Early Supported Discharge for Stroke

2020 & 2021 Report

Clinical Design & Innovation
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ROYAL COLLEGE OF PHYSICIANS OF IRELAND

National Clinical Programme for Stroke

National Clinical Programme for Stroke

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This report includes the output of teams in nine sites:

- Beaumont Hospital (BH)
- Cork University Hospital (CUH)
- Galway University Hospitals (GUH)
- Mater Misericordiae University Hospital (MMUH)
- Sligo University Hospital (SUH)
- St James's Hospital (SJH)
- St Vincent's University Hospital (SVUH)
- Tallaght University Hospital (TUH)
- University Hospital Limerick (UHL)

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Overview

The National Clinical Programme for Stroke, was established in 2010 with a mission to shape the delivery of improved stroke care in Ireland. Through organising the acute care of stroke, the programme was largely successful in achieving its initial goals of preventing one stroke a day, and reducing one death or disability from stroke each day. Stroke incidence reduced significantly in the first phase of the programme, death from ischaemic stroke fell from the high teens to under 10%, while fewer stroke survivors were discharged to nursing homes[1].

Early Supported Discharge (ESD) stroke services enable an accelerated discharge from the acute hospital setting, through the provision of specialist and stroke-specific rehabilitation in the home setting. Once medically fit, and if assessed as having ongoing rehabilitation needs, suitable patients can be discharged home with ESD to complete their acute period of rehabilitation in the community setting with the necessary nursing, therapy, and community supports. These teams particularly target the goal of reduced disability and ESD is an internationally appreciated model of best care for patients with mild to moderate deficits post stroke[2]. The National Clinical programme have led the development of this model in Ireland. This report describes the progress of ESD services in 2020 and 2021, and highlights most notably that the number of sites providing ESD has increased, and more patients than ever before are now receiving ESD intervention as a component of their stroke care.

ESD services significantly align with the principles of Sláintecare as they shift care from the acute hospital to the community, and by doing so reduce the capacity demands on the acute care system[3]. The National Cardiovascular Health Policy *Changing Cardiovascular Health 2010-2019*[4] and the *Towards Earlier Discharge, Better Outcomes, Lower Cost: Stroke Rehabilitation in Ireland*[5] report jointly produced by the Irish Heart Foundation, Economic and Social Research Institute (ESRI) and Royal College of Surgeons in Ireland (RCSI) in 2014 similarly recommended and supported the development of ESD services in Ireland. Key results of the 2017 Cochrane Review of ESD services[2] showed a reduction of 6 days in the hospital stay, and that stroke patients discharged with ESD were more likely to be living at home and to be independent in daily activities. The ESD model of care therefore facilitates a triple yield, with better outcomes for patients discharged to ESD, improved acute stroke unit capacity, and reduced costs.

The first ESD services were commenced in three Irish hospitals (Tallaght, MMUH and Galway) in 2012 and 2013. By 2020 seven hospital sites were delivering ESD, and two further teams were added in the winter of late 2020/ early 2021 bringing the total to nine. However, it was observable that despite this positive progress, by the end of 2021, many of the newer teams remained reliant on temporary funding streams, which posed a threat to both recruitment and sustainability. Additionally, none of the Irish ESD teams have the recommended complement of staffing and skill mix as outlined by the NCP for stroke[6]. The securing of sustainable funding for ESD teams, and the full staffing of existing teams at their recommended complement is a priority for the programme as a key component of the "Rehabilitation and Restoration to life" pillar of the National Stroke Strategy 2022-2026 [6], which aims to expand ESD services to 21 acute stroke sites in a phased implementation over 3 years to cover 92% of the stroke patient population.

As will be outlined in this report, delivery of ESD in 2020 and 2021 was, like so many other elements of our health service, characterised by the response to the Covid-19 pandemic. Despite the prevailing challenges, ESD services were not only maintained, but in fact expanded significantly during these first two years of the pandemic. The clear sense of purpose that ESD teams shared, together with national leadership, collaborative relationships with our international colleagues[7], and the rapid adoption of new technologies including telehealth by the ESD teams[8] enabled more Irish patients than ever before to avail of ESD services. In fact, 546 patients received ESD intervention in 2020, a 47% year on year increase from 2019, and by the end of 2021 a further 40% increase was realised with 764 patients receiving ESD intervention.

During the height of the pandemic, ESD teams were among a small handful of preserved services delivering risk-assessed care in people's homes. This enabled many people with stroke to leave hospital settings earlier, for which many patients and families expressed gratitude given the natural fears about hospital acquired infection in such circumstances. This in part may explain the rise in ESD activity observed during the pandemic[9]. We already know that ESD is effective in achieving better functional outcomes for selected patients including reducing death and disability in the short and long term. It may well be no exaggeration to say that the provision of ESD during the pandemic is likely to have saved even more lives by enabling earlier discharges at critical pressure points for the hospital system.

The clinical outcome section of this report will demonstrate that ESD services provide high-quality rehabilitation, which positively impacts both functional outcomes and the quality of life of people who have availed of this service. Patients and their families, loved ones and carers continue to rate ESD with high satisfaction, as noted by feedback through testimony, surveys and patient engagement work undertaken by a number of teams, and in collaboration with external researchers on a number of sites.

ESD is now a vital component of the continuum of stroke care in Ireland. While currently only available in less than half of our acute sites, the vision for ESD as identified by the National Stroke Strategy 2022-2027, is a comprehensive commissioning of this model of care across our acute stroke services to cover the vast majority of stroke patients. This report concludes with an overview of ESD implementation as detailed within the strategy document.

Early Supported Discharge after Stroke: The Irish Context

Early Supported Discharge (ESD) after stroke has been a feature of the Irish stroke pathway in some acute stroke sites for a decade now. Three initial sites were selected in 2012 by the National Clinical Programme for Stroke (referred to as NCP hereafter) and were supported with seed funding to develop and test initial service concepts in an Irish setting. These teams were at Tallaght University Hospital, the Mater Misericordiae University Hospital and Galway University Hospitals. A further midlands site was selected but did not become operational for local reasons at the time. With a coherent international evidence base, strong integration with existing acute stroke services and high patient acceptability, the model was quickly found to be tenable in an Irish context. Initial concerns that ESD would not be viable in rural areas with dispersed population were proved to be unfounded, due to creative approaches taken to optimise patient contacts and thus maintain dosage and intensity. An emphasis on centralised data collection, common metrics and regular centralised communication from the NCP helped to aggregate understanding across the newly developed teams and enabled the NCP to confidently produce the initial business case, in 2015, for both the expansion of existing teams and the development of new sites.

Over this ten-year period, ESD services have continued to expand, through a combination of national and local funding. As a result, by the end of 2021, stroke-specific Early Supported Discharge teams were operational in nine sites across Ireland, and in both urban and rural areas, demonstrating its scalability and applicability as a service model across the country. However, this remains well short of the total number of teams envisaged by the HSE Stroke Strategy, which outlines the need for 21 teams across the country which would enable earlier discharge for approximately 20% of people with acute stroke.

The joint RCSI/ ESRI report "*Towards Earlier Discharge, Better Outcomes, Lower Cost: Stroke Rehabilitation in Ireland*"[5], concluded that were suitably resourced ESD teams available across the

country, it would reduce hospital bed days by 24,000, resulting in annual net savings of €2 million to €7 million, using costings from 2014[5]. Meanwhile, the 2017 Cochrane review[2] identifies a reduction in the acute length of stay of approximately six days. Based on activity data that we present in later chapters, we can conclude that a minimum of 3,276 bed days have been saved as a result of ESD provision by teams in 2020 and 4,584 bed days in 2021. In fact, the experience of these teams is that the true figure is likely to be even higher in an Irish context. One team (Galway) have collected data regarding the predicted bed day savings associated with ESD for their team every year since 2013, and have consistently reported double figure bed day savings per patient discharged to ESD, with the 2020 figure being 13.7 bed days saved per participant. Similar figures have been predicted using a slightly different methodology by the St James' team. However considerable heterogeneity is likely to exist in regard to potential bed day savings with ESD across services, with differing access to subacute stroke rehabilitation beds undoubtedly having an impact on this metric.

The nine sites inputting to the 2020 and 2021 report herein are:

- Beaumont Hospital
- Cork University Hospital
- Galway University Hospitals
- Mater Misericordiae University Hospital
- Sligo University Hospital
- St James's Hospital
- St Vincent's University Hospital
- Tallaght University Hospital
- University Hospital Limerick

Fig 1: ESD sites in Ireland 2020 & 2021

The recommended composition and cost of an ESD team in the Irish context is outlined overleaf in Table 1, and is drawn from expert consensus within Ireland (the working group on the '*Rehabilitation and Restoration to Life'* pillar of the National Stroke Strategy 2022-2027), international consensus[10], and the experience to date in Irish sites as reported regularly to the NCP at ESD network meetings.

Table 1: Recommended composition and cost of an ESD team, with pay scales correct as of 01 October 2020.

ESD Team Composition & Costing			
Grade	**Total earnings incl PRSI**	**Non-pay costs 15% min-point**	**Total pay and non-pay**
Occupational Therapist, Senior (1WTE)	66,114	8,914	75,028
Physiotherapist, Senior (1 WTE)	67,231	8,914	76,145
Speech and Language Therapist, Senior (1WTE)	66,236	8,914	75,151
Social Worker-Medical, Senior (0.5WTE)	36,647	4,944	41,591
Clinical Nurse Specialist (0.5 WTE)	33,709	4,160	37,869
Physiotherapist Assistant (1WTE)	37,968	5,050	43,019
TOTAL COST	**€307,905**	**€40,896**	**€348,803**

Irish ESD teams are nested within the governance and structure of a larger stroke service. Undoubtedly individual patient needs will and do arise that cannot be met by the skill-mix of the core ESD staffing, or within the timeframe that ESD operates within, i.e. immediately post-discharge for up to 8 weeks. There is therefore the need to locally develop agreed pathways which enable onward referral, or repatriation to frailty services, dietitians, neuropsychology, and spasticity management services to name but a few. ESD teams are encouraged to be outward looking in their approach to working in an integrated way with both stroke specific services and other healthcare providers to ensure patient needs are met, and that transitions are smoothed at both entry and discharge from the

ESD services. New ESD teams, that will be established as part of the stroke strategy, will need to allocate some dedicated time to scoping out and negotiating local referral pathways across community, voluntary bodies, and hospital services, while established teams may need to look afresh and build bridges to newer services that now exist in their catchment areas, as we note and welcome a range of expanded options for both rehabilitation and integrated care provision such as Community Neuro-Rehabilitation Teams and the Integrated Teams for Older Persons and Chronic Disease.

As yet, no Irish team has the full complement of skill mix for ESD as envisaged by the NCP's National Stroke Strategy 2022-2027 and only one of the nine teams has the recommended 5 WTEs. The small scale of the majority of teams, ranging from as little as 2.5 WTE total staff, has resulted in not infrequent disruption to service provision in times of staff leave, and presented particular challenges in sustaining services when vacancies inevitably arose in individual sites. With this report covering the first two years of the pandemic, there were also disruptions to service continuity when some ESD staff members were advised not to work in clinically front-facing positions as part of occupational health guidance at various points in 2020 and 2021. In many cases clinicians and service leaders thankfully continued to support ESD through telehealth, allocating staff of a different grade, or sharing resources between services where it was possible to do so on a temporary capacity. This enabled momentum to be maintained at most sites, and undoubtedly played no small part in maximising the unprecedented numbers of patients who were able to avail of ESD in this time period. To ensure sustainable and consistent levels of service it is a priority of the NCP in the first phase of implementation of the Stroke Strategy to fully resource the gaps in these existing teams, which have nonetheless outperformed expectations with the resourcing to date and must be commended.

The staffing for each hospital site currently delivering ESD services is further challenged by the temporary nature of the funding at a number of sites. With competition for skilled staff noticeable in every area of the healthcare service at present, temporarily funded posts in many cases do not represent an attractive prospect despite the appeal of the service model. Where vacancies do occur, ESD services report often taking a "backseat" to other services with higher visibility in the hospital, resulting in lengthy recruitment delays, or only partial filling of vacancies. The NCP for Stroke strongly advocates for the prioritisation of recruitment to new and existing ESD positions and notes that delayed recruitment, or partial backfilling of vacant ESD posts is a disservice to patients and acute stroke services, and misses the golden opportunity to achieve greater efficiencies and our national KPIs for stroke through a shift of care from hospital to home, reducing length of stay and creating

badly-needed stroke unit capacity. These clinically efficient and cost-saving teams should be fully resourced and securely embedded into stroke pathways through permanent staffing and funding, as a clinical priority for all hospital groups.

Early Supported Discharge Interventions

Early Supported Discharge (ESD) interventions are typically carried out in the person's home or another location relevant to the person's individualised goals. This may include shops, places of work and worship, sports grounds, or indeed any location or activity, resulting in intervention diversity as rich and varied as the lives of those who have had a stroke. Treatment is designed to be goal-directed and initially is of an intensity equivalent to 'traditional' inpatient therapist treatment. It may also be delivered by digital means where that is appropriate and feasible[8]. Typically a patient will receive several interventions per week in total from a range of professionals depending on their needs.

Treatment goals may be easier for the patient to identify in the milieu of the home setting[11], and while at home there are rich practice opportunities for the patient in between therapy sessions in comparison with an inpatient setting, where the acute environment is typically more conducive to caregiving than independence. The diversity of interventions and settings necessitates a shift in the therapist approach towards collaboration, problem solving and complex reasoning of person, environment and task factors. The pay-off for patients is significant, and their satisfaction with Irish ESD services is very high as evidenced in the later section on outcomes. Furthermore, job satisfaction is typically high for team members with staff informally reporting the positive experiences of working in the home setting. This bodes well for the future recruitment of staff, which will be critical to delivery of the next phase of ESD expansion in Ireland.

The programme duration is capped at eight weeks, with the average duration of time on ESD treatment being 34 days in 2020 and 33 days in 2021 (see Table 2). This "Time on ESD" measure is longer than that cited in the original RCTs[12], and in some of our European counterparts, perhaps reflecting our commitment to extending the role and scope for ESD, which in itself is influenced by both the limited opportunities currently for onward referral to community rehabilitation services in Ireland and our shortage of hospital beds.

Table 2: "LOS" on ESD or Time on ESD service

Treatment duration on ESD Programme	Weighted Average	MMUH	TUH	GUH	UHL	BH	CUH	SVUH	SUH
2020	**34 days**	41	19	35	32	42	35	Not available	Not operational
2021	**33 days**	34	21	43	35	35	31	Not available	38

There are several factors which potentially impact on the duration of the treatment period, but the primary issues are the complexity of the patient's individual needs and the availability of other supports and services available in the community for onward referral. Many teams adjust inputs along the patient journey with ESD, with an emphasis typically on higher rehabilitation intensity and dosage during the initial phase of ESD, and a move towards self-management and self-directed programmes with lower intensity for the latter part of the programme. In areas where there are no other services for people who have suffered a stroke, such as acquired brain injury (ABI) teams, or alternative neuro-rehabilitation services, due to pressure of demand, the ESD teams report that they are:

a) More likely to accept a referral for a person who needs more intensive supports than ESD generally provides and
b) Keep that person on the ESD programme for longer given the complexity of the presentation and limited onward referral avenues at present

Further exploration of the impact of the introduction of neuro-rehabilitation teams on the ESD treatment duration metric will be interesting to examine over coming years, and the stroke programme intends to continue its collaborative relationship with other relevant programmes, including those run by the Irish Heart Foundation and Croí, to maximise opportunities for linkages and development of integrated pathways to support patients who still have ongoing needs at discharge from ESD.

Meanwhile in the UK, many services have removed or are in the process of removing in full, the requirement to discharge patients at the end of their ESD episode of care, and are moving towards a new model of integrated community stroke services which includes ESD but aims to better meet the long term needs of stroke survivors[13]. While the initial priority of the NCP is to roll out ESD teams

nationwide, further scoping of roles and mapping of rehabilitation services both new and existing will help to inform future evolution of the service model in Ireland.

Cognisant of the internationally known challenges in delivering ESD in rural settings, and in an effort to increase treatment time rather than losing time to travel, several Irish teams had introduced blended models of service delivery prior to 2020, whereby some sessions were delivered in the persons home or locality, with the remaining sessions delivered in an outpatient or clinic setting, typically at the referring hospital. With the advent of the pandemic in March 2020, there was a reticence to bring patients back to settings which could place patients at risk of Covid infection. Additionally, on some sites there was less available outpatient space due to social distancing requirements. This presented a challenge, and many sites quickly pivoted to using telehealth as an adjunct or alternative to their domiciliary delivered therapy or moved to domiciliary input only.

Consistent with the ethos of the informal ESD network, sharing of knowledge and experiences at quarterly meetings supported and enabled the many teams who were similarly incorporating telehealth as a component of their ESD intervention. The Cork ESD team were particularly enthusiastic about utilising tele-rehabilitation technology to deliver services, including using research and patient feedback to evaluate the process[8]. Other teams adopted it to varying levels, with some external factors such as broadband coverage and lack of familiarity with telehealth of platforms an issue in the early stages of the pandemic and playing a part in uptake by teams and patients. While telehealth was undoubtedly one factor in the increase in numbers availing of ESD in 2020 and 2021, it was coupled together with a strong drive from patients to be at home and to avoid the risk of nosocomial infections. It is important that telehealth is retained and further embedded as a facet of overall ESD care delivery in the future although it will require ongoing refinement to delineate the best application. It is acceptable across a range of ages, although initial research from the same study in Cork also suggests that only half of ESD patients consider it equivalent to in person intervention[8].

Variations exist in how teams structure themselves and in how they interface with the acute and/or rehabilitation sites to screen patients and identify referrals. Some sites have a designated team coordinator, while others rotate this position. Others use a key worker system for individual patients depending on their need, which distributes this work across the team members. These subtle variations do not seem to impact significantly on team performance, but we note that new teams will need to make a deliberate decision in how they screen referrals, process referrals and rotate or share the leadership roles and responsibilities. We plan to dedicate an ESD meeting in 2023 to further exploring this with existing teams and drawing awareness to the differing working models. The evidence base for ESD supports that where ESD treatment is both planned and delivered by co-ordinated teams, better functional outcomes are achieved for patients and there are greater organisational efficiencies[12], so team structures including team meetings, co-ordination of referrals and discharges and the stroke specialism of the service overall remains of strong interest to the NCP.

The national clinical programme for stroke considers ESD to sit primarily with the third pillar of the HSE Stroke Strategy, namely Rehabilitation and Restoration to Living, but there is also a close relationship with other pillars.

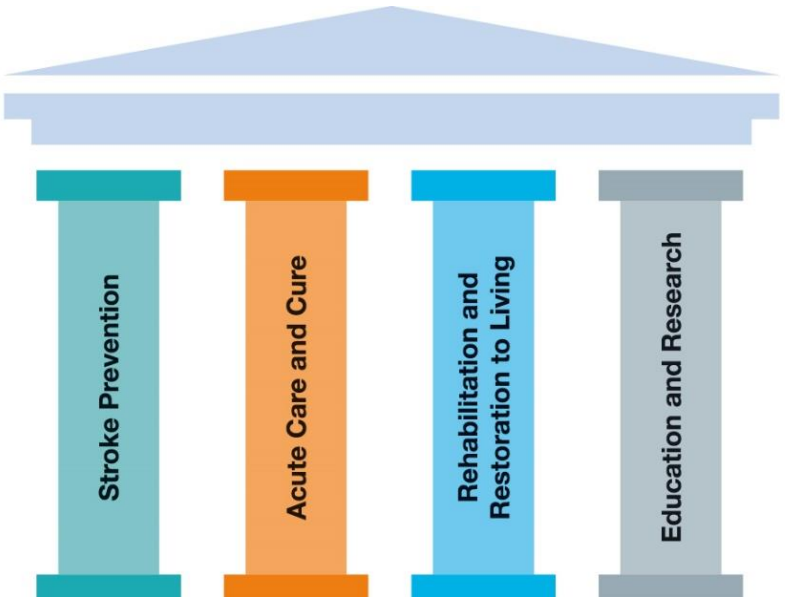


Figure 1: Four pillars of the National Stroke Strategy

Secondary stroke prevention is an important element of the ESD programme that requires particular attention and further development in the years ahead. The Clinical Nurse Specialist is the profession most commonly absent from the existing teams. ESD provides a unique opportunity to support the patient's transition to self-management of their secondary prevention programme, including both medication and lifestyle changes. With resourcing of existing teams as a matter of the first priority, nursing interventions will undoubtedly be of increasing focus in the coming years.

Activity & Trends in 2020 & 2021

Due to the Covid-19 pandemic, every element of the health service was stretched to extraordinary levels, and Early Supported Discharge (ESD) after Stroke was no different. ESD services in 2020 and 2021 were faced with enormous pressure to facilitate ever earlier discharges, while also navigating an evolving landscape of community outbreaks, patient and family anxieties and expectations, unexpected staff shortages, and risk managing practice in the context of changes in the national and local pictures occurring at rapid pace, particularly in 2020.

To mitigate against some of these challenges, and particularly to conserve ESD teams from redeployment, a consensus statement was developed collaboratively with stroke leaders in the UK. In late March 2020 the "Statement on the rationale for maintaining Early Supported Discharge and Community Stroke services during COVID-19 outbreak − A UK and Ireland collaborative[7] was agreed and made public. Throughout the pandemic, the National Stroke Programme also maintained and facilitated regular virtual contact between Irish ESD teams, enabling rapid sharing of resources, and providing additional supports such as risk management templates and sharing of information regarding telehealth platforms and policies. These collective leadership exchanges by the programme and ESD team members themselves aimed to initially ensure that ESD services were maintained as core work of the acute stroke services over the duration of the pandemic.

Some new ESD sites were also able to identify local opportunities for temporary funding during this time period. Three new temporary teams were thus formed in 2020 and 2021 in St James' Hospital, St Vincent's University Hospital and Sligo University Hospital. Cork University Hospital were also able to uplift their Occupational Therapy and Speech and Language Therapy for short intervals during 2021.

During the first two years of the pandemic, with increased capacity combined with an increased demand for the service, more Irish people than ever before received Early Supported Discharge services after stroke. 546 patients availed of ESD in 2020 (a 47% increase in contrast to 370 the

preceding year), while there was a further 40% increase in 2021, with a total of 764 patients receiving ESD.

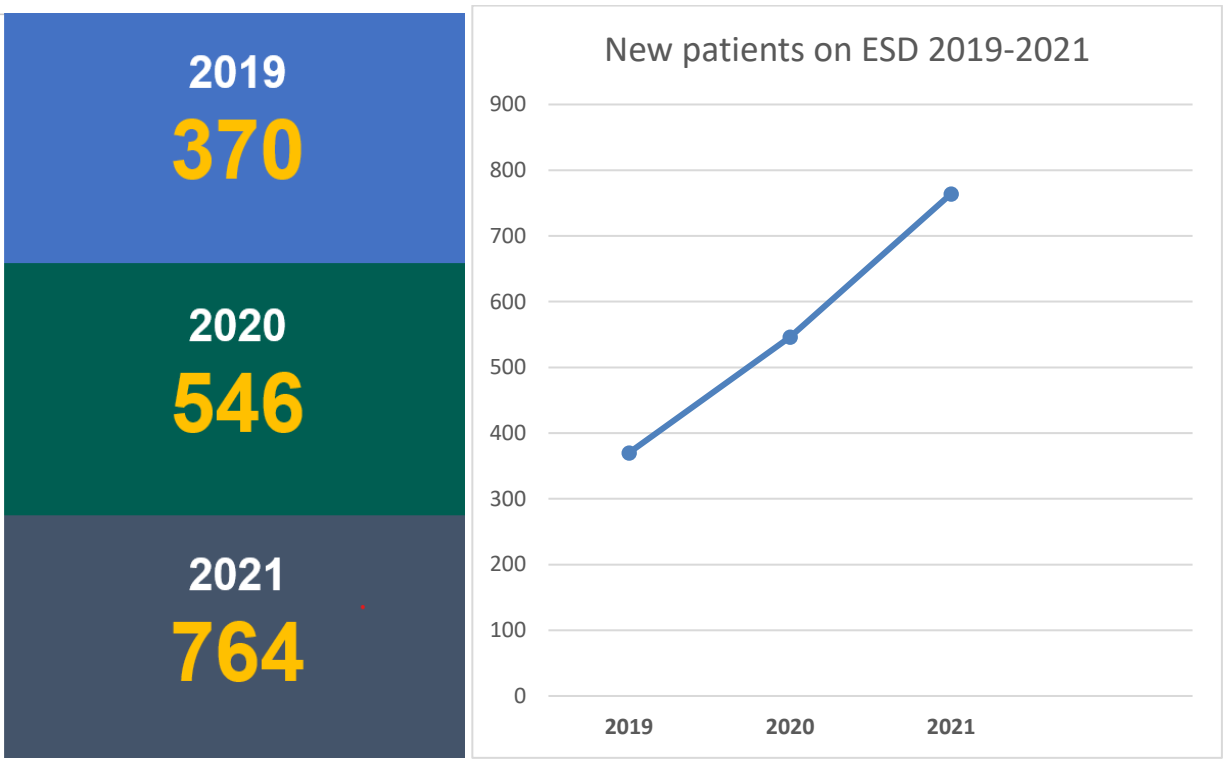
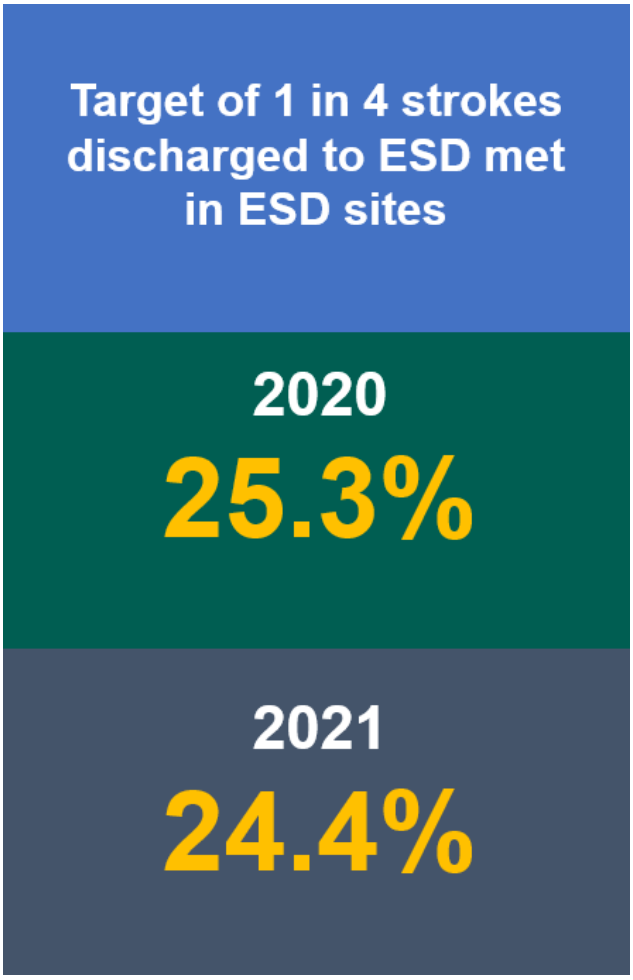


Figure 2: New Patients on ESD 2019-2021

While new sites commenced service and an additional site gained capacity, those uplifts alone only would account for approximately half of the increase in activity. The capacity was therefore built by the adaptation and creativity of both new and existing teams. A further breakdown of the activity on each site is provided in Table X. Telehealth played a not insignificant part, as previously discussed, and the public health situation also influenced demand. Anecdotally, patients and families seemed eager to embark on ESD earlier than before. A stroke typically requires a longer than average hospital stay, and with visiting restrictions common, people with new onset stroke did not have their usual support network around them in the hospital setting. This could have been with a view to reconnect with now isolated family members, to reduce the risk of nosocomial infection, or increased ESD activity may also be early evidence of the general public's engagement in the Sláintecare vision of care closer to the person's own home.

This growth in activity meant that where ESD was available one in four stroke survivors was discharged to ESD, i.e. 25.3% in 2020 and 24.4% in 2021. Further detail of the 2020 and 2021 activity, including the breakdown of percentages by site is available in Table 3. Typically, urban sites were able to discharge the highest percentages to ESD, reflecting the efficiencies that can be gained with a more densely grouped catchment area. Cork ESD team meanwhile have the lowest proportion of discharges to ESD relative to total strokes, but the activity overall is consistent with other teams, and this percentage reflects the very high volume of activity on the Cork sites, rather than any reflection on the activity of the team. Some teams are achieving almost twice the throughput of others, and further discussion of these details with the individual teams will uncover the secrets to success for both new and existing teams. Both larger sites and rural sites may also require some additional resources to realise the upper limits of what is possible for ESD.



The viability and scalability of the ESD model is hugely important when we look at anticipated increase in stroke cases into the future, with the known demographic projections towards an ageing population. With this imminent increased demand on acute stroke services, an increased focus is required on facilitating earlier discharge home with appropriate supports, including rehabilitation of this type to optimise usage of limited acute stroke unit beds as well improving patient outcomes. The NCP are heartened to see team activity above target, with strong activity throughout this time period.

Table 3: Activity at each ESD site 2020 and 2021

Hospital	Total discharged to ESD	Total discharged to ESD	Total Strokes less RIP	Percentage who received ESD
Beaumont	2020	90	322	28.0%
	2021	110	330	33.3%
Cork	2020	81	656**	12.4%
	2021	88	674**	13.1%
Galway	2020	52	208	25.0%
	2021	66	262	25.2%
Limerick	2020	121	406	29.8%
	2021	103	403	25.6%
Mater	2020	81	352	23.0%
	2021	80	314	25.5%
Sligo	2020	NA	NA	NA
	2021	57*	225	25.3%
St James'	2020	NA	NA	NA
	2021	75*	249	30.1%
St Vincent's	2020	47*	Unknown	Unknown
	2021	94	374	25.1%
Tallaght	2020	74	233	31.7%
	2021	91	301	30.2%
TOTAL	**2020**	**546**	**1969**	**25.3%*** **
	2021	**764**	**3132**	**24.4%**

** indicates newly established team/ first data entry on national ESD report*

*** inclusive of thrombectomy figures*

**** percentage calculated on sites with both ESD and total stroke figures provided*

The data presented herein reflects the metrics returned to the NCP by the individual sites. We are encouraged to also see that the increased activity we have detected is also appreciable in the wider stroke figures for Ireland in the NOCA Irish National Audit of Stroke for the same years[9,14]. NOCA report overall trends of shorter Length of Stay (LOS) for acute stroke (a median of 8 days in 2020 and 2021) and increasing percentages of overall patients in the country availing of ESD - 5% in 2019, 7% in 2020 and 10% in 2021.

Several ESD teams collect and provide data on referrals which cannot be accepted. In 54% of cases, the reason why the referral could not be accepted was due to lack of capacity from within the ESD teams. This sometimes referred to the caseload of the entire team being at maximum, while at other times there was a lack of capacity for just one discipline (most often SALT).Some other reasons provided for the non-acceptance of referrals included restrictions on the ESD catchment or that there were insufficient social supports to enable discharge onto the ESD pathway. The Tallaght team noted for example that the average wait time for patients who needed a home care package to allow discharge to ESD was 18.6 days, which negates much of the potential benefit in length of stay that could be achieved in this patient group. Optimisation of ESD team staffing across all services would clearly confer benefits at the level of the patient and also at organisational level. Additionally, with a team functioning at full capacity, the geographical scope could expand, or some patients awaiting home care supports could be supported by a therapy assistant in some self-care elements, and more patients would therefore be eligible for the services and at earlier junctures.

Patient Profile & Outcomes

The age profile of patients availing of Early Supported Discharge remains largely unchanged from previous years. The average age varied between sites from 65 to 70 in 2020, and 65 to 72 in 2021. Patients aged from 16 to 101 years of age availed of ESD during this time period. Age is not a barrier to availing of the service, and the individualised nature of ESD services allows a broad range of individual goals to be realised with therapeutic input tailored to each patient's needs whether that be return to work or education, managing transitions such as accepting formal supports or making longer term changes within one's home or indeed utilising an interdisciplinary approach that can be adjusted to meet the needs of those with frailty or multi-morbidity.

Table 4: Age profile of patients seen by ESD teams

	MMUH	TUH	GUH	UHL	BH	CUH	SVUH	SJH	SUH
Average Age 2020	66	65	65	67	70	65	Not available	Not available	Not operational
Average Age 2021	65	68	67	65	70	69	Not available	68	72
Age Range 2020	27-94	Not recorded	20-92	23-92	43-95	25-101	Not available	Not available	Not operational
Age Range 2021	16-94	Not recorded	27-97	31-91	20-93	24-92	Not available	35-90	24-93

The UK FIM+FAM is a measurement of functional performance, which is an internationally recognised, standardised assessment of functional performance across 30 domains[15]. The domains include daily living tasks, communication, mobility and thinking. The total achievable score, which reflects complete independence in each of the 30 areas is 210, and an additional measure of Extended Activities of Daily Living is also often used as an optional add-on. The FIM+FAM has been adopted as the standard measure of patient function by the majority of the Irish ESD teams, particularly those established via the programme.

Teams are currently using the FIM +FAM in slightly varied ways. Some use the extended tool, while others use the core tool only; some sites use the FIM+FAM with all patients, while others just administer it on those with a longer expected period of rehabilitation. It is therefore not possible to compare outputs across teams or to aggregate data for analysis. However, the data from each site does suggest that patients entering ESD are broadly similar in terms of their functional independence. It also shows that functional change is occurring on all sites and that ESD is happening within an active rehabilitation phase as intended. As not all sites are consistent in completing a FIM+FAM for all patients, it is not possible to tell if teams with higher changes in FIM+FAM suggests more effective therapy approaches, whether it reflects patient selection on sites, or indeed as the FIM+FAM has a lower threshold for minimally clinical significant change for cognitive and speech measures whether teams who targeted those very relevant goals appeared to have created less change, yet may have created enormous change within an area very significant for the patient such as communication.

Table 5: FIM+FAM scores pre and post ESD intervention (2020)

UK FIM+FAM	MMUH	TUH	GUH	UHL	BH	CUH	SVUH
Average Admission	186	175.5	182	171	Not available	176	Not available
Average Discharge	200	188.5	197	193	Not available	189	Not available
Score Change	+14	+13	+15	+22	Not available	+13	Not available

Table 6: FIM+FAM scores pre and post ESD intervention (2021)

UK FIM+FAM	MMUH	TUH	GUH	UHL	BH	CUH	SJH	SVUH
Average Admission	294*	184	171	178	Not available	173	217	Not available
Average Discharge	333*	200	180	202	Not available	197	235	Not available
Score Change	+39*	+16	+9	+24	Not available	+24	+18	Not available

** indicates use of extended EADL version*

At this stage of ESD implementation, the primary rationale for use of the FIM+FAM is for teams to be able to guide intervention and identify change at the level of the individual patient that they are working with, using a single measure that covers the inter-professional nature of ESD based rehabilitation. As the NCP move forward with a dedicated HSCP lead in post in the programme since Dec 2022, and working towards an expectation that existing teams will have the full staffing complement by end of 2023, a subgroup of ESD members are planning to develop guidance for teams in using and scoring common outcome measures and activity metrics. Consideration is being given by teams regarding the choice of best collective outcome measure, overall activity metrics, and patient reported outcomes. Collection data may also potentially change in future years with ESD teams inputting into the NOCA database or perhaps using a common language consistent with that used in NOCA as an interim step.

One interesting observation is to be made from looking at the pre and post-rehabilitation outcomes of the Limerick team, who achieved the greatest average functional improvement as measured by the FIM+FAM in 2020. They had the lowest average entry FIM + FAM score, suggesting that patients selected for ESD on that site were more dependent. ESD is designed to facilitate more rapid transition

to home-based rehabilitation for those with mild to moderate stroke, but system barriers, such as the availability of home help or other supports, can often restrict those with more moderate impairments from being able to avail of this service in a practical way. The data from the national teams would certainly appear to support the need to continue to explore how best we can facilitate those with moderate stroke to be able to avail of ESD services as the experience of the Limerick team that patients with moderate stroke can achieve significant gains is also known from the literature[12]. However, it is also well known that the FIM +FAM is subject to ceiling effects[15], and it may be that when the extended ADL measures are included that the tool then becomes more sensitive to the types of interventions undertaken in ESD. This can be clearly seen from the Mater figures in 2021 for example.

Patient Experience

The ESD model of care supports the patient's recovery from stroke by creating a seamless and supportive transition from hospital to home at a time of great change for the person and their extended family support unit. In addition to noted improvements on standardised functional assessment as demonstrated above, patients across the country continue to report high levels of satisfaction with the service they receive, both in terms of the quality of the service, the individualised nature of the rehabilitation, and the ability to have the service provided in their own homes.

A number of teams redesigned their satisfaction questionnaires during 2020 & 2021 to provide service users with an opportunity to feedback on the newly adopted ways of working, especially in relation to tele-rehabilitation. Aphasia-friendly literature and information packs were also examples of other quality improvements targeting patient experience and going beyond therapy delivery to address survivorship. All teams use some mechanism to collect satisfaction, and the overwhelming theme from patient feedback across the country, is positivity with regards to receiving input from a specialist team like ESD in their home environment. Feedback on tele-rehabilitation has been perhaps more mixed. Patients who were often receiving a combination of face to face and telemedicine were well placed to evaluate the relative impacts of each. Some commented that a purely remote intervention would not have met their needs, and this also tallies with feedback from the ESD teams via the national ESD Network meetings. Some research is ongoing in this area, and the ESD team in Cork have published a report on their experience in the Irish Medical Journal. The team in the Mater are also involved in a research project entitled "What's your view? Development of an Irish Early Supported Discharge for stroke service satisfaction survey with service user involvement", and their findings will have direct applicability to ongoing service design.

The experience of Peter, a person who availed of ESD, is presented here, and we are grateful to him for sharing his experience with us, and with readers of this report.

Peter - Galway ESD Patient

(Asked to describe his ESD experience)

The main thing I want to say is that it was not alone all the different individual aspects the girls covered between the physio and OT, but most of all they gave me the confidence to continue on with my life after it (the stroke) happened. Whether they did it deliberately or not, it was the biggest thing for me. On reflection, and this was now after it finished…. they made me feel as though I was the only patient they had. For the hour, maybe hour and half some days, I was their whole focus……their professionalism was something else. And I got to know them and know a bit about them too! In the hospital you are just one of many, but this (ESD) was a totally different scenario.

You know, it's a bit daunting when you are thinking about it (going home). I thought, they couldn't be as good (as the inpatient team), but from the first minute of meeting them, the very first minute, I was bowled over. I couldn't figure out how this wasn't happening everywhere! And nobody could believe it….family and friends. I felt so lucky and I mean that sincerely.

Going home I felt quite vulnerable. They gave me such confidence - a huge boost. I'd look forward to them coming and I thought it was great. I've no doubt that I recovered a lot quicker here than if I was in hospital.

(What would you advise other patients, funders, or healthcare managers?)

To try and roll it out in as many areas as you possibly can. When "E" (physio) told me about it, I was against it. I said, "Hold on a minute now, I need to be better, a lot better before I get home. Are you trying to get rid of me?" I just couldn't envisage it. I couldn't see how it would be as good. But it's actually much better at home. I can't believe the progress I've made and that's the truth.

I thought they'll be ringing and saying there'll be nobody coming this week and that week, but there was always someone and always cover and you'd know exactly who was coming to you. It was the other end of the spectrum to what I was worrying about. Everything was covered. Professionalism. I come back to that word again. Now I'm at the other end and I'm so so glad I did it.

Peter describes his concerns that ESD services would not materialise or would be of lesser quality, and also refers to the positive impact of the ESD team on his confidence in particular. It will be seen in the section on research that patient perspectives on transitions to and from care is an area that we need to place conscious attention to in terms of ESD design. The NCP are fortunate to have positive relationships with a number of research teams currently looking at this area in Ireland. For many people, experiencing a stroke is a profoundly life changing experience, and these changes impact on their confidence to go home after a stroke, and to negotiate new paths after discharge from ESD. In site specific questionnaires, some patients also recommended that some form of 6 month review is built into services so that new issues that arise can be addressed. The NCP commit to exploring how we might realise this recommendation with new and existing teams, and in particular as the Clinical Nurse Specialist posts become more established it may provide an opportunity for a holistic review of secondary prevention needs as well as a rehabilitation review by their lead therapist or therapists.

Quality Improvement & Research

Early Supported Discharge teams continue to demonstrate their drive to achieve local quality improvements in terms of patient experience, clinical effectiveness, and service efficiency. Teams are also well networked across the country, and this also enables scaling and sharing of learning to be achieved. There is active encouragement of collaboration among teams and deliberate action undertaken by the National Clinical Programme (NCP) for Stroke to foster a community of practice that is grounded in quality, evidence-based practice and being patient-centred. The NCP facilitates regular meetings among teams, and this typically includes a professional development component, which alternates between a virtual journal club and invited speakers. Collaboration and CPD will be further embedded through formalising the ESD Network membership in 2023.

As previously referred to in this report, telehealth was one area that a number of teams explored over the course of the pandemic. The Beaumont and Limerick sites looked at patient satisfaction with tele-rehabilitation received, while the Cork team presented their experiences at a range of webinars, including the Irish Gerontological Society series, RCSI Leadership series and HSCP Office webinars. Mixed-methods research into the use of tele-rehabilitation in ESD, was completed with Dr Irene Hartigan in UCC, and this collaboration also bore fruit in securing HSE Spark funding for development of a patient passport and a publication in the Irish Medical Journal[8] .

IPASTAR (Improving Pathways for Acute Stroke and Rehabilitation) is a five-year funded HRB Collaborative Doctoral Award (2020-2025); https://ipastar.eu. The primary investigators are Prof. David Williams and Prof. Frances Horgan at the RCSI Schools of Medicine, Physiotherapy and Population Health, and UCD School of Public Health, Physiotherapy and Sports Science (SPHPSS). The Galway and Beaumont ESD teams collaborated in particular with one of the PhD researchers, Geraldine O'Callaghan, who has been undertaking a programme of research entitled "*Beyond Early Supported Discharge (ESD): Supporting and improving transitions of care after stroke."* ESD team members supported the project with gatekeeping and connecting researchers with people with stroke, including those on ESD. The iPASTAR studies are in progress and the research outputs will be of immense value to those interested in design and delivery of optimal stroke care pathways in Ireland.

The reciprocal relationships with the researchers have meant that initial outputs are already being shared with ESD teams across the country, as well as through dissemination via publication of their systematic review into transitions after stroke[16].

ESD team members also participated in interviews exploring the roles of ESD team members, with Elaine O'Connor, another PhD candidate, who is carrying out her programme of research in ARC in the University of Limerick under the supervision of Dr Rose Galvin and Dr Katie Robinson. Further outputs from that research stream will also be valuable particularly as additional teams come on stream over the lifetime of the strategy implementation.

Some further examples of quality improvement initiatives include:

- Implementation of an e-referral system in Beaumont
- Preparatory work on a quality improvement project in Tallaght, entitled "The Introduction of a structured psychosocial assessment in Early Supported Discharge for Stroke Patients", which has moved to pilot project phase in February 2021.
- Commencement of national journal club for ESD team members (held virtually)
  Ongoing streamlining of ESD referral & discharge process, info packs and documentation in MMUH
- Development of Intensity Exercise classes (OT and Physio in TUH)

Collaboration also continues with national stakeholders such as the Irish Heart Foundation as well as key community partners in each location.

Future Opportunities & Challenges

Some perennial challenges also emerge with respect to ESD teams in Ireland. These focus primarily on either capacity or scope, all of which impact on patient experience and outcomes. ESD teams have performed admirably and with increased activity during the years 2020 and 2021, but both the NCP and teams themselves are aware on an ongoing basis of the challenges in maintaining ESD services with incomplete teams and the threat that this presents to the sustainability of the teams without investment.

However, the opportunities for Early Supported Discharge at the time of writing are the most positive they have been in years, with endorsement and the publication of the Stroke Strategy 2022-2027 by the HSE. This strategy outlines the vision for expansion of ESD services with a recommendation for:

Phase One:

Commissioning of the full team composition at each of the existing HSE funded sites, and expansion to four new sites – St James Hospital, Our Lady of Lourdes Hospital, St Vincent's University Hospital and Connolly Hospital Blanchardstown.

Phases Two and Three:

Further roll out of either full or half teams dependent on stroke numbers across a further 11 sites

Phase	Site
2	Sligo University Hospital
	Naas General Hospital
	University Hospital Waterford*
	Wexford General Hospital*
	University Hospital Kerry
	Letterkenny University Hospital
	Mayo University Hospital
3	St Luke's General Hospital, Kilkenny
	Cavan General Hospital*
	Regional Hospital Mullingar*
	Tipperary University Hospital*

The net result of implementing the strategy will be that with 21 services in total around the country by end of 2025, 92% of those with a new stroke will have access to ESD, and in those sites we anticipate a minimum of 20% of patients who are discharged from those stroke units, will actually avail of ESD. Based on the published evidence of bed day savings, the NCP predict a minimum bed day saving of 5,480 per annum.

Some other challenges arising relate more to the overall healthcare landscape as we rebound and recover from the ongoing Covid 19 pandemic.

Examples include:

- Delays in accessing homecare packages for patients which impact on LOS and the person's opportunity to avail of ESD services
- Lack of access to psychology services at inpatient or community level
- Recruitment challenges in a competitive landscape especially for temporary funded teams
- Lack of treatment space or team meeting spaces in acute sites that have increasing competition for available rooms

Recruitment of staff to new and existing teams could present some difficulties, particularly for certain grades and professions. However, with high rewards and positive feedback at the patient level, diverse and varied interventions with protected treatment time, and the intellectual challenge of working in a rapidly evolving area such as ESD, means that job satisfaction for ESD team members remains high and staff members tend to move more for personal, permanent or promotional opportunities, rather than to change clinical areas.

The national clinical programme will be available to support new teams both on a one to one basis and as part of the ESD Network. We plan an enhanced service specification document inclusive of job specifications, risk assessment templates and more. The ESD Network are very well subscribed and typically a number of members from the same team will join meetings, indicating that they continue to hold value for this highly motivated and engaged group of healthcare practitioners

Closing Summary / Conclusion

Early Supported Discharge (ESD) after stroke has now been an element of stroke services in Ireland for a decade. These services continue to go from strength to strength, and were immensely resilient and adaptable throughout the first two years of the SARS-CoV-2 pandemic. In fact, more Irish people than ever before accessed ESD in 2020 and that was increased still further in 2021. For both years combined, nine ESD teams delivered home based rehabilitation to 1,310 people after stroke, and saved 7,860 bed days over this critical period for our health service.

The immensely positive news is that with the planned investment associated with the HSE Stroke Strategy 2022-2027, this figure is set to continue to grow in the years ahead. In all, it is hoped that twenty-one ESD teams will be operational by the end of 2025, and this will cover the majority (92%) of acute stroke sites. It is well known internationally that ESD services improve outcomes for the patients who are able to access it. Indeed access is now our priority. Early Supported Discharge (ESD) is a vital component of the continuum of care for people with stroke. We are confident in our service model as it has been adapted to the Irish geography and population health needs. Patient testimony and feedback from across the country endorses the development of these teams, this vision for which aligns so closely with the Sláintecare ethos that will underpin our health service development for years ahead.

The stroke programme would like to take this time to thank the teams who contributed to this report, and who continue to commit themselves professionally with creativity, compassion, and clinical excellence. We would also like to thank the acute stroke teams who enable ESD teams to deliver safe care through close working relationships and supportive governance. Finally we would like to thank Peter, our patient voice for this report, and all the people who availed of ESD in 2020 and 2021 who were generous with giving feedback to their local teams and for their participation in much needed Irish research.

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