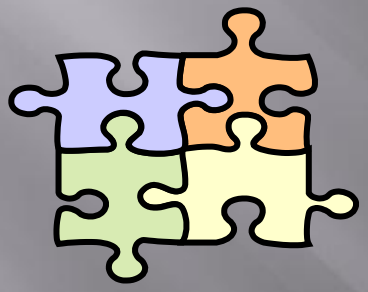
THE MODIFIED CHECKLIST FOR AUTISM IN TODDLERS (M-CHAT™)

(ROBINS, FEIN, & BARTON, 1999)

A Training Module for Early Interventionists



VT-ILEHP ASD LEND Program

2009

What is the M-CHAT?

- A **screening** tool used for the early detection of Autism Spectrum Disorder (ASD).
- Screens children whose diagnosis might be missed until much later.
- A **practical tool to give structure to concerns Early Interventionists (EIs) might have about a child's risk for Autism.**
- It is also used in pediatric offices for screening.

The NEED for screening

- **1 in 150 children are diagnosed with an ASD** (CDC, 2007)
- **Recent national survey suggests 1 in 91** (Kogan et al., 2009)

About 17 % of children under the age of 18 are affected by a developmental, behavioral, or learning disability. Autism is the fastest growing developmental disorder in the U.S.

M-CHAT Screening: Casting a Wide Net

- Autism can be difficult to identify at an early age as nearly 30% of children with autism present with periods of normal development followed by a plateau or regression (Chawarska et al., 2007; Tuchman & Rapin, 1997).

- To account for potential regressions, the M-CHAT should be administered at several intervals.

Early Intervention

Empirical studies of toddlers with ASDs suggest intensive, specialized early intervention leads to quantifiable gains (Horner et al., 2002; McEachin et al., 1993; Sallows & Graupner, 2005; Schreibman, 2000).

It is important for children simply suspected of ASD to start intervention services (Johnson et al., 2007, AAP).

Early intervention services by age 3 show significant developmental gains. (Robins et al., 2006)

Children with Autism who develop language and symbolic play before age 5:

- are more likely to be enrolled in a regular classroom
- show pronounced improvements in communication
- show additional improvements in developmental skills & language skills (ibid.)

Early intervention reduces the severity of ASD-associated deficits

Developmental components of the M-CHAT

M-CHAT includes a wide range of behaviors.

Screening areas:

- **Social play**
- **Social interest**
- **Pretend play** – *using objects/ toys as though they have other properties or identities*
- **Joint attention** – *sharing of an activity with a partner*
- **Protodeclarative pointing** – *a joint attention behavior, in which the point is intended to share*
- **Use of expressive and receptive language**
- **Functional play** – *objects used as intended*
- **Protoimperative pointing** – *use of the index finger to obtain or name an object (a non-social purpose).*
- **Motor development**
- **Rough and tumble play**
- **Sensory Impairment**

Properties of the M-CHAT

- Physicians cannot always reliably identify a developmental delay based on a child's behavior in one session
- For younger children, a communication & social delay may be confused with shyness, & behavior in a doctor's office may not represent the child's typical behavior.
- "The primary goal [in creating the] M-CHAT was to maximize sensitivity, meaning to detect as many cases of ASD as possible. Therefore, there is a high false positive rate, meaning that not all children who score at risk for ASD will be diagnosed with ASD. Even with the follow-up questions, a significant number of the children who fail the M-CHAT will not be diagnosed with an ASD; however, these children are at risk for other developmental disorders or delays, and therefore, evaluation is warranted for any child who fails the screening." (Robins et al., 2001)

Application of the M-CHAT

- 2-step screening tool for any ASD; objective & easy to administer.
- 23 questions
- Simple screen with a 6th-grade reading level that can be given to all parents during pediatric visits (Kleinman, 2007).
- Does not rely on physician's or early interventionist's observation of the child
- Must be used in its entirety to be valid
- Children for whom there are additional concerns or who fail a specific number of items will receive a follow-up interview to assess whether concerning behaviors indicate risk or whether the behaviors which might have indicated risk have continued.

How to administer the M-CHAT

- Can be given to parents or guardians at a home visit
- Can be scored immediately by EI for discussion with parents during the visit
- Questions or concerns can be resolved during a follow-up interview or home visit

The M-CHAT

Directions

Please fill out the following about how your child usually is. Please try to answer every question. If the behavior is rare (e.g., you've seen it once or twice), please answer as if the child does not do it.

1. Does your child enjoy being swung, bounced on your knee, etc.?
2. Does your child take an interest in other children?
3. Does your child like climbing on things, such as up stairs?
4. Does your child enjoy playing peek-a-boo/hide-and-seek?
5. Does your child ever pretend, for example, to talk on the phone or take care of a doll or pretend other things?
6. Does your child ever use his/her index finger to point, to ask for something?
7. Does your child ever use his/her index finger to point, to indicate interest in something?
8. Can your child play properly with small toys (e.g. cars or blocks) without just mouthing, fiddling, or dropping them?
9. Does your child ever bring objects over to you (parent) to show you something?
10. Does your child look you in the eye for more than a second or two?
11. Does your child ever seem oversensitive to noise? (e.g., plugging ears)
12. Does your child smile in response to your face or your smile?
13. Does your child imitate you? (e.g., you make a face-will your child imitate it?)
14. Does your child respond to his/her name when you call?
15. If you point at a toy across the room, does your child look at it?
16. Does your child walk?
17. Does your child look at things you are looking at?
18. Does your child make unusual finger movements near his/her face?
19. Does your child try to attract your attention to his/her own activity?
20. Have you ever wondered if your child is deaf?
21. Does your child understand what people say?
22. Does your child sometimes stare at nothing or wander with no purpose?
23. Does your child look at your face to check your reaction when faced with something unfamiliar?

Scoring the M-CHAT

- Can be scored in less than 2 minutes.
- An overhead transparency is laid over the completed M-CHAT to facilitate scoring.
- A follow-up interview for those children **who fail 2 critical items** or **3 non-critical items** is conducted to determine if the identified typical or delayed behaviors are truly risk factors or are continuing after the initial screening
- Follow-up interview decreases rate at which false-positive diagnoses are obtained.

Critical items

For these items, a score of "No" indicates a risk for Autism

2. Does your child take an interest in other children?
7. Does your child ever use his/her index finger to point, to indicate interest in something?
9. Does your child ever bring objects over to you (parent) to show you something?
13. Does your child imitate you? (e.g., you make a face-will your child imitate it?)
14. Does your child respond to his/her name when you call?
15. If you point at a toy across the room, does your child look at it?

Reverse Score Items

For these items meaning, a score of "Yes" indicates risk for Autism.

11. Does your child ever seem oversensitive to noise? (e.g., plugging ears)

18. Does your child make unusual finger movements near his/her face?

20. Have you ever wondered if your child is deaf?

22. Does your child sometimes stare at nothing or wander with no purpose?

Non critical items

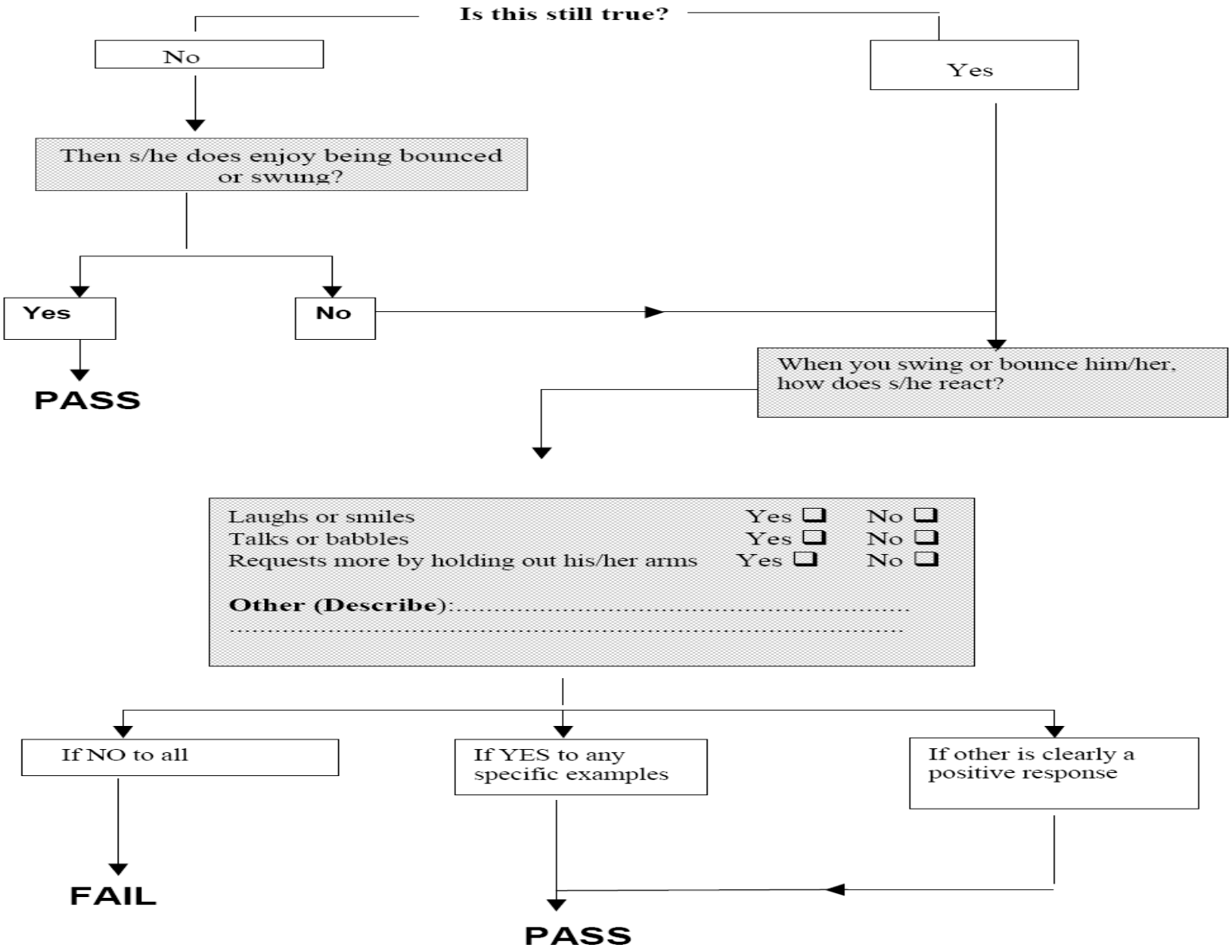
For these items, a score of "No" indicates a risk of Autism

1. Does your child enjoy being swung, bounced on your knee, etc.?
3. Does your child like climbing on things, such as up stairs?
4. Does your child enjoy playing peek-a-boo/hide-and-seek?
5. Does your child ever pretend, for example, to talk on the phone or take care of a doll or pretend other things?
6. Does your child ever use his/her index finger to point, to ask for something?
8. Can your child play properly with small toys (e.g. cars or blocks) without just mouthing, fiddling, or dropping them?
10. Does your child look you in the eye for more than a second or two?
12. Does your child smile in response to your face or your smile?
16. Does your child walk?
17. Does your child look at things you are looking at?
19. Does your child try to attract your attention to his/her own activity?
21. Does your child understand what people say?
23. Does your child look at your face to check your reaction when faced with something unfamiliar?

Follow-up interview

- Follows a structured questionnaire.
- Occurs during home visit after scoring the M-CHAT if it indicates concern with a significant number of behaviors.
- If behaviors occur irregularly or are only slightly concerning, the interview occurs by phone after 2 weeks.
- If after the follow-up interview, an item is failed, it indicates risk for an ASD.
- Failure of 2 critical items (items 2, 7, 9, 13, 14, 15) or any 3 items warrants referral to a specialist.
- Failing the interview does not diagnose ASD; it indicates increased risk (Robins et al., 2001)

1. You reported that _____ does not enjoy being swung, bounced on your knee, etc.



After the Interview

- Children who still fail **more than 3 items total or 2 critical** items should be **referred for evaluation by a specialist trained to evaluate ASD in young children**.

- Children for whom there are parent, or other professionals' concerns about ASD should be referred for evaluation, given that no screening instrument has 100% sensitivity (Robins et al., 2006)

Validity of the M-CHAT

- Validated for **screening** toddlers between 16 & 30 months

- Even with follow-up questions, a significant number of the children who fail the M-CHAT will not be diagnosed with an ASD. **However, these children are at risk for other developmental disorders or delays, warranting additional evaluation for any child who fails the screening**.

- Improved sensitivity at 24 months over 18 months on the basis that screening at 24 months will identify children who have passed at 18 months but subsequently regress by the time the screening is conducted 6 months later (Robins et al., 1999).

Validity of the M-CHAT

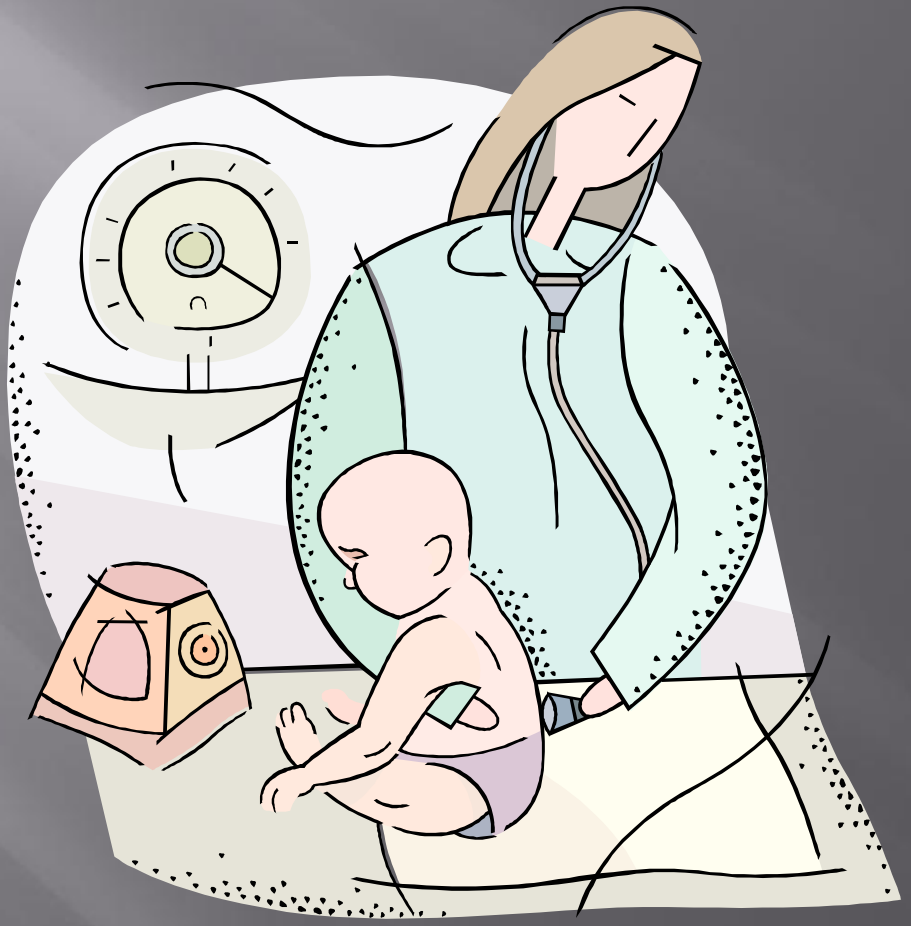
- While early screening is effective, ASD symptoms can appear at ages beyond 30 months.

- Autistic symptoms at the onset may not fully reflect their final outcome in an individual; children may present non-typical developmental behaviors at different ages (Charman et al., 2001).

Why the M-CHAT?

- To optimize long-term prognosis, early identification & early intervention are essential. (Robins et al., 2006)
- Although false-positive screening cases do not have ASD, most children, to date, show significant delays warranting intervention (e.g., language delay); therefore, overidentification with the M-CHAT is preferable to underidentification. (Robins et al., 2006)

Case Examples



Case Study #1

"Abigail" (19-month-old, non-verbal female)

Background: Abigail's mother brought her to her speech and language visit. Abigail clung tightly to her mother while in the waiting room, and began to make whining sounds when the Speech and Language Pathologist (SLP) greeted her mother. During the visit, the Abigail played with a doll but never looked at the SLP except in passing.

Initial M-CHAT Results:

According to the mother, Abigail failed the following items:

- 3. Does your child like climbing on things, such as up stairs? (No)
- 5. Does your child ever pretend, for example, to talk on the phone or take care of dolls, or pretend other things? (No)
- 13. Does your child imitate you? (e.g., you make a face-will your child imitate it?) (No)
- 14. Does your child respond to his/her name when you call? (No)
- 15. If you point at a toy across the room, does your child look at it? (No)
- 16. Does your child walk? (No)
- 20. Have you ever wondered if your child is deaf? (Yes)
- 21. Does your child understand what people say? (No)

Case Study #1

QUESTIONS:

1. Should the SLP do a follow-up interview? Why or why not?

ANSWER: Yes, because more than three items total and more than two critical items were failed, a follow-up interview is warranted.

2. What critical items were failed?

ANSWER: Three critical items were failed, numbers 13, 14, & 15.

Case Study #1

Follow-up Interview: The SLP administered the follow-up interview at the end of Abigail's home visit, and found that Abigail failed the same items excluding item 15 as it was reported by her mother that Abigail occasionally pointed across the room.

Case Study #1

QUESTION:

1. Does Abigail have autism?

ANSWER: The M-CHAT is a screening tool and is appropriate to identify red flags or those children who may be at risk for autism. It should not be used to make a diagnosis but would instead be used to support a referral indicating concerns in key areas typically identified for children suspected of autism.

2. What follow-up is needed by the SLP?

ANSWER: A child who fails two critical items or three or more other items, after the follow-up interview should be automatically referred for a developmental evaluation. Whether or not a child receives a diagnosis, these red flags indicate that a child is likely to have some developmental challenge and would benefit from intervention.

Case Study #1

Conclusion: A follow up interview was completed, the failed items were confirmed, and Abigail was referred to a developmental pediatrician for a developmental evaluation. In the meantime, early intervention began. Abigail was diagnosed with Autism and received early intervention services focused on the deficits associated with Autism.

Case Study #2

"Enrique" (20 month-old verbal male)

Background: An Early Interventionist (EI) visited the home of Enrique and his mother. Enrique's mother was asked to fill out the M-CHAT during the visit. Enrique played with some blocks by himself while his mother worked on the paperwork. The M-CHAT was then scored by the EI who had been trained to score M-CHATs.

Initial M-CHAT:

According to the mother, Enrique failed:

- Item 9. Does your child ever bring objects over to you (parent) to show you something? (No)
- Item 17. Does your child look at things you are looking at? (No)
- Item 18. Does your child make unusual finger movements near his/her face? (Yes)

Case Study #2

QUESTION: Should Enrique be referred for further evaluation or should a follow-up phone call be made?

ANSWER: Because Enrique failed three items (and only one critical item (#9)), the recommendation would be that Enrique's mother be contacted by the EI within two weeks by phone for a follow-up interview to determine if the three failed items continued to be a concern prior to making a referral for further evaluation.

Case Study #2

Follow-up Interview:

Within 2 weeks, the EI contacted Enrique's mother and used the follow-up question algorithm to determine if Enrique was still failing items 9, 17 and 18. The response to each of these questions indicated a failure.

Case Study #2

QUESTIONS:

1. What should be the EI's next step?

ANSWER: Enrique should be referred to a developmental pediatrician for a developmental evaluation as screening results indicate further referral is appropriate.

2. Does Enrique have autism?

ANSWER: The results of the M-CHAT screening tool suggest Enrique is at risk for a diagnosis of autism but would require further evaluation and should take part in early intervention with ongoing follow-up to track his progress.

Case Study #2

Conclusion:

Enrique was evaluated by a developmental pediatrician and was diagnosed with PPD-NOS. He also attended an early intervention program and continued to make progress in his language although his ability to engage socially was not typical compared to his peers.

Case Study #3

"Brittany" (24-month-old non-verbal female)

Background: Brittany's adoptive father and mother brought Brittany to her physical therapy visit to help address her delays in independent walking. Brittany was interested in touching different textures and hugging the legs of another physical therapist she met in the hallway as she came into the physical therapy gym. During the beginning of the visit, Brittany's adoptive parents mentioned the traumatic events surrounding Brittany's early childhood. The physical therapist quickly scored the M-CHAT, which the parents completed in the waiting room.

Initial M-CHAT:

Brittany failed the following items:

- 11. Does your child ever seem oversensitive to noise? (e.g., plugging ears) (Yes)
- 18. Does your child make unusual finger movements near his/her face? (Yes)
- 22. Does your child sometimes stare at nothing or wander with no purpose? (Yes)

The physical therapist immediately followed the survey with the associated follow up questions.

Case Study #3

Follow-up Interview:

The family mentioned that Brittany calmly covers her ears when she hears loud noises such as people yelling on the television. It was also determined that she only rarely moves her fingers in front of her face. Brittany's mom noted that her daughter continued to stare or wander off with no specific purpose.

Case Study #3

QUESTIONS:

1. Did Brittany continue to fail items 11, 18 & 22

ANSWER: The parents' responses during the follow-up interview indicated that items 11 & 18 were now passed but item 22 was considered a failure.

2. Are there any concerns that would warrant further assessment?

ANSWER: The M-CHAT results indicate it is unlikely that autism is characteristic of this child's profile. Considering Brittany's adoptive history, however, it is likely that Brittany may be having some difficulties adjusting or attaching to her environment.

Conclusion:

While Brittany passed the M-CHAT follow-up interview, the physical therapist still recommended that the family contact the local early intervention program for intervention and a child development clinic for further assessment related to a potential Attachment Disorder. Brittany was later diagnosed with Disinhibited Attachment Disorder.

Case Study #4

"Timothy" (non-verbal, 22-month old male)

Background: Timothy is slightly microcephalic. His father and mother filled out the M-CHAT survey during a visit to their home by a developmental educator who was part of the local early intervention team. The developmental educator scored the M-CHAT during the first part of the visit.

Initial M-CHAT Survey:

Timothy's parents reported that he failed items:

- 11. Does your child ever seem oversensitive to noise? (e.g., plugging ears) (Yes)
- 14. Does your child respond to his/her name when you call? (No)
- 15. If you point at a toy across the room, does your child look at it? (No)
- 20. Have you ever wondered if your child is deaf? (Yes)
- 21. Does your child understand what people say? (No)
- 22. Does your child sometimes stare at nothing or wander with no purpose? (Yes)

Case Study #4

QUESTION: Did Timothy fail any critical items on the M-CHAT, and if so, what were they? Should an interview be completed?

ANSWER: Timothy failed six items total and two critical items (14 and 15); therefore, the developmental educator administered the M-CHAT follow-up interview with Timothy's mother.

Case Study #4

Follow-up Interview:

On the follow-up interview, parent responses did not change, therefore, Timothy continued to fail the previously identified failed items.

Conclusion:

The developmental educator referred Timothy for an assessment by a developmental pediatrician and recommended Timothy be considered for an increase in his current early intervention services. Timothy was later diagnosed with a global developmental delay, and the developmental pediatrician recommended additional surveillance for risk of Autism through his 3rd birthday.

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