

The HiTrack EHDl data and patient information management system is designed to help hospitals operate more efficient and successful newborn hearing screening programs, including timely and appropriate referral to diagnosis and intervention where necessary. HiTrack does this by keeping track of where infants are in the early hearing detection and intervention process, compiling reports and reminders, and generating letters to various participants who need to be informed about results at various stages of the process. For these activities to occur, information about the infant's demographic characteristics, contact information, and screening status must be available in the HiTrack system. Although such information can be entered directly into HiTrack some of these data may also be available in other electronic databases. For example, computer-based hospital records often contain demographic and contact information about the baby. By importing the existing information into the HiTrack software, the data and patient management process is more efficient and accurate for the screening program staff. The purpose of this document is to outline how such an import is best accomplished.

When you are ready to begin working on an import, be sure to contact the HiTrack Helpdesk at 435-797-3584 or NCHAM.HelpDesk@usu.edu to make sure you have the most recent version of HiTrack for your testing procedures and so we can assist with your work as needed.

Flat File Structure

The data structure outlined in Table 1 includes all variables that can be picked up from a data file and imported into HiTrack (fields printed in bold must be filled). The data structure for any file sent to HiTrack must include all data fields listed. Please note, however, that the patient data system does not necessarily have to write to all fields. For example, even if you don't have information about specific risk indicators, those fields must be included in the export data structure.

If your data system will be exporting multiple screening attempts or multiple contacts these rows must be exported as separate rows. Be sure to export all of the patient identifying fields (infant's medical record number, infant's last name, birth hospital code and infant's date of birth) in the additional rows so that HiTrack will be able to append the data to the correct patient.

Use the provided Mother and Father columns to provide demographics for these two basic roles. For roles beyond these two types (midwife, etc) use a Code GUID in the "MCONTTYPE" field to differentiate between types of contacts.

File Data Format

Data to be imported to HiTrack must be written in a comma delimited ASCII text file (*.txt), and a .txt file extension must be included as part of the filename. Column headers should not be included. The following lists some further specifications for the various file elements, as well as some general formatting rules:

File Name "alldata.txt"

File Element	Format
Character fields	Must be enclosed in double quotes
Date fields	yyyymmdd (screening also dates support time – see below)
Field separator	Comma
Record separator	Carriage return/linefeed
End of file marker	1A hex or CHR(26)

In addition to the above specifications, some general formatting rules must be followed when writing to an ASCII text file:

- The data must be in a *comma delimited* text file format.
- Alphanumeric (text) fields **MUST BE** enclosed in double quotation marks (e.g., "some text"). The purpose of having text enclosed in double quotation marks is to prevent conflicts between comma(s) included in the text with the commas used to indicate location of variable fields.
- Date and numeric fields **SHOULD NOT** be enclosed in quotes.
- Strictly adhere to the order and number of fields as shown in Table 1 that contains a complete list of variables and their sequence.
- Records need to be separated with a carriage return/line feed, and an end of file marker needs to be sent.
- In the instances where data will not be written to a data field, a comma still needs to be included to denote the presence of a field.

The data structure for the file should contain all the columns described in Table 1, formatted as described above. **The exact order of the columns is critical.**

The process used to create the file should include a check for an existing file in the export location. If a file already exists the new data should be appended to the existing file. Existing files should not be overwritten.

Look-up Codes and Pick-Lists

Several of the columns listed in the field specification refer to Codes. (i.e. Foreign Key references) These lists of codes and their look-up definitions are collectively known as "Program Information".

Standard Code Lists

Code	Variable Description
	RACE/MRACE/FRACE
01	Caucasian
02	Black or African American
03	(Entry Retired Do Not Use)
04	Asian American/Pacific Island
05	American Indian/Alaska Native
R4	Asian Indian
R5	Chinese
R6	Filipino
R7	Japanese
R8	Korean
R9	Vietnamese
RA	Other Asian
RB	Native Hawaiian
RC	Guamanian or Chamorro
RD	Samoan
RE	Other Pacific Islander
98	Other
99	Unknown
	TYPE (Nursery type)
1	Well baby
2	Special Care - Level II
3	Special Care - Level III
4	Special Care - Level IV
	INS_CODE (Insurance)
01	Uninsured
02	Self Insured
03	Champus
04	Medical Assistance
1!	TriCare
2!	Medicaid
99	Unknown

	M_LANG, F_LANG and ALT_LANG (Mother's or Alternate Contact's Language) (Users can modify or add to this standard list)	16	Yiddish
		17	Asian Indian Lang.
		18	Filipino Lang.
01	English	19	Greek
02	Spanish	20	Arabic
03	French	21	Serbo-Croatian
04	Chinese Languages	22	Ukrainian
05	Italian	23	Polish
06	Portuguese	24	Am Ind./Alaska Native Lang
07	Hmong	25	Farsi
08	Mon-Khmer(Cambodian	26	Turkish
09	Haitian Creole	27	Aramaic
10	Japanese	28	Romanian
11	German	29	Armenian
12	Vietnamese	30	Russian
13	Korean	31	Thai and Laotian
14	Dutch and Afrikaans	32	Hungarian
15	Hebrew	99	Unknown

Advanced Tracking Code Lists

Additional demographic fields have been added to provide CDC reporting capabilities. The following tables show the CDC labels and the HiTrack compatible codes for these columns.

Ethnicity

eeeebbb-fa1c-4398-9230-045d3ce5abe0	Hispanic or Latino
eeeebbb-fa1c-4398-9230-045d3ce5abe1	Not Hispanic or Latino
eeeebbb-fa1c-4398-9230-045d3ce5abe3	Unknown

Education Level

eded6464-f022-1e7e-1479-4e91d70dd004	College Graduate or above
eded6464-f022-1e7e-1479-4e91d70dd002	High School Graduate or GED
eded6464-f022-1e7e-1479-4e91d70dd001	Less than High School
eded6464-f022-1e7e-1479-4e91d70dd003	Some College or AA/AS degree
eded6464-f022-1e7e-1479-4e91d70dd005	Unknown

Visual/Oral Language

A54DB2FE-ACA3-42C0-97B9-79CFB0CB5A00	American Sign Language
A54DB2FE-ACA3-42C0-97B9-79CFB0CB5A01	Cued Speech
A54DB2FE-ACA3-42C0-97B9-79CFB0CB5A02	Other (See Notes)
A54DB2FE-ACA3-42C0-97B9-79CFB0CB5A03	Oral - Same as Written
A54DB2FE-ACA3-42C0-97B9-79CFB0CB5A04	Total Communication

Contact Role Types

CAAABBBB-FA7B-0298-9230-045D3CE59000	Midwife
CAAABBBB-FA7B-0298-9230-045D3CE59004	Adoptive Parent
CAAABBBB-FA1C-4398-9230-045D3CE59005	Intervention Office
CAAABBBB-FA1C-4398-9230-045D3CE59006	Responsible School District
CAAABBBB-FA1C-4398-9230-045D3CE59007	State Custody
CAAABBBB-FA1C-4398-9230-045D3CE5900A	Birth Attendee
CAAABBBB-FA1C-4398-9230-045D3CE5900B	Gestational Carrier
CAAABBBB-FA1C-4398-9230-045D3CE59641	Father
CAAABBBB-FA1C-4398-9230-045D3CE59642	Birth Mother
CAAABBBB-FA1C-4398-9230-045D3CE59643	Legal Guardian
CAAABBBB-FA1C-4398-9230-045D3CE59644	Kin
CAAABBBB-FA1C-4398-9230-045D3CE59645	Primary Care Provider
CAAABBBB-FA1C-4398-9230-045D3CE59646	Attending Physician
CAAABBBB-FA1C-4398-9230-045D3CE59647	Attending Nurse
CAAABBBB-FA1C-4398-9230-045D3CE59657	Primary Contact
CAAABBBB-FA1C-4398-9230-045D3CE59658	Other Contact
CAAABBBB-FA1C-4398-9230-045D3CE59659	Foster Parent
CAAABBBB-FA1C-4398-9230-045D3CE5965A	Parent
CAAABBBB-FA1C-4398-9230-045D3CE5965B	Medical Home

Site Specific Lists

The possible values for items not listed in the specification tables are customizable and vary depending on the site installation and setup. These items can be exported from HiTrack using the "Export Program Information" feature in System. The following files will be from this feature:

- screener.txt (Screeners)
- pednames.txt (Physicians)
- hospital.txt (Birthing and Screening Sites)
- audnetid.txt (Audiologists)

These comma delimited files will reflect the current look-up codes in the HiTrack system. The first column in each file is the Code (Primary Key) that should be referenced when the patient information file is created.

NOTE: Although it is best to always send valid codes, records with unrecognized codes will be accepted during the merge process with a few exceptions. Temporary placeholders will be generated for these codes that can be resolved using a built-in tool provided by HiTrack.

Importing Data

To import data to HiTrack:

- Create a file named alldata.txt using the above instructions.
- Create the file in a specific location on the hard drive or network drive.
- Data for any or all of the variables in Table 1 can be included, but the data structure (noted by commas) must include all variables listed.
- Set up the HiTrack Merge
 - Go to **Merge** → Merge Settings (wrench icon.)
 - Add a new source for "Demographic Data (Expanded)" with an appropriate import path.
- Go to **Merge** in HiTrack and import the data.

When HiTrack imports the data it will first check whether a record for that child exists by matching on the three required fields (infant's medical record number, infant's last name, and infant's date of birth). If an exact match is found on all three variables HiTrack will assume it is the same child and update demographic data with the data from the hospital. If a record matches on 2 of 3 variables it is kept in Pending Merge Data for the user to examine and resolve. If an exact match is not found on all three variables a new record will be created in HiTrack.

If the file has been merged using the Merge Companion the alldata.txt file will be renamed with a time-stamp after HiTrack has merged the file. This prevents unnecessary merges of prior data. Files merged using manual upload must be managed by the sender to prevent merging of prior data.

Recommended Process for Testing Software Links and Coordinating Technical Assistance

Even the most carefully planned and programmed software link needs to be rigorously tested so that “bugs” can be found and fixed prior to general use. Although the length of time required to successfully execute this final phase of software development depends to some degree on the amount of time that can be devoted to the task by the patient system developers and the HiTrack staff, a rule of thumb would be to allow at least one month between the completion of the programming work and the time you expect to begin routine use. Steps for testing the links include:

1. “In-house” alpha testing, in which your team attempts to merge the file under varying data sets and conditions. During this phase, the HiTrack Help Desk and hospital staff will also work together to prepare documentation on the software link for distribution to users.
2. Beta testing, in which a small number of hospitals who have agreed to participate in the process use the export/import function on a routine basis.

Table 1: Expanded Merging Specifications for Merging Patient Information Data into HiTrack

Field Name	Type	Length	Required	Description
CMID	Character	15	Yes	Child's Medical ID
CDOB	Date	8	Yes	Child DOB (yyyymmdd)
CLAST	Character	20	Yes	Child's Lastname
CFIRST	Character	10	No	Child's Firstname
CINITIAL	Character	1	No	Child's Initial
HOSP_CODE	Character	3	Yes	3 Letter Code for Hospitals ("hospital.txt")
SCRN_SITE	Character	3	No	3 Letter Code for Screening Site ("hospital.txt"). Required if screening results are sent
SEX	Character	1	No	1 Letter code for Child's Gender (M, F, U)
TYPE	Character	1	No	1 Letter code for Nursery (1=Well baby, 2=NICU or Special care level II,3=Special care level III "nur_type.txt")
CTOB	Character	8	No	Child's Time of birth (text)
MULTI_CODE	Character	1	No	1 Letter code for birth order (S=single birth, A=1st born of multiple, B=2nd born of multiple, C=3rd born of multiple, etc.)
BW_GRAMS	Integer	4	No	Birth weight in grams
CICUDAYS	Integer	4	No	Number of days spent in ICU
CDELTYPE	Character	1	No	Delivery type (1=vaginal, 2=forceps, 3=CSEC, 4=Vacuum Ext, 9 =Unknown)
CDISDTE	Date	8	No	Child's Discharge Date (yyyymmdd)
PE_ID	Character	4	No	4 Letter code for Doctor ("pednames.txt")
INS_CODE	Character	2	No	2 Letter code for Insurance ("ins_prog.txt")
NOTES	Character	255	No	Free form notes.
RACE	Character	2	No	2 Letter code for Race ("race.txt")
CGESTTIME	Character	2	No	Gestation in weeks
TRKVAR1	Character	1	No	1st Tracking Flag (Attribute tracking)
TRKVAR2	Character	1	No	2nd Tracking Flag (Attribute tracking)
TRKVAR3	Character	1	No	3rd Tracking Flag (Attribute tracking)
BIRTH_ID	Character	15	No	Alternate Medical ID
MIDNUM	Character	50	No	Contact Identification number
MLAST	Character	20	No	Contact Last name
MFIRST	Character	15	No	Contact First name
MINITIAL	Character	1	No	Contact Initial
MADD	Character	30	No	Contact First Address line
MADD2	Character	30	No	Contact 2nd Address line
MCTY_TOWN	Character	16	No	Contact Town
MSTATE	Character	20	No	Contact State Abbreviation
MZIP	Character	10	No	Contact Postal Code
M_PHONE	Character	19	No	Contact Phone
MRACE	Character	2	No	2 Letter code for Race ("race.txt")
M_LANG	Character	2	No	2 letter code for Contact Language. ("languag.txt")
M_BIRTH	Date	8	No	Mother DOB (yyyymmdd)
MADMDATE	Date	8	No	Contact Admission Date (yyyymmdd)
MDISDATE	Date	8	No	Contact Discharge Date (yyyymmdd)
MMAIDEN	Character	20	No	Contact Maiden Name
MCONTTYPE	Character	2	No	Type of Contact. Used to distinguish between multiple contacts: 01=Foster Parent, FC=Father, MC=Mother) See Table 2 for full list of options. Mother assumed if field left blank.

MPHONE1	Character	19	No	Contact Secondary Phone Number
MPHONE2	Character	19	No	Contact Alternate Phone Number
MPREFER	Integer	4	No	Preferred Contact (1=Yes, 0=No)
SCRNLTEAR	Character	1	No	Left Ear Screen result: 1=Pass, 2=Refer, B=Broken appointment (outpatient only), C=Could not test, D=Deceased, E="No Scrn.->Dx" (outpatient), I=Invalid, L=Lost/Locate (outpatient), M=Missed (inpatient only), R=Refused, S=Scheduled (outpatient), T=Transferred Out (inpatient), X=Follow up discontinued (outpatient)
SCRNLTDTE	Date	8	No	Left Ear Screening Date (yyyymmdd) When screening time is available use: "yyyy-mm-dd hh:mm" (24 hour clock)
SCRNLTSCR	Character	3	No	Left Ear Screener ("screener.txt")
SCRNRTEAR	Character	1	No	Right Ear Screen Result (See Left Ear Screen result above for codes.)
SCRNRDTE	Date	8	No	Right Ear Screening Date (yyyymmdd) When screening time is available use: "yyyy-mm-dd hh:mm" (24 hour clock)
SCRNRDSCR	Character	3	No	Right Ear Screener ("screener.txt")
SCRN_TYPE	Character	1	No	Screen Type (A=A-ABR, O=OAE) Required if screening results are sent. If sending more than 1 type, then separate records should be sent each containing results for a different screening type.
STAGE	Character	1	No	Level of Screening (I=Inpatient, O=Outpatient) Required if screening results are sent
SCRNLTID	Character	12	No	Left Screening Test Equipment ID
SCRNRDID	Character	12	No	Right Screening Equipment Test ID
SCRN_SITE2	Character	3	No	(Not used, but column must be accounted for)
FX	Character	1	No	Risk Indicator - Family history (Y,N,U)
BW	Character	1	No	Risk Indicator - Birth weight less than 1500 grams (Y,N,U)
ME	Character	1	No	Risk Indicator - Bacterial Meningitis (Y,N,U)
OD	Character	1	No	Risk Indicator - Ototoxic Medication (Y,N,U)
HL	Character	1	No	Risk Indicator - Syndrome associated with hearing loss
HY	Character	1	No	Risk Indicator - Hyberbilirubinemia (Y,N,U)
CI	Character	1	No	Risk Indicator - Congenital Infection (Y,N,U)
CF	Character	1	No	Risk Indicator - Crano-facial anomalies (Y,N,U)
MV	Character	1	No	Risk Indicator - Mechanical ventilation (Y,N,U)
AP	Character	1	No	Risk Indicator - Abnormal Apgar Scores (Y,N,U)
OTHER	Character	30	No	Risk Indicator - Other Risk Indicators
RILLNICU	Character	1	No	Risk Indicator - Illness requiring more than 48 in NICU (Y,N,U)
RCAREGC	Character	1	No	Risk Indicator - Caregiver Concern (Y,N,U)
RHEADT	Character	1	No	Risk Indicator - Head trauma (Y,N,U)
ROMEFF	Character	1	No	Risk Indicator - Recurrent/Persistent otitis media with effusion
RSYNPHL	Character	1	No	Risk Indicator - Syndrome associated with progressive hearing loss (Y,N,U)
RNEONATI	Character	1	No	Risk Indicator - Neonatal Indicators (Y,N,U)
MCOUNTY	Character	50	No	Contact County
ETHNICITY	Character	36	No	Contact Ethnicity GUID (<i>HiTrack 4 only</i>)
EDUCATION	Character	36	No	Contact Education Level GUID (<i>HiTrack 4 only</i>)
CFAA	Character	50	No	Custom Field Import

HTID	Character	40	No	Baby Primary Key GUID
PE_GUID	Character	40	No	Physician Primary Key GUID
PE_LAST	Character	30	No	Baby's Physician Last Name
PE_FIRST	Character	30	No	Baby's Physician First Name
PE_ORG	Character	30	No	Baby's Physician Organization
PE_ADD1	Character	30	No	Baby's Physician Address Line 1
PE_ADD2	Character	30	No	Baby's Physician Address Line 2
PE_CITY	Character	16	No	Baby's Physician City
PE_STATE	Character	20	No	Baby's Physician State
PE_ZIP	Character	19	No	Baby's Physician Zip
PE_PHONE1	Character	19	No	Baby's Physician Phone 1
PE_PHONE2	Character	19	No	Baby's Physician Phone 2
PE_FAX	Character	18	No	Baby's Physician FAX
MEMAIL	Character	50	No	Contact Email Address
HYAD	Character	1	No	Risk Ind. - Hyperbilirubinemia with exchange transfusion regardless of length of stay
AMAD	Character	1	No	Risk Ind. - Aminoglycoside administration for more than 5 days
AHIE	Character	1	No	Risk Ind. - Asphyxia or Hypoxic Ischemic Encephalopathy
ECMO	Character	1	No	Risk Ind. - Extracorporeal membrane oxygenation (ECMO)
CMV	Character	1	No	Risk Ind. - In utero infection with cytomegalovirus (CMV)
MZPBZ	Character	1	No	Risk Ind. - Mother + Zika and infant with no laboratory evidence & no clinical findings
MZPBP	Character	1	No	Risk Ind. - Mother + Zika and infant with laboratory evidence of Zika + clinical findings
MZPBN	Character	1	No	Risk Ind. - Mother + Zika and infant with laboratory evidence of Zika - clinical findings
CMCH	Character	1	No	Risk Ind. - Congenital microcephaly, congenital or acquired hydrophalus
TEMPBA	Character	1	No	Risk Ind. - Temporal bone abnormalities
PERINS	Character	1	No	Risk Ind. - Syndrome (of 400+) identified with atypical hearing threshold
POSTNS	Character	1	No	Not used
WIC	Character	1	No	Mother participating in WIC
MOMADA	Character	1	No	ADA Communication Required
MVISORLANG	Character	50	No	Mother Visual Oral Language (See Table 6)
SCRNCONSENT	Character	1	No	Parent Screening Consent
DATACONSENT	Character	1	No	Parent Data Sharing Consent
FLAST	Character	50	Yes if Father Sent	Father Last
FFIRST	Character	50	Yes if Father Sent	Father First
FINITIAL	Character	50	No	Father Initial
FADD	Character	50	No	Father Address Line 1
FADD2	Character	50	No	Father Address Line 2
FCTY_TOWN	Character	50	No	Father Address City
FSTATE	Character	20	No	Father Address State
FZIP	Character	10	No	Father Address Zip
F_PHONE	Character	19	No	Father Phone
FRACE	Character	2	No	Father Race
F_LANG	Character	2	No	Father Language

F_BIRTH	Character	20	No	Father DOB
FPhone1	Character	19	No	Father Phone 1
FPhone2	Character	19	No	Father Phone 2
load_status	Integer		No	(reserved)
FETHN	Character	36	No	Father Ethnicity
FEDUC	Character	36	No	Father Education