

Transcript: SWYC Milestones Training Video

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Description: Discussion of developmental milestones, how they work, and how they differ from mental health symptoms or risk factors.

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Today, I'm going to talk about developmental milestones. Why do milestones get their own talk? In short, developmental milestones aren't quite like mental health symptoms or risk factors. They are different in some important ways, and it's worth taking a few minutes to understand why.

As you know, the SWYC milestones is one part of a larger tool that focuses on development. Note that the milestones section always starts with relatively easy questions and ends with hard ones. Thus, providers should not expect children to complete all milestones at any given age. Many people ask why.

The reason is because of how developmental milestones work. The word "milestone" may call to mind a stone set to mark a distance to a particular place, but we're actually talking about something else—we're talking about an action or event that marks an important stage of development.

The distinction is important. If we care about distance, we set a stone in a very particular place.

Not to the left

And not to the right

But right on the spot

Similarly, for each well child visit on the pediatric periodicity schedule...

The CDC recommends a list of milestones, and there is an age specific SWYC form as well

But in reality, developmental milestones don't just happen at these specific ages. Developmental milestones happen at different ages, often in between visits.

So it's really not a milestone in a concrete sense—it's a developmental achievement

Let's take a closer look at one milestone

If we survey a group of parents, we find that individual children pass at all different ages. So what age should we attach to this milestone?

Should we call it an 18-month milestone because about 50% of children pass by this age? We certainly could. But if a child doesn't pass by 18 months, is this cause for concern? Maybe..

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But what if we decided to call it a 24-month milestone? Nearly all children are expected to pass by this age. And what if a child hasn't passed by 24 months? Is this cause for concern? Definitely more so, simply because the vast majority of children already have. The point is that developmental milestones are VERY sensitive to age. Assigning them one particular age may be a useful heuristic, but it doesn't make a ton of sense unless we also say what proportion of kids pass by that age. So there's no such thing as a "2 year milestone." there are milestones that most 2-years pass, others that few 2-year olds pass, and still others that about ½ pass. This also means that at any given age, there is simply no single list of milestones we can ask about that all mean the same thing. When we conducted a study to compare CDC milestones to the SWYC, we found that when the CDC assigned a milestone to a given age, it could mean that anywhere from about 50% to 99% of kids pass by that age. That's a big difference. That's why the SWYC doesn't label milestones with specific ages—that is, we don't talk about 12 month milestones and 18 month milestones and 24 month milestones. Instead, there is a list of milestones for each of these ages that range from easy to hard.

If you are interested in seeing the evidence on norms for individual milestones, we provide it in two published papers. There's also a free tool that's available as a supplement and on the SWYC website.

You may also wonder how we score the SWYC milestones—including why it's so complicated and why the thresholds change for every month that a child ages. With something like mental health symptoms, it's generally reasonable to simply add up the responses to all the questions. But developmental milestones don't work that way—they are simply too sensitive to age, so they require a different way of scoring. On a technical level, the scoring relies on something called item response theory. Here's the basic idea of how it works. Imagine you need to guess a child's age by asking yes/no questions about developmental milestones. You start by asking

1. whether the child walks and the parent says yes.
2. So you figure the child is probably at least 12 months.
3. Next you ask if the Child uses 2-word phrases and the parent says no
4. So you figure the child is less than 21 months or so. After a few more questions, you're best guess as to the child's age is
5. 18months. The SWYC milestones uses the same logic to estimate the child's developmental age. Now the big reveal—what is the child's actual chronological age?
6. If it is less than their developmental age, then they appear to be a bit ahead. No problem

But if is older than their developmental age, then we worry about delay. A score of "needs review" on the SWYC milestones happens when we suspect at least a 15% delay.

So, what does a finding of "needs review" on the SWYC milestones really mean? Here's what I might say to a parent.

1. "Compared to other parents with children the same age, you're reporting fewer developmental milestones...so let's take a closer look". From a research perspective, there's at least two key concepts here.

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2. One is that we can often use plain language to concretely describe results. I'm not saying your child is at risk or suggesting any interpretation—I'm starting with what the result concretely means
3. And in this case, basic normative data are useful—concretely, the parent is reporting fewer milestones than other parents. Let's start there.

Finally, some notes about scoring the SWYC milestones. There are two methods.

The first is hand scoring. This is simple. Just add up the responses to each of the 10 milestones questions and compare the score to the recommended threshold to determine whether the score is positive. There's just one complication: thresholds change rapidly by age. For this reason,

1. We provide a scoring guide on our website.
2. Just consult the table to determine what threshold is appropriate for each age. This can easily be programmed into an EMR.

But there's a second way to score the SWYC milestones. It is more complicated, but it gives you a continuous score. Using IRT parameters as described above, you can

1. Estimate each child's developmental age based on responses to the milestones questions. You can then
2. divide by their chronological age. This gives you an estimate of
3. Developmental status. Values less than one mean that a parent is reporting fewer milestones than parents of other same-age children. Thresholds are set to reflect a delay of approximately 15%. When feasible, this method has several advantages. It offers more information to clinicians. It allows for thresholds to be adjusted as needed across forms. And, as is well known, continuous scores offer more information than binary scores for researchers as well.

For example, we used this scoring method to examine associations with child factors in a recent paper,

1. We found that associations between lower developmental status and positive behavioral screens increased with age.
2. We also found that associations between lower developmental status and family risk factors, such as parent depression, substance abuse, or family discord, also increased with age.
3. And we found a similar pattern for children on public health insurance, although unexpectedly,
4. results across three independent samples suggest that public health insurance is associated with parent reports of better developmental status before 12 months of age.

I hope this has been helpful. In a future talk, I'll discuss evidence on the accuracy of the SWYC Milestones and how it compares to other developmental screening questionnaires. As always, if you have more questions, check out our web site. And check back for updates because we hope to add new information in the future. Thank you for listening.