ESP CASE DETECTION ALGORITHM

Obesity

**Document Version 1.41**

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**June 7, 2016**

**Modification History**

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| **Version** | **Date** | **Modification** | **By** |
| 1.41 | 5/31/2018 | Initial inspection of existing load epic code for BMI calculation | CII |
| 1.4 | 6/7/2016 | Editing format | CII |
| 1.3 | 5/13/2016 | Edits/additions | DPM |
| 1.2 | 4/15/2016 | Edits to outliers | DPM |
| 1.1 | 3/31/2016 | Transfer to new template; formatting | DPM |

#  Introduction

Obesity reporting capabilities are required for MDPHnet. This reporting will be built around BMI information stored in ESP as data loaded directly from the ESP data partner’s EMR system or as calculated from raw height and weight information provided at data load time.

# BMI Data Loading elements

1. If available in the EMR, BMI data may be loaded directly as field 21 in the data loading specification. BMI is a numeric format.
2. Height may be provided in field 15 in the data loading specification. The format must be feet and inches - [x' y''].
3. Weight may be provided in field 14 in the data loading specification. The format must be pounds and ounces - [x lb y oz].

# ESP Data model elements

The ESP encounter data model includes the following elements as related to BMI:

* raw\_weight (text) – data as directly provided in the input data file.
* raw\_height (text) – data as directly provided in the input data file
* BMI (text) – data as directly provided in the input data file
* height (double precision) – calculated value during data loading
* weight (double precision) – calculated value during data loading

# Data Loading Logic for calculation of BMI

1. In ESP.utils there are two methods that use a regex process to identify strings that meet input criterias. These methods will recognize string values such as “33. lb 0 oz” , “33 lb 0 oz” etc. (See the section at the end of this document for outliers of heigt, weight, and BMI.)
	1. height\_str\_to\_cm
		1. Converts feet and inches to centimeters This is the value that is stored in the height field in the emr\_encounter database table.
	2. weight\_str\_to\_kg.
		1. Converts pounds and ounces to kilograms. This is the value that is stored in the weight field in the emr\_encounter database table
2. The Encounter data model also includes a method for generating BMI: \_calculate\_bmi.  This is used in the EncounterLoader after height and weight are calculated.  It uses the following logic:
	1. if raw bmi string is not null and can be converted to a number, then store that value in emr\_encounter in the bmi field.
	2. else try to determine an available height and weight to calculate bmi:
		1. if the encounter has height and weight converted from raw height and weight, then calculate BMI from that.
		2. else if there is a BMI value in the last 365 days, use that
			1. NOTE: Since we are also carrying BMI forward 2 years in TrimTracker, this will mean that BMI in trim tracker can be based on a measure that is up to 3 years old.
		3. else use the most recent height measurement available for the patient since their 16th birthday and use the most recent weight measurement in the past year.
			1. NOTE: Newer weight will take precedence over an older BMI even if the BMI is within the last 365 days.
		4. If there are usable height and weight values from 4.2.2.1 or 4.2.2.3, calculate BMI as weight / (height / 100)\*\*2

# Outliers

* Set to missing BMI >200
* Set to missing weight >400kg
* Set to missing height >250cm