

Complex Use of Voxco, Commercial-Off-the-Shelf Software, for Data Collection

Presenter: Nathan Sikes

Authors: Michelle Krzyzanowski, Ying Qin, Jean Robinson, Nathan Sikes

Commercial-Off-The-Shelf (COTS) Software

Organizations select “COTS” software for a variety of reasons:

- Client Requirements
- Financial considerations
- A desire to standardize software development

Commercial-Off-The-Shelf (COTS) Software

Organizations select “COTS” software for a variety of reasons:

- Client Requirements
- Financial considerations
- A desire to standardize software development

“COTS” software typically implies a one-size-fits-all approach:

- Meets most of the needs it was designed to address

Commercial-Off-The-Shelf (COTS) Software

Organizations select “COTS” software for a variety of reasons:

- Client Requirements
- Financial considerations
- A desire to standardize software development

“COTS” software typically implies a one-size-fits-all approach:

- Meets most of the needs it was designed to address

However, complex studies stretching the boundaries of COTS software framework require thoughtful and ingenious approaches to be successful.

A Sampling of Data Collection Tools Used at RTI

RTI-Developed Proprietary Software

Hatteras

CATI-CMS

Mobile FS

Integrated Field Management System (IFMS)

A Sampling of Data Collection Tools Used at RTI

RTI-Developed Proprietary Software

Hatteras

CATI-CMS

Mobile FS

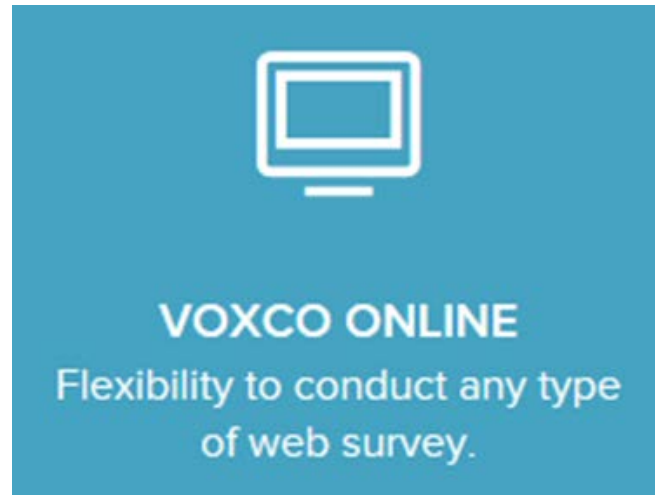
Integrated Field Management System (IFMS)

Commercial Off-the-Shelf Software



and others...

Addressing Challenges in Voxco Online



a.k.a. “Acuity for Surveys (A4S)”

Challenges Using Voxco Online

- **Complex Dynamic Preloads**
 - Instruments
 - Instrument Variables

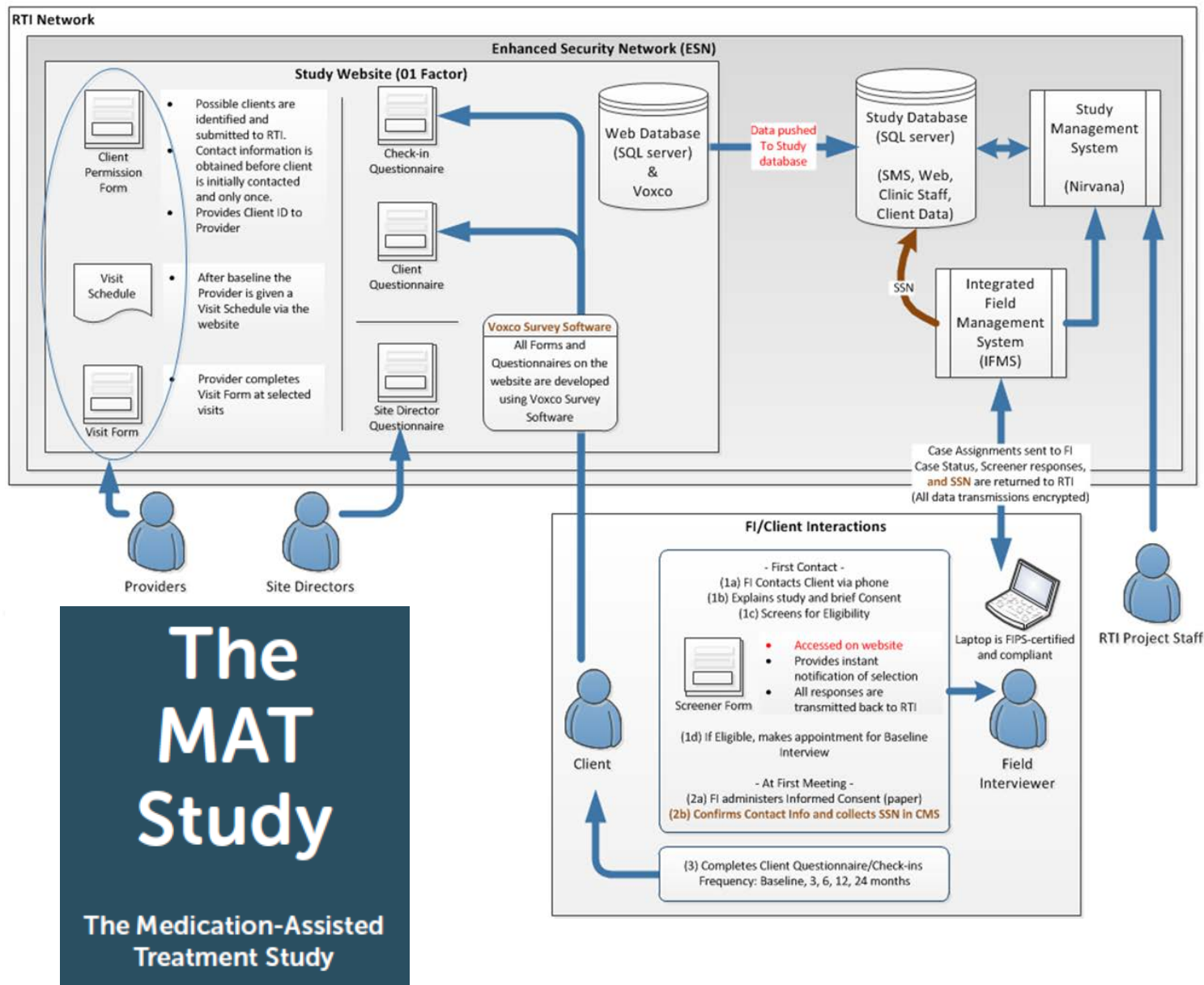
- **Automation of Voxco Functions**
 - Data Exports
 - Data Imports

- **Customized Grid Questions**
 - Responsive Design
 - Validating Input for the entire page of questions
 - Customizing Questions using HTML

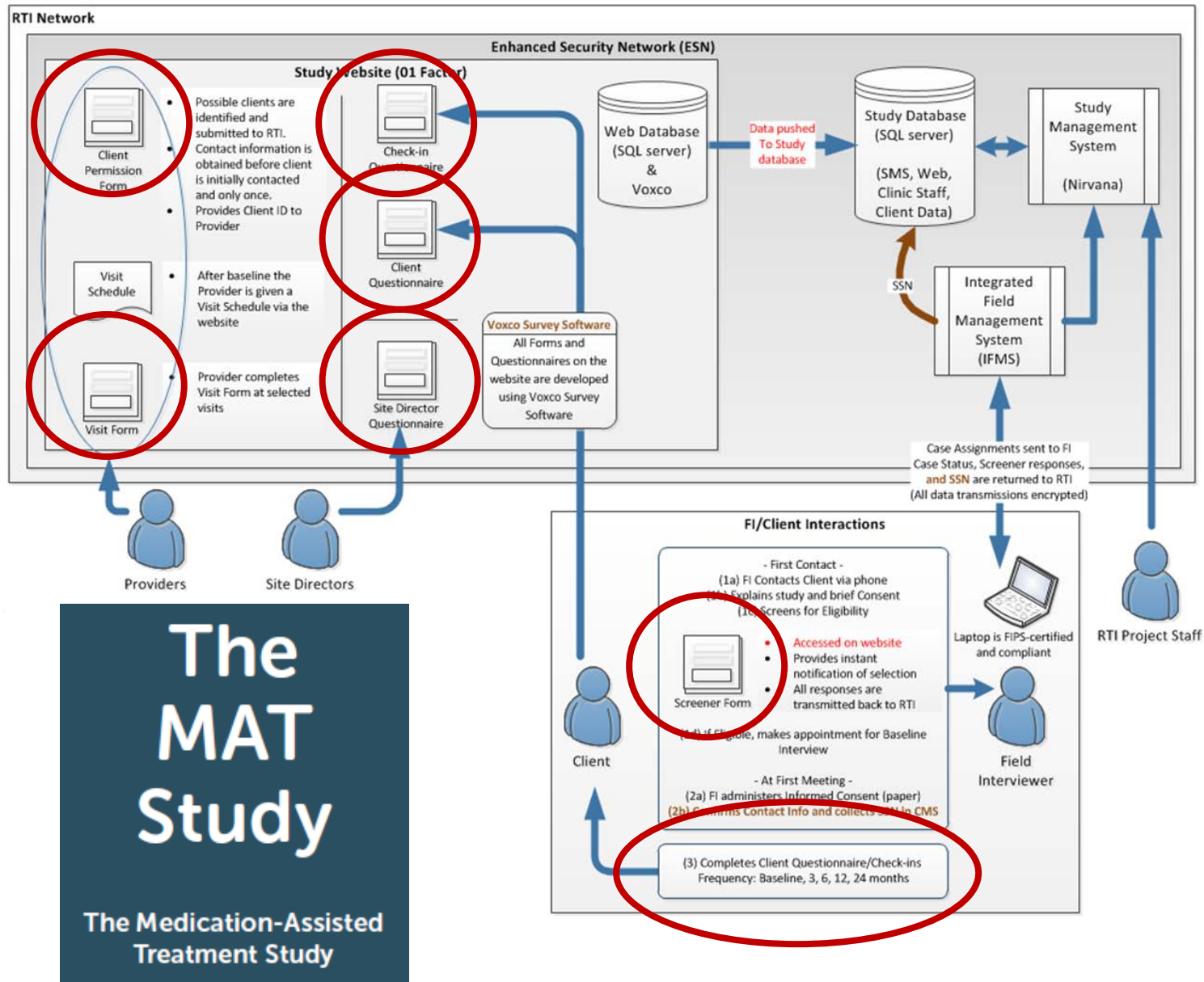
The MAT Study

**The Medication-Assisted
Treatment Study**

Voxco Challenges for The MAT Study (CDC)



Voxco Challenges for The MAT Study (CDC)



The MAT Study – Data Collection Flow

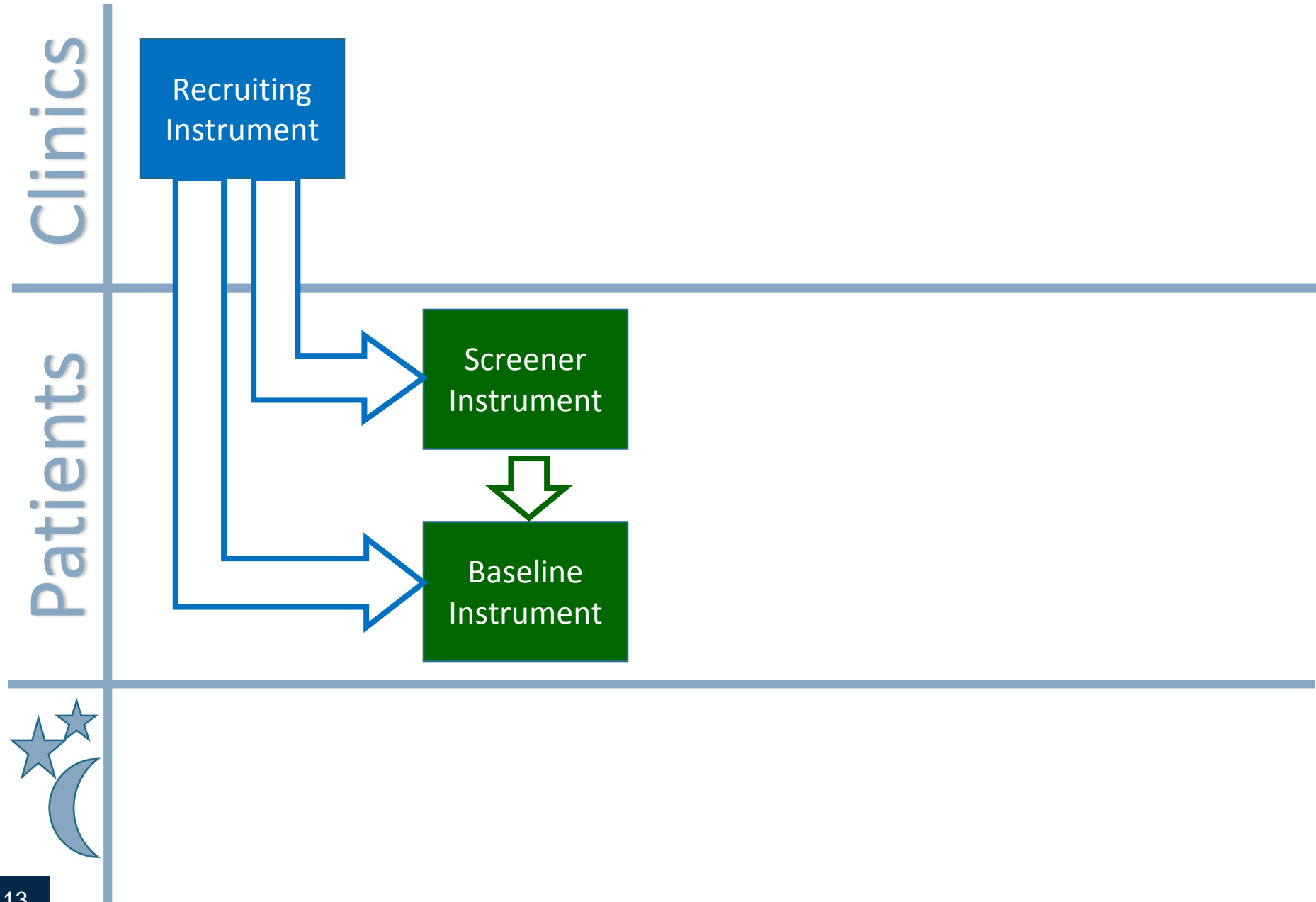
Clinics

Recruiting
Instrument

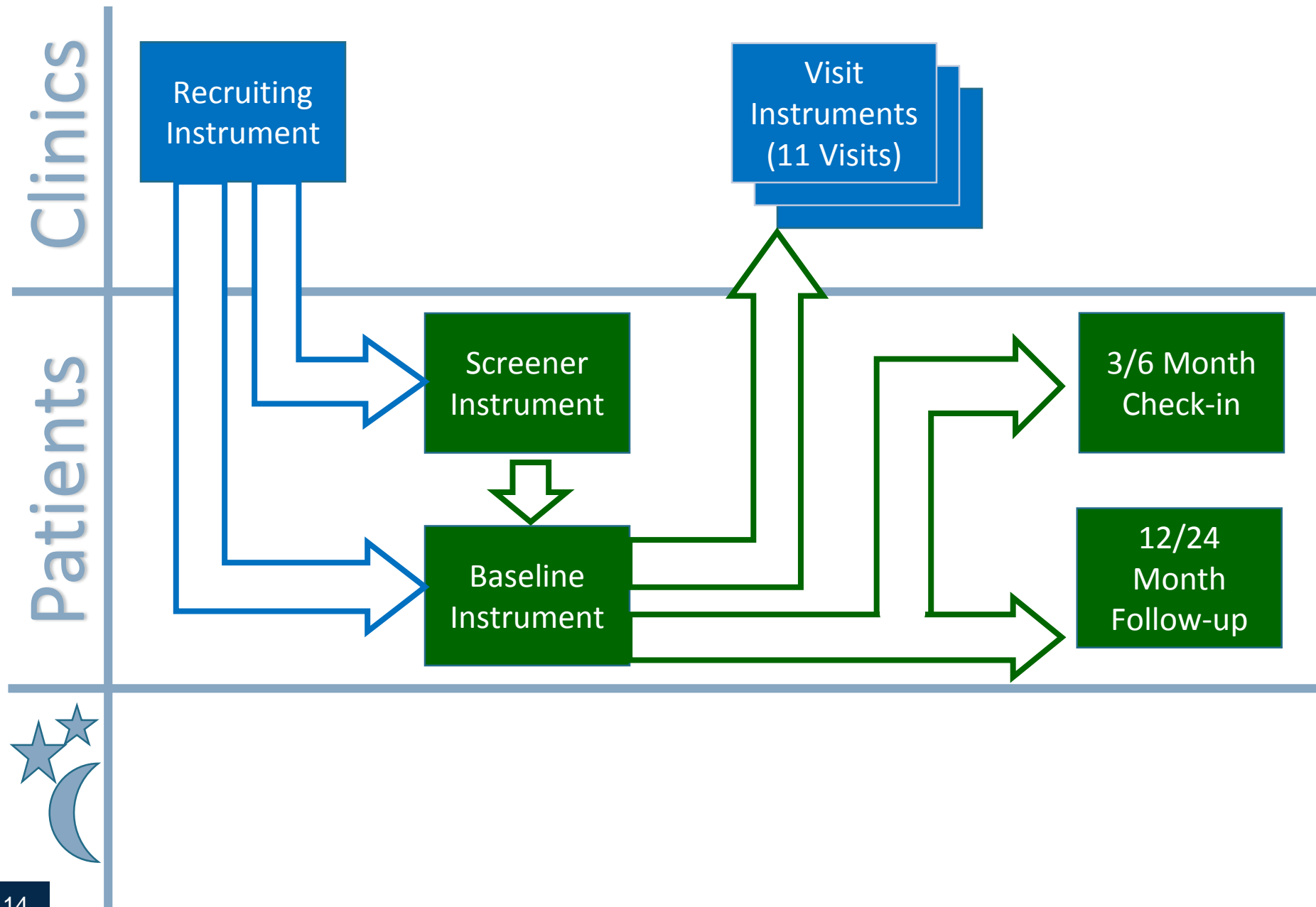
Patients



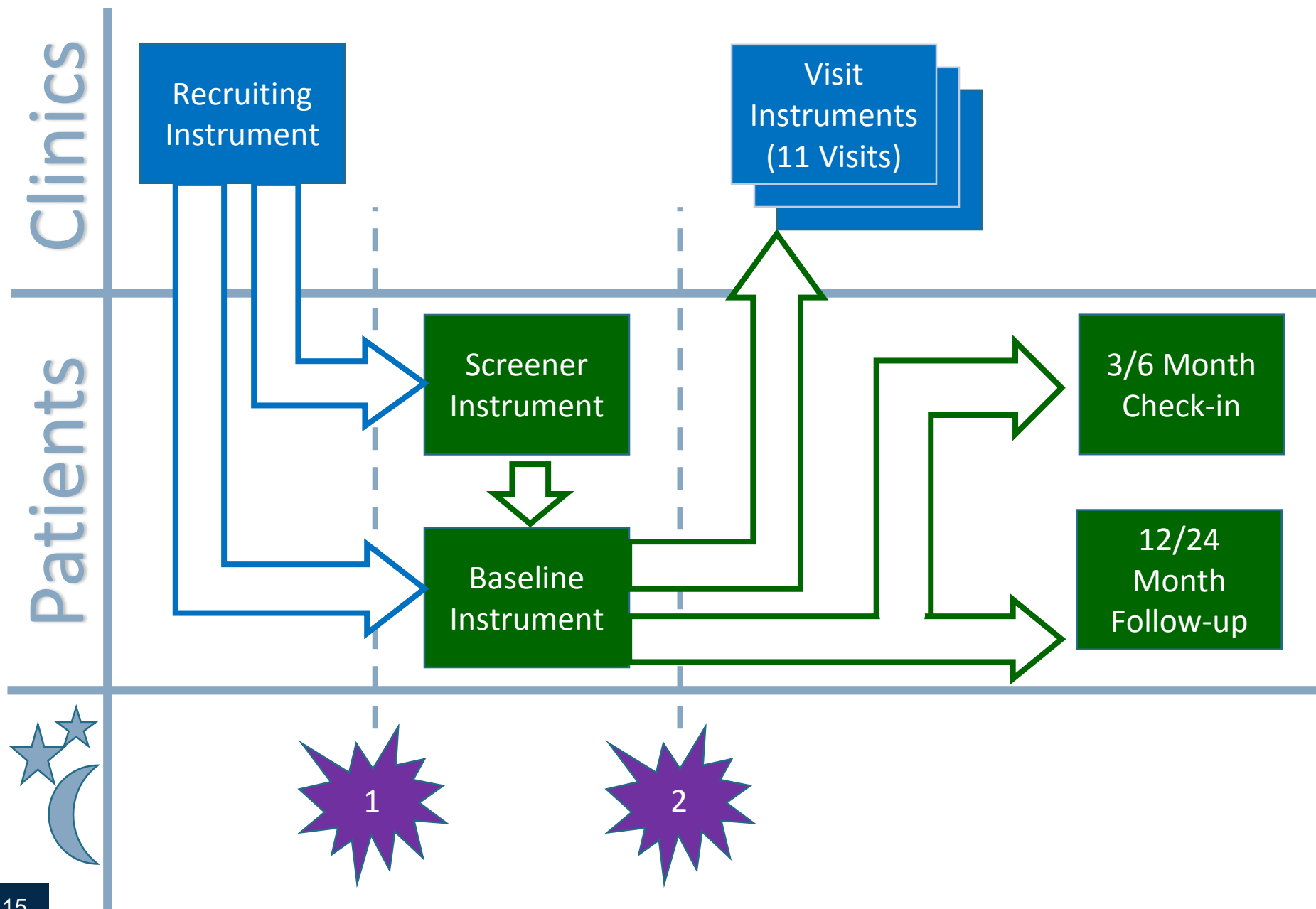
The MAT Study – Data Collection Flow



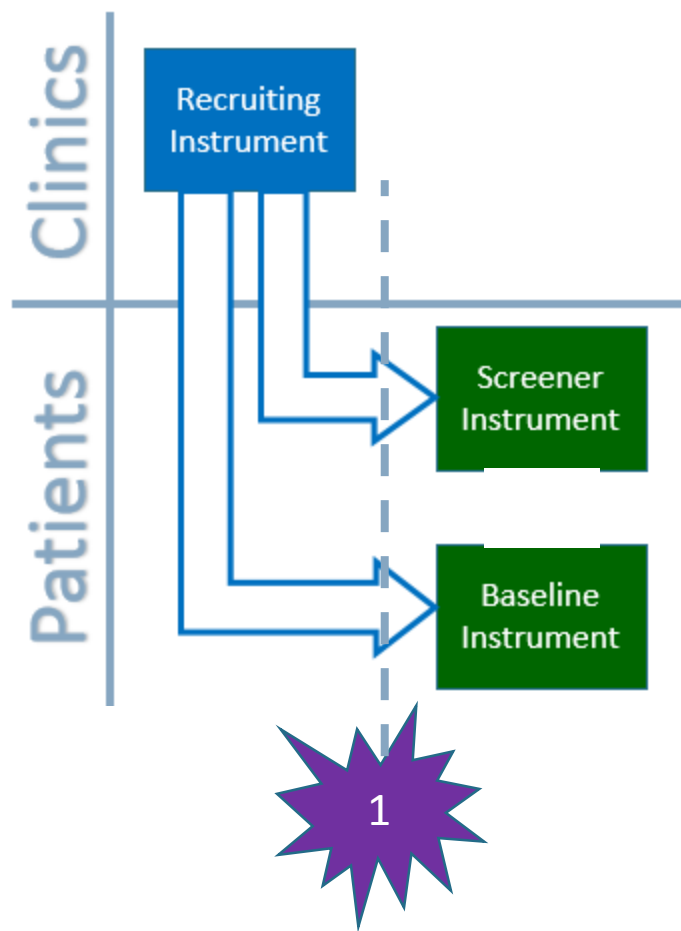
The MAT Study – Data Collection Flow



The MAT Study – Data Collection Flow

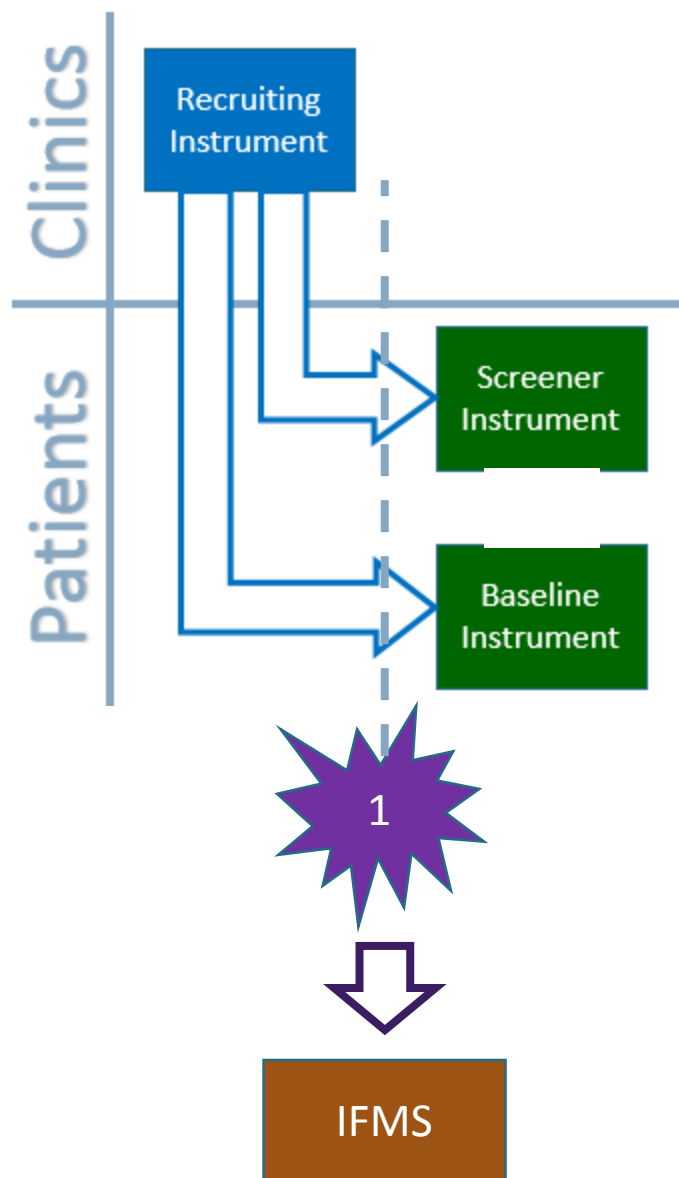


Preparing Screener/Baseline Instruments



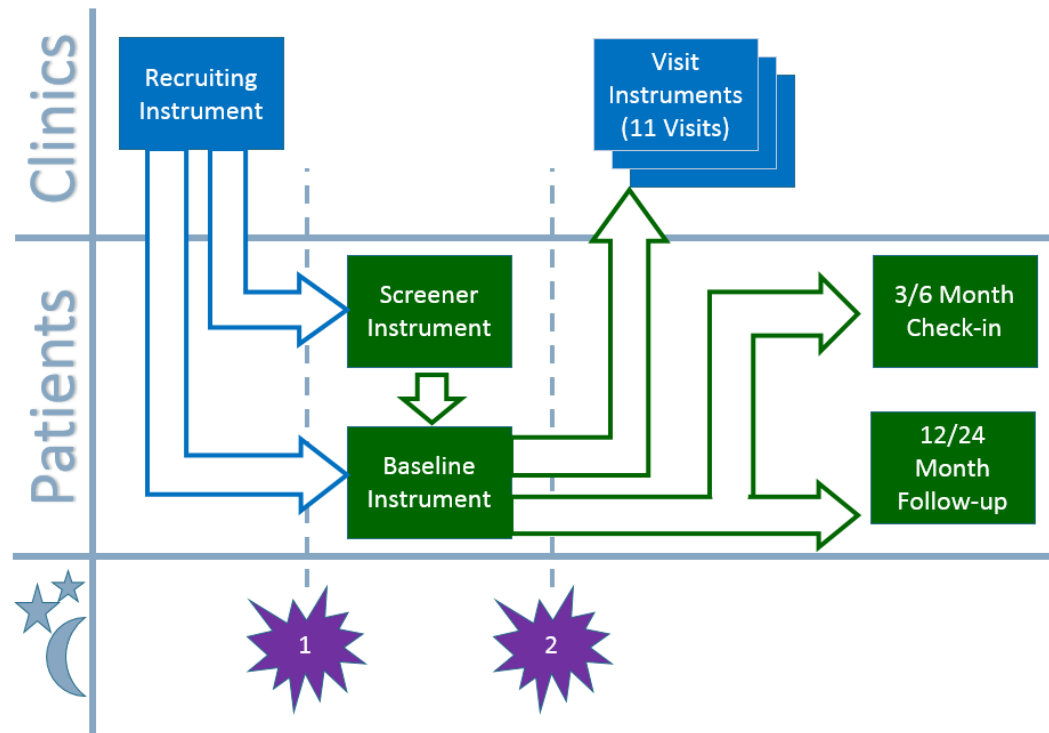
- Upon Completing the Recruiting of a Patient, Batch Processes:
 - Preload Screener and Baseline cases simultaneously
 - Assign Recruited Patients to Preloaded Voxco Cases (with matching Case IDs)
 - Preload values from the Recruiting Instrument to the Screener and Baseline instruments

Preparing Screener/Baseline Instruments



- Upon Completing the Recruiting of a Patient, Batch Processes:
 - Preload Screener and Baseline cases simultaneously
 - Assign Recruited Patients to Preloaded Voxco Cases (with matching Case IDs)
 - Preload values from the Recruiting Instrument to the Screener and Baseline instruments
 - Push Cases to the Integrated Field Management System (IFMS) for assignments to FIs

Preparation of Remaining Instruments – Similar Process



▪ Nightly Processing Approach

- Schedule the Voxco Online Export
- Batch programming processes run in the early AM.
- Schedule Voxco Online Import to run prior to the start of work day.

Batch Processing Challenge

- Challenge
 - Pushing the exported files to our project share for processing

Batch Processing Challenge

- Challenge

- Pushing the exported files to our project share for processing

- Problem

- The available options displayed are: **email**, **ftp** or a **manual** download.

The screenshot shows a software options dialog box with two main sections: 'Options' and 'Distribute'. The 'Options' section contains various checkboxes for file export formats (e.g., 'Include Open-Ends', 'Triple S XML'), a 'Max Record Length' input field, and a 'Select Encoding' dropdown menu. The 'Distribute' section contains checkboxes for 'Send files by email' and 'Publish files to FTP site'. Two red arrows originate from the text 'email' and 'ftp' in the slide's text and point to the 'Send files by email' and 'Publish files to FTP site' checkboxes, respectively. The 'Publish files to FTP site' section includes fields for 'Server address', 'Username', 'Password', and 'Folder', along with radio buttons for 'Security' (None, Use SSL, Use SFTP) and 'Compress files' (Yes, No). At the bottom, there are 'Cancel' and 'Save' buttons, and a 'Test connection' link.

Batch Processing Challenge

- Challenge

- Pushing the exported files to our project share for processing

- Problem

- The available options displayed are: **email**, **ftp** or a **manual** download.
- FTP option does not fit our needs, too many steps to get the data directly to our project share.

Batch Processing Challenge

- Challenge

- Pushing the exported files to our project share for processing

- Problem

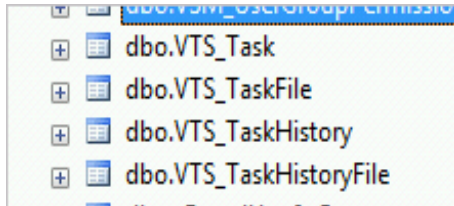
- The available options displayed are: **email**, **ftp** or a **manual** download.
- FTP option does not fit our needs, too many steps to get the data directly to our project share.

- Solution

- A table in the Voxco Online database stores the export tasks as BLOB data.
- A nightly batch process pulls the most recent export and build data import files and or datasets.

Batch Processing Export Solution

▪ SQL Code



```
[string] $sql = "SELECT thf.[Name], thf.[Data]
                FROM (Select max(ID) as id , taskid from dbo.VTS_TaskHistory group by taskid) th
                left join dbo.VTS_TaskHistoryFile thf on thf.taskhistoryid = th.id
                WHERE th.taskid = $Taskid";
```

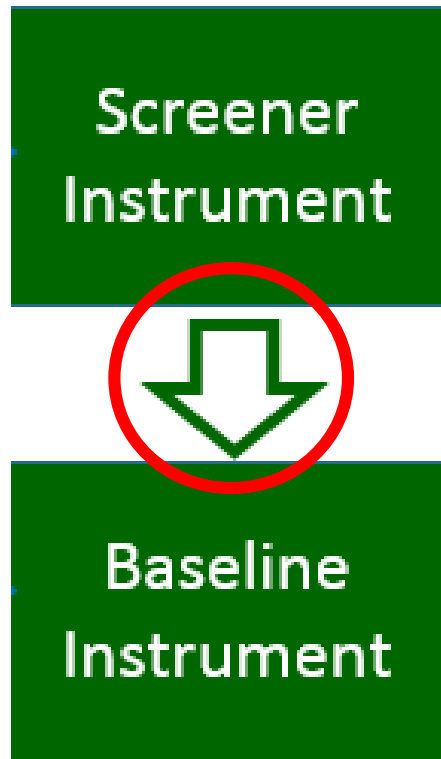
▪ Process

- Pulls the exported data file
- Unzips the zipped “blob”
- Conducts various processing steps
- Outputs dated file for the Voxco Online import step

Ex: screener_yyyy_mm_dd.csv

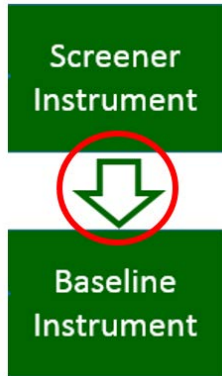
- The Voxco Online scheduled import task picks up the dated file

Preloading Variables w/o Nightly Processing



- The Baseline can be conducted immediately after the Screener without Nightly Processing
- Data from the Screener must be available in the Baseline
- How?

Using Execute SQL (Advanced Logic Option)

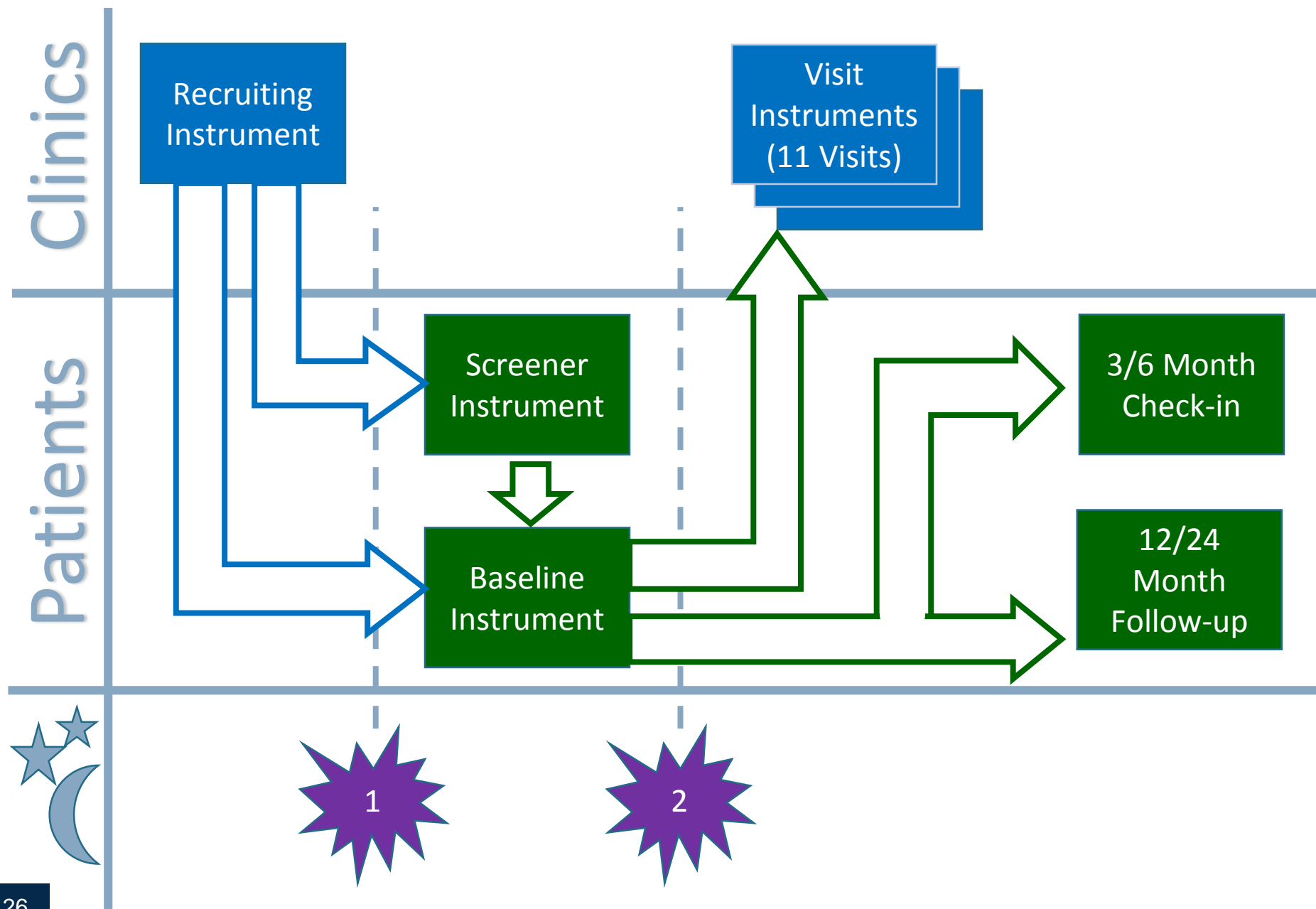


- **Execute SQL** is one of Voxco's advanced logic options.
 - We captured Screener data for our Baseline instrument to include as variable data that normally would have been preloaded.
 - We also use this approach to confirm that the previous instrument (Screener) was completed.

The screenshot shows the 'Add Action' configuration window. The 'Action' dropdown is set to 'Execute SQL'. The 'Condition' field has a '+ Add Advanced' link. The 'Connection String' field contains the text 'SERVER=xx; DATABASE=xx; UID=xx; PASSWORD=xx;'. The 'SQL Statement' field contains the text 'Select rpscontent from survey_abc.response where rpsquestion = 'Q1' and rpsrespondent=[SQ]'. A 'Test' button is located at the bottom right of the SQL statement field. Below the main configuration area, there is a section for 'Update variables with result'. It features a table with two columns: 'Variable' and 'Data Field Name'. The 'Data Field Name' column contains the value 'rpscontent'. An 'Existing variable' label points to the 'Variable' column, and an 'Add' button is located below the table.

Variable	Data Field Name
	rpscontent

The MAT Study – Data Collection Flow



The MAT Study – Data Collection Flow



Customized Grid Questions in Voxco Online

C2. Indicate whether the following assays have already been run on the **mother** using biospecimens already collected and stored prior to ECHO, according to life course stage of the child.

C2. <u>Mother's biospecimens assays, already run on biospecimens collected and stored prior to ECHO</u>	Performed on biospecimens from 1 or more life course stages of the child: Yes No	Life Course Stages of the Child					
		(1) Preconception	(2) Prenatal	(3) Delivery and Infancy Birth < 12 months	(4) Childhood 1 to < 5 years	(5) Middle Childhood 5 to <12 years	(6) Adolescence 12 to <18 years
44. Microbiome	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
45. Metagenome (shotgun sequencing)	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
46. Other, please choose one from following: Hormones <input type="text" value="Hormones"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Organophosphate or other alternative flame retardants	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Non-targeted or suspect screening approaches to assess chemical exposures	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Telomere length	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please check you have answered all rows.

Customized Grid Questions in Voxco Online

C2. Indicate whether the following assays have already been run on the **mother** using biospecimens already collected and stored prior to ECHO, according to life course stage of the child.

C2. <u>Mother's biospecimens assays, already run on biospecimens collected and stored prior to ECHO</u>	Performed on biospecimens from 1 or more life course stages of the	Life Course Stages of the Child					
		(1) Conception	(2) Prenatal	(3) Delivery and Infancy Birth < 12 months	(4) Childhood 1 to < 5 years	(5) Middle Childhood 5 to < 10 years	(6) Adolescence 10 to < 18 years
44. Microbiome	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
45. Metagenome (shotgun sequencing)	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
46. Other, please choose one following: Hormones <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Organophosphate or other alternative flame retardants	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Non-targeted or suspect screening approaches to assess chemical exposures	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Telomere length	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please check you have answered all rows.

Customized grid-type questions with:

- Radio button
- Checkbox
- Dropdown list
- Free text

Customized Grid Questions in Voxco Online

You have 1 Blocks and 2 Questions

Expand All / Collapse All Preview

Toolbox

- Block
- Page Break
- Check Box
- Radio Button
- Text Answer
- Choice Grid

Questionnaires

My Library

Public Library

Search

Edit Structure

Back to top

Custom Question

Name: CUSTOM

Text

C2. Indicate whether the following assays have already been run on the **mother** using biospecimens already collected and stored prior to ECHO, according to life course stage of the child.

Content

```
stored prior to ECHO</b></td>
  <td style="border: 1px solid black; text-align:
  center" rowspan="2"><b>Performed on bio-specimens from 1
  or more life course stages of the child:<br>Yes No</b></td>
  <td colspan="6" style="text-align: center"><b>Life
  Course Stages of the Child<b></td>
</tr>
<tr>
  <td style="border: 1px solid black; text-align:
  center"><b>(1)<br>Preconception</b><div
  class="tooltip">Mouse over for detail
  <span class="tooltiptext">The
```

Options

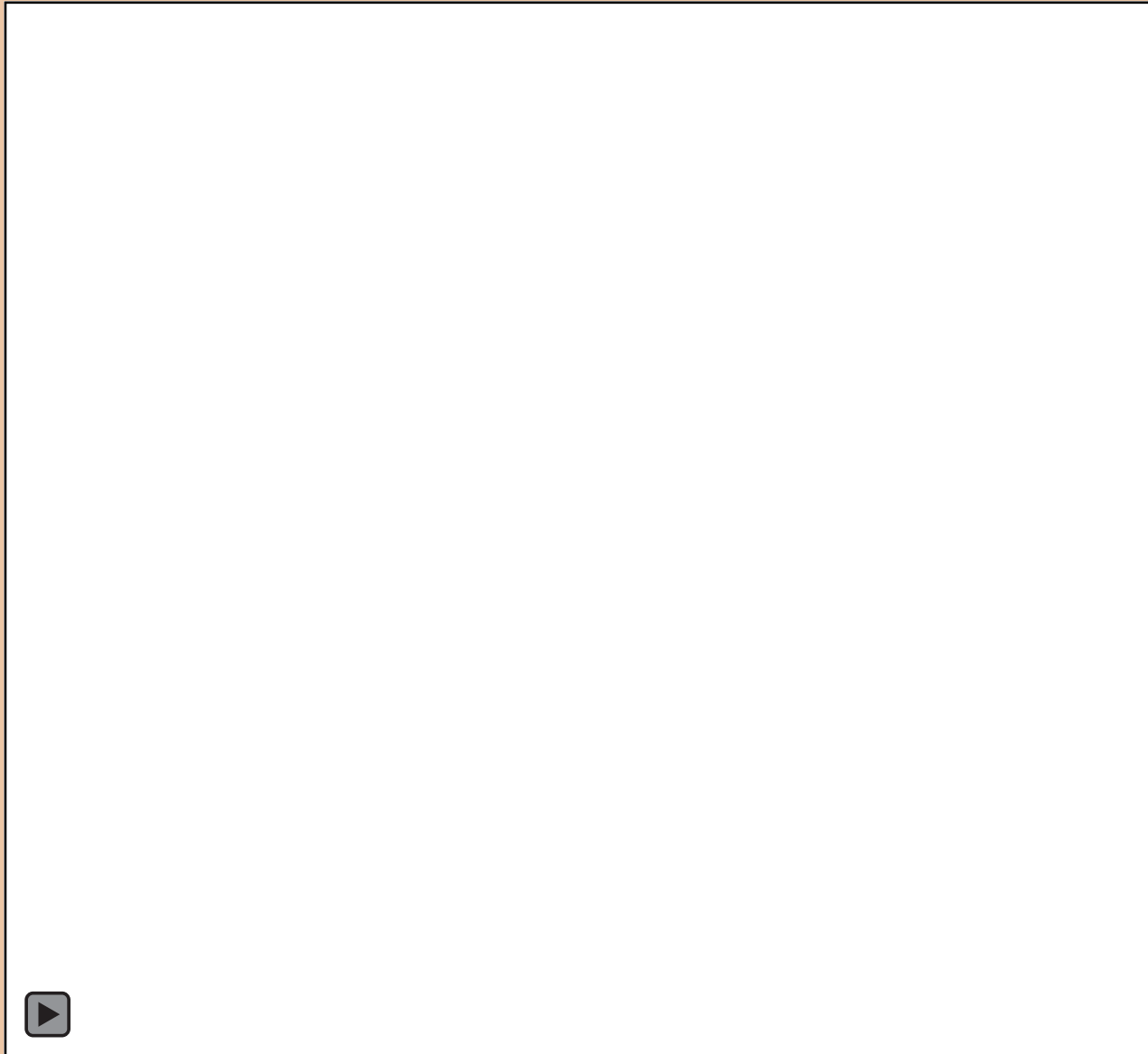
- Active
- Answer Required: Yes
- Skip Logic
- Advanced Logic

Revision

Name	Choices
C2_ROW_R44M1	1
	2

Use the “Content” box in a “Custom Question” form to achieve robust customization!

Responsive Design within the Customized Grid




Desired Behaviors

- When **“N”** is selected...
- When **“Y”** is selected...
- When **text** is entered in a **textbox**...

Using JavaScript to validate user input

C2. Mother's biospecimens assays, already run on biospecimens collected and stored prior to ECHO	Performed on biospecimens from 1 or more life course stages of the child: Yes No	Life Course Stages of the Child					
		(1) Preconception	(2) Prenatal	(3) Delivery and Infancy Birth < 12 months	(4) Childhood 1 to < 5 years	(5) Middle Childhood 5 to <12 years	(6) Adolescence 12 to <18 years
44. Microbiome	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
45. Metagenome (shotgun sequencing)	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
46. Other, please choose one from following: Hormones <input type="text"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Other, specify: <input type="text"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Other, specify: <input type="text"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Organophosphate or other flame retardants					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Non-targeted or suspect screening approaches to assess chemical exposures	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Telomere length	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Message from webpage

 At least one Y/N entry or life stage or input missed, recheck work please.

OK

Please check you have answered all rows.

Check form data

Customized JavaScript code is used to validate data input overcoming a limitation of form validation.

Customize further with HTML Styling

C2. Indicate whether the following assays have been performed on the **mother** using biospecimens already collected and stored prior to ECHO, according to the following definitions:

The definition of a preconception is a notion, opinion or idea that you have formed before going into something, sometimes based on bias or prejudice.

C2. Mother's biospecimens assays, already run on biospecimens collected and stored prior to ECHO	Performed on bio-specimens from 1 or more life course stages of the child: Yes No	Life Course Stages of the Child					
		Preconception Mouse over for detail	(2) Prenatal	(3) Delivery and Infancy Birth < 12 months	(4) Childhood 1 to < 5 years	(5) Middle Childhood 5 to < 12 years	(6) Adolescence 12 to < 18 years
44. Microbiome <input type="button" value="Detail"/>	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
45. Metagenome (shotgun sequencing)	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, anatomical site(s): <input type="text"/>							
46. Other, please choose one from following: Hormones <input type="button" value="v"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Other, specify: <input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Organophosphate and other alternative flame retardants	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Non-targeted or suspect screening approaches to assess chemical exposures	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Telomere length	<input type="radio"/> Y <input type="radio"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Tooltip
- Dialog box
- Color code table cells

Please check you have answered all rows.



delivering **the promise of science**
for global good



Nathan Sikes
sikes@rti.org
919-316-3320