Quality Improvement & Lean Overview
Post-Discussion Questions

• Does your Unit/UPC train QI/PI? How does it do so?

• What QI/PI tools does your Unit/UPC use?

• How does your Unit/UPC manage/track QI/PI implementation?

• How does your Unit/UPC sustain QI/PI results?

• How does your Unit/UPC spread QI/PI?
At UCLA Health, lean & QI terms are used synonymously.

<table>
<thead>
<tr>
<th>What is lean?</th>
<th>What is QI (Quality Improvement)?</th>
</tr>
</thead>
</table>

Why does lean or QI matter?

- These problem-solving methodologies reduce costs, increase efficiency, and improve patient outcomes
- Many specialties (Physicians & Nursing) require problem-solving evidence for individual or program (i.e. MAGNET) re-certification
- Because staff who understand and use lean & qi methodologies are highly-valued
- Because problems in quality and safety are costly
## Cost of problems in Quality and Safety

<table>
<thead>
<tr>
<th>Problem Description</th>
<th>Cost per stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital-Acquired Infection</td>
<td></td>
</tr>
<tr>
<td>Catheter line associated urinary tract infection:</td>
<td>$44,043</td>
</tr>
<tr>
<td>Central line associated blood stream infection:</td>
<td>$103,027</td>
</tr>
<tr>
<td>Ventilator associated Pneumonia:</td>
<td>$135,795</td>
</tr>
<tr>
<td>Deep vein thrombosis/pulmonary embolism:</td>
<td>$50,937</td>
</tr>
<tr>
<td>Surgical complications: Retained foreign objects:</td>
<td>$63,631</td>
</tr>
<tr>
<td>Pressure ulcers stage III and IV:</td>
<td>$43,180</td>
</tr>
<tr>
<td>Falls and trauma:</td>
<td>$33,894</td>
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</table>
Who is implementing lean?

- Toyota
- Porsche
- Amazon
- Virginia Mason
- Mayo Clinic
- ThedaCare
- Southwest Airlines
- Cleveland Clinic
- UCLA Health

Modern Origin
Aerospace & Manufacturing
Service Industries
Healthcare
Lean & QI “thinking” should be familiar to some health care professionals:

If you are a provider or will be working with one, patient-based lean and QI practices are taught in school as the scientific method:

Scenario – a patient arrives with a problem (clinic, ED, etc.). What is the Physician’s process (high level)?

<table>
<thead>
<tr>
<th>Physician Process</th>
<th>Lean &amp; QI Process</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Conduct History &amp; Physical (Facts)</td>
<td>Improvement Readiness Assessment (or FOCUS or Charter)</td>
<td>Neither process jumps to solutions</td>
</tr>
<tr>
<td>Develop Initial Diagnosis (Hypothesis)</td>
<td>Develop Problem Statement</td>
<td>Both processes involve the patient</td>
</tr>
<tr>
<td>Order Tests, Analyze &amp; Understand Data (Next Steps)</td>
<td>Conduct Observations, Collect, Analyze &amp; Understand Data</td>
<td>Both processes collect and analyze data</td>
</tr>
<tr>
<td>Develop Treatment Plan</td>
<td>Develop Improvement Plan</td>
<td>Both processes use the Scientific Method (Problem-Based Learning vs PDCA (Plan-Do-Check-Act), or PDSA)</td>
</tr>
<tr>
<td>Try, Measure, Adjust It (Differential Dx)</td>
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Lean & Quality Improvement supports the UCLA Way

**Mission** - Delivering leading edge patient care, education and research

**Vision** - Healing humankind one patient at a time, by improving health, alleviating suffering, and delivering acts of kindness

**Values***

- **Compassion**: Delivering quality and value to patients/education/research – our customers
- **Respect**: Respecting people by eliminating waste & non-value added efforts, providing the necessary resources
- **Excellence**: Continuous improvement to seek perfection – with error proofing and active daily management
- **Discovery**: Scientific method (PDCA) / Problem-Based Learning / Evidence Based Practice
- **Integrity**: Every time, delivering highest quality, safety & service performance with stability and control
- **Teamwork**: Systemic thinking to understand processes and value streams

*Our Values can form a mnemonic called “CREDIT”*
Lean & Quality Improvement is embedded in the UCLA Way through Active Daily Management

PDCA Problem-Solving Approach

*PDCA (Plan Do Check Act)*
- A3 methodology
- A4 methodology

Visual Systems

- *Performance Boards: visual Systems to see performance*
- Standards/Metrics* - Trended Dashboards & Daily Metrics*
- Clean/Safe Environment (5S)

Huddles & Rounds

- *Daily Huddles, Huddles with Performance Boards*
- Rounding, Linked-check-ins, PCAT Rounds, etc.

Leader Standard Work

- Evidence-based standard work for Management  *(PDCA, VS, H&R, 5 Pillars)*
- Management through the SOP Pillars: People, Quality, Service, Operations, Strategy/Finance
- Evidence-based Standard Work for staff (designed by staff, with training)
A3s and A4s provides structure to manage and communicate improvements

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<th>A4 Problem Solving (8.5 x 11)</th>
<th>A3 Problem Solving (11 x 17)</th>
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<td><strong>Daily</strong> problem solving, consensus &amp; communication tool used by staff</td>
<td><strong>Complex</strong> problem solving, consensus, communication tool</td>
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<td><strong>Known</strong> root-causes and solutions</td>
<td><strong>Unknown</strong> root-causes and solutions</td>
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<tr>
<td><strong>Quick</strong> and easy to use</td>
<td>Requires Planning (PDCA) and usually data</td>
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Example: Peanut butter and jelly sandwiches in the RR.

Example: A unit wants to improve poor patient satisfaction scores but they do not understand why the scores are so poor or how to improve them.
A3 Problem Solving

A4 Problem Solving (8.5 x 11)

Daily problem solving, consensus & communication tool used by staff

Known root-causes and solutions

Quick and easy to use

Example: Peanut butter and jelly sandwiches in the RR.

A3 Problem Solving (11 x 17)

Complex problem solving, consensus, communication tool

Unknown root-causes and solutions

Requires Planning (PDCA) and usually data

Example: A unit wants to improve poor patient satisfaction scores but they do not understand why the scores are so poor or how to improve them

A3 Project Title

Project Lead:

Facilitator:

Project Champion(s):

Project Team:

1) Problem Statement: (description of the problem and its effect)

2) Current State: (description of the current state, its processes, and problems)

Best Practices/Literature Search:

3) Goal: (what will we know to have the project successful) (states/numbers for comparison)

4) Root Cause Analysis: (investigation depicting the problem’s root causes)

5) Solutions: (section with findings of tested solutions)

Root Cause Tented Solution Responsible Due Finding

6) Check: (summary of the solutions’ results, overall goal success, and any supporting metrics)

Goal & Metrics Baseline Target Current

7) Act: (actions taken as a result of the Check, and the plan to sustain results)

*The is UCLA Operating System 11x17 template used to document and communicate complex problem solving using the Plan-Do-Check-Act (PDCA) method: Steps 1-4 (Plan), Steps 1-3 (Do), Step 1 (Check), Step 5 (Act)
**PDCA/A3 Template**

**A3 Project Title**

Date Updated:

1) **Problem Statement:** (description of the problem and its effect)

2) **Current State:** (depiction of the current state, its processes, and problem(s))

Best Practices/Literature Search:

3) **Goal:** (how will we know the project is successful; standard/basis for comparison)

4) **Root Cause Analysis:** (investigation depicting the problems’ root causes)

5) **Solutions:** (action plan and findings of tested solutions)

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1) Problem Statement:
(description & quantification of the problem and effect)

Project Lead:
Project Champion(s):
Date Updated:
Project Team:

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A3* Project Title

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Goal & Metrics
Baseline
Target
Current
Goal
Supporting Metric
Supporting Metric

Root Cause
Tested Solution
Responsible
Due
Finding

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Project Lead
- Partners with facilitator for the planning and the development of all project deliverables; responsible for managing team members, implementation and sustaining gains

Project Champion(s)
- Provides leadership support; validates project objective and approach; ensures availability of appropriate resources and support; helps to remove cross-functional barriers.

Project Team
- Participate in project as requested by team leader and facilitator – including: completing assigned work; informing the project leader of issues, scope changes, risk and quality concerns; communicating changes to peers
6) Check:

(Summary of the solutions' results, overall goal success, and any supporting metrics)

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description & quantification of the problem and effect

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DO
- Describe the problem
- Quantify the gap between the problem and the ideal
- Describe the effect/impact of the problem

DONT
- Don’t include the solution (if you have the solution it should be an A4)
1) **Problem Statement:** Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

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5) **Solutions:**

   - **Root Cause:** Trauma residents waiting to write admit orders.
   - **Tested Solution:** Communicate through Dr. Cryer that orders need to be written before leaving CT.
   - **Responsible:** Marilyn Cohen, Dr. Cryer
   - **Due:** 5/16/2014

   - **Root Cause:** Delay in nurse report due to nurse availability
   - **Tested Solution:** ED Charge and ICU Charge to communicate basic report while patient is in CT. ED Primary nurse to transport patient and give bedside report to ICU nurse.
   - **Responsible:** Liz Overbeck, Nichole Roberts, Kayla Vandegrift, Erik Coll
   - **Due:** 5/16/2014

   - **Root Cause:** Delays in submitting bed request and confusion as to who submits it.
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   - **Responsible:** Marilyn Cohen, Dr. McCullough, Dr. Cryer
   - **Due:** 5/16/2014

6) **Check:**

   - Weekly trauma to ICU data sent every Friday
   - Cases with patient in ED > 2 hrs to be reviewed and root cause documented

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**Observe, document, & study the current state**
- Observe it with your own eyes
- Document it so it can be analyzed
  - Value Stream Map
  - Process Map
  - Time Observation Sheets
  - Spaghetti Diagram
- Collect and analyze data
- Interview experts (pain points)
- Lit Review
1) **Problem Statement:** Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

2) **Current State:**

   ![Value Stream Map](image)

3) **Goal:** (how will we know the project is successful; standard/basis for comparison)

4) **Root Cause Analysis:** (investigation depicting the problems’ root causes)

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**Date Updated: 10/21/2014**

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4) **Root Cause Analysis**: (investigation depicting the problems’ root causes)

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**Define the Goal**
- **Ask**: what is the ideal outcome?
- **It is often the inverse of the problem statement**

**Goal Elements**
- **Do (action verb)**
- **To (what/who)**
- **By How Much**
- **By When**
- **Example**: Increase patient satisfaction from 80% to 85% by August 30th
1) Problem Statement: Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

2) Current State:

3) Goal: To reduce the amount of time the critical trauma patient spends in the ED waiting for an ICU bed. Goal is 1.5 hours from patient entering the Resuscitation Suite (ED trauma bay) to patient arriving in ICU when a bed is available by 9/26/2014.

4) Root Cause Analysis: (investigation depicting the problems' root causes)

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4) **Root Cause Analysis:** (Investigation depicting the problems' root causes)

While the Current State tells the “facts”...

**Root Cause Analysis:**
- Examines underlying, not “surface” causes
- By asking “Why” as much as necessary
- To make the solution(s) clear, and
- To eliminate the problem permanently

**Tools:**
- Pareto
- Fishbone
- 5 Whys
1) Problem Statement: Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

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Tools:
- Pareto
- Fishbone
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What is Root Cause Analysis?

- Problem: The granite of the Jefferson Memorial is crumbling at an increasing rate
  - Why?
  - Because it was being washed more frequently
    - Why?
  - Because a larger bird population led to increased waste
    - Why?
  - Because of the number of spiders for birds to eat
    - Why?
  - Because there were a large number of midges for spiders to eat
    - Why?
  - Because midges are attracted to the lights, which are turned on before dusk, and they smash into the memorial while swarming
1) **Problem Statement:** Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

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4) **Root Cause Analysis:**

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**Do**

**Check**

**Act**
Problem Statement:

Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

Project Lead: Marilyn Cohen
PE Facilitator: Keith Cox
Project Champion(s): Barbara Anderson, Dr. Cryer, Chris D’Amore, Dr. Martin, Mark Mayes, Jennifer Osborne, Joann Rigali, Dr. Vespa

The project aims to reduce the amount of time critical trauma patients spend in the ED waiting for an ICU bed. The goal is to reduce the median and mean arrival in the ED to depart ED time to 1.5 hours by September 26, 2014.

Root Cause Analysis:

Based on the analysis, the root causes identified are:

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<th>Tested Solution</th>
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Solutions:

- Marilyn continues to send weekly Trauma to ICU data to the team.
- Issues to be brought up with the team and monthly Trauma Committee as needed.

DO

- Target solutions based on the identified root causes
- Test & Track solutions & Findings
- Prioritize the solutions so that the action plan can be achieved

DONT

- Identify solutions before conducting root cause analysis!
6) Check:

1. Weekly trauma to ICU data sent every Friday
2. Cases with patient in ED > 2 hrs to be reviewed and root cause documented

1) Problem Statement:
Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

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2) Current State:

3) Goal:
To reduce the amount of time the critical trauma patient spends in the ED waiting for an ICU bed. Goal is 1.5 hours from patient entering the RS to patient arriving in ICU when a bed is available by 9/26/2014.

4) Root Cause Analysis:

5) Solutions:

7) Act:
Marilyn to continue sending weekly Trauma to ICU data to team. Issues to be brought up with team and monthly Trauma Committee as needed.

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DO
- Target solutions based on the identified root causes
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Date Updated: 10/21/2014
“Check” the results of the “Solutions” and the “Goal”

- Did the tested solutions eliminate the root causes?
- Did implementation of the solutions improve the goal time?
- Are their supporting metrics that need to be tracked?
- What worked? What didn’t?

### 5) Solutions:

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### 6) Check:

(Summary of the solutions’ results, overall goal success, and any supporting metrics)

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**Act**
“Check” the results of the “Solutions” and the “Goal”

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6) Check:

1. Weekly trauma to ICU data sent every Friday
2. Cases with patient in ED > 2 hrs to be reviewed and root cause documented

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What “Act” (s) were taken (or will be taken) as a result of the “Check”? 

Did it improve?
- Celebrate success
- Communicate with stakeholders
- Standardize the change
- Continue tracking, raise target

Did it not change at all?
- Continue monitoring
- Wait for solution uptake
- Reinvestigate root cause analysis
- Involve process owners, refine solutions
- Increase communication

Did it get worse?
- Same as “not changing” but perhaps conduct Mini-PDCA

### 5) Solutions:

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### 7) Act: (Action taken as a result of the Check, and the plan to sustain results)
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7) Act:
Marilyn to continue sending weekly Trauma to ICU data to team. Issues to be brought up with team and monthly Trauma Committee as needed.
**1) Problem Statement:** Critical trauma patients spend an average of 5 hours in the ED before going to the ICU. This causes unsafe patient conditions, potentially negative outcomes, staffing and patient flow issues in the ED, and a decrease in patient and staff satisfaction.

**2) Current State:**

![Trauma to ICU Current State VSM](image)

**3) Goal:** To reduce the amount of time the critical trauma patient spends in the ED waiting for an ICU bed. Goal is 1.5 hours from patient entering the RS to patient arriving in ICU when a bed is available by 9/26/2014.

**4) Root Cause Analysis:**

![Root Cause Analysis Diagram](image)

**5) Solutions:**

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**Goal & Metrics**

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## A4 Problem Solving

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<td>Known root-causes and solutions</td>
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<tr>
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<td>Requires Planning (PDCA) and usually data</td>
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Example: Peanut butter and jelly sandwiches in the RR.

Example: A unit wants to improve poor patient satisfaction scores but they do not understand why the scores are so poor or how to improve them.
**A4 Problem Solving (8.5 x 11)**

**Daily** problem solving, consensus & communication tool used by staff

**Known** root-causes and solutions

**Quick** and easy to use

Example: Peanut butter and jelly sandwiches in the RR.

---

**A3 Problem Solving (11 x 17)**

**Complex** problem solving, consensus, communication tool

**Unknown** root-causes and solutions

Requires Planning (PDCA) and usually data

Example: A unit wants to improve poor patient satisfaction scores but they do not understand why the scores are so poor or how to improve them.
What is an A4?

- Evidence based tool
- Proven in industry and healthcare (Toyota)
- One of the tools used across UCLA Health to generate ideas from staff to improve their work
- Reduce waste (time, cost, movement)

- UCLA has adopted elements of Lean in Operating System
  - Value people
  - Encourage frontline input into problem solving
  - Provide problem solving tools
  - Leadership support and follow up
A4 – Nursing Idea to improve the A4 template

Old Version

<table>
<thead>
<tr>
<th>A4</th>
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<tbody>
<tr>
<td><strong>Opportunity:</strong></td>
<td><strong>Date:</strong></td>
</tr>
<tr>
<td><strong>Problem Statement</strong></td>
<td></td>
</tr>
<tr>
<td>- What is the problem?</td>
<td></td>
</tr>
<tr>
<td>- What needs to be fixed or changed?</td>
<td></td>
</tr>
<tr>
<td><strong>Current Method</strong></td>
<td><strong>Current Conditions</strong></td>
</tr>
<tr>
<td>- How do you do it today?</td>
<td></td>
</tr>
<tr>
<td>- What are we doing currently?</td>
<td></td>
</tr>
<tr>
<td><strong>Suggestion/New Method</strong></td>
<td><strong>Recommendations</strong></td>
</tr>
<tr>
<td>- How do you think we can fix this problem?</td>
<td></td>
</tr>
<tr>
<td>- What do you suggest we do differently?</td>
<td></td>
</tr>
<tr>
<td><strong>Expectations/Indicators</strong></td>
<td><strong>Next Steps (if any)</strong></td>
</tr>
<tr>
<td>- How will you know that the problem is fixed?</td>
<td></td>
</tr>
<tr>
<td>- How will we know if we have improved?</td>
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Owner(s):

Sponsor:

Updated Version

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Owner(s):

Sponsor:
A4 Template

Opportunity:
Impact (Align with OS Pillar):

Date:

Problem Statement

Current Method (Current Conditions)

Suggestion/New Methods

Expectations/Indicators/Next Steps

Owner(s):
Sponsor:
## How to use the A4 Template

### Opportunity: Impact (Align with "Why")

### Problem Statement
- Concise description of the opportunity
- Patients are unhappy with the consistency and amount of the peanut butter in PB & Jelly sandwiches in RRUCLA

### Current Method (Current Conditions)
- Describes and/or illustrates the current state, method, or conditions
- Unhappy patients! 4 patient have complained PB& J sandwiches. We only make 10 PB&J sandwiches every month. We have very little storage so we typically buy 5 kg jars of PB, but these expire after 30 days

### Suggestion/New Methods
- Describes, proposes and/or illustrates recommendations (i.e. solutions)
- Use the pre-packaged peanut butter and jelly to make the sandwiches

### Expectations/Indicators/Next Steps
- Describes any necessary next steps
- Pilot new process and assess patient satisfaction with amount and consistency of the sandwich. Track number of sandwiches made and present cost savings to admin.

---

**Owner(s):**

**Sponsor:**

---

[Image of UCLA Health logo]
What do we do with A4s once we get them?

- Collect ideas
- Track ideas
- Communicate to staff
- Celebrate your staff
- Share with others
Some ideas that have worked (Thedacare)

- Priority matrix
- Visual tracking tool
- Celebrating success
- Branding the opportunity cards (not calling them A4s)
Where to find the tools

Several tools and templates are used by lean & QI change agents:

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<td>Process Map Template</td>
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<td>A3 Strategy</td>
<td>Time Observation Sheets</td>
</tr>
<tr>
<td>Charter Document</td>
<td>Spaghetti Diagram with Rows</td>
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<tr>
<td>FOCUS PDCA</td>
<td>Spaghetti Diagram without Rows</td>
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<td>Downtime Waste ID Sheet</td>
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http://mednet.ucla.edu/hii/QIToolkit.html
UPCs QI/PI culture

• Does your Unit/UPC train QI/PI? How does it do so?
• What QI/PI tools does your Unit/UPC use?
• How does your Unit/UPC manage/track QI/PI implementation?
• How does your Unit/UPC sustain QI/PI results?
• How does your Unit/UPC spread QI/PI?
Any Questions?