



Health System Improvement Guide

# SUPPORTING LIFE AFTER STROKE

Early Supported Discharge

**KO AWATEA**  
HEALTH SYSTEM INNOVATION AND IMPROVEMENT

  
**COUNTIES  
MANUKAU**  
HEALTH

The Supporting Life After Stroke Collaborative team would like to acknowledge the valued work, input and support of the past team members, staff and patients who contributed to our project and the production of this guide.

### Past team members

- » Pamela Baines – Operations Manager
- » Katrina Moles – Clinical Lead and CBRT Section Head
- » Penny Wilkinson – Data Analyst
- » Ian Dodson – Service Manager

### Staff

- » The Community Based Rehabilitation Team
- » Ward 6 (Acute) and Ward 23 (Assessment, Treatment & Rehabilitation), Middlemore Hospital, Counties Manukau Health
- » All the support services

### Patients

- » All our patients, their families, whaanau and carers
- » Miss Elizabeth Tua, Mrs Laine Taifau, Ms Susan Hunt, Mr Ian Hampton, Mr Maselusi Ese, Mr Leo Lemalu, Mr Cedric Cocker and Mr Eric Williams for sharing their stories and experiences

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Supporting Life After Stroke (SLAS) was launched in 2013 by Counties Manukau Health (CM Health) in Auckland, New Zealand, to implement a home-based specialist rehabilitation service for patients with mild to moderate stroke.

Stroke patients traditionally receive rehabilitation in hospital, but evidence has emerged over the last 15 years to support the effectiveness of early supported discharge for these patients. Rather than staying in hospital for an extended period of rehabilitation, early supported discharge allows stroke patients to receive intensive rehabilitation in the comfort of their own homes without compromising functional outcome.<sup>1</sup> The Stroke Foundation of New Zealand recommends early supported discharge as best practice.<sup>2</sup>

In addition to the growing evidence for early supported discharge, CM Health needed to improve its stroke rehabilitation pathway to address population growth among over-65 year olds in the CM Health catchment area, unnecessarily long hospital stays for stroke patients, the demand for hospital beds and the need to improve the care experience for stroke patients.

The Supporting Life After Stroke collaborative team was formed as part of CM Health's Beyond 20,000 Days campaign. Teams in the campaign used Model for Improvement methodology to develop and test a 'package' of change ideas.<sup>3</sup>

The Supporting Life After Stroke change package focussed on four key factors. Change ideas were developed and tested for each one.

### Identifying the 'right' patients

- » Eligibility
- » Suitability
- » Readiness for discharge

### Planning for, and transition to, ESD

- » Handover
- » In-hospital general assessment
- » Developing a rehabilitation plan
- » ESD coordinator

### Delivering the ESD service

- » Time period
- » Ensuring patient safety
- » Multidisciplinary team meetings
- » Interventions
- » Keyworker role
- » Staffing model
- » Engaging with primary care

### Discharge from the ESD service

- » Streamlining administration
- » Handing over patient care
- » Understanding patient flow and scheduling for continuity in care
- » Discharge straight from ESD

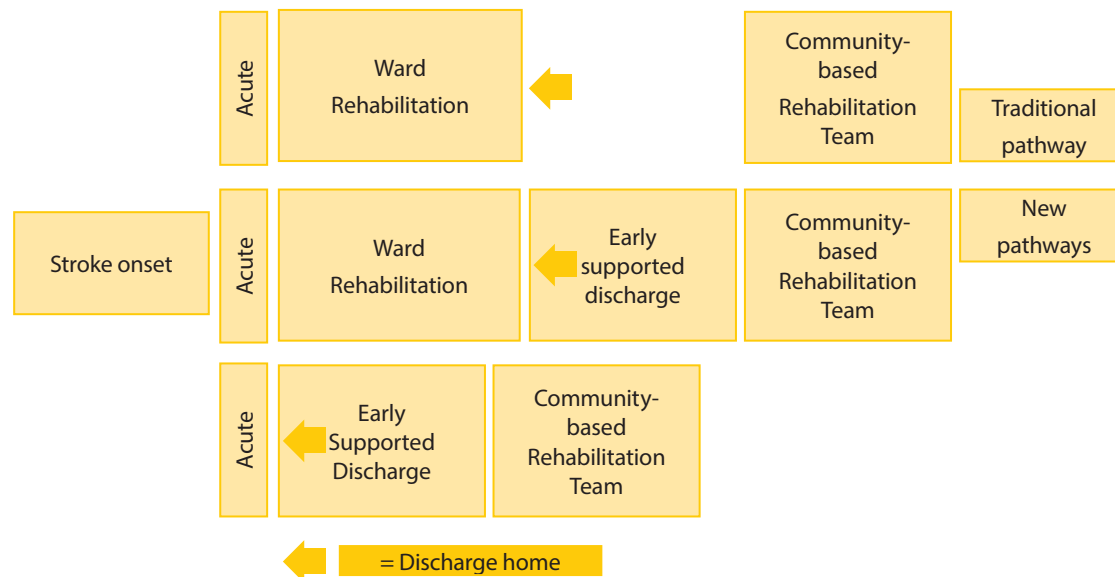


## Outcomes

Supporting Life After Stroke created new pathways for rehabilitation following stroke that saved bed days and improved the patient experience compared with the traditional pathway (Figure 1). This was the first ESD service for stroke in New Zealand.

- » The cumulative bed days saved over a 10 month period was 492.
- » The ESD model of care is more effective in terms of length of stay reduction for mild to moderate stroke.
- » Average length of stay on the rehabilitation ward for mild-moderate patients reduced from 22 days to 6 days.
- » Functional gains made with ESD are equivalent to those made in hospital.
- » Waiting time for community rehabilitation was reduced to zero for ESD patients.
- » Almost all (99.5%) of ESD participants were satisfied with the service.
- » Readmission rates were negligible, and readmissions were not related to the stroke or to rehabilitation needs.

Figure 1: Traditional vs. new pathways



Early supported discharge is doing wonders for patients like Elizabeth, who was admitted to hospital in November 2013 with a stroke. After spending two weeks in acute care and one week in rehabilitation, Elizabeth was keen to return to her own home, which she shared with her sister. Her sister, with whom she has a very close relationship, was making the journey into the hospital every day to assist Elizabeth with her cares.

"I couldn't wait to go home. I felt happy and excited about having the rehab at home – it made me really push myself," says Elizabeth. "I like the rehab at home. I can do most things now."

Elizabeth was seen every day in the comfort of her own home by a team of specialist clinicians, including a physiotherapist, occupational therapist, speech language therapist, nurse, social worker and rehabilitation assistant.

Although it has taken a lot of determination and hard work, Elizabeth has seen great results. On discharge from hospital, she required assistance with all daily tasks and a wheelchair to mobilise, but she is now independent with her mobility, transfers and personal cares. Elizabeth feels she is able to help her sister again. She has made positive lifestyle changes to reduce her stroke risk, and has taken control of her own health.

"Patients like Elizabeth are the reason we established the ESD programme, and we are delighted at the progress she and others are making," says Katrina Moles, Section Head of the Community-Based Rehabilitation Team.



Supporting Life After Stroke (SLAS) is a collaborative project to implement a home-based specialist rehabilitation service for patients with mild to moderate stroke. The service is the first of its type in New Zealand.

SLAS was launched by Counties Manukau Health (CM Health) in 2013. CM Health is the public healthcare provider that serves South Auckland, East Auckland and parts of the Hauraki and Waikato areas of New Zealand's North Island. It admits around 540 stroke patients to hospital each year.

The main burden of stroke is chronic disability.<sup>2</sup> Patients often require rehabilitation to enable them to return home. Traditionally, patients receive stroke rehabilitation in hospital. At CM Health, conventional acute stroke care is delivered on a stroke unit, and is followed by transfer to a rehabilitation unit once patients are medically stable. Patients are discharged once they are deemed safe to go home, and those who need it receive community rehabilitation from a stroke-specific community team. Community rehabilitation is less intensive than inpatient rehabilitation and, on average, begins three weeks after discharge. This conventional pathway ensures that stroke patients receive a safe and effective standard of care.

However, research shows that stroke patients do not need to stay in hospital for a prolonged period of rehabilitation. The last 15 years have produced a growing body of evidence for the effectiveness of early supported discharge (ESD).<sup>1</sup> ESD shortens the time stroke patients spend in hospital by providing intensive rehabilitation at home immediately after discharge. It is now recommended best practice for stroke rehabilitation in New Zealand.<sup>2</sup> The SLAS team was formed to translate international evidence into local clinical practice.

SLAS was developed, funded and implemented as part of Beyond 20,000 Days. This was an umbrella campaign run by CM Health that supported a range of projects aimed at keeping people well in their communities. The campaign used the Breakthrough Series (BTS) approach to train and support participating teams in improvement methodology and collaborative

working. The BTS was structured as four learning sessions interspersed with action periods.<sup>4</sup> During action periods, project teams in Beyond 20,000 Days used Model for Improvement methodology to develop 'packages' of change ideas to meet specific goals which related to the overall campaign aim.<sup>3</sup>

The SLAS team is multidisciplinary, consisting of frontline allied health, nursing and medical staff across community and inpatient teams, and management personnel. A project manager and improvement advisor were added to the team through Beyond 20,000 Days to assist with the planning and implementation of the project. The team combines expertise in stroke rehabilitation, quality improvement and commissioning of services.

The purpose of this guide is to assist others to develop their own early supported discharge programme. The SLAS collaborative team and Ko Awatea invite you to make contact for further information.

In addition to the growing international evidence for ESD and its inclusion in the Clinical Guidelines for Stroke Management 2010 as recommended best practice in New Zealand, the key factors that prompted CM Health to revisit its stroke rehabilitation pathway were the effect of local population growth in the CM Health catchment area, unnecessarily long hospital stays for stroke patients, the demand for hospital beds and the need to improve the care experience for stroke patients.

### Local population growth

The population of CM Health's catchment area is around 520,140 in 2015, and is growing by 1-2% per year. Numbers of over-65 year olds in the area, who are at higher risk of stroke, are growing by 4-5% per year and are projected to increase from 57,520 in 2015 to nearly 70,000 by 2020.<sup>5</sup>

### Length of stay

For patients with mild to moderate stroke at CM Health, the length of stay in the rehabilitation ward before the SLAS project started was 22.7 days. With an average stay in acute care of seven days, stroke patients spend almost a month in hospital overall. Factors such as the responsiveness and level of community rehabilitation intensity provision play a role in discharge planning for stroke. Data showed a three week delay before community rehabilitation started. Consequently, patients stay in hospital until they acquire the functional independence needed to be safe during this three week period.

Furthermore, the fragmentation of stroke services into inpatient acute, inpatient rehabilitation and community based rehabilitation components slows communication and creates unnecessary delays and repeated assessments in the patient journey.

### Demand for hospital beds

Freeing up hospital beds for essential healthcare treatment is a priority

for CM Health. With an average cost of \$650 a day for a rehabilitation bed, keeping patients in hospital for rehabilitation they could safely receive at home costs the healthcare system unnecessarily.

### Patient experience

Patient feedback on the conventional stroke rehabilitation pathway showed that patients felt they were being assessed repeatedly and asked the same questions over and over again during the care journey.

Patients also felt worried and anxious waiting for community rehabilitation to start. It is common for people with stroke to experience a "black hole" period when returning home for the first time after discharge from hospital. The transition home from the protected hospital environment can be the most anxiety provoking time in the stroke pathway. Support during this phase is particularly important to help patients cope with the changes that stroke brings, improve outcomes and reduce risk.

Finally, patients prefer to be at home with family when it is safe for them to be there.

## Rationale

SLAS used the Model for Improvement to design and test each element of the service. A key premise of the Model for Improvement is to use known evidence and start with small scale change.

The evidence suggested that patients with mild to moderate stroke have the best outcomes under ESD.<sup>6</sup> The target patient population for SLAS was based on this evidence.

The SLAS team selected five communities in the South Auckland area to focus on. The demographics of these communities were representative of the wider CM Health catchment area. They were also in close proximity to the hospital.

Evidence suggests that ESD programmes reduce length of stay (LOS) by an average of eight days.<sup>6</sup> However, previous work done at CM Health using a community-based rehabilitation team (CBRT) had already reduced the average LOS by four days. Taking this into account, a four day reduction was a realistic target.

It was crucial that the new service did not negatively impact clinical outcomes for stroke patients. Functional outcomes under ESD had to be comparable to, or better than, those achieved through inpatient rehabilitation.

Maintaining functional outcomes was paramount, but ensuring that patients had a positive overall patient experience of the service was also important.

## Aim statement

The aim of SLAS was to implement a new service for patients with mild to moderate stroke in order for them to receive specialist rehabilitation in their own home rather than in hospital. This was to be the first ESD service for stroke in New Zealand.

## Project objectives

By July 1st 2014, the SLAS team aimed to:

- » reduce the average LOS by four days compared to the baseline population
- » achieve functional improvements comparable to those made during inpatient rehabilitation
- » attain a patient satisfaction response of greater than 90%



## Outcome measures

### Inpatient length of stay (days)

- » Measured on acute and rehabilitation wards for individual patients.

### Functional measures

- » Functional Independence Measure (FIM) - FIM is an outcome measure used in the rehabilitation ward. Measured at the start and end of ESD in the home this measure enabled us to compare change in function for baseline patients (inpatient rehabilitation) to change in function for ESD rehabilitation.
- » Nottingham Extended Activities of Daily Living Scale (NEADL) - Widely used as a measure of patient progress in ESD community rehabilitation, this new measure was used to evaluate improvements in patient functioning at home.

### Patient satisfaction

- » Measured using a questionnaire administered to all ESD patients (Appendix A).

## Process measures

### Time from discharge to first visit for rehabilitation in the community

- » This measure ensured that patients were not disadvantaged by having gaps introduced into their rehabilitation programme by ESD that they would not experience as an inpatient.

## Percentage of eligible patients receiving ESD service

- » This measure was gathered to understand how many patients were getting access to the new model of care and check that patients were being appropriately identified for the new service.

## Balancing measures

### Readmissions

Readmission rates are a helpful way to evaluate any undue risk to patients brought about through the introduction of an ESD programme. Most studies used this and were able to show that there was no increase in readmission rates.<sup>6</sup> Due to the small numbers entering the ESD service during the initial design phase of the project, it was not possible to confidently compare readmission rates to baseline. Instead, any readmissions underwent a case review to look at the cause of readmission and assess whether it was potentially due to an unsafe discharge or the ESD service.

### Mood measures

Patient mood was evaluated at Week 1 and Week 3 after discharge home.

### Carer strain

Carer strain due to the burden of care and adjustment to changing roles in the context of new disability is identified as a potential concern in some studies.<sup>7</sup> This was routinely screened using the Carer Strain Index in the second week post-discharge, once patient and family/caregivers had settled into routines at home. Observed or reported carer strain was referred to a social worker.



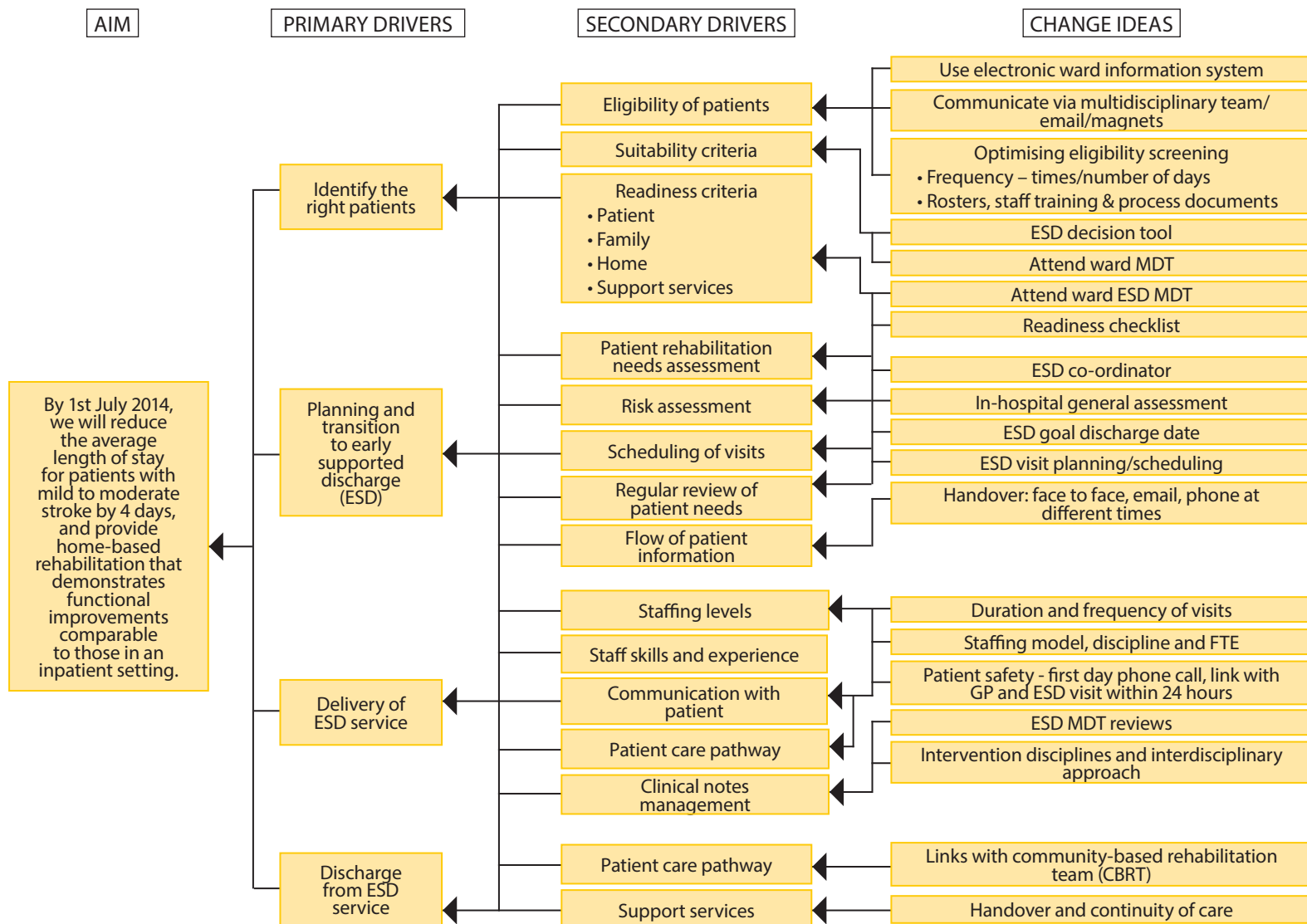
## Data analysis

Data gathered was plotted on statistical process control charts. These included baseline data from July 2012. Data for patients who entered the new service were compared to data from the baseline population.

Only patients who received rehabilitation in the rehabilitation ward were included in the baseline data. Patients with very mild stroke who are discharged home directly from acute wards are less likely to benefit from ESD,<sup>8</sup> LOS is unlikely to change, and the existing community rehabilitation service meets the needs of these patients. To be appropriate for ESD, patients must be discharged to one of the five geographical areas, have a new diagnosis of stroke, and have been identified as requiring inpatient rehabilitation. They were admitted to the programme if they could be safely discharged early and required further intensive rehabilitation.



# THE DRIVERS OF CHANGE





There were four key factors, or 'drivers', that needed to be designed into new processes to establish the ESD service (see driver diagram, p.12).

1. Identifying the 'right' patients
2. Planning for, and transition to, ESD
3. Delivering the ESD service
4. Discharge from the ESD service

Once the ESD model of care (Figure 2, p. 14) had been drafted, it was refined by testing with a:

- » patient who was discharged from the rehabilitation ward at the usual time
- » range of patients on the rehabilitation ward exploring stroke severity, and different presentations
- » patient discharged from the acute stroke unit
- » patient going home from a non-stroke area within the acute hospital.

## Identifying the 'right' patients: eligibility, suitability, and readiness for discharge

Discharge planning for stroke is complex. Clinicians concurrently consider multiple factors, and these vary from patient to patient. It was important to disentangle the systems and processes operating to understand how to bring the discharge date forward. Distinguishing between eligibility, suitability and readiness was important, as was understanding where each sat along a decision-making continuum. There needed to be clear and transparent processes so that rapid collaborative decision-making could occur. For this reason, we split these

drivers into identification of eligible patients, determining their suitability, and readiness for discharge.

## Planning for, and transition to, ESD

There needed to be an efficient and seamless means to move rehabilitation from the ward to the community. ESD studies suggest in-hospital rehabilitation assessments to ensure the right resources are assigned with no delays in service provision.<sup>9</sup>

## Delivering the ESD service

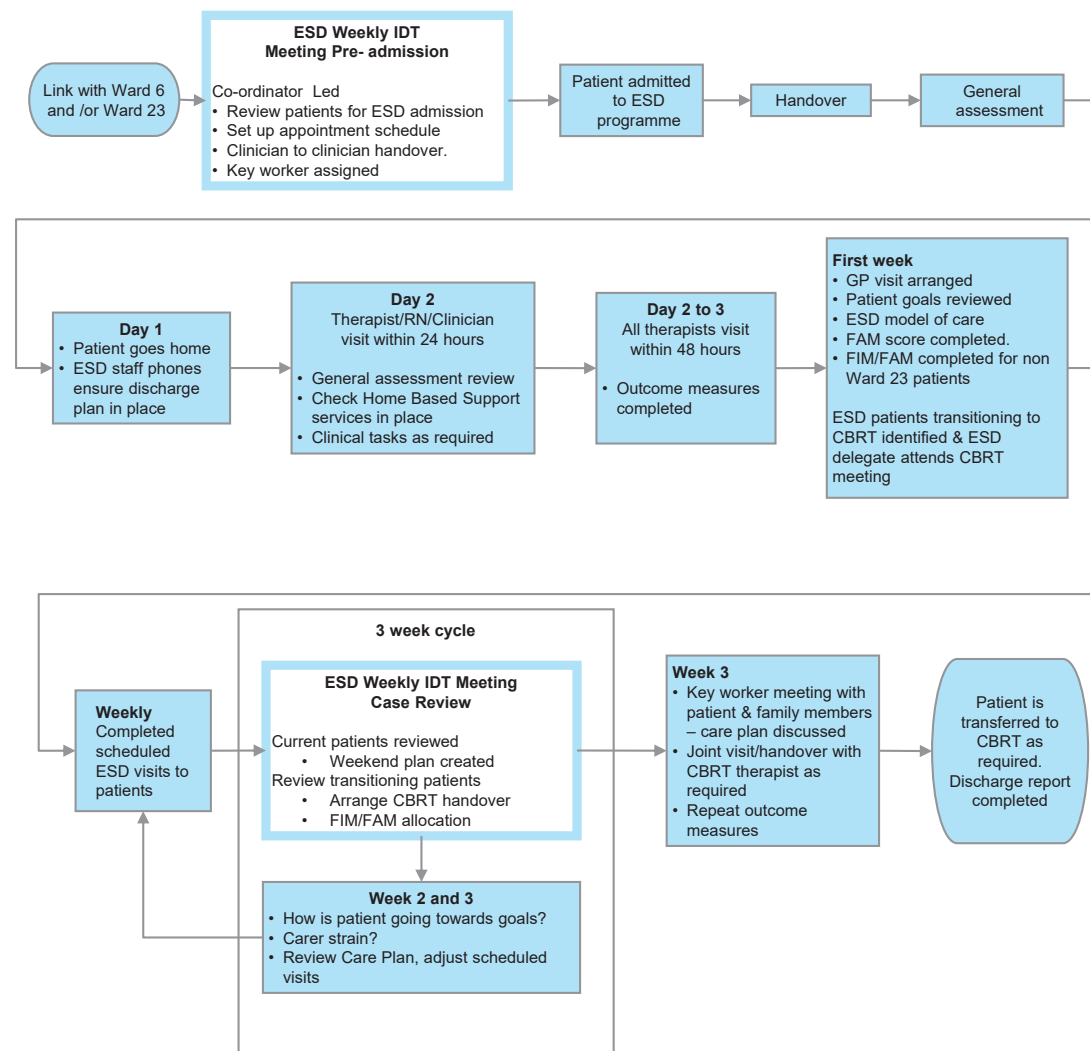
Fisher recommends designing a model of care that fits within existing systems.<sup>10</sup> Service location, staffing model, service provision of inpatient units (acute and rehabilitation), community service and care providers were taken into account.

## Discharge from the ESD service

Most ESD patients require further community rehabilitation beyond the three week intensive phase provided by the ESD service. To minimise the risk of a disjointed patient transition between community-based services, the SLAS team explored the administration processes, the process for handing over patient care, and scheduling for continuity of care.

## THE CHANGE PACKAGE: OVERVIEW

Figure 2: ESD model of care



The SLAS service needed to ensure that the appropriate patients were accepted. Initially, a rigid criteria checklist was used. However, stroke patients vary widely and a much more fluid admission process was needed. The service divided the admission process into three stages: eligibility, suitability and readiness.

## Eligibility

To identify patients as early as possible and avoid excluding any patient who might later qualify, the service defined eligibility as all patients with a new diagnosis of stroke who lived in one of the five focus communities. The hospital already had an electronic ward information-management system (WIMS) and this was used to pull information on stroke admissions.

- » Eligible patients were identified by ESD staff screening WIMS daily for new stroke patients.
- » Eligibility was communicated to inpatient staff by attendance at multidisciplinary team meetings, phone calls/emails to ward managers, and use of magnets on patient status boards.
- » Eligibility screening process was refined by:
  - » evaluating whether the time of screening, frequency per day and number of days per week made a difference to time taken to identify patients
  - » using rosters, training staff and process documents.

## Lessons learned

- » Early knowledge of ESD eligibility prompted inpatient staff to prepare patients for an earlier discharge.
- » Early identification prompted inpatient staff to find out collateral

information earlier that is essential to determine suitability and readiness.

- » An ESD coordinator role was developed to facilitate the transition of care and manage the service demands. The eligibility identification process was more consistent and efficient when completed by the ESD coordinator.

## Suitability

Once a patient was identified as eligible, suitability for ESD was discussed at multidisciplinary team meetings. In the early stages of the project, education and support were provided to inpatient staff to develop their understanding of who was suitable for ESD. Eventually this enabled them to participate actively in decision making and therefore ESD took on more of a consultative role.

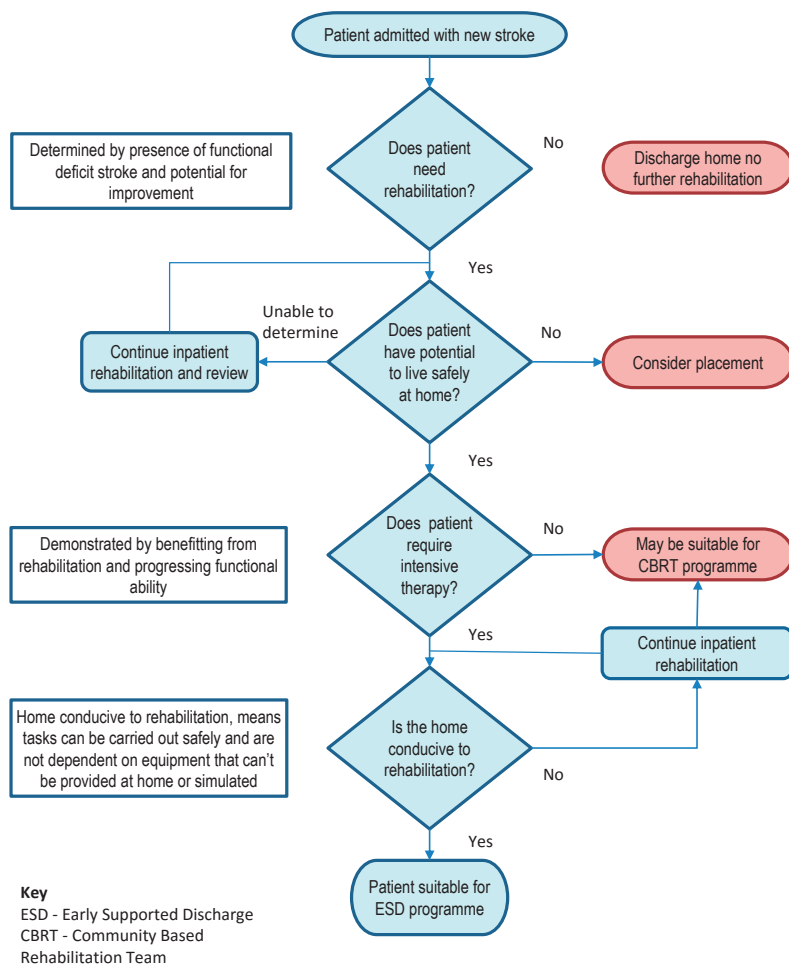
A tool for identifying patients likely to benefit from ESD was developed based on a review of the evidence and used to guide decision making (Appendix B). The tool promoted consistency and transparency around decision making.

The ESD coordinator gathers information about a patient's progress at a multidisciplinary team meeting to determine whether the patient can return home safely and whether he or she requires the level of rehabilitation intensity provided under the ESD model of care.

We found the barriers that prevent patients from going home with ESD include:

- » no suitable family support at home
- » overcrowding, which can limit the patient's ability to manage their fatigue
- » patient's care or rehabilitation requires equipment that is only available in a hospital setting.

Figure 3: Suitability flow chart



## Lessons learned

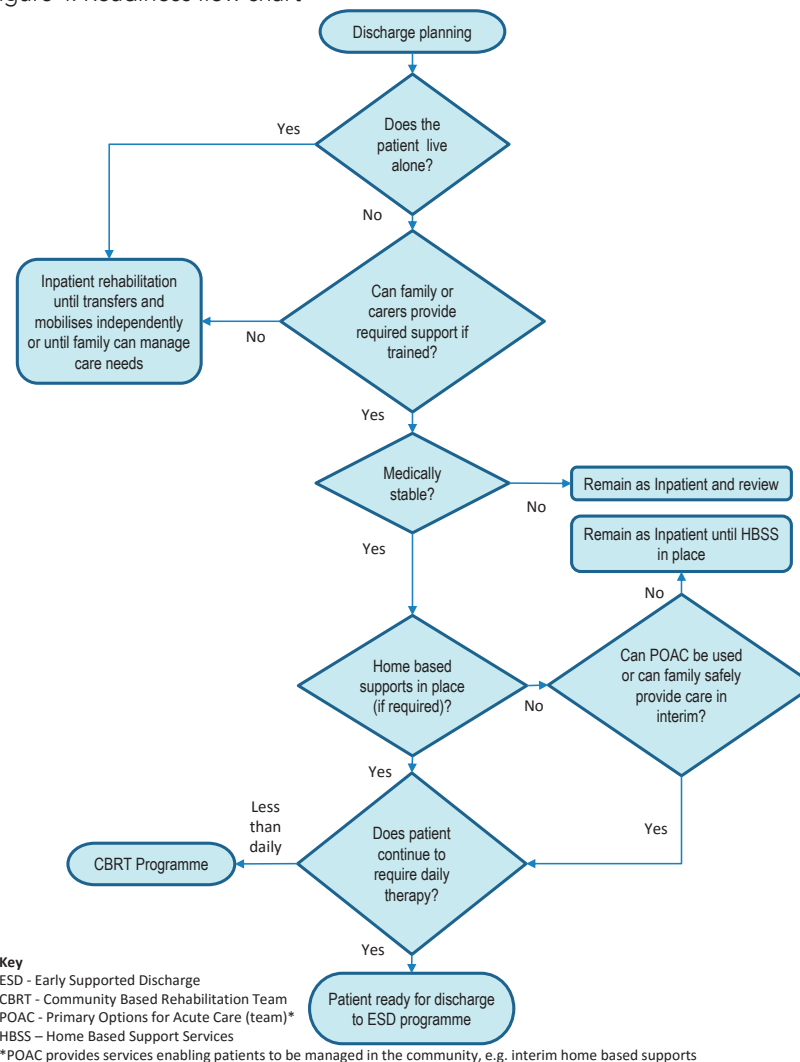
- » Initially ESD team members took the lead in identifying suitable patients, but once inpatient teams knew what an ESD patient 'looked' like, ESD staff stepped back and acted as consultants, guiding and supporting decision making.
- » To make a decision of suitability at the right time for an individual patient requires close monitoring of the patient's recovery. Suitability may change with time.
- » Despite research indicating patients with mild to moderate strokes derive greater benefit from ESD,<sup>6</sup> SLAS found that people with severe strokes can also benefit from this service.

## Readiness

A patient was considered ready for discharge with ESD if they were medically stable, and if their rehabilitation and care needs could be safely met at home. Again, this was determined at multidisciplinary team meetings. Using a checklist, the ESD coordinator enquires about preparation for discharge. Initially, inpatient staff required education to understand the difference between being ready for discharge on the conventional pathway and being ready for discharge with ESD.

A goal discharge date was set between the ESD team and the ward team predicting when the patient would be 'ready' for discharge with ESD.

Figure 4: Readiness flow chart



### Lessons learned

- » Even with a robust decision making process in place, there are challenges in transitioning home early for rehabilitation. People need time to adjust to a new way of working, especially when the new way is introduced alongside the conventional pathway.
- » Patients are often anxious about returning home after a significant event such as a stroke. With early communication around ESD, patients were more prepared for the discharge process and anxiety was not a barrier.
- » It was found that having the ESD coordinator attend all of the MDT (multidisciplinary team) meetings allowed the coordinator to make more timely and effective decisions regarding admissions.

### Prioritisation

A number of different factors are being recorded to guide prioritisation when demand for the service exceeds capacity. These include insight, motivation, comorbidities, stroke severity, age and rate of recovery. Anecdotally, these factors appear to influence outcome, but insufficient patient data has yet been analysed to draw firm conclusions.



The SLAS team aimed to achieve continuity of care between hospital and home, reduce duplication in assessment, ensure collation of information was efficient, clinically meaningful, comprehensive and relevant for its purpose. Three aspects were explored to establish a transitioning process: handover, in-hospital general assessment, and rehabilitation planning/scheduling.

## Handover

Once patients were accepted for ESD rehabilitation, a handover between the hospital and ESD team was initiated. At the start, time spent arranging the handover significantly exceeded time receiving it, and it took many attempts to establish a robust process. After several plan, do, study, act (PDSA) cycles, the team adopted a more semi-structured approach.

Components identified, refined and adopted are shown below.

Content	Structured format; progress towards goals, rehabilitation focus, risks/mitigation in place, assessment results.
Timing	Prior to the in-hospital general assessment.
People	Determined by rehabilitation needs, goals and any risks or issues highlighted by the ESD decision-making tool.
Process	Coordinator sends email to inpatient team requesting handovers. Face to face, over the phone or email methods were trialled. ESD clinicians now use a variety of these three methods to receive the handovers. Information is recorded, filed in ESD patient file, and discussed in ESD multidisciplinary meeting.

## In-hospital general assessment

A general assessment used on entry to CBRT model of care already existed; this is a comprehensive patient-focussed tool designed to identify priorities for care and unmet needs. It incorporates all possible areas that may have been affected by the stroke, as defined by the World Health Organisation's International Classification Framework (ICF).<sup>11</sup> It seeks the patients' views on the consequences of their stroke rather than a re-assessment of the specific deficits and functional difficulties.

Assessment is completed on the ward prior to the patient's inpatient discharge. The assessment is usually completed by the ESD coordinator, but any member of the team is able to do so.

## Developing a rehabilitation plan

Clinical information collated through the ESD decision making tool, handover and the in-hospital assessment was used by the ESD team to create a rehabilitation care plan for each patient. This determined which clinicians were needed, intensity of rehabilitation required and priorities for the first week. Visits were then organised and a schedule provided to the patient.

Planning and scheduling was tested at different points across the week and eventually this was routinely incorporated into the weekly multidisciplinary team meeting. However, the team recognised the need for some flexibility in the timing of scheduling particularly when time to discharge was short.

## Lessons learned

- » By doing the general assessment before the patient leaves hospital, anxiety is alleviated because patients know exactly who, when, how much and what rehabilitation they will receive.



- » Because of the in-hospital assessment at the first visit, clinicians were able to focus on safety and the adaptation of goals to the home, thereby facilitating an earlier start to rehabilitation than in the conventional pathway.

### ESD coordinator

The ESD coordinator is a member of the clinical team with additional responsibilities. The coordinator is responsible for coordinating admissions to ESD, for the transition of care to the community rehabilitation service, and also for education about access to ESD services. In addition, the role has oversight of demand and capacity, enabling rapid decision-making about admission to ESD. Meeting attendance and the follow-up afterwards enables the coordinator to expedite discharge planning.

Another advantage of the role is the ESD coordinator's ability to consult with staff on whether a patient would benefit more from the ESD rehabilitation pathway, the CBRT pathway, or from remaining in hospital.

Furthermore, as change ideas were tested and refined, the coordinator ensured that referrers were informed by providing training. The ESD coordinator role is critical to the successful functioning of the service.





The SLAS team needed to ensure that the ESD model of care met the needs of the target population. As CM Health already had a successful community based stroke rehabilitation team, the ESD service ran as a subset of this. The team also needed to consider the existing stroke pathway and service providers to ensure the ESD service would run alongside effectively.

Seven components were considered to create a model of care to deliver the service.

### Time period

SLAS trialled a three week model consisting of six days a week of therapy. In the majority of cases, three weeks intense rehabilitation is sufficient. Patients are either able to have their rehabilitation continued by CBRT or, in a few cases, are ready for discharge after three weeks. As ESD is a subset of CBRT, this allows for intensity to be somewhat flexible during transition between the two services. Saturday working was trialled and was found to be essential in Week 1 to guarantee continuity of rehabilitation for patients discharging later in the week.

### Ensuring patient safety

Patients are given a phone call on the day of discharge to ensure safety at home. When the first week of rehabilitation is being scheduled, a staff member makes a follow-up phone call. This could be any team member. Each patient is asked a structured set of questions, and advice is given as required. The first visit occurs within 24 hours. As patients' medical needs are to be met by their general practitioner (GP), having already determined medical stability, patients are encouraged to visit their GP during the three weeks of ESD. Every patient is seen by the registered nurse in the team within their first week of discharge to monitor risk factors and review medical wellbeing.

### Multidisciplinary team meetings

Work was completed on when and how often team meetings needed to occur in order to discuss patient goals and progress. Team meetings are also used for timetabling for the following week, so the timing of the meetings is important. Meetings are held on Wednesday afternoons and run by the ESD coordinator.

### Interventions

A multidisciplinary approach was proposed for patient treatment. Multidisciplinary practice included joint assessment and treatment sessions, patient-led goal setting and goal-focussed treatment planning. Team members work together on the same goals, which are reviewed weekly with the team and discussed with the patient. Roles and responsibilities documents were created for each team member specifying processes for each discipline.

### Keyworker role

Widely recognised as an important part of patient care in stroke rehabilitation, the keyworker role ensures that care is coordinated and patient-focussed. Staff felt that because they were in the home every day, there were strong links with patient and family, and this meant the keyworker wasn't always required to do anything additional. The presence of the ESD coordinator also played a part in the underutilisation of the keyworker role. This may be because the coordinator provided continuity spanning both the hospital and home and this could be when most needs arose.

Future service growth and changes in staff make it necessary to define the key attributes of the keyworker role. This is under development.

### Staffing model

The staffing model developed was based on the literature and analysis of community rehabilitation referral volumes in the pilot area. On a predicted

50 referrals per year, the following staffing model was tested and deemed appropriate:

- » Physiotherapist 0.5 FTE (full-time equivalent)
- » Occupational therapist 0.5 FTE
- » Rehabilitation assistant 0.5 FTE
- » Speech and language therapist 0.4 FTE
- » Registered nurse 0.2 FTE
- » Coordinator 0.2 FTE
- » Senior medical officer 0.1 FTE

### Engaging with primary care

Once patients have been discharged from the hospital setting, primary medical care is provided by the patient's GP. As a result, it is important that patients engage with their GP early on following discharge. The level of support provided depends on whether the patient understands his or her medical condition and its management.

### Lessons learned

- » To facilitate continuity of care, and facilitate communication and co-operation within working relationships between the services, a number of staff were split across services. This included a mixture of ESD, ward and CBRT staff.
- » The ESD team's office space is located adjacent to CBRT and beside the rehabilitation ward. The advantages of close physical proximity are timely communication between teams, breaking down silos and relationship development.



Due to the complex nature of stroke most ESD patients require further community rehabilitation beyond the three week intensive phase. Although ESD was established as a subset of the existing community-based rehabilitation service, the model of care, delivery and data collection differed, so there was a risk of a disjointed transition (potential for introducing gaps, duplication and loss of continuity).

Three aspects were explored to establish a more streamlined admissions process: administration, handing over patient care, and scheduling for continuity.

### Streamlining administration

The CBRT admission process is triggered by an electronic referral, which initiates everything from reporting in patient management systems to triage. Transitions between ESD and CBRT needed to trigger these processes.

The SLAS team developed a new trigger for administration processes such as the patient management system and caseload management. Initially, notification of transition to CBRT was done verbally, but there were inconsistencies depending on who provided the notification. Once the key information was determined and standardised, an email was sent by the ESD coordinator to the CBRT administrator.

Patients transitioning from ESD to CBRT are discussed in MDT meetings in Week 2 so that CBRT therapists can plan the admission.

### Handing over patient care

The aim of this component was to provide continuity from the patient's perspective and remove the need to duplicate assessment. Two handover methods were tried: with the patient present, and without. Both methods had merits depending on the patient's needs so both remained options

in the model of care. Clinicians choose the method that ensures the greatest continuity. For example, patients are invited to be present in cases where they feel anxiety about the handover or there are specific interventions that require demonstration.

### Understanding patient flow and scheduling for continuity in care

The admission process for CBRT produced a usual response time of three weeks, and although CBRT had the capability to shorten response time for higher risk patients when required, this was irregular. CBRT needed to be able to admit a patient from ESD every week with no delays up front, so the current admissions process needed to change.

Community-based rehabilitation clinicians consistently operate at full capacity. Protecting time in their diaries for a patient transitioning from ESD required an understanding of patient flow. This was achieved through improvements in goal discharge date planning and scheduling. Changes ensured that CBRT therapists had at least one week's notice of a transitioning patient and that patients received an appointment with CBRT within one week of the last ESD visit.

This change idea created a seamless transition between the two community services. Administration tasks were triggered at the right time, staff were able to work efficiently, and patients knew when and with whom their next appointment would be.

### Discharge straight from ESD

Although most patients go on to require further community rehabilitation there are some that achieve their goals within three weeks and can be discharged straight from ESD. These patients are booked in to attend a clinic appointment for a stroke medical review within three months to ensure they are followed up.

### Critical success factors

There were a number of factors that were critical to the success of the SLAS project.

The project team was made up of clinicians who held a strong belief in early supported discharge, which was supported by undeniable evidence. The team was enthusiastic and embraced the Model for Improvement methodology, making a commitment to actively participate and contribute.

The project team were fully supported by managers and improvement advisors, and were given the time and opportunity to completely engage in the change process. It has been reported in literature that buy-in and support from the broader team is essential for service success, as people can often be cautious when referring to a new service.<sup>12</sup> The SLAS team made it a priority to communicate to all stakeholders as well as the wider teams involved. Presentations and road shows were held regularly to ensure people were informed and opportunities were created for stakeholders to engage and provide feedback. In addition, a member of the SLAS team attended weekly ward meetings to ensure that the flow of communication was frequent and uncomplicated.

The commitment, enthusiasm and conviction together with the consistent flow of communication were critical to the success of the SLAS project.

## Overview

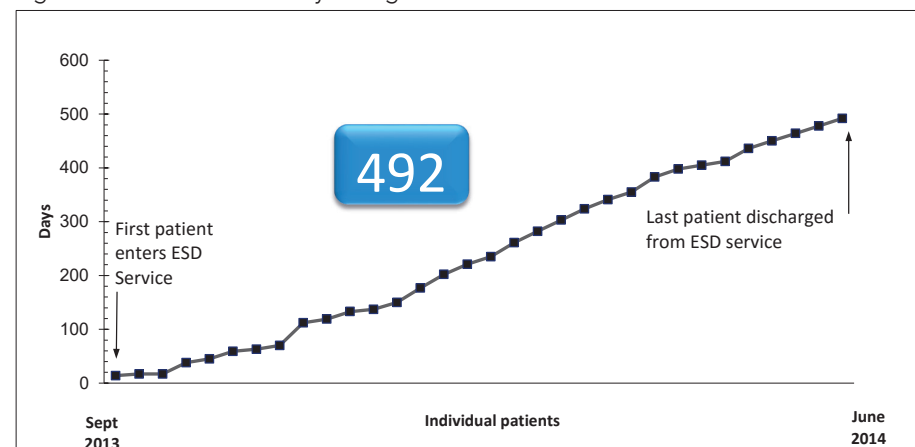
The addition of an ESD model of care within the stroke pathway produced exceptional results.

- » The cumulative bed days saved over a 10 month period was 492 (Figure 5).
- » The ESD model of care is more effective in terms of length of stay reduction for mild to moderate stroke (Figure 6 and 7).
- » Average length of stay on the rehabilitation ward for mild-moderate patients reduced from 22 days to 6 (Figure 8).
- » Functional gains made with ESD are equivalent to those made in hospital (Figure 9).
- » Waiting time for community rehabilitation was reduced to zero (Figure 10).
- » Almost all (99.5%) of ESD participants were satisfied with the service.
- » Readmission rates were negligible, and readmissions were not related to the stroke or to rehabilitation needs. The SLAS team stopped tracking this.

## Bed days saved

Between September 2013, when the first patient went home under the care of the ESD service, until 1st July 2014 stroke patients have spent a total of 492 days at home with loved ones rather than in hospital.

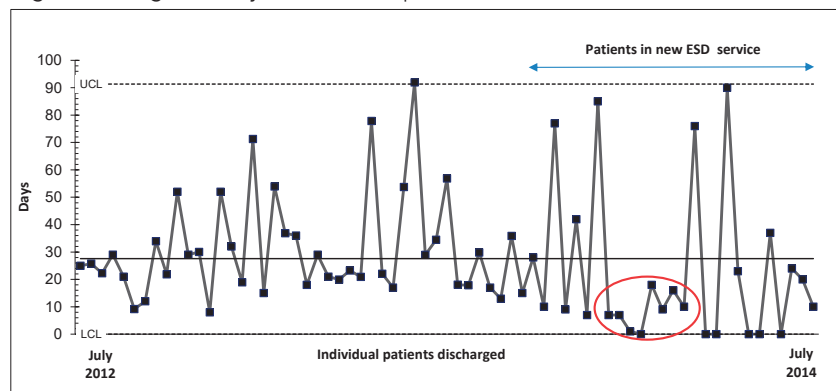
Figure 5: Cumulative bed day savings



### ESD model reduces LOS for patients with mild to moderate stroke

When LOS data for mild, moderate and severe stroke patient discharges with ESD are grouped together there is too much variability to detect any effect of the new model of care (Fig 6). For a short period, indicated by the red circle, there was a pattern of reduction in LOS that could be attributed to ESD. However, this was not sustained. These findings did not entirely align with observations reported by the ESD team, prompting further investigation of the data.

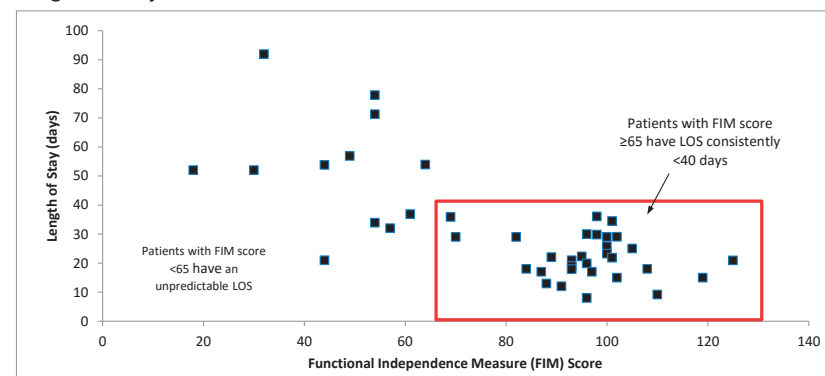
Figure 6: Length of stay for all stroke patients



To understand the variation in the length of stay, severity of stroke was considered as an underlying factor contributing to length of stay. To examine this, LOS was plotted against a patient's FIM, which assesses the patient's ability to function at the point of entering intensive rehabilitation.

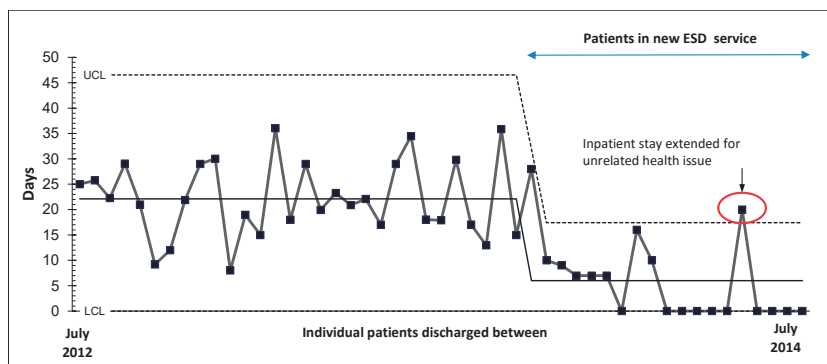
Figure 7 shows that LOS is more predictable in the area indicated by the red box, with all patients having stayed 40 days or less. Using a FIM score of 65 as the cut-off, we did further analysis of LOS data for patients in two subgroups: severe stroke (FIM <65) and mild to moderate stroke (FIM ≥ 65).

Figure 7: The relationship between stroke severity and rehabilitation ward length of stay



The average length of stay on the rehabilitation ward for patients with mild to moderate stroke receiving care in the new service has been reduced by 16 days compared with the baseline patient group. Patients who stayed for 0 days are those for whom an admission to the rehabilitation ward was avoided by having the ESD service.

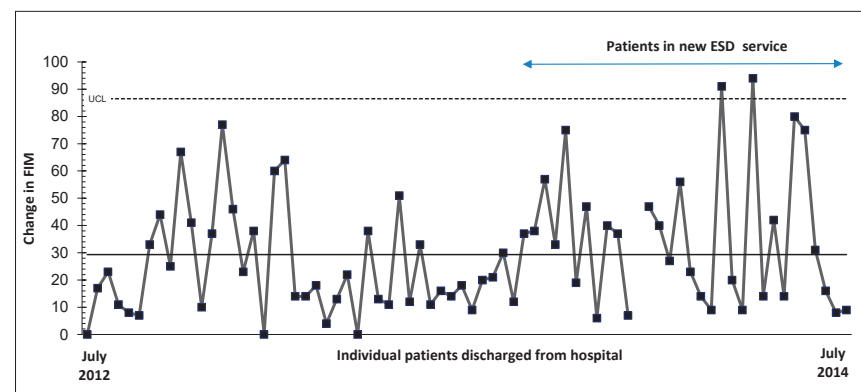
Figure 8: Rehabilitation ward LOS for patients with mild to moderate stroke



## Comparable functional outcomes

Patients achieved functional improvements comparable to those of inpatient rehabilitation as measured by the Functional Independence Measure (FIM). Patients also consistently achieved clinically significant improvements in the Nottingham Extended Activities of Daily Living (NEADL) score which measures a patient's own perception of their improvement.

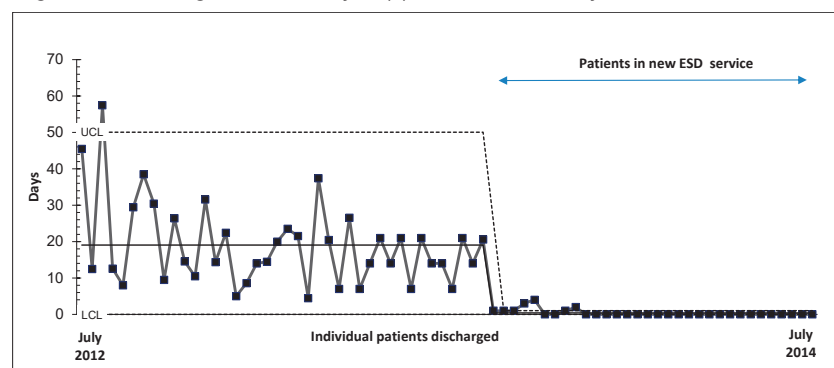
Figure 9: Improvement in FIM score between admission and discharge from intensive rehabilitation



## Improved continuity of care

Another benefit of the ESD service has been improved continuity of care. Prior to the introduction of ESD, patients who were discharged home waited, on average, 18 days before their first community rehabilitation visit. Feedback from patients about this delay indicated that it was a difficult time for them to adjust to being at home. Patients are now seen within 24 hours of discharge.

Figure 10: Waiting time for Early Supported community rehabilitation





### Direct discharge from acute ward to ESD: Mrs Laine Taifau

Mrs Taifau was discharged straight from the acute stroke ward to ESD. When she came home she was unable to walk or use her left arm.

Before her stroke Mrs Taifau was a stay-at-home mum running a busy household. She was not used to being the one being looked after and was very motivated to get back to cleaning the house, making the kids lunches and doing the washing, among other things.

Mrs Taifau made excellent progress while working with ESD and her husband was able to go back to work full-time.



*"When she was in hospital I thought it was all over, she would be like this forever. Now she can do everything like before. I am so happy and thankful."*  
Mrs Taifau's husband

### Discharge from long-term inpatient rehabilitation to ESD: Mr Ian Hampton

Mr Hampton spent about a month in inpatient rehabilitation to get to a point where he could safely manage at home with ESD and the support of his wife.

At home Mr Hampton was able to work on his goals of showering himself, taking himself to the toilet, walking, getting back to bridge club and helping around the house.



*"The rehab from the ward was continued for the first 3 weeks after I went home. The continuity was great. It meant I could continue the progress I'd made in hospital."* Mr Hampton



*"The occupational therapist showed me how to do the dishes, which gave me a purpose. I used to help my wife out with the chores and now I can't do much so it makes me feel useful."*

Mr Hampton



### Discharge from short-term inpatient rehabilitation to ESD: Ms Susan Hunt

Sue did not enjoy being in hospital and had difficulty applying what she was working on in the gym to what life would be like at home. She spent two weeks on Ward 23 before continuing her rehabilitation at home with ESD. When she first came home she had no use of her right arm, used a wheelchair to mobilise and lacked confidence with her communication.

At home Sue was able to practice everyday activities in a familiar environment and made dramatic improvements. By the end of the three weeks Sue waved goodbye to her wheelchair. She is now walking everywhere, able to use her right arm to help get dressed, and is making her own breakfast.

As a number of ESD therapists work across inpatient and outpatient stroke teams, Sue was able to have continuity in her rehabilitation journey. Her physiotherapist was the same in hospital as with ESD and her ESD occupational therapist continued to see her when she transitioned to the Community-Based Rehabilitation Team.



*"Having my aunts around all the time has meant they can help me do things for myself."*  
Susan Hunt

*"Imagine if I was still in hospital! I wouldn't be able to do half of the things I can do now."*

Susan Hunt



The Supporting Life After Stroke collaborative team have worked extremely hard to ensure that the improvements achieved by the project can be sustained. This has involved the development of orientation processes for new staff, continued feedback on patient outcomes, standardised procedures and training. Strong clinical leadership and engagement of stakeholders has been vital to maintain momentum while this new pathway has been added onto the stroke pathway.

The leadership team is developing a business case to spread the model of care to the rest of the Counties Manukau population. If successful, the proportion of stroke patients discharging with ESD is expected to increase, firmly establishing ESD as a safe alternative to inpatient rehabilitation.

The ESD team has already explored staff rotations into the service and this has been reported to promote better understanding of roles within the stroke pathway.<sup>13</sup> The ESD coordinator role is also being evaluated to better understand where in the service this should be placed to have the greatest influence.

The team continue to track factors such as stroke severity and its effect on outcomes. It is anticipated that this will identify opportunities for further development of the model of care, such as whether a longer period of ESD rehabilitation would be better for the moderately severe stroke patients.

This model of care is likely to be successful for other diagnostic groups and Model for Improvement methodology would enable it to be tailored appropriately.

## THE COLLABORATIVE TEAM



**Alison Howitt**  
Collaborative Project  
Manager



**Amanda Shapleski**  
Coordinator and  
Occupational Therapist



**Deirdre Gough**  
Physiotherapist and  
Coordinator



**Dina San Gabriel**  
Registered Nurse



**Raewyn Maguire**  
Associate Charge Nurse  
Manager



**Jacqui Hooper**  
Occupational Therapist



**Jill Grieve**  
Speech Language Therapist



**Joanna Leckenby**  
Coordinator and  
Occupational Therapist



**Michele Moore**  
Rehabilitation Assistant



**Stephanie Easthope**  
Improvement Advisor

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### Clients' rating of service (Aim: 90% satisfaction)

1. Were you informed about ESD before discharge? Yes/No
2. Were you given enough information about ESD before leaving hospital? Yes/No
3. When ESD visited you in hospital, were you able to discuss any concerns re. going home? Yes/No
4. Was your hospital discharge well planned? Yes/No
5. Was all the equipment you needed in place for when you got home? Yes/No
6. Did ESD show you respect and help maintain your dignity? Yes/No
7. Did ESD visit you at convenient times? Yes/No
8. Were you able to talk to ESD about your problems? Yes/No
9. Did ESD involve you in decisions throughout your treatment? Yes/No
10. Did the treatment meet your needs? Yes/No
11. Did ESD show you how to do things for yourself? Yes/No
12. Did ESD provide info about benefits, stroke clubs, the Stroke Foundation? Yes/No



## APPENDIX B: DECISION-MAKING TOOL

## Early Supported Discharge Decision Making Tool

Date:     /     /

Name: NHI: Cons: Ward:

Goal discharge date (without ESD) \_\_\_\_/\_\_\_\_/\_\_\_\_ Actual Discharge date: \_\_\_\_/\_\_\_\_/\_\_\_\_

[illegible]

### Early Supported Discharge Decision Making Tool

<b>3. Is the home suitable for rehab?</b>	
Support available from family:	
Is home conducive to continued recovery? ie patients functional level (physically or cognitively) is appropriate for rehab at home, able to benefit from being at the home	
Are there any safety issues that ESD staff should be aware of? Eg infection control, environment, dogs, people?	
Discharging to live in a geographical area covered by ESD?	
Yes – Discharge destination:	No – no longer eligible for ESD
<b>For ESD? Yes / No (if no provide reason)</b>	
Goal discharge date (with ESD):	

If suitable - Give tool to administrator to file in ESD patient folder

If not suitable - file in ESD Project folder & complete CBRT handover sheet and place in CBRT triage tray.

### Factors affecting outcome

**Insight:** What changes have you experienced since your stroke?

**Motivation:** Score (+) if they are engaged and participating in therapy or (-) if they are not engaged in therapy

**Comorbidities:** Presence of 3 comorbidities considered important, these are being tracked until their impact is better understood

**Stroke Severity:** FIM score of 65 based on outcomes observed in the data, this is monitored for its appropriateness

**Age:** 75 – this is the age reported in the literature around outcomes

**Rate of recovery:** helps to inform benefit for further rehabilitation. This can be determined by considering stroke severity and functional change over time. The guidance we use comes from a rehab candidacy tool this is as follows:

- Mild stroke (FIM>80) over 3 days
- Moderate (FIM 40-80) over 7 days
- Severe (FIM <40) over 14 days

Record steady progress (+) or all else (-) in the columns overleaf

## References:

Evidenced Based Rehabilitation EBRSR Canada module: Managing the stroke rehabilitation triage process  
[www.ebrsr.com](http://www.ebrsr.com) [http://www.ebrsr.com/sites/default/files/Chapter4\\_Triage\\_FINAL\\_16ed.pdf](http://www.ebrsr.com/sites/default/files/Chapter4_Triage_FINAL_16ed.pdf)

Stroke rehabilitation candidacy Tool (2010): <http://swostroke.ca/welcome/wp-content/uploads/2011/11/Stroke-Rehab-Candidacy-Screening-Tool-2010.pdf>



## APPENDIX B: DECISION-MAKING TOOL

Preparation for discharge/discharge checklist		
	Date	Comments
Medical needs can bet met by primary care Home blood tests arranged when required?		
Does not require urgent diagnostics		
Equipment in place		
Family/Carers trained in: <ul style="list-style-type: none"> <li>• Transfers</li> <li>• Toileting/Continence (day and night)</li> <li>• Rehabilitation programme</li> <li>• Medication management</li> <li>• Nutritional intake</li> </ul>		
If lives alone: <ul style="list-style-type: none"> <li>• Is safe on own during the day?</li> <li>• Do they need an alarm/ other aid?</li> <li>• Manage medication</li> <li>• Access community</li> <li>• Manage nutritional needs</li> </ul>		
Home based supports in place		

Eligibility	
Lives in Manukau, Papakura, Takanini, Manurewa or Mangere	Did they live in one of 5 domiciles? (not PH or RH)
New diagnosis of stroke	Is this a new episode of stroke defined by a discrete and identifiable acute neurological deficit, as a result of a vascular cause, which has left a residual functional impairment
Suitability for rehabilitation with ESD	
1. Will patient be able to live safely at home	Prediction based on stroke severity and consequences, previous functioning and recovery
2. Is patient making steady progress with rehab?	Determined by observable functional improvements on a regular basis - may not be suitable if the answer is no, or may need more time to demonstrate potential. Consideration given to intensity of rehab patient is receiving– should be daily input from required disciplines
3. Is home suitable for rehab? <ul style="list-style-type: none"> <li>&gt; Family/caregiver Support</li> <li>&gt; Home environment conducive to further recovery</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Wishes of patient and family capability is taken into account. Is adequate support available throughout the day? Including overnight when required?</li> <li>&gt; Is patients functional level (physically or cognitively) appropriate for rehab at home, will they be able to benefit from the possibilities that being at the home offers?</li> </ul>
4. Discharging to live in area covered by ESD?	If patient is discharging to a different address outside of area covered then they are no longer eligible.
Readiness for discharge/discharge checklist	
Medical needs can bet met by primary care	Are they medically ready for discharge? Dr's support discharge. If home blood tests are required - has this been arranged?
Does not require urgent diagnostics	Are there any investigations/diagnostics that require outpatient visits? Can they access essential outpatient clinics?
Equipment/products in place	Patient/caregiver trained in use of the equipment Continence aids provided, aware of where to purchase products.
Family/Carers trained in: <ul style="list-style-type: none"> <li>• Transfers</li> <li>• Toileting/Continence (day and night)</li> <li>• Rehabilitation programme</li> <li>• Medication management</li> <li>• Nutritional intake</li> </ul>	Patient is safe with a trained caregiver who understands basic principles of rehabilitation to promote ongoing recovery Caregiver strain has been considered and carer support has been considered and arranged where needed.
If lives alone: <ul style="list-style-type: none"> <li>• Is safe on own during the day?</li> <li>• Do they need an alarm/ other aid?</li> <li>• Manage medication and basic health needs</li> <li>• Access community</li> <li>• Manage nutritional needs</li> </ul>	Has an alarm/aid been considered? Are they safe preparing a meal, or supports been considered What supports are in place to ensure medication is administrated safely? Can patient collect medications? Any financial barriers? Can they perform BSL monitoring and administration of insulin and warfarin?
Home based supports in place	NASC has co-ordinated supports for discharge

