

Using the North Dakota Immunization Information System (NDIIS) to Order Publicly Funded Vaccine and Manage Provider Inventory



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Background



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NDIIS Background

- The North Dakota Immunization Information System (NDIIS) is a confidential, population-based, computerized information system that attempts to collect vaccination data for all North Dakotans
- Established in 1988 as a modem, dial-up system
- The ND Department of Health (NDDoH) contracted with BCBSND in 1996 to develop the current web-based system
 - NDIIS is located on their THOR (The Healthcare Online Resource) network
- ND Century Code requires North Dakota providers enter all childhood (under 18 years of age) immunizations into the NDIIS within 4 weeks of administration



NDIIS continued...

- North Dakota participates in the Vaccines For Children (VFC) federal entitlement program
- VFC eligibility is screened for each administered dose of vaccine and the NDIIS requires that dose-level VFC status be recorded for each administered dose
- Vaccine lot inventory in the NDIIS also differentiates between privately purchased and publicly purchased vaccine which needs to be matched with the appropriate VFC status when doses are added to a client record in the NDIIS
 - Publicly purchased vaccines are ordered through the NDIIS vaccine ordering module
 - Publicly purchased lot numbers are automatically entered into the NDIIS provider inventory through the VTrckS shipping file
 - Privately purchased lot numbers are manually entered into the NDIIS by the provider

Dose Management	
*Provider:	9990 - TEST
*Dose Date:	09/19/2013
*Lot #:	<input checked="" type="checkbox"/> Exclude Expired Lots H010916 - State
Vaccine:	PPV23 (Pneumococcal)
Reaction:	NONE
*VFC:	NO INSURANCE

Dose Management	
*Provider:	9990 - TEST
*Dose Date:	09/19/2013
*Lot #:	<input checked="" type="checkbox"/> Exclude Expired Lots H010145 - Private
Vaccine:	HAV (2 doses)
Reaction:	NONE
*VFC:	NOT ELIGIBLE



NDIIS continued...

- In 2011, North Dakota was awarded a Prevention and Public Health Fund (PPFH) grant to implement a vaccine ordering module in the NDIIS that interfaces with CDC's VTrckS vaccine ordering and management system
- The NDDoH contracted with BCBSND to develop the NDIIS ordering module
- In December 2012, North Dakota began using CDC's VTrckS system to order publicly funded vaccine
 - Providers still submitted paper vaccine orders and the immunization program used the NDIIS ordering module to place vaccine orders on behalf of the providers
- 100% of VFC enrolled providers began placing their own vaccine orders in the NDIIS in February 2013



NDIIS Vaccine Ordering Module



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Ordering Access

- Access to the ordering module is limited to only those users associated with a currently enrolled VFC provider
 - currently have 197 enrolled providers with ordering access
- Ordering module is accessed as it's own application on BCBSND's THOR menu
- Users can have access to order for more than one provider
 - Need to select the correct provider after opening the ordering application
 - Immunization Program staff can order on behalf of any enrolled provider

NDIIS VtrckS Ordering System

Provider Information | Provider Order

Provider

Provider: 1 - N.D. DEPT OF HEALTH

Provider ID: 1

Facility Name: N.D. DEPT OF HEALTH

Provider

Provider: 1 - N.D. DEPT OF HEALTH

Provider: 2 - SWDHU ADAMS COUNTY

Provider: 3 - CITY-COUNTY HEALTH DISTRICT

Provider: 4 - LRDHU BENSON COUNTY

Provider: 5 - SWDHU BILLINGS/GLDN VALLEY



Provider Information

- Provider Information page
 - Contains all of the provider facility information
 - Includes provider address, primary and back-up contacts, office hours and VFC enrollment dates
 - Contacts must provide an email address
 - Initially populated with data from the NDIIS provider profile
- Providers can enter special shipping instructions
 - optional, free-text field
 - limit of 35 characters

Shipping Instructions: (35 Char Max)

deliver to front office desk



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Provider Information continued...

- Users must enter business hours for each day of the week
 - Have to indicate if they are open or closed
 - Can enter one or two sets of hours for each day of the week

Business Hours

*Monday	Office Open	*Tuesday	Office Closed	*Wednesday	Office Open	*Thursday	Office Closed	*Friday	Office Closed
From:	10:00 AM	From:		From:	10:00 AM	From:		From:	
To:	03:00 PM	To:		To:	04:00 PM	To:		To:	
From:		From:		From:		From:		From:	
To:		To:		To:		To:		To:	

- Users must certify that their provider information is accurate each time they access the ordering application before they can enter an order

Information Certification


* I certify the provider information provided above is accurate and complete: ☐



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Provider Order History

- Displays all past provider orders
 - Order status indicates which part of the process the order is in
 - Users can review and print all past orders
 - Users can only edit or delete an order with a “SAVED” or “Returned to Provider” status

**NDIIS VtrckS Ordering System**
[Help](#)

[Provider Information](#) [Provider Order](#)
Order History
Prov ID:27

ORDER ID	ORDER DATE	STATUS	NDDOH COMMENT	SHIPPING INFO
679	05/16/2013	Submitted to CDC		UPS#1Z3208460289799936; FEDEX#799812128565;
532	04/11/2013	Submitted to CDC		FEDEX#799535536876;
395	03/12/2013	Submitted to CDC		UPS#1ZE861850246744692; FEDEX#799267373449;
321	02/19/2013	Return to Prov	Specific reasons for order requests over a 3 month inventory based on doses administered are required. "Need Vaccine" is not sufficient information. Please change the reason for those over the ordering max and submit again.	
220	01/22/2013	Submitted to CDC		FEDEX#794586364001;
159	01/10/2013	Submitted to CDC		FEDEX#794509438270;
79	12/17/2012	Submitted to CDC		FEDEX#794351422979;



Provider Order

- Vaccines a provider can order is controlled by NDC number
 - Immunization Program determines which providers can order which vaccines
 - Marked by NDC number according to their provider type and/or individual provider
 - Certain vaccines, such as influenza, are visible to Immunization Program users but not to provider users
- Ordering grid is defaulted to list vaccines by Brand Name
 - Users can sort the ordering grid by Brand Name, Vaccine Name or Manufacturer

New Order											
	VAC NAME	BRAND NAME	MANUFACTURER	PKG DESCRIPTION	NDIIS INVENTORY	INVENTORY ON HAND	DOSES ADMIN	SUGG ORDER MIN	SUGG ORDER MAX	DOSES ORDERED	COMMENTS
Edit	HIB (PRP-T) ActHib	ActHIB	SANOFI PASTEUR	5 pack - 1 dose vials	8	<div></div>	33			<div></div>	
Edit	TDAP	Adacel	SANOFI PASTEUR	10 pack - 1 dose vials	129	<div></div>	258			<div></div>	
Edit	TDAP	Adacel	SANOFI PASTEUR	5 pack - 1 dose syringe	129	<div></div>	258			<div></div>	
Edit	INFL (IIV3 W/P)	Afluria	MERCK	10 dose vials - 1 pack	70	<div></div>	0			<div></div>	



New Orders

- Users can view their NDIIS inventory on hand and doses administered for each vaccine
 - NDIIS inventory
 - sums all on hand doses for lots with that same vaccine type
 - Doses Administered
 - sums all doses administered during the previous calendar month for that vaccine type
 - multiplies the number by 3

Edit Vaccine

Vaccine Name	TDAP
Brand Name	Adacel
Manufacture Name	SANOPI PASTEUR
Package Description	5 pack - 1 dose syringe
NDIIS Inventory	129
Inventory On Hand	
Doses Admin	258
Sugg Order Min	
Sugg Order Max	
Doses Ordered	
Comments	
Save	Cancel



New Order continued...

- Providers can have up to a 3 month supply of vaccine on hand at any given time
- Based on *Inventory on Hand* entered by the user and doses administered, the system will calculate a suggested order minimum and maximum
 - Order minimum is 1 month of vaccine, rounded to the nearest package quantity
Algorithm: $(\text{Doses Administered} - \text{Inventory on Hand})/3$
 - Order maximum is 3 months of vaccine, rounded to the nearest package quantity
Algorithm: $\text{Doses Administered} - \text{Inventory on Hand}$
 - System requires that providers enter a comment if they are ordering over the suggested maximum

Edit Vaccine

Vaccine Name	TDAP
Brand Name	Adacel
Manufacture Name	SANOFI PASTEUR
Package Description	5 pack - 1 dose syringe
NDIIS Inventory	129
Inventory On Hand	
Doses Admin	258
Sugg Order Min	
Sugg Order Max	
Doses Ordered	
Comments	
Save	Cancel

Edit Vaccine

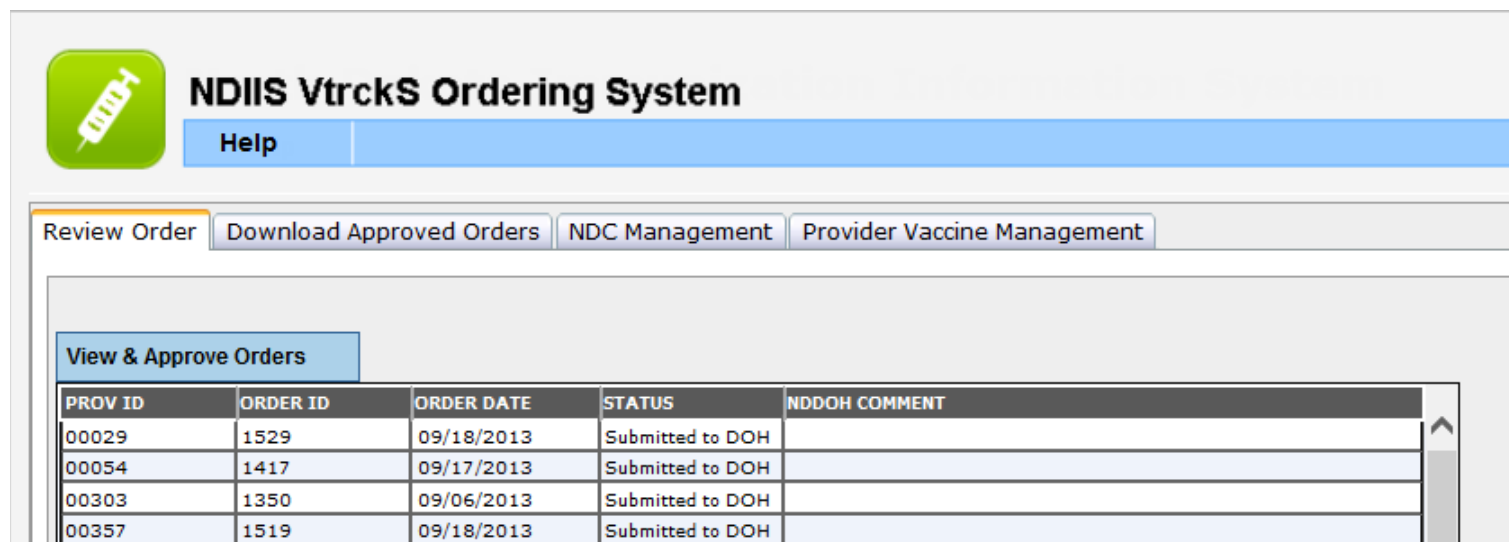
Vaccine Name	TDAP
Brand Name	Adacel
Manufacture Name	SANOFI PASTEUR
Package Description	5 pack - 1 dose syringe
NDIIS Inventory	129
Inventory On Hand	100
Doses Admin	258
Sugg Order Min	0
Sugg Order Max	160
Doses Ordered	
Comments	
Save	Cancel

- Did not use NDIIS inventory on hand as this number is not always accurate due to the limitations of our inventory management system



Order Approval

- All submitted orders are listed for approval by the NDDoH
- During the order approval process, Immunization Program staff are able to view provider order history and a complete doses administered report



The screenshot displays the NDIIS VtrckS Ordering System interface. At the top left is a green syringe icon. To its right is the title "NDIIS VtrckS Ordering System" and a "Help" button. Below the title is a navigation bar with four buttons: "Review Order" (highlighted), "Download Approved Orders", "NDC Management", and "Provider Vaccine Management". Under the "Review Order" button is a sub-section titled "View & Approve Orders" which contains a table of orders.

PROV ID	ORDER ID	ORDER DATE	STATUS	NDDOH COMMENT
00029	1529	09/18/2013	Submitted to DOH	
00054	1417	09/17/2013	Submitted to DOH	
00303	1350	09/06/2013	Submitted to DOH	
00357	1519	09/18/2013	Submitted to DOH	



Order Approval continued...

- Additional or alternate vaccines can be added during order approval and the number of doses ordered by the provider can be altered
- The number of pediatric and adult doses being ordered are entered during order approval
- Funding source is entered for direct ship vaccines

Vaccine Order Details

Order ID: 1470
Provider Name: TESTING PROVIDER
Provider ID: 06054
Order Date: 09/17/2013

BRAND NAME	VAC NAME	MFG	PCKG DESC	UNIT SIZE	NDIIS INVENTORY	INVENTORY ON HAND	DOSES ADMIN	SUGG ORDER MIN	SUGG ORDER MAX	DOSES ORDERED	REASON FOR OVER SUGG MAX	DA PED	DA ADULT	DSH FUND 317	DSH FUND VFC	DSH FUND STATE	STATE PO
Gardasil	HPV-4	MERCK	10 pack - 1 dose vials	1	36	6	36	10	30	20							

Approve

Return To Prov

Cancel & Close



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Order Approval continued...

- Immunization Program staff can return an order to a provider if changes are needed
 - Primary and Backup Contacts (listed on the Provider Information page) will receive an automated email letting them know that they have a returned order
 - The order will have a comment from the NDDoH telling the users why the order was returned
 - Users can see the returned order in their Order History and are able to make the required changes and re-submit the order to the NDDoH for approval



NDIIS Vtrcks Ordering System

Help

Provider Information

Provider Order

Order History

Prov ID:9999

ORDER ID	ORDER DATE	STATUS	NDDOH COMMENT
703	06/05/2013	Return to Prov	need to submit temperature logs to the NDDoH before order can be approved
702	06/04/2013	Return to Prov	tasting tasting tasting tasting



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Creating VTrckS File

- Once outstanding orders have been approved, they are selected for download
 - Orders must have an “Approved by NDDoH” status in order to be available for download
- Ordering module creates the Provider Master Data, Provider Inventory and Provider Order Files and puts them into one zip file available for download

NDIIS VtrckS Ordering System

Help

Review Order | **Download Approved Orders** | NDC Management | Provider Vaccine Management

Orders to Download

SELECT	PROV ID	ORDER ID	ORDER DATE	STATUS
<input checked="" type="checkbox"/>	00003	1422	09/17/2013	Approved by NDDOH
<input checked="" type="checkbox"/>	00004	1424	09/17/2013	Approved by NDDOH
<input checked="" type="checkbox"/>	00010	1427	09/17/2013	Approved by NDDOH

Prepare Download



Creating VTrckS File

- Zip file for the current day is selected from the list and downloaded to a desktop folder for upload into CDC's VTrckS system

NDIIS VtrckS Ordering System

Help

Review Order | **Download Approved Orders** | NDC Management | Provider Vaccine Management

Orders to Download

SELECT	PROV ID	ORDER ID	ORDER DATE	STATUS
<input type="checkbox"/>	00003	1422	09/17/2013	Approved by NDDOH
<input type="checkbox"/>	00004	1424	09/17/2013	Approved by NDDOH
<input type="checkbox"/>	00010	1427	09/17/2013	Approved by NDDOH

Prepare Download

ORDERS
<input type="checkbox"/> VTrcksBatch_144_201306120324.Zip
<input checked="" type="checkbox"/> VTrcksBatch_145_201306130343.Zip
<input type="checkbox"/> VTrcksBatch_146_201306171252.Zip

Download Refresh



Influenza Vaccine Orders

- As publicly funded influenza vaccine allocations are released to North Dakota, the Immunization Program calculates individual provider allocations based on the amount of each type of flu vaccine the provider pre-booked
- An order is placed in the NDIIS ordering module on behalf of the provider
 - Immunization Program users can see all presentations of influenza vaccine in the ordering grid, but they are hidden from provider view (based on login usercode)
 - When an influenza order is approved, an automated email is sent to the primary and backup contacts for the provider letting them know that an influenza vaccine order has been placed on their behalf
 - Influenza vaccine orders can be viewed in the provider's order history along with all other vaccine orders
- Influenza vaccine orders are uploaded into CDC's VTrckS system following the same process as all other vaccine orders



Vaccine Shipping File

- Semi-automated process
 - NDDoH staff download shipping file from VTrckS
 - Enter date range of previous day through the current day
 - Upload VTrckS CSV shipping file to the NDIIS secure file transport portal (FTP) site
 - Created a naming convention for the shipping file used by all NDDoH staff who pull the shipping file
 - BCBSND engine checks for file hourly
 - Only picks up one file per day
 - Engine grabs file and uploads to NDIIS
- Automated engine checks the CSV for duplicate orders
 - Uses order ID
 - Possibility of having same order in two separate shipping files
- NDIIS inventory management system does not allow for duplicate lots
 - Increase number of doses on hand if lot already exists in provider's inventory



Vaccine Shipping File continued...

- Includes tracking numbers
 - Tracking numbers are added to the provider order review in ordering module
 - Includes the shipping carrier name
 - Providers can copy and paste tracking number into carrier's tracking web site to find out where their vaccine is and when it will be delivered
 - Will add multiple tracking numbers to one order if not all vaccines being shipped at the same time



NDIIS VtrckS Ordering System

Help

Provider Information

Provider Order

Order History

Prov ID:10

ORDER ID	ORDER DATE	STATUS	NDDOH COMMENT	SHIPPING INFO
1427	09/17/2013	Ready For Download		
1414	09/16/2013	Submitted to CDC		
1346	09/06/2013	Submitted to CDC		FEDEX#796640193598;
1143	08/27/2013	Submitted to CDC		FEDEX#796565880657;
1102	08/16/2013	Submitted to CDC		UPS#1ZE861850200773773; UPS#1ZE861850200774110; FEDEX#796490136833;
997	07/30/2013	Submitted to CDC		UPS#1ZE861850200596527; UPS#1ZE861850200596554; FEDEX#796356837782;
866	06/28/2013	Submitted to CDC		UPS#1ZE861851300375129; UPS#1ZE861851300375147; FEDEX#796172196474;
788	06/03/2013	Submitted to CDC		FEDEX#799932252800;



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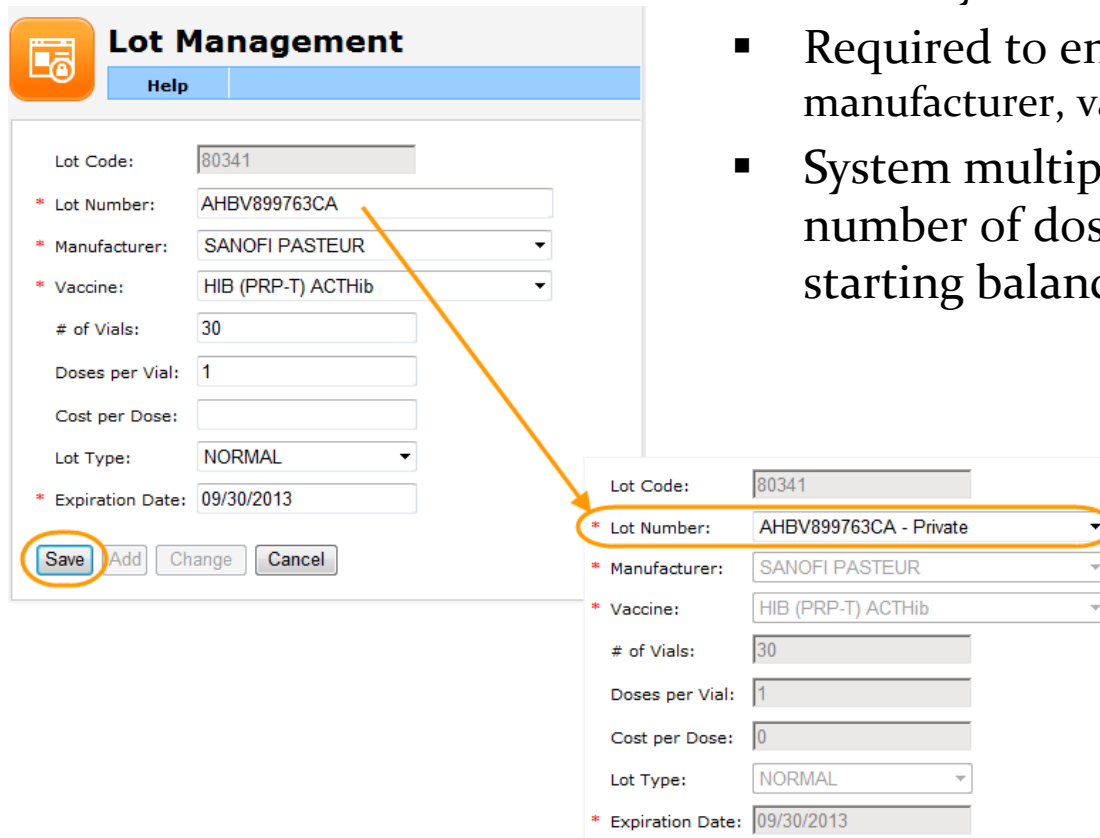
Inventory Management



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Adding Private Lots

- Enter privately purchased vaccine lots
 - Only new lots
- Required to enter lot number, manufacturer, vaccine and expiration date
- System multiplies number of vials and number of doses per vial to calculate a starting balance of doses on hand



Lot Management

Help

Lot Code: 80341

* Lot Number: AHBV899763CA

* Manufacturer: SANOFI PASTEUR

* Vaccine: HIB (PRP-T) ACTHib

of Vials: 30

Doses per Vial: 1

Cost per Dose:

Lot Type: NORMAL

* Expiration Date: 09/30/2013

Save Add Change Cancel

Lot Code: 80341

* Lot Number: AHBV899763CA - Private

* Manufacturer: SANOFI PASTEUR

* Vaccine: HIB (PRP-T) ACTHib

of Vials: 30

Doses per Vial: 1

Cost per Dose: 0

Lot Type: NORMAL

* Expiration Date: 09/30/2013




Lot Decrement

- Publicly purchased lots have the word “State” automatically added behind it when the lot is added to provider inventory
- Private lots have the word “Private” automatically added behind it when the lot is added to provider inventory
 - Private lots are also highlighted in green in the selection drop-down during dose entry
- Each time a lot number is selected during the dose entry process, a dose is decremented from that lot in the provider’s inventory
- Users can choose to include expired lots in the selection list during dose entry and are able to select lots with a zero or negative balance of doses on hand
- Interoperable provider locations send both the vaccine lot number and funding source through the HL7 interface
 - NDIIS looks for matching lot number in provider’s inventory based on funding source sent



Provider Lot Distribution

- Providers can manually adjust their lot inventory, waste doses and transfer doses between provider inventories
 - When transferring doses, users must indicate which provider is sending the vaccine and which provider is receiving the vaccine as well as the date of the transfer
 - Once the transaction is complete, the number of doses transferred are decremented from the sending provider's inventory and the lot and/or doses are added to the receiving provider's inventory
 - If the lot is new to the receiving provider's inventory, the lot is only available in the lot selection drop-down during dose entry if the dose date is after the date of transfer

**9990 - TEST**

Prov: 00001 User: Mary Woinarowicz

Help

Provider Information

Comments

Lot Distribution

Name: 9990 - TEST

Type: -- SELECT ONE --

Lot Number	Vaccine	Expiration	On Hand
00001THTEST - Private	MCV4 Menactra	12/31/2099	14
0020AE - State	HEPB (Preservative Free)	06/10/2014	5
999MWTEST887 - Private	PCV13 (PNEUMOCOCCAL)	06/30/2014	16
H010145 - Private	HAV (2 doses)	02/27/2015	5
MWTESTLOT - Private	DTaP-Hib-IPV (Pentacel)	10/27/2014	6
scott test2 - Private	BOTULINUM ANTITOXIN	12/31/2021	54
UPGRADETEST - Private	ROTAVIRUS (2 DOSE)	10/31/2017	10

-- SELECT ONE --

Adjust

Inquiry

Transfer

Waste

☐ Include Expired Lots

☐ Include No Doses on Hand

Lots Found: 7



Inventory Management Reports



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Provider Inventory Report

- Creates a pdf report listing of all lots in the selected provider's inventory
 - Lots are separated by vaccine type
 - Report includes:
 - Lot Number
 - Expiration Date
 - Doses on Hand
- Users can choose to include expired lots from the report

Provider Inventory		
Printed on 10/25/2012 5:24:30 PM		
Provider:	4921 - MW TRAINING PROVIDER	
Include Expired	NO	
MMR		
Lot Number	Expiration Date	Doses On Hand
0579Z - Private	04/16/2013	10
	Total	10
HBVAdult		
Lot Number	Expiration Date	Doses On Hand
AHBVB945CB - Private	03/23/2013	25
	Total	25



Lot Inventory Expiring Report

- Creates a pdf report of a provider's lots that expire within a specified date range
 - Users must specify expiration "From" and "To" dates
 - Report includes:
 - Lot Number
 - Quantity (doses on hand)
 - Vaccine Name
 - Expiration Date and Manufacturer

Lot Inventory Expiring					
Printed on 10/25/2012 5:16:25 PM					
Expiration from		01/01/2012			
Expiration to date:		06/30/2012			
Provider:		4921 - MW TESTING PROVIDER			
Lot Number	Qty	Vaccine Name	Expiration Date	Manufacturer	Manufacturer's Control Number
0310Z	-78	CHICKENPOX	02/26/26	MERCK	
0335Z	3	MMR	03/06/06	MERCK	
0345Z	73	CHICKENPOX	03/05/05	MERCK	
0502Z	-93	ROTAVIRUS (3	05/12/12	MERCK	



Limitations & Challenges



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Limitations – Ordering Module

- Updating provider information in ordering module does not update NDIIS provider profile
- Entering doses on hand in provider order does not update NDIIS provider inventory
 - Inventory reconciliation must be done separately from the vaccine ordering
- Ordering module data updates once per day so inventory adjustments made in the NDIIS don't show up until the next day



Limitations – Inventory Management

- Doses are decremented through data entry but are never added back to inventory when data entry corrections are made
- Interoperability
 - Providers free-text enter lot numbers into their electronic health record (EHR) system
 - If matching lot is not found in NDIIS (based on lot number and funding source) the system adds a “dummy dose” and the correct lot is not decremented
- Providers not required to enter private vaccine lot numbers into their NDIIS inventory
- Shipping file always includes lots from outer packaging
 - Providers may want to record the lot from the vial



Challenges

- BCBSND Programmers are in a different city
 - Have to rely on email, phone calls, web-ex meetings and demonstrations to communicate changes and fixes needed and to coordinate testing and deployment of new functionality and fixes
- Flexibility of Ordering Module
 - Application can be changed and/or updated to meet the changing needs of the immunization program, although not always within the time limits required
- Influenza vaccine ordering and allocation
 - Influenza pre-booking is still sent to the NDDoH on paper and then entered into an excel spreadsheet
 - Influenza vaccine allocations are calculated based on pre-booked amounts and then orders need to be placed on behalf of the providers
 - Do not want to allow providers to place their own influenza orders since initial public vaccine needs to be allocated based on pre-booked amounts



Questions?



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