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Using ECRS to shorten hospital stay for liver transplant pre-operative assessment

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INTRODUCTION

Liver transplant operations provide patients with end-stage liver disease the opportunity to live on. However, the patients must be evaluated for liver trans-plant before the operation to determine whether they meet the trans-plant conditions and can be included in the waiting sequence for organ transplant after being reviewed by the Bureau of National Health Insurance.

This study collected the statistics of a total of 33 patients who were hospitalized to receive liver transplant pre-operative assessment from January 2021 to March 31 2022.

AIM

This study found that the recipients spent a mean of 5,784 minutes (4.02 days) completing this inpatient examination process.

According to the comparison between our hospital and other transplant hospitals in southern Taiwan (where the mean time spent was 4,320 minutes (3 days), this study found that our hospital indeed could be optimized in terms of inpatient examination time scheduling procedures. As a result, this study set 4,320 minutes as the improvement goal.

METHOD

We focused on improving two main parts using ECRS (Eliminate, Combine, Rearrange, Simplify; ECRS) for detailed analysis.

1.**In-patient hospital physical examination process**: to perform (1) blood collection process that mimics the indocyanine green metabolism test (ICG test) and reduced the number of blood; (2) used a 24-hour urine collection reminder card.

2.**In-patient examination process**: to perform (1) implemented the pre-hospitalization deployment plan;(2) recipient would be asked to start to fast at midnight the night before in preparation for the examination.

RESULTS

The total evaluation time was reduced from 5,784 minutes to 3,036 minutes. The target achievement rate was 187%, and the progress rate was 47.5%. Additionally, the health insurance cost was reduced, and patient satisfaction was 100%. After shortening the recipients' hospital stay, this study increased the unit bed turnover rate by 10% and also reduced hospitalization expenses reported to the National Health Insurance Administration by at least NTD 3,796.

Table 1. In-patient hospital physical examination process improvement

Working code	Before deploying ECRS		After deploying ECRS		difference	
	Total Steps	Total Average time	Total Steps	Total Average time	Steps	time
○Task	14	1610	12	1590	2	20
⇨Moving	2	50	1	20	1	30
□Inspection	1	120	1	120	0	0
D Waiting	1	540	0	0	1	540
▽Stockpile	0	0	0	0	0	0
displacement distance(m)	671		421		250	
Clock time(min).	2320		1730		590	

Physical examination process：18 items of inpatient sample collection process, 3 were merged, 2 were eliminated, and 1 was reorganized.

Table 2. In-patient examination process improvement

Working code	Before deploying ECRS		After deploying ECRS		difference	
	Total Steps	Total Average time	Total Steps	Total Average time	Steps	time
○Task	36	1430	33	875	3	555
⇨Moving	27	323	23	288	4	35
□Inspection	9	253	9	253	0	0
D Waiting	11	1525	10	1397	1	128
▽Stockpile	0	0	0	0	0	0
displacement distance(m)	2822		2662		160	
Clock time(min).	3531		2813		718	

Examination process: 82 items of impatient examination process, 2 were merged, 5 were eliminated, and 32 were recognized.

Improvement Strategies

Figure1. mimics ICG test

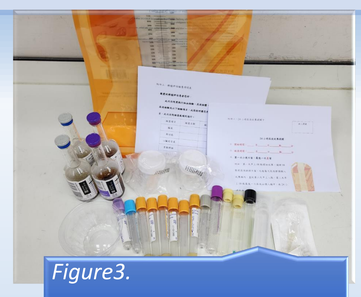

Figure3. liver transplant pre-operative nursing package

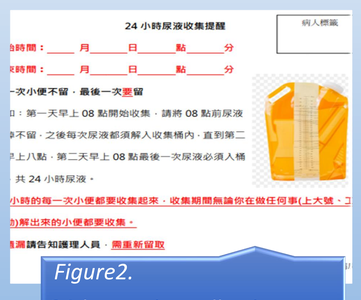

Figure2. 24-hour urine collection reminder card

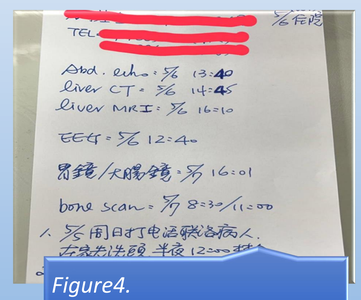

Figure4. examination time manner

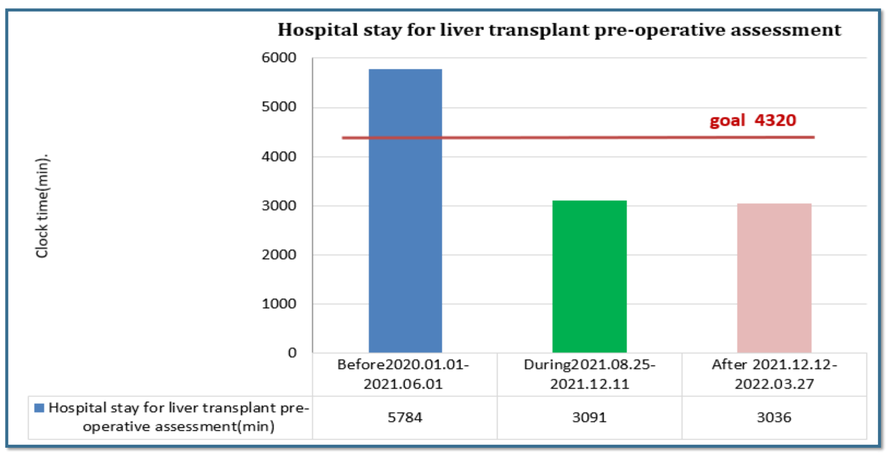

Figure5. Improvement process

CONCLUSIONS

We have established a standardized evaluation framework for liver transplantation admission guidelines, providing a more efficient process. The earlier recipients complete the evaluation, the earlier they can be included on the waiting list.

However, due to limited organ sources, it is impossible to know exactly how long the recipient will have to wait after the organ registration procedures are completed before receiving a transplant.

ACKNOWLEDGEMENT

This study would like to express the gratitude to the recipients who participated in this improvement plan for their cooperation, as well as the cooperation between clinical nurses, various examination departments, and the transplant surgery team to optimize the examination procedures, which resulted in the effective shortening of hospital stay for liver transplant pre-operative assessment.

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