



# Quality and Safety in Healthcare I

## Enhancement in Radiotherapy Treatment for Breast Cancer Patients : From 1-by-1 to Continuous

**Ms Ruby Lam**

*Radiation Therapist II*

*Department of Clinical Oncology, Tuen Mun Hospital, NTWC*

Hospital Authority Convention 2013

15 May 2013





# Treatment daily workflow

1. Patient arrived
2. Set up patient to treatment position
3. Time out procedure
4. Treat patient with **a total of 8 radiation fields**
5. Treat ~40 patients (16 breast cases) / per day





# Current Situation & Problems

- Long waiting list

Pre-treatment waiting time: 2-4 weeks

- Long treatment time

Average treatment time  
for each case: ~12 mins

Include

Set-up time: ~8 mins

Beam-on time: ~4 mins





# Long treatment time

From patients' perspective:

- Patient comfort ↓
- Position stability ↓
- Accuracy of treatment ↓
- Patient satisfaction ↓





# Long treatment time...

From department's perspective:

- Machine throughput ↓
- Tx device turnover rate ↓
- Cost of extra device ↑

**Efficiency** ↓





# Aim

- Reduce treatment time
- Shorten waiting list
- Enhance patient's satisfaction
- Increase machine throughput
- Increase treatment efficiency





# New way Out

*To reduce  
the total number of cycles*

**HOW??**

Convert from "1-by-1" into "Continuous"





# Old treatment plans

# 1-by-1



新界西·醫院聯網  
New Territories West Cluster





# Old treatment plans



Load and treat "one by one"





# Load & treat “one by one”

8 Cycles





**New treatment plans**  
**Continuous**



# New treatment plans

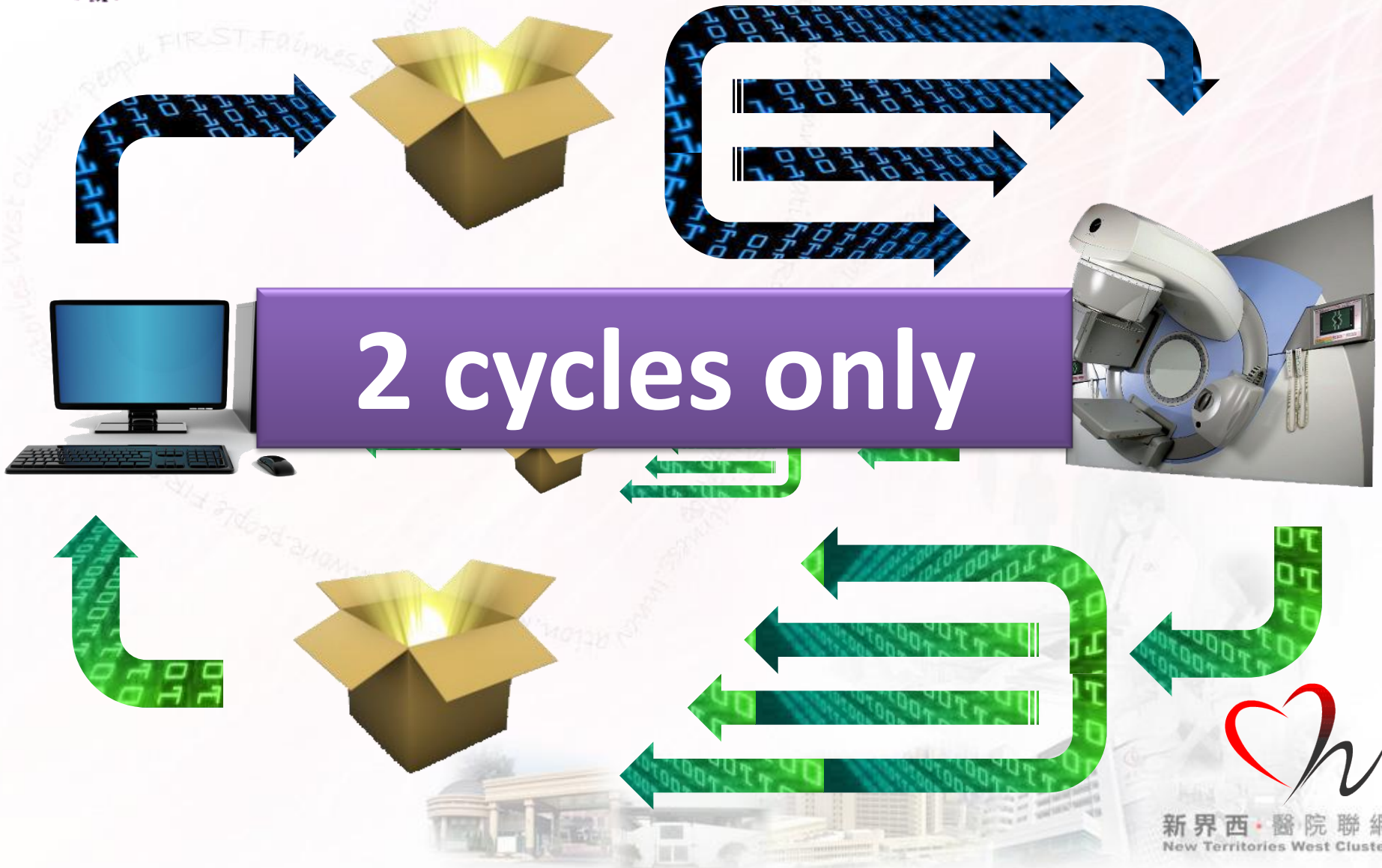


**Load Whole Package first  
then Treat continuously**





# Load & Treat continuously





# Required resources

- Existing Computer planning system
- Existing Treatment machines

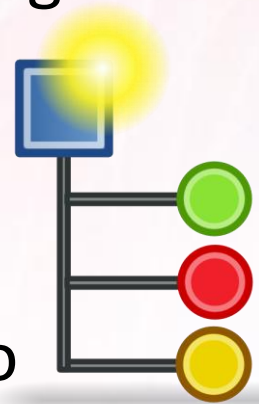
Then ... Do we need any extra ?





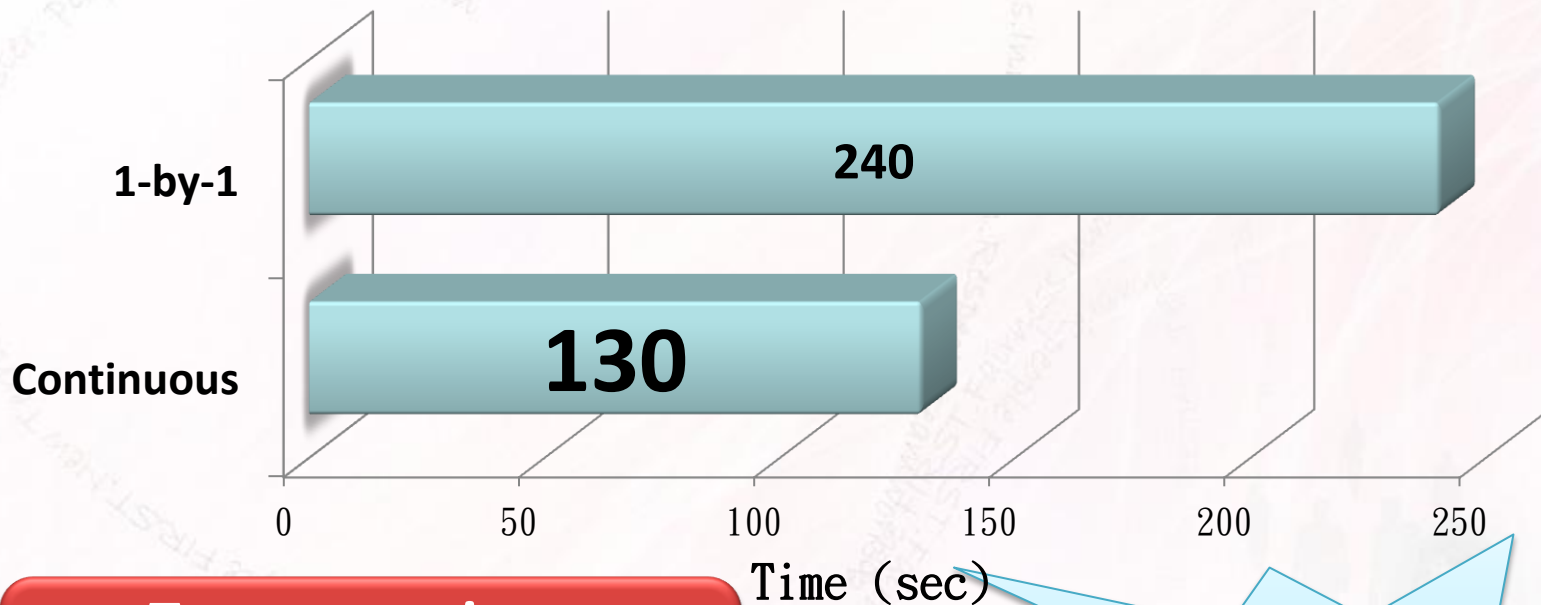
# ? Extra resources

- Of course, a bright idea !!! To make use of an **OUT of Book / Manual** way in computer planning
- A software update ....
  - an update between the control interface and the treatment machine
- Uncompromised devoting collaboration team to **define, measure, analyze, pilot run, feedback,** and **final implement** the project
- Strong management support



# Outcome

## 1. Reduce treatment time



**Treatment time :**  
240 sec → **130 sec**

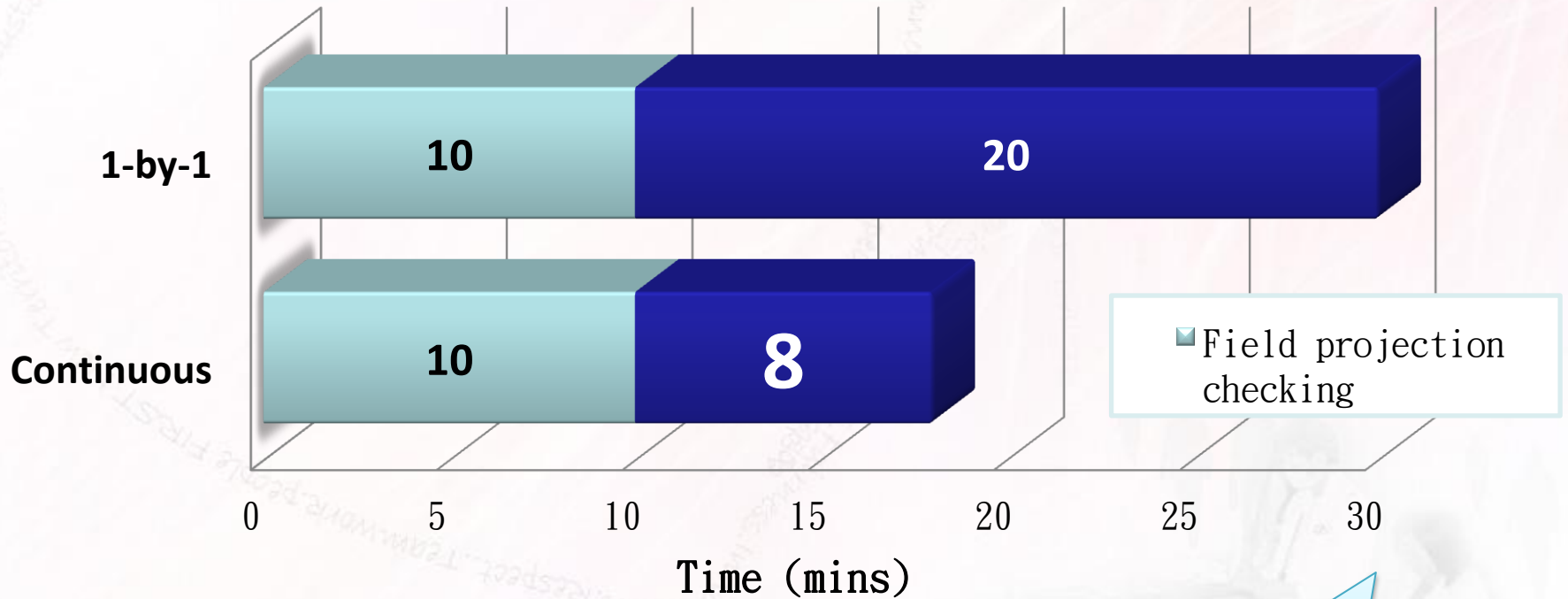
**Time gain:**  
**110 sec ( 46% )**

**Breast Case gain: ~ 3 cases/day (19%)**



# Outcome (side-gain)

## 2. Reduce pre-treatment checking time

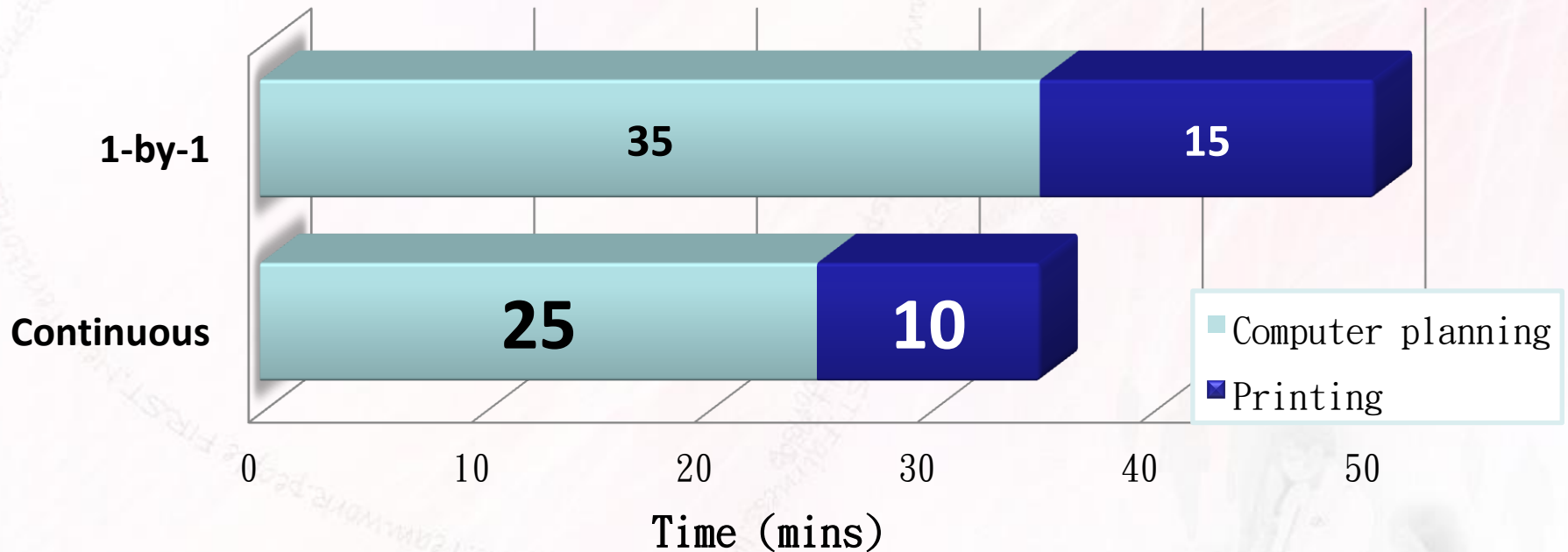


Checking time :  
30 mins → **18 mins**

**Time gain:**  
**12mins ( 40% )**

# Outcome (side-gain)

## 3. Reduce planning time



Total planning time :  
50 mins → 35 mins

Time gain:  
15 mins ( 30% )

# Final Outcome

- Treat 16 Ca Breast patients / per day



**19** Ca Breast patients / per day



- Pre-treatment waiting time: 2 - 4 weeks



**1 - 3** weeks





# Conclusion

1. Reduce treatment time
2. Reduce pre-treatment checking time
3. Reduce planning time

Improve patient  
comfort

Improve treatment  
accuracy &  
efficiency

**BENEFITS BOTH  
PATIENTS AND DEPARTMENT**

Improve  
patient satisfaction

Improve  
planning  
efficiency

Minimize  
extra cost



# Follow up

- Possibility of extension to other treatment sites
- For example:  
rectum, cervix and uterine corpus





# Acknowledgement

- Dr. C.S. Wong (Cons, Clinical Onc.)
- Mr. Thomas Wong (DM, Clinical Onc.)
- Mr. W.W. Tsang (SRT, Clinical Onc.)
- Mr. Max Cheng (SRT, Clinical Onc.)
- All Radiation Therapists in TMH
- Medical Physics Unit, TMH

