

Autism Spectrum Disorders

Report to the Minnesota Commissioner of Human Services

By the Health Services Advisory Council

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Table of Contents

Executive Summary.....	ES-1
Abstract.....	1
Background.....	1
About the Health Services Advisory Council (HSAC)	1
Legislative and Agency Context	2
HSAC Process Regarding Autism Spectrum Disorders (ASD)	3
Symptomatology and Prevalence of ASD	4
Treatments and Interventions for ASD.....	7
Minnesota Health Care Programs (MHCP) Data.....	8
Summary of Evidence	9
Non-Pharmaceutical Interventions for Young Children Aged 0 – 12.....	9
Literature Scans	9
HSAC’s Decision to Endorse the AHRQ Young Children Report	10
AHRQ Young Children Report Methodology	11
Year 2000 Cut-Off for Including Studies	13
Single-Subjects Studies.....	13
Updated Literature 2009 – 12	15
HSAC’s Conclusions Regarding Strength of Evidence for Interventions for Young Children	15
Non-Pharmaceutical Interventions for Adolescents and Young Adults Aged 13 – 30	16
Literature Scans	16
AHRQ A/YA Report Methodology.....	17
HSAC’s Decision to Endorse the AHRQ A/YA Report and Conclusion Regarding Strength of Evidence	18
Non-Pharmaceutical Interventions for Older Adults.....	18
Pharmaceutical Interventions for All Age Groups	19
Process	19
Background and Literature Pertaining to Children and Adolescents	19
Collaborative Psychiatric Consultation Service’s Input	20
Literature Pertaining to Adults.....	21
Coverage Recommendations from DHS Pharmacy Staff.....	23
Coverage with Evidence Development (CED).....	23
Literature and Policy Review	23
CED Discussion.....	25
CED Recommendation.....	28

Coverage Recommendations	28
Early Intensive Behavioral and Developmental Interventions (EIBDI) for Children	28
Diagnostic Standards	29
Progress Evaluation Standards	30
Parental/Caregiver Participation	31
Therapeutic Intensity	32
Other Treatments for Children and Adolescents	33
Treatments for Adults	33
Conclusion	33
Appendix A: Health Services Advisory Council Charter	A-1
Appendix B: Draft Outline for Purposes of Prompting HSAC’s Discussion of ASD Coverage Options.....	B-1
Appendix C: Principles for Assessing the Quality of Evidence	C-1
Appendix D: Public Comments.....	D-1
Appendix E: Bibliography.....	E-1

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Executive Summary

The Health Services Advisory Council (HSAC) is a legislatively created, 13-member, physician-based council. It provides advice to the Minnesota Commissioner of Human Services by recommending health care benefit and coverage policies for Minnesota's public health care programs. HSAC advises decisions regarding health care services paid for by public programs using the best available research on their effectiveness. HSAC is staffed by the Office of the Minnesota Health Care Programs Medical Director. More information is available on [HSAC's public web page](http://www.dhs.state.mn.us/hsac) at www.dhs.state.mn.us/hsac.

The 2012 Legislature specifically mandated that HSAC address Autism Spectrum Disorders (ASD). At the direction of the Legislature, this HSAC report:

- reviews the evidence base for various treatments for ASD across the lifespan;
- recommends on-going collection of outcomes evidence; and
- recommends coverage parameters for ASD interventions.

ASD is increasingly prevalent and its treatments multifaceted. It encompasses a spectrum of neurodevelopmental disorders estimated to occur in one in 88 children in the United States. Individuals with ASD have in common a core set of symptoms related to:

- qualitative impairment in social interaction;
- qualitative impairment in communication; and
- idiosyncratic or repetitive and restricted behaviors and interests.

ASD is considered a spectrum disorder due to the variability of individual symptoms and the range in impact on individuals from mild to severe. There is no cure for ASD, thus interventions are directed to help reduce or manage symptoms. The inherent variability in signs and symptoms creates challenges in developing treatment programs. Some children receive early intensive behavioral and developmental interventions (EIBDI). Interventions also include prescription drugs; allied health interventions such as speech, occupational, music and physical therapies; and complementary and alternative medicine.

Approximately 17,000 individuals with an ASD diagnosis were enrolled in Minnesota Health Care Programs in 2010. Approximately three fifths were children under the age of 18.

Evidence for the Treatment of Autism Spectrum Disorders (ASD)

HSAC reviewed studies pertaining to interventions for ASD across the lifespan. This body of literature is extensive and quite variable in its design and rigor. HSAC extensively discussed two recent literature reviews funded by the Agency for Healthcare Research and Quality (AHRQ) pertaining to young children and adolescents and young adults, respectively:

- Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011. Available

at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.*

- Lounds Taylor J, Dove D, Veenstra-VanderWeele J, et al. *Interventions for Adolescents and Young Adults With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 65. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 12-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2012. Available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1196&pageaction=displayproduct>

Together the authors of these two reports reviewed approximately 9,000 abstracts and 1,750 full studies, of which over 190 met inclusion criteria. Their evaluations concluded with determinations about the strength of evidence for or against the effectiveness and harms of specific interventions for ASD. (For example, evidence may support a specific intervention, but the quality of the research may be poor, leading to a conclusion that the strength of the evidence is low.) HSAC endorsed both reports. HSAC also relied on additional AHRQ-funded reports and two bibliographies provided by the Medicaid Evidence-based Decisions Project that update this literature to the present time and extend the work into older age groups. HSAC also acknowledged the large body of small-scale (single-subjects) studies that dominates ASD literature.

From its discussion and endorsements of these literature reviews, HSAC concluded:

- *The strength of evidence of Early Intensive Behavioral and Developmental interventions' (EIBDI's) effectiveness in improving cognitive, language and adaptive outcomes in certain subgroups of children aged 12 and under is low.*
- *The strength of evidence of any other non-pharmaceutical interventions for any age group is insufficient to determine effectiveness or harms.*

HSAC relied on DHS' pharmacy staff and psychiatrists from the Minnesota Collaborative Psychiatric Service for Minnesota input regarding the evidence for and making coverage recommendations regarding prescription drugs. They concluded that the strength of evidence for pharmacologic interventions for specific symptoms varies from insufficient to high, depending on the drug, age group, and whether the evidence concerns effectiveness or harms of the drug in question. DHS currently covers the full range of pharmaceutical interventions in common use to treat ASD's associated symptoms. Pharmacy staff recommends against making any changes in coverage policy at this time. The Minnesota Collaborative Psychiatric Service should continue facilitating the availability of social and behavioral health services and ensuring the appropriate use of psychotropic pharmaceutical interventions for pediatric Medicaid recipients.

On-going Collection of Outcomes Evidence—Coverage with Evidence-Development (CED)

The Legislature authorized HSAC to recommend “coverage with on-going collection of evidence.” In health policy literature parlance, this refers to a policy tool known as “coverage with evidence

* All websites contained in this report (including executive summary and appendices) were accurate as of January 7, 2013.

development” (CED). CED is a mechanism by which a payer can cover promising but as yet insufficiently studied interventions, while at the same supporting expansion of the evidentiary bases regarding such interventions. It allows a payer to help support the research it needs to fill in gaps impacting care and coverage decisions.

Because of the substantial gaps in research on ASD interventions across the lifespan, HSAC supported CED:

- *HSAC recommends to the Commissioner that CED should be used while making intensive services and other interventions for autism available, and that stakeholders participate in all aspects of CED development, including recommending priorities for research and collaborating in registry and study design. It should include a funded registry for data collection and analysis, and also incorporate reliable and valid outcome measures.*

Coverage Parameters

Early Intensive Behavioral and Developmental Interventions (EIBDI) for Children

Many providers believe that intervening early and intensively in a child’s life offers the most potential to reduce symptoms of ASD. While the literature on EIBDI is far from robust, it is still the best studied of ASD interventions. HSAC offered principles to guide the development of an EIBDI benefit.

- *HSAC recommends to the Commissioner that diagnosis be confirmed by a professional trained in diagnosing neuro-developmental disorders. Diagnoses must be based on DSM-IV criteria (DSM-5, once DSM-5 is final), together with assessments of functional status from direct observations by a multi-disciplinary team and parental/caregiver reports. The diagnosis and assessments should be used to develop a treatment plan and establish a baseline from which to measure a person’s treatment progress. Identification and selection of assessment tools should be informed by stakeholders.*
- *HSAC recommends to the Commissioner that individuals and families should be informed of their right to a second opinion, and the availability of alternative therapies.*
- *HSAC recommends to the Commissioner that periodic progress evaluations, at reasonable intervals and using standardized tools developed with stakeholder input, be required. Independent evaluations would be preferred when feasible, and evaluation should be prioritized toward cases where progress is unclear.*
- *HSAC recommends to the Commissioner that DHS require an assessment of parental/caregiver resiliency and ability to participate coupled with a therapeutic plan that reflects assessment results. Parental/caregiver involvement and support of culturally responsive therapy improves the likelihood of therapy’s success. A high parental/caregiver participation requirement should be expected, allowing for exemptions in individual cases. Parent/caregivers’ unwillingness or inability to participate should not impede a child’s access to therapy, though children should show sufficient progress from evaluation to evaluation to continue therapy.*

- *HSAC recommends to the Commissioner that DHS support the appropriate amount of hours to maximize results for any given child, but also support evaluation of actual, optimal therapy a child can receive in a given week. DHS should distinguish therapeutic services from support services in order to match services to the child's needs.*

Other Treatments for Children, Adolescents and Adults

DHS currently covers a range of services for people with ASD. Such services include, for example, allied health interventions such as speech, occupational and physical therapy, other mental health interventions and services for people with disabilities HSAC discussed coverage of such interventions but did not take a formal vote.

Conclusion

Autism Spectrum Disorder is an increasingly prevalent diagnosis, and its spectrum of symptoms and treatments is complex. HSAC supported DHS' commitment to covering supportive and medically necessary, client- and family-centered services for children and adults with ASD. The science of treating ASD is still emerging. Indeed, the evidence for most interventions across the lifespan of a person with ASD is insufficient even to draw preliminary conclusions. Many providers believe that intervening early and intensively in a child's life offers the most potential to reduce symptoms of ASD. While the literature on EIBDI is far from robust, it is still the best studied of ASD interventions for children. HSAC has recommended that DHS cover EIBDI in a way that allows for therapeutic flexibility suited to each child's constellation and severity of symptoms and family context. Its approach rests on recommendations for rigorous standards for diagnosis, treatment planning, and progress evaluation with expected changes in covered services and treatments based on these evaluations. HSAC also recommends coverage with evidence development, by which DHS, with sufficient external support and community collaboration, would help improve the evidentiary base for ASD. By adhering to rigorous evaluation criteria and contributing to the science of ASD treatments in the process, HSAC's recommended approach will foster access to medically necessary interventions for the children of today while stewarding resources and improving care for the children of tomorrow.

[end of Executive Summary]

Abstract

Autism Spectrum Disorder (ASD) is increasingly prevalent and its treatments multifaceted. At the direction of the Legislature, this report reviews the efficacy of various treatments for ASD across the lifespan. It also recommends coverage for ASD interventions and the ongoing collection of outcomes evidence.

Background

About the Health Services Advisory Council (HSAC)

The Health Services Advisory Council (HSAC) is a 13-member council that provides advice to the Minnesota Commissioner of Human Services by recommending health care benefit and coverage policies for Minnesota's public health care programs. HSAC advises decisions regarding health care services paid for by public programs using the best available research on their effectiveness.¹ HSAC structures each meeting to allow for public input on the agenda topics at hand. HSAC also welcomes written input between meetings.

In 2006 the Legislature created HSAC as an intentionally multi-disciplinary body, representing a wide spectrum of providers with stakeholder input. Dominated by physicians in active medical practice, it includes primary care practitioners and medical specialists (three of whom represent managed care plans that serve Minnesota Health Care Programs clients) as well as non-physician health care providers and a consumer representative. The Minnesota Health Care Programs (MHCP) Medical Director serves as an ex-officio, non-voting member. HSAC's roster currently reflects expertise in psychiatry, psychology, ethics, pediatrics (including pediatrics for children in foster care), family medicine, internal medicine, occupational health, geriatrics, surgery, emergency medicine and services for people with disabilities. All HSAC members, including its non-physician and consumer members, share a commitment to and expertise in evaluating research and making decisions that are informed by scientific evidence. HSAC is staffed by the Office of the MHCP Medical Director.

HSAC generally focuses its energies on the topics where the science is unclear—on the gray areas in medicine where the literature provides insufficient or conflicting evidence. In such cases, HSAC's charter calls for the group to be guided by science but also to rely on professional consensus. HSAC considers criteria such as these when choosing how to prioritize its work:

- Magnitude of potential impact for improving the health of persons served by Minnesota Health Care Programs (MHCP);
- Potential for improving the stewardship of MHCP resources;
- Potential for reducing health disparities among subpopulations served by MHCP;
- Extent of or potential for practice pattern variation unrelated to differences in patient populations;
- Likelihood of coverage variation or inconsistency within the Minnesota Department of Human Services (DHS) or among managed care plans and DHS;
- Sufficiency and quality of evidence; and

¹ [Minnesota Statutes, section 256B.0625, subd.3c.](#)

- Other relevant evaluations, internal or external to DHS, that have addressed the topic or are in the process of doing so, to consider if HSAC’s contributions would add value or redundancy.

From time to time the Legislature asks HSAC to address a particular topic. At the Legislature’s request, HSAC has previously reported on options for provider reimbursement that reflect patient-centered decision-making, as well best practices related to minimizing caesarean sections.

By addressing emerging technologies (such as spinal cord stimulation for chronic pain), practice standards (e.g., imaging) and centers of excellence criteria (e.g., bariatric surgery), HSAC has provided DHS with unique and significant guidance on a wide range of topics.

[HSAC’s public web page](#) includes its membership roster, charter, transparency policy, meeting minutes and agendas, previous evidence summaries and legislative reports. It also includes public comments on the topic at hand. A copy of HSAC’s charter is attached as [Appendix A](#).

Legislative and Agency Context

In 2012 the Legislature charged HSAC to:

1. review the evidence base for various treatments for ASD across the lifespan;
2. recommend coverage for services based on existing evidence; and
3. consider recommending a coverage-with-evidence (CED) approach, should the strength of existing evidence of ASD treatments’ effectiveness be inadequate.²

HSAC’s work is but one important piece of the puzzle to inform and shape DHS’ policy regarding ASD. In its *Reform 2020: Pathways to Independence Section 1115 Waiver Proposal*, DHS has signaled to the Centers for Medicare & Medicaid Services its intent to redesign services to support persons diagnosed with ASD.³ The Minnesota Autism Spectrum Disorder Task Force (created by the Legislature in 2009) has been developing recommendations, among other things, on service improvements and coordination across agencies.⁴ DHS is represented in an interagency work group that includes the Minnesota Departments of Health and Education; this work group is prompting cross-sector dialog to coordinate public health, education and Medicaid services for people with ASD. In 2012 DHS created the ASD Advisory Council, an external stakeholder group to advise on restructuring the Medicaid benefits set to better serve individuals with ASD.

People with ASD and their providers intersect with DHS in many ways. Policies relevant to people with ASD are set in the Health Care, Chemical and Mental Health Services and Continuing Care Administrations of DHS. For foster children who have ASD, DHS’ Children and Family Services Administration is also involved. DHS is working to streamline its ASD-related services and policies. To

² [Minnesota Session Laws 2012, chapter 247, section 26](#).

³ Minnesota Department of Human Services. Reform 2020 Section 1155 Waiver Proposal; available at [DHS’ Reform 2020 website](#).

⁴ Autism Spectrum Disorder Task Force. [Minnesota Session Laws 2009, Chapter 79, section 25](#). More information is available at the [ASD Task Force’s website](#).

that end DHS has recently hired an autism coordinator, whose job it is to coordinate ASD-related work within DHS as well as to represent DHS at inter-agency and public forums.

The Legislature requested HSAC to provide professional guidance that would inform evolving ASD policy. This has also left room for other, on-going external stakeholder processes. Accordingly, HSAC was very detailed and specific with regard to its review of ASD scientific evidence, a task with which none of the other stakeholder groups was charged. With regard to coverage (and coverage with evidence development) recommendations, HSAC provided a set of parameters grounded in the evidence and members' best judgment to guide policy development.

HSAC Process Regarding Autism Spectrum Disorders (ASD)

HSAC devoted its June – December 2012 meetings to ASD. Consistent with HSAC's transparency policy,⁵ all meetings were open to the public, all meeting materials were distributed via HSAC's email distribution list, and all speakers disclosed conflicts of interest. Each meeting began with DHS staff's overview of the agenda topic(s) at hand, followed by opportunities for public comment. Then HSAC's chair would close the comment portion of the agenda in order to allow HSAC members to deliberate publicly.

HSAC extended its normal two-hour meeting time by 30 minutes to allow more time for public comments. Everyone who requested an opportunity to speak at HSAC meetings was granted time to do so. In some meetings the public comment period spilled well over 30 minutes, with robust dialog between individual commenters and HSAC members. In addition, HSAC received extensive written comments from the public, copies of which were circulated via email to everyone on HSAC's distribution list and posted on [HSAC's website](#). (A list of people and organizations that submitted oral or written comments is attached as [Appendix D](#).)

HSAC initially considered the literature on interventions for people with ASD. As discussed more fully below in the [Summary of Evidence](#) section, HSAC had at its disposal several scans of the literature and annotated bibliographies from the Agency for Healthcare Research and Quality (AHRQ) and the Medicaid Evidence-based Decisions (MED) Project. It also relied on DHS pharmacy staff and external pediatric psychiatric consultants to review evidence regarding pharmaceutical interventions for commonly associated symptoms of ASD.

As HSAC turned to the task of making coverage recommendations (including coverage with evidence development recommendations) DHS staff suggested starting points for discussion. A copy of the "Draft Outline for Purposes of Prompting HSAC's Discussion of ASD Coverage Options" is attached as [Appendix B](#). The draft outline reflected input from DHS' Children's Mental Health and Disability Services divisions, as well as the office of the MHCP Medical Director. HSAC used this outline as a discussion tool and was not constrained by it. HSAC's ultimate recommendations vary from the outline.

Following HSAC's final meeting on ASD in December, DHS staff circulated a draft of this report for HSAC members' review and input. The draft and copies of HSAC members' comments were circulated publicly via email. This final report was issued in February 2013.

⁵ HSAC Commitment to Transparency, available on [HSAC's website](#).

Symptomatology and Prevalence of ASD

ASD is a spectrum of neurodevelopmental disorders estimated to occur in one in 88 children in the United States. It is among the fastest growing developmental disabilities and is almost five times more common among boys than among girls.⁶ The spectrum includes Asperger's Disorder, Autistic Disorder and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS).

Individuals with ASD have in common a core set of symptoms related to:

1. qualitative impairment in social interaction;
2. qualitative impairment in communication; and
3. idiosyncratic or repetitive and restricted behaviors and interests.

ASD is considered a spectrum disorder due to the heterogeneity of individual symptoms, unique combinations of core symptoms and the range in impact on individuals from mild to severe. More than one parent and provider who spoke during HSAC meetings said that "if you've seen one person with autism, you've seen one person with autism." There are many individuals with ASD who have co-occurring developmental, psychiatric, neurologic and medical disorders, any of which may be mild to severe. The frequency of co-occurrence may indicate a common etiology between ASD and a particular co-occurring condition⁷ (e.g., ASD with intellectual disability, ASD with schizophrenia or ASD with epilepsy). Effective therapeutic interventions for a child with co-morbidities may differ significantly from interventions for a child for whom ASD is the sole diagnosis.

There currently is no cure for ASD; as such, it is considered a life-long condition.⁸ (After HSAC completed its work, a highly publicized⁹ study declared the possibility of a cure for a very small subset of the ASD population. Study authors acknowledged that more research is required to better understand the characteristics of an ASD population for whom recovery might be possible and the nature of the intervention(s) that promote greatest success and "whether intervention is even always necessary."¹⁰)

⁶ Autism and Developmental Disabilities Monitoring Network Surveillance Year 2008 Principal Investigators; Centers for Disease Control and Prevention (ADDM Network). Prevalence of autism spectrum disorders—Autism and Developmental Disabilities Monitoring Network, 14 sites, United States, 2008. *MMWR Surveill Summ*. 2012;61(3):1-19. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6103a1.htm?s_cid=ss6103a1_w.

⁷ Levy S, Giarelli E, Lee L, Schieve L, et al, Autism spectrum disorder and co-occurring developmental, psychiatric, and medical conditions among children in multiple populations of the United States, *J Dev Behav Pediatr* 2010;31:267–275.

⁸ Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011;3. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

⁹ Carey B. Some with autism diagnosis can overcome symptoms, study finds. *NY Times*. Jan 16, 2013. Available at http://www.nytimes.com/2013/01/17/health/some-with-autism-diagnosis-can-recover-study-finds.html?_r=0.

¹⁰ Fein D, Barton M, Eigsti IM, et al. Optimal outcome in individuals with a history of autism. *J Child Psychol Psychiatry*. 2013;54(2):195-205 at 203.

Professionals face challenges when diagnosing ASD. There is no reproducible, objective medical test with a high degree of specificity and sensitivity, such as a brain scan or blood test, to confirm the condition. Instead, qualified professionals must conduct comprehensive developmental, psychological and behavioral evaluations, encompassing clinical observation, parental reports of developmental and health histories, psychological testing, speech and language assessments. The constellation of these assessments must best fit into an ASD diagnosis while also eliminating other conditions. Neurologic and genetic testing can be used to rule out other disorders.¹¹

Nationally, the median age for identifying children with special health care needs and ASD is five years. Forty percent of such children were first identified with ASD at six years or older. Less than 20% were identified at age two or younger.¹²

Calculating the number of people with ASD is challenging, in part because ASD is difficult to diagnose and in part because ASD signs and symptoms are identified in medical and educational settings. The Centers for Disease Control and Prevention (CDC) estimates that one in 88 children in the US has ASD. The estimated prevalence of ASD has risen dramatically over the past decade. The following table shows this increase:

Table 1: Estimated Prevalence of ASD in the United States¹³

Surveillance Year	Prevalence per 1,000 children	About 1 in X children...
2000	6.7	1 in 150
2002	6.6	1 in 150
2004	8.0	1 in 125
2006	9.0	1 in 110
2008	11.3	1 in 88

The reasons for increased prevalence over time are not well understood. Some of the increase is almost certainly due to increased awareness by doctors, teachers and parents, along with improved surveillance and identification of ASD. The extent that increases in ASD prevalence are also attributable to a true increase in the incidence of ASD is not known.¹⁴

The national estimate is based on detailed surveillance in 14 sites (a metropolitan area, county or multi-county region) chosen not for their representativeness but for their ability to conduct in-depth ASD surveillance across various sectors. None of the sites are in Minnesota. Estimates of ASD prevalence in each of these sites vary considerably, as shown in table 2. The CDC attributes much of the geographic

¹¹ Centers for Disease Control and Prevention (CDC). *Community Report From the Autism and Developmental Disabilities Monitoring (ADDM) Network: Prevalence of Autism Spectrum Disorders (ASDs) Among Multiple Areas of the United States in 2008*. Centers for Disease Control and Prevention, US Department of Health and Human Services. 2012. Available at <http://www.cdc.gov/ncbddd/autism/documents/ADDM-2012-Community-Report.pdf>.

¹² Pringle BA, Colpe LJ, Blumberg SJ, et al. Diagnostic history and treatment of school-aged children with autism spectrum disorder and special health care needs. NCHS data brief, no 97. Hyattsville, MD: National Center for Health Statistics. 2012. Available at <http://www.cdc.gov/nchs/data/databriefs/db97.pdf>.

¹³ US Centers of Disease Control and Prevention. Website: CDC Features: New Data on Autism Spectrum Disorders. 2012. Available at <http://www.cdc.gov/features/countingautism/>.

¹⁴ Ibid.

variation to methodology: Study sites that have access to educational data as well as health data identify higher ASD prevalence than those that rely solely on health data sources. The CDC acknowledges that other factors, such as demographic differences and service availability, might also contribute to geographic variation.¹⁵

Table 2: Varying Prevalence of ASD across CDC study sites¹⁶

Site	Prevalence per 1,000 children	About 1 in X children...
Alabama	4.8	1 in 208
Arizona	15.6	1 in 64
Arkansas	10.5	1 in 95
Colorado surveillance area 1	11.8	1 in 85
Colorado surveillance area 2	6.4	1 in 156
Florida	7.2	1 in 139
Georgia	11.9	1 in 84
Maryland	12.4	1 in 81
Missouri	13.9	1 in 72
New Jersey	20.5	1 in 49
North Carolina	14.2	1 in 70
Pennsylvania	13.3	1 in 75
South Carolina	11.1	1 in 90
Utah	21.2	1 in 47
Wisconsin	7.8	1 in 128
Average	11.3	1 in 88

The American Psychiatric Association has announced that new diagnostic criteria for ASD contained in its Diagnostic and Statistical Manual of Mental Disorders (DSM-5), currently in the final stages of revision, are expected to become effective in May 2013. Among other refinements, the term “Asperger’s disorder” will be dropped and incorporated under the umbrella diagnosis of Autism Spectrum Disorder. The new ASD criteria are intended to be clearer. A spokesperson for the American Psychiatric Association (APA), which is issuing the DSM-5, has explained that the new criteria “will lead to more accurate diagnosis and will help physicians and therapists design better treatment interventions for children who suffer from [ASD].”¹⁷ The APA’s statement goes on to say that the new ASD diagnostic criteria represent:

... a continuum from mild to severe, rather than a simple yes or no diagnosis to a specific disorder. They [also] ... describe the individual’s overall developmental status—in social communication and other relevant cognitive and motor behaviors.... This change will

¹⁵ Autism and Developmental Disabilities Monitoring Network Surveillance Year 2008 Principal Investigators; Centers for Disease Control and Prevention (ADDM Network). Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *MMWR Surveill Summ*. 2012;61(3):1-19. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6103a1.htm?s_cid=ss6103a1_w.

¹⁶ Ibid.

¹⁷ American Psychiatric Association. *News Release 12-03: DSM-5 Proposed Criteria for Autism Spectrum Disorder Designed to Provide More Accurate Diagnosis and Treatment*. January 20, 2012. Available at <http://www.dsm5.org/Documents/12-03%20Autism%20Spectrum%20Disorders%20-%20DSM5.pdf>.

help clinicians more accurately diagnose people with relevant symptoms and behaviors by recognizing the differences from person to person, rather than providing general labels that tend not to be consistently applied across different clinics and centers.¹⁸

It is too early to know what impact, if any, the new criteria will have on how ASD's prevalence in the population is understood.¹⁹

Treatments and Interventions for ASD

Because there is no cure for ASD, treatments are designed to ameliorate symptoms. The inherent variability in signs and symptoms leads to great variability in treatment. Interventions can range from prescription drugs to address particular symptoms to allied health interventions (such as speech, occupational, and physical therapies) to improve delayed social, communication and physical skills; from complementary and alternative medicine to behavioral and developmental therapies.

Many providers believe that intervening early and intensively in a child's life offers the most potential to address problematic behaviors. Examples of these kinds of early intensive behavioral and developmental interventions (EIBDI) include:

- Applied Behavioral Analysis (ABA) approaches including the UCLA/Lovaas method and variants;
- Naturalistic/developmental principles (e.g. Early Start Denver Model); and
- Parent/family-based training (e.g., Pivotal Response Training, Hanen More Than Words, and social communication training).²⁰

ABA is an approach that has been used by behaviorists for decades and isn't limited to addressing ASD. It describes techniques for assessing, treating and preventing challenging behaviors and promoting new, desired behaviors. Among ASD-specific ABA approaches, the UCLA /Lovaas model and its variants are the best known. For very young children, the Early Start Denver Model (ESDM) blends ABA principles with developmental and relationship-based approaches. ESDM and UCLA/Lovaas rest on different theoretical frameworks and implementation, but are similar in that they both rely on high intensity (several hours per week, one-on-one instruction from a trained therapist or aide) and on published manuals to facilitate adherence to their respective treatment models. Yet another set of related approaches for very young children is clumped into the "parent/family-based training" category. This kind of training tends to focus on specific behaviors (e.g., initiating or organizing activity) or on core social communication skills, rather than on more global improvements.²¹

¹⁸ Ibid.

¹⁹ American Psychiatric Association DSM-5 Task Force. *DSM-5: The Future of Psychiatric Diagnosis*. Website available at <http://www.dsm5.org/Pages/Default.aspx>.

²⁰ Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011;31. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

²¹ Ibid at 20.

The heterogeneity of symptoms, severity and interventions makes it hard to evaluate outcomes of treatment. There are currently no widely accepted evaluation standards that cut across the different kinds of interventions and disciplines. (One of HSAC’s recommendations, discussed below under “[Progress Evaluation Standards](#),” is to foster a learning collaborative to improve assessments and comparisons of therapeutic progress.)

In sum, treatments for ASD:

- address individuated symptoms;
- vary considerably in application and design; and
- are difficult to assess, because of the lack of widely accepted evaluation standards and tools that can be used to compare treatment outcomes of different therapeutic approaches.

Minnesota Health Care Programs (MHCP) Data

Approximately 17,000 individuals with an ASD diagnosis were enrolled in MHCP in 2010. Approximately three fifths were children under the age of 18. (See Table 3.) Approximately three fifths used some type of long term service and support (LTSS) that year. The use of such services changes with age. By definition, the Children’s Therapeutic Services and Support program (CTSS—DHS’ mental health rehabilitation program) is limited to children. Children are also more likely to access personal care assistance (PCA) services. In contrast, adults are more likely to be receiving services through one or more waived programs.

Table 3: Number and Percent of Individuals with ASD enrolled in MHCP in December 2010

Age Group	Individuals with ASD	Total Enrollees (with or without ASD diagnosis)	Individuals with ASD as a % of Total Enrollees
0 – 5	2,052	151,208	1.4%
6 – 17	8,004	209,680	3.8%
18 – 20	1,260	48,688	2.6%
21 – 64	5,470	392,741	1.4%
65 and older	568	73,063	0.8%
Total	17,354	875,380	2.0%

CTSS services must be provided by a DHS-certified agency (county, tribe or provider). The spectrum of services available under CTSS allows providers to address the conditions of emotional disturbance that impair and interfere with children’s abilities to function. These rehabilitative services offer a broad range of medical and remedial services and skills to restore a child’s functional abilities as much as possible. For more information, see the [CTSS website](#).

Some ASD providers have become certified as CTSS providers and offer various kinds of intensive therapies to children with ASD in the form of individual and family skills training. In the data reported below, CTSS is considered to be a subset of LTSS, so Table 4 includes children receiving CTSS.

Tables 4 and 5 show how program and service utilization differed across age groups in calendar year 2010. Table 4 shows that children with ASD are high users of LTSS compared to other children. In contrast, adults with ASD submit proportionately fewer LTSS claims compared to adults without ASD.

Table 4: Long Term Services and Supports Usage by Age Group in CY 2010²²

Age Group	Number of Individuals with ASD Receiving LTSS	ASD-Diagnosis as a % of all LTSS recipients
0 to 5	808	24.9%
6 to 17	5,163	25.8%
18 to 20	841	23.7%
21 to 64	2,898	5.9%
65 +	310	0.9%
Total	10,020	9.0%

Table 5: CTSS Use in CY2010 by Children with ASD.

Age Group	Number with ASD	Total CTSS Participation (ASD and non ASD)	ASD as a % of all CTSS participants
0 – 5	452	1,563	28.9%
6 – 17	2,104	11,831	17.8%
18 – 20	114	844	13.5%

In December 2010 the most common non-LTSS claims for children with ASD were physician visits and prescription medications. They had relatively few inpatient claims.

Summary of Evidence

Non-Pharmaceutical Interventions for Young Children Aged 0 – 12

Literature Scans

In 2011 the results of a comprehensive literature review funded by the federal Agency for Health Care Research and Quality (AHRQ) were reported. The review examined the evidence for treating ASD among children aged 0 – 12 (the “AHRQ Young Children Report”).²³ Researchers from Vanderbilt University’s Evidence-based Practice Center performed the review. AHRQ also funded a surveillance report that updated the 2011 report, which was compiled by researchers from RAND Corporation (the “AHRQ RAND Update”).²⁴ The Medicaid Evidence-based Decisions Project (MED)²⁵ provided HSAC with an annotated

²² Table 4’s data about LTSS usage include children receiving CTSS.

²³ Ibid.

²⁴ Maglione M, Motala A, Shanman R, et al. *Therapies for children with Autism Spectrum Disorders (ASDs)*. AHRQ Comparative Effectiveness Review Surveillance Report CER#26. 2012. Available at http://effectivehealthcare.ahrq.gov/ehc/products/106/656/TherapiesforChildrenWithAutism_UpdateSurveillanceReport_20120803.pdf.

²⁵ The Medicaid Evidence-based Decisions (MED) Project is a collaboration of 11 states’ Medicaid programs. Minnesota has been a MED member since MED was formed in 2006. Housed at Oregon Health & Science University’s Center for Evidence-based Policy, MED fosters extends the research and policy analysis capacity of

bibliography of articles meeting the AHRQ Young Children Report’s inclusion criteria but which were too recent to be included in that report. The AHRQ RAND Update included studies published from January 2009 to October 2011; the MED bibliography included studies published from January 2010 to May 2012. The studies identified by these updates are included in the bibliography in [Appendix E](#).

In addition to the above resources from AHRQ and MED, HSAC considered two other literature scans. In 2010 researchers from IMPAQ International compiled an “environmental scan” of autism literature.²⁶ In 2009 the National Autism Center (NAC) issued its National Standards Report, which provided clinical and educational guidance grounded in its own scan of the autism literature.²⁷

HSAC’s Decision to Endorse the AHRQ Young Children Report

HSAC has previously endorsed the use of the generally accepted Assessment of Multiple SysTemAtic Reviews (AMSTAR) principles to evaluate the quality of literature reviews.²⁸ AMSTAR evaluates, not whether an intervention has strong scientific support, but whether the science used to measure a body of literature is sound.

A well conducted systematic review addresses a carefully formulated question by analyzing all available evidence. It employs an objective search of the literature, applying predetermined inclusion and exclusion criteria to the literature, critically appraising what is found to be relevant. It then extracts and synthesizes data from the available evidence base to formulate findings.

However, in spite of the care with which they are conducted, systematic reviews may differ in quality, and yield different answers to the same question. As a result, users of systematic reviews should be critical and look carefully at the methodological quality of the available reviews.²⁹

AMSTAR comprises an 11-question checklist that assesses the methodological quality of systematic reviews. It asks about question and inclusion criteria, whether at least two people extracted and reviewed data independently, how comprehensive the literature search was, and so forth. It includes criteria about transparency, so that readers can track for themselves what studies were and were not

participating states’ medical director offices. MED supports improved decision-making in Medicaid programs by: (1) producing independent and objective evaluations of clinical evidence to inform decisions made by policy-makers, purchasers, providers, and consumers; (2) sharing best practices and engaging in collaborative problem-solving to accelerate improvements in healthcare outcomes and health system efficiency; and (3) supporting state efforts to increase transparency and evidence-based decision-making in state health coverage policies.

²⁶ Young J, Corea C, Kimani J, et al. *Autism Spectrum Disorders (ASDs) Services: Final Report on Environmental Scan*. (Prepared by Impaq International for the Centers for Medicare & Medicaid Services). 2010. Available at http://www.impagint.com/files/4-Content/1-6-publications/1-6-2-project-reports/Autism_Spectrum_Disorders.pdf.

²⁷ National Autism Center. *National Standards Report*. 2009. Available at <http://www.nationalautismcenter.org/pdf/NAC%20Standards%20Report.pdf>.

²⁸ Shea BJ, Grimshaw JM, Wells GA, et al. Development of AMSTAR: A Measurement Tool to Assess the Methodological Quality of Systematic Reviews. *BMC Med Res Methodol*. 2007;7:10.

²⁹ Ibid.

included and why or why not. It examines whether the reviewers assessed the relative scientific quality of each of the studies and described the studies well. In addition, it asks whether and how publication bias is assessed and whether the conflict of interests of both the systematic review and the individual studies were disclosed. Taken together, the AMSTAR criteria reveal how well the literature review was conducted and whether it objectively and accurately reports the state of the science.

Two staff members from the MED Project independently applied the AMSTAR criteria to the AHRQ Young Children Report, IMPAQ's environmental scan and NAC's guidance (see [Appendix C](#)). Only the AHRQ Young Children Report satisfied the AMSTAR criteria.

HSAC agreed with MED's conclusions and endorsed the quality of the AHRQ Young Children Report. HSAC also reviewed the articles identified in the AHRQ RAND update and the MED updated bibliography (which overlapped significantly). HSAC declined to rely on either the IMPAQ environmental scan or the NAC guidance. HSAC also expressly acknowledged the large body of single-subject studies (see below) that did not meet the inclusion criteria for the AHRQ Young Children Report.

AHRQ Young Children Report Methodology

The AHRQ Young Children Report analyzed the literature regarding a range of ASD interventions. They sought to answer the following key questions:

1. Among children ages 2 – 12 with ASD, what are the short and long-term effects of available behavioral, educational, family, medical, allied health, or CAM treatment approaches?
Specifically,
 - a. What are the effects on core symptoms (e.g., social deficits, communication deficits and repetitive behaviors), in the short term (≤ 6 months)?
 - b. What are the effects on commonly associated symptoms (e.g., motor, sensory, medical, mood/anxiety, irritability and hyperactivity) in the short term (≤ 6 months)?
 - c. What are the longer-term effects (> 6 months) on core symptoms (e.g., social deficits, communication deficits and repetitive behaviors)?
 - d. What are the longer-term effects (> 6 months) on commonly associated symptoms (e.g., motor, sensory, medical, mood/anxiety, irritability and hyperactivity)?
2. Among children ages 2 – 12, what are the modifiers of outcome for different treatments or approaches?
 - a. Is the effectiveness of the therapies reviewed affected by the frequency, duration, and intensity of the intervention?
 - b. Is the effectiveness of the therapies reviewed affected by the training and/or experience of the individual providing the therapy?
 - c. What characteristics, if any, of the child modify the effectiveness of the therapies reviewed?
 - d. What characteristics, if any, of the family modify the effectiveness of the therapies reviewed?
3. Are there any identifiable changes early in the treatment phase that predict treatment outcomes?
4. What is the evidence that effects measured at the end of the treatment phase predict long-term functional outcomes?
5. What is the evidence that specific intervention effects measured in the treatment context generalize to other contexts (e.g., people, places, materials)?

6. What evidence supports specific components of treatment as driving outcomes, either within a single treatment or across treatments?
7. What evidence supports the use of a specific treatment approach in children under the age of two who are at high risk of developing autism based upon behavioral, medical or genetic risk factors?

Researchers examined a full range of interventions that have been studied to treat ASD or ASD's commonly associated symptoms. *Behavioral interventions* include:

- early intensive behavioral and developmental interventions (EIBDI), including:
 - UCLA/Lovaas-based approaches involving Applied Behavioral Analysis;
 - Early Start Denver model and other developmental and relational approaches;
 - Parent training approaches;
- social skills training;
- play- and interaction-based interventions;
- cognitive behavioral therapy;
- neurofeedback; and
- sleep interventions

Allied health interventions include speech, occupational, movement and music therapies and animal-assisted interventions (such as horseback riding therapy). *Complementary and alternative medicine interventions* include massage and acupuncture.

The AHRQ Young Children Report reviewed 4,120 abstracts and 714 full studies. Of these, 159 studies met inclusion criteria. Using AHRQ's well-established process for assessing the quality of individual studies,³⁰ two or more researchers independently ranked each of the 159 studies as good, fair or poor. The assessment took into account criteria such as study design, diagnostic approach, participant ascertainment, intervention characteristics, outcomes measurement, statistical analysis and applicability.³¹

Once each individual study was ranked, researchers then assessed the strength of evidence for each kind of intervention. "Strength of evidence" refers to the relative confidence that what is known now about a particular intervention's effectiveness or capacity to cause harm is stable and unlikely to change with further study.³² (For example, evidence may support a specific intervention, but the quality of the research may be poor, leading to a conclusion that the strength of the evidence is low.) Researchers

³⁰ Owens DK, Lohr KN, Atkins D, et al. AHRQ series paper 5: Grading the strength of a body of evidence when comparing medical interventions—Agency for Healthcare Research and Quality and the effective health-care program. *J Clin Epidemiol.* 2010;63(5):513-523.

³¹ Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders.* Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011;22-27. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

³² Owens DK, Lohr KN, Atkins D, et al. AHRQ series paper 5: Grading the strength of a body of evidence when comparing medical interventions—Agency for Healthcare Research and Quality and the effective health-care program. *J Clin Epidemiol.* 2010;63(5):513-523.

analyzed strength of evidence by considering four domains among the studies for each particular intervention:

- risk of bias;
- consistency in direction of the effect;
- directness in measuring intended outcomes; and
- precision of effect.

Ultimately, they ranked each type of intervention as follows:

- High: High confidence that the evidence reflects the true effect. Further research is unlikely to change estimates.
- Moderate: Moderate confidence that the evidence reflects the true effect. Further research may change confidence in the estimate of effect and may change the estimate.
- Low: Low confidence that the evidence reflects the true effect. Further research is likely to change confidence in the estimate of effect and is also likely to change the estimate.
- Insufficient: Evidence is either unavailable or does not permit a conclusion.

Year 2000 Cut-Off for Including Studies

The AHRQ Young Children Report excluded studies that were published prior to 2000. They did so because diagnostic criteria changed that year with the implementation of DSM-IV. In addition, two of the best assessment tools were in broad use by that year: the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview-Revised (ADI-R).

HSAC received public comments that criticized the AHRQ Young Children Report's exclusion of studies prior to 2000. Commenters argued that important research had been conducted prior to 2000. In response, HSAC members echoed the report authors' concerns about diagnostic fidelity prior to 2000; noted that in studies prior to 2000, results were not always reproducible; and agreed with the decision to exclude older studies.

Single-Subjects Studies

Most research on interventions for ASD comprises very small studies, often single-subjects studies. Single-subject studies by definition are limited to one research participant at a time, but despite their small size may be rigorously designed as experimental. Thus, for example, a study may involve starting and stopping a particular course of treatment three or more times over the course of months or years in order to measure the treatment's short-term degree of impact, while controlling for a child's natural maturation.³³

The researchers who compiled the AHRQ Young Children Report chose to include single-subjects studies only if they were reported as part of a case series of at least ten or more subjects. The report explains:

³³ Smith T, Scahill L, Dawson G, et al. Designing research studies on psychosocial interventions in autism. *J Autism Dev Disord.* 2006;37:354-366.

Single-subject design studies can be helpful in assessing response to treatment in very short timeframes and under very tightly controlled circumstances, but they typically do not provide information on longer term or functional outcomes, nor are they ideal for external validity without multiple replications. They are useful in serving as demonstration projects, yielding initial evidence that an intervention merits further study, and, in the clinical environment, they can be useful in identifying whether a particular approach to treatment is likely to be helpful for a specific child. Our goal was to identify and review the best evidence for assessing the efficacy and effectiveness of therapies for children with ASD, with an eye toward utility in the treatment setting. With the assistance of our technical experts, we selected a minimum sample size of 10 in order to maximize our ability to describe the state of the current literature, while balancing the need to identify studies that could be used to assess treatment effectiveness.³⁴

This perspective about the utility and limitations of single-subjects research is consistent with a consensus opinion of a National Institute of Mental Health-sponsored working group convened from 2002 to 2004 to develop guidelines for designing research studies of psychosocial interventions for individuals with ASD:

Although well-suited to initial studies of an intervention, single-case designs have limitations. Because they involve a small number of participants, they yield little information on how the intervention compares with other interventions and what proportion of individuals with ASD would benefit.³⁵

The NIMH-sponsored work group categorized single-case studies as phase one studies, useful in formulating and systematically applying new interventions. Studies to determine efficacy or community effectiveness required randomized clinical trial or other between-group designs.³⁶

HSAC members participated in a robust series of discussions concerning the utility of single-subjects studies. Several people offered public comments, both oral and written, criticizing the AHRQ Young Children Report's authors for excluding a large body of single-subjects research pertaining to ASD. They argued that the heterogeneity of ASD is best studied with single-subject designs—that population-based studies can mask heterogeneity and make it difficult to identify subgroups for which study interventions are effective.

Many HSAC members disagreed, and pointed to complex, heterogeneous conditions like dementia and various cancers, the understanding of which is being greatly advanced by larger-scale studies. As an example, most childhood leukemia is treatable, because despite cancer's heterogeneity, rigorous

³⁴ Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011;18. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

³⁵ Smith T, Scahill L, Dawson G, et al. Designing research studies on psychosocial interventions in autism. *J Autism Dev Disord*. 2006;37:354-366 at 358.

³⁶ Ibid. at 357-358.

randomized controlled trials have identified particular therapeutic approaches for particular cancer variations. Some treatments may work for some individuals, but absent comparative and larger studies it is hard to predict which subgroups will respond.

There was also discussion about journals' publication practices (and authors' decisions about whether to publish negative results of single-subject studies) and concerns that single subject studies with negative results were not published except as part of a series in which effectiveness was demonstrated with other research subjects. It has become important to publish negative results and question the practices of journals that do not do so.

Other commenters claimed that a decision to exclude single-subjects studies would hold autism researchers to too high a standard. Relatively sparse funding has likely limited the ability of ASD researchers to conduct large-scale studies. Many HSAC members acknowledged that such might be the case, but the evidentiary base for understanding efficacy across the large and heterogeneous ASD population remains weak. They suggested that this concern supported DHS' embracing a coverage-with-evidence-development approach, rather than lowering the evidentiary bar for understanding efficacy.

Updated Literature 2009 – 12

HSAC reviewed literature updates from two sources: (1) the MED Project, which assembled an annotated bibliography of studies meeting AHRQ Young Children Report inclusion criteria, except that they were from 2010 – 2012 and (2) the AHRQ RAND update, which included studies from 2009 – 2011. The studies from both reports are cited in [Appendix E](#). HSAC members agreed that the overlapping studies from these sources were not sufficient to change the conclusions expressed in the AHRQ Young Children Report.

HSAC's Conclusions Regarding Strength of Evidence for Interventions for Young Children

HSAC members ultimately agreed to endorse the AHRQ Young Children Report's conclusions, while also acknowledging the large body of evidence residing in the single-subject study literature. In sum, the AHRQ Young Children Report concluded:

- *EIBDI improves cognitive, language and adaptive outcomes in certain subgroups of children; however the strength of evidence to draw this conclusion is low.*
- *The evidence is insufficient to understand the effectiveness, benefits or adverse events from any other non-pharmaceutical interventions.*

In other words, of all interventions studied EIBDI has the best evidentiary base, but the evidence for EIBDI is far from robust. EIBDI likely works well for some children, works moderately well for others, and is ineffective for still others. The literature isn't developed enough yet to provide clear, stable guidance about which children fall into which of those categories. EIBDI is also a very broad category of interventions, and the literature hasn't answered which therapeutic modalities within EIBDI work better for which groups of children and at what doses or intensity levels.

The literature is also replete with other unproven interventions. In clinical experience and small scale studies, parents and providers report success with various interventions. The literature is insufficient, though, to understand their effectiveness, benefits or adverse events.

This paucity of *current* evidence does not equal a lack of effect or potential effect of treatment. Some ASD interventions have a strong effect in some children and don't work as well for others. Until the science of treating ASD matures, individual children, their families and their providers must embark on a trial and error approach and rely on their providers' clinical expertise to identify and hone the intervention(s) that work best for them.

Non-Pharmaceutical Interventions for Adolescents and Young Adults Aged 13 – 30

Literature Scans

Symptoms and signs that combine to create an autism diagnosis may be ameliorated, but often persist into adolescence and adulthood. In 2012 the results of an AHRQ-funded review of the evidence for treating ASD among adolescents and young adults were issued (the "AHRQ A/YA Report").³⁷ Researchers from Vanderbilt University's Evidence-based Practice Center conducted the literature review; the research team overlapped with the team that produced the AHRQ Young Children Report.

The methodology for the AHRQ A/YA Report was identical to the predecessor report on young children, except for the following:

- By definition, the ages of the research subjects concerned adolescents and young adults, instead of young children. Researchers tailored their key questions to topics pertinent to this older age group.
- The analysis of treatments included studies going back to 1980, because there are far fewer studies available in the literature for this age group and there is greater diagnostic confidence in this age group. (It is easier to diagnose a teenager with autism than a toddler, so the researchers were willing to accept less diagnostic specificity inherent in the 1980 – 1999 studies.³⁸)
- Studies of fewer than 20 research participants were excluded from this report. In comparison, the earlier AHRQ Young Children Report excluded studies of fewer than 10 participants for non-medical studies, and drew the line at 30 participants for medical studies. A co-author for both reports explained that the earlier report had been criticized for having differing inclusion criteria for medical (pharmacological) and non-medical studies. (The AHRQ Young Children Report used the higher bar for medical studies, because studies that seek to understand a potential intervention's harms in addition to efficacy require larger study populations. For non-medical studies that didn't attempt to assess harms, they could accept smaller studies.) Researchers compromised on an n>20 criterion for all literature—both medical and non-

³⁷ Lounds Taylor J, Dove D, Veenstra-VanderWeele J, et al. *Interventions for Adolescents and Young Adults With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 65. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-1.) AHRQ Publication No. 12-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2012. Available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1196&pageaction=displayproduct>.

³⁸ Personal communication between Zachary Warren (primary author of AHRQ Young Children Report and co-author of AHRQ Adolescents Report) and Ellie Garrett (HSAC staff), August 29, 2012.

medical—pertaining to adolescents and young adults, because harm associated with medical studies could not be reliably assessed with fewer than 20 participants.³⁹

AHRQ A/YA Report Methodology

The AHRQ A/YA Report analyzed the literature regarding a range of ASD interventions. They sought to answer the following key questions:⁴⁰

1. Among adolescents and young adults with ASD, what are the effects of available interventions on the core symptoms of ASD?
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.)?
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?
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?
5. Among adolescents and young adults with ASD, what harms are associated with available interventions?
6. What are the effects of interventions on family outcomes?

Researchers examined a full range of interventions that have been studied to treat ASD or ASD's commonly associated symptoms. The interventions fell into these categories:

- Behavioral
- Educational
- Adaptive/life skills
- Vocational
- Allied health
- Medical (pharmacological)

The AHRQ A/YA Report reviewed 4,855 abstracts and 1,035 full studies. Of these, 32 studies met inclusion criteria.⁴¹ Standards for rating quality of individual studies and assessing strength of evidence were identical to those described in the AHRQ Young Children Report.

³⁹ Ibid.

⁴⁰ Lounds Taylor J, Dove D, Veenstra-VanderWeele J, et al. *Interventions for Adolescents and Young Adults With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 65. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-1.) AHRQ Publication No. 12-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2012;5 – 6. Available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1196&pageaction=displayproduct>.

HSAC's Decision to Endorse the AHRQ A/YA Report and Conclusion Regarding Strength of Evidence

Having already declined to endorse the IMPAQ and NAC reports because of their failure to score well on the AMSTAR criteria (see [Appendix C](#)), HSAC considered the AHRQ A/YA Report.

The application of the AMSTAR criteria to the report on adolescents and young adults was identical to the AMSTAR criteria for the AHRQ Young Children Report. As with the predecessor report on young children, public criticism regarding the AHRQ A/YA Report centered on exclusion criteria. Specifically, HSAC heard critiques regarding the exclusion of single-subject studies. (One of the commenters explained that the exclusion of studies with 10 – 19 recipients, which the AHRQ Young Children Report would have accepted, was not particularly material to the conversation. The bulk of behavioral studies of adolescents and young adults comprise single-subjects studies.)

HSAC members ultimately agreed to endorse the AHRQ A/YA Report's conclusions, while also acknowledging the body of evidence residing in the single-subject study literature. In sum, HSAC and the authors of the AHRQ A/YA Report concluded:

- *The strength of evidence is insufficient to understand the effectiveness, benefits or adverse events from any non-pharmaceutical interventions for adolescents and young adults.*

Non-Pharmaceutical Interventions for Older Adults

In the absence of a literature review from AHRQ regarding interventions for adults aged 31 and older, HSAC staff requested the MED Project to assemble an annotated bibliography of relevant studies. MED employed the same search and inclusion/exclusion criteria used for the AHRQ A/YA Report, except that MED included meta analyses and limited the population to adults aged 31 and older. The studies that MED reviewed are included in the bibliography attached as [Appendix E](#).

A total of 1,776 citations were received. Out of those, only 14 met inclusion criteria. Of the 14 studies meeting inclusion criteria, nine were non-medical studies (the remaining five pertained to pharmaceuticals and are discussed in the next section):

- Four vocational studies (each of which concerned a different specific intervention)
- Five other studies, each concerning a different category of intervention:
 - Effect of leisure on quality of life
 - Residential programs comparison
 - Interactive media to improve recognition of complex emotions
 - Support groups for Asperger syndrome
 - Music therapy

HSAC members agreed that these studies were insufficient to establish the efficacy of interventions for adults over 30 with ASD.

⁴¹ Ibid at 18.

Pharmaceutical Interventions for All Age Groups

Process

HSAC traditionally has not been tasked with reviewing evidence pertaining to pharmaceutical interventions; such matters are generally the purview of DHS staff and two legislatively mandated external stakeholder advisory groups with specific expertise in pharmacy (the Drug Formulary Committee and the Drug Utilization Review Board). Accordingly HSAC staff requested DHS' internal pharmacy staff to review the evidence and make recommendations regarding pharmaceutical coverage for persons with ASD. In turn, DHS' internal pharmacy staff surveyed members of the Minnesota Collaborative Psychiatric Consultation Service and Minnesota Psychiatric Society expert in treating ASD.

The Minnesota Collaborative Psychiatric Consultation Service provides access to board-certified child and adolescent psychiatrists to consult on the psychiatric pharmaceutical treatment of children. Consultations are required for high-risk children; other consultations are voluntary. More information about the service, including when consultations are required, is available at the [consultation service's website](#).

Background and Literature Pertaining to Children and Adolescents

More than half of school aged children with special health care needs with ASD use psychotropic medications. ("Psychotropic medication" refers to any medication used to treat a mental disorder.) Almost one-third of school-aged children with special health care needs with ASD use stimulant medications, one-quarter use anti-anxiety or mood-stabilizing medications, and one-fifth use antidepressants.⁴² The FDA has approved two antipsychotics (aripiprazole and risperidone) to treat irritability in children with ASD. The bulk of drugs prescribed to treat ASD in children are being used off-label (i.e., without FDA approval for the specific purpose or population) to treat hyperactivity, repetitive or other challenging behaviors. Such drugs or hormones include cyproheptadine, haloperidol, serotonin reuptake inhibitors, psychostimulants and secretin.⁴³

Two reports, the AHRQ Young Children Report and the AHRQ A/YA Report, reviewed the literature on efficacy and harms of pharmaceutical and supplements interventions.

For children aged 12 and under, the AHRQ Young Children Report concluded that:

- Aripiprazole
 - Strength of evidence is high that aripiprazole reduces challenging and repetitive behaviors when compared with placebo.

⁴² Pringle BA, Colpe LJ, Blumberg SJ, et al. *Diagnostic history and treatment of school-aged children with autism spectrum disorder and special health care needs*. NCHS data brief, no 97. Hyattsville, MD: National Center for Health Statistics. 2012. Available at <http://www.cdc.gov/nchs/data/databriefs/db97.pdf>.

⁴³ Warren Z, Veenstra-VanderWeele J, Stone W, et al. *Therapies for Children With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2011;59-72. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

- Strength of evidence is high that aripiprazole is associated with significant weight gain, sedation and extrapyramidal effects.
- Risperidone
 - Strength of evidence is low that risperidone reduces challenging and repetitive behaviors when compared with placebo.
 - Strength of evidence is high that risperidone is associated with significant weight gain, sedation and extrapyramidal effects.
- Secretin
 - Strength of evidence is high that secretin does not improve language, cognition, behavior, communication, autism symptom severity or socialization.
- Other interventions
 - Strength of evidence is insufficient to understand the effectiveness, benefits or adverse events of all other medical interventions, including serotonin-reuptake inhibitors and stimulant medications.

For adolescents and young adults aged 13 – 30, the AHRQ A/YA Report concluded that:

- Antipsychotics, opioid receptor antagonists and serotonin reuptake inhibitors
 - The strength of evidence is insufficient to understand the effectiveness or harms of these or any other medical interventions.⁴⁴ That said, the authors acknowledged that the adverse effects present among children with ASD may well extend to an older population:

It is reasonable to expect that, in contrast to efficacy, which is more likely to be specific to disorder and symptom, adverse effects are more likely to extend across diverse groups of subjects studied. Clinicians evaluating the evidence and sharing information with families routinely take this perspective, as does the Food and Drug Administration in mandating that all adverse events be listed for a drug, rather than just those for a particular indication.⁴⁵

Collaborative Psychiatric Consultation Service's Input

As noted above, DHS pharmacy staff requested input from the Collaborative Psychiatric Consultation Service, along with a few other members of Minnesota Psychiatric Society with identified expertise in treating ASD symptoms in children and adolescents. Eight experts provided input as follows:

⁴⁴ Lounds Taylor J, Dove D, Veenstra-VanderWeele J, et al. *Interventions for Adolescents and Young Adults With Autism Spectrum Disorders*. Comparative Effectiveness Review No. 65. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 12-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2012;ES-12, 59-61. Available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1196&pageaction=displayproduct>.

⁴⁵ Ibid at 56.

- Treatment of Young Children
 - Aripiprazole
 - All agreed with the AHRQ Young Children Report, echoing the conclusion that compared to placebo, aripiprazole is effective to reduce challenging and repetitive behaviors, though it also can cause significant side effects.
 - Risperidone
 - Most said risperidone was likely more effective than AHRQ researchers did, but based their conclusions on early trial results and/or clinical experience; they did not question the AHRQ researchers' conclusions regarding the state of the literature.
 - All agreed with AHRQ that regarding the strength of evidence is high for risperidone's significant side effects in young children.
 - Secretin
 - All agreed with the AHRQ Young Children Report's assessment regarding lack of proof of secretin's efficacy.
 - A few respondents observed that while harms of other drugs have not been well studied specifically in ASD patients, there is little reason to think that ASD patients would suffer unique or more harms than other patients.
- Treatment of Adolescents
 - Most respondents agreed with AHRQ A/YA Report that there is insufficient evidence to assess the effectiveness of pharmaceutical interventions for ASD and its commonly associated symptoms.
 - Those who didn't (1 – 3 respondents, depending on the drug) acknowledged the paucity of research and argued in favor of coverage based on clinical experience. They urged that DHS continue coverage of antipsychotics, opioid receptor antagonists and serotonin reuptake inhibitors in spite of insufficient research.

Literature Pertaining to Adults

To supplement the findings of the AHRQ A/YA Report, which pertained to adolescents and young adults up to age 30, HSAC staff requested the MED Project to provide an annotated bibliography pertaining to adults over age 30.

MED identified two systematic reviews regarding pharmaceutical interventions. In 2007 Broadstock and colleagues reviewed the effectiveness of pharmacological treatments for adolescents and adults with ASD.⁴⁶ More specifically, following a comprehensive literature search of studies dating back to 1980, they identified only five double-blind, randomized controlled trials (RCTs) that met their inclusion criteria. They observed that:

The paucity of trials and their methodological limitations means that there is only preliminary evidence about the short-term effectiveness of a few drug treatments for this age group. There was also a lack of reliable data reported on drug safety profiles.⁴⁷

⁴⁶ Broadstock M, Doughty C, Eggleston M. Systematic review of the effectiveness of pharmacological treatments for adolescents and adults with autism spectrum disorder. *Autism*. 2007;11(4):335-348.

⁴⁷ Ibid at 335.

The authors concluded that:

Randomized controlled trials involving larger samples and extended treatment duration are required to quantify the potentially valuable role of pharmacotherapy as adjunctive treatment for people with autism beyond childhood.⁴⁸

Dinca and colleagues published a systematic review of RCTs of atypical antipsychotics and selective serotonin reuptake inhibitors for behavioral problems associated with PDD.⁴⁹ These authors found only two trials that had “satisfactory methodological quality” and named risperidone as the best studied drug within a body of literature that overall was poor. Each of the RCTs “suffer[ed] from a number of methodological weakness that diminish[ed] the strength of their findings and prevent ... firm conclusions for clinical practice.”⁵⁰

The authors concluded:

There is yet no coherent body of data concerning the effects of these medications across all sub-classifications of [PDD], across all age categories, and also concerning their medium- and long-term effects, and their effects on quality of life...⁵¹

MED also identified one study each of fluoxetine, fluvoxamine and clomipramine. For drug studies pertaining to a large and heterogeneous population, all were small studies (fewer than 40 participants each).

In 2012 Hollander and colleagues published a study of fluoxetine with 37 participants, half of whom were assigned to a placebo and the other half to the study drug. The authors observed that the drug appeared to be well tolerated and that it resulted in significantly greater improvement in repetitive behaviors than placebo.⁵²

McDougle and colleagues’ 1996 study of fluvoxamine included 30 participants, half of whom were assigned to a placebo and the other half to the drug. Of the 15 drug recipients of the drug, only eight responded to it. None of the placebo recipients were categorized as respondents. The authors concluded that “[f]luvoxamine is more effective than placebo in the short-term treatment of the symptoms of autistic disorder in adults.” They stated that the drug was “superior to placebo in reducing

⁴⁸ Ibid at 345.

⁴⁹ Dinca O, Paul M, Spencer NJ. Systematic review of randomized controlled trials of atypical antipsychotics and selective serotonin reuptake inhibitors for behavioural problems associated with pervasive developmental disorders. *J Psychopharmacol*. 2005;19(5):521-532.

⁵⁰ Ibid at 528.

⁵¹ Ibid at 529-530.

⁵² Hollander E, Soorya L, Chaplin W, et al. A double-blind placebo-controlled trial of fluoxetine for repetitive behaviors and global severity in adult autism spectrum disorders. *Am J Psychiatry*. 2012;169(3):292-299.

repetitive thoughts and behavior..., maladaptive behavior ... and aggression ... and in improving some aspects of social relatedness..., especially language usage...”⁵³

Brodkin and colleagues published a small, prospective, open-label investigation of clomipramine in 1997. They examined the short-term efficacy and tolerability of the drug in 35 adults with ASD. Eighteen of the participants (55%) were “much” or “very much” improved while receiving the drug, due to reduced aggression and repetitive thoughts and behaviors and improved social relatedness. Thirteen of the patients had clinically significant adverse effects, such as seizures.⁵⁴

Coverage Recommendations from DHS Pharmacy Staff

DHS pharmacy staff reported that DHS currently covers the full range of pharmaceutical interventions in common use to treat ASD’s associated symptoms. Having reviewed the all of the literature sources described above and the input from the Collaborative Psychiatric Consultation Service, pharmacy staff recommends against making any changes in coverage policy at this time. They noted that the paucity of research on pharmaceutical interventions renders the work of the Minnesota Collaborative Psychiatric Consultation Service particularly crucial. The Minnesota Collaborative Psychiatric Service should continue facilitating the availability of social and behavioral health services and ensuring the appropriate use of psychotropic pharmaceutical interventions for pediatric Medicaid recipients.

Coverage with Evidence Development (CED)

Literature and Policy Review

The Legislature authorized HSAC to recommend “coverage with on-going collection of evidence.” In health policy literature parlance, this refers to a policy tool commonly referred to as “coverage with evidence development” (CED). CED is a mechanism by which a payer can cover promising but as yet insufficiently studied interventions, while at the same time contributing to the evidentiary bases for such interventions. It helps balance the tension between demands for access with sound stewardship. It allows a payer to direct and support the research it needs to fill in the gaps impacting coverage decisions. In the US, most of the experience with CED resides in the Medicare program. CED has generally not been used in Medicaid programs. Medicaid coverage is generally limited to services that are “medically necessary”. Other countries have also employed CED.

MED summarized relevant policy literature on CED for HSAC and conducted web-based searches as follows; the resources MED identified are included in the bibliography ([Appendix E](#)):

- MEDLINE search for “coverage with evidence development”;
- Search of Medicare CED policies, via CMS and MEDPAC websites and related resources; and

⁵³ McDougle CJ, Naylor ST, Cohen DJ, et al. A double-blind, placebo-controlled study of fluvoxamine in adults with autistic disorder. *Arch Gen Psychiatry*. 1996;53(11):1001-1008.

⁵⁴ Brodtkin ES, McDougle CJ, Naylor ST, et al. Clomipramine in adults with pervasive developmental disorders: A prospective open-label investigation. *J Child Adolesc Psychopharmacol*. 1997;7(2):109-121.

- Search of websites of major CED policy sources including England’s National Institute for Health and Clinical Experience, Health Quality Ontario and the US-based nonprofit Center for Medical Technology Policy.

Medicare has employed CED policies 18 times since 1996. All were issued through Medicare’s National Coverage Determination process. At times Medicare has used CED to support development of and participation in registries; at other time to support prospective clinical trials. On two occasions Medicare made changes in coverage policy directly in response to improved knowledge gained from CED: lung-volume reduction surgery and coverage for positron emission tomography for cancers. A change in policy, however, is not the only way to measure CED relevance. Confirmation of a technology’s effectiveness, and/or safety in a given population, for example, would likely result in continued coverage.

Analysts have urged that other payers follow Medicare’s lead with CED:

CED would be more effective if insurers other than just Medicare could also participate in this approach. ... With public and private payers participating in CED studies for the same technologies, a broader range of patients could be recruited into these studies, and enrollment in studies such as comparative ... studies and pragmatic trials could be significantly accelerated.⁵⁵

The implementation of CED is growing in the private sector. Private payers in the US have employed CED approaches to support: experimental therapies in clinical trials; registries; learning health systems; and requirements for electronic health data submission.

Washington State has employed CED in connection with its workers’ compensation program’s coverage of spinal cord stimulation. That CED policy was implemented in 2004, and policy was revised in 2008 in response to what had been learned through CED. Following a court settlement, Washington is also exploring a CED approach for coverage of applied behavioral analysis for ASD in its Medicaid and state employees’ programs.

CED offers a useful bridge between the insurance and research worlds. The traditional hierarchy of evidence-based medicine can be burdensome to those bringing new technologies and interventions to clinical practice and lag behind the pace at which technologies are developed and refined. Policymakers are often expected to make coverage decisions based on the “best available” evidence, which can be inadequate. Absent CED, coverage decision makers have a yes or no decision as their only options. Promising interventions may be rejected, while ineffective (or harmful) interventions are covered. CED offers a third, practical option: the option of learning while doing, which honors the medical necessity to intervene for patients while helping to gather important outcomes evidence to improve future care and hone coverage policy over time.⁵⁶

⁵⁵ Tunis S, Whicher D. The National Oncologic PET Registry: lessons Learned for Coverage With Evidence Development. *J Am Coll Radiol*. 2009;6:360-365 at 364.

⁵⁶ Tunis SR, Chalkido K. Coverage with evidence development: A very good beginning but much to be done. Commentary to Hutton et al. *Int J Technol Assess Health Care*. 2007;23(4):432-5.

In sum, CED has been used to support both registries (retrospective research) and clinical trials (prospective research). Given the breadth of research gaps across all of medicine and health care, criteria are needed to decide when to employ CED. The success of any CED policy—with success defined as the completion of useful research to inform policy-making and health care—depends on research funding, design and implementation.

One of the other important lessons learned from others who have embarked on CED is the importance of stakeholder involvement in CED policy development. Stakeholders should be engaged earlier rather than later to help shape the research questions; external expertise is generally required to design and implement research:

It is essential to utilize the input of decision-makers (i.e., end users of evidence like patients/patient advocates, providers and payers) to identify potential topics for CED. These groups have unparalleled insight in to the practical uses of emerging technologies, and their perspective is vital to identifying important unanswered questions about their use and diffusion.⁵⁷

Stakeholders should also be engaged early as partners in funding. Depending on the stakeholder's resources, roles could include advocacy for external funding or partnership in sponsoring collaborative research.⁵⁸

CED Discussion

The body of literature on ASD interventions is only two decades old, and like any young research field the literature is dominated by small studies and few randomized, clinical trials. ASD is particularly challenging because there is great variability in diagnosis, treatment and outcome evaluation. There is much to learn and confirm. All of the major, recent literature scans on ASD (AHRQ, IMPAQ and the National Autism Center's National Standards Report) agree that there are important gaps in our understanding of ASD interventions. The AHRQ Young Children Report contains a section on "areas for future research:"

A critical area for further research is identifying which children are likely to benefit from particular interventions. ...[I]t is clear that positive outcomes are more prominent in some children than in others, [but] ... not all children receiving early intensive intervention demonstrate robust gains, and many children continue to display prominent areas of impairment. ... [E]arly intensive approaches have significant potential but require further research.⁵⁹

⁵⁷ Centers for Medical Technology Policy. *Coverage with Evidence Development in the Private Sector: Lessons in Design and Implementation*. 2010;4. Available at <http://cmtynet.org/wp-content/uploads/downloads/2012/01/CED-in-the-Private-Sector.pdf>.

⁵⁸ Personal communication among Sean Tunis (president and founder of the Center for Medical Technology Policy), Jeffrey Schiff (MHCP Medical Director) and Ellie Garrett (HSAC Staff), August 15, 2012.

⁵⁹ Warren Z, Veenstra-VanderWeele J, Stone W, et al. Therapies for Children With Autism Spectrum Disorders. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-02-HHSA-290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for

The evidentiary gaps about ASD treatments for adolescents and young adults are so striking that AHRQ commissioned a report dedicated to digesting the future needs for research in this age group.⁶⁰ That report recommends rigorous, prospective studies of particular interventions, but also acknowledges the need for foundational research prior to such interventional studies:

[F]oundational research should also be conducted to better understand the degree to which psychiatric and medical comorbidities may affect successful transition to adulthood, and to better describe the trajectory faced by maturing adolescents and young adults with autism.⁶¹

DHS staff proposed to HSAC that CED for ASD interventions was merited for several reasons:

- ASD is a prevalent condition, and diagnoses of ASD among children are climbing at a dramatic rate.
- The science of treating ASD is not yet well developed. Clinical practice is currently being guided by a generally insufficient evidentiary base on which to understand heterogeneous clusters and severity of symptoms, heterogeneous interventions, and heterogeneous outcomes across the lifespan of people with ASD.
- The time commitment imposed by intensive treatments offered in childhood is significant on all concerned: children, families and providers.
- Simultaneously, there are decreased opportunities for other services during pivotal periods in a child's development. The window of opportunity for treating children is short; most researchers and providers agree that interventions performed in the early stages of a child's development are more likely to be effective.

DHS further proposed to HSAC that it recommend a CED approach along the following lines:

- DHS should seek community input into developing research priorities and generating support for external funding.
- At a minimum, a CED policy should encompass a robust registry from which retrospective studies can be conducted to study the relative effectiveness of ASD interventions in specific sub-populations across varying ages, diagnostic categories, diagnostic severity, symptomatology and co-morbidities. The registry could be linked to the DHS authorization process.
- Should community partners also suggest prioritizing prospective studies, DHS would be open to participating in such studies with some limitations:
 - DHS suggested limiting studies to those with active treatment arms only (not placebo or "no treatment" arms).

Healthcare Research and Quality. 2011;ES 12-13. Available at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=656>.

⁶⁰ Warren Z, Taylor JL, McPheeters ML, Worley K, et al. Future Research Needs: Interventions for Adolescents and Young Adults With Autism Spectrum Disorders. Future Research Needs Paper No. 20 (Prepared by Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I). AHRQ Publication No. 12-EHC129-EF. Rockville, MD: Agency for Healthcare Research and Quality. 2012. Available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1247&pageaction=displayproduct>.

⁶¹ Ibid at ES-7.

- DHS suggested against requiring randomized studies (clients' and parents' treatment preferences should be honored).
- DHS would be open to other features of well-designed studies (e.g., blinded reviewers).

Early in HSAC's meetings on ASD as discussions about the current evidentiary base for ASD interventions ensued, HSAC members expressed general support for the notion of CED. HSAC members also generally agreed early on about the utility of asking stakeholders—and in particular people with ASD and their families—about important research design questions. For example:

- Do they share a sense of urgency regarding the development of a robust ASD registry in Minnesota?
- Of the many unanswered questions pertaining to ASD interventions across the lifespan, which would they prioritize?

The primary concerns expressed by members of the public regarding CED fell into two categories: concerns about DHS' capacity to implement a CED policy and skepticism regarding use of a tool in Medicaid that hitherto has been employed mostly in Medicare in the US.

HSAC members understood that DHS would need to rely on external funding and engage partners to conduct research. Some HSAC members observed that a registry would allow DHS to contribute meaningfully to the research infrastructure for ASD, while encouraging University-based and other researchers to seek permission and external funding for conducting studies with the registry's data. Others encouraged DHS to explore partnerships with other insurers or Medicaid programs to collaborate in building a larger registry.

HSAC members discussed ethical implications of CED. They observed that while DHS is responsible to the current children it serves, it should also be mindful of its and society's duties to improve care for future children. A CED policy would support access to interventions for children who need them today, while also helping inform care for children tomorrow. Members also discussed the ethics of rigorous trial designs, again analogizing to the progress that had been made in treating childhood leukemia as a direct result of children's participation in randomized controlled trials. Some urged DHS to remain open to such rigorous methodology (particularly randomized controlled trials that compare treatments to each other, rather than to placebo) and defer to researchers and institutional review boards to vet study design decisions.

HSAC members stressed the importance of engaging stakeholders, including people with ASD and their families, providers and researchers to inform key decisions relating to CED, as well as to engender their support for research conducted via CED.

HSAC members stressed the importance of using CED to better understand which interventions and therapeutic modalities work best for which groups of people with ASD and which are less effective for various sub-populations. Some members stressed that participation in CED-related research should be mandatory for people receiving ASD interventions. Standardized assessment and progress evaluation tools should be used, so that therapies' effectiveness can be compared. DHS should work aggressively to secure external funding for a CED registry and related research, so that treatments can be improved over time and coverage policies refined. In particular, HSAC is interested in learning about more about

intensive interventions for children and how much intensity (i.e., how many hours a week) are effective and tolerable.

CED Recommendation

HSAC recommends to the Commissioner that CED should be used while making intensive services and other interventions for autism available, and that stakeholders participate in all aspects of CED development, including recommending priorities for research and collaborating in registry and study design. It should include a funded registry for data collection and analysis, and also incorporate reliable and valid outcome measures.

Coverage Recommendations

Early Intensive Behavioral and Developmental Interventions (EIBDI) for Children

HSAC assessed the state of the evidence regarding efficacy of various interventions for ASD generally to be sparse. While the science of treating ASD is far from fully developed, there are many therapies and different combinations of therapy available. The heterogeneity of ASD argues against one-size-fits all therapeutic approaches. For example, if a child has a significant developmental disability, the strategies for intervening with ASD may be different than for a child for whom ASD is the sole diagnosis.

Of all interventions studied for children, EIBDI has the best evidentiary base, but the evidence for EIBDI is far from robust. Strength of evidence for EIBDI is low, which means that further research could change our understanding of EIBDI's effect. EIBDI is also a very broad category of interventions, and the literature hasn't answered which therapeutic modalities within EIBDI work better for which groups of children and at what doses or intensity levels. HSAC's recommendations for coverage are grounded in its understanding of this literature and the professional judgment of HSAC members.

DHS suggested to HSAC an approach by which children, families and providers have great flexibility in choosing a therapeutic modality to fit each child, while providing rigor around diagnostic evaluation and assessment, as well as progress evaluations. The outline called for independent, multidisciplinary, expert diagnosis and developmental assessment to inform an initial treatment plan. It also called for independent progress evaluations at every 500 – 600 hours of therapy. The progress evaluations would be used to decide whether the current treatment was successful enough to warrant continued or modified EIBDI or whether other interventions or services should be substituted. The full outline offered by DHS to prompt HSAC's discussions is attached as [Appendix B](#).

Many of HSAC's meetings dedicated to ASD were dominated by discussions of EIBDI. HSAC received extensive public comments, both written and oral, regarding the utility of EIBDI. Suggestions were offered and concerns voiced in the following main categories:

- Diagnostic standards;
- Progress evaluation standards and periodicity;
- Parental/caregiver involvement in therapy; and
- Caps on intensity (i.e. number of hours of therapy per week).

Diagnostic Standards

DHS suggested independent, ASD-expert, multidisciplinary team-based diagnostic and developmental assessment and initial therapeutic recommendation for these reasons:

- Concern that generalists and non-ASD specialists lack the expertise to diagnose ASD definitively, because ASD is difficult to diagnose particularly at the youngest ages;
- Concern that single-discipline ASD specialists may be over/misdiagnosing ASD because they lack expertise in a broader array of disorders and conditions;
- Concern that children may be over/misdiagnosed with ASD in order to access services; and
- Families are best served when they are able to make informed choices about a full range of therapeutic options available for their children.

This suggestion for improving diagnostic rigor sparked several comments such as:

- There is an undersupply of providers who are qualified to provide independent, multidisciplinary team-based diagnostic assessment/evaluation; rigorous, independent diagnostic requirements could create a bottleneck in accessing needed treatments.
- Some providers believe that current diagnostic quality in ASD is sufficient.
- Some providers questioned the degree of separation of the diagnostic team from any recommendation for therapeutic modality.

HSAC members shared concerns about diagnostic quality. Some pointed out that EIBDI providers had a natural conflict of interest in diagnosing ASD while also providing EIBDI. EIBDI is a preference-driven intervention that is time-intensive and costly and offers significant profit potential to providers. Similarly, they voiced concern that specialists in a single ASD treatment modality may have incentives to view their specialty as most beneficial. They acknowledged that these conflicts are not unique to ASD providers, and stressed the importance of making second opinions available to families.

They also discussed that distinguishing ASD from other conditions requires particular expertise in neuro-developmental disorders that a non-medical provider lacks. They pointed out the advantages of multidisciplinary assessments that can be tailored to the specific presentation of individual children.

Some members stressed that EIBDI's purpose is to treat particular, challenging behaviors among young children and that is not appropriate for every child with ASD. Treatment planning should reflect what is learned through the comprehensive diagnostic process, and EIBDI should be considered when problem behaviors targeted by this modality dominantly impact a child's well-being.

HSAC members shared concerns about provider capacity and sought to balance their desire for rigorous diagnostic standards with the realities of the current availability of providers. They decided against recommending a diagnosis by an independent provider, opting instead to prioritize a multi-disciplinary approach. They wished to reinforce to families, though, that they had the right to a second opinion.

Ultimately, HSAC agreed as follows:

1. *HSAC recommends to the Commissioner that diagnosis be confirmed by a professional trained in diagnosing neuro-developmental disorders. Diagnoses must be based on DSM-IV criteria*

(eventually DSM-5), together with assessments of functional status from direct observations by a multi-disciplinary team and parental/caregiver reports. The diagnosis and assessments should be used to develop a treatment plan and establish a baseline from which to measure a person's treatment progress. Identification and selection of assessment tools should be informed by stakeholders.

- 2. Individuals and families should be informed of their right to a second opinion and the availability of alternative therapies.*

Progress Evaluation Standards

Each child with ASD is on a developmental trajectory that makes choosing treatments all the more critical: While the child is in one primary therapeutic modality, there is no time to employ a different therapy. Therefore, every effort must be made to ensure that a family's choice of therapy is informed and a child's time in therapy is invested as optimally as possible.

DHS suggested rigorous progress evaluation standards in order to help families learn early whether therapy is working or should be redirected and also to avoid imposing arbitrary caps on duration of services. More specifically:

- Rigorous evaluation can identify whether a child is appropriately responding to therapy so that the child's therapy can be either reinforced or re-directed. Every effort should be made to ensure that the child's time in therapy is invested as well as possible.
- Transparent and rigorous evaluation standards can allow needed therapeutic flexibility. Providers and families can have substantial flexibility to structure intensive interventions for each child between each evaluation period.
- Progress evaluation should assess the effectiveness of the therapy outside of the treatment setting. A successful intervention should be generalizable to other individuals (aside from the therapist), other physical environments, and other social settings.
- The autism community currently lacks consensus about evaluation standards. The development of a learning collaborative or a common training program for evaluation would support inter-rater reliability and consistent application of evaluation standards.

A learning collaborative is a formal or informal network of colleagues designed to foster shared learning. In this case, one of the expectations for such a collaboration would be the development and consistent application of progress evaluation criteria. Other activities might include mentoring and networking, problem-solving, identifying and addressing training gaps and sharing best practices.⁶²

The primary concerns raised in public comment were that the proposed frequency of evaluation was arbitrary and that current provider capacity is insufficient to support independent evaluation. Members of the public stressed that administrative bottlenecks should not impede timely access to services.

HSAC members embraced the need for rigorous progress evaluations that employ agreed-upon, standardized measures and instruments. They stressed the importance of developing evaluation

⁶² See, e.g., Chilingirian J., Flieger S., and Hart AR. *Establishing an AHRQ Learning Collaborative: A White Paper*. (Prepared by Professional and Scientific Associates under contract 290-10-000190). AHRQ Publication No. 12-0037-EF. Rockville, MD: Agency for Healthcare Research and Quality; 2012. Available at <http://www.ahrq.gov/fund/training/learningcollab/>.

standards that could be applied to measure progress regardless of which therapeutic intervention was employed. Standardized measures and tools are crucial to assessing whether treatments for individual children are effective. Standardized approaches to measurement are equally important to foster comparisons of treatments through CED.

Evaluations should occur at reasonable intervals. Evaluations that are too frequent become unnecessarily burdensome for all: families, providers and DHS. Evaluations that are not frequent enough risk creating situations in which children's therapies may not be optimized. Treatments that are not working should be identified early so that the child receives best care during key developmental phases.

HSAC members agreed that access to services should not be delayed because of evaluation backlogs. Some HSAC members observed that obvious success or failure of therapy could be easily identified and should not require extensive resources to review. Therapeutic results that are less clear would merit closer scrutiny. They suggested that evaluation resources be prioritized for the more difficult decisions when therapeutic results are less than obvious.

HSAC members agreed as follows:

- *HSAC recommends to the Commissioner that periodic progress evaluations, at reasonable intervals and using standardized tools developed with stakeholder input, be required. Independent evaluations would be preferred when feasible, and evaluation should be prioritized toward cases where progress is unclear.*

Parental/Caregiver Participation

Public comments and emerging literature signal that supportive engagement of parents/caregivers in a child's therapy helps to make EIBDI more effective. Intentional parental/caregiver involvement can help extend therapy into daily living, reinforcing lessons learned and reflecting the importance of familial relationships as a part of social engagement. Engaging parents and caregivers as partners in therapy also builds cultural responsiveness into the therapeutic relationship. Accordingly, DHS suggested to HSAC that it recommend a high ratio of parental/caregiver participation in the child's therapy.

Members of the public and HSAC members expressed concern with inhibiting a child's access to services when parents/caregivers were unwilling or unable to participate in therapy. DHS agreed, and suggested either that exemptions be readily allowed for such parents/caregivers. Alternatively, HSAC might recommend an assessment of parental/caregiver resiliency and ability to participate coupled with a therapeutic plan that reflects assessment results.

HSAC members discussed ways in which to encourage high rates of parental/caregiver involvement without imposing an unfairly rigid requirement on families.

HSAC members agreed as follows:

- *HSAC recommends to the Commissioner that DHS require an assessment of parental/caregiver resiliency and ability to participate coupled with a therapeutic plan that reflects assessment results. Parental/caregiver involvement and support of culturally responsive therapy improves the likelihood of therapy's success. A high parental/caregiver participation requirement should*

be expected, allowing for exemptions in individual cases. Parents/caregivers' unwillingness or inability to participate should not impede a child's access to therapy, though children should show sufficient progress from evaluation to evaluation to continue therapy.

Therapeutic Intensity

As with other aspects of EIBDI, the literature offers insufficient guidance about how many hours of therapy can be tolerated and are effective. Some programs are geared toward 40 hours weekly for the child with a significant, additional commitment from parents/caregivers; the average appears to be 25 or fewer hours. Many states that cover applied behavioral analysis or other forms of EIBDI through Medicaid place caps on the number of hours of therapy per week. DHS initially suggested that HSAC discuss a 25 hour cap as a starting point.

Some (but not all) members of the public objected to a cap on hours/week of therapy. They stated that some children require more hours of therapy than average, and that any cap would be arbitrary.

In early discussions, HSAC members appeared split on this issue. Some members argued strongly against caps; others suggested that a reasonable cap was warranted, given the treatment's high cost and lack of evidence that 40 hours, for example, is more effective than 25. Some HSAC members expressed skepticism that young children could tolerate as many as 40 hours of intense therapy weekly. One ABA provider showed a video of ABA therapy. She stated that the treatment was segmented into three-hour blocks, with some children participating in two blocks daily or two blocks plus some additional time.

HSAC discussed the distinction between therapy and support services. Some members observed that drawing a clear line between therapy and support services would be difficult, because much of the intervention involves reinforcing behaviors in social and family contexts. So support services could be viewed as containing some therapeutic elements and vice versa.

In the final meeting, DHS suggested a new approach: that HSAC recommend coverage for an appropriate amount of hours to maximize results for any given child, but also support evaluation of actual, optimal therapy a child can receive in a given week. DHS also should distinguish therapeutic services from support services in order to match services to the child's needs. They should also distinguish therapeutic services from and coordinate with educational services provided by schools.

Discussion paralleled that of earlier meetings. Some members agreed with removing intensity caps, given the lack of evidentiary guidance. Others expressed concern that absent reasonable caps, some children might receive unfettered access to services at the expense of others who would have access to little or nothing. They also suggested that treatment be clinically efficient and least restrictive, with intensity of hours stepped up only for those who do not respond to a lower number of hours.

Others stressed that the CED research agenda should prioritize learning more about the comparative effectiveness and cost effectiveness of different levels of therapeutic intensity.

Ultimately, HSAC members voted in favor of the following statement, with one abstention:

- *HSAC recommends that the Department support the appropriate amount of hours to maximize results for any given child, but also support evaluation of actual, optimal therapy a child can*

receive in a given week. The Department should distinguish therapeutic services from support services in order to match services to the child's needs.

Other Treatments for Children and Adolescents

Not all children will benefit from EIBDI, and some children may need services in addition to such interventions. DHS currently covers a range of services to serve children with ASD. Such services include, for example, allied health interventions such as speech, occupational and physical therapy, mental health services, medications and other behavioral interventions (including health related services provided by Minnesota public school districts to eligible children through an Individualized Education Program or Individualized Family Services Plan), and services for people with disabilities (including disability waivers and personal care assistance services). HSAC discussed coverage of such interventions but did not take a formal vote.

Treatments for Adults

DHS currently covers a range of services to serve adults with ASD. Such services include, for example, allied health treatments such as ASD and speech, occupational and physical therapy), other mental health and behavioral interventions, and services for people with disabilities (including disability waivers and personal care assistance services). HSAC discussed coverage of such interventions but did not take a formal vote.

Conclusion

ASD is an increasingly prevalent diagnosis, and its spectrum of symptoms and treatments complex. HSAC supported DHS' commitment to covering supportive and medically necessary, client- and family-centered services for children and adults with ASD. The science of treating ASD is still emerging. Indeed, the evidence for nearly all interventions across the lifespan of a person with ASD is insufficient even to draw preliminary conclusions. Many providers believe that intervening early and intensively in a child's life offers the most potential to reduce symptoms of ASD. While the literature on EIBDI is far from robust, it is still the best studied of ASD interventions for children. HSAC has recommended that DHS cover EIBDI in a way that allows for therapeutic flexibility suited to each child's constellation of and severity of symptoms and family context. Its approach rests on recommendations for rigorous standards for diagnosis, treatment planning, and progress evaluation with expected changes in covered services and treatments based on these evaluations. HSAC also recommends coverage with evidence development, by which DHS, with sufficient external support and community collaboration, would help improve the evidentiary base for ASD. By adhering to rigorous evaluation criteria and contributing to the science of ASD treatments in the process, HSAC's recommended approach will foster access to medically necessary interventions for the children of today while stewarding resources and improving care for the children of tomorrow.

Appendix A: Health Services Advisory Council Charter

The Minnesota Department of Human Services (DHS) Health Services Advisory Council (HSAC) was created to advise the agency regarding health services covered under Minnesota Health Care Programs (MHCP) including Medical Assistance and MinnesotaCare. Authority for the development of the Council comes from Minnesota Statutes, section 256B.0625, subd.3c.

Objective

The Council will advise DHS regarding evidence-based decision-making and provide leadership designing health care benefit and coverage policies for Minnesota's publicly funded health care programs.

Guiding Principles

Quality of Care

- Quality of medical care for the patients served by DHS is the primary concern of the agency and this Council.
- The use of evidence will guide this Council and the agency. Scientific evidence will be sought, and conclusions drawn concerning the effect of services on health outcomes.
 - Consideration will be given to available scientific evidence, professional standards, expert opinions, safety, and clinical effectiveness.
 - Decisions are flexible to permit exceptions and take clinical circumstances, improvements in care and changes in literature into consideration.
 - Consensus among the medical community can be used and play a role when no definitive evidence exists or evidence is insufficient at the present time.
- Health care services and technology must improve the net health outcome.
 - A recommendation necessitates good evidence that the procedure is effective in reducing morbidity and mortality: medical benefits must outweigh risks.
 - Services must be as beneficial as any established alternative and improvement must be attainable outside the investigational setting.

Value of Care

- Reasoned and defensible coverage decisions are essential for a fairer and more efficient health care system.
- Cost-effectiveness will guide decision-making. Cost-effective services and technologies are considered to be:
 - At least as effective and less costly than alternatives.
 - More effective and more costly than alternatives, but resultant patient outcomes justify additional expenditure.
 - Less effective and less costly than alternatives, but resultant patient outcomes from the use of more expensive alternatives *do not* justify additional expenditures.

Council and DHS Process

- The process is transparent and public.

- Recommendations made by the Council are subject to agency approval. DHS will communicate with the Council regarding final decisions on all recommendations.
- Recommendations must be practical and feasible, and coverage policy should be equivalent across all delivery systems.

Membership

HSAC membership comprises:

- Seven voting members who are licensed physicians actively engaged in the practice of medicine in Minnesota, one of whom must be actively engaged in the treatment of persons with mental illness, and three of whom must represent health plans currently under contract to serve Medical Assistance recipients.
- Two voting members who are physician specialists actively practicing their specialty in Minnesota.
- Two voting members who are non-physician health care professionals licensed or registered in their profession and actively engaged in the practice of their profession in Minnesota.
- One consumer who shall serve as a voting member.
- The DHS Commissioner's MHCP Medical Director who shall serve as a nonvoting member.

Members of HSAC shall not be employed by DHS, except for the MHCP Medical Director.

Terms and Compensation

- Members shall serve staggered three-year terms, with one-third of the voting members' terms expiring annually. Members may be reappointed by the Commissioner.
- The HSAC will meet nine months per year. Meetings will not be held in June, August and December.
- An honorarium of \$200 per meeting and reimbursement for mileage and parking shall be paid to each committee member in attendance, except the MHCP Medical Director.
- The HSAC does not expire as provided in section 15.059, subd. 6.

Responsibilities

- Attend all meetings. If a member misses two meetings without good reason, the DHS will discuss this with the member and consider appointment of a new member.
- Bring concerns of the community to the attention of the Chair, MHCP Medical Director, and DHS staff.
- Take part in discussions.
- Actual conflict of interest or the appearance of conflict of interest may exist in certain situations. Members should disclose, orally in a HSAC meeting, whenever actual conflict or the perception of conflict of interest occurs. Members will then refrain from the participation in discussion of and voting on motions pertaining to the matter. Members and guest presenters will also be required to sign a conflict of interest disclosure statement.
- Review the HSAC agenda and information before meetings and prepare comments or questions.
- Review and make recommendations on proposals presented by the department related to clinical issues, evidence based practice guidelines, legislation and other DHS policies in accordance with the guiding principles stated above.

Appendix B: Draft Outline for Purposes of Prompting HSAC's Discussion of ASD Coverage Options

Context: HSAC has a three-part task: to (1) review the strength of the evidence of effectiveness for ASD treatments across the lifespan; (2) recommend coverage based on existing evidence (or lacking sufficient evidence, based on professional consensus); and (3) optionally recommend a coverage-with-evidence (CED) approach, should the strength of existing evidence of ASD treatments' effectiveness be low.

HSAC has assessed the strength of evidence for ASD treatments of children aged 12 and under, as ranging from low to insufficient. Though HSAC is still in the midst of its work to assess the quality of evidence for ASD treatments for adolescents and adults, DHS anticipates that the strength of evidence for these populations will be no better than that for young children. On that assumption, DHS offers this document to prompt discussion around the second part of HSAC's task: to recommend coverage based on existing evidence or professional consensus.

This outline is contingent upon HSAC also recommending a CED approach that would help improve the evidentiary bases for ASD treatments. HSAC is awaiting recommendations from a newly formed stakeholder group in order to shape a CED agenda.

DHS is committed to covering supportive and medically necessary, client- and family-centered services. Treatment plans should be developed together by the client (or parents/caregivers, in the case of a child) and the team of diagnostic, treating and evaluating providers, as described below.

I. Independent Diagnosis

Diagnosis must be confirmed by a professional trained in diagnosing ASD and who is independent of the treating provider. Diagnosis must be based on DSM-IV criteria (eventually DSM-5), together with assessments of functional status from direct observations by a multi-disciplinary team and parental/caregiver reports. The diagnosis and assessments will be used to develop a treatment plan and establish a baseline from which to measure a person's treatment progress.

II. Intensive Treatments for Children

A. Children aged 0 – 2 diagnosed as "at risk" for ASD and children aged 3 – 6 diagnosed with ASD

If a child's parents/caregivers, together with the diagnostic and treating providers, agree that early intensive behavioral and developmental interventions ("intensive interventions") are medically necessary, then such treatments will be covered as follows.

DHS should cover intensive interventions at intensity levels that start suitably low to accommodate the child's age and may gradually increase up to 25 hours per week, as is medically necessary and as the child's age permits.

Intensive interventions should emphasize parent/caregiver participation in the child's treatment and with the child present. At least one caregiver (parent, guardian, foster parent, grandparent, etc.) must participate in an average of at least 20% of weekly documented training hours from the same provider who is working with the child. If the child has two caregivers, then the second caregiver must participate in at least 5% of the training hours on average.

Draft to prompt discussion at HSAC meetings.

Medically necessary treatment intensity and modalities must be tied to a treatment plan that is approved independently and designed to address the child's core deficits and constellation of symptoms. The plan should be coordinated with any educationally based interventions the child may be receiving in pre-school or school settings, acknowledging that such settings present useful opportunities for socialization within a population that experiences social deficits. Meaningful progress should be made toward generalization of functional gains across activities, interactants (provider, family, other adults, children) and environments (clinic, home, school, community). Periodically (as described below) an independent evaluator will assess whether meaningful progress is being made, but a well-designed treatment plan will encompass interim progress measures by the provider.

B. Children aged 7 and older who are diagnosed with ASD

What literature is available indicates that early intensity works better than intensive interventions later in a child's life. Not all children are diagnosed early, though, and some children may respond to intensive interventions after age six. Accordingly, intensive interventions may be initiated or continued beyond age six as medically necessary, so long as the child is meeting functional treatment goals and the treatments are well coordinated with services provided in the educational setting. All other conditions and limitations described in section IIA apply.

III. Independent Evaluations of Functional Progress

Intensive interventions require a significant investment of time by the child, child's family and providers. To justify this investment, the treatments must be shown to offer significant benefit to the particular child. Treatment plans and subsequent measures of treatment effectiveness for the child must show significant reduction in repetitive or destructive behaviors and/or significant gains in initiation of spontaneous communication in functional activities, depending on the nature of the child's particular deficit(s). The gains must be generalizable across activities, interactants and environments.

Periodic evaluation of functional progress will be required over the course of treatment, with appropriate reports of diagnosis, treatment and evaluation made available to DHS. Functional progress toward meeting pre-determined goals will be evaluated by a professional trained in treating ASD and who is not affiliated with the treating provider. Ideally, the independent evaluator will be the same person who independently diagnosed the child. The frequency of evaluation will be tied to treatment intensity: the more intense the treatments, the more frequent the evaluation. If continued treatment is medically necessary, at the end of each evaluation a treatment plan for the next cycle of care must be developed and approved by the independent evaluator.

Independent evaluation must occur within the first 500 – 600 hours of treatment, and repeated every 500 – 600 hours for successive treatment cycles. A child under the age of seven may have two treatment cycles to establish initial treatment effectiveness, and thereafter significant improvement must be made at each evaluation cycle in order to justify continued intensive interventions. Thus, if a child's first evaluation shows insufficient progress, then treatments should be adjusted and intensity may be maintained for one more cycle. If the second cycle shows insufficient progress, then a new treatment plan with significantly lowered intensity must be developed and implemented. Intensive treatments may be continued as medically necessary and so long as each successive evaluation (performed at 500 – 600 hour treatment intervals) establishes that the child is achieving treatment goals. For children commencing intensive interventions at age seven or older, treatment effectiveness must be demonstrated at the first evaluation in order to justify continuation, given the paucity of literature about effectiveness of intensive interventions at older ages.

Draft to prompt discussion at HSAC meetings.

To support inter-rater reliability and consistent application of evaluation standards, DHS should conduct training or sponsor a learning collaborative among independent evaluators.

IV. Other Treatments for Children

Not all children will benefit from intensive interventions, and some children may need services in addition to such interventions. DHS currently covers a range of services to serve children with ASD. Such services include, for example, medical interventions (pharmaceutical treatments for some of the symptoms commonly associated with ASD and speech, occupational and physical therapy), other mental health and behavioral interventions (including children’s mental health and other health related services provided by Minnesota public districts to eligible children through an Individualized Education Program or Individualized Family Service Program), and services for people with disabilities (including disability waivers, such as CADI or DD) and/or Personal Care Assistance services. These services should continue to be offered, consistent with existing DHS policy.

V. Treatments for Adults

DHS currently covers a range of services to serve adults with ASD. Such services include, for example, medical interventions (pharmaceutical treatments for some of the symptoms commonly associated with ASD and speech, occupational and physical therapy), other mental health and behavioral interventions, and services for people with disabilities (including disability waivers, such as CADI or DD) and/or Personal Care Assistance services. These services should continue to be offered, consistent with existing DHS policy.

DRAFT

Appendix C: Principles for Assessing the Quality of Evidence

AMSTAR (Assessment of Multiple Systematic Reviews)*

AMSTAR is a measurement tool for assessing the methodological quality of systematic reviews. Answer each of these questions with one of the following:

- Yes
- No
- Can't answer
- Not applicable

1. Was an 'a priori' design provided?

The research question and inclusion criteria should be established before the conduct of the review.

2. Was there duplicate study selection and data extraction?

There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

3. Was a comprehensive literature search performed?

At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?

The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

5. Was a list of studies (included and excluded) provided?

A list of included and excluded studies should be provided.

6. Were the characteristics of the included studies provided?

In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

7. Was the scientific quality of the included studies assessed and documented?

'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?

The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

9. Were the methods used to combine the findings of studies appropriate?

For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

10. Was the likelihood of publication bias assessed?

An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

11. Was the conflict of interest stated?

Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

* Shea BJ, Grimshaw JM, Wells GA, et al. Development of AMSTAR: A Measurement Tool to Assess the Methodological Quality of Systematic Reviews. *BMC Med Res Method.* 2007;7:10.

MED Project's Application of AMSTAR Criteria

AMSTAR Criterion	AHRQ Young Children Report	IMPAQ Environmental Scan	NAC Guidance
1. Was an 'a priori' design provided?	Y	Y	Y
2. Was there duplicate study selection and data extraction?	Y	Can't answer	Can't answer
3. Was a comprehensive literature search performed?	Y	Y	Y
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Y	Y	Y
5. Was a list of studies (included and excluded) provided?	Y	N	N
6. Were the characteristics of the included studies provided?	Y	N	N
7. Was the scientific quality of the included studies assessed and documented?	Y	Y	Y
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Y	N (quality was assessed for the evidence base by intervention but not provided by study or stated within the analysis)	N (quality was not provided by study or for analysis or conclusions)
9. Were the methods used to combine the findings of studies appropriate?	Y (for drug studies) Not applicable (No meta-analysis performed for behavioral studies)	Not applicable (No meta-analysis performed)	Not applicable (No meta-analysis performed)
10. Was the likelihood of publication bias assessed?	Y	N	N
11. Was the conflict of interest stated?	Y	N	N

Appendix D: Public Comments

The following people and organizations submitted comments to HSAC during its deliberations concerning ASD. Meeting minutes (which reflect oral comments) and written comments are available on [HSAC's public website](#).

Oral Comments (listed in speaking order)

April 19, 2012

- Sheri Radoux, autism parent
- Amy Dawson, autism parent, Autism Advocacy and Law Center, representing Lovaas Institute Midwest

June 14, 2012

- Eric Larsson, Lovaas Institute Midwest
- Amy Dawson, autism parent, Autism Advocacy and Law Center, representing Lovaas Institute Midwest

August 2, 2012

- Eric Larsson, Lovaas Institute Midwest
- Amy Dawson, autism parent, Autism Advocacy and Law Center, representing Lovaas Institute Midwest

September 13, 2012

- Jonathan Tarbox, Center for Autism and Related Disorders and Autism Research Group
- Eric Larsson, Lovaas Institute Midwest
- Amy Dawson, autism parent, Autism Advocacy and Law Center, representing Lovaas Institute Midwest
- Joe Timmons, Institute on Community Integration, University of Minnesota

October 11, 2012

- Anne Henry, Minnesota Disability Law Center
- Eric Larsson, Lovaas Institute Midwest

November 8, 2012

- Kevin Goodno, Fredrikson & Byron, representing Minnesota Autism Center
- Jackie Harth, Behavioral Dimensions Inc.
- Timothy Moore, University of Minnesota

December 13, 2012

- Pat Pulice, Fraser
- Randall Bachman, Autism Recovery Foundation
- John Hoch, Behavioral Dimensions, Inc.
- Kevin Goodno, Fredrikson & Byron, representing Minnesota Autism Center
- Eric Larsson, Lovaas Institute Midwest

Written Comments (alphabetically, with dates of submission in parentheses)

Excluding copyrighted articles, HSAC received 490 pages of written comments and supporting materials from the following individuals and organizations:

- Name redacted to protect privacy of vulnerable adult son (August 28)
- Idil Abdull, autism parent, Somali American Autism Foundation (October 25; December 13)
- Autism Advocacy & Law Center (September 7, 2012)
- Randall W. Bachman, Autism Recovery Foundation (December 12)
- Amy Dawson, Autism Advocacy and Law Center (June 29)
- Fraser (October 10; November 8)
- Anne Harrington, autism resource specialist and mental health practitioner (July 11)
- Lesley Heil, autism parent and educator (July 30)
- John Hoch, Behavioral Dimensions, Inc. (October 8)
- Eric Larsson, Lovaas Institute Midwest (June 29; October 11; December 13)
- Kathryn Marshall, Minnesota Autism Center (November 6; December 13)
- Minnesota Northland Association for Behavior Analysis (December 5)
- Tim Moore, Institute on Community Integration, University of Minnesota (multiple submissions on June 14)
- Timothy Mulrooney and Melissa Haley, autism parents (November 8)
- Sheri Radoux, autism parent (multiple submissions on April 20; October 22; December 13)
- Jonathan Tarbox, Center for Autism and Related Disorders at the request of Minnesota Autism Center (September 17)
- Brad Trahan, autism parent, RT Autism Awareness Foundation, Inc. (December 12)

Appendix E: Bibliography*

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* All websites contained in this appendix were accurate as of January 7, 2013.

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