

The Role of Nurse Prescribing in the Prevention of Stroke

*Imelda Noone, Advanced Nurse
Practitioner in Stroke Care*

*St. Vincent's University Hospital,
Elm Park, Dublin 4.*

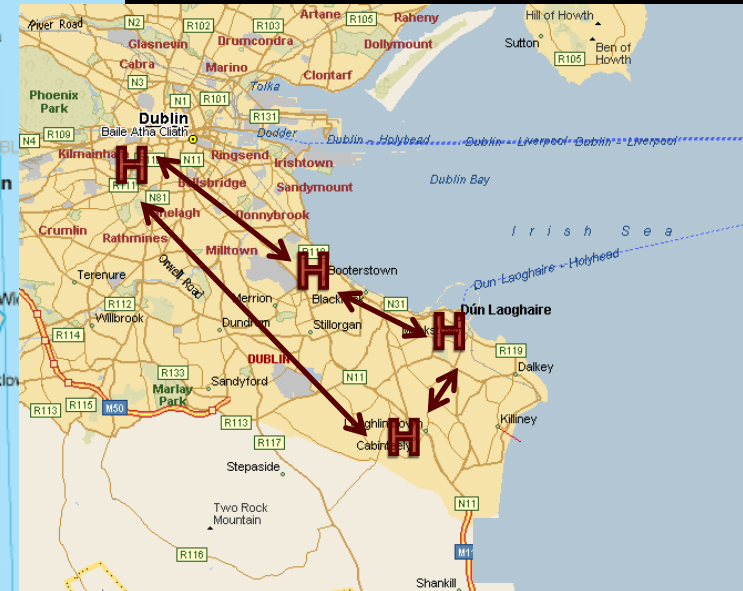
i.noone@st-vincent's.ie



Stroke in Ireland

- 3rd leading cause of death.
- Leading cause of adult physical disability.
- $\approx 7,500$ new stroke events annually
- $\approx 2,500$ new TIA events annually
- $\approx 30,000$ people have stroke related disability.
- Average age of onset ≈ 74 years.
- Male = Female
- 1/5 of nursing home residents there because of stroke
- Number of strokes will increase by 50% in the next 10 years.

Stroke Networks



National rapid access to best-quality stroke services

Prevent 1 stroke every day.

Avoid death or dependence in 1 patient every day.

Review of available guidelines

- Royal College of Physicians of London: National clinical guidelines for stroke, 3rd edition, 2008
- Scottish Intercollegiate Guidelines Network: Management of patients with stroke or TIA (SIGN 108), 2008.
- Scottish Intercollegiate Guidelines Network (SIGN): Management of patients with stroke: identification and management of dysphagia, (SIGN 78) 2004.
- European Stroke Organisation: Guidelines for the management of ischaemic stroke, 2008.
- Canadian best practice recommendations for stroke care, 2008
- AHA Guidelines for the Early Management of Adults With Ischemic Stroke. 2007
- AHA Guidelines for the Management of Spontaneous Intracerebral Hemorrhage in Adults: 2007 Update
- Australian Stroke Foundation: clinical guidelines for acute stroke management, 2008
- Irish Heart Foundation Council for Stroke, March, 2010

www.irishheart.ie/iopen24/pub/strokereports/strokeguidelines.pdf

Risk Factors for stroke

- High blood pressure
- Smoking
- High cholesterol
- Obesity
- Sedentary Lifestyle
- Carotid artery disease
- Excess alcohol intake
- Atrial fibrillation
- Diabetes
- Heart disease
- **Family history**
- **Age**
- **Prior stroke/TIA**



- From the moment a person has an acute Stroke/ TIA they are at increased risk of further events.
- The risk is substantial, being between **30% and 43%** over the next five years
(Mant et al 2004)
- The risk is highest early after stroke/TIA and may be as high as **20%** within the first month and **10%** within the first week.

Irish Heart Foundation 2010

 <p>FACE.</p>	 <p>ARMS.</p>	 <p>SPEECH.</p>	 <p>TIME.</p>
<p>Has their face fallen on one side? Can they smile?</p>	<p>Can they raise both arms and keep them there?</p>	<p>Is their speech slurred?</p>	<p>Time to call 999 if you see any single one of these signs.</p>

TIA Recommendations

- People who have had a suspected TIA, that is, they have no neurological symptoms at the time of assessment (within 24 hours), **should be assessed as soon as possible** for their risk of subsequent stroke using a validated scoring system,* such as **ABCD²**.
- CT brain scan
- aspirin (300 mg daily) started immediately
- specialist assessment and investigation within 24 hours of onset of symptoms
- measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.

Who should be admitted?

ABCD ²

		Points
Age	≥ 60 YEARS	1
Blood Pressure	Systolic >140	
	+/- Diastolic ≥ 90	1
Clinical Features	Unilateral weakness	2
	Speech disturbance alone	1
	Other	0
Duration of symptom	≥ 60 minutes	2
	10-59 minute	1
	< 10 minutes	0
Diabetes	present	1

A score of ≥ 4 is highly predictive of 7 day risk of stroke and these patients should be admitted for further management

Short term risk of stroke and ABCD² score

Score	2day	7day	90day
6-7	8.1%	11.7%	17.8%
4-5	4.1%	5.9%	9.8%
0-3	1%	1.2%	3.1%

Stroke Medications - Antiplatelets

No.	Drug	Route	Indications	Evidence
1	Nu-Seals 75mg - 300mg Disprin 300mg Aspirin soluble 300mg Aspirin suppositories 300mg	PO/PR	First choice antiplatelet agent used in acute ischaemic stroke/TIA. Given orally, rectally or enteral tube if the patient is dysphagic. Initiation, titration and repeat prescription.	RCP Guidelines 2008 NICE 2008
2	Clopidogrel Plavix 75mg	PO	Antiplatelet agent given after ischaemic stroke/TIA for those who are allergic to aspirin or generally intolerant of aspirin. Initiation and repeat prescription.	RCP Guidelines 2008
3	Asasantin Retard 200mg / 25mg Aspirin	PO	Used in adjunct to aspirin for secondary prevention of ischaemic stroke /TIA. Initiation and repeat prescription.	RCP Guidelines 2008
4	Persantin Retard 200mg	PO	Secondary prevention of ischaemic stroke/ TIA used on its own (e.g if allergic to aspirin) or in adjunct to aspirin if history of GI disturbances.	RCP Guidelines 2008

Anti-thrombotic treatment

- Aspirin and dipyridamole should be the standard secondary prevention treatment following ischaemic stroke:
- **The daily dose of aspirin should be between 50 mg and 300 mg aspirin and dipyridamole MR 200 mg bd.**
- For patients who are unable to tolerate dipyridamole, aspirin alone is appropriate.
- For patients who are intolerant of aspirin, clopidogrel 75 mg once daily is a suitable alternative.
- Any person being discharged before 2/52 can be started on long-term tx earlier.
- Addition of a **proton pump inhibitor** should only be considered when there is dyspepsia or other significant risk of gastrointestinal bleeding associated with aspirin, to allow aspirin medication to continue.
- > 80years

Medications - PPI

No.	Drug	Route	Indications	Evidence
15	Lansoprazole Zoton 15 –30mg	PO	First choice PPI (proton pump inhibitor) given in adjunct to aspirin in acute setting and maybe longterm in elderly patients (NICE). Initiation and repeat prescription	RCP Guidelines 2008

Side-effects: include GI disturbances (nausea, vomiting, diarrhoea, constipation) headache and dizziness

Immediate specific management of intracerebral haemorrhage (PICH)

- About 11% of all patients presenting with acute stroke have an underlying primary intracerebral haemorrhage.

Management of specific cardiovascular causes of stroke

- About 1/4 of all people presenting with stroke are in **atrial fibrillation**.
- It is probable that any stroke occurring in a person with **any arrhythmia** has had an **embolic** stroke from a thrombus within the heart.
- A small number of patients presenting with stroke have known cardiac valvular disease or prosthetic heart valves; the risk is high but the total number of patients small.

Recommendations (ACT)

- People with disabling ischaemic stroke who are in **atrial fibrillation** should be treated with **aspirin 300 mg** for the first **2 weeks** before considering anticoagulation treatment.
- TIA's anticoagulated sooner (once CT brain excludes haem)
- In people with **prosthetic valves** who have disabling cerebral infarction and who are at significant risk of haemorrhagic transformation, anticoagulation treatment should be stopped for **1 week** and aspirin 300 mg substituted. (RCP, guidelines)

Anticoagulation

- Recommended in every patient with persistent or paroxysmal atrial fibrillation, atrial flutter.
- (valvular and non-valvular) unless contraindicated should not be started (after cerebral events) until brain imaging has excluded haemorrhage
- and not usually until 14 days have passed from the onset of disabling ischaemic stroke

should not be used for patients in sinus rhythm unless a major cardiac source of embolism has been identified.

- Dabigatran/Apixaban

Statin treatment in people with acute stroke

- Immediate initiation of statin treatment is not recommended in people with acute stroke (24-48°).
- Reasonable to commence approximately 4 weeks (SPARCL trial)
- People with acute stroke who are already receiving statins should continue their statin treatment.

Medications –Statins

No.	Drug	Route	Indications	Evidence
12	Atorvastatin Lipitor 10 – 40mg	PO	First choice statin used in secondary prevention of ischaemic stroke or TIA. Initiation, titration and repeat prescription.	RCP Guidelines 2008
13	Pravastatin Lipostat 10 – 40mg	PO	Alternative statin which may be used in patients who may not tolerate atorvastatin. Initiation, titration and repeat prescription. May also be used in preference to atorvastatin in other situations, i.e. drug interaction.	

Side- effects: headache, altered LFT's, paraesthesia, GI effects including abdominal pain, rash, interactions (Klacid).

Lipid-lowering therapy

- **All** patients who have had an **ischaemic** stroke or transient ischaemic attack should be treated with a statin drug unless contraindicated

The treatment goals should be:

- total cholesterol <3.5 mmol/L *and* LDL cholesterol <2.0 mmol/L, *or*
- a 25% reduction in total cholesterol *and* a 30% reduction in LDL cholesterol,
- whichever achieves the lowest absolute value.
- Treatment with statin therapy should be avoided or used with caution (if required for other indications) in individuals with a history of **haemorrhagic stroke**, particularly those with inadequately controlled hypertension.

Screening tool to alert doctors to the right treatment for older people (START)

<p>Cardiovascular System</p> <ul style="list-style-type: none"> (i) Warfarin in the presence of chronic atrial fibrillation, where there is no contraindication to warfarin. (ii) Aspirin in the presence of chronic atrial fibrillation, where warfarin is contraindicated, but not aspirin. (iii) Aspirin or Clopidigrel with a documented history of coronary, cerebral or peripheral vascular disease in patients in sinus rhythm, where therapy is not contraindicated. (iv) Antihypertensive therapy where systolic BP consistently > 160 mmHg, where antihypertensive therapy is not contraindicated. (v) Statin therapy in patients with documented history of coronary, cerebral or peripheral vascular disease, where the patients' functional status remains independent for activities of daily living and life expectancy is more than 5 years (vi) ACE inhibitor in chronic heart failure, where no contraindication exists. (vii) ACE inhibitor following acute myocardial infection. (viii) Beta blocker in chronic stable angina, where no contraindication exists. <p>Respiratory System</p> <ul style="list-style-type: none"> (i) Regular inhaled β_2-agonist or anti-cholinergic agent for mild to moderate asthma or COPD (ii) Inhaled steroid in moderate-severe asthma or COPD, where reversibility of airflow obstruction has been shown. (iii) Home continuous oxygen where chronic type 1 respiratory failure ($pO_2 < 8.0kPa$, $pCO_2 < 6.5kPa$) or type 2 respiratory failure ($pO_2 < 8.0kPa$, $pCO_2 > 6.5kPa$) has been well documented and where there is no contraindication to continuous oxygen therapy. 	<p>Central Nervous System</p> <ul style="list-style-type: none"> (i) L-DOPA in idiopathic Parkinson's disease with definite functional impairment and resultant disability. (ii) Antidepressant in the presence of clear-cut depressive symptoms, lasting at least 3 months. <p>Gastrointestinal System</p> <ul style="list-style-type: none"> (i) Proton pump inhibitor in the presence of chronic severe gastro-oesophageal acid reflux or peptic stricture requiring dilatation. (ii) Fibre supplement for chronic, symptomatic diverticular disease with constipation. <p>Locomotor System</p> <ul style="list-style-type: none"> (i) Disease-modifying anti-rheumatic drug (DMARD) with known, moderate-severe rheumatoid disease lasting more than 12 weeks. (ii) Bisphosphonate in patients taking glucocorticoids for more than 1 month (i.e. chronic corticosteroid therapy). (iii) Calcium and vitamin D supplement in patients with known osteoporosis (previous fragility fracture, acquired dorsal kyphosis). <p>Endocrine System</p> <ul style="list-style-type: none"> (i) Metformin with type 2 diabetes +/- Metabolic Syndrome (in the absence of renal impairment present i.e. blood urea > 12.0 mmol/l, \pm serum creatinine > 200 μmol/l). (ii) ACE inhibitor or Angiotension Receptor Blocker in diabetes with nephropathy i.e. overt dipstick proteinuria or microalbuminuria (>30 mg/24 h) \pm serum biochemical renal impairment (blood urea > 8.0 mmol/l or serum creatinine > 130 μmol/l). (iii) Aspirin therapy in diabetes mellitus with well controlled blood pressure. (iv) Statin therapy in diabetes mellitus if fasting serum cholesterol > 5.0 mmol/l or additional cardiovascular risk factor(s) present.
---	---

Barry P J et al. Age Ageing 2007;36:632-638

Blood pressure (2° prevention)

All patients should have their blood pressure checked, and should be treated in keeping with national guidelines:

- Target BP for patients with established cardiovascular disease is **130/80** mmHg
- For patients known to have **bilateral severe (>70%)** internal carotid artery stenosis a slightly higher target (eg systolic BP of > **140/80** mmHg) may be appropriate.

Blood pressure reduction should be undertaken using one or more of the following agents:

- In hypertensive patients **aged 55 or older** or black patients of any age, the first choice for initial therapy should be either a **calcium-channel blocker** or a **thiazide-type** diuretic.
- In hypertensive patients younger than 55, the first choice for initial therapy should be an **angiotensin-converting enzyme** (ACE) inhibitor (or an angiotensin-II receptor antagonist if an ACE inhibitor is not tolerated).
- An ACE inhibitor, calcium-channel blocker or a thiazide-type diuretic should be **added** if target BP is not achieved with the initial choice.
- Beta-blockers should not usually be initiated as first- or second-line for the prevention of recurrent stroke (unless there are other specific clinical indications).

Medications –Antihypertensives (acute)

No.	Drug	Route	Indications	Evidence
5	Transiderm Nitro 5-20 mgs (Glycerin trinitrate)	TOP	First choice nitrate used in acute stroke for blood pressure >220/120 (ischaemic stroke) and 180/100 (haemorrhage stroke). For initiation and up-titration.	RCP Guidelines 2008 NICE 2008

- Side- effects

- postural hypotension, tachycardia, headache, dizziness.

Medications –Antihypertensives (2° prevention)

No.	Drug	Route	Indications	Evidence
6	Ramipril Tritace 1.25-10mgs	PO	First choice antihypertensive to treat hypertension 7-10 days post stroke. Initiation, up-titration and repeat prescription.	RCP Guidelines 2008 HOPE 2000
7	Perindopril Coversyl 2.5-10mgs	PO	Alternative ACE inhibitor, to treat hypertension 7-10 days post stroke. Initiation, up-titration and repeat prescription.	RCP Guidelines 2008 PROGRESS 2001
8	Valsartan Diovan 40-160mg	PO	ARB (Angiotensin Receptor Blocker), used to treat hypertension post stroke when ACE inhibitors are not tolerated. Initiation, up-titration and repeat prescription.	RCP Guidelines 2008

Monitoring ACE-Inhibitors

- Coversyl, Ramipril.
- Monitor U/E's regularly
- Angioedema, renal impairment, hypotension (including dizziness), cough, hyperkalemia
- **Monitoring ARB's**
- Valsartan
 - (low and slow)

Medications –Antihypertensives (2° prevention)

No.	Drug	Route	Indications	Evidence
9	Indapamide NatriliX SR 1.5mg	PO	Thiazide diuretic for the treatment of mild to moderate hypertension 7-10 days post stroke. Initiation, titration and repeat prescription.	RCP Guidelines 2008 PROGRESS 2001
10	Bendroflumethiazide 2.5mg	PO	Alternative thiazide diuretic for the treatment of mild to moderate hypertension 7-10 days post stroke. Initiation, titration and repeat prescription.	RCP Guidelines 2008
11	Amlodipine 5 -10mg (Istin)	PO	Calcium channel blocker to treat hypertension post stroke in the elderly. Initiation, titration and repeat prescription.	RCP Guidelines 2008

Common Complications Post Stroke

- Urinary Incontinence/ urinary retention/UTI
- Faecal Incontinence/constipation/overflow
- Respiratory tract infection
- Low mood
- Deep venous thrombosis/PE
- Pain (central post stroke pain/shoulder)
- Seizures
- Falls
- Stroke recurrence
- Confusion

Medications - laxatives

No.	Drug	Route	Indications	Evidence
16	Senokot 2 – 4 tablets Senna	PO	First choice stimulant laxative for mild constipation post stroke. Initiation and repeat prescription.	www.cks.library.nhs.uk/Constipation/in_summary/scenario_adults
17	Glycerol suppositories 1-2	PR	First choice stimulant laxative glycerine suppository for mild constipation post stroke. Initiation and repeat prescription	www.cks.library.nhs.uk/Constipation/in_summary/scenario_adults

Stimulant laxatives increase intestinal motility and often cause abdominal cramp, avoided in intestinal obstruction

Medications - laxatives

No.	Drug	Route	Indications	Evidence
18	Movicol 1- 4 sachets (Macrogols)	PO	First choice osmotic laxative for mild to moderate constipation post stroke. Initiation and repeat prescription	www.cks.library.nhs.uk/ Constipation/in_summary/scenario_adults
19	Fletchers phosphate enema (phosphate enema)	PR	First choice osmotic laxative enema for moderate constipation post stroke, Initiation and repeat prescription	www.cks.library.nhs.uk/ Constipation/in_summary/scenario_adults

Abdominal distension, pain, nausea, attributable to the expansion of the contents of the intestinal tract can occur.

Medications

No.	Drug	Route	Indications	Evidence
21	Detrusitol 1-2mg Detrusitol SR 2mg, 4mg (tolteradine tartrate)	PO	Initiation and titration for the symptomatic treatment of urge incontinence and/or increased urinary frequency and urgency as may occur in patients with overactive bladder syndrome.	NICE 2008
22	Omnice 400 mcg Tamsulosin 400mcg	PO	Initiation and titration for lower urinary tract symptoms associated with benign prostatic hyperplasia in patients with urinary retention post stroke prior to removal of urinary catheter for 1/52 treatment.	

Side-effects (22): Dry eyes, abnormal vision including abnormal accommodation, Dyspepsia, constipation, urinary retention.

Side-effects (23): Dizziness, orthostatic hypotension, headache, tachycardia

Medications - Analgesia

No.	Drug	Route	Indications	Evidence
14	Paracetamol 0.5 - 1g	PO/PR	Initiation, titration and repeat prescription for the treatment of headache, transient musculoskeletal pain and pyrexia post stroke.	RCP Guidelines 2008

Use with caution in hepatic and renal impairment

Side-effects

- rash, blood disorders (including thrombocytopenia)

Medications – Neuropathic pain

No.	Drug	Route	Indications	Evidence
20	Pregabalin Lyrica 25 – 300mg	PO	Initiation and titration for the treatment of central neuropathic pain post stroke.	RCP Guidelines 2008

Side-effects: dry mouth, constipation, drowsiness, angioedema, confusion, Dizziness, diplopia,

Medications - antispasticity

No.	Drug	Route	Indications	Evidence
23	Tizanidine Zanaflex 2mg	PO	First choice α_2 -adrenergic receptor agonist for the treatment of spasticity associated with stroke. Initiation, titration and repeat prescription.	NICE 2003
24	Baclofen Lioresal 5mg	PO	Alternative antispastic drug post stroke used when the patients liver function tests maybe abnormal or they may not have responded to tizanidine, Initiation, titration and repeat prescription	

Side-effects(24): drowsiness, fatigue, dizziness, dry mouth, nausea, gastrointestinal disturbances, and a reduction in blood pressure.

Side-effects(25): Sedation, confusion, dizziness, headache, insomnia, euphoria mood, depression, muscular weakness.

Medications - antidepressants

No.	Drug	Route	Indications	Evidence
25	Citalopram Cipramil 10 – 40mg	PO	First choice SSRI (selective serotonin reuptake inhibitor) for the treatment of anxiety and depression post stroke. Initiation, titration and repeat prescription.	NICE 2008
26	Mirtazepine Mirap 7.5 –15 mg Zispin	PO	First choice antidepressant for Primary Intracerebral haemorrhage due to the risk of bleeding associated with SSRI's. Can also be prescribed when an antidepressant with a sedative effect is required. Initiation and titration at 2 weekly intervals.	

Side-effects (26): nausea, somnolence, dry mouth, hyponatraemia.

Side-effects (27): Increase in appetite, dizziness, drowsiness.

Lifestyle

- **Stop smoking (? 35% relative risk reduction*)**
 - individualised approach(± pharmacological agents, psychological support)
- **Regular exercise –(24% relative risk reduction*)**
 - to slight breathlessness, 20-30 min daily
- **Moderate alcohol intake – (? 20% relative risk reduction*)**
 - ≤ 3 units per day for men and ≤ 2 units per day for women
- **Healthy diet**
 - ≥ '5 a day' fruit and veg, 2 fish portions per week(one oily), low fat dairy products, reduce meat intake
- **Target weight**
 - advice, support and exercise
- **Restricted salt intake**
 - avoid adding to food, minimise in cooking, choose lower sodium/ salt foods

The Irish Times - Tuesday, September 13, 2011

Patients benefit from nurse prescribing

MICHELLE McDONAGH

PATIENTS HAVE improved access to medication and are sticking to their medication regimes better since the introduction of nurse prescribing in Ireland, a new survey reveals.

The research, carried out by the School of Nursing and Midwifery at University College Cork, shows that nurse prescribing has been an innovative and welcome addition to the role of the Irish nurse, which has led to an improvement in patient satisfaction.

To date, 631 nurses and midwives have undertaken the HSE-funded nurse prescribing programme nationally. They are employed in 78 different clinical areas from primary to tertiary care within the health service.

The first cohort of qualified nurse prescribers in Ireland was registered in January 2008.

Prospective nurse prescribers must complete an approved six-month course and adhere to a set of practice standards and competencies for prescribing.

Rena Creedon, nurse prescribing programme co-ordinator at UCC, said: "Nurse prescribing is in its infancy in Ireland, however, professional boundaries are already being redefined with nursing roles having an ever increasing responsibility."

Nurses surveyed reported that being able to prescribe was a great benefit, particularly for patients with chronic disease and pregnant women.

One of the main barriers identified by the survey participants was the extra administration load associated with nurse prescribing.

The survey results were presented at an interdisciplinary conference on nurse and midwife prescribing hosted by the Departments of Nursing, Pharmacy and Medicine and the College of Medicine and Health at UCC on Friday last.