



BY JARROD SHAPIRO, DPM

# The Most Important Equation

It's important to understand the power of compounding interest.

*Practice Perfect is a continuing every-issue column in which Dr. Shapiro offers his unique personal perspective on the ins and outs of running a podiatric practice.*

**W**hat is the most important equation in the life of a doctor? Is it the Cockcroft-Gault equation for creatinine clearance? Is it calculating the LRINEC score for necrotizing fasciitis? Could it be the Gupta score or the Revised Cardiac Risk Index for perioperative major cardiac adverse events? Could it even be the calculation of neutral subtalar joint position? Not a chance.

It's an equation we all learned back in high school. We just didn't realize at the time—and maybe even now—just how important this equation really is. The equation is—drum-roll please....

## Calculation of Compound Interest

$$A = P \left( 1 + \frac{r}{n} \right)^{nt}$$

Total letdown, right? Well, what were you expecting? Calculation of the meaning of life, the universe, and everything? The answer to that, by the way, is the number 42. Just read, *The Hitchhiker's Guide to the Galaxy*, by Douglas Adams to understand why. But in fact, the great Albert Einstein is credited in observing that compound interest is “The



**Albert Einstein is credited in observing that compound interest is “The most powerful force in the universe.”**

most powerful force in the universe. He who understands it, earns it. He who doesn't, pays it.”

Anyway, yes, this is a very important equation for the simple reason that it greatly affects how much money each of us ends up with when it comes time to retire. Now, for those of you just starting your career, you're probably thinking, “I don't need to

worry about retirement; I have many years and plenty of time before that happens.” You don't have the money to invest in retirement, which is so many years away. You need money to live. Maybe you just started in practice, and this is the first time you have a reasonable income. Perhaps you have children—they're expensive! Well, dear readers, we all tell ourselves about the same thing for a good number of years. We all have the excuses ready-made: so many bills, a young family, the need for a home, the desire to have just a little fun after all those years of training.

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*Equation (from page 37)*

Now, at the ripe old age of 48, after being in practice for almost 16 years and at a point in life where income generation allows investment, we look back at the missed opportunities compound interest affords and realize we now must work extra hard to build for a safe retirement.

started residency two months ago. He makes a salary of \$50,000/year. Dr Pod decides to invest an initial \$500 and contributes \$200 monthly to an account that has a 6% return and compounds monthly. When he retires at 65 years-old (a 35-year time period), this investment will have grown to \$289,003.<sup>1</sup> On the other hand, Dr Older Pod instead waits until he is 48

incomes over time, so that investment amount should also increase. Additionally, there are several types of investments of varying risk and return. For example, investing in an index mutual fund that follows the S&P 500 gives an average 10% return annually.

It's also important to consider 401K and 403b retirement plans, especially for those of us employed by companies large enough to offer them. These often include matching plans that increase the overall amount invested by the individual. Similarly, consider IRAs and Roth IRAs, which have specific tax advantages. College investment plans such as 529 plans allow us to pay for our children's educations while using compound interest and market investments to grow that money without taxing the profit (if the money is used for educational expenses).

The message for all you young podiatrists is to start early. Retirement is not as far away as you might think, and you can use the power of time and compound interest to make your money work for you. **PM**

**The message for all you young podiatrists is to start saving and investing early.**

You see, the “n” and “t” of that all-important equation tell the story. The “n” equals the number of times interest is applied, while “t” is time, that oh-so-powerful force in life. Notice also that both n and t are exponents, meaning growth of an investment is exponential over time. One very important ramification is that we have two choices in life:

1) Invest a relatively small amount of money early in life and allow a lot of time to go by while that investment builds at an ever-increasing rate over time.

2) Invest a much larger amount of money later in life to catch up and recoup the lost opportunity of time.

Let's look at an example case. Dr Young Pod is 30 years old. He just graduated from podiatry school and

years-old to invest the same amount with the same parameters. Now, at 65 years-old, he only has a measly \$72,029. What a difference!

At 48 years old, to catch up to Dr Young Pod's original 35-year investment, Dr. Older Pod would now have to invest \$10,000 initially and deposit \$700/month. At 65 years-old, he would have earned \$274,923. It's still not as much of a return as with the original investment.

The lesson to learn is the incredible power of time in building wealth via compound interest. The earlier we start investing, and the longer we allow that investment to grow, the larger it will be at the end. Now, the numbers used in the example are small, and they leave out a lot of life's factors. Most podiatrists will make increasing

**References**

<sup>1</sup> Compound Interest Calculator. <https://www.investor.gov/financial-tools-calculators/calculators/compound-interest-calculator>.

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