

Supply Chain Excellence in the Post-Pandemic World

Slides and links:

www.MarkGraban.com/SupplyChainExcellence

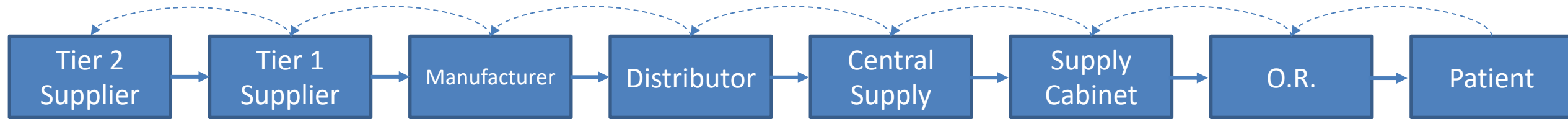
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Healthcare Supply Chain Problems

- Pre-Pandemic: “Only a third of respondents rated the management of their hospital's supply chain as ‘**very effective.**’”
- 67% agree better supply chains would
 - Reduce costs
 - Increase revenue
 - Improve outcomes for patients

The Supply Chain





“...Baxter has no redundancy in manufacturing capacity for small-volume saline bags.”



The NEW ENGLAND
JOURNAL of MEDICINE

Perspective

Saline Shortages — Many Causes, No Simple Solution

Maryann Mazer-Amirshahi, Pharm.D., M.D., M.P.H., and Erin R. Fox, Pharm.D.



Health — Check Up

A dad embraces the pharmacist responsible for his daughter's death

Updated: NOVEMBER 14, 2011 — 6:10 AM EST



**This Was a
Systems Problem**

Lean Thinking: Asking ~~Five~~ Many Whys

1. Why did Emily die?
 - Massive brain damage
2. Why did she suffer brain damage?
 - She was given a 28x overdose of sodium chloride in her IV bag
3. Why did the IV bag have too much sodium chloride?
 - The pharmacy tech compounded a solution for the bag
4. Why did the pharmacy tech do that?
 - The pre-mixed IV bag was out of stock
5. Why was the IV bag out of stock???
 - Supply chain problems... of what kind?

Fix the System!

**What's the
Ideal State for
Staff & Patients?**

The Ideal

- What you need
- Where you need it
- When you need it
- In the right quantity
- No searching
- No hunting
- No distraction
- No delays in care

**What's Expected
of the
Supply Chain?**

Not This



Nor This



Finding the Right Balance



A Japanese Sensei of Mine:

“Job 1 is meeting customer demand”

“Job 2 is low inventory”

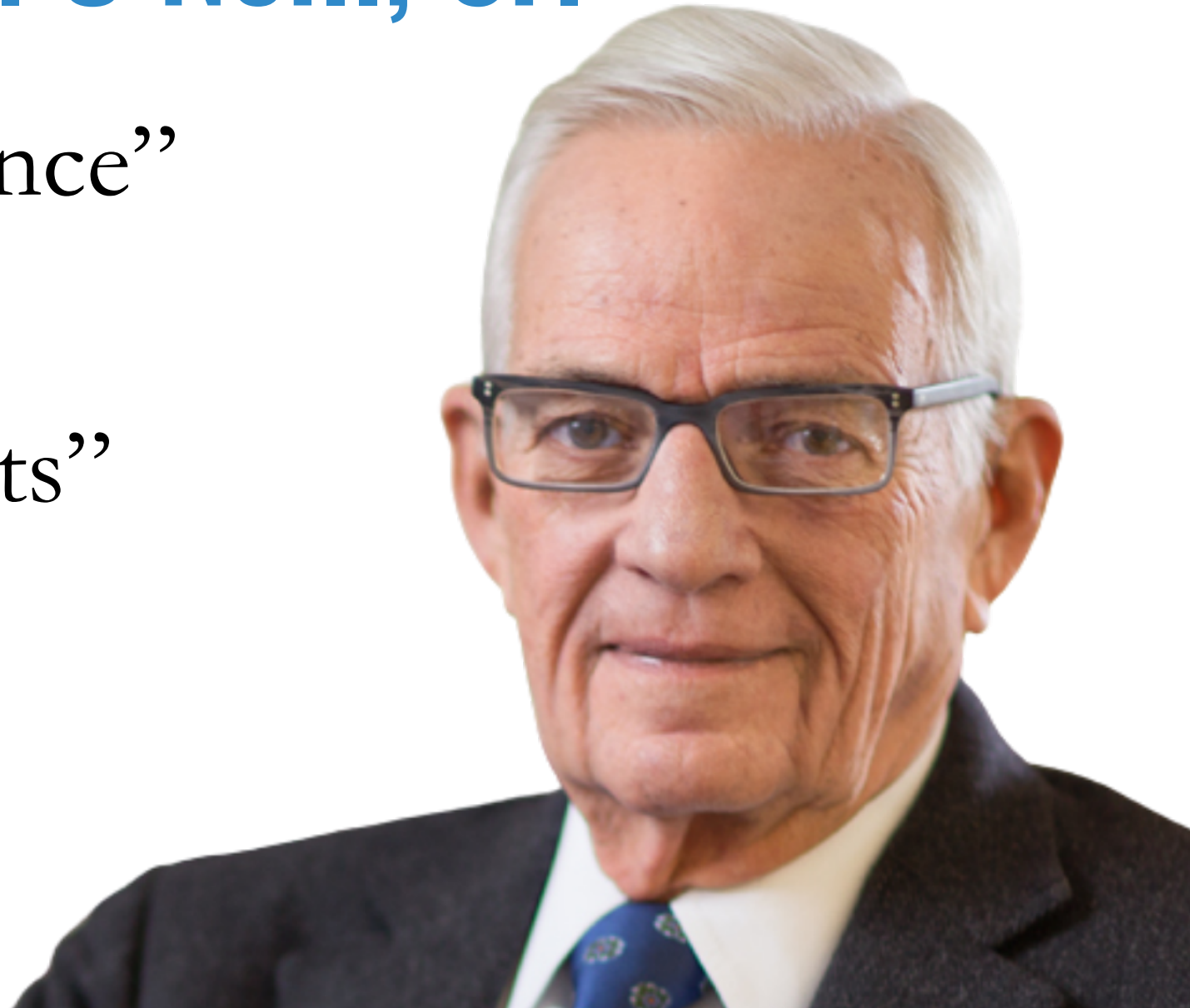
Lessons From Other Industries

Safety Culture



Paul H. O'Neill, Sr.

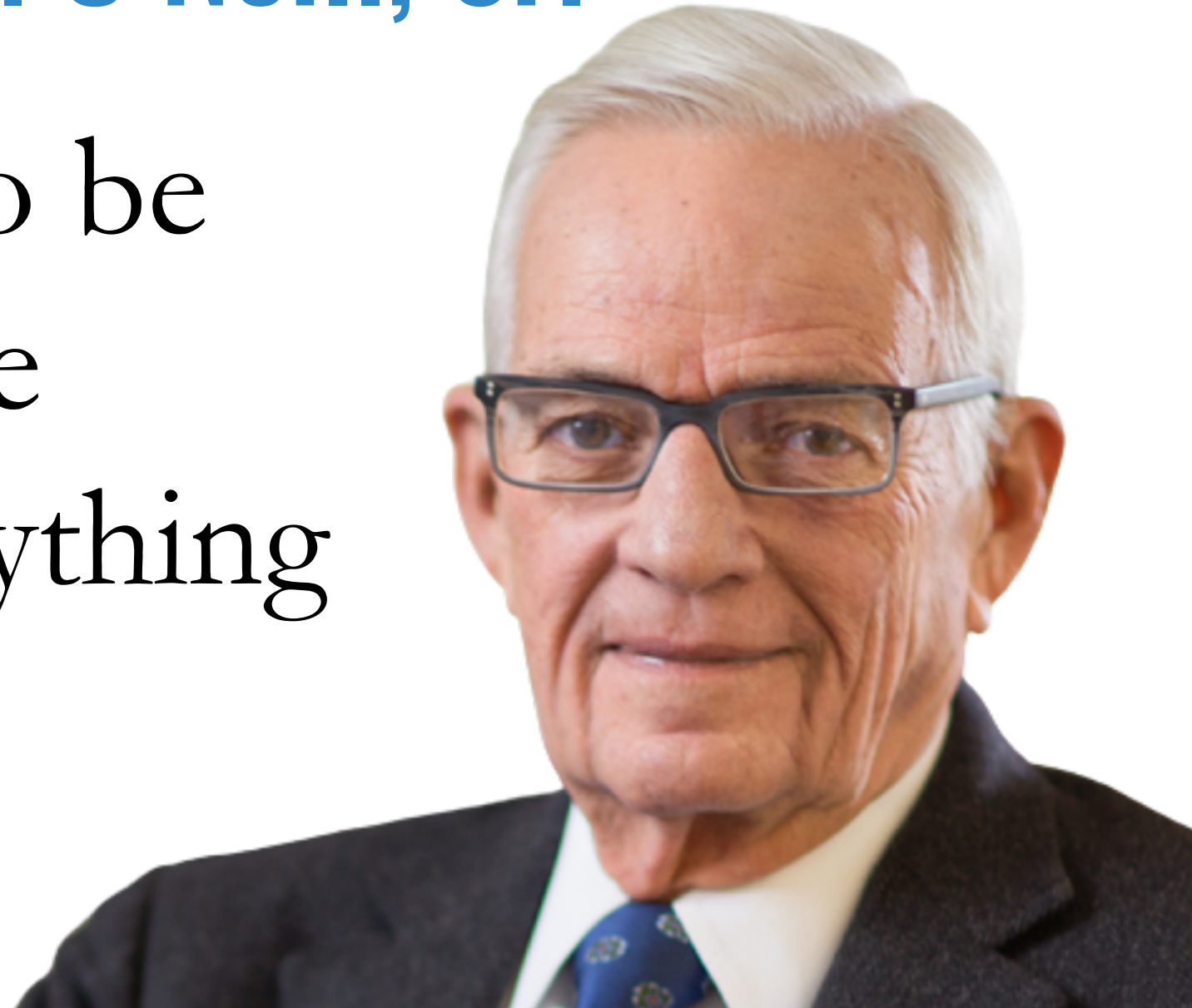
- “Habitual Excellence”
- “Theoretical Limits”



**Supply Chain Excellence
is part of
Habitual Excellence**

Paul H. O'Neill, Sr.

“Our goal is to be the best in the world at everything we do.”



Copying Tactics vs. Working on the Culture

Goal: Never Hunting for Materials

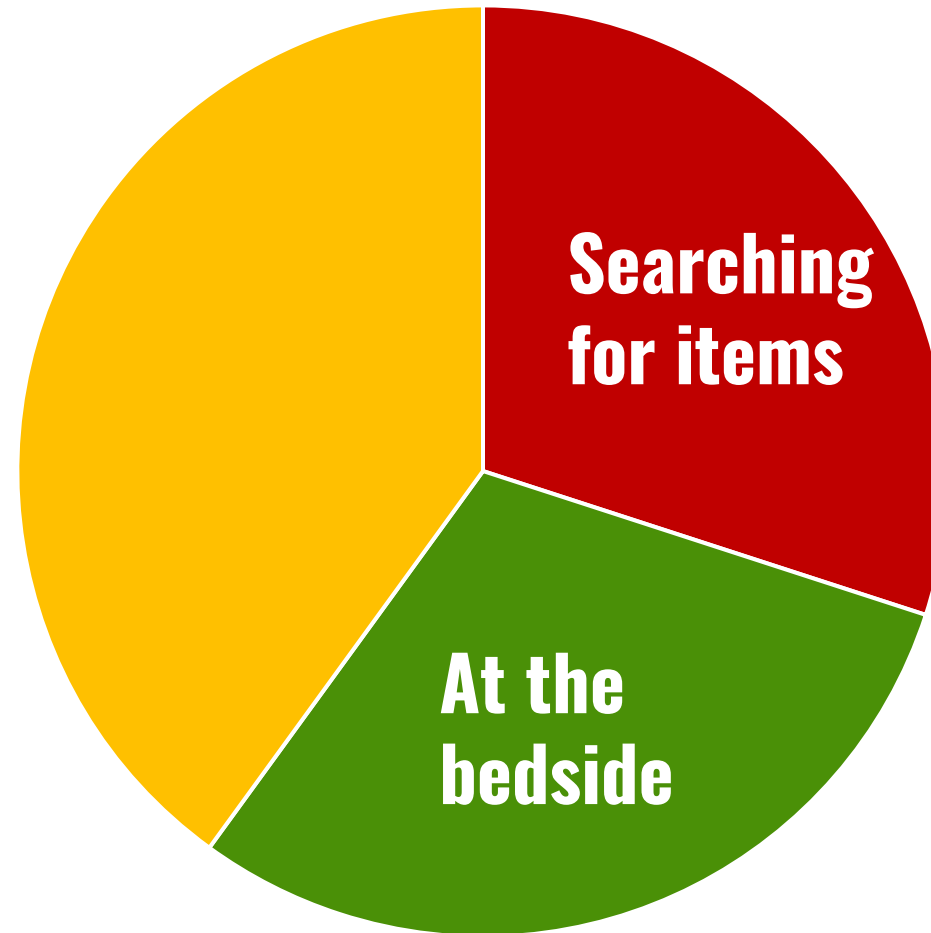
Toyota Tactics



Toyota Culture

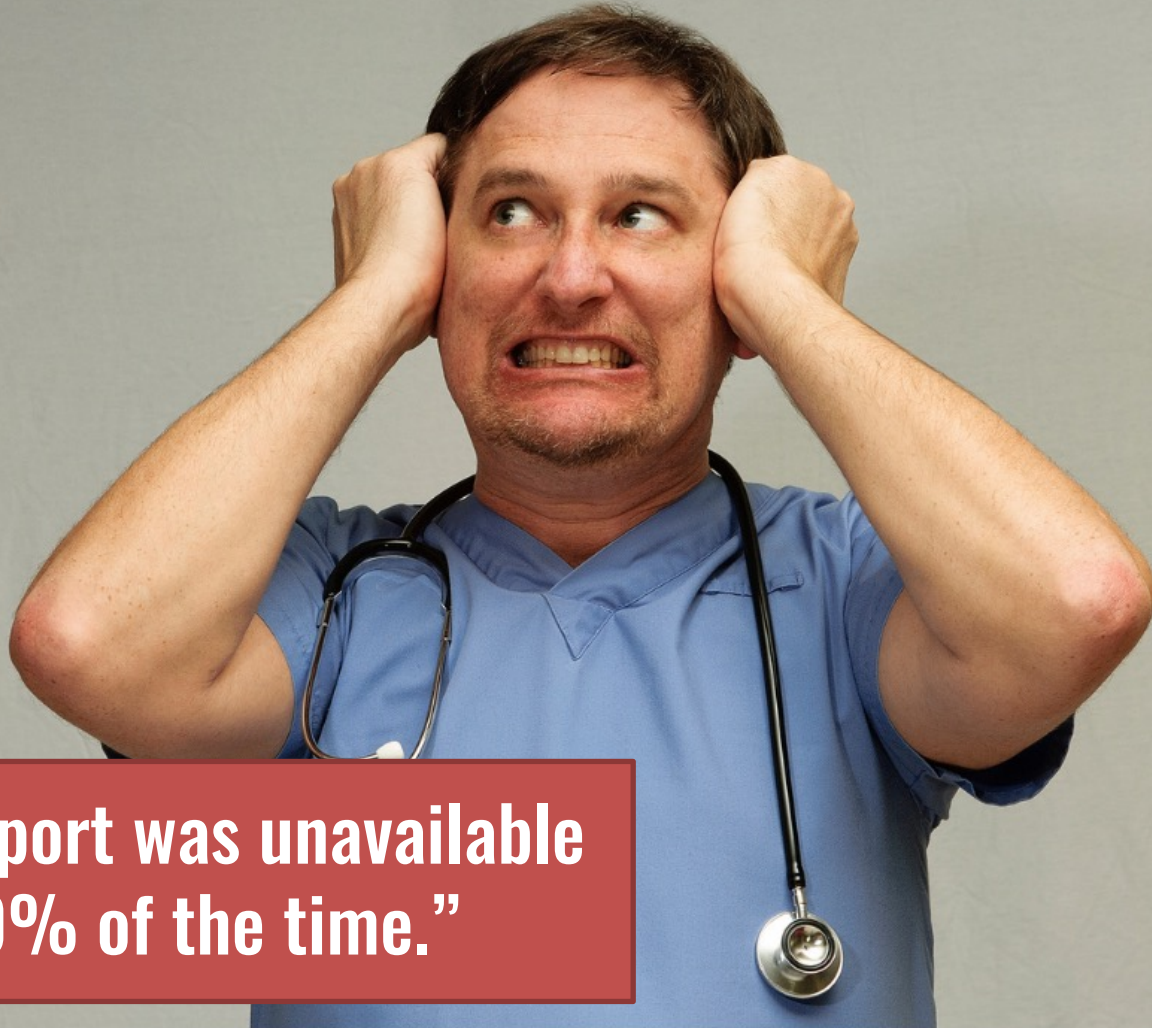
Let Staff Focus on Their Real, Value-Adding Work

A Typical Nurse's Day



**Over 3 hours out
of a 12-hour shift**

The Impact of Missing Supplies

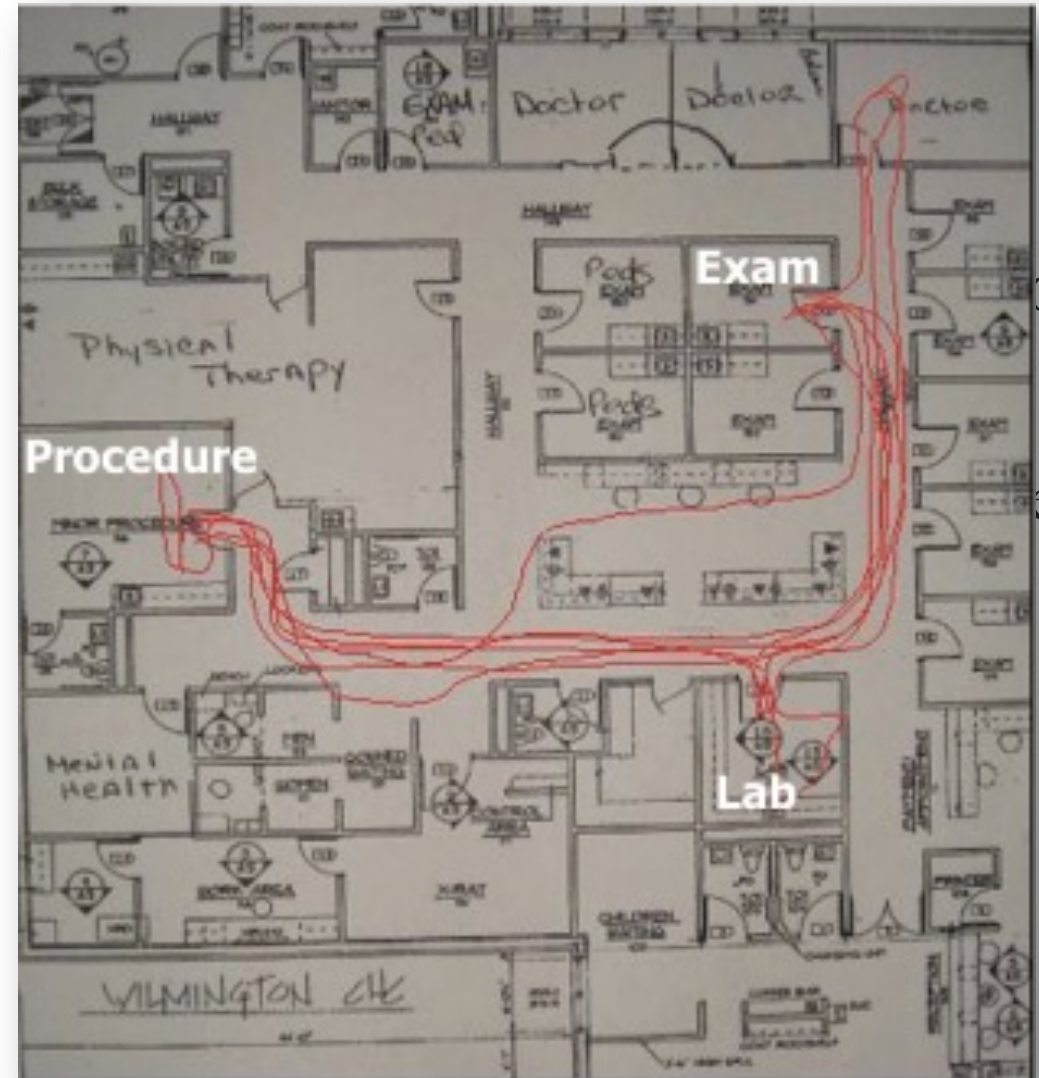


**"Transport was unavailable
50% of the time."**



The Wandering Podiatrist

- Running around gathering supplies (10 minutes)
 - Delays patient
 - Hurts productivity



One Healthcare VP of Materials

“My team’s job is to make sure clinicians never have to spend any time dealing with materials.”

Fix the System!

Workaround: Hidden Inventories



Don't Blame Them for Hoarding



Fix the System!

Fix the Culture

Lean Lesson: Pull the “Andon Cord”

- “Defect” in the supply chain process
- From workarounds and fire fighting
 - Get more supplies STAT
- To root-cause solutions
 - Fix the System



Reflecting on Lessons Learned for a Future Pandemic



**Shortages on
Both Sides of
the Pandemic**

CNN politics LIVE TV  

Watchdog report finds severe shortages and significant challenges to hospitals' coronavirus responses

United States

Canada

 **CBC** | **MENU** 

London

PPE shortage the biggest worry ahead of expected COVID-19 surge

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Health

Coronavirus: The NHS workers wearing bin bags as protection

England

In Mid-2021

Healthcare Supply Chain Still Fragile A Year After COVID-19

“9% of [Tennessee] hospitals are reporting supply shortages... above the national average of 6%.”

**Michigan nurses say they face staffing, preemptive
COVID-19 testing and PPE shortages**

**It's An
Old Story**



Just-in-Time Inventories Make U.S. Vulnerable in a Pandemic

Low Stockpiles at Hospitals Boost Efficiency but Leave No Extras for Flu Outbreak

By Bernard Wysocki Jr. and Sarah Lueck Staff Reporters of
THE WALL STREET JOURNAL

Updated Jan. 12, 2006 12:01 am ET

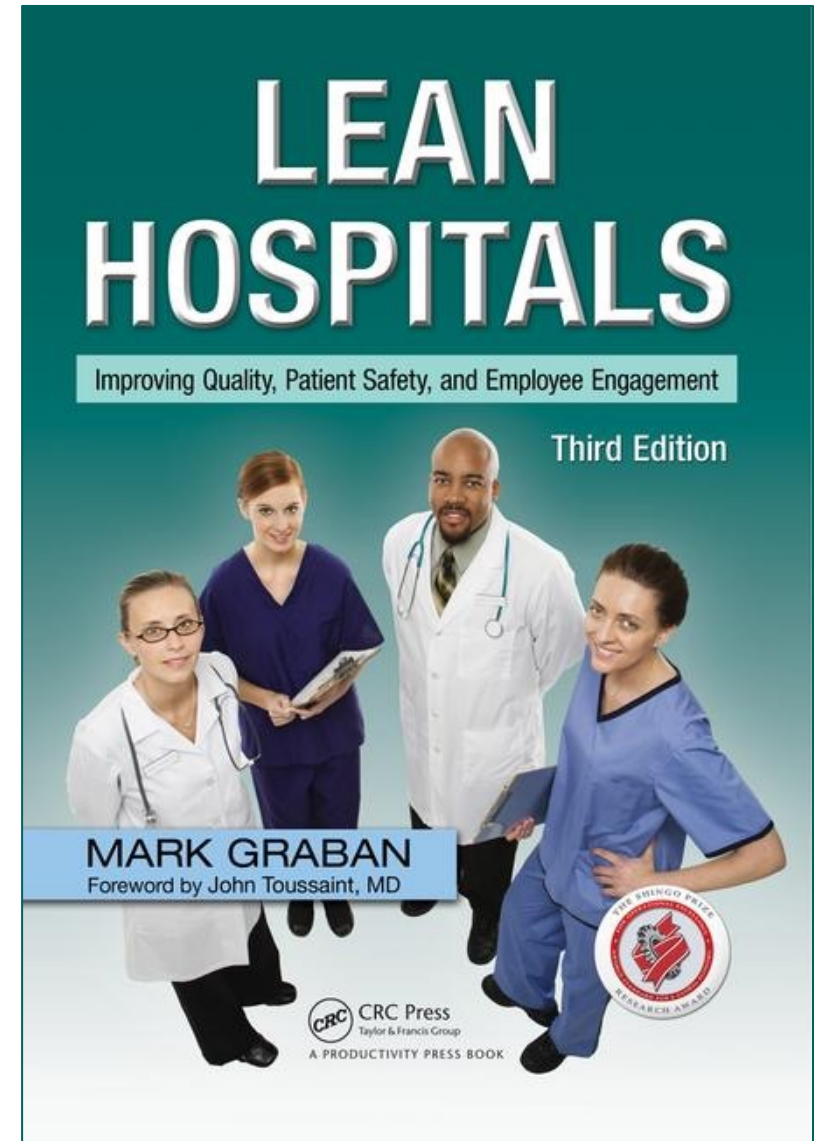
“Like many big hospitals, the University of Utah Hospital carries a 30-day supply of drugs, in part because it would be too costly or wasteful to stockpile more.”

**What's Meant by
“Efficiency”?**

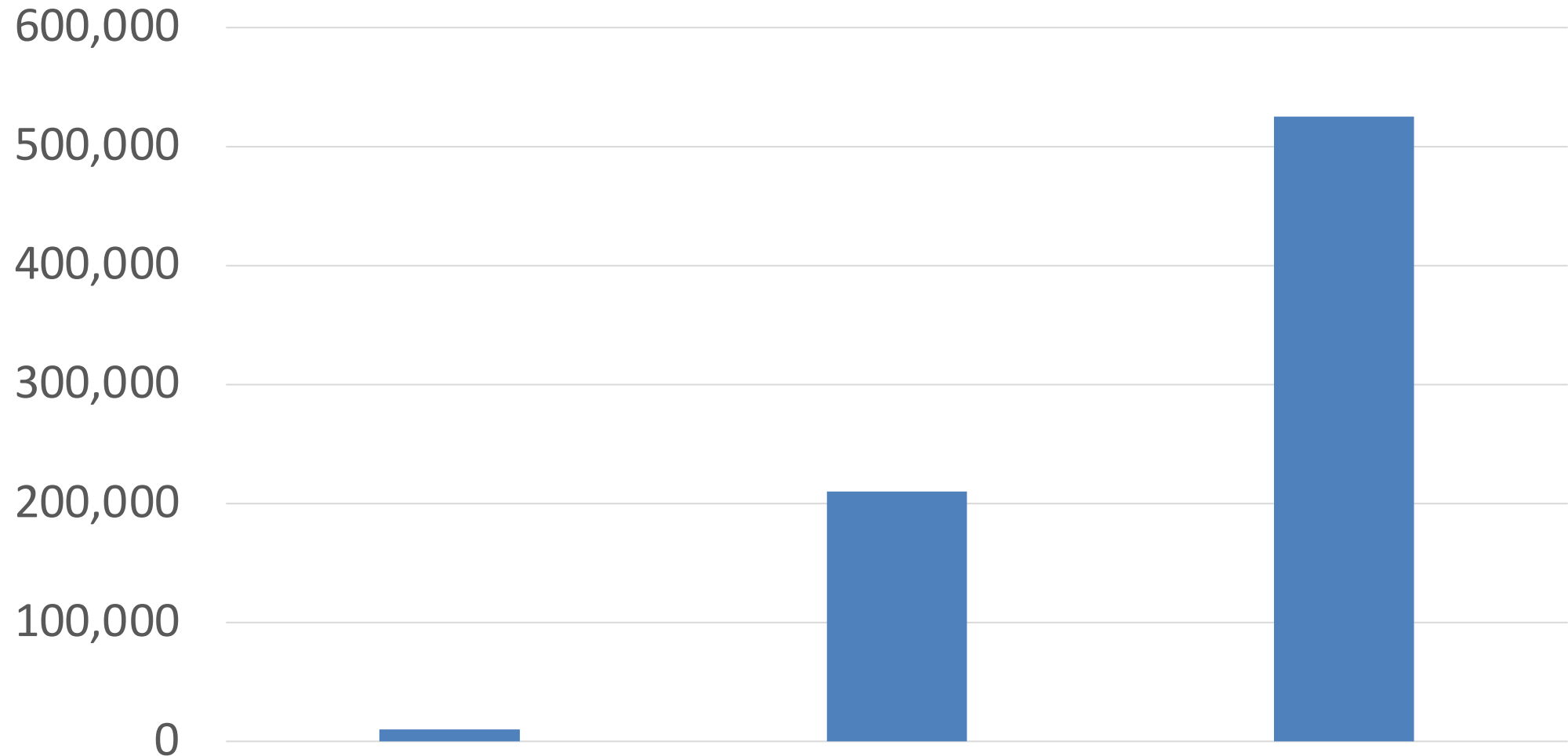
Let's Shift Our Focus From...

- **Efficiency** = $\frac{\text{Outputs}}{\text{Inputs}}$
- When low inputs hamper your outputs...
- **Effectiveness** → The right care at the right time

“When the cost of stockouts is high, we have to err on the side of ~~excess~~ more inventory.”



Can anyone absorb a **60X** spike in demand?



Taleb Says 'White Swan' Coronavirus Was Preventable

March 30th, 2020, 8:35 PM EDT

Nassim Taleb, New York University distinguished professor of risk engineering, says a "white swan" event like the coronavirus pandemic was preventable. He speaks during an interview with Bloomberg's Erik Schatzker on "Bloomberg Markets: European Close." (Source: Bloomberg)

A photograph of two black swans standing on a green lawn scattered with brown and orange autumn leaves. The swans have dark feathers and bright red beaks. One swan is in the foreground, facing left, while the other is slightly behind it, also facing left. The background is a soft-focus view of the same grassy area with more leaves.

“There’s no excuse for companies or government not to be prepared for this.”

So we have two possible strategies?



1



2

Alanna Shaikh | TEDxSMU

Why COVID-19 is hitting us now — and how to prepare for the next outbreak



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Recommend

If a hospital -- or a country -- runs out of face masks or personal protective equipment, there's no big warehouse full of boxes that we can go to to get more.



13:45



**There was
supposed to be**



Public Health Emergency

Public Health and Medical Emergency Support for a Nation Prepared

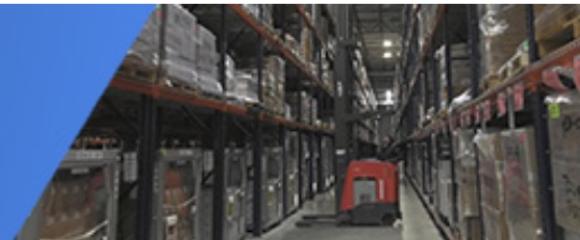
[PHE Home](#) > [About ASPR](#) > [Strategic National Stockpile](#)



Strategic National Stockpile

SNS Responds to the COVID-19 Pandemic

[Learn More](#)



The Strategic National Stockpile's role is to supplement state and local supplies during public health emergencies. Many states have products stockpiled, as well. The supplies, medicines, and devices for life-saving care contained in the stockpile can be used as a short-term stopgap buffer when the immediate supply of adequate amounts of these materials may not be immediately available.



[About the Stockpile](#)



[Sustaining
the Stockpile](#)



[Stockpile Products](#)

About the SNS



Contact Us

For further questions or information about the Strategic National Stockpile (SNS), please [email us at](#) sns.ops@cdc.gov

The hospital that now needed 210,000 a month

- At \$2.50 per N95 mask, that's \$1.58 million to stockpile 3-month supply
- For a case of 200, it's 1.78 cubic feet in size
- Storing 630,000 requires 600 sq ft warehouse (10' high)
 - Rental cost is about \$1 per sq ft

“FEMA ordered 180 million masks to fight coronavirus”

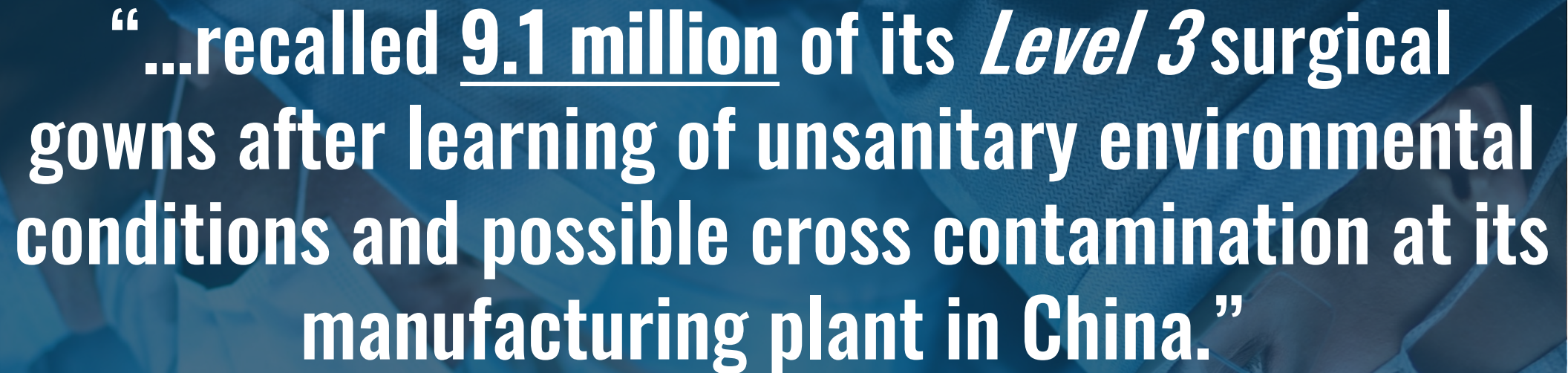
- At \$2.50 per N95 mask, that's \$450 million to stockpile
- For a case of 200, it's 1.78 cubic feet in size
- Storing 180 million requires 160,000 sq ft warehouse
 - Rental cost is about \$1 per sq ft
 - An Amazon fulfillment center is 800,000 sq ft

Myth:

**Inventory is
risk free**

CARDINAL HEALTH BEGINS RECALL OF CONTAMINATED SURGICAL GOWNS

BY [JOHN COMMINS](#) | JANUARY 31, 2020



“...recalled 9.1 million of its *Level 3* surgical gowns after learning of unsanitary environmental conditions and possible cross contamination at its manufacturing plant in China.”

A Ventilator Stockpile, With One Hitch: Thousands Do Not Work

While President Trump has assured states that thousands of ventilators remain at the ready, thousands more are in storage, unmaintained or otherwise unusable.



The Federal Emergency Management Agency sent about 7,000 ventilators to states, with 400 directed to New York, above, by Wednesday. Stephanie Keith for The New York Times

THE
HILL

Alabama county received 5,000 rotted masks from national stockpile

BY KAE LAN DEESE - 04/03/20 12:21 PM EDT

1,240 COMMENTS

30,883 SHARES



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TWEET



Just In...

Teddy Roosevelt's great-grandson weighs in on dismissal of Navy captain: 'Crozier is a hero'

DEFENSE — 3M 54S AGO

Cuomo: 'I wish you could be immune to coronavirus like I'm immune to NRA lawsuits'

STATE WATCH — 8M 21S AGO

Trump eyes additional funds for small businesses impacted by pandemic

ADMINISTRATION — 27M 6S AGO

Decentralized leadership raises questions about Trump coronavirus response

ADMINISTRATION — 44M 20S AGO



Officials in Montgomery County, Ala., say that thousands of medical masks the county received from the national stockpile last week were rotten and expired.

Local emergency management director Christi Thornton said the package of 5,880 procedure masks was ruined because they had dry rot, [The Associated Press reported](#).

The face covers reportedly had a 2010 expiration date.

From a Recent Conversation (TN)

- “We HAD a ton of N-95 mask inventory, but it had dry rotted after not being touched for 7 years.”
- Countermeasure: Ensure rotation of stock

Myth:

**“Just in Time” involves a
slow boat from China**

Alanna Shaikh | TEDxSMU

Why COVID-19 is hitting us now — and how to prepare for the next outbreak



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You have to order more from the supplier, you have to wait for them to produce it and you have to wait for them to ship it, generally from China. That's a time lag at a time when it's most important to move quickly.



13:45



Bad Things Can Happen to Big Boats



Bad Things Can Happen to Big Boats



I feel the need – the need for speed!



Speed & Agility



Use Creativity When Needed, But...



Fix the System!

Agility – Making Supply When it's Needed



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HEALTH NEWS APRIL 6, 2020 / 8:35 AM / UPDATED 6 HOURS AGO

Getinge to ramp up ventilator production capacity by 160% due to coronavirus



[NEWS](#) [WEATHER](#) [SPORTS](#) [VIDEO](#) [BEST OF](#) [CONTESTS & MORE](#)

CBSN Pittsburgh
WATCH NOW ▶

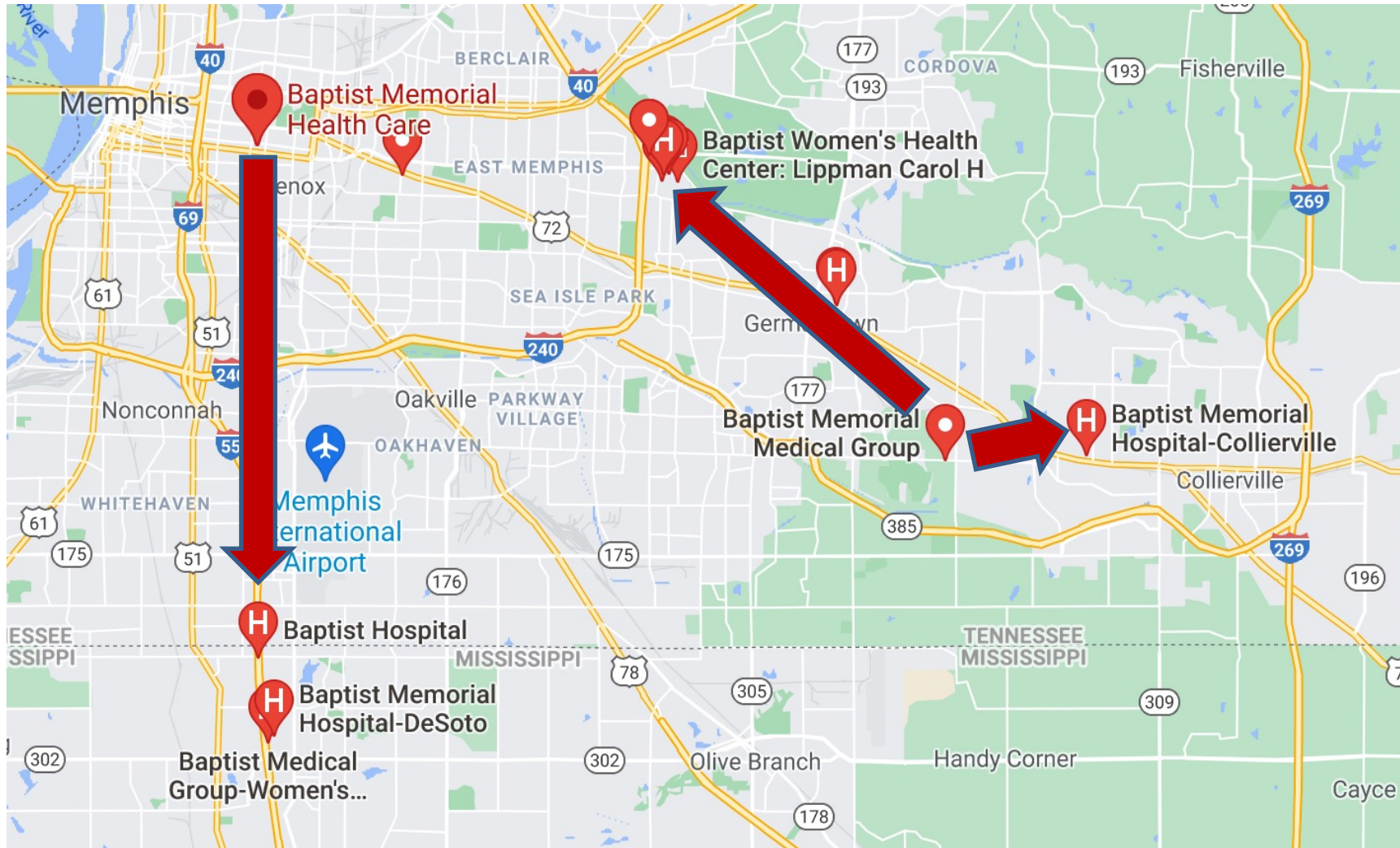
Local Company Increasing Ventilator Production

Categories: [News](#), [General](#), [Local News](#), [KDKATV](#)

Philips Respironics in Murrysville plans to increase its ventilator production from 1,000 to 4,000 a week.

NEX

Agility – Moving Supply Where it's Needed



Reflecting on Lessons Learned for a Post- Pandemic World

Fixing Local Systems

Myth:

**We have to count
everything**

“2-Bin Kanban”



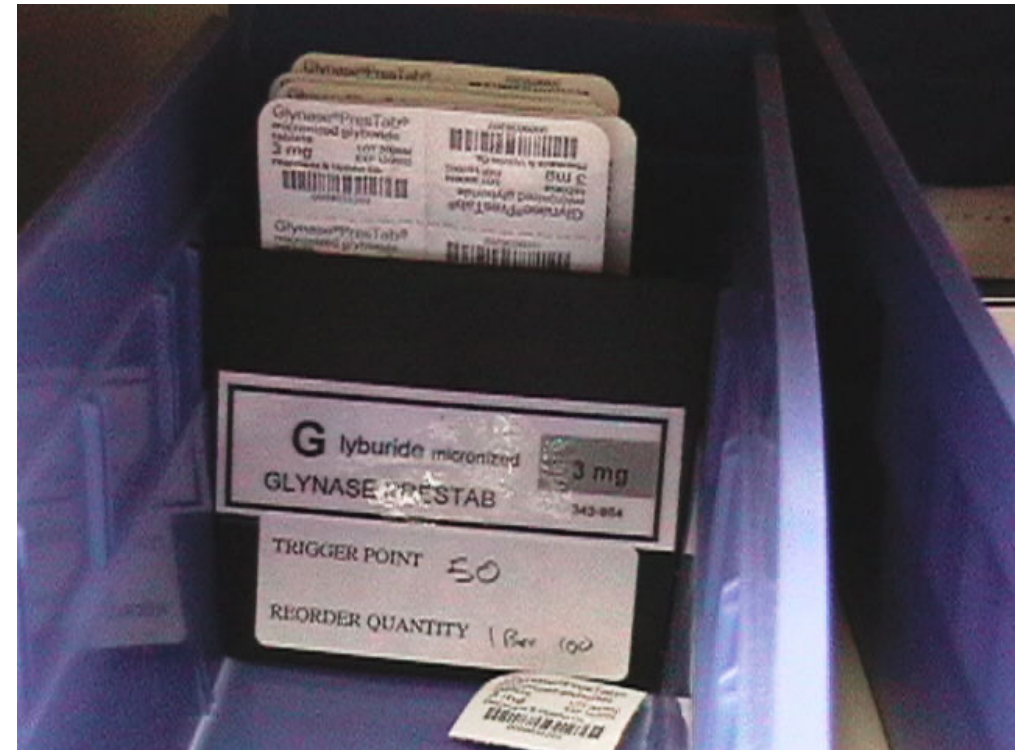
Myth:

**Everything has to be
in an
automated cabinet**

Nursing Unit Supply Room



Pharmacy Med Storage



Point of Use Inventories



Myth:

One size fits all

Different Materials / Different Situations

- Steady usage rate vs. highly fluctuating usage
 - Inexpensive vs. highly expensive
 - Patient-chargeable vs. not charged
 - Short lead time vs. long lead time
 - Highly reliable supply vs. unreliable supply
 - Mission critical vs. substitutable
-
- **Pull based on usage rate or pull based on schedule?**

Myth:

**You can adopt one
piece of a system**

Effective Just in Time for Toyota*

- Short domestic supply chains
- Production leveling
- Strong, cross-functional teams, respect for people
- Culture of stopping to fix problems

**How Can We Get
Better Supply Chain
Performance?**

Design Your Supply Chain

- Many supply chains “just happened”
- Fight against “the way we’ve always done it”
 - Who orders inventory?
 - Who chooses items and vendors?
 - Where is inventory stored?
- How should you do it?

Learn from Others, Don't Copy

- Learn from others
- Understand WHY they have “best” practices
 - What problem were they solving?
- Yes, you're different, but...
 - Is there a good reason for adopting or adapting a practice from other sites, organizations, or industries?



Toyota and Piggly Wiggly

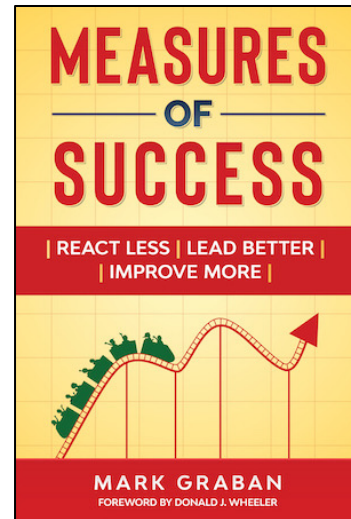
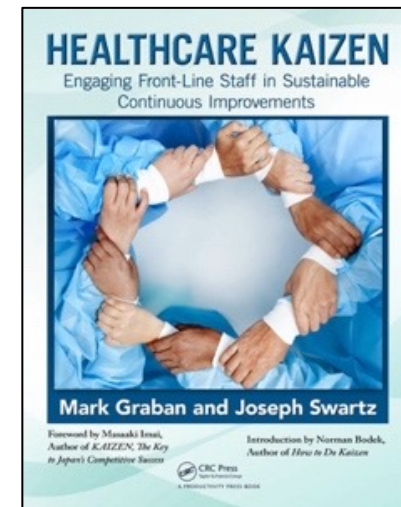
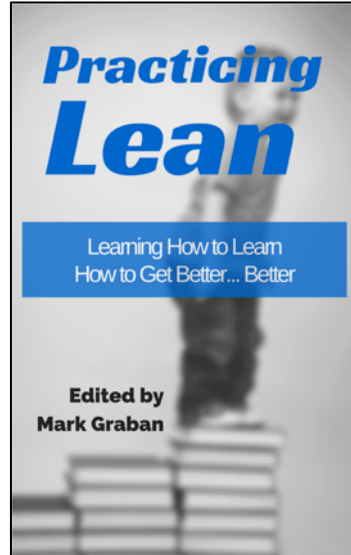
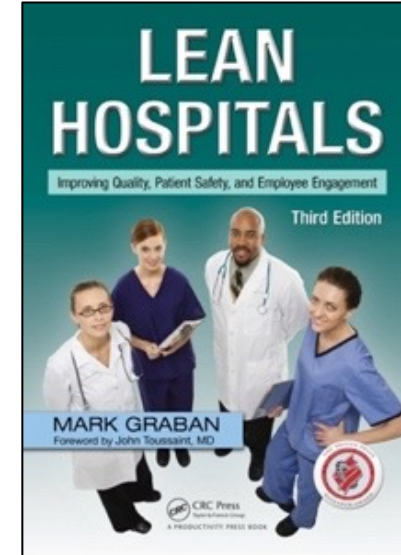
**How Can We Get
Better Supply Chain
Performance?**

Fix the System!

Thank You!

- **Email:** Mark@MarkGraban.com
- **Website:** www.MarkGraban.com
- **Blog:** www.LeanBlog.org
- **Twitter:** @MarkGraban

Slides and links:
www.MarkGraban.com/SupplyChainExcellence



Backup

Summary

- When times are good, JIT rarely means “zero inventories”
- When we have demand variation and the cost of stockouts is high, we need *safety stock*
- *Sometimes we need “emergency stock”*
 - Whose job is it to store and move it?
- We are well served by shorter lead times
- Lean provides frameworks, not easy answers
- Do. What. Makes. Sense. – Then Study and Adjust