Project Title

Streamlining Renal Dialysis Centre Operations

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Nursing, Healthcare Administration

Applicable Specialty or Discipline

Operation, Nephrology, Office of Safety Network

Aims

To streamline renal dialysis centre's operations

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign

Quality Improvement, Workflow Redesign, Lean Methodology, Value Based Care, Productivity

Keywords

Haemodialysis, Value Stream Mapping, Ergonomic

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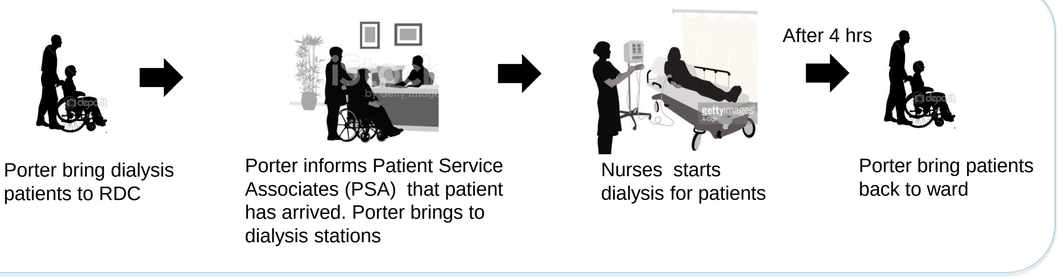
Streamlining Renal Dialysis Center Operations

Renal Dialysis Centre (RDC) provides Hemodialysis (HD) treatment for patients admitted to Singapore General Hospital . Dialysis treatments are provided as both In-center and Out-center services. For In-center service, RDC operates 20 dialysis stations on full-time six days per week, and part-time for emergency care on Sunday. For patients who are suffering from severe shock, trauma, post cardiac and vascular surgery, or hospitalized at intensive care units (ICUs), ICAs and Isolation Wards, out-centre dialysis is provided at the patient's bedside.

In-Centre

Workflow



Porter bring dialysis patients to RDC

Porter informs Patient Service Associates (PSA) that patient has arrived. Porter brings to dialysis stations

Nurses starts dialysis for patients

Porter bring patients back to ward

Problem

Long

Waiting time for porters

Delays

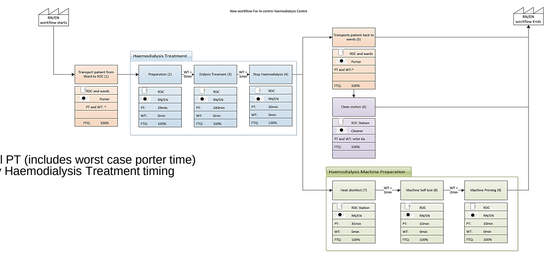
Affect dialysis start time

Morale

Of staff affected

Methodology

Ground observation and Value Stream Mapping (VSM) of Renal Dialysis Center (RDC) processes are used to identify problem areas



*Total PT (includes worst case porter time)
^Only Haemodialysis Treatment timing

Findings & Solutions

Managing scheduling & patient transportation

Initial Workflow

RDC Clerk assigns cases to porters → Cases are written on handwritten slips → Porter fetches patient from/ to wards & RDC

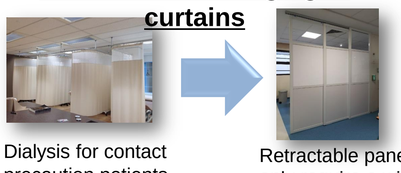
- Clerk does not have expertise knowledge
- **Difficulty tracking** porter assignment and movement
- Cancellations result in a disorganized hardcopy scheduling form

Final Workflow

RDC Clerk request for porters through e-porter system → Transport Controller assigns cases to porters → Porter fetches patient from/ to wards & RDC

- Transport Controller **possess expertise knowledge**
- System for **easy tracking** of porter assignment and movement
- Softcopy schedule listing allows changes while keeping list **organized**

Wait time for changing of curtains



Dialysis for contact precaution patients requires **curtain change** after patient leaves

Retractable panels only require a wipe-down after each dialysis session

Non-standardized layout for injection trolleys

- Drawers not **labelled**
- **Constant stock-out** of items
- **Congested counter-top**

- Drawers **labelled** and **sequenced by retrieval order**
- Items are **stocked** to last each shift
- **Clear counter-top**

Cost Savings

Time Savings

i. **Waiting time for porter (Wheelchair Cases)**
- 7800 cases
- 20 minutes reduction per case
- Annual reduction: 2, 600 hours

ii. **Wait time for curtain change (Contact Precaution Case)**
- 7884 cases
- 52.5 minutes reduction per case
- Annual reduction: 6, 898.5 hours

Manpower Savings

iii. **Preparation time to initiate cases**
- 20,000 cases
- 15 minutes reduction per case
- $30 per man-hour cost
- Annual man-hour cost savings: $150,000

Out-Centre

Workflow

Incidences of Workplace Injuries

Ergonomics issue from carrying heavy load leading to body aches and injuries

Problem

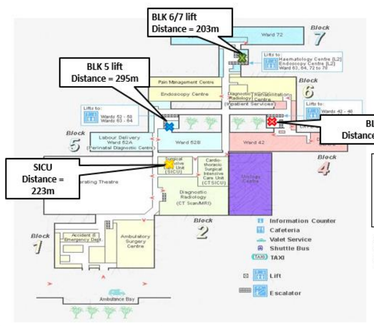
Nurse pushes dialysis machine from RDC to ward

Nurse starts dialysis for patient

Nurse pushes dialysis machine back to RDC

Methodology

(1) Distance travelled by nurse from RDC to wards was mapped and calculated. **(2)** Ergonomics study by Office of Safety Network



Average distance travelled by staff per month = 67 km

Highest workload from W42,W45, W58,W68

*Distance are approximate. Includes travel to and from wards.
**Travel time : Excludes takeover cases – cases will require staff to push machines up to wards. Doesn't include the number of machine pushed

Findings & Solutions

Long distance travelled by staff

Staff pushes HD and RO machines together with accessories and reagents (total 80 – 120kg)

Average distance travelled a staff/ per month: 67 km

Stationed machines at wards

Average distance travelled a staff/ per month: 0.00 km for ward 68

Ergonomic Issues

Rusty wheels on dialysis and RO machines

Study by Office of Safety Network:
1. When loaded with 20 kg reagents, machine **exceed the recommended initial push force** required for 90% of average females
2. Machines **exceed the recommended pull force** required when exiting the lift car
3. The wheels of the dialysis machines were found to be in **poor condition**

Accumulated RMS incidences: 3 cases

Improved Ergonomics

Functional wheels on dialysis and RO machines

- One-time **replacement of wheels** for dialysis machines
- Inclusion of wheel maintenance in Preventive Maintenance List in future purchase

Accumulated RMS incidences: 0 cases

Cost Savings

Time Savings

Turnaround time to complete each case
- 876 cases annually
- Reduction of 30 min per case
- $30 per man-hour cost
- Annual man-hour savings: $13,140