

Conditional Logic in Templates – A Tutorial

by

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This is something that can easily be confusing. The documentation in Practice Partner is accurate (find it by searching for “Using conditional logic in letter templates”), but it is not easily understood if you are not used to programming. Here is my attempt to simplify it.

The most basic statement is in this form:

```
|| IF <something> <is related to> <something else> {this happens}||
```

For example

```
|| IF PAT_SEX = “male” {he} ||
```

In the above, everything between the two || delimiters will be replaced with the word “he” if the patient is a male, and the phrase will evaluate to nothing if the patient is not a male.

We can make this more sophisticated by adding an ELSE phrase:

```
|| IF PAT_SEX = “male” {he} ELSE {she}||
```

In an ideal world, this would substitute the appropriate pronoun for the patient wherever it was placed in a template. But, what if someone forgot to enter the patient sex in the demographics? In that case, the snippet of code would evaluate to “she,” even if the patient was really a male, because PAT_SEX would evaluate to “” (nothing). To fix this, we might do the following:

```
|| IF PAT_SEX = “” {he or she} ELSE { IF PAT_SEX = “male” {he} ELSE {she} } ||
```

We can format this to make it more understandable as follows:

```
|| IF PAT_SEX = “” {he or she}
   ELSE { IF PAT_SEX = “male” {he}
         ELSE {she}
       }
||
```

Lining up the || vertically and the {} vertically helps understand how the logic goes.

In general, you can keep from being confused by using the following as your basic construct:

```
|| IF something compares somethingelse {      } ELSE {  } ||
```

You can fill in the blanks between the curly braces { } with a phrase you want to be substituted, you can enter another conditional statement between the curly braces, or you can even leave the space between the curly braces blank { } and it will not change how the statement is evaluated.

In other words, the following two statements evaluate the same:

```
|| IF PAT_SEX = "male" {he} ||
|| IF PAT_SEX = "male" {he} ELSE { } ||
```

The only logical operators Practice Partner understands are IF, ELSE, AND, and OR. They must be capitalized, and you can not use them except in conditional statements. Thus, capitalized they are “reserved words.”

To get more complex, you can use AND or OR after your first comparison and before your first “{“ .

For example

```
|| IF PAT_SEX = "male" AND PAT_AGE > "50" {he might just need a prostate exam} ||
```

or

```
|| IF PAT_SEX = "male" OR PAT_AGE > "95" {the patient probably doesn't need a screening Pap smear} ||
```

You can use lab values for doing comparisons. For example,

```
|| IF LAB<HDL CHOLESTEROL>[-Date] < "40" AND PAT_SEX ="male" { The HDL
is too low.}
    ELSE
        {IF LAB<HDL CHOLESTEROL>[-Date] < "50" AND PAT_SEX =
"female" {The HDL is too low}
            ELSE
                {The HDL is OK}
        }
||
```

You can construct these compound statements by using the basic statement

```
|| IF something compares somethingelse {xxxxxxx} ELSE {yyyyyyy} ||
```

and pasting it into the space between the curly braces. For example, paste it into itself (without the double bar || characters) where the xxxxxx is:(the pasted text will be in blue):

```
|| IF something compares somethingelse { IF something compares somethingelse
{xxxxxxx} ELSE {yyyyyyy}
    }
    ELSE {yyyyyyy}
||
```

We can add another conditional to the last set of curly braces above, replacing the last yyyyyyy: with the basic statement (this time in red)

```

    || IF something compares somethingelse { IF something compares somethingelse
    {xxxxxxx} ELSE {yyyyyyy}
    }
    ELSE { IF something compares somethingelse {xxxxxxx} ELSE
    {yyyyyyy}
    }
    ||

```

You can continue making more and more complex statements by simply replacing the xxxxxxx or yyyyyyy statements between the curly braces with the basic statement. The following has two more substitutions (in green).

```

    || IF something compares somethingelse
    { IF something compares somethingelse {xxxxxxx}
    ELSE
    { IF something compares somethingelse {xxxxxxx}
    ELSE
    {yyyyyyy}
    }
    }
    ELSE { IF something compares somethingelse
    { IF something compares somethingelse {xxxxxxx}
    ELSE
    {yyyyyyy}
    } ELSE
    {yyyyyyy}
    }
    ||

```

If one fails to format this with the curly braces lined up, it can be much more difficult to read and understand:

```

    || IF something compares somethingelse {IF something compares somethingelse
    {xxxxxxx} ELSE { IF something compares somethingelse {xxxxxxx} ELSE
    {yyyyyyy}} } ELSE {IF something compares somethingelse {IF something compares
    somethingelse {xxxxxxx} ELSE {yyyyyyy} } ELSE {yyyyyyy}}||

```

Or, with the colors removed:

```

    || IF something compares somethingelse {IF something compares somethingelse
    {xxxxxxx} ELSE {IF something compares somethingelse {xxxxxxx} ELSE
    {yyyyyyy}} } ELSE {IF something compares somethingelse {IF something compares
    somethingelse {xxxxxxx} ELSE {yyyyyyy} } ELSE {yyyyyyy}}||

```

The point of all this is that you should make your templates easy to understand by formatting your conditional logic statements appropriately. It will save you lots of headaches.

Another point about conditional logic is that *spaces* are important in some situations. For example,

```
||IF PATIENT_AGE >"65" {bill Medicare}||
```

will **not** evaluate correctly because there is no space between the > and the "65".

You should have a space before and after the keywords AND, OR, and ELSE.

You need a space after the keyword IF, but it is OK not to have a space in front of it if a curly brace ({} or double bars (||) are in front of it.

You need a space between the last set of double bars in one expression and the first set in the next. For example

```
||IF LAB<CHOLESTEROL> > "130" {Too High}|||IF LAB<HDL> > "160"
{GOOD}||
```

Will not evaluate due to lack of a space between the two expressions, but

```
||IF LAB<CHOLESTEROL> > "130" {Too High}|| ||IF LAB<HDL> > "160"
{GOOD}||
```

will evaluate just fine.

Also, remember that Practice Partner can only compare string values. Although the lab values appear to be numbers, they are stored and treated by Practice Partner as characters or string values. This means that you have to put quote marks around a value you want to compare. You do not need to put the quote marks around lab values or letter codes, because they are understood to be string values.

The following pages list a lab letter that shows some of these techniques:

=====

PGSETUP<PLFM2>

```
||PAT_FNAME|| ||PAT_LNAME||
||PAT_ADDR1||
<delb>||PAT_ADDR2||
||PAT_CITY|| ||PAT_STATE|| ||PAT_ZIP||
```

```
||DATE||
```

Dear ||IF PAT_SEX = "male" {Mr.} ELSE {Ms.} PAT_LNAME||,

The following are your recent blood results. Also included may be some tests done previously.

```
<del>||LAB<HEMATOCRIT>[-Date]||
```

```

«del»||IF LAB<HEMATOCRIT>[-Date] >= ".001"
  {IF PAT_SEX = "male"
    {IF LAB<HEMATOCRIT>[-Date] < "40.0"
      {You are «*a_little» anemic. «*»}
    ELSE
      {IF LAB<HEMATOCRIT>[-Date] > "50.0"
        {Your blood count is «*a_little» too high. «*»}
      ELSE
        {You are not anemic.}
      }
    }
  ELSE
    {IF LAB<HEMATOCRIT>[-Date] < "35.0"
      {You are «*a_little» anemic. «*»}
    ELSE
      {IF LAB<HEMATOCRIT>[-Date] > "46.0"
        {Your blood count is «*a_little» too high. «*»}
      ELSE
        {You are not anemic.}
      }
    }
  }
}
||
«del»
«del»||LAB<CHOLESTEROL>[-Date]||
«del»||IF LAB<CHOLESTEROL>[-Date] >= ".001"
  {Your total cholesterol is
    IF LAB<CHOLESTEROL>[-Date] <= "200"
      { normal.}
    ELSE
      {IF LAB<CHOLESTEROL>[-Date] > "200"
        {abnormal. The goal is less than 200.
        IF LAB<LDL CHOLESTEROL>[-Date] > "130"
          { You can improve this by lowering the saturated fats in
your diet. }
        ELSE
          {IF LAB<TRIGLYCERIDES>[-Date] < "151"
            { You don't have to worry about this because
your good cholesterol (HDL) is the main reason for this elevation. }
          ELSE
            {}
          }
        }
      }
    }
  }
}
||
«del»
«del»||LAB<TRIGLYCERIDES>[-Date]||
«del»||IF LAB<TRIGLYCERIDES>[-Date] >= ".001"
  {Your Triglyceride level is
    IF LAB<TRIGLYCERIDES>[-Date] <= "150"
      {normal. }
    ELSE
      {too high. The goal for triglycerides is less than 150. If you did not go
without eating for at least 8 hours before this was drawn, however, the number is
meaningless. If you were fasting when the blood was drawn, you can lower your

```

```

        triglycerides by reducing the starches (bread, potatoes, rice, noodles) and
        alcohol in your diet.}
    }
    ||
    <del>
    <del>||LAB<HDL CHOLESTEROL>[-Date]||
    <del>||IF LAB<HDL CHOLESTEROL>[-Date] >= ".001"
        {IF PAT_SEX = "male"
            {IF LAB<HDL CHOLESTEROL>[-Date] < "40.0"
                {Your good cholesterol is «*a_little» too low. An HDL of less than 40 is
                considered a risk factor for heart disease. Ideally, it should be over 65. You can raise your HDL
                cholesterol by exercising more and perhaps by eating more fish and monosaturated oils such as
                olive oil and peanut oil. }
            ELSE
                {IF LAB<HDL CHOLESTEROL>[-Date] >= "65.0"
                    {Your good cholesterol is excellent.}
                ELSE
                    {Your good cholesterol is normal, but it would be
                    better if it were greater than 65. You can raise your HDL cholesterol by exercising more and
                    perhaps by eating more fish and monosaturated oils such as olive oil and peanut oil. }
                }
            }
        ELSE
            {IF LAB<HDL CHOLESTEROL>[-Date] < "50.0"
                {Your good cholesterol is «*a_little» too low. Ideally, it should be over 75.
                You can raise your HDL cholesterol by exercising more and perhaps by eating more fish and
                monosaturated oils such as olive oil and peanut oil. }
            ELSE
                {IF LAB<HDL CHOLESTEROL>[-Date] >= "75.0"
                    {Your good cholesterol is excellent.}
                ELSE
                    {Your good cholesterol is normal, but it would be
                    better if it were greater than 75. You can raise your HDL cholesterol by exercising more and
                    perhaps by eating more fish and monosaturated oils such as olive oil and peanut oil}
                }
            }
        }
    ||
    <del>
    <del>||LAB<LDL CHOLESTEROL>[-Date]||
    <del>||IF LAB<LDL CHOLESTEROL>[-Date] >= ".001"
        { IF LAB<LDL Goal>[-Date] <> ""
            {IF LAB<LDL CHOLESTEROL>[-Date] <= LAB<LDL Goal>
                {Your bad cholesterol is to goal. The LDL Goal for you is LAB<LDL
                Goal>}.}
            ELSE
                {IF LAB<LDL CHOLESTEROL>[-Date] > LAB<LDL Goal>
                    {Your bad cholesterol is not to goal. The LDL Goal for you is
                    LAB<LDL Goal>. You can reduce your LDL cholesterol by reducing the saturated fats in your
                    diet.}
                }
            }
        }
    }
    ELSE

```

{Your bad cholesterol is ~~»~~ «*too high» «*fine» «*better» «*worse»
«*not_meas» Your goal is an LDL cholesterol that is «*LT_130» «*LT_100» «*LT_70»
You
can reduce your LDL cholesterol by reducing the saturated fats in your diet. }

```
}
||
«del»
«del»||LAB<CREATININE>[-Date]||
«del»||IF LAB<CREATININE>[-Date] >= ".001"
    { IF LAB<CREATININE>[-Date] > "1.5"
        {Your kidney function is somewhat decreased. «*Comp-Last» }
    ELSE
        {Your kidney function is normal.}
    }
||
«del»||LAB<GLUCOSE, RANDOM>[-Date]||
«del»||IF LAB<GLUCOSE, RANDOM>[-Date] >= ".001"
    {Your random blood sugar is » «*normal» «*borderlin» «*abnormal»}
||
«del»||LAB<GLUCOSE, FASTING>[-Date]||
«del»||IF LAB<GLUCOSE, FASTING>[-Date] >= ".001"
    {Your fasting blood sugar is
        IF LAB<GLUCOSE, FASTING>[-Date] >= "70" AND LAB<GLUCOSE,
FASTING>[-Date] < "100"
            {normal.}
        ELSE
            {IF LAB<GLUCOSE, FASTING>[-Date] <= "125"
                {too high. Normal is less than 100. Diabetes is defined as over
125. Your glucose puts you in the impaired fasting glucose category «*Comp-Last» }
            ELSE
                {IF LAB<GLUCOSE, FASTING>[-Date] >= "126"
                    {in the diabetic range, which is defined as over 125.
«*Comp-Last»}
                }
            }
    }
||
«del»||LAB<HEMOGLOBIN A1C>[-Date]||
«del»||IF LAB<HEMOGLOBIN A1C>[-Date] >= ".001"
    {Your 90-day average blood sugar is
        IF LAB<HEMOGLOBIN A1C>[-Date] <= "5.8"
            {normal.}
        ELSE
            {IF LAB<HEMOGLOBIN A1C>[-Date] <= "6.5"
                {to goal. The goal is less than 6.5. «*Comp-Last» }
            ELSE
                {not to goal. The goal is less than 6.5. «*Comp-Last» }
            }
    }
||
«del»||LAB<AST>[-Date]||
«del»||LAB<ALT>[-Date]||
«del»||LAB<GGT>[-Date]||
«del»||LAB<ALK>[-Date]||
«del»||LAB<LDH>[-Date]||
«del»||IF LAB<ALT>[-Date] >= ".001"
    {Your liver tests were» «*normal» «*abnormal»}
```

```

||
<<del>>||LAB<HEP B SURF AB>[-Date]||
<<del>>||IF LAB<HEP B SURF AB>[-Date] <> ""
    {IF LAB<HEP B SURF AB>[-Date] = "Positive"
        {You are immune to Hepatitis B}
    ELSE
        {You are not immune to Hepatitis B}
    }
||
<<del>>||LAB<TSH>[-Date]||
<<del>>||IF LAB<TSH>[-Date] >= ".001"
    {Your thyroid level is
        IF LAB<TSH>[-Date] < "0.4"
            {too high. <<*>}
        ELSE
            {IF LAB<TSH>[-Date] > "5.5"
                {too low. <<*Comp-Last>}
            ELSE
                {normal. }
            }
    }
||
<<del>>||LAB<TESTOSTERONE>[-Date]||
<<del>>||IF LAB<TESTOSTERONE>[-Date] >= ".001"
    {IF LAB<TESTOSTERONE>[-Date] > "1195"
        {Your Testosterone level is higher than normal. <<*Comp-Last>}
    ELSE
        {IF LAB<TESTOSTERONE>[-Date] < "270"
            {Your Testosterone level is lower than normal. <<*Comp-Last>}
        ELSE
            {Your Testosterone level is normal.}
        }
    }
||
<<del>>||LAB<TESTOSTERONE FREE>[-Date]||
<<del>>||IF LAB<TESTOSTERONE FREE>[-Date] >= ".001"
    {IF LAB<TESTOSTERONE FREE>[-Date] > "48"
        {Your Free Testosterone level is higher than normal. <<*Comp-Last>}
    ELSE
        {IF LAB<TESTOSTERONE FREE>[-Date] < "5.0"
            {Your Free Testosterone is lower than normal. <<*Comp-Last>}
            ELSE
                {Your Free Testosterone is normal.}
        }
    }
||
<<del>>||LAB<FSH>[-Date]||
<<del>>||IF LAB<FSH>[-Date] >= ".001"
{You are<<del>> <<*>notmen> <<*>premen> <<*>postmen>}||
<<del>>||LAB<URIC ACID>[-Date]||
<<del>>||IF LAB<URIC ACID>[-Date] >= ".001"
    {IF LAB<URIC ACID>[-Date] > "8.1"
        {Your Uric Acid level is too high. High levels of uric acid can lead to gout, kidney
stones, and other problems. We can discuss this next time I see you. In the mean time, you can
improve things by drinking more water. <<*Comp-Last>}
    ELSE

```

```

        {Your Uric Acid level is normal}
    }
    ||
    <del>||LAB<POTASSIUM>[-Date]||
    || IF LAB<POTASSIUM>[-Date] >= ".001"
        {IF LAB<POTASSIUM>[-Date] > "5.3 "
            {Your Potassium level is too high. «*»}
        ELSE
            {IF LAB<POTASSIUM>[-Date] < "3.5"
                {Your Potassium level is too low. «*»}
            ELSE
                {Your Potassium level is normal.}
            }
        }
    }
    ||
    <del>||LAB<SODIUM>[-Date]||
    <del>||IF LAB<SODIUM>[-Date] >= ".001"
        { IF LAB<SODIUM>[-Date] > "145"
            {Your Sodium level is too high. «*Comp-Last»}
        ELSE
            {IF LAB<SODIUM>[-Date] < "135"
                {Your Sodium level is too low. «*»}
            ELSE
                {Your Sodium level is normal.}
            }
        }
    }
    ||
    <del>||LAB<MAGNESIUM>[-Date]||
    <del>||IF LAB<MAGNESIUM>[-Date] >= ".001"
        { IF LAB<MAGNESIUM>[-Date] > "2.4"
            {Your Magnesium level is too high. «*»}
        ELSE
            {IF LAB<MAGNESIUM>[-Date] < "1.5"
                {Your Magnesium level is too low. «*»}
            ELSE
                {Your Magnesium level is normal.}
            }
        }
    }
    ||
    <del>||LAB<PSA>[-Date]||
    <del>||IF LAB<PSA>[-Date] >= ".001"
        {Your prostate blood test was
            IF LAB<PSA>[-Date] <= "4.0"
                {normal.}
            ELSE
                {abnormal. Normal is less than 4.0. «*Comp-Last»}
        }
    }
    ||
    <del>||LAB<VITAMIN B12>[-Date]||
    <del>||IF LAB<VITAMIN B12>[-Date] >= ".001"
        {Your Vitamin B12 level was
            IF LAB<VITAMIN B12>[-Date] >= "200"
                {normal.}
            ELSE
                {too low. Normal is over 200. «*»}
        }
    }

```

```

||
«del»||LAB<FOLIC ACID>[-Date]||
«del»||IF LAB<FOLIC ACID>[-Date] >= ".001"
    {Your Folic Acid was
        IF LAB<FOLIC ACID>[-Date] >= "3.0"
            {normal.}
        ELSE
            {too low. Normal is greater than 3.0. «*»}
    }
}
||
«del»||LAB<CRP-HI SENS>[-Date]||
«del»||LAB<CRP QUINTILE>[-Date]||
«del»||LAB<CVD RISK>[-Date]||
«del»||IF LAB<CRP-HI SENS>[-Date] >= ".001"
    {The test to asses your risk for heart disease based on inflammation puts you at «del»
«*LowRisk» «*AvgRisk» «*HighRisk»}
}
||
«del»||LAB<ANA>[-Date]||
«del»||IF LAB<ANA>[-Date] <> ""
    {Your test for anti-nuclear antibodies was
        IF LAB<ANA>[-Date] = "Negative"
            {normal.}
        ELSE
            {abnormal. This may indicate «*» .}
    }
}
||
«del»
«del»||LAB<INR>[-Date]||
«del»||IF LAB<INR>[-Date] >= ".001"
    {IF LAB<INR Goal>[-Date] <> ""
        { IF LAB<INR Goal>[-Date] = "2.0 - 3.0"
            { IF LAB<INR>[-Date] < "2.0"
                {Your warfarin level is too low. The goal is an INR that is
between 2.0 and 3.0. «*» }
            ELSE
                { IF LAB<INR>[-Date] > "3.0"
                    {Your warfarin level is too high. The goal is an INR that
is between 2.0 and 3.0. «*»}
                ELSE
                    {Your warfarin level is at goal. The goal is an INR that is
between 2.0 and 3.0. Please continue taking your warfarin at the present dose. }
                }
            }
        }
    ELSE
        {IF LAB<INR Goal>[-Date] = "2.5 - 3.5"
            {IF LAB<INR>[-Date] < "2.5"
                {Your warfarin level is too low. The goal is an INR that is
between 2.5 and 3.5. «*» }
            ELSE
                { IF LAB<INR>[-Date] > "3.5"
                    {Your warfarin level is too high. The goal is an
INR that is between 2.5 and 3.5. «*»}
                ELSE
                    {Your warfarin level is at goal. The goal is an
INR that is between 2.5 and 3.5. Please continue taking your warfarin at the present dose. }
                }
            }
        }
    }
}

```

```
    }  
  }  
  }  
  ELSE  
    {Your warfarin level is <del> «*atgoal» «*too high» «*toolow» «*INR_Goal»}  
  }
```

```
||  
<del> «*PAP»  
<del> «*HEMOCULT»  
<del> «*MAMMO»  
<del> «*CHESTXRAY»  
<del> «*STOOL»
```

```
<del> «*INSTRUCT»  
<del> «*BloodFine»  
<del> «*WATCHFAT»  
<del> «*EXERCISE»  
<del> «*LOSEWGHT»  
<del> «*RPTBDTEST»  
<del> «*FOLLOWUP»
```

Please note that we now have the ability to conduct liver and cholesterol tests in house. Please come in fasting (no food for 8 hours) if you wish to have these tests performed at your next appointment «*.»

Sincerely,

<req> «*STEW» «*PALMER» «*CHEN» «*HEATHER» «*EVA» «*CARLYN» «*Liu»