summary table (Appendix G) that includes the key questions, the original conclusions, the findings of the new literature search, and the expert assessments that pertained to each key question. Because we did not find any FDA black box warnings relevant to the key questions in this CER, we did not include a column for this in the summary table. We categorized currency of conclusions using a 3-category scheme:

- Original conclusion is still valid and this portion of the CER is likely current.
- Original conclusion is possibly out of date and this portion of the CER may not be current.

- Original conclusion is out of date.

We considered the following factors when making our assessments:

- If we found no new evidence or only confirmatory evidence and all responding experts assessed the CER conclusion as still valid, we classified the CER conclusion as likely not out of date.
- If we found some new evidence that might change the CER conclusion, and /or a minority of responding experts assessed the CER conclusion as having new evidence that might change the conclusion, then we classified the CER conclusion as possibly out of date.
- If we found new evidence that rendered the CER conclusion out of date or no longer applicable, we classified the CER conclusion as out of date. Recognizing that our literature searches were limited, we reserved this category only for situations where a limited search would produce *prima facie* evidence that a conclusion was out of date, such as the withdrawal of a drug or surgical device from the market, a black box warning from FDA, etc.

Signal Assessment for Currency of the CER

We used the following considerations in our assessment of the currency of the CER:

- **Strong signal:** A report is considered to have a strong signal if new evidence is identified that clearly renders conclusions from the original report out of date, such as the addition or removal of a drug or device from the market or a new FDA boxed warning.
- **Medium signal:** A report is considered to have a medium signal when new evidence is identified which may change the conclusions from the original report. This may occur when abstract review and expert assessment indicates that some conclusions from the original report may be out of date, or when it is unclear from abstract review how new evidence may impact the findings from the original report. In this case, full-text review and data abstraction may be needed to more clearly classify a signal.
- **Weak signal:** A report is considered to have a weak signal if little or no new evidence is identified that would change the conclusions from the original report. This may occur when little to no new evidence is identified, or when some new evidence is identified but it is clear from abstract review and expert assessment that the new evidence is unlikely to change the conclusions of the original report.

Results

Literature Search

The literature search identified 143 titles (Appendix E) published in the selected high priority journals since the last surveillance search. Upon abstract review, 132 articles were rejected because they did not meet the original CER inclusion criteria (see Appendix D). The remaining 9 abstracts⁴⁻¹² were examined for potential to change the results of the original review.

Horizon Scanning

We identified one intervention, *Off-label intranasal oxytocin for treatment of social dysfunction in autism spectrum disorders*.⁴ The high-impact potential for this intervention was classified moderately high, but the current evidence on this intervention related to this review is limited.

FDA Black Box Warnings

We did not find any FDA black box warnings relevant to the key questions in this CER.

Expert Opinion

We shared the conclusions of the original report with eleven experts in the field (original peer reviewers, TEP members, and a local expert) to request their assessment of currency of report conclusions and their recommendations of any relevant new studies. Three subject matter experts responded. Appendix F shows the form that was sent to the experts.

The three experts felt all the conclusions were up to date. Although new studies which merit inclusion were identified¹³⁻²¹, the experts felt that the new evidence would not change the conclusions of the original report (see Appendix G).

Identifying Qualitative Signals

Appendix G shows the original key questions, the conclusions of the original report, the results of the literature search, the experts' assessments, and the conclusions of the Scientific Resource Center (SRC) regarding the currency of the CER.

For Key Questions 1, 2, 3, 4 and 6, new studies^{4-13, 17-20} were identified that may meet the inclusion criteria of the original report. However, our review of the literature and the expert assessment agreed that although some new studies merit inclusion, the new evidence is unlikely to change the conclusions of the original report. For Key Question 5, four recent systematic reviews have been published since 2012^{14-16, 21}, however these are unlikely to contain new data to change the conclusions of the original report.

Signal Assessment

In general, the vast majority of the new studies we identified reflected the conclusions of the original CER. The experts agreed that although new studies merit inclusion, the new evidence is unlikely to change the conclusions of the original report. The topic in the horizon scanning priority area matching this report has moderately high *high-impact potential*. However, currently the evidence on this topic relevant to this CER is limited. No FDA boxed warnings were identified since the original report was published

The SRC conclusion based on literature published since the original report, FDA boxed warnings, horizon scanning, and expert assessment is that the original conclusions for all key questions in the report are still valid and the original report is likely current. The signal for this report is weak, suggesting that the conclusions in the original CER are likely up to date.

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Appendices

Appendix A: Top 10 Journals

Appendix B: Most Cited Journals from Original Systematic Review

Appendix C: Original Search Strategy

Appendix D: Inclusion and Exclusion Criteria from Original Systematic Review

Appendix E: Literature Search Results

Appendix F: Questionnaire Matrix Sent to Expert Reviewers

Appendix G: Summary Table

Appendix A. Top 10 Journals

In the Journal Citation Reports database, the science and social science sections were searched by subject area discipline(s) for each surveillance reports topic area. For each subject area discipline the list was constructed by selecting the top 10 journals from the 5 year citation impact factor average list. Selected citations were downloaded in .csv format.

Behavioral Sciences:

1. Behavioral and Brain Sciences
2. Trends in Cognitive Sciences
3. Neuroscience & Biobehavioral Rev
4. Advances in the Study of Behavior
5. Cognitive Affective & Behavioral Neuroscience
6. Frontiers in Behavioral Neuroscience
7. Cortex
8. Autism Research
9. Neuropsychologia
10. Biological Psychology

Developmental Psychology:

1. JAACAP
2. Developmental Review
3. Development and Psychopathology
4. Journal of Child Psychology and Psychiatry
5. Child Development
6. Autism Research
7. Developmental Science
8. Developmental Psychology
9. Journal of Autism and Developmental Disorders
10. Journal of Abnormal Child Psychology

Educational Psychology:

1. Child Development
2. Journal of Educational Psychology
3. Educational Psychology Review
4. Educational Psychology – US
5. Contemporary Educational Psych
6. Learning and Instruction
7. Journal of School Psychology
8. Journal of Counseling Psychology
9. Journal of the Learning Sciences
10. School Psychology Review
7. Journal of School Psychology

Pediatrics Top 10:

1. JAACAP
2. Pediatrics
3. Archives of Pediatrics & Adolescent Medicine
4. Journal of Pediatrics
5. Developmental Disabilities Research
6. Journal of Adolescent Health
7. Seminars in Fetal and Neonatal Med
8. Archives of Disease in Childhood
9. The Pediatric Infectious Disease Jour
10. Developmental Medicine & Child Neurology

Psychiatry:

1. Archives of General Psychiatry
2. The American Journal of Psychiatry
3. Journal of Molecular Psychiatry
4. Biological Psychiatry
5. Schizophrenia Bulletin
6. Neuropsychopharmacology
7. JAACAP
8. British Journal of Psychiatry
9. Journal of Psychiatry and Neuroscience
10. World Psychiatry

Psychology:

1. The Annual Review of Psychology
2. Psychology Bulletin
3. Annual Review of Clinical Psychology
4. Psychological Review
5. Social Cognitive and Affective Neuroscien
6. Journal of Child Psychology and Psychiatry
7. Psychological Medicine
8. Psychotherapy and Psychosomatics
9. Cognitive Psychology
10. Health Psychology

Special Education:

1. Research in Autism Spectrum Dis
2. Exceptional Children
3. Journal of Fluency Disorders
4. Research in Developmental Disabl
5. Journal of Positive Behavior Int.
6. AJIDD
7. Journal of Learning Disabilities
8. The Journal of Special Education
9. Journal of Emotional and Behavioral Disorders
10. Annals of Dyslexia

Top 10 General Medical:

1. New England Journal of Medicine
2. Lancet
3. JAMA
4. PLoS Medicine
5. Annals of Internal Medicine
6. British Medical Journal
7. Archives of Internal Medicine
8. Canadian Medical Assoc. Journal
9. Cochrane Database of Systematic Reviews
10. BMC Medicine

Appendix B. Most Cited Journals from Original Systematic Review

Journal	Citations
Journal of Autism and Developmental Disorders	18
Autism	5
Journal of Vocational Rehabilitation	4
Archives of General Psychiatry	3
JAACAP	3
Pediatrics	3
American Journal of Psychiatry	2
Cochrane Database of Systematic Reviews	2
Journal of Child Psychology and Psychiatry	2
Journal of Clinical Epidemiology	2
Journal of Clinical Psychopharmacology	2
Journal of Intellectual Disabilities Research	2
Progress in Brain Research	2

Appendix C. Original Search Strategy

Top Journals used for surveillance of this topic:

- Autism Research
- Autism
- Journal of Autism and Developmental Disorders
- Pediatrics
- Archives of General Psychiatry
- American Journal of Psychiatry
- New England Journal of Medicine
- Lancet
- British Medical Journal
- Cochrane Database of Systematic Reviews
- Journal of the American Medical Association

Medline via PubMed Searched June 5 th 2014 Rose Relevo	
Search from Original Report	<p>((((((((((((((((((((((("therapy"[Subheading] OR "Therapeutics"[Mesh]) OR "Teaching"[Mesh]) OR "Psychotherapy"[Mesh]) OR "Treatment Outcome"[Mesh]) OR "Vocational Education"[Mesh]) OR "Vocational Guidance"[Mesh]) OR "Rehabilitation, Vocational"[Mesh])) OR ((((((vocational[Title/Abstract]) OR transition[Title/Abstract]) OR transitional[Title/Abstract]) OR transitioning[Title/Abstract]) OR transitions[Title/Abstract]) OR occupational[Title/Abstract])) OR "Employment, Supported"[Mesh]))) AND (((("Autistic Disorder"[Mesh]) OR "Asperger Syndrome"[Mesh]) OR "Child Development Disorders, Pervasive"[Mesh:noexp])) OR ((((((autistic[Title/Abstract]) OR autism[Title/Abstract]) OR asperger[Title/Abstract]) OR asperger's[Title/Abstract]) OR aspergers[Title/Abstract]) OR pervasive development[Title/Abstract]) OR pervasive developmental[Title/Abstract])) NOT ((jsubsetk) OR (((((((((((("Newspaper Article"[Publication Type]) OR "Letter"[Publication Type]) OR "Comment"[Publication Type]) OR "Case Reports"[Publication Type]) OR "Review"[Publication Type]) OR "Practice Guideline"[Publication Type]) OR "News"[Publication Type]) OR "Editorial"[Publication Type]) OR "Historical Article"[Publication Type]) OR "Meta-Analysis"[Publication Type]) OR "Legal Cases"[Publication Type]))) AND</p>
Journal Limits	<p>((((((((((((("Autism research : official journal of the International Society for Autism Research"[Journal]) OR ("Autism : the international journal of research and practice"[Journal])) OR ("Journal of autism and developmental disorders"[Journal])) OR "Pediatrics"[Journal]) OR "Archives of general</p>

	psychiatry"[Journal]) OR "The American journal of psychiatry"[Journal]) OR "The New England journal of medicine"[Journal]) OR "lancet"[Journal]) OR "bmj"[Journal]) OR "The Cochrane database of systematic reviews"[Journal]) OR "JAMA : the journal of the American Medical Association"[Journal]) AND
Date Limits	("2011/12/01"[PDat] : "3000/12/31"[PDat]) AND Humans[Mesh] AND English[lang]) Filters: Publication date from 2011/12/01; Humans; English
Results=143	

Appendix D. Inclusion and Exclusion Criteria from Original Systematic Review

Category	Criteria
Study population	Adolescents or young adults (ages 13-30) with ASD (autistic disorder, Asperger syndrome, PDD-NOS) or families/caregivers of individuals with ASD between the ages of 13-30
Interventions	Interventions aimed at ameliorating core symptoms of ASD, affecting independent functioning, adaptive behavior, or the transition process, or targeting family outcomes
Comparators	Placebo Other intervention
Outcomes	Social skills/interaction, language and communication, repetitive and other maladaptive behaviors, motor outcomes, psychological distress, adaptive skills development, academic skills development, and family outcomes including family distress and family satisfaction
Time period	Studies published from 1980-present with no limits on timing of outcomes
Setting	Any setting including educations, residential, and clinic
Publication languages	English only
Admissible evidence (study design and other criteria)	<p><u>Admissible designs</u></p> <ul style="list-style-type: none"> Controlled trials, observational studies including prospective and retrospective cohort studies, prospective and retrospective case series <p><u>Study size</u></p> <ul style="list-style-type: none"> N \geq 20 total individuals between 13-30 years of age with ASD or family members of such individuals <p><u>Other criteria</u></p> <ul style="list-style-type: none"> Original research studies that provide sufficient detail regarding methods and results to

enable use and adjustment of the data and results

- Patient populations must include adolescents or young adults (13-30 years of age) with ASD or families/caregivers of individuals with ASD between the ages of 13-30
- Studies must address one or more of the following:
 - Treatment modality aimed at modifying ASD core symptoms, common comorbidities, family-related outcomes, or assisting with transitional issues
 - Outcomes (including harms) related to interventions for ASD
- Studies must include extractable data on relevant outcomes, including data presented in text or tables (vs. solely in figures)
- Studies must present aggregate data (vs. only data for each individual participant)

ASDs = autism spectrum disorders; N = number; PDD-NOS = pervasive developmental disorder-not otherwise specified

*Note: Original inclusion/exclusion criteria extracted from Effective Health Care Program, CER #26, *Interventions for Adolescents and Young Adults with Autism Spectrum Disorders*, p. 11, Table 1.

Appendix E. Literature Search Results

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Appendix F. Questionnaire Matrix Sent to Expert Reviewers

Surveillance and Identification of Triggers for Updating Systematic Reviews for the EHC Program

Title: Interventions for Adolescents and Young Adults with Autism Spectrum Disorders

Conclusions From CER Executive Summary	Is this conclusion almost certainly still supported by the evidence?	Has there been new evidence that may change this conclusion?	Do Not Know
Key Question 1: Among adolescents and young adults with ASD, what are the effects of available interventions on the core symptoms of ASD?			
SOE Insufficient: <ul style="list-style-type: none"> • Behavioral Interventions, 8 studies All studies were poor quality: 4 RCTs, 3 case series, and 1 nRCT. Most reported improved core symptoms but each study had different approach. • Educational Interventions, 1 poor quality nRCT • Vocational Interventions, 2 poor quality nRCTs • Allied Health Interventions, 3 poor quality case series studies <i>Future research: more rigorous studies needed.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Please explain:	New Evidence:	Please explain:
Key Question 2: Among adolescents and young adults with ASD, what are the effects of available interventions on common medical and mental health comorbidities (e.g., epilepsy, sleep disorders, motor impairments, obesity, depression, anxiety, acute and episodic aggression, attention deficit hyperactivity disorder, etc.)?			
SOE Insufficient: <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Medical Interventions, 8 studies Four fair quality RCTs, 1 poor quality RCT and 3 poor quality RCTs . Reduction in irritability, compulsion and self-injurious behavior reported with antipsychotics (Risperidone, Clomipramine). Reductive in aberrant 	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Please explain:	New Evidence:	Please explain:

<p>behavioral reported with opioid receptor antagonists (naltrexone). Reduction in obsessive compulsive, maladaptive, self-injurious and aggressive behavior reported with serotonin reuptake inhibitors (Haloperidol, Clomipramine, Fluvosamine, Setraline, Fluoxetine). <i>Future research: more rigorous studies needed.</i></p>			
<p>Key Question 3: Among adolescents and young adults with ASD, what are the effects of available interventions on functional behavior, attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?</p>			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Educational Interventions, 1 poor quality RCT • Adaptive/Life Skills Interventions, 3 studies All studies were poor quality: RCT, prospective cohort, case series. • Vocational Interventions, 3 studies All studies were poor quality: prospective cohort, case series, cross-sectional. • Allied Health Interventions, 2 studies One fair quality RCT and 1 poor quality case series. <p><i>Future research: more rigorous studies needed.</i></p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
	<p>Please explain:</p>	<p>New Evidence:</p>	<p>Please explain:</p>
<p>Key Question 4: Among adolescents and young adults with ASD, what is the effectiveness of interventions designed to support the transitioning process, specifically to affect attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?</p>			
<p>SOE Insufficient:</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>

<ul style="list-style-type: none"> • Adaptive/Life Skills Interventions, 1 poor quality case series <i>Future research: more rigorous studies needed.</i> 	Please explain:	New Evidence:	Please explain:
Key Question 5: Among adolescents and young adults with ASD, what harms are associated with available interventions?			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Medical Interventions, 8 studies Four fair quality RCTs, 1 poor quality RCT and 3 poor quality RCTs. Most commonly reported adverse events were nausea and fatigue. <i>Future research: more rigorous studies needed.</i> 	<input type="checkbox"/> Yes <input type="checkbox"/> No Please explain:	<input type="checkbox"/> Yes <input type="checkbox"/> No New Evidence:	<input type="checkbox"/> Yes <input type="checkbox"/> No Please explain:
Key Question 6: What are the effects of interventions on family outcomes?			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Adaptive/Life Skills Interventions, 1 poor quality prospective cohort <i>Future research: more rigorous studies needed.</i> 	<input type="checkbox"/> Yes <input type="checkbox"/> No Please explain:	<input type="checkbox"/> Yes <input type="checkbox"/> No New Evidence:	<input type="checkbox"/> Yes <input type="checkbox"/> No Please explain:
Are there new data that could inform the key questions that might not be addressed in the conclusions?			

Appendix G. Summary Table

Conclusions From Original Review	SRC Literature Analysis	Expert Opinion	SRC Conclusion
Key Question 1: Among adolescents and young adults with ASD, what are the effects of available interventions on the core symptoms of ASD?			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 8 studies All studies were poor quality: 4 RCTs, 3 case series, and 1 nRCT. Most reported improved core symptoms but each study had different approach. • Educational Interventions, 1 poor quality nRCT • Vocational Interventions, 2 poor quality nRCTs • Allied Health Interventions, 3 poor quality case series studies <p><i>Future research: more rigorous studies needed.</i></p>	<p>Behavioral Interventions Two RCTs^{8, 12} and one nRCT¹⁰ examining social skills interventions reported improvements in core symptoms.</p> <p>Educational Interventions One nRCT⁷ examining inclusive educational settings reported no differences in core symptoms.</p> <p>Medical Interventions One retrospective case-series⁶ reported improved core symptoms with oxcarbazepine treatment. One RCT⁹ reported improved core symptoms with fluoxetine treatment. One secondary analysis of two randomized trials¹¹ showed improved core symptoms with risperidone treatment.</p>	<p>One RCT⁸ examining social skills training merits inclusion. Three systematic reviews have been published since 2012^{13, 17, 18}. The limited new data is unlikely to change the conclusions of the original report.</p>	<p>Original report conclusion is still valid and this portion of the original report does not need updating.</p>
Key Question 2: Among adolescents and young adults with ASD, what are the effects of available interventions on common medical and mental health comorbidities (e.g., epilepsy, sleep disorders, motor impairments, obesity, depression, anxiety, acute and episodic aggression, attention deficit hyperactivity disorder, etc.)?			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Medical Interventions, 8 studies Four fair quality RCTs, 1 poor quality RCT and 3 poor quality RCTs . Reduction in irritability, compulsion and self-injurious behavior reported with antipsychotics (Risperidone, Clomipramine). Reductive in aberrant behavioral reported with opioid 	<p>No new research.</p>	<p>One RCT examining a medical intervention⁹ and one RCT examining a behavioral intervention¹⁹ merit inclusion. The limited new data is unlikely to change the conclusions of the original report.</p>	<p>Original report conclusion is still valid and this portion of the original report does not need updating.</p>

<p>receptor antagonists (naltrexone). Reduction in obsessive compulsive, maladaptive, self-injurious and aggressive behavior reported with serotonin reuptake inhibitors (Haloperidol, Clomipramine, Fluvosamine, Setraline, Fluoxetine).</p> <p><i>Future research: more rigorous studies needed.</i></p>			
<p>Key Question 3: Among adolescents and young adults with ASD, what are the effects of available interventions on functional behavior, attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?</p>			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Educational Interventions, 1 poor quality RCT • Adaptive/Life Skills Interventions, 3 studies All studies were poor quality: RCT, prospective cohort, case series. • Vocational Interventions, 3 studies All studies were poor quality: prospective cohort, case series, cross-sectional. • Allied Health Interventions, 2 studies One fair quality RCT and 1 poor quality case series. <p><i>Future research: more rigorous studies needed.</i></p>	<p>Educational Interventions</p> <p>One nRCT⁷ examining inclusive educational settings reported no differences in educational attainment.</p>	<p>One RCT²⁰ examining competitive employment merits inclusion. The limited new data is unlikely to change the conclusions of the original report.</p>	<p>Original report conclusion is still valid and this portion of the original report does not need updating.</p>
<p>Key Question 4: Among adolescents and young adults with ASD, what is the effectiveness of interventions designed to support the transitioning process, specifically to affect attainment of goals toward independence, educational attainment, occupational/vocational attainment, life satisfaction, access to health and other services, legal outcomes, and social outcomes?</p>			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Adaptive/Life Skills Interventions, 1 poor quality case series <p><i>Future research: more rigorous studies needed.</i></p>	<p>Vocational Interventions</p> <p>One nonrandomized study⁵ examining sheltered workshops reported worse occupational outcomes among sheltered workshop participants.</p>	<p>No new evidence.</p>	<p>Original report conclusion is still valid and this portion of the original report does not need updating.</p>
<p>Key Question 5: Among adolescents and young adults with ASD, what harms are associated with available interventions?</p>			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Medical Interventions, 8 studies Four fair quality RCTs, 1 poor quality RCT and 3 poor quality RCTs. Most commonly 	<p>No new research</p>	<p>Four new systematic reviews have been published since 2012^{14-16, 21} but are unlikely to contain new data to change conclusions of original</p>	<p>Original report conclusion is still valid and this portion of the original report does not need updating.</p>

<p>reported adverse events were nausea and fatigue.</p> <p><i>Future research: more rigorous studies needed.</i></p>		report.	
Key Question 6: What are the effects of interventions on family outcomes?			
<p>SOE Insufficient:</p> <ul style="list-style-type: none"> • Behavioral Interventions, 1 poor quality case series • Adaptive/Life Skills Interventions, 1 poor quality prospective cohort <p><i>Future research: more rigorous studies needed.</i></p>	<p>Behavioral Interventions</p> <p>One nonrandomized study⁴ reported improved parental and sibling outcomes with applied behavior analysis programs.</p>	No new evidence.	Original report conclusion is still valid and this portion of the original report does not need updating.