eReports CCHD Data Collection and Submission to

Michigan Department of Health & Human Services Newborn Screening Program

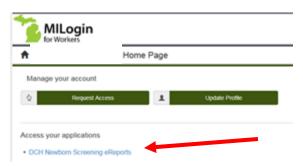
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Introduction

The Michigan Department of Health & Human Services has established the Newborn Screening eReports web based module to record information regarding critical congenital heart disease (CCHD) screening and evaluation administered by health care providers. The eReports module is a data reporting system that allows providers to securely enter pulse oximetry results online. The Newborn Screening eReports will allow for the implementation of the U.S. Secretary of Health and Human Services' recommendation for routine pulse oximetry (Pulse Ox) screening of newborns and for the improvement, evaluation of screening outcomes, and surveillance of congenital heart defects.

eReports is one of the four configurable modules available in the SpecimenGate Enterprise software suite. SpecimenGate software, which has been developed by PerkinElmer, is designed to simplify the data collection and workflow processes involved in neonatal and prenatal laboratories. eReports has been configured as per the specifications agreed upon between the State of Michigan Newborn Screening Laboratory and PerkinElmer. It has been incorporated into SpecimenGate Enterprise deployment at the Newborn Screening Laboratory.



Access to the Newborn Screening eReports module is through the State of Michigan MILogin site.

The application is 'DCH Newborn Screening eReports'.

Figure 1

After selecting the 'DCH Newborn Screening eReports' application you will be at the Terms & Conditions DCH Newborn Screening eReports screen.

After clicking on the Acknowledge/Agree button you will open up to the eReports Home Screen.



Figure 2

eReports Home Screen



Figure 3

eReports Home Screen features

- 1. The upper left navigation menu shows the current options available. The options that will be used for the Pulse Ox screening results will be:
 - Home
 - Specimen Search
 - Pulse Ox
 - Logout
- 2. The eReports Home page includes the Specimen Search feature.

Note: the upper left navigation menu appears on all the eReports screens.

Specimen Search





Figure 4

- 1. The pulse oximetry readings entered by the user will be linked to the Newborn Screening blood spot card received in the State laboratory. Specimen search is a tool that allows the user to check if the Newborn Screening blood spot card has arrived in the State laboratory.
- 2. The specimen search screen is accessible by clicking "Specimen Search" on the left navigation menu or from the Home page.
- Specimen search will find those specimens that have been entered into the Newborn Screening Laboratory Information Management System, Specimen Gate, based on matching search criteria.

4. Search fields

- Baby's Last Name
- Baby's Birth Date (mm/dd/yyyy)
- Mother's Last Name

- Multiple Birth Order
- Baby's Medical Record Number
- Newborn Screening Kit Number (the bar code number on the Newborn Screening blood spot card)

5. Performing a search

- All fields are not required to perform a search
- If the Newborn Screening Kit Number is not available it is recommended to use a combination of the other fields for the search. Mother's Last Name **and** Baby's Birth Date work well as search parameters.
- If the baby you are searching for is not found on the first attempt, try running the query again.

Search Results

- Any specimen results returned from a search are visible in the Search Results grid as noted below in figure 5.
- Searching on just one field (other than Newborn Screening Kit Number) can bring up pages of results in the Search Results grid as noted in figure 5.
- You can sort in descending or ascending order by clicking any column heading that has a blue, underlined link in the name.

Michigan Department of Health & Human Services

Results	Filter Paper	<u>Last Name</u>	Birth Date	Collection Date	Gender	Pulse Ox	Clinical Exam	Case Report
Results	0003130	-	10/24/2003	10/26/2003	Male	Pulse Ox		
Results	0003241	2	10/17/2003	10/19/2003	Female	Pulse Ox		
Results	0005072	100	11/12/2003	11/13/2003	Female	Pulse Ox		
Results	0007356		09/30/2003	10/02/2003	Female	Pulse Ox		
Results	0008003		10/16/2003	10/18/2003	Male	Pulse Ox		-11

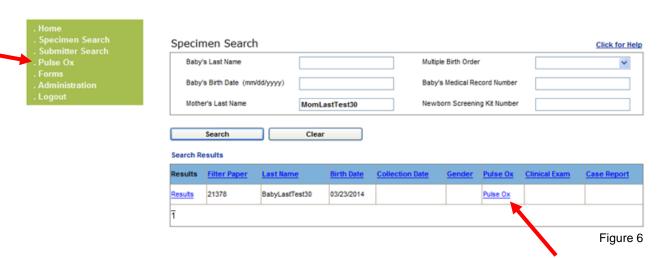
Figure 5

Pulse Ox Data Entry

There are two ways to access the Pulse Ox entry screen:

- The Pulse Ox screen is accessible by clicking "Pulse Ox" on the left navigation menu. This brings up a blank Pulse Ox entry screen (see page 12 for example).
- Run a Specimen Search query for a baby you want to enter pulse ox results for and when results are returned click on <u>Pulse Ox</u> in the Search Results grid. If the baby is found in your Specimen Search that means that the Newborn Screening blood spot card demographics are already entered in the lab database.

Using the **Specimen Search** query here is an example of doing a search by Mother's Last Name and Baby's Birth Date where just one search result is returned:



To enter the pulse oximetry results on the baby you are going to click on <u>Pulse Ox</u> in the result grid.

When the Pulse Ox screen opens from the link in the Search Results return grid you will see that the demographic fields are automatically filled in due to the link made to the Newborn Screening blood spot card demographics. Make sure that the demographics showing in the Pulse Ox entry screen are for the baby you did your search on. If not, go back to Specimen Search screen and run your query again.

Any changes attempted to the demographic fields that fill in from the Newborn Screening blood spot card will not be accepted.



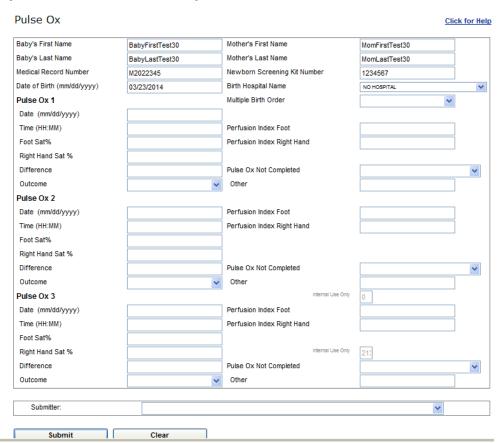


Figure 7

Pulse Ox Data Entry:

- 1. Required Pulse Ox data fields:
 - Pulse Ox Date
 - Pulse Ox Time
 - Foot Saturation % reading
 - Right Hand Saturation % reading
 - Difference between the Foot and Right Hand Saturation readings
 - Outcome of the Pulse Ox reading
 - Pass
 - Rescreen
 - Fail

- If Pulse Ox reading was not done then the reason not completed must be entered in one of these fields:
 - Pulse Ox Not Completed (choose from drop down options)
 - Other (if reason not completed is not found in Pulse Ox Not Completed drop down list)

Recommended suggestions for 'Other' reasons Pulse Ox Not Completed

- a) ECHO
- b) Home on oxygen
- c) Hospice

2. Optional data fields

- Perfusion Index Foot (not all machines have this reading)
 Do not enter the '<' or '>' sign that might be associated with reading, enter the number only
- Perfusion Index Right Hand (not all machines have this reading)
 Do not enter the '<' or '>' sign that might be associated with reading, enter the number only
- Data entered must conform to the entry format specified
 - Dates should be in 'MM/DD/YYYY' format. i.e. '01/23/2013'
 - Times should be in 'HH:MM format, i.e. '14:20' or '04:05'
 - For 'Perfusion Index Foot' and 'Perfusion Index Right Hand' fields do not to enter '<'or '>' as part of the input value. Numbers with decimal points are accepted.

For all 'Foot Sat %' and 'Right Hand Sat %' fields -

- Do not enter % sign as part of the input value.
- Enter positive numbers only.
- 'Difference' between Foot and Right Hand Saturation readings must be absolute number only (no negative numbers)
- Pulse Ox Not Completed: If applicable 'not completed' reason is not available in the drop down box, enter the reason in 'Other' text field below Pulse Ox Not Completed.
- 4. If a second (Pulse Ox 2) or third (Pulse Ox 3) Pulse Ox reading was performed, enter additional reading(s).
- 5. In the Submitter field you will select your hospital from the drop down list provided. This will associate that the pulse oximetry results being submitted are from hospital selected.
- 6. Click "Submit" to process the information and save the data.

- 7. Click "Clear" to clear the screen.
- 8. Data entered is processed against validation rules.
 - The validation rules relate to items 1, 3 and 5 from above:
 - Required data fields
 - Data entered must conform to the entry format specified
 - If validation fails, a message is displayed at the top of the screen in red with instructions regarding what must be corrected.
 - If validation passes, a message is displayed at the top of the screen in red confirming the entry.
 - Table A lists typical error messages.

Here is an example of a pulse ox reading entered correctly. Note the entry in red at the top confirming the entry: Pulse Ox saved for: BabyLastTest30

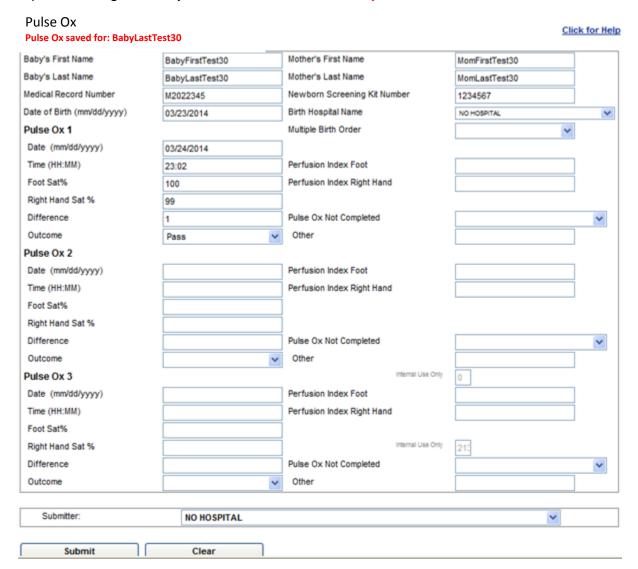


Figure 8

Here is an example of pulse ox readings entered incorrectly with error messages for:

- Pulse Ox 1 Date entered incorrectly (Pulse Ox Date must be in MM/DD/YYYY format)
- Pulse Ox 1 Time entered incorrectly (Pulse Ox Time must be HH:MM format)
- Pulse Ox 1 Outcome entered incorrectly (The difference between Foot Sat% and Right Hand Sat% for Pulse Ox 1 is 4 or greater. Outcome must be Rescreen.)

Pulse Ox			CI	ick for Help		
Pulse 0x entry failed because:						
-Pulse Ox Date 1 must be MM/DD -Pulse Ox Date 1 is invalid	-Pulse Ox Date 1 must be MM/DD/YYYY format -Pulse Ox Date 1 is invalid					
-Pulse Ox Time 1 must be in XX:)						
 The difference between Foot Sa Correct these fields and try agai 		Pulse 0x 1 is 4 or greater. Outcome mu	ist be Rescreen.			
Baby's First Name	BabyFirstTest1	Mother's First Name	MomFirstTest1			
Baby's Last Name	BabyLastTest1	Mother's Last Name	MomLastTest1			
Medical Record Number	M12345	Newborn Screening Kit Number	1012345	j l		
Date of Birth (mm/dd/yyyy)	03/01/2014	Birth Hospital Name	NO HOSPITAL	~		
Pulse Ox 1		Multiple Birth Order	~			
Date (mm/dd/yyyy)	03022014			_		
Time (HH:MM)	315	Perfusion Index Foot				
Foot Sat%	100	Perfusion Index Right Hand				
Right Hand Sat %	95					
Difference	5	Pulse Ox Not Completed		~		
Outcome	Pass	Other				
Pulse Ox 2						
Date (mm/dd/yyyy)		Perfusion Index Foot				
Time (HH:MM)		Perfusion Index Right Hand				
Foot Sat%						
Right Hand Sat %						
Difference		Pulse Ox Not Completed		~		
Outcome	~	Other				
Pulse Ox 3		Internal Use Only				
Date (mm/dd/yyyy)		Perfusion Index Foot				
Time (HH:MM)		Perfusion Index Right Hand				
Foot Sat%						
Right Hand Sat %		Internal Use Only	193			
Difference		Pulse Ox Not Completed		~		
Outcome	~	Other				

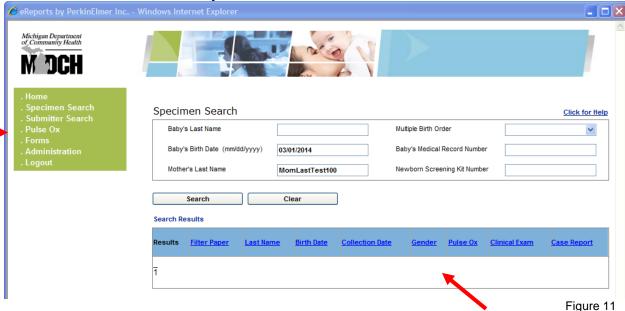
Figure 9

When the fields are corrected and Submit button selected again you get the message that Pulse Ox updated for this baby.

Pulse Ox			Click	c for Help
Pulse Ox updated for: BabyLast1	Test1.			
Baby's First Name	BabyFirstTest1	Mother's First Name	MomFirstTest1	
Baby's Last Name	BabyLastTest1	Mother's Last Name	MomLastTest1	
Medical Record Number	M12345	Newborn Screening Kit Number	1012345	
Date of Birth (mm/dd/yyyy)	03/01/2014	Birth Hospital Name	NO HOSPITAL	~
Pulse Ox 1		Multiple Birth Order	~	
Date (mm/dd/yyyy)	03/02/2014			
Time (HH:MM)	03:15	Perfusion Index Foot		
Foot Sat%	100	Perfusion Index Right Hand		
Right Hand Sat %	95			
Difference	5	Pulse Ox Not Completed		~
Outcome	Rescreen	Other		
Pulse Ox 2		-		
Date (mm/dd/yyyy)		Perfusion Index Foot		
Time (HH:MM)		Perfusion Index Right Hand		
Foot Sat%				
Right Hand Sat %				
Difference		Pulse Ox Not Completed		~
Outcome	~	Other		
Pulse Ox 3		Internal Use Only		
Date (mm/dd/yyyy)		Perfusion Index Foot		
Time (HH:MM)		Perfusion Index Right Hand		
Foot Sat%				
Right Hand Sat %		Internal Use Only	193	
Difference		Pulse Ox Not Completed		~
Outcome	~	Other		

Figure 10

For this example, we will use the **Specimen Search** option to conduct a search using Mother's Last Name and Baby's Birth Date:



In this particular case the baby was not found and the Search Results fields were returned blank.

As mentioned on page 4, if a baby you want to enter Pulse Ox readings on is not found with Specimen Search query then you can still enter the Pulse Ox results. Open a blank Pulse Ox screen by clicking on Pulse Ox from the upper left navigation menu.

Blank Pulse Ox Screen



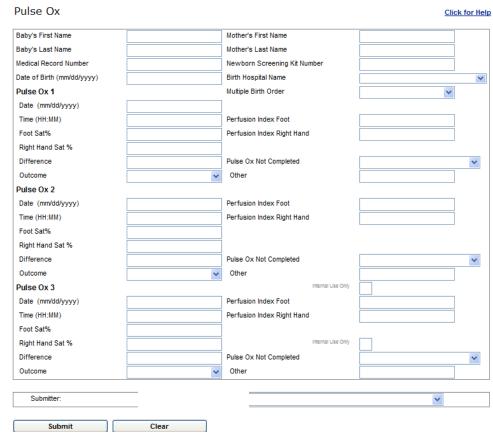


Figure 12

You can see that none of the demographic fields are filled in so you will need to supply that information.

The required demographic fields are:

- Mother's First Name
- Mother's Last Name
- Date of Birth (MM/DD/YYYY). This is the baby's date of birth.

You will receive an error message if these are missing.

Providing more demographic fields will make linking to the Newborn Screening blood spot card demographics more exact.

This is an example of entering the demographics and the pulse ox information starting from a blank Pulse Ox screen:

Pulse Ox Pulse Ox saved for: BabyLas	tTest3		Click for Help
Baby's First Name	BabyFirstTest3	Mother's First Name	MomFirstTest3
Baby's Last Name	BabyLastTest3	Mother's Last Name	MomLastTest3
Medical Record Number	M87655	Newborn Screening Kit Number	1234567
Date of Birth (mm/dd/yyyy)	03/02/2014	Birth Hospital Name	NO HOSPITAL
Pulse Ox 1		Multiple Birth Order	~
Date (mm/dd/yyyy)	03/03/2014		
Time (HH:MM)	14:02	Perfusion Index Foot	
Foot Sat%	91	Perfusion Index Right Hand	
Right Hand Sat %	92		
Difference	1	Pulse Ox Not Completed	~
Outcome	Rescreen	Other	
Pulse Ox 2			
Date (mm/dd/yyyy)	03/03/2014	Perfusion Index Foot	
Time (HH:MM)	15:10	Perfusion Index Right Hand	
Foot Sat%	91		
Right Hand Sat %	90		
Difference	1	Pulse Ox Not Completed	~
Outcome	Rescreen	✓ Other	
Pulse Ox 3		Internal Use Only	
Date (mm/dd/yyyy)	03/03/2014	Perfusion Index Foot	
Time (HH:MM)	16:15	Perfusion Index Right Hand	
Foot Sat%			
Right Hand Sat %		Internal Use Only	
Difference		Pulse Ox Not Completed	Referred for further follow-up
Outcome		∨ Other	
Submitter:	NO HOSPITAL		~
Submit	Clear		

Figure 13

Table A. eReports Error List

<u>Issue</u>	Error Message Explanation
Date format	Pulse Ox Date must be in MM/DD/YYYY format
Pulse ox date(s) precedes birth date	Pulse ox date(s) cannot be earlier than birth date
Pulse ox 2 date/time precedes pulse ox 1 date/time	Pulse ox 2 date/time cannot be earlier than pulse ox 1 date/time
Pulse ox 3 date/time precedes pulse ox 1 and/or pulse ox 2 date(s)/time(s)	Pulse ox 3 date/time cannot be earlier than pulse ox 1 and/or pulse ox 2 date(s)/time(s)
Time format	Pulse Ox Time must be HH:MM format and time must be a valid time
Difference opposed to outcome	Pulse Ox Outcome must be either Pass, Rescreen or Fail based on Pulse Ox Difference. (See CCHD algorithm for Outcome guide, page 18)
Actual difference in reading opposed to that entered by the user	Pulse Ox Difference between the Foot Saturation and Right Hand Saturation readings is entered incorrectly. This must also be an absolute number (no plus or minus signs).
Invalid characters	Pulse ox Foot Sat%, Right Hand Sat % and Difference, cannot contain invalid characters. Only numeric integer values are accepted. Do not enter the '%' sign.
Invalid characters	Perfusion Index Foot and Perfusion Index Right Hand fields cannot contain invalid characters. Do not enter the '<' or '>' sign. Decimal numbers are allowed.
'Pulse Ox Not Completed' reason selected when there are values entered for pulse ox readings (see figure 14)	If there are values entered for Pulse Ox Foot Sat%, Right Hand %, Difference and Outcome fields then there should not be a selection showing in the Pulse Ox Not Completed field.
'Other' field populated when there are values entered for pulse ox readings	If there are values entered for Pulse Ox Foot Sat%, Right Hand %, Difference and Outcome fields then there should not be a selection showing in the Other field
Mother's first name empty (see figure 15)	Mother's first name is a required demographic field, cannot be empty
Mother's last name empty (see figure 15)	Mother's last name is a required demographic field, cannot be empty
Baby's date of birth is empty (see figure 15)	Baby's date of birth is a required demographic field, cannot be empty.

Following is an example of Pulse Ox reading entries rejected due to:

- 1. Not completed reason specified when Pulse Ox values are also entered:
 - Pulse Ox Foot Sat% entered but there is also Pulse Ox Not Completed reason
 - Pulse Ox Right Hand % entered but there is also Pulse Ox Not Completed reason
 - Difference entered but there is also Pulse Ox Not Completed reason
 - Outcome entered but there is also Pulse Ox Not Completed reason

Pulse Ox				Cli	ck for Help
-Not completed reason specif	fied but a value is entered		Pulse Ox 1 Foot Sat%. Please remove th Pulse Ox 1 Right Hand Sat%. Please rem		
			Pulse 0x 1 Difference. Please remove the value selected for Pulse 0x 1 Outcome.	-	
completed reason. Correct these fields and try a	gain				
Baby's First Name	BabyTestFirst200		Mother's First Name	MomTestFirst200]
Baby's Last Name	BabyTestLast200		Mother's Last Name	MomTestLast200	ĺ
Medical Record Number	M1012345		Newborn Screening Kit Number	1234567	
Date of Birth (mm/dd/yyyy)	03/30/2014		Birth Hospital Name	NO HOSPITAL	~
Pulse Ox 1			Multiple Birth Order	~]
Date (mm/dd/yyyy)	03/31/2014				1
Time (HH:MM)	23:19		Perfusion Index Foot]
Foot Sat%	100		Perfusion Index Right Hand		ĺ
Right Hand Sat %	99				•
Difference	1		Pulse Ox Not Completed	Transfer	~
Outcome	Pass	~	Other		
Pulse Ox 2					-
Date (mm/dd/yyyy)			Perfusion Index Foot		
Time (HH:MM)			Perfusion Index Right Hand		
Foot Sat%					
Right Hand Sat %					
Difference			Pulse Ox Not Completed		~
Outcome		~	Other		
Pulse Ox 3			Internal Use Only		
Date (mm/dd/yyyy)			Perfusion Index Foot		
Time (HH:MM)			Perfusion Index Right Hand		
Foot Sat%					
Right Hand Sat %			Internal Use Only		
Difference			Pulse Ox Not Completed		~
Outcome		V	Other		

Figure 14

If the baby actually did transfer that would be entered as a separate event. In case above it would be entered under Pulse Ox 2 as there were actual Pulse Ox 1 readings.

Following is an example of Pulse Ox reading entries rejected due to:

- 1. Required demographic fields are empty
 - Baby's Date of Birth (MM/DD/YYYY) is missing
 - Mother's First Name is missing
 - Mother's Last Name is missing

Example 2

Pulse Ox			<u>c</u>	lick for Help
Pulse Ox entry failed because: -Mother's first name cannot be -Mother's last name cannot be -Baby's date of birth cannot be -Pulse Ox Date 1 is invalid Correct these fields and try ag	empty.			
Baby's First Name	BabyTestFirst200	Mother's First Name		
Baby's Last Name	BabyTestLast200	Mother's Last Name		
Medical Record Number	M1012345	Newborn Screening Kit Number	1234567	
Date of Birth (mm/dd/yyyy)		Birth Hospital Name	NO HOSPITAL	~
Pulse Ox 1		Multiple Birth Order	`	•
Date (mm/dd/yyyy)	03/31/2014			
Time (HH:MM)	23:19	Perfusion Index Foot		
Foot Sat%	100	Perfusion Index Right Hand		
Right Hand Sat %	99			
Difference	1	Pulse Ox Not Completed		~
Outcome	Pass	Other		
Pulse Ox 2		_		_
Date (mm/dd/yyyy)		Perfusion Index Foot		
Time (HH:MM)		Perfusion Index Right Hand		
Foot Sat%				
Right Hand Sat %				
Difference		Pulse Ox Not Completed		~
Outcome	~	Other		<u> </u>
Pulse Ox 3		Internal Use Only		_
Date (mm/dd/yyyy)		Perfusion Index Foot		7
Time (HH:MM)		Perfusion Index Right Hand		i l
Foot Sat%				_
Right Hand Sat %		Internal Use Only		
Difference		Pulse Ox Not Completed		~
Outcome	~	Other		

Figure 15

If you ever inadvertently hit a wrong key you may get kicked out of eReports and find yourself at this screen (see figure 16) If this happens, **do not try to reconnect to eReports by using this screen.** You will have to close out of this screen by clicking on the upper right X box.

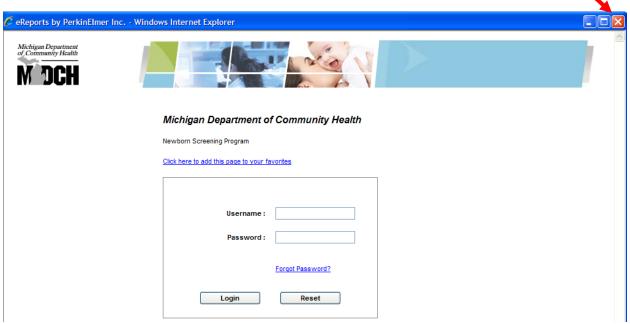


Figure 16

That will bring you back to the MILogin portal (see Figure 17 screen below). Click on 'DCH Newborn Screening eReports' to get back into the eReports module

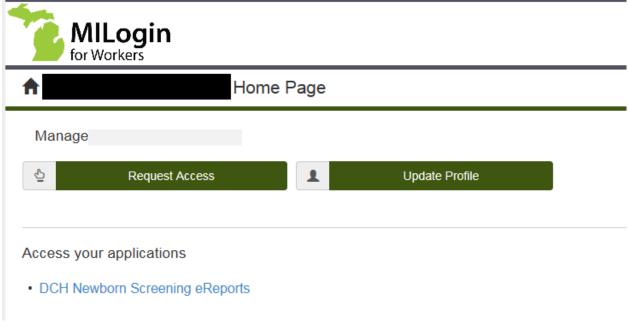


Figure 17