Continuous Specimen Flow Changes Night Shifts to Day Shifts While Reducing Turn-Around-Time (TAT)

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INTRODUCTION

To reduce average TAT from 36-42 hours to 24-26 hours, the laboratory was restructured to include, relocation and a new floor plan for linear specimen workflow with a larger workspace. Conventional tissue processors were replaced with continuous flow, rapid tissue processors, cassette batch sizes reduced to an maximum of 32, and fully automated embedding was introduced. Personnel was rescheduled to decrease family unfriendly working hours (3pm-5am) and total hours, while increasing laboratory efficiency.

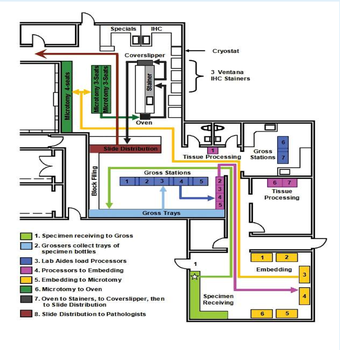
MATERIALS & METHODS

- Customized WinSURGE® (Computer Trust Corp) Scanning Records using customized tools in Microsoft® Excel® 2013.
- Floorplans analyzing pathway crossings.
- Analysis of scheduled personnel shifts, family unfriendly (3pm-5am) schedules, and overtime.
- Analysis of cassette number reduction by increasing the number of spatially separated cross sectioned ellipse/s in Tissue-Tek® Paraform® Sectionable Cassette Systems (Sakura Finetek, Torrance, CA).
- Specimens were processed on Tissue-Tek VIP® 5, Tissue-Tek Xpress® *x120*, and embedded on Tissue-Tek AutoTEC® (Sakura Finetek, Torrance, CA).

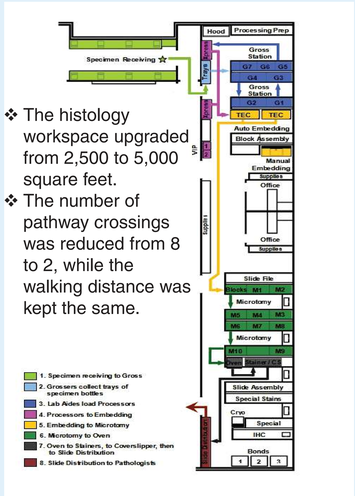
RESULTS

The Paraform Sectionable Cassette System allows multiple cross sectioned ellipse/s in one cassette, locking their orientation from grossing to microtomy. Using Paraform Cassettes resulted in less cassettes grossed, processed, embedded, sectioned, and less slides stained and reviewed. Daily volumes decreased from 1,600 to 1,358 (-13%), reducing costs and increasing profitability.

Old Laboratory



New Laboratory



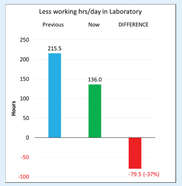
- The histology workspace upgraded from 2,500 to 5,000 square feet.
- The number of pathway crossings was reduced from 8 to 2, while the walking distance was kept the same.

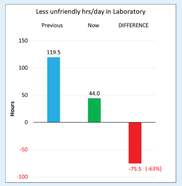
The new laboratory set-up reduced overall daily working time for the entire Team from 215.5 hrs. to 136 hrs. (-79.5 hrs./-37%) while reducing the daily family unfriendly time (3pm to 5am) by 61% from 119.5 hrs. to 44 hrs./ 75%.

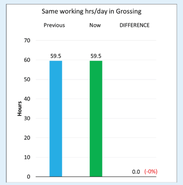
The highest reduction of working and family unfriendly time was achieved in Embedding: -52 hrs./-100%, followed by Microtomy and Grossing.
The Grossing and Microtomy Teams assist loading and unloading the Tissue-Tek Xpress *x120* and Tissue-Tek AutoTEC, allowing task variety.

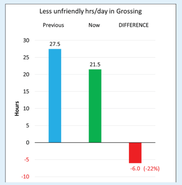
The 4 stacked graphs on the left show the effect on working hours, the 4 stacked graphs on the right show the effect on family unfriendly hours. Noticeably, cumulative overtime was reduced from an average daily total of 16 hours to 0 hours.

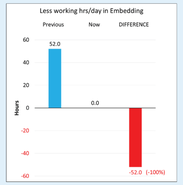
Overall, all Teams highly appreciated these changes and do not want to return to the previous set-up.

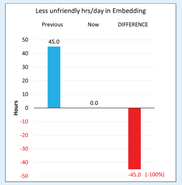


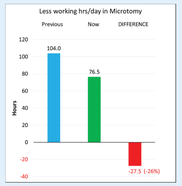


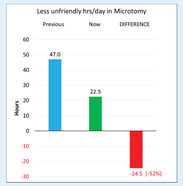




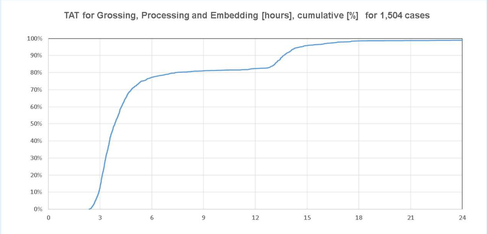








The TAT depends on the instrument platform used: using the Xpress *x120* and AutoTEC shortens the average time to Microtomy to 3 hrs. compared to 13.5 hrs. using VIP 5.



CONCLUSIONS

- Specimens are oriented at grossing eliminating mis-orientation with manual embedding.
- Excisions can have multiple cross sectioned ellipse/s and are correctly oriented at grossing using Paraform Sectionable Cassette System reducing the total number of cassettes generated.
- Only 2% of the daily volume needs manual embedding due to specialty circumstances.
- Utilization of the Tissue-Tek Xpress *x120* and Tissue-Tek AutoTEC allows 80% of specimens to be ready for microtomy within 7 hours after arrival into the laboratory.
- Continuous flow, rapid tissue processing means no more large batches, bottlenecks, or waiting time.
- The Tissue-Tek AutoTEC allowed 6 Histotechnicians to change their hours from night shift to day shift, allowing them to work more employee/family friendly shifts.
- Better hours and less blocks meant staff are able to perform additional duties allowing variety during the work day.
- Designing a laboratory in a new building with a Lean workflow floor plan eliminated retraced steps and excessive walking time.
- Clients, Pathologists, and employees are happier.

CONTACT INFORMATION

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