Workflow Efficiency and Data Trending for Community-Based Radiation Oncology Practice Using an EMR-Based Electronic Whiteboard

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INTRODUCTION
- Treatment planning in a state-of-the-art Radiation Oncology department involves multiple teams working together to generate a high quality radiotherapy plan within a stipulated time.
- “No-Fly” policy was introduced in our clinic in 2012 to reduce rushed planning and improve patient safety.
- An EMR-based Electronic Whiteboard (EWB) was implemented in 2016 (Sons Automation, Waterford, PA) to replace manual labor-intensive data collection of plan progress and monitor real-time workflow efficiency.

RESULTS
- A variety of useful statistics can be generated (in-house Analytics program) based on the tremendous amount of data recorded by EWB program.
- EWB analysis allows all staff involved in the treatment process to visualize the time spent at each step of the workflow of every patient and investigate possible bottlenecks. (Fig. 1)
- EWB display is customizable by user to sort and/or filter the view as desired.
- Since implementation last year, EWB emerged as a powerful tool in our clinic to quickly flag “Fast Track” or delayed cases during our daily Physics & dosimetry huddle.
- Fig. 2 clearly demonstrates the significant difference in physician contouring time for different body sites. This can help with optimizing physician workflow for contouring and peer review.
- As shown in Fig. 3, the percentage of plans fell behind scheduled time can be readily recognized and investigated.
- Fig. 4 demonstrates the close correlation between “Fast Track” patients (< 3 days turnaround time from CT sim to PV) and percentage of plans that fell behind schedule.
- Fig. 5 depicts the process overtime and remaining time for a plan ended with significant delay. Two processes (Ready & Approval) with long overtime caused the plan to fall behind schedule (red line dropped below zero). The EWB tools thus enable us to retrospectively investigate individual cases and find root causes of the delay.
- Our entire planning process has vastly benefitted from the EWB real time data and retrospective analysis.
- Improvement in workflow efficiency is expected to have a direct impact on patient safety as a whole and improve patient satisfaction scores.

DISCUSSION / CONCLUSION
- Thanks to all CCHS Radiation Oncology doctors, physicists, dosimetrists and therapists for their dedicated time and effort to make this program successful.
- Thanks for the technical support by Robert Bestvina and Mark Adams from Sons Automations.

MATERIAL & METHODS
- Each of eleven steps in our treatment planning workflow was assigned a Quality Check List (QCL) in our Electronic Medical Record (EMR) Database (ELEKTA MOSAIQ 2.62)
- Time stamps of each process was captured for every patient on the EWB, along with other patient and treatment details, including name, ID, site, doctor names... etc.
- EWB queries MOSAIQ database every 10 min (adjustable frequency) and results are saved in a spreadsheet which is shared with all staff of the department.
- Analysis was performed on data collected over a year with baseline established for all steps.

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