

Release 2017.2.1 Vitals Enhancements

Age-specific vital signs

Vital sign functionality in CareVue now enables age-related reference ranges for pulse, blood pressure, and respirations. Users can determine the number of age ranges and high and low value expressions based on site-specific guidelines and protocols. Vital signs that fall outside of the configured ranges display as abnormal.

Two new fields—**Low Value Expression** and **High Value Expression**—in the **GMRV VITAL TYPE** and **BEH MEASUREMENT CONTROL** files enable age-based ranges. Contact Customer Care for customization of the age and vital sign ranges.

```
Select GMRV VITAL TYPE NAME: BP BLOOD PRESSURE BP
Another one:
Standard Captioned Output? Yes// (Yes)
Include COMPUTED fields: (N/Y/R/B): NO// BOTH Computed Fields and Record Number (IEN)

NUMBER: 1 NAME: BLOOD PRESSURE
ABBREVIATION: BP RATE: YES
RATE HELP: GMRV-BLOOD PRESSURE RATE HELP
PCE ABBREVIATION: BP
RATE INPUT TRANSFORM: I '("UNAVAILABLEPASSREFUSED"[$$UP^XLFSTR(X)) K:X'?2.3N0.1"/"0.3N0.1"/"0.3N&(X'?2.3N0.1"/"0.3N) X I $D(X),X>0 K:$P(X,"/",1)>300!($P(X,"/",2)>300)!($P(X,"/",3)>300) X I $D(X),$P(X,"/")>$P(X,"/",1) K X
LOW VALUE: 7/1 HIGH VALUE: 300/299
LOW VALUE EXPRESSION: $$S(AGEHRS<13:"50/25",AGEHRS<97:"60/20",AGEDAYS<8:"52/25",AGEDAYS<43:"76/53",AGEMONTHS<7:"87/53",AGEYRS<3:"95/53",AGEYRS<8:"97/57",AGEYRS<15:"112/66",1:"90/60")
HIGH VALUE EXPRESSION: $$S(AGEHRS<13:"70/45",AGEHRS<97:"90/60",AGEDAYS<8:"96/63",AGEDAYS<43:"100/65",AGEMONTHS<7:"105/66",AGEYRS<3:"105/66",AGEYRS<8:"112/71",AGEYRS<15:"128/80",1:"140/90")
```

Figure 1: Blood Pressure GMRV VITAL TYPE

```
Select BEH MEASUREMENT CONTROL NAME: BLOOD PRESSURE
Another one:
Standard Captioned Output? Yes// (Yes)
Include COMPUTED fields: (N/Y/R/B): NO// b BOTH Computed Fields and Record Number (IEN)

NUMBER: 524 NAME: BLOOD PRESSURE
DEFAULT UNITS: US UNITS (US): mmHg
UNITS (METRIC): mmHg NORMAL LO: 100
NORMAL HI: 150 ABBREVIATION: BP
INPUT TRANSFORM: D VALIDBP(.X,20,275,20,200)
DESCRIPTION:
Enter a blood pressure measurement, in mmHg, in the format:
<Systolic>/<Diastolic>
For example,
120/95
LOW VALUE EXPRESSION: $$S(AGEHRS<13:"50/25",AGEHRS<97:"60/20",AGEDAYS<8:"52/25",AGEDAYS<43:"76/53",AGEMONTHS<7:"87/53",AGEYRS<3:"95/53",AGEYRS<8:"97/57",AGEYRS<15:"112/66",1:"90/60")
HIGH VALUE EXPRESSION: $$S(AGEHRS<13:"70/45",AGEHRS<97:"90/60",AGEDAYS<8:"96/63",AGEDAYS<43:"100/65",AGEMONTHS<7:"105/66",AGEYRS<3:"105/66",AGEYRS<8:"112/71",AGEYRS<15:"128/80",1:"140/90")
BLOOD PRESSURE SYSTOLIC LO: 100
BLOOD PRESSURE SYSTOLIC HI: 160 BLOOD PRESSURE DIASTOLIC LO: 60
```

Figure 2: Blood Pressure BEH MEASUREMENT CONTROL

Example of Low Value Expression for HR:

`$(SEX="M":$(AGEHRS<97:108,AGEDAYS<43:90,AGEMONTHS<13:80,AGEYRS<4:80,AGEYRS<6:8`

0,AGEYRS<11:70,AGEYRS<15:60,AGEYRS<21:60,1:50),1:\$\$(AGEHRS<97:108,AGEDAYS<43:90,AGEMONTHS<13:80,AGEYRS<4:80,AGEYRS<6:80,AGEYRS<11:70,AGEYRS<15:60,AGEYRS<21:60,1:50))

Example of High Value Expression for HR:

\$(SEX="M":\$(AGEHRS<97:165,AGEDAYS<43:150,AGEMONTHS<13:140,AGEYRS<4:130,AGEYRS<6:120,AGEYRS<11:110,AGEYRS<15:105,AGEYRS<21:100,1:80),SEX="F":\$(AGEHRS<97:165,AGEDAYS<43:150,AGEMONTHS<13:140,AGEYRS<4:130,AGEYRS<6:120,AGEYRS<11:120,AGEYRS<15:115,AGEYRS<21:110,1:90),1:"")

Age	Low Value Expression	High Value Expression
<13 hours	50/25	70/45
<97 hours	60/20	90/60
<8 days	52/25	96/63
<7 months	87/53	105/66
<3 years	95/53	105/66
<8 years	97/57	112/71
<15 years	112/66	128/80

Table 1: Examples of Low and high BP values based on age

A new field in the **GMRV VITAL MEASUREMENT** file stores the reference range appropriate for the date/time the vital sign was taken.

```

Output from what File: BEH MEASUREMENT CONTROL// GMRV VITAL MEASUREMENT
                        (3719 entries)
Select GMRV VITAL MEASUREMENT DATE/TIME VITALS TAKEN: 12-11-17  DEC 11,2017
1  DEC 11,2017@10:19  STUCK,TWIN  TEMPERATURE
2  DEC 11,2017@10:19  STUCK,TWIN  PULSE
3  DEC 11,2017@10:19  STUCK,TWIN  RESPIRATION
4  DEC 11,2017@10:19  STUCK,TWIN  BLOOD PRESSURE
5  DEC 11,2017@10:19  STUCK,TWIN  PULSE OXIMETRY
Press <Enter> to see more, 'A' to exit this list, OR
CHOOSE 1-5: 4  DEC 11,2017@10:19  STUCK,TWIN  BLOOD PRESSURE
Another one:
Standard Captioned Output? Yes// (Yes)
Include COMPUTED fields: (N/Y/R/B): NO// BOTH Computed Fields and Record Number
(IEN)
NUMBER: 3676
DATE/TIME VITALS TAKEN: DEC 11,2017@10:19
PATIENT: STUCK,TWIN  VITAL TYPE: BLOOD PRESSURE
DATE/TIME VITALS ENTERED: DEC 11,2017@10:49:25
HOSPITAL LOCATION: ICU  ENTERED BY: STUCK,PHYSICIAN
RATE: 60/45/20
LOINC CODES: 8480-6
LOINC CODES: 8462-4
VTSIT: DEC 11,2017@10:09  ABNORMAL FLAG: LOW
REFERENCE RANGE: 50/25-70/45
  
```

Figure 3: New Reference Range field

A new **Birth Date/Time** field in the **Patient** file allows the time of birth to be stored for age-sensitive vital signs.

Note: Additional interface configuration work is necessary for the time of birth to populate the **Patient** file

from the ADT interface. Contact Customer Care for further information.

```

Type <Enter> to continue or 'A' to exit:
K-STREET ADDRESS [LINE 1]: 46 FRAME RD
K-CITY: Saint Albans                                K-STATE: WES
K-ZIP CODE: 25177                                    K-PHONE NUME
PRIMARY NOK CHANGE DATE/TIME: DEC 11,2017@10:11:22
K-ZIP+4: 25177                                       SERVICE CONN
BIRTH DATE/TIME: DEC 11,2017@09:02
LANGUAGES ENTRY DATE: DEC 11,2017@10:11:22
PRIMARY LANGUAGE: ENGLISH                            PREFERRED LA
ENTERPRISE PATIENT IDENTIFIER: 1000000542
NAME COMPONENTS: 2                                    K-NAME COMPO
VETERAN (Y/N)?: 0
AGE (c): 0                                           TERMINAL DIQ
IU4N (c): S3787                                       DIVISION (c)
DISPLAY AGE (c): <1m
DIVISIONAL MRNS (c): 904893787P
                  : 1000000542                        ID (c): 1000
ACCOUNT NUMBERS (c): 2000000881

Select PATIENT NAME: █
  
```

Figure 4: New Birth Date/Time field

If time of birth is not populated through registration for patients whose time of birth is relevant to vitals, i.e., newborns with an age in hours, the user is prompted to enter a time of birth prior to entering vital signs on the Vitals tab, in Flowsheets, or via the vitals interface. Users can bypass the dialog if the time of birth is unknown, but the dialog will continue to display in new patient sessions for relevant vital sign entry attempts until a time of birth is recorded.

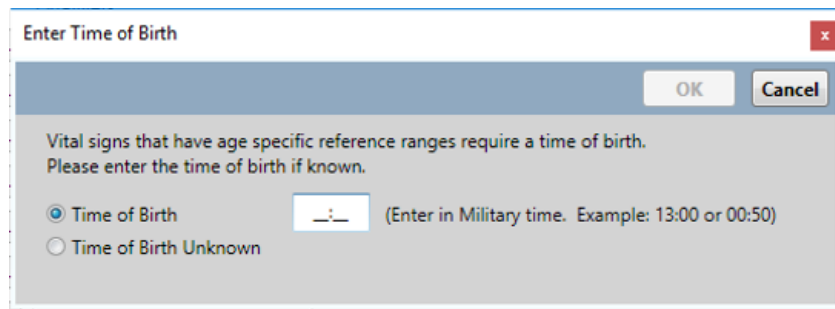
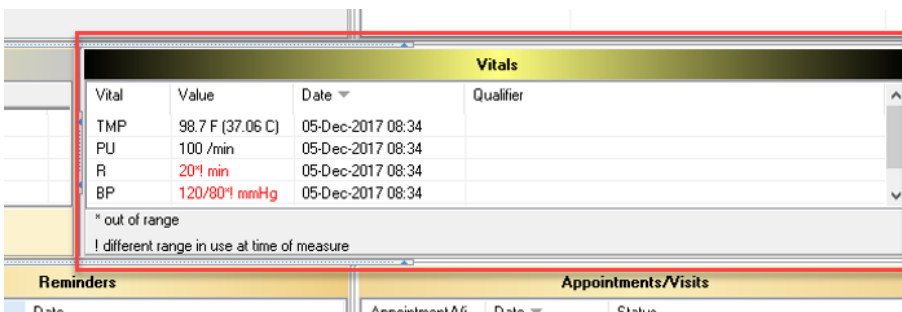


Figure 5: The Enter Time of Birth dialog

Coversheet

Vital sign values that are out of range display in red and with an asterisk (*). Values entered before the current range values went into effect display with an exclamation mark (!).



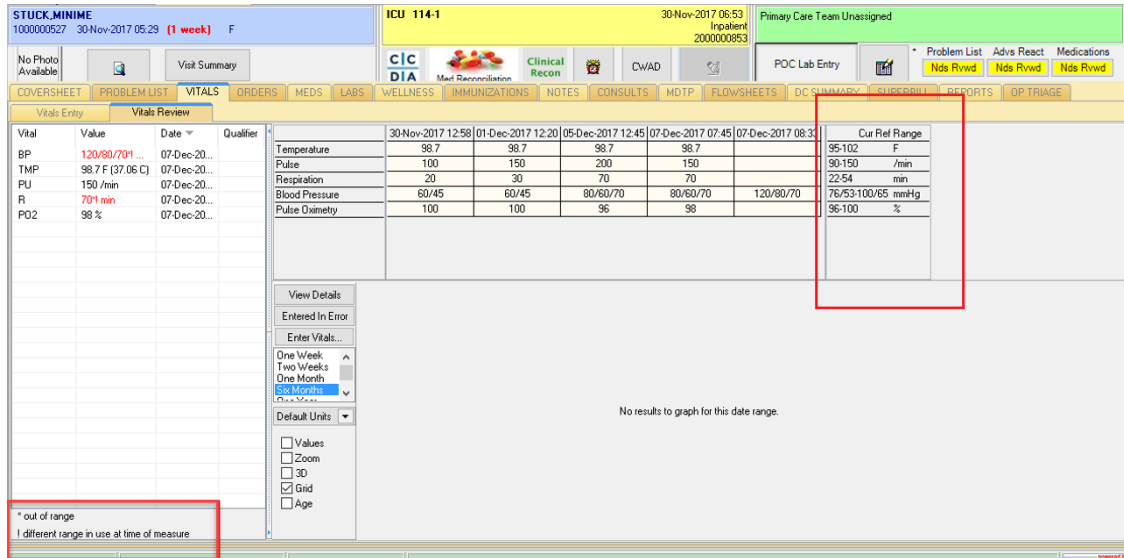
Vital	Value	Date	Qualifier
TMP	98.7 F (37.06 C)	05-Dec-2017 08:34	
PU	100 /min	05-Dec-2017 08:34	
R	20!* min	05-Dec-2017 08:34	
BP	120/80!* mmHg	05-Dec-2017 08:34	

* out of range
! different range in use at time of measure

Figure 6: The Vitals window in CareVue with abnormal ranges

Vitals Review Tab

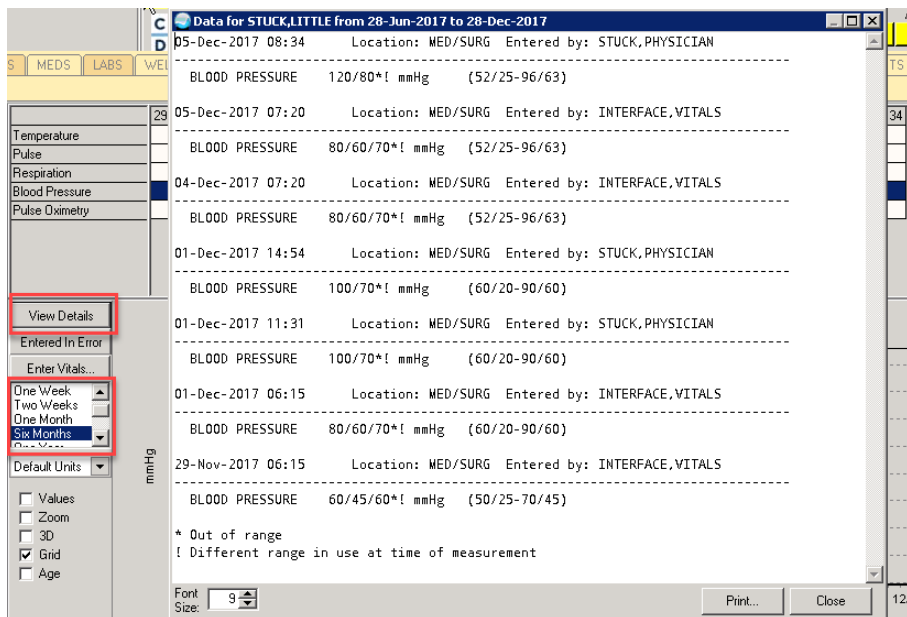
The Current Reference Range column to the right of the vitals table displays vital sign reference ranges for the current date and time. **Vital sign values that are out of range display in red and with an asterisk (*)**. Values entered before the current range values went into effect display with an exclamation mark (!).



Vital	Value	Date	Qualifier	Cur Ref Range
Temperature	98.7	30-Nov-2017 12:58		95-102 F
Pulse	100	01-Dec-2017 12:20		90-150 /min
Respiration	20	05-Dec-2017 12:45		22-54 /min
Blood Pressure	60/45	07-Dec-2017 07:45		76/53-100/65 mmHg
Pulse Oximetry	98 %	07-Dec-2017 08:33		96-100 %

Figure 7: Vitals Review tab, Current Reference Range column

A new **View Details** button has been added to the Vitals Review tab. Users can select a vital sign component, e.g., blood pressure, then click on **View Details** to display a dialog that details vital sign entries for the selected date range and compares with normal ranges. Users can print this information. The timeframe selection now displays condensed date options and a scroll bar for navigation.



Date	Time	Location	Entered by	Value	Normal Range
05-Dec-2017	08:34	MED/SURG	STUCK, PHYSICIAN	BLOOD PRESSURE 120/80*!	(52/25-96/63)
05-Dec-2017	07:20	MED/SURG	INTERFACE, VITALS	BLOOD PRESSURE 80/60/70*!	(52/25-96/63)
04-Dec-2017	07:20	MED/SURG	INTERFACE, VITALS	BLOOD PRESSURE 80/60/70*!	(52/25-96/63)
01-Dec-2017	14:54	MED/SURG	STUCK, PHYSICIAN	BLOOD PRESSURE 100/70*!	(60/20-90/60)
01-Dec-2017	11:31	MED/SURG	STUCK, PHYSICIAN	BLOOD PRESSURE 100/70*!	(60/20-90/60)
01-Dec-2017	06:15	MED/SURG	INTERFACE, VITALS	BLOOD PRESSURE 80/60/70*!	(60/20-90/60)
29-Nov-2017	06:15	MED/SURG	INTERFACE, VITALS	BLOOD PRESSURE 60/45/60*!	(50/25-70/45)

Figure 8: Display for the View Details button

Flowsheets

High and low values are still indicated by an up arrow (high abnormal value) or down arrow (low abnormal value). Age-specific vital sign reference ranges display by using the Flowsheets hover-over feature. The range displayed in the hover-over is the age-specific range in use when the entry was made.

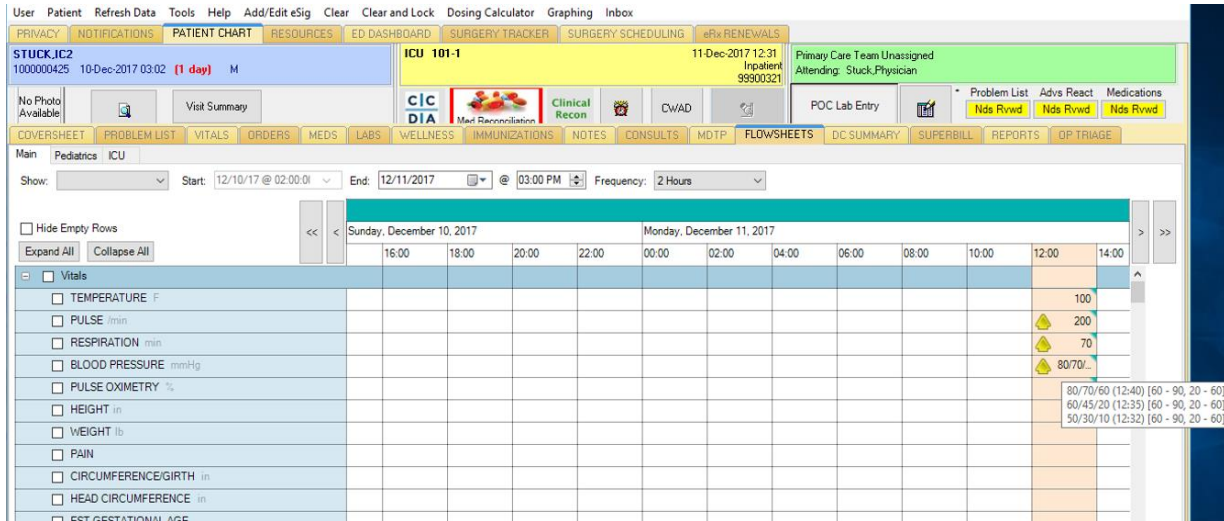


Figure 9: Flowsheets with high and low values displayed

Note: The use of Vitals.exe is not currently supported with age-specific vital signs.

Required action: If your facility is not using the age-specific vital signs feature, test using normal vital signs entry workflow. If your facility is interested in this feature, determine the vital signs, age ranges, and low and high ranges that correlate with your policies and procedures. Contact Customer Care for configuration. After configuration is completed, test this feature by entering high, low and normal vital sign values on a variety of test patients with different ages.

Related artifact: 21178