supplementary material

Experimental Manipulation Content in Two Versions of the NC NEXUS Decision Aid



[Not applicable. No voice over on this screen.]

screen	experimental condition
2	EDUCATION-ONLY
L	EDUCATION + VALUES CLARIFICATION
screenshot	
	NC _{Ne} sus Welcome to the NC NEXUS decision guide.
	Overall Progress: 2%
	Purpose of the study
	How genes can affect your child's health
	Genomic sequencing
	Results that might be found
	Decide if you want genomic sequencing

Welcome to the NC NEXUS decision guide.

This decision guide will help you learn more about the NC NEXUS Study, including:

- The purpose of the study
- How genes can affect your child's health.
- Genomic sequencing, and
- The types of results that might be found.

The guide will also help you decide if you want to have genomic sequencing for your child.

screen 3	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	
$ \begin{array}{c} \bullet \bullet \bullet \bullet \\ \hline \\ \leftarrow \\ \bullet \\ \end{array} \end{array} $ NC NEXUS	× https:// → → f? → ○ :
	$NC_{Ne \ge us}$ How to use this online decision guide.
	

Before getting started, let's look at the navigation controls you can use to move through the decision guide. Here is the next button to move forward.



If you need to pause for a moment and come back, click the play/pause button.





On some screens you will be asked questions. One way to answer is with a sliding scale. Click and drag the slider, moving it to the point on the scale that best fits your answer. You can choose any point on the scale. Then click the next button to continue.

screen	experimental condition
	EDUCATION + VALUES CLARIFICATION
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screenshot	
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	NCNesus How to use this online decision guide.
	Overall Progress: 12%
	Click and drag the unsorted item into the Reserved to box ideal deported, or the dags
	2 Release to drop the item. Feel free to change your mind.
	3 Click the "Next" button to continue.

voice-over script

Other questions will ask you to sort items. Click and drag each item into the desired box. When you are done sorting the items, click the next button to continue.

screen	experimental condition
8	EDUCATION + VALUES CLARIFICATION
screenshot	
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← → C	thtps:// → → → → ↓ f? 🖡 O :
	NC _{Ne} sus How to use this online decision guide.
	Overall Progress: 14%
	 Select one of the blank boxes and write out your own reason. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the check mark to save what you typed. Click the "Next" button to continue. Click the "Next" button to continue.
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Some questions will ask you to type in your own thoughts or opinions. Click inside the text box, and then type your answer. When you are done typing, click the check mark to save what you typed.

screen	experimental condition					
0	EDUCATION-ONLY					
7	EDUCATION + VALUES CLARIFICATION					
screenshot						
	NC _{Ne} sus How to use this online decision guide.					
	Overall Progress: 16%					
	Will genomic sequencing help you learn things that are important to you?					
	Do you have enough information to make a decision about having genomic sequencing for your child?					
	Are you prepared to learn genomic sequencing results for medically actionable childhood conditions?					
	Are you interested in learning if your child has gene differences that can cause medically actionable Yes No					
	Are you and your partner confident you can decide?					

Lastly, some questions will ask you to select "yes" or "no." You can answer by clicking the button that matches your selection.

Now, if you're ready to begin, please click the next button

screen	
10	 EDUCATION + VALUES CLARIFICATION
screenshot	
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	Overall Progress: 18%
	Advance of the second sec
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	Multiple call Country A water of Call And
	Find out if sequencing finds other important conditions
voice-over scrip	
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NC NEXUS is a research study that offers you the option to have genomic sequencing for your child.

One goal of NC NEXUS is to find out how well genomic sequencing finds over 30 conditions that all babies in North Carolina are tested for at birth. This test is called newborn screening.

Another goal is to find out if genomic sequencing finds hundreds of other important conditions that are not part of newborn screening, but are otherwise similar to them.



The NC NEXUS study team hopes to learn

- How parents like you decide if they want to have genomic sequencing for their child
- The types of information parents want to learn from genomic sequencing
- How parents react after learning their child's genomic sequencing results, and
- Whether this decision guide helps parents make informed choices about genomic sequencing

screen	experimental condition						
12	EDUCATION-ONLY						
12	EDUCATION + VALUES CLARIFICATION						
screenshot							
	θ						
← → C ≜ Secure							
	NCNezus What is newborn screening?						
	Overall Progress: 22%						
	Newborn screening finds serious conditions before a child becomes sick:						
2 Delayed physical development							
	Hearing loss						
	Heart and breathing problems						
	3 Seizures						
	Coma						
	Image: Second seco						

What is newborn screening?

Newborn screening is testing done when a baby is born to find serious conditions before a child becomes sick. The conditions found by newborn screening can cause disability or even death if they are not treated early.

screen	experimental condition		
13			
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screenshot			
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← → C	https://www.weige		★ <i>f</i> ? % ○ :
	NC _{Ne≥us}	What is newbo	orn screening?
	The second s	Overall Progress: 24%	
	Conditions found by		
	rare		
	13 out of every 10,000		
	babies born in the U.S.		

		13 out of 10,000	****
		3	

Most of the conditions are rare. Only about 13 out of every 10,000 babies born in the United States have a condition that can be found by newborn screening.



The conditions found by newborn screening have treatments. If a child has one of these conditions, finding out early can help keep him or her from getting sick. It might even save the child's life. If you decide to have genomic sequencing as part of the NC NEXUS study you would still have regular newborn screening when your baby is born.

screen 15	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	* B * P & O : NCNesus What is genomic sequencing?
	Cell Chromosome NA Verder Verder Verder Cell Chromosome Cell Cell Chromosome Cell Chromosome Cell Chromosome Cell Chromosome Cell Chromosome Cell Chromosome Cell Cell Chromosome Cell Chromosome Cell Cell

What is genomic sequencing?

Each cell in a person's body contains a copy of his or her DNA. DNA provides the instructions a person's body needs to grow and function. These instructions are divided into genes. Just like how the order of words in a sentence is important for understanding what you read, the order of DNA building blocks is important for telling the body's cells what to do.

screen 16 screenshot	experimental condition EDUCATION-ONLY EDUCATION + VALU	IES CLARIFICATION	
	× https://		↔ f? 🖕 O 🗄
	NC _{Ne≥us}	What is genomic sequencing?	
	100 100 100 100 100 100 100 100 100 100	Overall Progress: 31%	
		People can have different forms of the same gene	
	0	2 Most <u>gene differences</u> have no effect on health	
	C G	E G G But some lead to health problems	
		Genomic sequencing is a way to look for gene differences	
	C G		
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			and the state

Differences in a person's DNA can cause people to have different forms of the same gene. Most often these gene differences, or variants, will have no effect on health, but some gene differences can lead to health problems.

Genomic sequencing is a way to look for differences in your child's DNA that could cause rare but serious health problems.



What Can Genomic Sequencing Tell You About Your Child?

In the NC NEXUS study, genomic sequencing will look for gene differences that cause the same conditions that are found through newborn screening, plus more than a hundred other conditions like them.



Researchers are still trying to understand how useful genomic sequencing is compared to other tests that tell people about their health. The NC NEXUS study team wants to learn if genomic sequencing can improve current newborn screening.

They also want to see if genomic sequencing can be used to find conditions that are not part of the current newborn screening, but could be in the future. These are rare conditions that affect children early in life and can be improved with early treatment.



How common is it for genomic sequencing to find gene differences that cause medically actionable childhood conditions?

It is not known for sure how often genomic sequencing will find gene differences that cause these conditions. This is one of the things the NC NEXUS study will try to find out. The best estimate is that sequencing will find gene differences that cause these conditions in less than 1% of children. Genomic sequencing done by the NC NEXUS study cannot find all gene differences related to all medically actionable childhood conditions.



What is a medically actionable childhood condition?

These are rare but serious genetic conditions that...

- Usually begin during childhood and are medically actionable; that is, they
- Can be improved with early treatment, and
- The benefits of treatment typically outweigh the risks.

In addition to over 30 conditions that are part of current newborn screening, the NC NEXUS study will look for more than a hundred other conditions like them.

The signs and symptoms of medically actionable childhood conditions differ greatly from one to the next.



Pompe disease is one example of a medically actionable childhood condition. Pompe disease affects about 1 out of every 40,000 people in the United States and usually begins in the first few months after birth. Children who have Pompe disease have weak muscles so they are not able to do things like hold their heads up or crawl at the same age as other babies. Other signs of Pompe disease include an enlarged liver and heart problems. If untreated, Pompe disease often leads to heart failure and death in the first year of life. There are drugs that can prevent some of these problems if given early in a child's life.



What can genomic sequencing tell you about medically actionable childhood conditions?

The NC NEXUS team will look for gene differences that are known to cause specific conditions. For some medically actionable childhood conditions, these gene differences determine how the condition will affect a child. For other conditions, these gene differences are not the only thing that determines how the condition will affect a child, but they are known to play an important role in a child developing the condition.



Finding these gene differences in your child's DNA can tell that he or she is more likely to have one of these conditions during childhood. Still, it is hard to know for sure how severe the condition would be because other factors also play a part in most conditions.



What will happen if you decide to have genomic sequencing for your child?

- If you decide you want your child to have genomic sequencing in NC NEXUS, you will come to UNC Hospitals. The visit will take about one hour.
- If you consent to sequencing, we will ask you to sign a consent form.
- After your baby is born, you will come back to UNC Hospitals. A small sponge will be lightly rubbed inside your baby's mouth to get saliva, or spit, that will be used for sequencing.
- After the sequencing is done, you will learn results for medically actionable childhood conditions found by new born screening, and many other conditions like them.
- All parents in the study will complete several online surveys.

screen

25

experimental condition

EDUCATION-ONLY

EDUCATION + VALUES CLARIFICATION

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	NC _{Ne} What if genomic sequencing finds these conditions?				
	Overall Progress: 49%				
	Results will be confirmed with another test				
	2 A genetic counselor and a doctor will discuss the results with you				
	3 You will be referred for medical or other services your child needs				
	3 You will be asked if you want the results added to your child's health record				

voice-over script

What if genomic sequencing finds that your child has gene differences that cause these conditions?

- The results will be confirmed with another test. •
- A genetic counselor and a doctor will meet with you to discuss the results. •
- You will be referred for medical or other services your child needs for those conditions. •
- You will be asked if you want the results added to your child's health record at UNC Hospitals. •

screen 26	experimental condition O EDUCATION-ONLY O EDUCATION + VALUES CLA	RIFICATION		
screenshot	× NCNezus	Which way a	re you leaning?	0 ☆ ff %, ○ :
. =	Which way are you leaning about having geno Leaning away from having genomic sequencing	Overall Progress: 53% mic sequencing for your child? Not sure	Leaning toward having genomic sequencing	
_				
	•	3		

Which way are you leaning?

If you had to decide right now, which way are you leaning about having genomic sequencing for your child in NC NEXUS?

Click and drag the slider, moving it to the point on the scale that fits your answer.

- Leaning away from having genomic sequencing
- Not sure
- •
- Leaning toward having genomic sequencing

When you are done, click the next button to continue.

screen 27	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION 			
screenshot				
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	NCNe	≊us Reasons f	or and against genomic seque	ncing.
		Overal	I Progress: 55%	
		REASONS FOR	REASONS AGAINST	
		Genomic sequencing may help scientists make better tools for finding serious conditions before people get sick.	Waiting for genomic sequencing results may cause you to worry or feel anxious.	
	•		3	

voice-over script

The following screens will show you some reasons for and some reasons against having genomic sequencing for your child. Thinking about which reasons matter most to you can help you make a decision.

screen 28	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	
	× ● https:// ☆ /? ☆ ○ :
	NC _{Ne≥us} Reasons for genomic sequencing.
	Overall Progress: 57%
	Sort "reasons for" into the boxes labeled Important or Not important.
	IMPORTANT NOT IMPORTANT UNSORTED REASON FOR
	Krowing your child has a genetic condition may help him or her get early teatment and support services.

First, tell us if the following reasons for your child to have genomic sequencing in NC NEXUS are important or unimportant to you. Please sort these "reasons for" into the boxes labelled important or not important. You can sort as many or as few reasons into each box as you want. To sort, click the reason and drag it into a box.

• Knowing your child has a genetic condition may help him or her get early treatment and support services.

When you are done sorting, click the next button to move on to the next reason.

screen	experimental condition
20	O EDUCATION-ONLY
27	EDUCATION + VALUES CLARIFICATION
screenshot	
	NC _{Ne} sus Reasons for genomic sequencing.
	Overall Progress: 59%
	Sort "reasons for" into the boxes labeled Important or Not important.
	IMPORTANT NOT IMPORTANT UNSORTED REASON FOR
	Knowing your child has a genetic condition may help you and your family be prepared if he or she develops the condition.

• Knowing your child has a genetic condition may help you and your family be prepared if he or she develops the condition.

screen 30	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	
 ♦ ● ● ♦ → C ♦ Secure 	* B * If % 0 : NCNe>us Reasons for genomic sequencing.
	Overall Progress: 61% Sort "reasons for" into the boxes labeled Important or Not important. IMPORTANT UNSORTED REASON FOR Genomic sequencing may help doctors understand genetic conditions better.

• Genomic sequencing may help doctors understand genetic conditions better.

screen	experimental condition
21	O EDUCATION-ONLY
51	EDUCATION + VALUES CLARIFICATION
screenshot	
	×
← → C ≜ Secure	
	NCNesus Reasons for genomic sequencing.
	Overall Progress: 63%
	Sort "reasons for" into the boxes labeled Important or Not important.
	IMPORTANT NOT IMPORTANT UNSORTED REASON FOR
	Genomic sequencing may help
	scientists make better tools for finding serious conditions before people get
	sick.

• Genomic sequencing may help scientists make better tools for finding serious conditions before people get sick.

screen 32	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
	e x e https://www.internationalized and the sequencing. NCNe Sus Reasons for genomic sequencing.
	Overall Progress: 65% Sort "reasons for" into the boxes labeled Important or Not important.
	IMPORTANT UNSORTED REASON FOR UNSORTED REASON FOR Unsorted reading of the set of any problems occur to find out if your child may have a genetic condition.
_	

• You would rather not wait to see if any problems occur to find out if your child may have a genetic condition.

screen 33	experimental condition O EDUCATION-ONLY O EDUCATION + VALUES CLA	ARIFICATION		
screenshot				
	* NC _{Ne} zus	Reasons for genor	nic sequencing.	⊖ ☆] f? % ○ :
		Overall Progress: 67%		
	Sort "reasons for" into the boxes labeled Imp	ortant or Not important.		
	IMPORTANT	NOT IMPORTANT	UNSORTED REASON FOR	
			Are there any other reasons you can think of?	
			Add reason 👦 🧭	
			Add reason	
		3	• •	

Are there any other reasons you can think of? Please type them in the text boxes labelled "Add reason"

When you are done sorting, click the next button to continue.

screen 34	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	× https:// → // → // → // → // → // → // → //
	Overall Progress: 69% Sort "reasons against" into the boxes labeled Important or Not important. MPORTANT NOT IMPORTANT VISORTED REASON AGAINST Waiting for genomic sequencing results may cause you to worry or feel anxious.

Now we would like you to tell us if the following reasons against your child having genomic sequencing are important or unimportant to you. Please sort these "reasons against" into the boxes labeled important or not important.

• Waiting for genomic sequencing results may cause you to worry or feel anxious.

When you are done sorting, click the next button to move on to the next reason.

screen 35	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	
	e https:// * // * * //
	Overall Progress: 71% Sort "reasons against" into the boxes labeled Important or Not important.
	IMPORTANT VDT IMPORTANT UNSORTED REASON AGAINST Our child near heat gonetic condition.

• You do not feel prepared to learn that your child may have a genetic condition.

	experimental condition
screen	experimental condition
26	O EDUCATION-ONLY
30	EDUCATION + VALUES CLARIFICATION
screensnot	
	×
← → C iii Secure	
	NC _{Ne≥us} Reasons against genomic sequencing.
	Overall Progress: 73%
	Sort "reasons against" into the boxes labeled Important or Not important.
	IMPORTANT NOT IMPORTANT UNSORTED REASON AGAINST
	Knowing that the NC NEXUS study
	team will have your child's genomic security makes your
	uncomfortable.

• Knowing that the NC NEXUS study team will have your child's genomic sequencing results makes you uncomfortable.

screen	experimental condition		
37	O EDUCATION-ONLY		
	EDUCATION + VALUES CLARIFICATION		
screenshot			
	×		
← → C Li Secure			
	NC _{Ne} sus Reasons against genomic sequencing.		
	Overall Progress: 76%		
	Sort "reasons against" into the boxes labeled Important or Not important.		
	IMPORTANT NOT IMPORTANT UNSORTED REASON AGAINST		
	You are satisfied with knowing that your		
	child will have standard newborn screening. 🍖		

• You are satisfied with knowing that your child will have standard newborn screening.

screen	experimental condition
20	O EDUCATION-ONLY
50	EDUCATION + VALUES CLARIFICATION
screenshot	
	× P
\leftarrow \rightarrow \mathcal{C} \blacksquare Secure	https://www.ii.en
	NC _{Ne>us} Reasons against genomic sequencing.
	Overall Progress: 78%
	Sort "reasons against" into the boxes labeled Important or Not important.
	IMPORTANT NOT IMPORTANT UNSORTED REASON AGAINST
	You would rather wait to see if your
	child has any problems before having genetic testing.

• You would rather wait to see if your child has any problems before having genetic testing.

screen 39	experimental condition EDUCATION-ONLY EDUCATION + VALUES CL/ 	ARIFICATION		
screenshot				
	* NCNezus	Reasons against ger	nomic sequencing.	⊖ ★ <i>f</i> ? ∿ ⊙ :
	Sort "reasons against" into the boxes labeled	Overall Progress: 80%		
	IMPORTANT	NOT IMPORTANT	UNSORTED REASON AGAINST Are there any other reasons you can to of?	hink
			Add reason Add reason	
			Add reason Add reason	0
		3		

Are there any other reasons against having genomic sequencing that you can think of? Please type them in the text boxes labelled "Add reason"

When you are done sorting, click the next button to continue.

screen 40	experimental condition EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION
screenshot	× ● https:// ■ ● ★ f? & • i NCNe≋us Here are the reasons that are important to you.
	
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Here are the reasons for and against genomic sequencing for your child that are important to you. This is a summary of what you just sorted. When you are done reviewing these reasons, click the next button to continue.

screen experimental condition ○ EDUCATION-ONLY EDUCATION + VALUES CLARIFICATION screenshot × ☆ f? 💁 ○ : C Secure https:// NC_{Ne≥us} Questions to help you decide. Overall Progress: 84% Will genomic sequencing help you learn things that are important to you? Yes No Do you have enough information to make a decision about having genomic sequencing

for your child?

0

Yes No Are you prepared to learn genomic sequencing results for medically actionable childhood conditions? Yes No Are you interested in learning if your child has gene differences that cause medically actionable childhood conditions? Yes No Are you confident you can decide? 3 •

voice-over script

Here are some questions that can help you decide if you want your child to have genomic sequencing in NC NEXUS.

Please answer "yes" or "no" to the following questions. You can pick your answers by clicking the button that matches your selection.

- Will having genomic sequencing for your child help you learn things that are important to you? •
- Do you have enough information to make a decision about having genomic sequencing for your child? •
- Are you prepared to learn genomic sequencing results for medically actionable childhood conditions? •
- Are you interested in learning if your child has gene differences that can cause • medically actionable childhood conditions?
- Are you confident you can make the decision that is right for you and your family? •

When you are done, click the next button to continue.

experimental condition
O EDUCATION-ONLY
EDUCATION + VALUES CLARIFICATION
s ×Ө
https://
NC _{Ne≥us} Questions to help you decide.
Overall Progress: 86%
YOU ANSWERED YES TO: YOU ANSWERED NO TO:
Will genomic sequencing help you learn things that are important No reasons listed.
Do you :
having genomic sequencing for your child?

If you answered Yes to more of these questions, maybe you are ready for your child to have genomic sequencing. If you answered No to more, maybe this is not the right decision for your family at this time. Or you might still need more time or information to decide.

You should make the decision that is best for you and your family. There are no right or wrong choices.

screen	experimental condition				
12	EDUCATION-ONLY				
43	EDUCATION + VALUES CLARIFICATION				
screenshot					
	NC _{Ne} sus Making a decision about genomic sequencing.				
	Overall Progress: 88%				
	Do you want your child to have genomic sequencing for conditions like those found in newborn screening?				
	No, I do not want my child to have genomic sequencing I'm not sure Yes, I want my child to have genomic sequencing				

You have a decision to make at this time.

Do you want your child to have genomic sequencing for conditions like those found in newborn screening?

Click and drag the slider, moving it to the point on the scale that best fits your answer.

- No, I do not want my child to have genomic sequencing at this time for conditions like those found in newborn screening. I do not want to schedule a study visit.
- I'm not sure if I want my child to have genomic sequencing or not, but I want to schedule a study visit with a genetic counselor at UNC Hospitals to discuss the decision.
- Yes, I want my child to have genomic sequencing for conditions like those found in newborn screening. I want to schedule a study visit with a genetic counselor at UNC Hospitals.

If you select "Yes" or "I'm not sure," a member of the NC NEXUS study team will contact you to schedule a study visit at UNC Hospitals. Remember, even if you decide to schedule a study visit, you can change your mind and stop participation in this study at any point in time.

When you are done making your decision, click the next button to continue.



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