Quality and Safety in Healthcare I

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

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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 ↑
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
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

2 cycles only
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
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:
12 mins (40%)
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 and stability
Improve patient satisfaction
Improve planning efficiency
Improve treatment accuracy & efficiency
Minimize extra cost

BENEFITS BOTH PATIENTS AND DEPARTMENT
Follow up

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