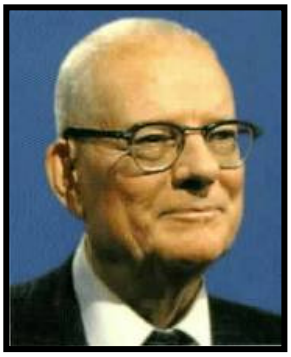
Annexe 15-A : Les 14 points de W. Edwards Deming pour la qualité

1. Garder fermement en vue l'objectif d'améliorer produits et services.
2. Améliorer toujours et en permanence
3. Adopter une nouvelle philosophie
4. Mettre fin aux inspections finales.
5. Mettre fin aux pratiques consistant à acheter au plus bas prix
6. Établir un système de formation
7. Instaurer un vrai « leadership »
8. Faire disparaître la peur
9. Éliminer les barrières entre les services
10. Éliminer slogans et objectifs de rendement
11. Éliminer les quotas et objectifs chiffrés
12. Supprimer les obstacles à la fierté du travail
13. Encourager l'éducation et l'amélioration de chacun
14. Agir pour accomplir la transformation



Annexe 15-B : Utiliser une approche “lean” pour améliorer le temps de rendu de rapport pour des hémocultures positives (en anglais)

INTRODUCTION Leans Systems Approach (LSA) improves process by identifying each step, removing non-value added steps, and eliminating waste. The benefits of applying such principles include a more efficient and timely delivery of product. The time to reporting of microbiology results using traditional culture-based phenotypic methods is complicated by the dependence on the growth rate of organisms for both initial detection and subsequent identification, often considered the limiting factor to timely reporting. We were interested to use LSA in our laboratory to assess the impact on the time to reporting of results.

The Microbiology laboratory at Vancouver General Hospital (VGH) is a full service regional laboratory. We receive 47,000 blood cultures annually, which are tested using the BACTEC 9240 blood cultures system. Given the importance of timely blood cultures results and the numbers of blood cultures performed in our laboratory, any potential improvements in blood cultures processing would have a high clinical impact. Preliminary review revealed a delay in turn around time from first notification of a positive culture to the finalized result.

METHODS The steps of LSA were followed:
1) process selected, 2) problem statement and objectives developed, 3) team selected and trained, 4) baseline data obtained, and 5) changes implemented and evaluated during the run event.

Blood culture time to reporting was selected for the project according to the following criteria: importance of results, probability of success, visibility of impact, attitude of staff (can vs. can’t), and strength of leadership. The project scope was all positive blood cultures from receipt in the laboratory to final results reporting.

Three technologists were dedicated to the project for three months, assisted by an operations director (project champion) and an outside consultant. Two months were spent studying blood cultures processing. The laboratory was cleaned, de-cluttered, and organized to achieve standardization and to decrease unnecessary waiting and motion. Process changes were introduced. The final month was spent to assess the impact of changes. Data collected pre- and post-changes were tabulated and reviewed.

All Microbiology technologists and Medical Microbiologists had the opportunity to provide feedback.

LSA principles and tools were followed. Key tools included:

- “5S” (sort, store, shine, standardize, sustain),
- value stream mapping (capture details of process),
- eliminate/reduce waste (waiting, overproduction, rework, motion, processing, inventory, intellect, transportation),
- spaghetti diagrams (map motion),
- measure times (Cycle time-from beginning to completion, Queue time-wait time between processes, Lead Time-Cycle time-total process time).

PROBLEM STATEMENT In our laboratory, only 19% of positive blood cultures are finalized with identification and susceptibilities within 24 hours of first signal as a positive blood cultures.

PROJECT SCOPE All positive blood cultures from receipt to final results reporting.

Table 1: Work Flow for Pre-Analytic Processing of Blood cultures, Pre- and Post-LSA.

Pre-LSA: Not standardized	Post-LSA: Standardized
1. Blood cultures received in Laboratory Reception by Tube / Porter / Cooler.	1. Blood cultures received in Laboratory Reception by Tube/ Porter/ Sweeper.
2. Blood cultures sorted, NOT treated as STAT.	2. Blood cultures treated as STAT.
3. Random arrival and log-in of blood cultures in Microbiology.	3. Blood cultures delivered to Microbiology every half hour, and directly by pneumatic tube system.
4. Blood cultures loaded into BACTEC when convenient.	4. Blood cultures accessioned as priority, loaded directly.

RESULTS All steps in processing of positive blood cultures were reviewed and value stream mapping was done. Data collected to determine current state revealed that only 20% of positive blood cultures were finalized with identification as positive. Controllable steps in blood culture processing identified to have an impact on this figure were: time to accession blood cultures, time to load blood cultures into automated equipment, time to investigate blood cultures signaled as positive, review of culture for early growth to begin investigations, time to receive, review and release results of identification and susceptibility tests, the number of technologists working on blood cultures at critical points, and the order of work flow on the blood cultures bench. Results are represented in Tables 1-3 and Graphs 1-5.

CONCLUSIONS Applications of LSA have not been widely reported from Microbiology Laboratories. This study demonstrates that LSA can be used to improve the time to reporting of final blood cultures results after initial detection of a positive blood culture. In our study, the percentage of positive results finalized at 24 hours after initial identification improved from 19% to 40%. This benefit was a result of LSA applied to both pre-analytic and analytic blood cultures processes. Heightened awareness

around the importance of expedited blood cultures processing led to much improved handling from collection to entry into the BACTEC, and earlier positivity from time of collection. The blood cultures analytic process was enhanced by standardized work flow, prompt handling of positive blood cultures, early review of growth, and additional technologists assigned to the blood cultures bench during critical times.

LSA led to improvements in other VGH Microbiology processes:

- A cleaner and less cluttered environment in which to work.
- A better organized physical lay-out to decrease extra motion.
- New and standardized workflow processes, posted as appropriate, and very importantly
- **An enthusiastic and energized microbiology laboratory staff.**

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Project Technologists: Angela Whitley, Harjinder Garcha, Stephanie Namocatcat, with Richard Walker as champion.

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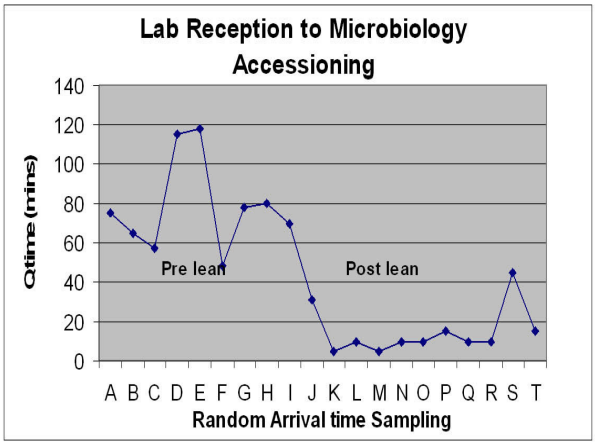
[Notes: 1. This study was originally presented as a poster at the AMMI Canada-CACMID Conjoint meeting held in Vancouver, Feb 2008. It was reformatted as an article for the on-line newsletter CMPT Connections 2008; 12(1):2-4. 2. The terminology examination, preexamination and post-examination is used for analytic by CLSI GP26-A3; 24;36.]

Table 2: Time Measurements Pre-Analytic Processing of Blood Cultures. (Time reductions range: 31- 100 minutes)

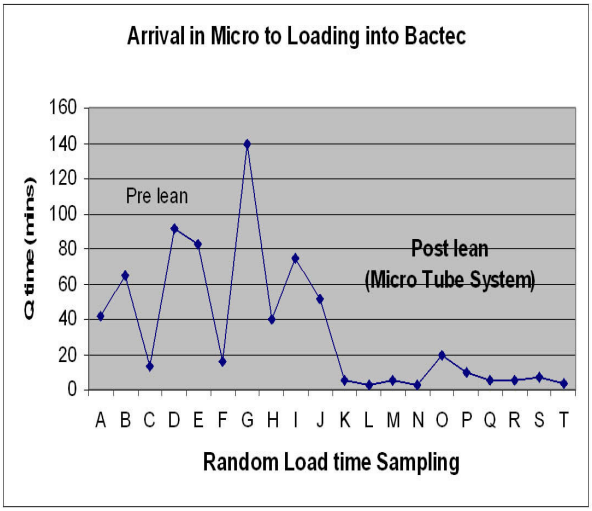
Step in pre-analytic processing of blood cultures	Pre-LSA Time ranges, minutes	Post LSA Time ranges, minutes
Laboratory reception to Microbiology accessioning.	1 to 118	**1 to 45**
Microbiology accessioning to computer log-in.	1 to 71	**1 to 40**
Computer log-in to load into blood cultures system.	1 to 110	**1 to10**

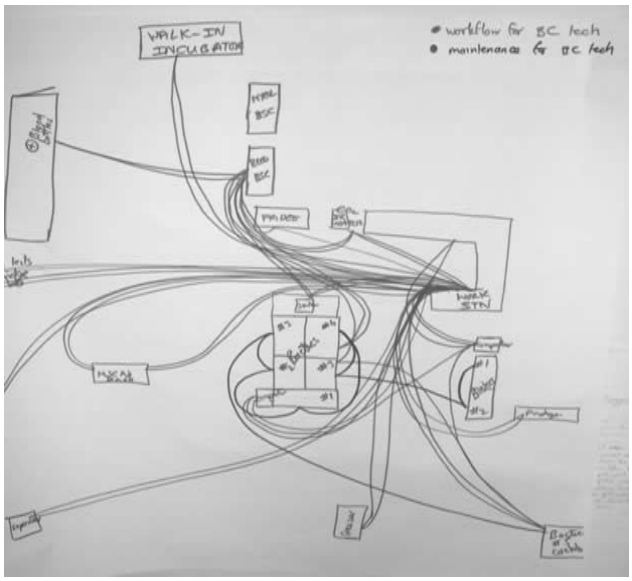
Table 3: Work Flow for Analytic Processing of Blood Cultures, Pre- and Post-LSA.

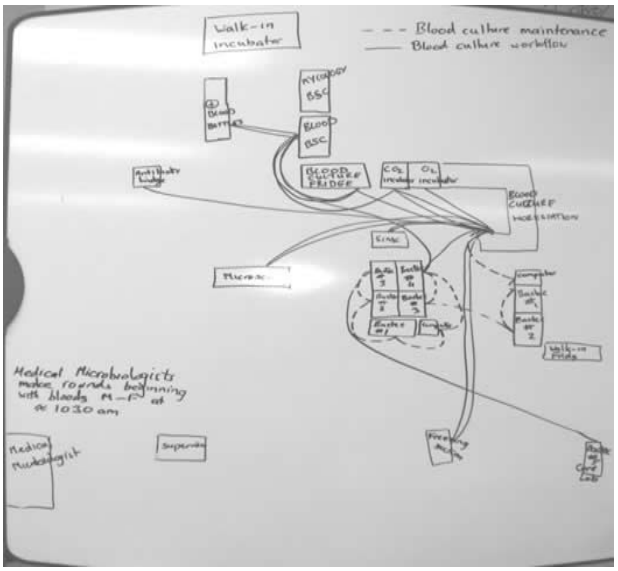
Pre-LSA: Not standardized	Post-LSA: Standardized
1. Blood cultures not staffed to accommodate busy work periods.	1. Blood cultures helper assigned 0600 to 0800.
2. No protocols for order of work flow.	2. Protocols established standardized order of work.
3. Review of plated cultures for early set-up inconsistently performed, or done too early in the day.	3. Review of plated cultures standardized to be done at 1400 and 1630 (early set-up of biochemicals and susceptibility tests).
4. Positive signal from machine not monitored on afternoon shifts when staff in other laboratory areas.	4. Monitor frequently to better detect positive signal when working in areas away from the BACTEC machines.

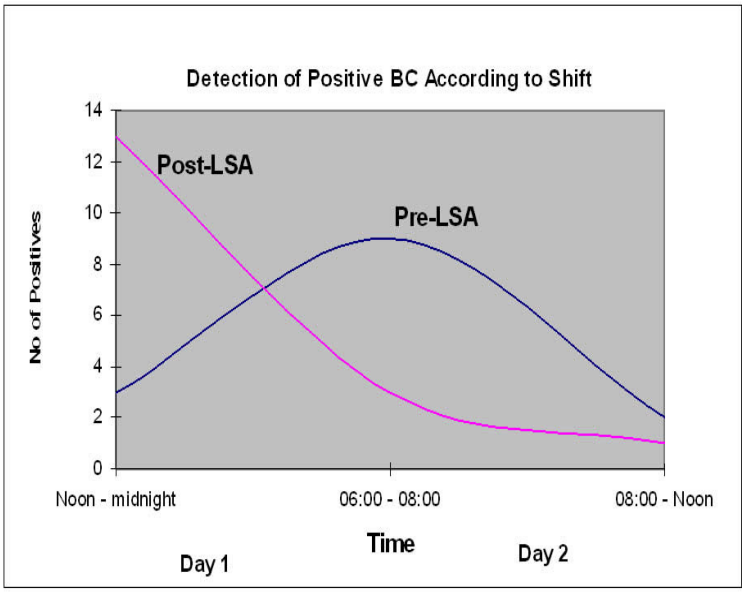


Graph 1 (above), graph 2 (below): Decreased time to enter blood cultures into BACTEC.







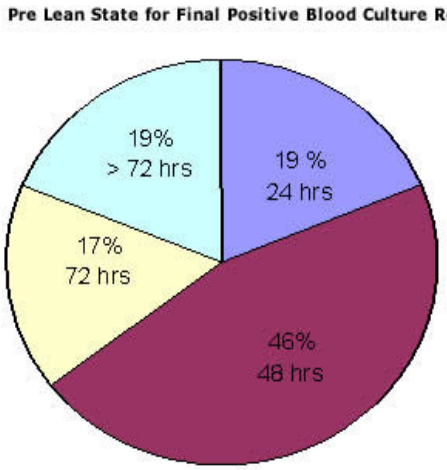


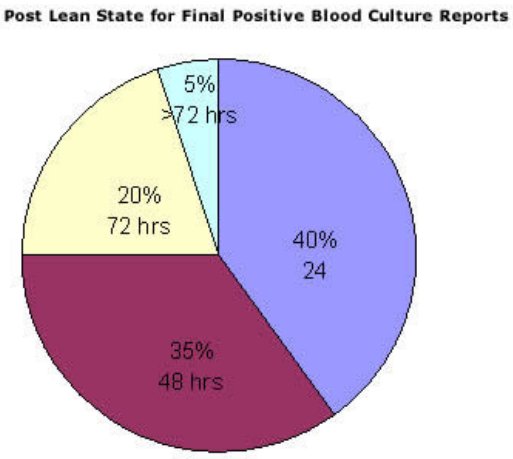
Spaghetti Diagrams (above): illustrate decreased motion with improvement in physical lay-out.

(top left) Pre LSA

(top right) Post LSA

Graph 3 (left): Expediting blood cultures into BACTEC: more positive blood cultures detected during regular operating hours, decreasing time to initial positive from time of collection.





Graphs 4 and 5 (above): Time to finalize results at 24 hours after initial positive improved from 19% to 40%.

Annexe 15-C : Indicateurs qualité et ISO

ISO9001 : 2000 (5.4.1)
La direction doit s'assurer que les objectifs qualité, incluant ceux nécessaires pour répondre aux exigences du produit, sont établies à des niveaux et fonctions différents au sein de l'organisation. Les objectifs qualité doivent être *mesurables* et doivent aller dans le même sens que les lignes directrices de qualité.

ISO9001 : 2000 (8.4)
L'organisation doit déterminer, collecter et analyser les données permettant de démontrer l'adéquation et l'efficacité du système de gestion de la qualité et évaluer où une amélioration de l'efficacité du système de gestion de la qualité peut être apportée. Ceci peut inclure les données générées par le suivi, le monitoring et les mesures provenant de différentes sources. L'analyse des données doit fournir des informations en relation avec :

- La satisfaction des clients ;
- La conformité des exigences produit ;
- Les caractéristiques et tendances des processus et produits, incluant les opportunités de mise en place d'actions préventives ;
- Les fournisseurs.

ISO15189 : 2003 (4.12.4)
La direction du laboratoire doit mettre en place des indicateurs qualité pour un *suivi systématique et une évaluation de la contribution du laboratoire aux soins du patient*
Lorsque ce programme identifie des opportunités d'amélioration, la direction doit les adopter ; indépendamment de la personne à son origine. La direction doit s'assurer que le laboratoire participe aux activités d'amélioration de la qualité qui sont liées aux différents aspects et bénéfices des soins apportés aux patients.

Annexe 15-D : Exemples d'indicateurs qualité

Le processus d'analyse (pré analytique, analytique et post analytique) comprend toutes les activités, depuis la décision du médecin de demander une analyse jusqu'au retour de l'information nécessaire pour soigner le patient.

Les exemples suivants d'indicateurs qualité peuvent être utilisés dans le contexte du processus d'analyse au laboratoire.

- L'analyse demandée est appropriée pour soigner le patient
- Le consentement du patient est obtenu de façon appropriée
- Le formulaire de demande d'analyse du médecin est reçu avec chaque échantillon
- Evaluation du rapport bénéfices/coût pour chaque analyse du laboratoire
- Identification du patient et son exactitude
- Préparation du patient pour le recueil d'échantillon
- Le récipient est adapté à l'échantillon
- Le moment du recueil de l'échantillon est adapté
- Prélèvements de sang effectués avec succès
- Intégrité de l'échantillon
- Quantité d'échantillon
- Transport de l'échantillon
- Exactitude de l'identification de l'échantillon
- Conditions de stockage de l'échantillon
- Contrôle de qualité
- Evaluation externe de la qualité ou PT
- Temps nécessaire pour la disponibilité des premiers résultats
- Exactitude du rendu des résultats
- Adéquation de l'information disponible pour l'interprétation des résultats
- Temps nécessaire pour le rendu des résultats
- Cohérence des valeurs critiques rendues
- Interprétation du résultat par le médecin
- Contamination de l'échantillon
- Blessures ou accidents au laboratoire
- Compétence du personnel
- Satisfaction des clients vis à vis des services du laboratoire
- Satisfaction des médecins vis à vis des services du laboratoire