Chapter 1: Par Level versus Kanban
Chapter 2: Batch versus Flow
Chapter 3: Staff Flexing
Chapter 4: Error Proofing in the Pharmacy
Chapter 5: Sequencing
Chapter 6: Quick Changeover
Chapter 7: Patient Room Changeover
Chapter 8: The Red Bead Game
Chapter 9: Spreadsheet Simulations
Appendix A: Sample Forms
Lean Training Games in the OR

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Lean Training Games in the OR

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Introduction

Just about everyone learns best by doing. A pilot, for example, needs to complete some classroom work, but much of the training will take place in the air and at the controls of a plane. This is good, but also time and fuel consuming, and a potentially risky use of an expensive resource, the plane. For that reason and more, commercial pilots log time in a flight simulator. While the simulator is not identical to actual flight, it is a valuable and much cheaper substitute for flight time. Dangerous procedures can be practiced over and over in a simulator, without putting the pilot and the hardware at risk, until the pilot response becomes “muscle memory”.

In the same way, Lean training often includes hands-on exercises to demonstrate important Lean methods. In this case the term simulation refers to a classroom exercise that mimics the functioning of a real-world system, but in much less time and much less effort. Some common Lean simulations include the Batch Versus Flow exercise, where students will build a classroom “product” in batch mode and then in flow mode, and compare the results. These exercises can be real eye-openers for the students, because the performance difference between the two scenarios is so great. In the case of the Batch Versus Flow simulation, the same number of units can be built (with the same number of people) in flow mode in
\(1/10^{th}\) of the time needed to build them in batch mode. This simulation is included in this book in Chapter 2.

Another eye-opening simulation included in this book is the *Par Versus Kanban* simulation in Chapter 1. If your hospital is using the Par Level method, and most are, you will be shocked at the difference between it and the Kanban method. Spoiler alert: Kanban wins!

Don’t miss the opportunity to actually complete some real improvements, by taking your simulation directly to the “gemba”, where the work is done. Ideally these simulations would be part of a Kaizen event, where the participants would be able to apply what they have learned immediately on a real-world opportunity. After all, if these methods are not going to be put into practice, then the training itself is a waste.

There are no limits to the possibilities for new simulations, and please share your ideas if you come up with a new one!

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*Richard D. Rahn*
Lean Training Games in the OR
Chapter 1: Par Level vs Kanban Simulation

Most hospitals today use the Par Level method to manage supplies. This system is fundamentally broken, but the force of habit is strong and the following simulation will shine a spotlight on the difference between it and the method of choice, Kanban. If you have Kanban skeptics in your group, fewer will remain after seeing this simple exercise. Just follow the instructions below. Note that this is a simplified version of a more in-depth simulation exercise in the Par Versus Kanban Simulation Toolkit, and the Kanban method itself is discussed in detail in our companion book Supplies Management in the OR. Both of these tools are available for sale at www.flowpublishing.com.

First gather the supplies you’ll need:

1. One plastic bin.
2. Twenty poker chips, to represent supplies.
3. Two plastic zip-lock bags. We’ll use them in the Kanban portion of the simulation.
4. The data collection worksheet. A link to this file is provided in Appendix 2 in the back of this book.
5. A stop watch.
6. A space to conduct the simulation, with enough room to walk around. A conference room or training room will be fine.

You will also need two physical locations within your training space, a Point of Use and a Central Stores. These areas should not be next to each other. Locate them on opposite sides of the room, in order to simulate the distance between the storeroom and the place where the supplies are used. Require some walking.

Prepare the data collection sheet (provided as a PDF):

<table>
<thead>
<tr>
<th>METRIC</th>
<th>PAR</th>
<th>KANBAN</th>
<th>DIFF</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Supplies Counted Per Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Spent Counting Supplies (Seconds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Replenishment Cycles (Trips)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Spent Replenishing Supplies (Seconds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance Traveled (Feet or Meters)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elapsed Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As you can see, we'll be measuring the number of replenishment trips to and from central stores, the time required to replenish supplies, the number of
counts and the time required to count, the distance walked and the total time.

This simulation will be conducted in two cycles, one as a Par Level simulation and the other in Kanban mode. You will need to staff the simulation with the following roles:

1. **A user.** This person will be consuming the supplies based on the schedule provided below. He/she will simply remove the required number of items from the bin or container. It is important to run both simulations under the same consumption pattern, in order to compare apples to apples.

2. **A data recorder.** This person will be managing the data collection sheet, and recording the results as they happen. You will be simulating five days of consumption, so the data recorder will keep a tally of the results for each day.

3. **A timer.** This person will be responsible for keeping track of the time (in seconds) for the various activities during the simulation, and to report results to the data recorder.

4. **A supplies handler.** This person will be restocking the supplies, using the Par Level method first and then the Kanban method. We’ll explain the work in more detail below.
5. **A Master of Ceremonies.** This is usually the instructor, who will direct the activities of the simulation and give instructions to the participants as needed.

Place 10 poker chips or coins in the bin, in the Point of Use area. This is the actual Par Level for this bin. The Point of Use could represent an OR suite, a nursing floor, or anywhere that supplies are used in the hospital. Place the other 10 poker chips in the Central Stores area. This represents the supplier of the items, from which you will restock the Point of Use.

**Running the Par Level Simulation**

You will be simulating 5 days of consumption, based on the following usage:

<table>
<thead>
<tr>
<th>Day</th>
<th>Quantity Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>2</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2</td>
</tr>
<tr>
<td>Wednesday</td>
<td>4</td>
</tr>
<tr>
<td>Thursday</td>
<td>2</td>
</tr>
<tr>
<td>Friday</td>
<td>1</td>
</tr>
</tbody>
</table>

The Master of Ceremonies will announce to the group “We are now on Monday”. The user will remove from the bin the number of items consumed on Monday (2), and place the items aside. This step will not be timed. The timer will then start the stop watch, and
the supplies handler will complete the following steps:

1. Walk to the bin from Central Stores. Remember to record the distance.

2. Count the number of items in the bin. We’re doing a strict Par Level method, where actual counting is required. Eye-ballling is not permitted.

3. Calculate the difference between the Par Level and the counted quantity. On Day 1, for example, you should be short 2 pieces.

4. Walk back to the Central Stores. Again record this distance.

5. Count out the required number of items. For example, 2 will be needed on Monday.

6. Walk back to the Point of Use and place the items into the bin.

7. Walk back to Central Stores, which is “home base” for the supply handlers.

8. This completes one day of the simulation. You should have taken two round trips to and from Central Stores, completed two counting exercises (one at the Point of Use and one in Central Stores) and one replenishment cycle,
along with the respective times. Repeat this exercise for all five days and add up the numbers. We’re now ready for the Kanban simulation.

Running the Kanban Simulation

In the Kanban portion of this exercise you will use exactly the same consumption pattern shown above. In preparation, however, you will count out 5 poker chips and place them in the plastic bag. You will also place 5 poker chips in Central Stores in a plastic bag. The items in the bag represent a “two-bin” Kanban system, where the first quantity is loose in the bin, and the second quantity is in a plastic bag. Explain to the group that no replenishment will be done until the last loose piece is consumed and the plastic bag is opened. Otherwise no action is required. When the plastic bag is opened and the items are placed in the bin, no counting is needed. The replenishment quantity will always be 5.

The user will notify Central Stores when a plastic bag has been opened. In this simulation you will signal verbally, but in an actual hospital the signal could be a bar-code, a Kanban reorder card, an RFID tag, a phone call or a variety of other methods. Let’s go through this simulation step by step, as before.

1. The user will remove items from the bin, based on the schedule shown above. No action is required until all of the loose poker chips have
been consumed and the plastic bag needs to be opened (this will happen on Day 3). The poker chips in the bag will be placed in the bin, and the user will notify the supplies handler verbally: “We need supplies!”.

2. The supplies handler does nothing until notified by the user. At that point (Wednesday in the simulation) he/she will simply pick up the plastic bag in Central Stores (previously prepared), deliver it to the Point of Use, and place it in the bin. Don’t open the bag, just place it in the bin.

3. During the Kanban cycle, only 1 roundtrip to the Point of Use should be needed, and no counting at all should be done. This concludes the Kanban portion of the simulation. The data recorder should now complete the results sheet by calculating the difference between Par Level and Kanban, and the percent difference, which will be dramatic.

**Post-Simulation Discussion**

Here are some of the questions you should ask the group in order to stimulate discussion:

1. What would the signal to the Supplies Handler actually be in a hospital? *The choices include a telephone call, having supplies handlers come to*
pick up the Kanban cards, bar-coding, and even RFID tags as an advanced option.

2. Could the supplies handler simply pick up Kanban cards (instead of a signal to Central Stores)? Would this be more efficient than counting or eye-balling parts? Having a Supplies Handler do a “round” to pick up or record reorder cards is a simple option, and can be done in a fraction of the time needed to count or eye-ball the bins.

3. Does the Kanban method require more storage space? As you saw, the storage space should be the same or less than the Par Level method. Two physical bins are not required.

4. Could we run out of supplies 100% in either scenario? What might we do to reduce that risk? Of course you could run out of supplies in either scenario, if usage is highly variable. That’s why we like the “supermarket” concept, where an additional supply is not far away. Also evaluate the quantities stored, and increase them if necessary.

5. Are there any reasons why a Kanban method would not work in our hospital? Why isn’t this method more common in hospitals? We wonder that ourselves. There is no good reason why Kanban should not work extremely well in hospitals.
The results of this simulation are *dramatic*, and one of the best ways to engage hospital staff in this new way of thinking.