Excel Functions Every Excel User Should Know, Pt. 6

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This article will add two more Excel functions to our list of functions that can be helpful in analyzing medical practice data: LARGE and SMALL. Both functions assume you have a list and want to choose a value from the list either starting at the largest (LARGE) or the smallest (SMALL). First, we will review the syntax for the function, and then we will describe how the function might be used to add interesting analyses to your medical practice data. The functions offer time saving insights that are hard to replicate using other Excel techniques.

LARGE

The syntax for LARGE is =LARGE(array, K). Despite Excel's terminology, the syntax is easier than it looks. Array is a range. Arrays in Excel can do very powerful analyses across multiple cells with a simple formula. To start with, an array can also simply be a range of cells. For example, you might have a list of all dates of patient visits in cells B3:B24. That range of cells can be an array. The variable K is simply the position of the value in the list you want to return.

The example in Figure 1 should help. Column C has a list of patient visit dates when a given patient has visited the clinic. Cell B1 has the number 5. The formula (not shown) in cell A3 is =LARGE(C3:C17,B1). The formula searches the range C3:C17 looking for the fifth largest value, since B1 is 5. If B1 was 2, the formula would look for the second largest value. The LARGE function starts looking at the largest value and works down. The data does not need to be sorted for LARGE to work. The data is sorted in Figure 1 to make the example easier to follow. Start with the largest value in the array, 7/27/2018. Counting down, the fifth largest value is 7/3/2018, the answer stored in cell A3.

You might use LARGE to track how long it takes patients to visit your clinic a certain number of times. For example, on average, how many days does it take for a patient to be seen 4 times in your practice? Does that average vary by provider, location, diagnosis, or some other factor? Use LARGE to find the fourth visit. To find the first time a patient visited your practice, you could use the MIN function or the SMALL function, described next.

FIGURE 1

	A	B	C
1	Latest patient visit	5	
2			
3	7/3/2018		7/27/2018
4			7/20/2018
5			7/16/2018
6			7/10/2018
7			7/3/2018
8			6/27/2018
9			6/22/2018
10			6/13/2018
11			6/9/2018
12			6/9/2018
13			6/6/2018
14			6/6/2018
15			6/3/2018
16			5/24/2018
17			5/8/2018
18			

SMALL

SMALL has the same syntax as LARGE. The only difference is t where LARGE started at the largest value and counted down, SMALL starts at the smallest value and counts up. An example is in Figure 2. Cells C4:C18 are dates a provider

has a new patient appointment available on the schedule. Cell C1 has the value 3, since we are looking for the third next available new patient appointment. The formula (not shown) in cell A4 is =SMALL(C4:C18,C1). Starting with the first available appointment on 5/9/2018, the third next available appointment is 5/16/2018. Like LARGE, SMALL does not require the data to be sorted to return an accurate result. The SMALL function is a great way to calculate the third next available appointment.

Adding Power to LARGE and SMALL With Arrays

What if you would like to find the third next available appointment for a certain provider in a list of all upcoming appointments? What if you have a list of all patient visits and you need to find the date of each patient's fifth most recent visit? Instead of simply using a range of cells, try using an array instead. Arrays are Excel formulas that can make complex calculations. There are two types of array formulas, array formulas that calculate a single result and array formulas that generate multiple results.

The way to identify an array formula is by the curly braces that surround a cell formula. The formula {=MIN(LEN(C4:C18))} is an array formula that calculates the length of each cell from C4:C18, and then calculates the minimum length. The key is that you cannot enter the braces in the formula by typing them. Instead, when you finish typing a formula, use Ctrl+Shift+Enter and Excel automatically adds the braces. Sometimes array formulas are known as Ctrl+Shift+Enter or CSE formulas because of the keystrokes required to enter an array formula. One use of array formulas is to put criteria in the LARGE and SMALL calculations in these examples.

There are Excel Videos at mooresolutionsinc.com that introduce arrays and then use arrays to put criteria in a SMALL example. Arrays are a complex topic that go beyond Excel functions every Excel user should know, but the power of an array formula is worth learning the basics. To get started, here are two playlists of Excel Videos to learn arrays.

mooresolutionsinc.com/arrayspart1
mooresolutionsinc.com/arrayspart2

We will start working through some basic array formulas in the next issue of RCM Advisor. For dozens of free articles and hundreds of free videos on using Excel in a medical practice, please visit **www.mooresolutionsinc.com** ■

FIGURE 3

	A	B	C	D
1	Which next available?		3	
2				
3				
4	5/16/2018		5/9/2018	
5			5/13/2018	
6			5/16/2018	
7			5/20/2018	
8			5/26/2018	
9			5/29/2018	
10			6/9/2018	
11			6/16/2018	
12			6/18/2018	
13			7/6/2018	
14			7/9/2018	
15			7/14/2018	
16			7/21/2018	
17			7/23/2018	
18			7/25/2018	
19				

Nate Moore, CPA, MBA, FACMPE, writes custom SQL Server code to mine practice management data for analysis in Excel, web pages, and via email. Nate's second book, **Better Data, Better Decisions – The SQL: Business Intelligence for Medical Practices,** ***was just published by MGMA. His free Excel Videos have been viewed over 2 million times and are available at mooresolutionsinc.com. Like PivotTableGuy on Facebook or follow PivotTableGuy on Twitter to be notified each time an Excel Video is released. Attend HBMA's 2018 Healthcare Revenue Cycle Conference to get hands-on training with Nate.***