

Five Secrets

To Creating Exceptional Healthcare Employees



By Thomas Meloche
President and CEO of ProcuIt
Copyright © 2009 ProcuIt Inc. All Rights Reserved

Introduction

You are about to learn five secrets for creating exceptional healthcare employees. These secrets are a result of decades of research in cognitive science, and are directly applicable to your organization. Most organizations, of course, are not surprised by the essential findings: **long-term employee memory is essential for success in the healthcare industry.**

Healthcare is a knowledge intensive industry. Everything we see, hear, say and do on our jobs is directly influenced by and is critically dependent on our long-term memory. Even advanced problem solving and expert reasoning are dependent on long-term memory. It should not be surprising then, that the secrets we are about to share are all related to improving long-term memory. If you apply these secrets of cognitive science to your healthcare training initiatives, you will create measurably more effective employees.

The Problem

Healthcare organizations who first start to train their employees may wonder if their training is efficient or effective. These organizations eventually discover that their concerns are merited. And even though all employees are different, they all share the same basic brain structure, so they all face this same significant challenge.

The problem these businesses quickly discover? Employees leak. That's right, they leak information. You may know leaking by its more common name – forgetting. If you send your employees through a week long training course, they will likely forget 80% or more of the information within ninety days. They may have forgotten half of the information by the following Monday!

Employees forget – a lot – very quickly. Experienced trainers know this all too well. This leakage is why training frequently *feels* like a complete waste of time. This leakage is why healthcare organizations usually cut training budgets first when times get tough, because they secretly suspect that most of their training initiatives are not helping the bottom-line. It turns out, these organizations are right, and that most training initiatives are wasted because of lack of proper cognitive follow-up.

In 1885, Hermann Ebbinghaus described the exponential nature of forgetting in the following mathematical equation:

$$R = e^{-\frac{t}{S}}$$

Where **R** is Retention (how much you remember), **S** is Strength of Memory, **t** is Time

An example curve for this equation may be seen below in Figure 1, which shows how quickly a typical employee will forget 100 new facts they have just learned (for example, the how to encode certain diseases in medical reporting).

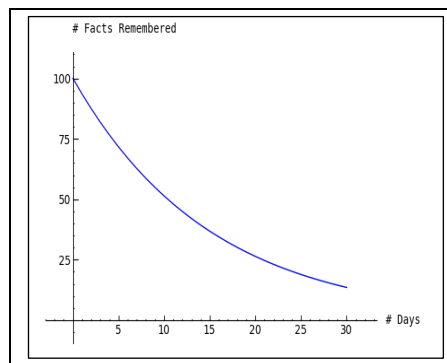


Figure 1: Forgetting Curve For Typical Employees

The precise details of the curve vary from employee to employee and subject to subject. Still, there is always a dramatic drop in knowledge retention over time. The shape of this curve represents how quickly average employees forget information. Do you recognize the curve? It is what is known as an *exponential curve*. That's right: employees forget information exponentially. This isn't much of a surprise. Most trainers and employees already understand how difficult it can be to learn new things; or rather, how easy it is to forget them.

What does this curve mean practically? Here is an example: Let's say that Callie, learns how to encode 100 diseases into ICD-10-CM by cramming really hard today. A week later Callie remembers only 65 of them, two weeks after that Callie can recall only 34, and at the end of the month, Callie remembers only 20. Callie's cram session really didn't help her learn her encodings for the long-term. No wonder everybody hates having to cram for a test; we all know it has little long-term value.

So what is the difference between average employees and above average employees? Above average employees have learned how to make their memories stronger. They have learned how to remember longer. This flattens out their forgetting curve. They still forget, of course, but it takes a lot more time. For example, as seen in Figure 2, an above average employee may remember three times more facts at the end of 30 days than the typical employee.

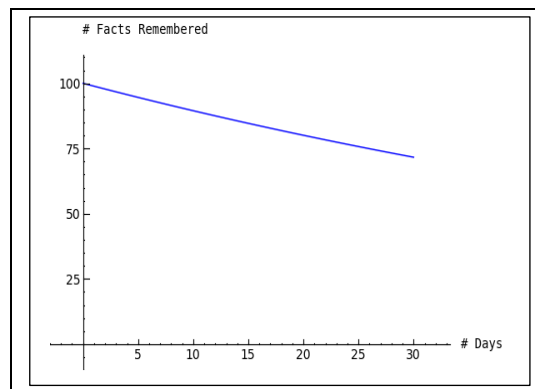


Figure 2: Forgetting Curve For An Above Average Employee

Of course, we are looking for our employees to be more than just above average. We want them to be *exceptional* employees. Do exceptional employees still forget? Absolutely.

The key to creating exceptional employees is to understand the nature of forgetting, and to develop a strategy for making stronger memories. Exceptional employees still forget, but they use strategies to reinforce their memories, making them stronger. What does the forgetting curve of an exceptional employee look like?

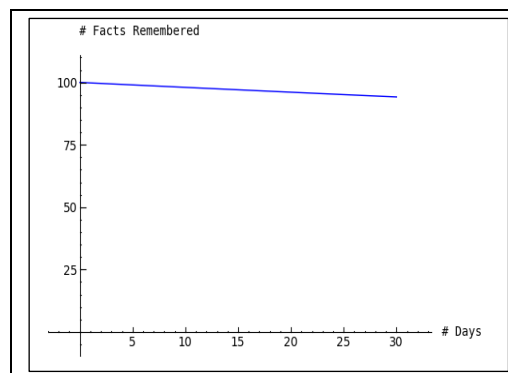


Figure 3 Forgetting Curve For Exceptional Employees

All knowledgeable employees forget important information. However, exceptional employees forget information *more slowly*. They have learned to create a forgetting curve that is closer to Figure 3 *Figure 1*. They have discovered the secrets of retaining and recalling knowledge. In fact, exceptional employees are trained by organizations that have learned the five secrets to creating exceptional healthcare employees.

These secrets dramatically improve retention and recall. These secrets will move any employee from the curve in Figure 1 toward the curve in Figure 3. The base biological speed at which humans tend to forget differs little between individuals, so if exceptional employees are remembering more, it is because they use techniques that make their memories stronger. So what are the techniques?

The Five Secrets to Creating Exceptional Healthcare Employees:

1. Train Every Day
2. Reinforce With Spaced Repetition
3. Actively Recall Facts
4. Build Knowledge Nets
5. Seek Associations

This paper will review each of these secrets one at a time. If you want to dramatically change how your employees learn, if you want to create exceptional healthcare employees, then read on.

Secret #1: Train Every Day

This may sound crazy, but it is only crazy to those doing traditional training. Healthcare organizations must create an environment where employees learn every day. This is the first lesson we teach healthcare organizations. At first, this may appear to be a lesson in persistence, but it is not. This advice is about brain chemistry and human cognitive architecture. This advice is the secret to spending less time and money training your employees while they learn dramatically more and retain it longer. The first step is to learn to work with the brain's natural capabilities, and not against them.

Here is a practical question: Say an employee is going to learn the names of one hundred products in a product catalog and you wish to invest three hours time to train them. Which strategy do you think is better?

Strategy 1: Spend three hours today in totally focused study (180 minutes total).

Strategy 2: Spend just ten minutes a day for the next eighteen days studying (180 minutes total).

- Both strategies have the employee studying for three hours, but are these strategies equivalent?
- Which strategy creates a stronger memory?
- Which strategy is easier for the employee? Less disruptive to the organization?
- Which strategy results in a higher test score if the employee is tested for retention? What if the employee is tested a month later? Three months later? A year later?
- Which strategy is closer to the one you use in your training?

A Little Every Day

Cognitive research tells us that Strategy 1 and Strategy 2 are not remotely equivalent, and that one is clearly superior. Procu it uses the correct strategy – Strategy 2. Strategy 2 is **dramatically** better at supporting *long-term* retention and recall. Strategy 2 will give dramatically better results one day, one week, one month, and one year after the test. If you want to have exceptional employees, incorporate Strategy 2 into your training program.

Strategy 2 has other benefits as well. It is much more pleasant for the employee. A few short minutes of focused study:

- Fits better with how the brain naturally operates.
- Is easier for the employee.
- Doesn't lead to boredom (which is actually counter-productive to long-term memory).
- Doesn't interrupt existing work-related obligations.

There are many reasons why Strategy 2 is so much more effective, many of which will be covered in the remaining secrets. But the fundamental secret is simple: slow down information acquisition by spreading it out over time. Don't cram; instead learn in a way that actually supports creating strong memories, that supports long-term retention and recall.

A Little at a Time

There is a second part to this secret: Learn a little every day and learn a **little** at a time. Specifically, learn about **four new** facts from a single subject at a time and no more than **five**. Why such a small number of facts? Because that is all that most people can hold in short-term (working) memory. Exceptional employee training programs focus on training a few key facts at a time and then work to move them from short-term to long-term memory by applying the remaining secrets.

The beauty of learning a few new facts at a time, a little every day, is the cumulative effect over time. Exceptional employees know that if they study a little, two or three times a day, every day, over time they will actually master a great deal.

We recognize that Strategy 2 could be more difficult for the instructor. It is a lot of work to create new, focused, short study sessions covering multiple subjects, for multiple employees, each and every day. It can be a lot of work, but it doesn't have to be. This is just one of the things that Procu's HealthCare Advantage does for your organization.

Secret #2: Reinforce Facts with Spaced Repetition

To create exceptional healthcare employees, it is important not to overwhelm them. That means it is important to be selective in choosing what facts to study and when to study them. Smart healthcare organizations maximize the return on the time invested in training.

If an employee is trying to learn, say, five hundred potential negative drug interactions, and we wish to dedicate only five minutes a day to training, then clearly study time cannot be wasted. Fortunately, Procu has refined a technique for making study time highly effective, a technique for choosing what to study on any given day. The technique is called *Spaced Repetition*.

Spaced Repetition

Spaced repetition is a learning technique that uses regularly increasing intervals of time between reviews of a previously learned piece of information. With every successful review, the interval increases, but if the employee makes a mistake at a review, the interval decreases. Spaced repetition improves retention and recall, promotes long-term memory, and frees employees to spend more time on their primary responsibilities. It maximizes recall while minimizing study time.

To demonstrate how this technique works, let's look at a simple example of another employee (we'll call him Derek) who works in health care coding and is learning this specific fact: *Z51.0 is the code for: Encounter for radiotherapy session*. He is using a spaced repetition learning system, which will present the fact to him for review for a few seconds on different days, according to the appropriate schedule.

Derek first learned this fact on January 1st, and reviews it on January 2nd, 3rd, 7th, 14th and 30th. Each time he reviewed the fact, he remembered it successfully. So the time until his next review kept increasing.

Learn Today Jan. 1	Review Jan. 2	Review Jan. 3	Review Jan. 7	Review Jan. 14	Review Jan. 30
Recalled Correctly	Yes	Yes	Yes	Yes	Yes

Of course, if Derek failed to recall the fact correctly at some point, then the spacing schedule would have been adjusted. This schedule is always dynamic, adjusting to how well Derek can recall the fact. If Derek did not recall the fact correctly on January 7, the schedule adjusts; if Derek cannot recall it on January 8, the schedule adjusts again.

Learn Today Jan. 1	Review Jan. 2	Review Jan. 3	Review Jan. 7	Review Jan. 8	Review Jan. 9	Review Jan. 10	Review Jan. 14	Review Jan. 21
Recalled Correctly	Yes	Yes	No	No	Yes	Yes	Yes	Yes

When an employee has trouble recalling information, the spaced repetition plan has to adjust to the individual employees' current ability. Once the employee has begun to master the information and has created a strong memory, the interval between successive reviews can continue to grow to months and eventually years in duration.

Exceptional Results

This spaced repetition approach delivers exceptional results because it selectively strengthens memories. That nice, almost flat forgetting curve is something that effective employees eventually demonstrate, but they don't start that way. In fact, without review, exceptional employees forget as fast as typical employees do. However, with spaced reviews, something wonderful happens, as seen in Figure 4

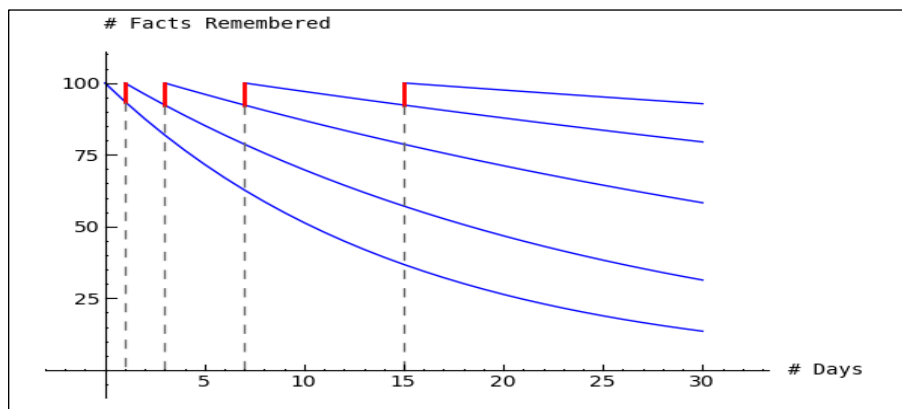


Figure 4: Creating the Exceptional Employee's Curve

Spaced repetition allows an employee to flatten their forgetting curves. Each well-timed review provides an opportunity for the memory to be strengthened and for the curve to flatten. The forgetting curve for a successfully reviewed fact declines **more slowly** than one for an unreviewed fact. That means that after a successful review of a fact, the employee can wait **even longer** until the next review.

With spaced repetition the employee, over time, is **forgetting more slowly** because of the **schedule**. The employee has begun to plug their memory leaks.

Just Say No to Cramming

Even though it is well understood that “cramming”, (intense, last-minute studying) is not nearly as effective as spaced repetition, the typical healthcare organization’s training program is built around events and rewards that actually encourage cramming. They encourage cramming through how they structure courses, how they test, how they certify, and how they award credit for having taken a required healthcare related course. This is true for almost all business and healthcare training, live and on-line. They encourage exactly the wrong behaviors.

It is much better if employees are reinforced and tested on something *every day*, where no one test is bigger or more important than any other.

So why aren't more healthcare organizations using these techniques? More importantly, why isn't your healthcare organization using these techniques? Up until now, the excuse was that it was just too hard to track so much different knowledge for so many different employees. In the past, that may have actually been a good excuse; however, that excuse stops today. By using computers to handle this complexity, Procu it built an easy-to-use spaced repetition system that is effective and easy to use. Use it, and you will be well on your way to having exceptionally exceptional employees.

Of course, you will still want to apply secret #3.

Secret #3: Actively Recall Facts

Exceptional employees learn a little every day, and review what they have learned using spaced repetition. But there is another secret to maximizing the effectiveness of a spaced repetition. Exceptional employees use *active recall*, not passive review.

The concept of *active recall* is simple to understand. To make a memory as strong as possible, actively recall the memory. For example: Jessie is learning all key healthcare codes. Initially, she simply hears or reads the fact that needs to be learned:

Z51.0 is the code for Encounter for radiotherapy session.

This is called passive review. Jessie receives this information in a passive manner, whether from a lecture, a book, a paper or in some other external media. Passive review is essential at first, but is not how to study the material in order to remember it later. To remember it, Jessie has to practice recalling it *from her own memory*, and not out of a book or from a review sheet.

An employee needs to be challenged to actively recall the fact by answering a question. For the ICD encoding example, the questions we would ask Jessie could be in one of many different forms:

True/False: *Z50.0 is the code for Encounter for radiotherapy session.*

Multiple Choice: _____ is the code for *Encounter for radiotherapy session.*

1. Z49.0
2. Z50.0
3. Z50.1
4. Z51.0
5. Z52.1

Fill In the Blank: _____ is the code for *Encounter for radiotherapy session.*

Each one of these questions will challenge Jessie to actively recall the fact from her memory. This is a

scientifically proven method to improve long-term retention and recall. Active recall helps cement the fact into her memory every time she has to recall the answer. If Jessie cannot answer correctly, she is simply given the answer again and her spaced repetition schedule is updated accordingly.

To further strengthen the active recall experience for Jessie, every time a fact comes up for review, the question for it should take a slightly different form. This challenges Jessie to learn the *fact* behind the question, not the question itself. For example, for the first repetition ask a True/False question, for the second repetition ask a Multiple Choice question, and for the third repetition ask a Fill in the Blank Question. Each time a question is asked, some aspect of the question should be changed (if possible) to keep challenging Jessie to learn the fact, not the question.

After a topic is introduced, smart healthcare organizations incorporate active recall into their training regimens. Active recall is essential to consolidating long-term memory. Coupled with space repetition and doing a little every day, you are well on your way to creating truly exceptional employees.

Secret #4: Build Knowledge Nets

Effective employees frequently do amazing things with their memory, things that to mere mortals appear almost miraculous. For example, they may hear a fact once and remember it days, weeks, or even months later without studying. They hear an explanation and seem to instantly grasp what it means. They are engaged and interested in subjects or conversations that their peers find boring. Some think this ability is entirely genetic. This is not the case. It is possible for any employee to develop the same characteristics of exceptional employees.

Have you ever seen a fish net? Even though it is very light and even flimsy-looking, a fish net can catch a great deal of fish in just one pass. It is possible to turn your brain into a knowledge net that catches knowledge, like a fish net catches fish. The key to a fish net is its structure, which allows a relatively small amount of material to hold something much heavier. Likewise, by building a knowledge net from a small, carefully chosen set of facts, the employee's mind is then prepared to catch and hold onto a great many more facts. By being able to remember certain important events, dates, people, places, ideas, and facts you create a net to catch and remember other new information in that same subject area. Because one's brain now has key reference points, new information will get caught in your knowledge net.

Cognitive science refers to these knowledge nets as schemas, associations or frameworks. To us they are simple nets, catching the knowledge that swims by each one of us every day. Knowledge nets equip employees to learn faster and better. If you want your employees to learn more, faster, and with less effort, then incorporate knowledge nets into their training regimen.

Selecting & Mending Knowledge Nets

Since knowledge nets exist in our brains, it is not surprising that they themselves are made up of knowledge. More importantly, the kind of knowledge that a net is made of determines the kind of "knowledge fish" it can catch. Select the right net and you catch a whole different type of fish, a whole different field of knowledge. Use a large number of different knowledge nets to round out your training program and your employees will be smart, in any sense of that word.

Knowledge nets are also like fish nets in that to be effective they have to be maintained and mended. Since the nets themselves are made up of knowledge, we must properly retain and successfully recall that knowledge for our nets to work.

Smart employees build knowledge nets naturally. But anyone can learn how to do it. This is a skill that can be taught. It can be learned. It can be used by any employee to become a brilliant and very valuable employee.

So exactly what is a knowledge net? As was mentioned before, it is a schema, a scaffolding, a framework for capturing information on a given subject. The net is carefully selected to highly intersect with the domain or subject for which it was created. We understand that this explanation is a bit formal, and probably won't clear up

what a knowledge net is. Let's make this more concrete, with a real life general knowledge examples to explain knowledge nets further.

Human Anatomy Knowledge Net

One particular knowledge net we strongly recommend for healthcare workers of any age is *Human Anatomy*. This knowledge net consists of the medical names of the parts of human anatomy. This is not just important for doctors to know, everyone working in the field will benefit, perhaps even financially. For example, medical coders encoding the left or right ventricle on a heart surgery correctly can dramatically impact payment. Learning anatomy facts produces a knowledge net around coding that could dramatically improve a hospital's bottom line. Of course, with traditional education this would be too difficult or too time consuming. However, with ProcuIt's HealthCare Advantage, the knowledge net could be created in just 5 minute study patterns three or four times a week. It may take a few months, but it will ultimately lead to a dramatically better medical coder.

What is more amazing is that building a knowledge net of anatomy will help an employee remember medical terms that seem unrelated to encoding of a specific pathology. Why? Because once a knowledge net is created, other interesting business related information will get caught in it; like a fish caught in a net. The challenge for healthcare organizations is to determine the appropriate knowledge level for their employees. Fortunately, ProcuIt's HealthCare Advantage has ways to determine this critical information for you, making the selection and creation of your organization's knowledge nets easy to achieve.

Secret #5: Seek Associations

As soon as employees start building knowledge nets, it is possible for them to begin catching knowledge. In practice, exceptional employees catch information both intentionally (when they are deliberately studying something) and incidentally (when they are doing something else). Either way, they learn by relating new knowledge to knowledge already in the net. Unlike physical fishing nets, catching knowledge makes a knowledge net stronger.

Cognitive researchers call this activity *making associations*. Making associations is about connecting one piece of knowledge in an employee's long-term memory with another piece of knowledge also in long-term memory. This process makes **both** memories stronger for the long term. Brilliant employees actively seek to make new associations with knowledge as soon as they acquire it. They do this by actively looking, reading, and researching to try to find knowledge that can be associated with something they have learned.

For example, when an employee learns that Z50.0 is the code for *Encounter for radiotherapy session*; they will seek to learn a little more about radiotherapy. They may read a brief one page article on the Internet or visit the radiotherapy clinic at lunch, or they may read a chapter in a book about the types of therapy. Truly exceptional employees may do all of these things. The key is this: they actively look for information they can associate with a key piece of knowledge they are learning.

As a result of making associations, radiotherapy becomes a treatment, and not just a name. As exceptional employees learn more about radiotherapy, their net gets stronger and it gets easier and easier to catch more information and even detect from the chart when radiotherapy was coded incorrectly.

At the beginning of this paper we stated: "Everything we see, hear, say and do is directly influenced by and is critically dependent on long-term memory. Even advanced problem solving and expert reasoning are dependent on long-term memory."

Making associations is where long-term memory is leveraged into advanced cognitive reasoning skills, where employees move beyond memory and onto advanced and productive thinking. Making associations is how employees become highly effective and exceptional. Making associations is facilitated by, and the natural outcome of, using ProcuIt's system.



Beyond Secrets

Procuit's HealthCare Advantage was created to ensure that every healthcare employee can be exceptional. Our system provides an automated way to help your employees retain core material. With our system, healthcare employees learn a little every day using spaced repetition and active recall to build strong knowledge nets.

But don't take our word for it. We can prove the effectiveness of our system in improving the knowledge and performance of your healthcare employees. Call us today at 734-355-0983 to see a free demonstration and see how we can use HealthCare Advantage to train your employees.

About Procuit

Procuit Inc. is a privately held corporation that provides individuals, businesses and institutions with the ability to rapidly and effectively master and share knowledge. We provide the tools to deliver knowledge to a global market of employees, customers, and students.

Procuit Inc. •
2570 Packard, Ann Arbor, MI 48104 •
Phone: 734-355-0983