

Clean, Green and Lean

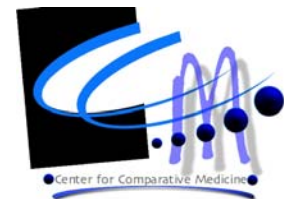


Managing Continuous Improvement in Animal Care Programs

**Center for Comparative Medicine
Massachusetts General Hospital
Boston, MA**

American Association for Laboratory Animal Science
60th Annual Meeting, Denver Colorado

November 11, 2009



Management Challenges

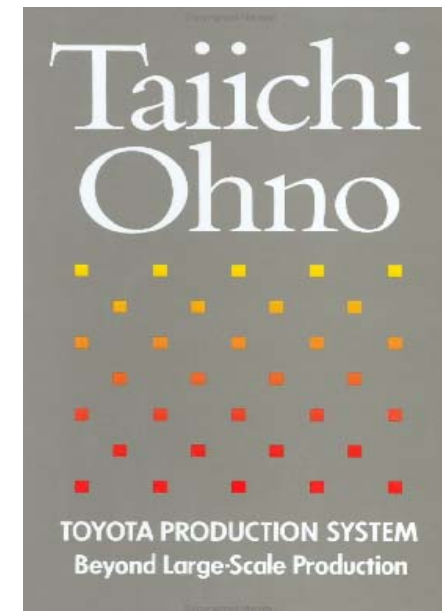
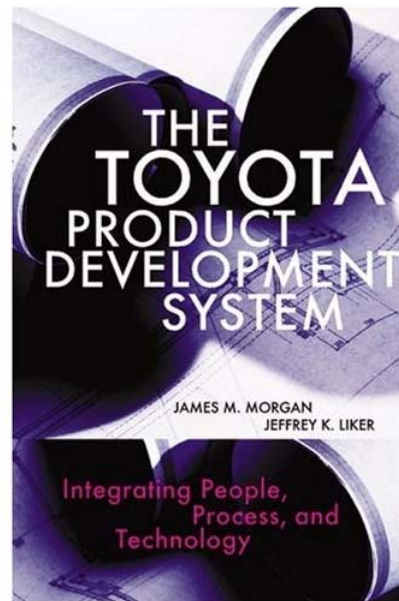
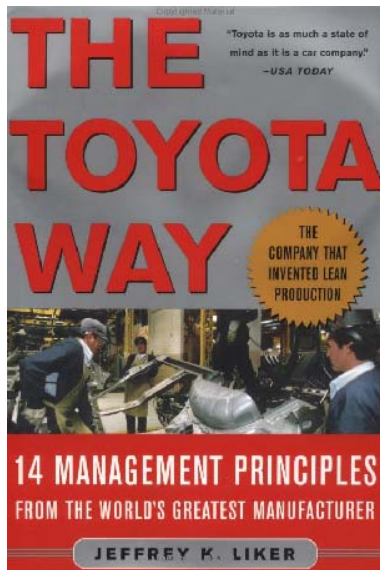


Common problems exist in our programs that adversely affect either cost, quality, safety or efficiency?

- Customers are not satisfied with services provided
- Staff work in silos and work performance differs greatly between employees
- Employee performance failure is the primary reason for poor service and regulatory non-compliance
- Problems are generally hidden and problem-solving generally occurs at the mid- and high-management levels with varied implementation success
- Partnering departments do not understand how they impact our operations

Lean Management/TPS

Global reputation of excellence in quality, cost reduction and understanding what the customer wants; in the "Top 5" with J.D. Power Initial Quality Awards for automotive quality, dependability and green efficiency



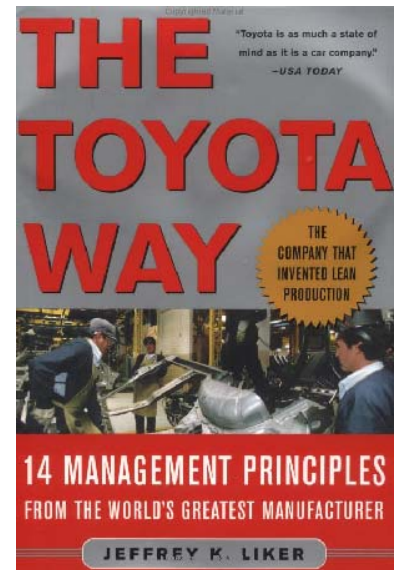
But We Don't Make Cars...

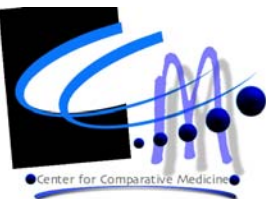
Toyota Production System (TPS)/Lean Management has been successfully adapted to non-manufacturing industries including insurance, healthcare and now research management



Four “P” Management Model

- **PHILOSOPHY: *Long-Term Picture***
 - Relentless reflection & continuous improvement
- **PEOPLE & PARTNERS: *Team Empowerment; Expand partnerships***
- **PROCESS: *Eliminate Waste***
- **PROBLEM-SOLVING: *Jidoka***
 - Problem Identification through analysis
 - Problem Solving by consensus, considering multiple options
 - Document Plan (A3 Process) with measurable goals





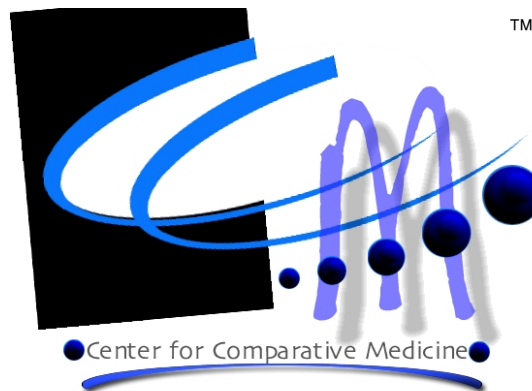
Vision of the Future



Maximize Efficient

Control Cost

**Massachusetts General Hospital
Center for Comparative Medicine**



Ensure Safety

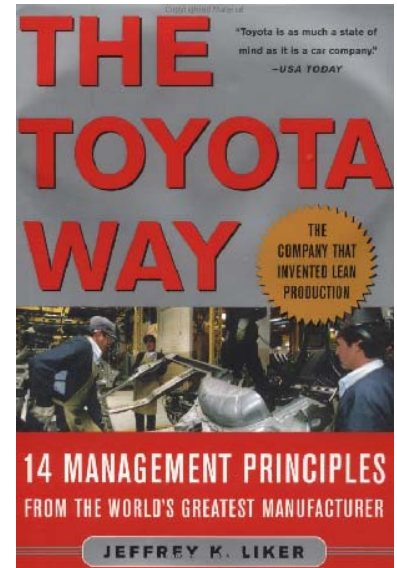
**Enhance
Quality**

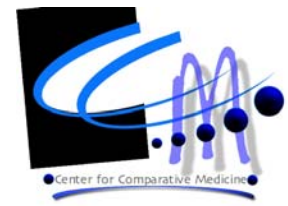
**FY 2007-2009
STRATEGIC PLAN
[CONFIDENTIAL]**

Go Green

Four “P” Management Model

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CCM “On-the-Floor” Roles



Research Animal Technician/Specialists:
Combination of Animal Care and Veterinary Technical
Support

Rooms/facility maintenance

Critical equipment maintenance

Basic husbandry

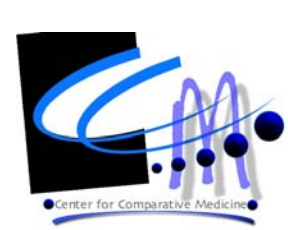
Animal health assessments/treatments

Research support services

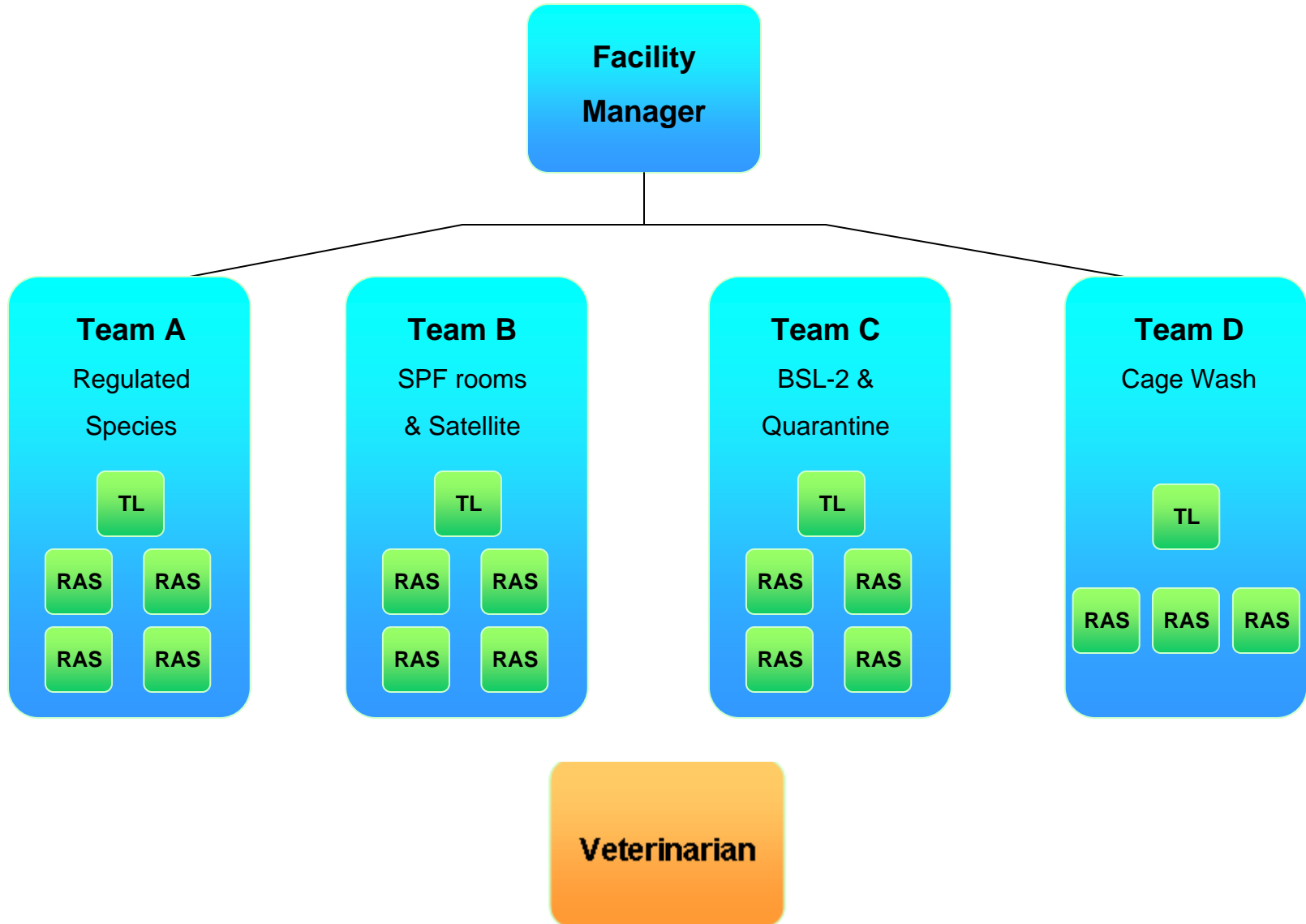
SOP development

Process problems/root-cause analysis

Pilot possible solutions to problems



Team-Oriented Organization



- Mid- and High-level management mindset cannot be to “blaming” employees when problems arise
- Staff have to trust that they will not be penalized if they bring problems to light; help will come
- Continuously Support Team Concept



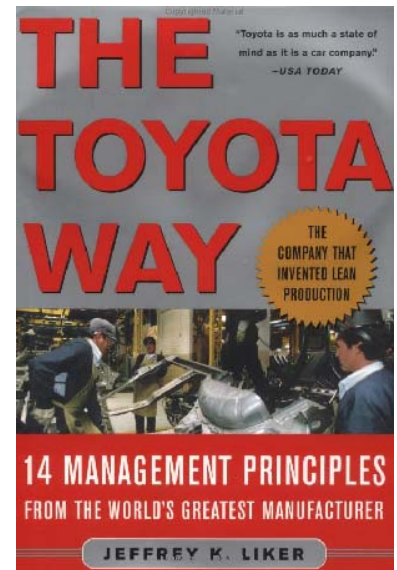
TPS Training Program 2005-2009

- Management training
 - 4 sessions
- Team Lead training
 - 6 sessions
- Basic training (All CCM Staff)
 - Given 3x a year



Four “P” Management Model

- PHILOSOPHY: *Long-Term Picture*
 - Relentless reflection & continuous improvement
- PEOPLE & PARTNERS: *Team Empowerment; Expand partnerships*
- **PROCESS: *Eliminate Waste***
 - Standardize and visualize procedures
 - Recognize workflow connections
 - Look for all types of waste (7)
- PROBLEM-SOLVING: *Jidoka*
 - Problem Identification through analysis
 - Problem Solving by consensus, considering multiple options
 - Document Plan (A3 Process) with measurable goals



Standardization

All tasks/procedures performed the same way

- Consistent quality
- Accurate estimate of time required to complete work
- Enhances teamwork; discourages individualism
- Starting line for continuous improvement initiatives



Traditional Standardization

STANDARD OPERATING PROCEDURE	SOP Number/Revision:
	Supersedes:
	Effective Date: November 26, 2002
SIGNATURES	
PREPARED BY: _____	DATE _____
REVIEWED BY: _____	DATE _____
APPROVED BY: _____	DATE _____

- 1 **OBJECTIVES:**
The objective of this Standard Operating Procedure (SOP) is to provide daily monitoring and veterinary support to all laboratory animals housed and used at Massachusetts General Hospital (MGH) by the Center of Comparative Medicine and Laboratory Animal Services (CCM).
- 2 **SCOPE:**
This SOP for clinical rounds includes all vertebrate animal species housed or used at MGH.
- 3 **RESPONSIBILITY:**
The veterinarian and veterinary technician are responsible for clinical rounds. They are responsible for assuring and providing adequate animal care, such as prevention, diagnosis, control and treatment of disease, in accordance with federal, state, and local laws and regulations and international accreditation standards. The clinical rounds staff, along with animal facility managers and animal technicians, are responsible for providing effective animal care on a daily basis. Clinical rounds staff is responsible for training animal technicians on those activities pertaining to animal health.
- 4 **DEFINITIONS**
 - 4.1 Small animals: include mice, rats, hamsters, guinea pigs, frogs, zebrafish and other small-sized vertebrate species
 - 4.2 Large animals: include rabbits, non-human primates, sheep, goats, pigs, dogs, cats

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Standard Operating Procedure for Clinical Rounds	SOP Number / Revision
<p>and other large-sized animals.</p> <p>Animal Technician: individual who is responsible for providing food, water, clean facilities, and micro-environmental conditions on a daily basis as a part of husbandry practice.</p> <p>Veterinary Technician: person with education and experience in observation and capture of animals requiring veterinary intervention.</p> <p>Macrolactin: an animal that is not weaning, unable to stand or maintain anal posture, unresponsive to stimuli or touch with an evidence of recent anesthetic or sedation. Mortality is defined as the period prior to death.</p> <p>PROCEDURE: Animal Technician - Small animals</p> <p>5.1 The animal technician performs a daily health assessment on all animals in all animal rooms to which (s)he is assigned. This daily check is performed first thing in the morning (i.e. before 06:00) unless the center is under quarantine or isolation (i.e. BSL-2 suite) in which case this is done upon quarantine/isolation. Animal technicians continue working in clean rooms first. Time is time allowed for daily health checks is guaranteed/protected when they are not required to return to any other rooms.</p> <p>5.2 The animal technician looks at every animal to confirm that it is alert and able to stand. If an animal is down, it is not necessary to handle it. The animal technician focuses on distress, apyrexia, fever, urines, stool profiles, breathing, fighting, teeth problems, abnormal gait, abnormal breathing, abnormal posture or other relevant presymptomatic conditions.</p> <p>5.3 In the absence or absence of a signal, the animal technician affixes a HEALTH CHECK CARD (Document 10.1) to the front of the cage that includes:</p> <p>5.3.1 The animal technician's name</p> <p>5.3.2 The animal technician's PT's name</p> <p>5.3.3 The animal technician's initials</p> <p>5.3.4 Problem noted (acute problem)</p> <p>5.4 The animal technician notifies staff in the Animal Health Problems section of the SMALL ANIMAL HEALTH AND ROOM MAINTENANCE RECORD (Document 10.2).</p> <p>5.5 If the animal appears unwell, the animal technician reports this immediately to a member of the clinical rounds staff or a veterinary technician (veterinarian) by phone or email.</p> <p>5.6 The animal technician checks each cage daily to make sure there is adequate food and drinking water for the next 24 hours. If food is water is either moldy or contaminated, the animal technician adds more if the water is leaking from either the bottle or automatically watering into the cage. The empty cage is changed and the animals checked for distress. If animals are severely distressed, the animal technician goes back to a clean environment and follows Step 5. above. All problems with food or water are reported on the SMALL ANIMAL HEALTH</p>	
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Standard Operating Procedure for Clinical Rounds	SOP Number / Revision
<p>AD ROOMS MONITORING SHEET (Document 10.3).</p> <p>7.0 The animal technician checks the environmental conditions using the following MGH Subcommittee on Research Animal Care (SRAC) policy for standard daily environmental observations: mouse cages (1) and PT's in quarantine.</p> <p>Quarantine room(s) for mice in the cage room should be checked through the MGRAC.</p> <p>7.1.1 Measurement of 1 min per standard observation mouse cage if the body weight of the largest mouse is more than 20 grams.</p> <p>7.1.2 Measurement of 1 min per standard observation mouse cage if the body weight of the largest mouse is between 20-30 gm.</p> <p>7.1.3 Measurement of 1 min and 1 additional min per standard observation mouse cage MGRAC policy for environmental observations the standard duration on cage of 1:4 MGRAC.</p> <p>7.1.4 Measurement of 1 min per standard observation mouse cage if the body weight of the largest mouse is between 300-500 gm.</p> <p>7.1.5 Measurement of 1 min per standard observation mouse cage if the body weight of the largest mouse is between 500-600 gm.</p> <p>7.1.6 Measurement of 1 min and 1 additional minute per cage if the body weight of the largest mouse is between 700 gm-900 gm.</p> <p>7.1.7 Measurement of 1 min and 1 additional minute per standard observation mouse cage.</p> <p>7.1.8 Measurement of 1 min and 1 additional minute per standard observation mouse cage.</p> <p>7.1.9 Measurement of 1 min and 1 additional minute per standard observation mouse cage.</p> <p>7.1.10 Measurement of 1 min and 1 additional minute per standard observation mouse cage.</p> <p>7.1.11 Measurement of 1 min and 1 additional minute per standard observation mouse cage.</p> <p>7.1.12 The animal technician places a clean plastic bag and labels the bag with the PT's name, pre-weaned number, date and animal technician name. The animal technician then the plastic bag and places it in the correct refrigerator for the animal.</p> <p>7.1.3 The animal technician reports the final animal on the SMALL ANIMAL</p>	
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Standard Operating Procedure for Clinical Rounds	SOP Number / Revision
<p>HEALTH ROOM AND MONITORING SHEET (Document 10.7).</p> <p>10.12 The animal technician initiates Animal Health Check (AHC) Time. Food is not checked. WARE LAW CHECKED ONLY on SMALL ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD (Document 10.2).</p> <p>PROCEDURE: Animal technician - Large animals</p> <p>6.1 (Same as 5.1 above for large animals in cages or pens)</p> <p>6.2 (Same as 5.2 above for large animals in cages or pens)</p> <p>6.3 If food or water is moldy, the animal technician should contact the veterinary technician (veterinarian) and document on the LARGE ANIMAL HEALTH AND ROOM MAINTENANCE RECORD (Document 10.2) the following:</p> <p>6.3.1 The name of the veterinarian</p> <p>6.3.2 The animal technician's initials</p> <p>6.3.3 The animal technician's PT's name</p> <p>6.3.4 The animal cage and/or number</p> <p>6.3.5 The problem observed</p> <p>6.4 There is 1.4 above for large animals in cages or pens using LARGE ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD (Document 10.2).</p> <p>6.5 There is 3.3 above for large animals in cages or pens)</p> <p>6.6 The animal technician checks each cage daily to make sure there is adequate food and water available according to the facility schedule. Automatically watering systems are given checked daily. Some automatic watering systems are not checked daily. The animal technician reports this immediately to a member of the clinical rounds staff or a veterinary technician (veterinarian) by phone or email.</p> <p>6.7 The animal technician checks each cage for dead animals. If dead animals are found, the animal technician contacts the veterinary technician immediately. Proper disposal instructions will be provided by the veterinary technician based on the organism and possible cause of death.</p> <p>6.8 The animal technician checks Health Check, Clean Feed and Water Lot/Checked area on the LARGE ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD (Document 10.2).</p> <p>PROCEDURE: Veterinarian technician - Small animals</p> <p>7.1 The veterinarian technician assigned clinical rounds for that specific animal room checks the SMALL ANIMAL HEALTH AND ROOM MONITORING SHEET (Document 10.2) for any signs that most recently by the animal technician. Cages with health check marks are not required for observation. Findings on a daily basis or more often if necessary. The veterinarian technician enters the animal's condition and records any findings on CLINICAL RECORD REPORT (Document 10.4.3). The HEALTH CHECK CARD (Document 10.1) is completed, including clinical problems, observations, any treatments then indicated by the PT (veterinarian and then indicated), the veterinarian technician's initials and date. A</p>	
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Standard Operating Procedure for Clinical Rounds	SOP Number / Revision
<p>self-observation and the PT must occur with any treatment or anesthesia before it is performed. In emergency cases when the PT does not respond or is not available, the veterinary technician will rely on the veterinarian to determine if and when treatment or anesthesia will be performed.</p> <p>7.2 The veterinary technician also checks the OVERRECORDED ROBERT REPORT (Document 10.4.4). If any over-recorded signs are noted by the animal technician or discovered by the veterinary technician (more than 5 days 7.1.1), the veterinary technician sends an email message to the clinical rounds staff on the sign out. In most situations, if environmental signs are not addressed within seven calendar days, the veterinary technician prepares a clean cage with new bedding and water per specifications 7.1 and 7.2 above and labels each cage with a SEPARATE AGE CARD (Document 10.7). The veterinarian technician fills out the BILLING STATEMENT (Document 10.8) and labels it to both the Technical Support Supervisor and the facility manager.</p> <p>7.3 The veterinary technician initiates the SMALL ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD (Document 10.2) on a daily basis.</p> <p>PROCEDURE: Veterinarian technician - Large animals</p> <p>8.1 The veterinary technician checks the LARGE ANIMAL HEALTH AND ROOM MONITORING SHEET (Document 10.2) for any signs recorded for that room by the animal technician and evaluates animals noted to have abnormal findings.</p> <p>8.2 The veterinarian technician enters individual animal health notes daily, by direct observation and information recorded by the animal technician in the DAILY CLINICAL RECORD (Document 10.2), by written and/or verbal notification and DAILY CLINICAL RECORD (Document 10.2) for CVY animals. If any health problems have been noted, an examination is performed and findings recorded in the CM INDIVIDUAL CLINICAL RECORD (Document 10.3) or the individual animal record.</p> <p>8.3 If the animal requires immediate or significant medical attention, the veterinary technician contacts the PI and the staff veterinarian to establish a treatment plan for the animal. All treatments are documented in the individual animal record and are printed on the cage.</p> <p>8.4 After completion of daily clinical rounds, the veterinary technician initiates the LARGE ANIMAL HEALTH AND ROOM MAINTENANCE RECORD (Document 10.2).</p> <p>PROCEDURE: Veterinarian</p> <p>9.1 The veterinarian performs clinical rounds at least weekly in animal facilities and also at least weekly in MGH as assigned by the Director, CCM.</p> <p>9.2 The assigned veterinarian receives ongoing input with the veterinary technician.</p> <p>9.3 The assigned veterinarian reports any findings (particularly related to animal care)</p>	
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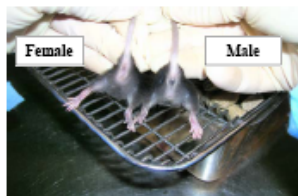
Standard Operating Procedure for Clinical Rounds	SOP Number / Revision
<p>and husbandry to the appropriate CCM facility manager or facilities facility manager.</p> <p>9.4 The assigned veterinarian initiates the SMALL ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD (Document 10.2) on a daily basis.</p> <p>10 DOCUMENTS</p> <p>10.1 HEALTH CHECK CARD</p> <p>10.2 Animal Health and Room Monitoring Forms</p> <p>10.2.1 SMALL ANIMAL HEALTH AND ROOM MONITORING SHEET</p> <p>10.2.2 LARGE ANIMAL HEALTH AND ROOM MONITORING SHEET</p> <p>10.3 OVERRECORDED ROBERT REPORT</p> <p>10.4 OVERRECORDED ROBERT REPORT</p> <p>10.5 Animal Husbandry and Room Maintenance Forms</p> <p>10.5.1 Small Animal Husbandry and Room Maintenance Forms (per species)</p> <p>10.5.1.1 SMALL ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD - MICE</p> <p>10.5.1.2 SMALL ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD - RATS, HAMSTERS, GUINEA PIG</p> <p>10.5.2 LARGE ANIMAL HUSBANDRY AND ROOM MAINTENANCE RECORD</p> <p>10.6 Clean Records Forms</p> <p>10.6.1 CLINICAL RECORD REPORT</p> <p>10.6.2 DAILY CLINICAL RECORD (Wolcott and Edwards)</p> <p>10.6.3 DAILY CLINICAL RECORD (HAPP Form)</p> <p>10.7 SEPARATE AGE CARD</p> <p>10.8 BILLING STATEMENT FORM</p> <p>10.9 CM INDIVIDUAL CLINICAL RECORD</p> <p>11 CONTINGENCIES</p> <p>11.1 If any difficulties or questions with respect to performing this SOP are incurred, contact with the Clinical Rounds Coordinator for clarification.</p>	
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1-Page SOPs (“Visual Insurance”)



	STANDARD OPERATING PROCEDURE	Tracking Code: OCC-1
	Overcrowded Cage Management	Effective Date: 4/3/06
Title: Determining the Sex of Mice and Rats		

1. Pick up the mouse by the base of the tail, per the appropriate “Handling Mice and Rats” SOP, to observe the distance between the anus and the genital opening. This distance is greater in males than in females.

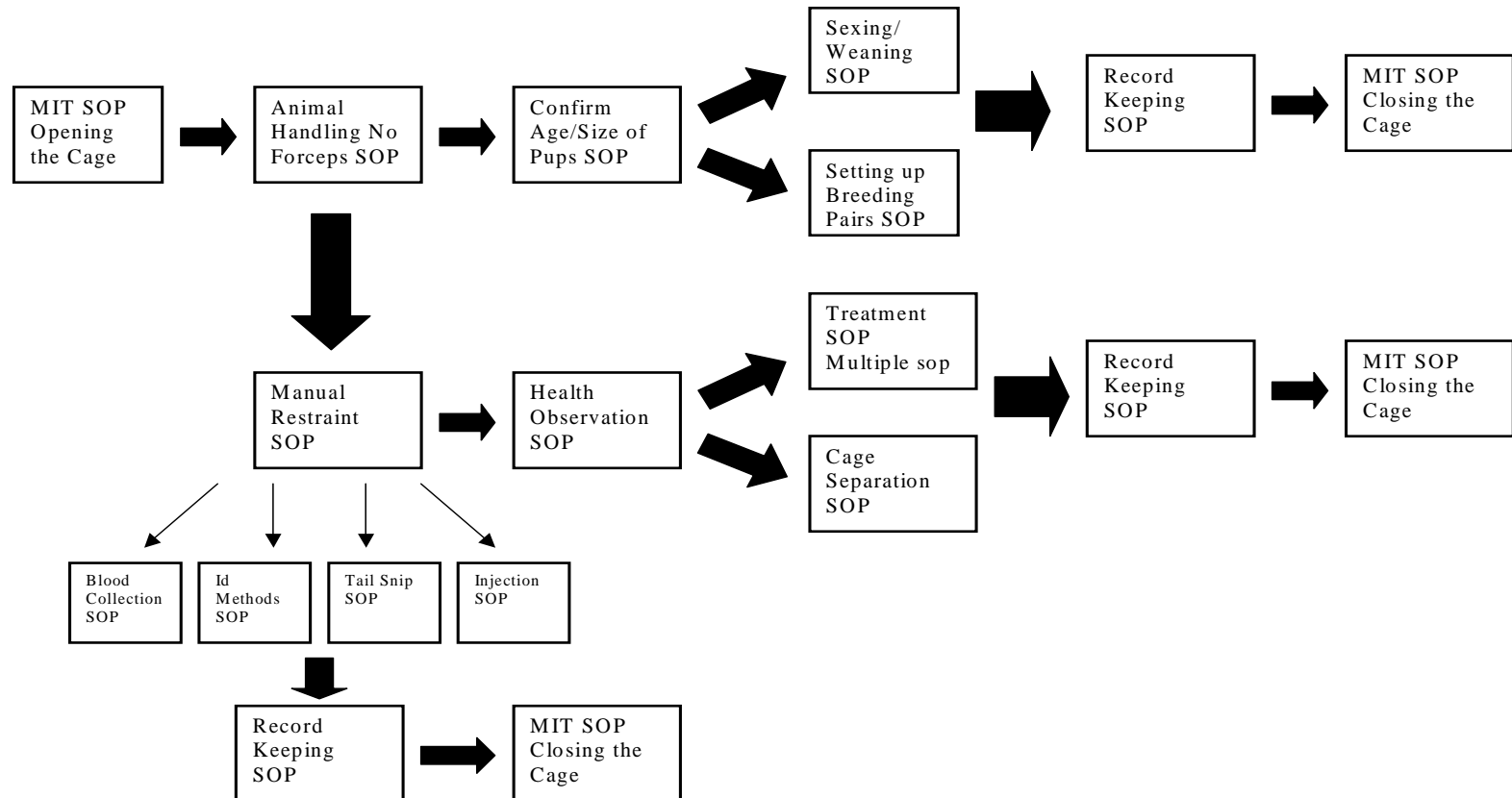
	Female	Male	
Adults			Anus Genital opening
Weanlings			

Facility Entrance - PPE



Understanding Workflow

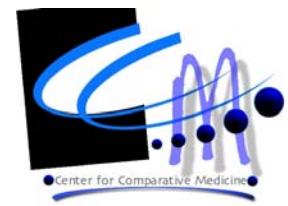
Use Process flow mapping/Value Stream mapping to visualize connections; uncover quality issues, rework or excessive “work-in-process”



Seven Types of “Waste”

1. Overproduction
2. Waiting
3. Unnecessary transportation or conveyance
4. Over processing/
Unnecessary steps
5. Excess Inventory
6. Unnecessary Movement/
Walking or Ergonomic Concerns
7. Defects





Waste: Value Stream Perspective



- Output Problems

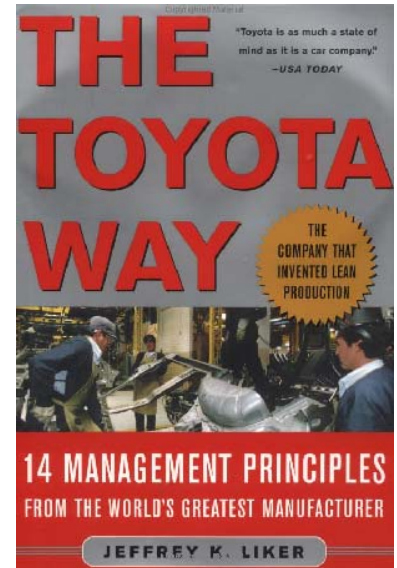
- Producing Wrong Thing
- Producing defective product
- Batch producing
- Producing less than what's needed
- Producing too late (waiting)
- Variations in output rate and quality
- Spikey demand
- External inspection

- Flow Problems

- Waiting for material, information, decisions
- Duplicating effort
- Rework and correction
- Over producing
- Work interruptions
- Frequent & uncoordinated handoffs
- Unbalanced workload
- Incomplete information
- Day or Week end push
- No standard work

Four “P” Management Model

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- PEOPLE & PARTNERS: *Team Empowerment; Expand partnerships*
- PROCESS: *Eliminate Waste*
- PROBLEM-SOLVING: *Jidoka*
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Traditional Problem-Solving

Short-term resolutions
See a problem and fix it
Get the problem taken care of
and move on
One year to resolve a
problem:
3 months planning
3 months implementing
6 months tweaking/reacting
to new problems that
surface



Lean Problem-Solving

Long-term resolutions

Fix the overall system and
problem goes away forever

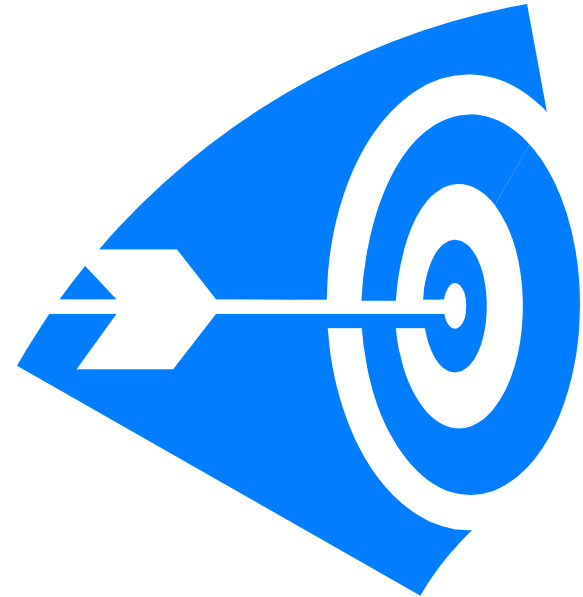
Empower staff to own
improvement; enhance desired
problem-solving skills

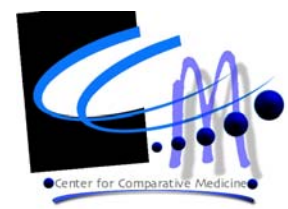
One year to resolve a problem:

11 months planning

1 month implementing

0 months tweaking/reacting to
new problems that surface



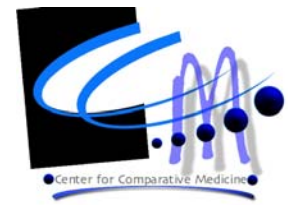


Animal Welfare Value of TPS



Rodent Health Program – Baseline Data

Template type	Response rate	Average Response Time	Maximum Treatment Delay
Old Customized Version	50%	4-5 days	12 days



5 Whys Root-Cause Analysis



Identified Problem: *Initial diagnosis takes a long time*

First Why: AC staff makes the observation and wait for veterinary diagnosis and RX plans for each individual case

Countermeasure: *Have AC staff call vets on each case*

Second Why: Each case is considered unique and process is two-tiered between AC staff and Veterinary staff

Countermeasure: *Create one-tier process for observations/diagnosis/RX plans*

Third Why: No standardization of diagnosis and RX plans

Countermeasure: *Standardize Diagnosis and RX plans whenever possible*

Fourth Why: CCM has not formalized such a program

Countermeasure: *Dept initiative to standardize diagnosis and RX plans whenever possible; make one-tier through AC staff training*


Fifth Why: Delays were not visible to Leadership

Countermeasure: *Create tracking process*

Dx & Rx Standardization

- Developed by vets and animal care staff
- 15 most common health concerns, with standardized treatments
- Posted in all rodent rooms for immediate reference

Digital Paradigm "Symptoms"	MILD	MODERATE	SEVERE	Email template
Ataxia <small>No Picture Available</small>	SIGNS/SYMPOMS Unsteady gait WHAT TO DO: Monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Unsteady gait, turning in circles WHAT TO DO: Monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Unable to right, keeps falling over, spinning WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Ataxia
Barbering 	SIGNS/SYMPOMS Complete hair loss with regular, smooth borders, no visible lesions WHAT TO DO: Monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Complete hair loss with regular, smooth borders, no visible lesions WHAT TO DO: Remove dominant mouse (mouse with no hair loss) Monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Complete hair loss with regular, smooth borders, lesions visible WHAT TO DO: Due to the lesions, this is now dermatitis, refer to ulcer, dermatitis for action <small>Enter in Bioware, send email</small>	Barbering
Conjunctivitis/Blepharitis 	SIGNS/SYMPOMS Inflammation, no discharge RECOMMEND TREATMENT: Apply antibiotic eye ointment daily for 2 weeks <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Inflammation, slight discharge, eye shut RECOMMEND TREATMENT: Apply antibiotic eye ointment daily for 2 weeks <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Inflammation, redness, discharge, lesions WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Conjunctivitis/Blepharitis
Poor Body Condition 	Slightly hunched posture, fur slightly ruffled, lethargic, dehydrated, swollen abdomen, difficulty breathing WHAT TO DO: Check teeth, check water supply, supportive care, monitor <small>Enter in Bioware, send email</small>	Thin, hunched posture, ruffled fur, dehydrated, swollen abdomen, difficulty breathing WHAT TO DO: Check teeth, check water supply, supportive care, monitor <small>Enter in Bioware, send email</small>	Emaciated, hunched posture, sunken eyes, lethargy WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Poor Body Condition
Diarhea 	SIGNS/SYMPOMS Soft feces WHAT TO DO: Supportive care, monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Wet feces around tail & in cage, hunched posture, dehydration WHAT TO DO: Supportive care, monitor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Wet feces around tail & in cage, sunken eyes, thin, lethargic, hunched posture WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Diarhea
Dystocia 	N/A	N/A	SIGNS/SYMPOMS Pups visibly stuck in birth canal, or pregnant female lethargic, hunched, distended abdomen labored breathing WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Dystocia
Fighting Wounds 	SIGNS/SYMPOMS Mice observed fighting, small wounds on back, tail, forelimbs, wounds look dry in appearance WHAT TO DO: Monitor, provide additional enrichment <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Mice observed fighting, open lesions or fresh blood, scabs visible RECOMMEND TREATMENT: oral sulfation in water for 2 weeks WHAT TO DO: separate out aggressor <small>Enter in Bioware, send email</small>	SIGNS/SYMPOMS Poor body condition, infected areas, large lesions, paralysis, blood visible in cage WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	Fight Wounds

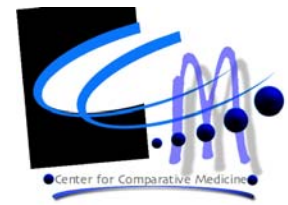
Conjunctivitis/blepharitis	SIGNS/SYMPOMS	SIGNS/SYMPOMS	SIGNS/SYMPOMS	Conjunctivitis/Blepharitis
	Inflammation, no discharge	Inflammation, slight discharge, eye shut	Inflammation, redness, discharge, lesions	
	RECOMMEND TREATMENT: Apply antibiotic eye ointment daily for 2 weeks <small>Enter in Bioware, send email</small>	RECOMMEND TREATMENT: Apply antibiotic eye ointment daily for 2 weeks <small>Enter in Bioware, send email</small>	WHAT TO DO: Euthanasia required within 24 hours <small>Enter in Bioware, send email</small>	

Requires significant
standardized vet-directed
training program

Severity descriptions
allow for minor individual
interpretations



Incorporate into daily welfare checks and
scheduled cage changing process for
workflow efficiency

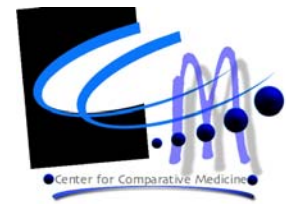


Animal Welfare Value of TPS



Full Implementation Results

Template type	Response rate	Average Response Time	Maximum Treatment Delay
Old Customized Version	50%	4-5 days	12 days
New Standardized Version	90%	0-1 days	3 days



Championing Continuous Improvement



Senior Leaders

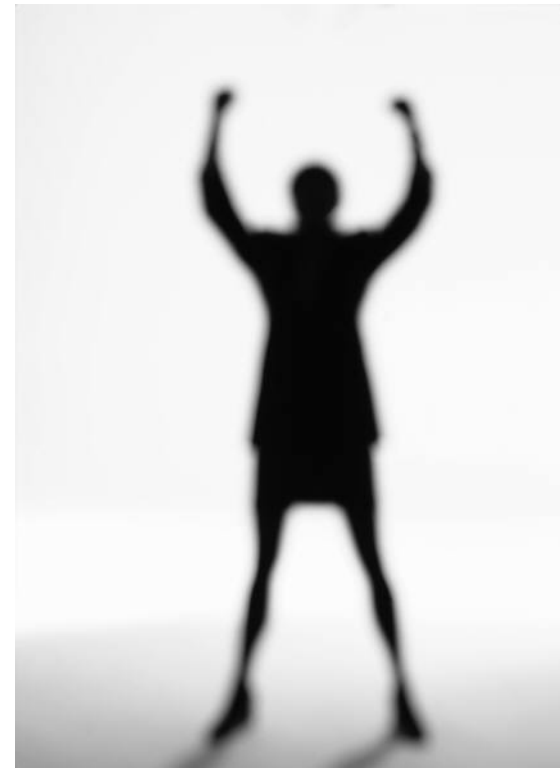
- Communicate Department Status
- Set Goals
- Organizational Development/Lean Champions
- Approve Continuous Improvement Initiatives

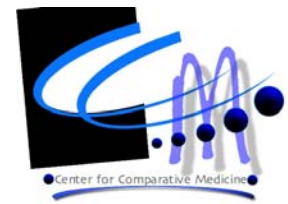
Facility/Program Leaders

- “On-The-Floor Gemba” Walks
- Assure Full Analysis/Comprehensive Solving
- Avoid living with “band-aids”
- Process Stakeholders

“On the Floor” Leaders

- Bring ALL problems to the surface
- Watch/Validate Current State
- Process Stakeholders





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FEATURED CONTENT

Welcome to Virtual Vivarium

Promoting innovative tools and concepts for care of laboratory animals.

MAN IS A RATIONAL ANIMAL.

— SENECA THE YOUNGER

Welcome to the Virtual Vivarium, created to advance the care of laboratory animals through innovative management tools and concepts.

INNOVATING Lab Animal Care

The provision of daily animal needs offers many opportunities to improve animal welfare and worker productivity at less cost.

INNOVATING Lab Animal Medicine

Advances in human patient care can serve as "animal models" for improved veterinary medicine for lab animal species.

INNOVATING Occupational Safety

New approaches to managing safety may mitigate risks and highlight specific areas for improvement.

COMPARATIVE Management

Successful management strategies in other sectors are provided that could apply to lab animal care programs.