



Lean and Mean...How to streamline your follow up service

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An Exciting Time For Implants

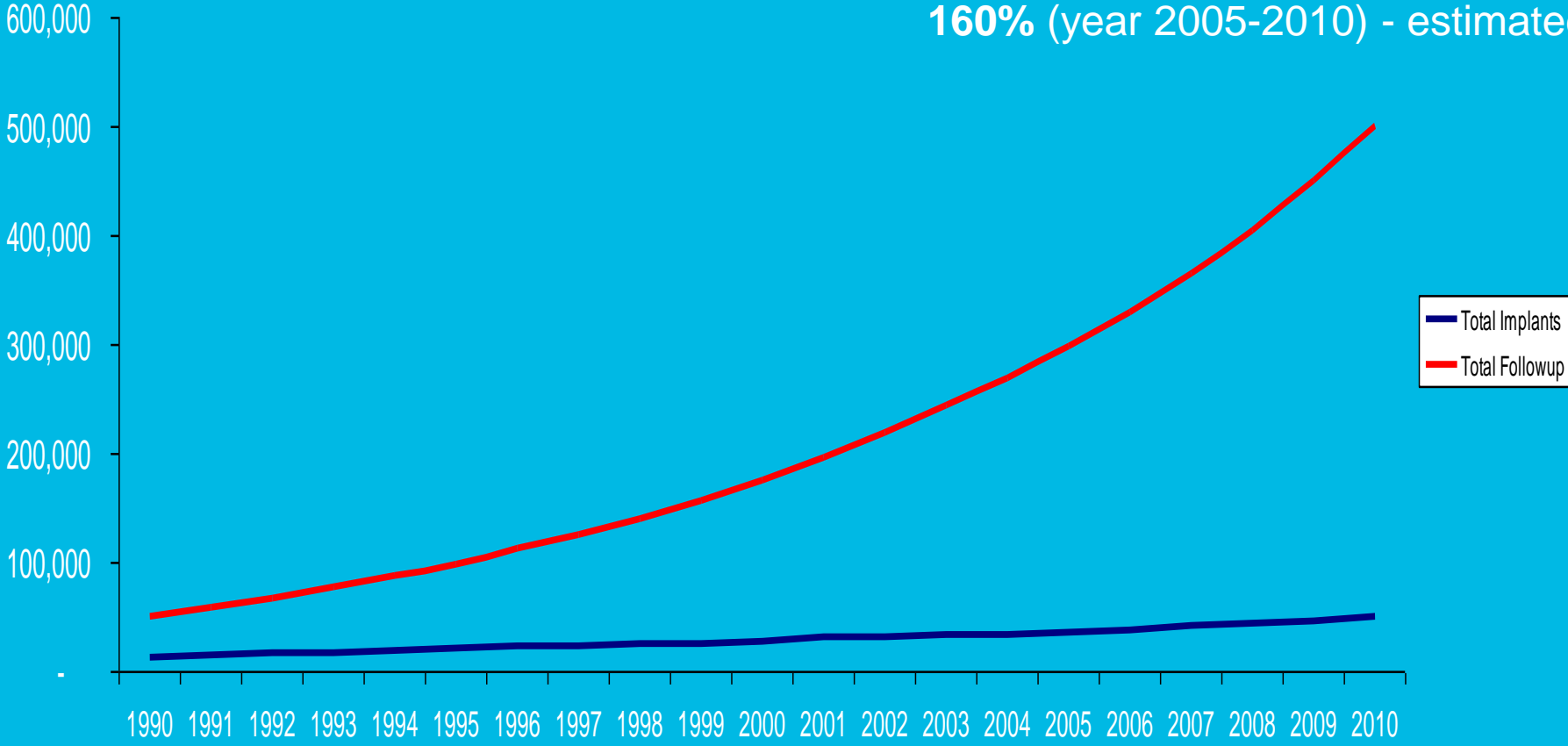


Exponential Increase in Demand for Device Follow-up

Growth:

140% (year 2000-2005) - actual

160% (year 2005-2010) - estimated



Economic modelling based on CCAD data. NICE recommendations are 5 FU per year - model based on 1.3 pacemaker FU and 3 ICD / CRT FU

Remote Data Flow



1

The patient holds the antenna of the Medtronic CareLink Monitor over the implanted device to collect the device data via interrogation

Data are transferred from the patient's implanted device to the Monitor

2

Data are sent from the Monitor to a secure server via a standard telephone line

3

Clinicians review the patient's device data using the Medtronic CareLink Clinician website

Continual Monitoring of Device Status With Automatic Alerts



1 The implanted cardiac device detects a problem such as atrial fibrillation or a device integrity issue. If the patient's device is programmed to notify the clinician of Medtronic CareAlert status, the heart device automatically establishes wireless communication with the CareLink Monitor.

2 Device data is sent automatically from the monitor to a secure server via a standard phone line.

3 The clinician is notified via SMS and / or e-mail.

4 The clinician checks the Medtronic CareLink website to review the alert information.

5 If necessary, the clinician calls the patient for further instructions.

Reliability

Remote monitoring is easy to use and has no negative effect on patient health-related quality of life (HRQoL)

Ease of use

User satisfaction survey¹

96% of patients reported ease-of-use

78% preferred remote follow-up to in-clinic visits

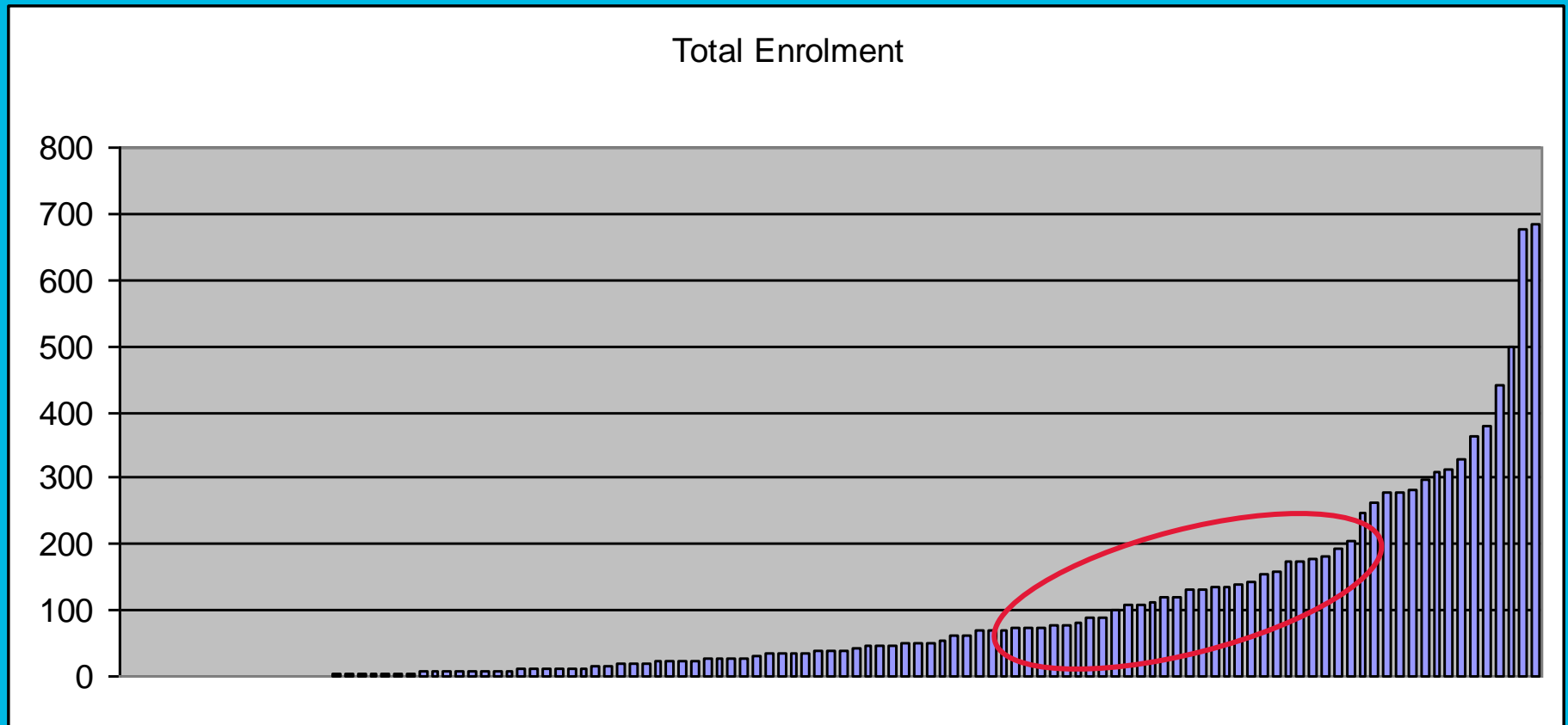
83% reported a positive effect on calmness and anxiety

HRQoL

Studies show there are no significant differences to patients using remote monitoring^{2, 3}

And you may get paid....

Remote follow up today....



Approx 50% centres < 50 patients enrolled

Approx 10-15% centres >250 patients

Majority 50-250 patients (“where the pain comes”)

The Starting Point....

Manchester Heart Centre: Nov 2009

96 Patients on remote follow up

An overloaded and over-burdened follow up service

Ever increasing yearly implant rates

No dedicated remote follow up clinics...meaning analysis of the remote patients is seen as 'extra work' and becomes more time consuming

No dedicated administrative support assigned to remote service

Enrolment to Carelink largely opportunistic

First Steps

Initial meeting with all stakeholders

- Nurses
- Physiologists
- Doctor(s)
- Admin
- Managers

No universal buy-in for change

It's All About the Team (no misunderstandings)



Key Challenges

No standard protocol for enrolment/follow-up

Long delays between transmissions

Inconsistent numbers and timings of transmissions

Major admin burden on physiologists in terms of time
commitment for enrolment/scheduling

No regular scheduled clinics – therefore no dedicated
physiologists (and no payment)

Patient calls management (in/out) – poor patient training

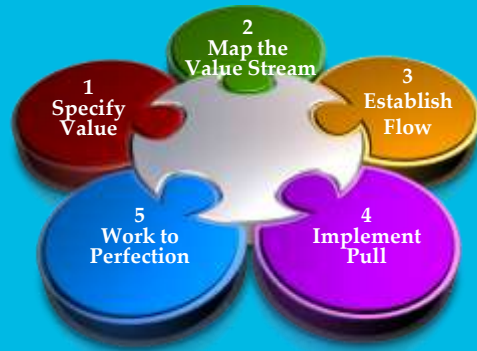
The Stuart Allen Way....



There is Another Way....

Lean Strategy (continuous improvement)

A strategy to improve the process by continuously removing all steps in the process which do not add any value in the eyes of the customer.



Six Sigma Strategy (break through)

A strategy to improve the process by eliminating all sources of variation in the process.



Consequential of waste elimination is variation reduction.
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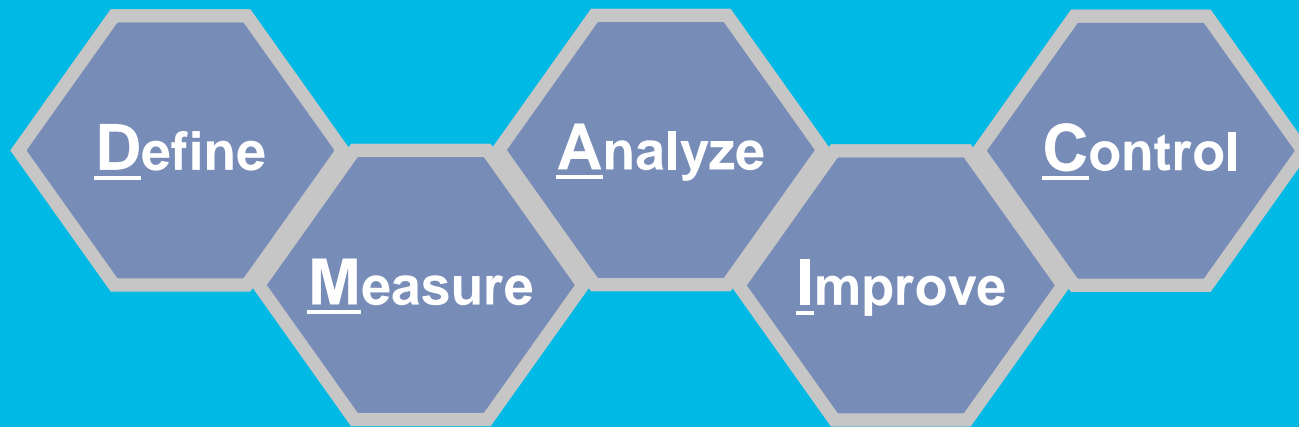
} Complementary

RESULT: LEAN SIGMA

Our Solution....Getting Lean!

Lean: An improvement approach developed on the Toyota production line to improve flow and eliminate waste

A logical process which follows 5 clear process steps: **DMAIC**



People are only as effective as the process they work in.

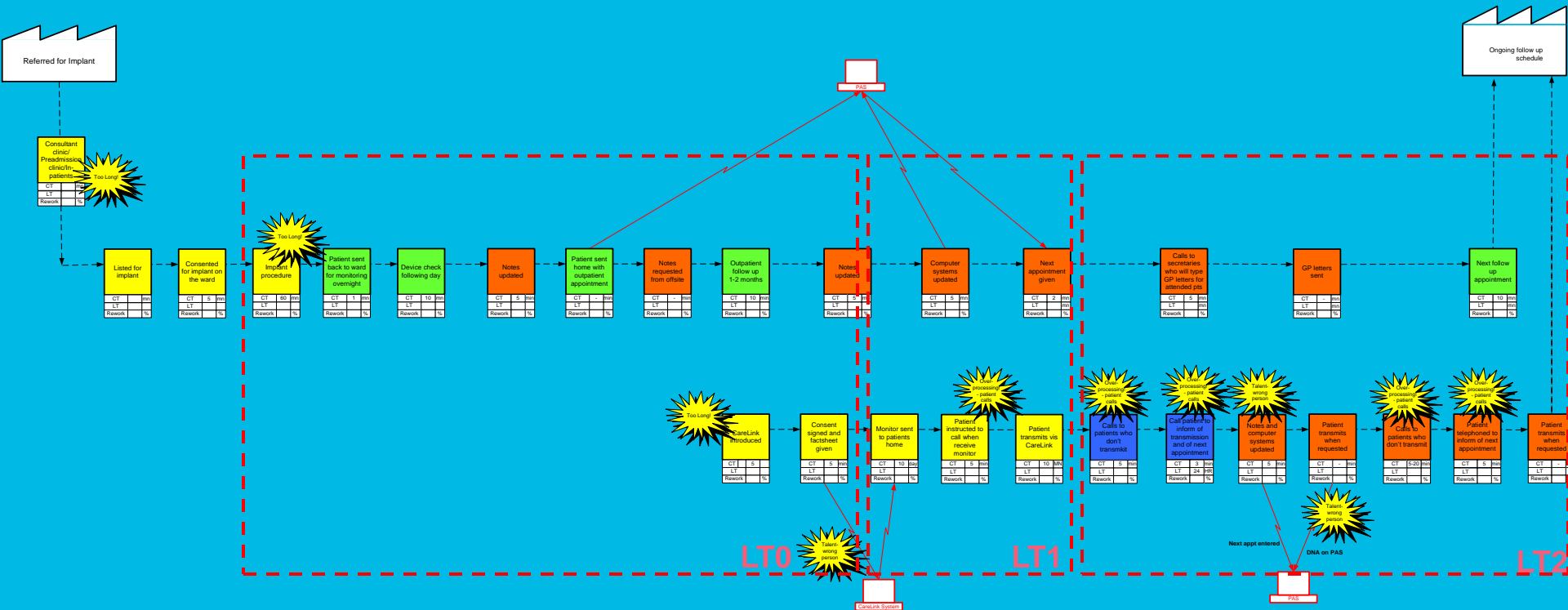
Sometimes it's impossible to see the obvious flaws because you are so caught up in the daily workings of your process

Lean Works



Toyota consistently makes the highest-quality cars with the fewest defects of any competing manufacturer, while using fewer man-hours, less on-hand inventory and half the floor space of its competitors

Initial Process Map - Nov 2009

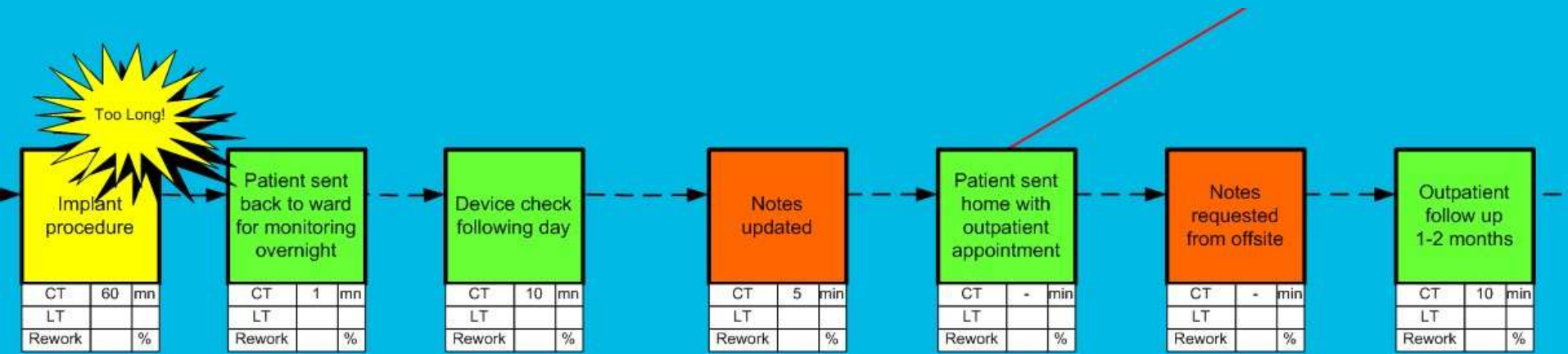


LT0 implant to enrolment

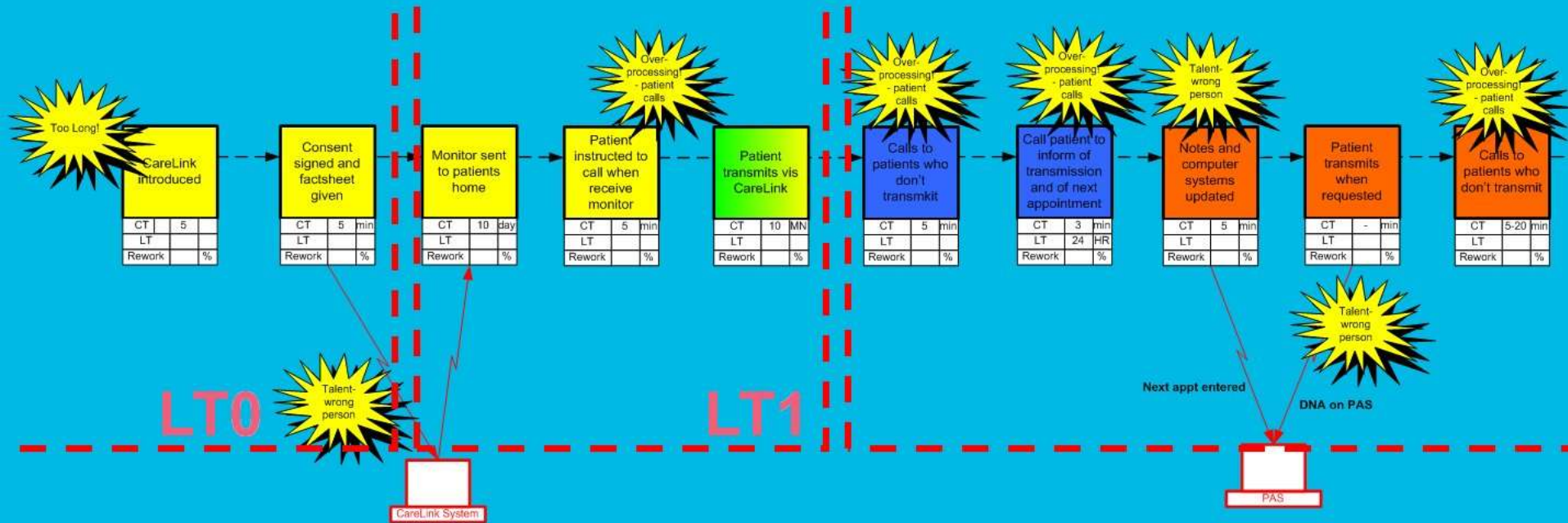
LT1 enrolment to test transmission

LT2 test transmission to first scheduled transmission

Initial Process Map – Creating a Continuous Process

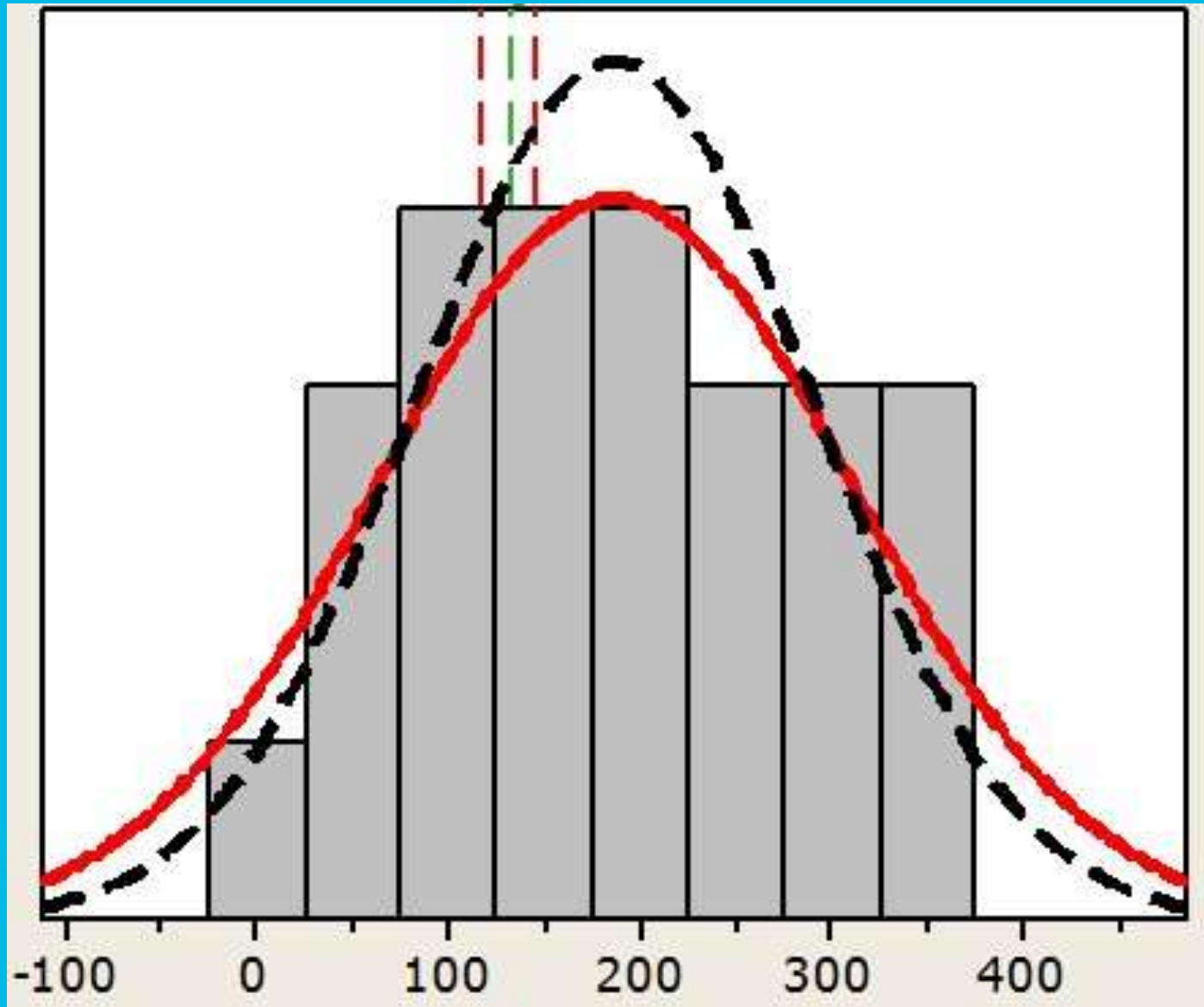


Initial Process Map – Identifying Processes With No Added Value

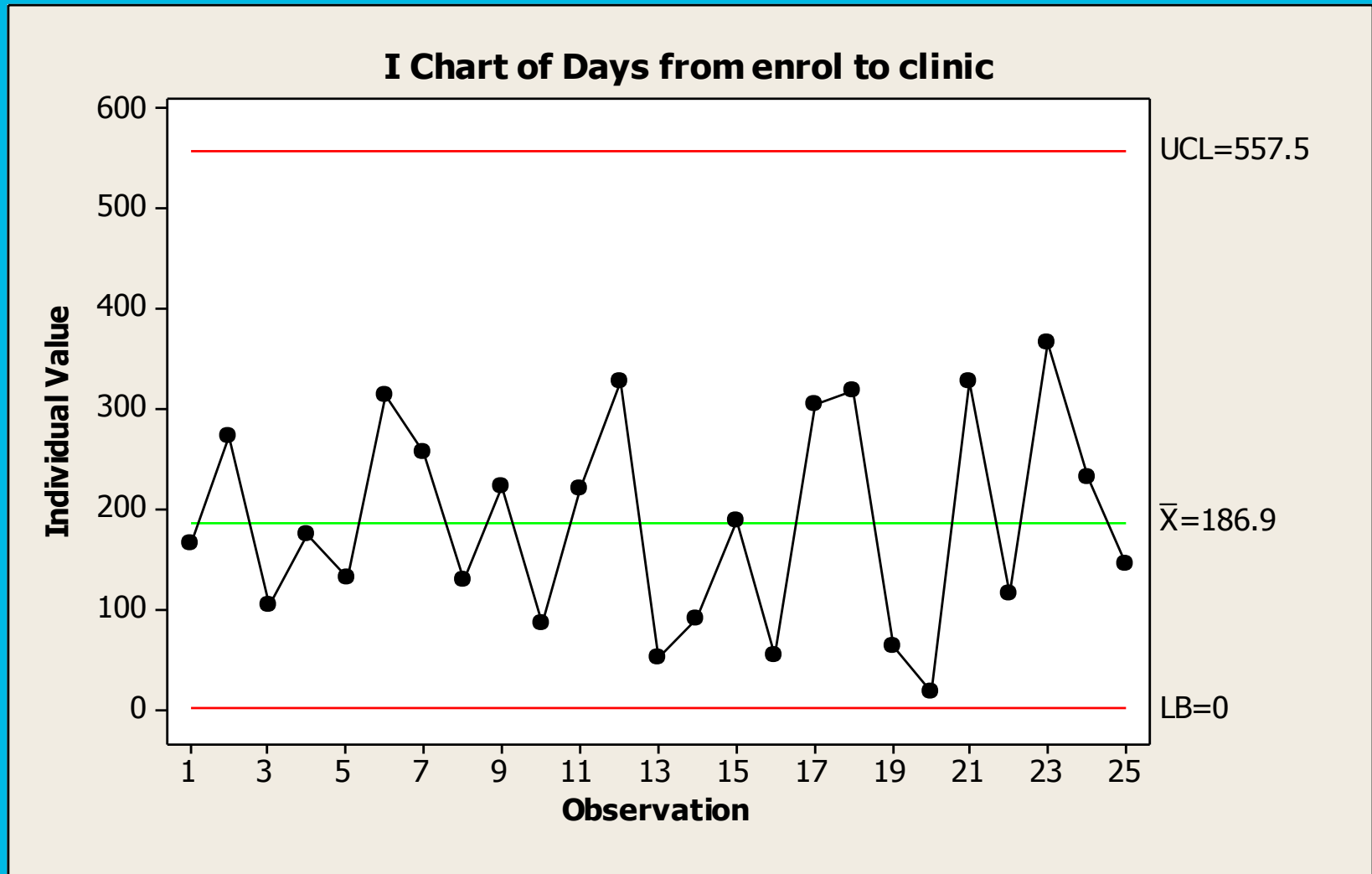


Wasted time
Wasted talent

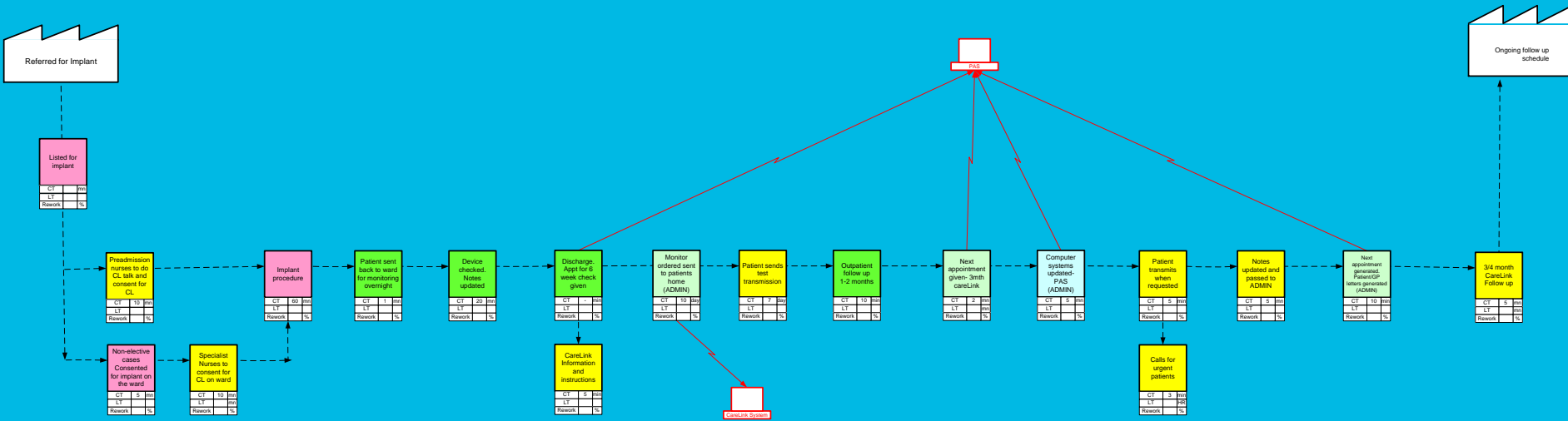
Initial State – Lead Time Baseline



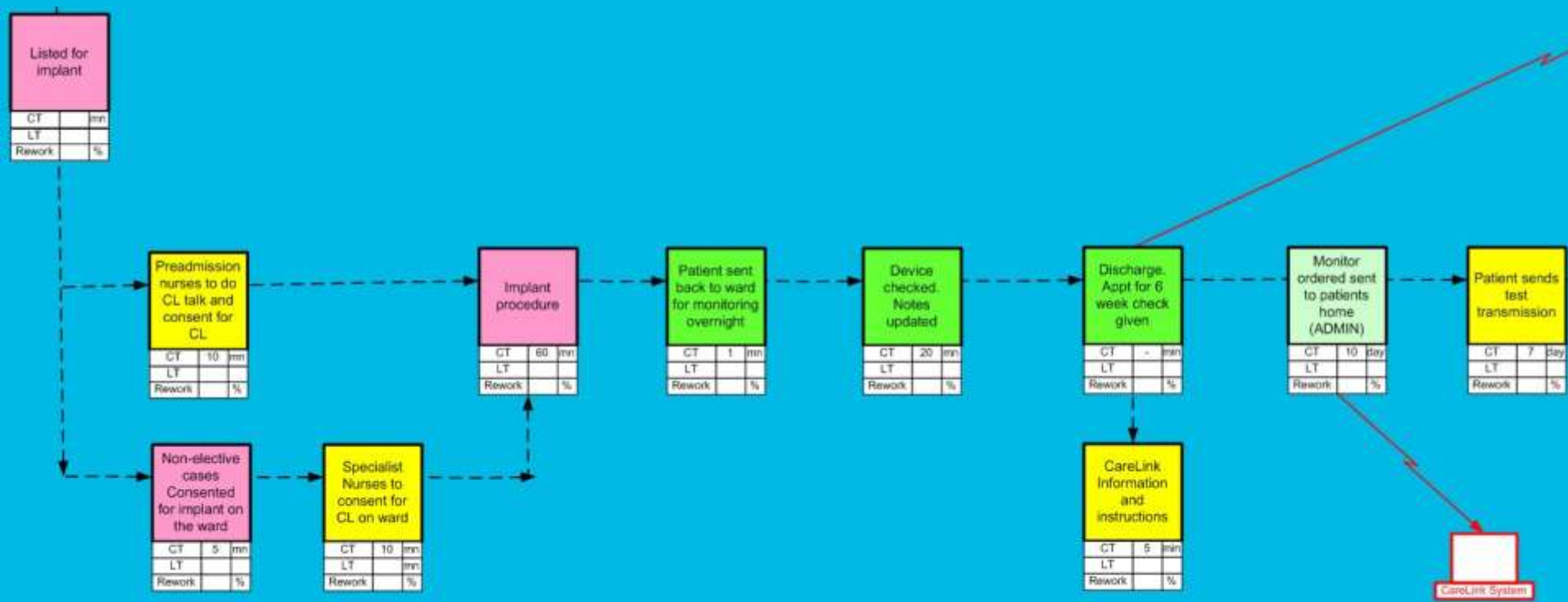
Initial State – Variable and Unpredictable



Revised Process – From 27 Steps to 13 Steps



Revised Process – Preserving Value With Less Work



Key improvements

All new patients are enrolled in Carelink immediately

Test transmission is linked with the first clinic visit post-implant

All pacing staff now trained to support the process

Official Carelink clinics registered so that CL follow-up is paid

Admin process in place so that roles are clear

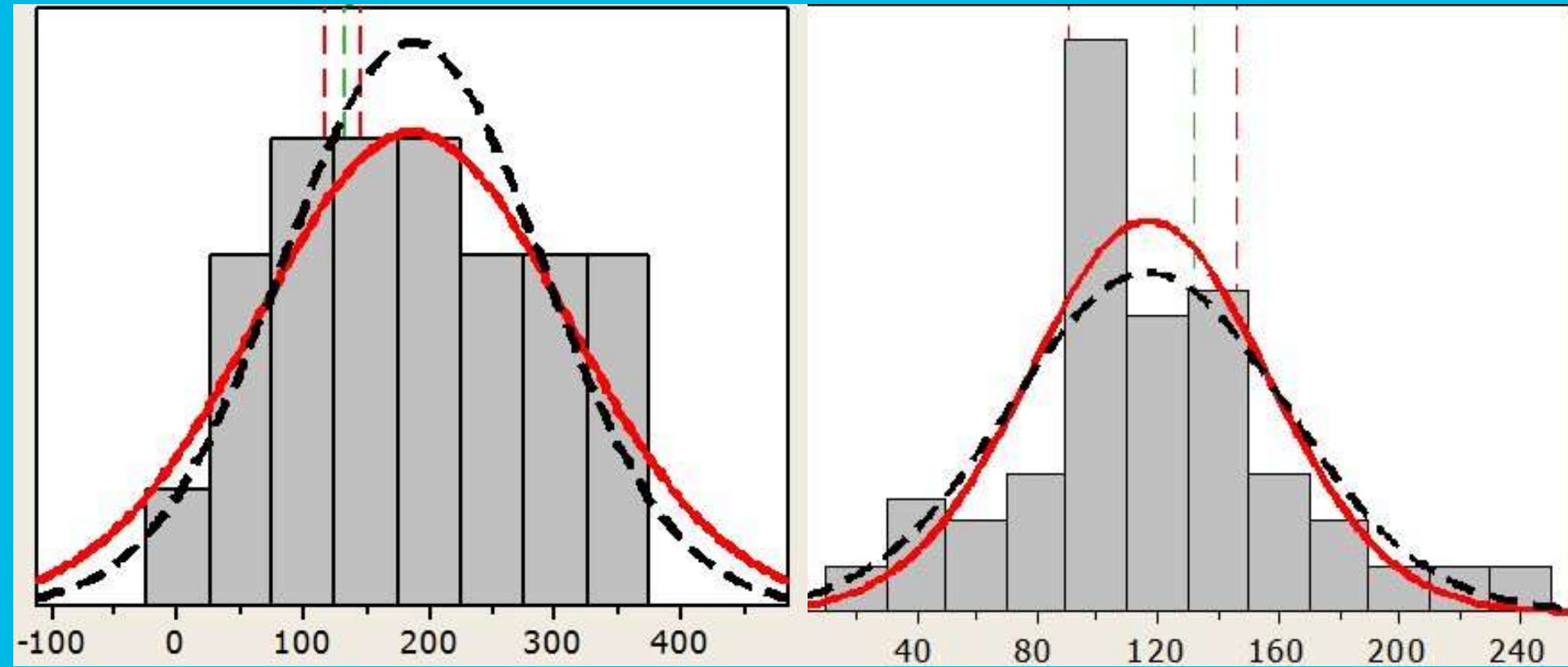
Follow-up process to ensure existing patients on CL aren't lost

Clear instructions both for nursing staff and patients

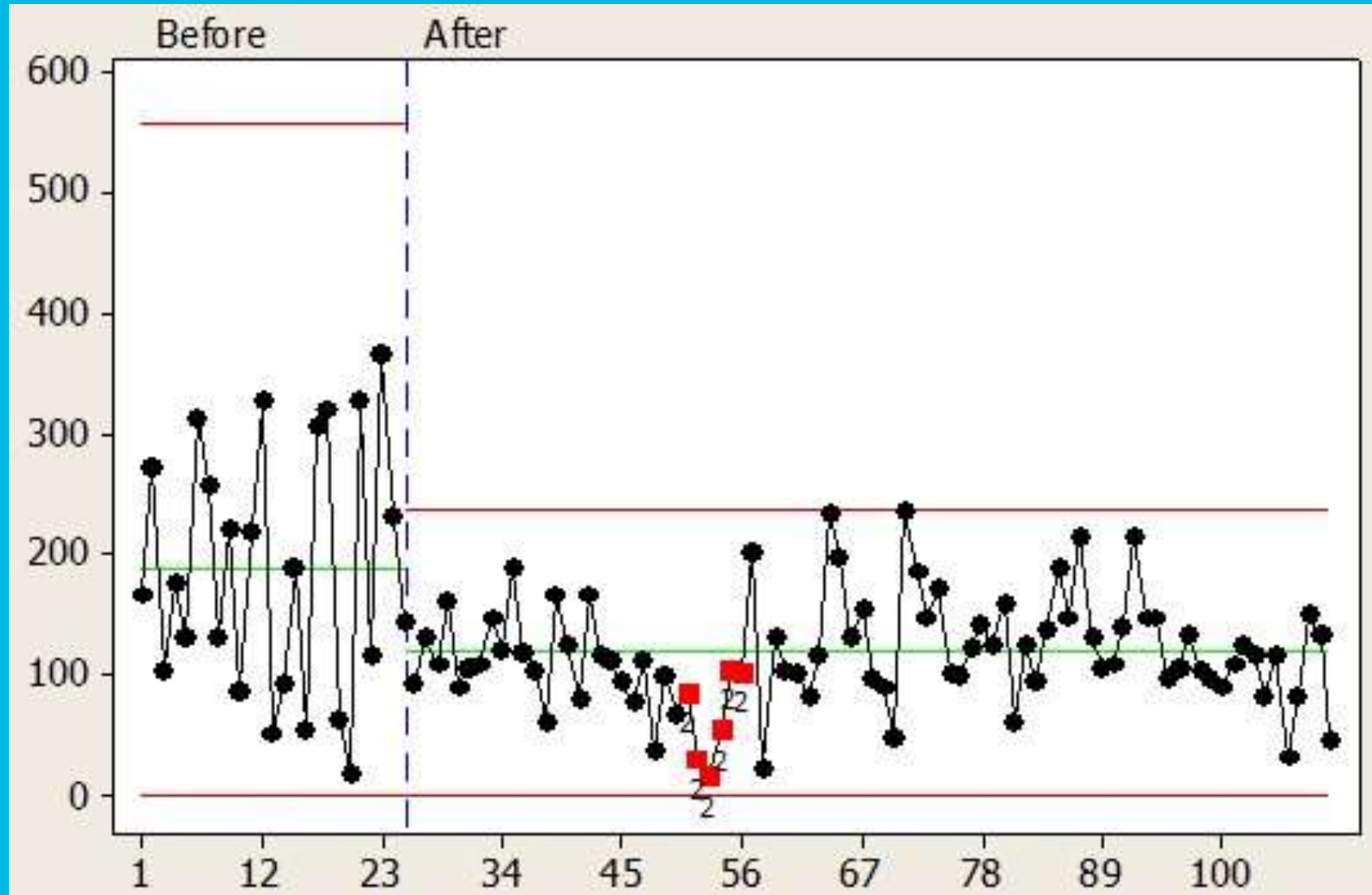
Change in Performance After Redesign

November 09

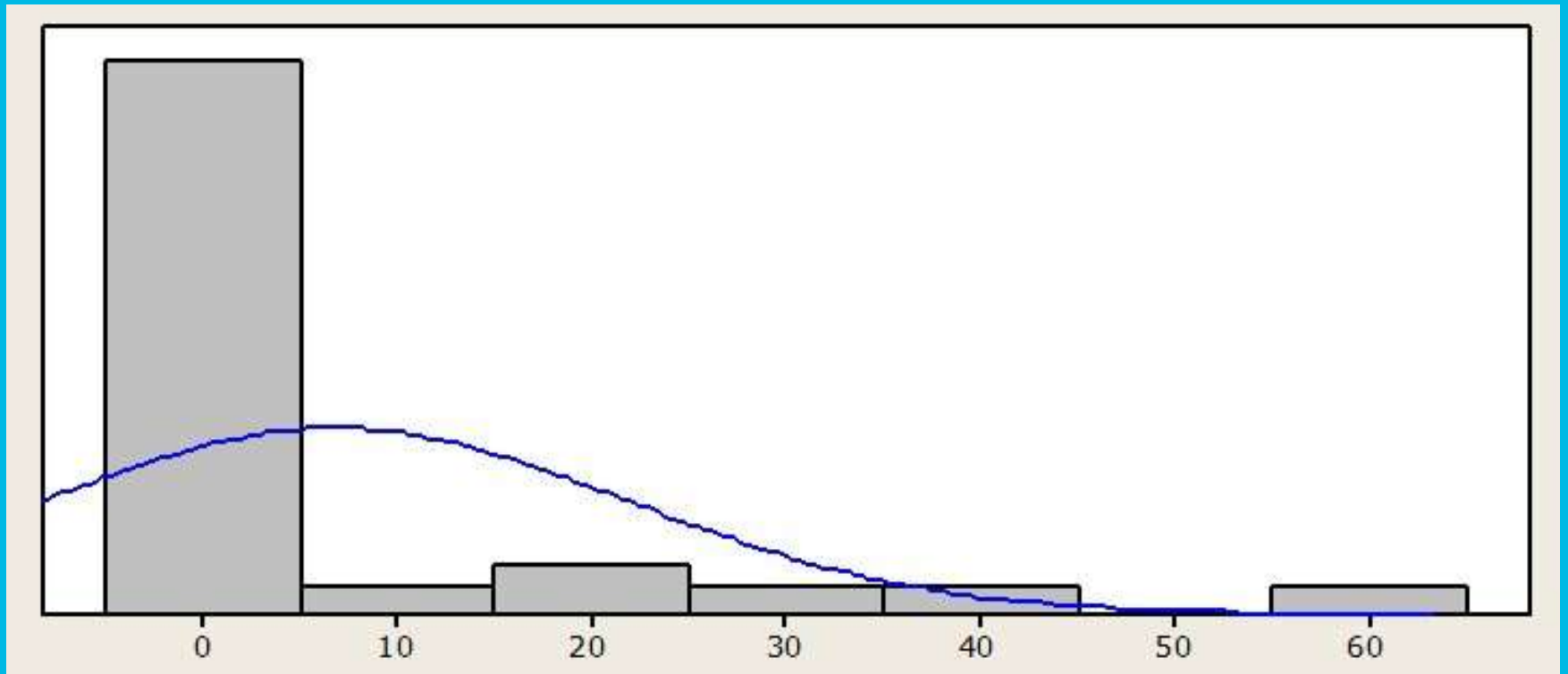
October 10



Status Oct 2010 – More Predictable and Efficient



Implant to Enrolment Time (from March 2010)



Successes of Redesign

Increased Carelink utilisation

'Non-users' reduced from 23% to 10% of patients

Majority of patients enrolled within 1 day

Overall lead time reduced from 187 days to 117 days

Improved teamwork

General positive feedback from staff

Current Status

650 patients on remote follow up

Clear protocol for enrolling patients

Much more focussed follow up service

- Troubleshooting clinics
- Post-implant clinics
- Training clinics

Dedicated remote follow up clinics

Dedicated administrative support assigned to remote service

Negatives

Focus was on ICDs so all the patient information for Carelink referred to ICDs rather than being generic for use with devices

Didn't address wireless scheduling so all new letters and processes had to be developed specifically for wireless follow up

Didn't address setting up of different Carelink clinics (e.g brady, CRT, advisory)

Most of the focus was about getting the patients registered and patient information but not about managing patients via the Carelink website

Timelines were not enforced

Next Steps

Brady devices & CRT-P

Management of ERI

Patients with a higher risk of AF

Young patients/non retired patients

MRI conditional systems

Nursing home/EPH patients/transport patients

Summary

Process mapping helps understand patient journey for follow up

Highlights the barriers to recruiting patients

Simplifies enrolling patients on remote monitoring

Ensures key professionals are performing appropriate tasks

Ensures integration of remote monitoring with pacemaker

implant and follow-up

