



**Senate Economics
References
Committee Inquiry**

'The indicators of, and
impact of, regional
inequality in Australia'

A call to action

This year, more than 56,000 Australians will suffer a stroke – many of these strokes will be experienced by regional and rural Australians.¹ In fact, regional and rural Australians are 19 percent more likely to suffer a stroke than their city counterparts¹, and are also more likely to die from stroke or be left with a serious disability.

Yet stroke can be prevented, it can be treated and it can be beaten.

Federal and State and Territory Governments have an opportunity to vastly improve access to stroke treatment and support for all Australians. Governments can provide all Australians a fair go at surviving stroke, avoiding disability and living well after stroke.

Actions outlined in this submission will save the lives of Australians and in turn reduce stroke's burden on our community and health system.

Unless action is taken, it is estimated that by 2050 the number of strokes experienced by Australians will grow to more than 132,000 annually, and there will be more than 1 million stroke survivors living in the community – many of them in regional Australia.¹

A concerted national approach is needed to ensure evidenced-based stroke treatment and care is available to all Australians.

As the voice of stroke in Australia, the Stroke Foundation welcomes the Senate Economics References Committee Inquiry into 'The indicators of, and impact of, regional inequality in Australia'. This submission addresses the following Terms of Reference:

- d) Infrastructure
- g) Enhancing local workforce skills
- j) Innovation
- l) Any other related matters

The Stroke Foundation calls on the Federal and State and Territory governments to commit to action that will save lives.

What is a stroke?

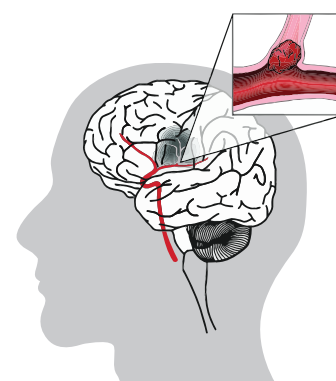
Stroke attacks the brain – our most vital organ. A stroke occurs when blood supply to the brain is cut off because of a clot blocking an artery (an ischaemic stroke) or due to a burst artery (haemorrhagic stroke). When blood supply to the brain is blocked brain cells begin to die at a rate of 1.9 million a minute.²

Every stroke is different depending on where in the brain it strikes and how severe it is. What is common is the devastation it can cause the survivor, their carer and family.

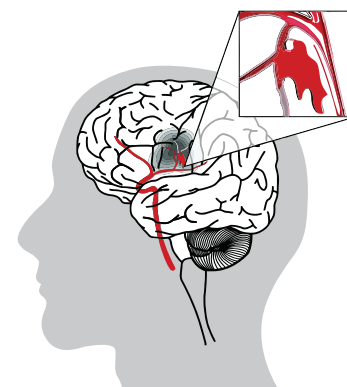
The impact of stroke

Stroke is a leading cause of disability for Australians, placing a significant burden on the community, health system and economy. Consequences of stroke can include:

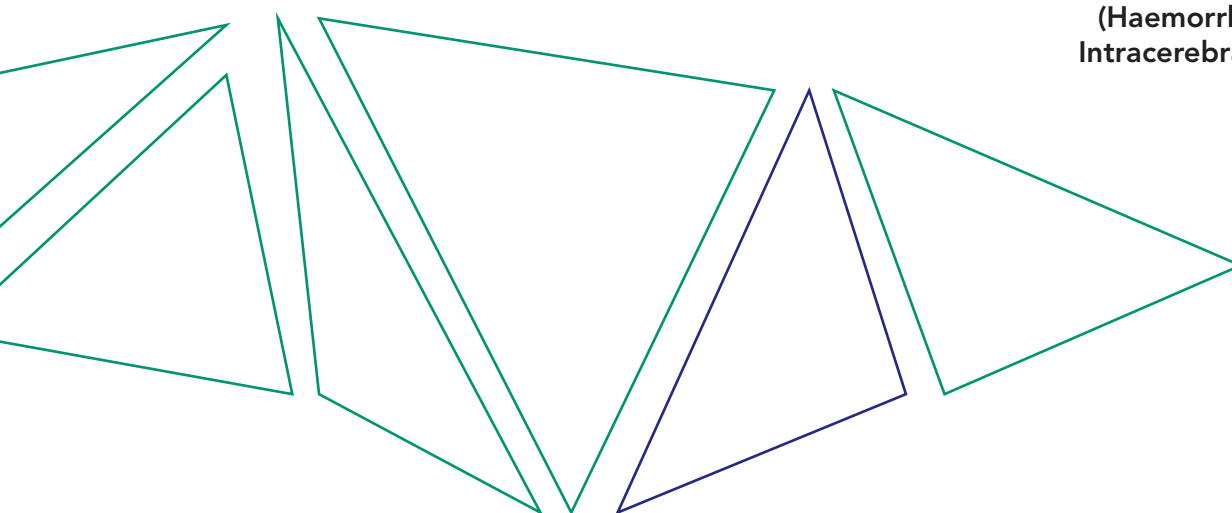
- › Weakness or paralysis of the face, arm or leg.
- › Blurred vision or loss of vision.
- › Difficulties communicating, speaking or understanding.
- › Difficulty with memory and thinking.
- › Problems completing everyday activities such as dressing and eating.



Clot
(Ischaemic stroke)



Bleed
(Haemorrhagic or
Intracerebral stroke)



The economic impact of stroke

A Deloitte Access Economics study commissioned by the Stroke Foundation to investigate the economic impact of stroke in Australia, estimated that the total financial costs of stroke in Australia were \$5 billion in 2012.³ It is important to note that at this time Australians experienced 49,000 strokes per year and there were around 420,000 stroke survivors in the community, this number has since increased. The largest cost component was productivity costs (\$3 billion), while health costs also presented a significant cost at \$881 million. Carer costs were estimated to be \$222 million.³

Largely reflecting productivity costs, individuals bear the greatest financial burden of stroke (\$2.2 billion in 2012).³ The Federal Government bore \$1.5 billion of the costs, or \$3,507 per person, while State Governments bore \$233 million, families and friends bore \$67 million, and employers bore \$407 million.³

There are currently approximately 142,500 Australian stroke survivors who are of working age (between 18 and 65 years), and increasing rates of young or working age stroke have been observed internationally⁴, thought to be due at least in part, to an increase in modifiable risk factors such as hypertension, diabetes and obesity. Importantly, health and social care services are not well set up to deal with younger stroke survivors. As a consequence, many are returning home without the necessary follow-up therapy and support needed to resume everyday life, including returning to work.

This comes at a significant cost, not only to the individual, but to their family, health and social care services, and the economy as a whole.

It was estimated that in 2012, the cost of lost earnings caused by reduced employment due to stroke in people of working age in Australia was \$975 million.³ In addition, the cost of absenteeism and lost home production due to stroke was estimated to be \$1.14 billion, while the cost of presenteeism (lower productivity while at work) was estimated to be \$0.7 billion.³

New, innovative models of care are needed in order to enable more patients to survive, avoid significant disability and live well after stroke, thus reducing the burden on individuals, their families, the community and the health system, and increasing productivity and cost savings.

The over representation of stroke in regional Australia

Regional Australians are 19 percent more likely to suffer a stroke than those in metropolitan areas.¹

Statistics have shown the further people live from major Australian cities, the poorer their health and the lower their life expectancy.⁵ Communities living in regional areas are over represented in part, due to an aging population.

These figures are disturbing, yet echo a widespread issue of health inequality across Australia.

Hospitals with specialist staff and stroke units are proven to deliver improved outcomes for survivors, but due to the small numbers of patients treated for stroke, many rural hospitals do not have stroke units or specialist treatment and care teams.

Many stroke specialists, who play an essential role in diagnosing and treating stroke, work predominantly in metropolitan areas.

Treating stroke

Stroke is a serious medical emergency requiring urgent medical attention, but with the right treatment at the right time, many people are able to recover.

'Time is brain' therapies

Approximately 80 percent of strokes are caused by a blood clot that blocks a blood vessel in the brain (ischaemic stroke).⁶ There have been significant advances in stroke treatment that have improved survival and reduced disability. These treatments are time critical and can only be provided within the first few hours of a stroke. The earlier treatment is delivered, the better the outcomes for patients.

- › Thrombolysis (clot dissolving treatment) must be delivered within the first 4.5 hours of stroke symptoms occurring. Thrombolysis involves administering a drug which can break down and disperse a clot that is preventing blood from reaching the brain.⁷
- › Endovascular thrombectomy (removal of a clot by retractable mechanical device) is generally administered within six hours of stroke symptoms occurring.⁸ A large clot blocking a vessel is removed via an artery (intra-arterial approach) and has been shown to be highly effective. New research now entering stroke guidelines has shown this treatment is also beneficial up to 24 hours after symptom onset in selected patients.^{9, 10} Endovascular thrombectomy requires highly specialised teams and is restricted to major metropolitan hospitals. However, the expanded time window increases the potential access to this therapy for rural patients.

Stroke unit care

Building on time critical treatment, access to a stroke unit is proven to save lives and reduce disability caused by stroke. Stroke unit care is characterised by provision of care in one location by an interdisciplinary team including medical, nursing and allied health professionals (occupational therapists, physiotherapists, speech therapists, speech pathologists, social workers and dieticians) with expertise in stroke.

Regional inequality of access to best-practice stroke treatment

Surviving and living well after stroke should not be determined by your postcode.

Currently, regional and rural Australians have limited access to 'time is brain' therapies and it is costing lives and devastating families.

The 2017 Stroke Foundation Acute Audit found that among the 127 Australian hospitals that participated (including 45 regional and one rural)¹¹:

- › **53 percent of regional hospitals offered thrombolysis as an acute stroke treatment 24/7, compared with 83 percent of metropolitan hospitals.**
- › **47 percent of patients received stroke unit care compared to 77 percent of metropolitan patients.**

Too many patients are missing out on best-practice care because of where they live.

It is not practical to expect all hospitals to have dedicated onsite stroke specialist services. Some may only have a small number of stroke admissions, but all patients need and deserve access to best-practice stroke care.

The 2015 Acute Stroke Services Framework recommends all patients with suspected stroke be transported to a hospital with a stroke unit. Smaller services need appropriate systems to rapidly screen and transfer patients with stroke to the nearest dedicated stroke unit or where access to time critical treatments is available.

Case study

Stephen and Tracey Ward, regional New South Wales

Stephen Ward is a well-regarded member, and councillor, in the Muswellbrook community. Stephen suffered a stroke when he was 48. His wife Tracey knew the signs of stroke. Stephen had lost his speech and could not lift his right arm. Tracey dialled 000 immediately. The paramedics thought Stephen was too young to have a stroke and took him to Muswellbrook hospital, which at the time did not have a CT (computed tomography or “CAT”) scanner. Normally, local patients utilised a private CT machine locally, but as it was the weekend the provider was closed. The team at Muswellbrook hospital knew immediately that Stephen had suffered a stroke, but they could not confirm the type of stroke and thus provide appropriate treatment.

Time was ticking and brain cells were dying.

The Westpac Rescue helicopter was called to take Stephen to John Hunter Hospital, a large regional hospital with specialised stroke services, for treatment; however, a motorcycle accident delayed Stephen’s transfer.

Stephen continued to wait – more time, more brain.

By the time Stephen arrived at John Hunter Hospital, it was too late for ‘time is brain’ therapies.

In the days after the stroke Stephen suffered multiple life threatening complications, spending four weeks in intensive care, six weeks on the stroke ward and another six months in rehab.

“The one thing I always remember is the doctor in charge in ICU saying it took us too long to get to the stroke unit,” Tracey said. “I remember asking how rural patients were supposed to get to hospital in time.”

Stephen has been left with physical, communication and some cognitive deficits (fatigue and memory). Stephen is in a wheelchair, however, can walk with a cane for short distances. Prior to his stroke, Stephen was an engineer. Today, he is learning to read and write again by sharing books with his young son Patrick, 6.

“We need to make it better for regional and rural people because we deserve the same treatment as those in the city.”

Tracey Ward, wife and carer to stroke survivor Stephen and regional Australian.



The solution:

An Australian Telestroke Network (ATN)

Innovative new technologies provide an opportunity to ensure regional and rural Australians have the same access to evidence-based stroke treatment and care as those living in the city. Telehealth will break-down geographical barriers to treatment and care, saving lives and reducing stroke's burden on the health system and economy.

Telemedicine for stroke (telestroke)

Telemedicine for stroke (telestroke), in which patient-practitioner consultations are undertaken using audio-visual technology rather than face-to-face interactions, has been in use since the 1990s. This model of care delivers people living in rural and regional areas the opportunity to quickly access stroke specialists who can correctly diagnose stroke. It also supports clinicians on the ground to administer time critical thrombolysis treatment or arrange a transfer to a comprehensive stroke centre for endovascular thrombectomy treatment.

Extensive telestroke networks, typically consisting of a stroke centre 'hub' servicing a number of 'spoke' hospitals, have been established (and are working well) in Europe and North America. There is now strong evidence to show stroke telemedicine can help address disparity in access to acute stroke care between regional and metropolitan areas, increasing access to assessment by specialist stroke physicians and neurologists. This in turn increases timely access to clot busting treatment^{7, 12, 13}, and the identification of patients to be transferred to another hospital for clot removal treatment. As a consequence, patients assessed by stroke telemedicine are less likely to require transfer to other hospitals to receive specialist care, and are more likely to return home without significant disability.^{12, 13}

International studies have indicated telestroke networks are cost-effective from a long-term, societal perspective¹⁴⁻¹⁶, with the initial costs required to establish the service balanced over the longer term by the reduced need for rehabilitation and advanced nursing care when there is increased use of thrombolysis.

Despite the successful implementation of telestroke networks internationally, the adoption of this model of care in Australia has been limited.

Victorian Stroke Telemedicine Program

A comprehensive telestroke service has been delivering stroke care in Victoria for the last eight years. It was the first of its kind in Australia. The Victorian Stroke Telemedicine (VST) Program began in 2010, as a single-site 12-month pilot project. The objective of the Program was to develop an effective and sustainable model of stroke telemedicine for regional hospitals in Victoria, providing them with access to a network of neurologists. The Program was successfully scaled up, initially to four sites, and eventually to 16 sites (Figure 1).¹⁷ In April 2018, the program delivered a record 150 consultations during the month.



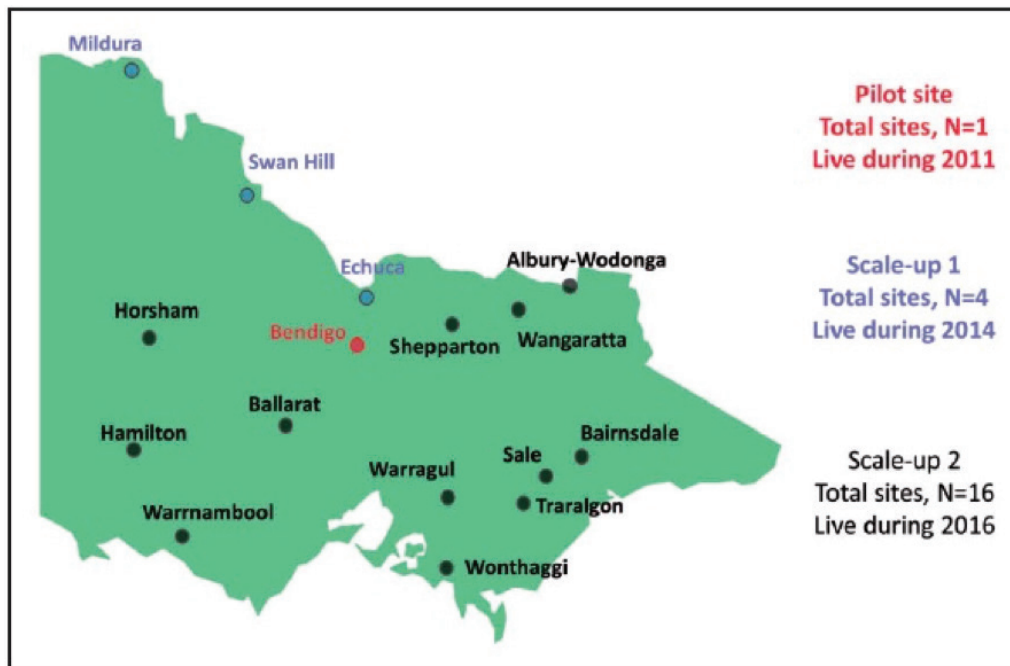


Figure 1 – Scaling of the Victorian Stroke Telemedicine Program between 2011 and 2016¹⁷

The Program links regional hospitals to an on-call roster of neurologists employed at different metropolitan hospitals. These stroke specialists provide immediate telemedicine consultations to patients with suspected stroke who present to the emergency department. The service, which is available 24 hours per day, seven days a week, 365 days a year, involves the regional doctor calling a single telephone number to access a neurologist who may then decide to proceed with a video consultation, review brain imaging and provide treatment advice.

The VST Program has demonstrated the ability to facilitate rapid clinical decision-making and treatment of stroke by seamlessly connecting regional emergency departments to a roster of metropolitan based neurologists. The program utilises innovative technology to break down barriers to best-practice, time-critical stroke treatment.

Major achievements of the VST Program to date include:

- › More than 3000 initial consultations performed.
- › More than 450 patients identified as meeting the criteria to receive thrombolysis.
- › More than 120 patients referred for endovascular clot retrieval.
- › 30 minute reduction in door-to-needle time (the crucial delay from emergency department arrival to thrombolysis that is directly linked to patient outcomes).
- › 23 percent increase in patients with acute stroke treated with thrombolysis within 4.5 hours of symptom onset.
- › 130 percent increase in patients with acute stroke treated within 60 minutes of arrival in hospital.¹⁸

Ongoing funding has been secured and the VST Program is now run by Ambulance Victoria as a clinical service, providing regional hospitals with access to stroke specialists as healthcare business-as-usual. The service will be expanded to include a 17th regional hospital at Werribee in mid-2018.

Research indicates that the benefits of the VST Program extend beyond the direct patient and clinician involved in the clinical consultation, and the diagnosis and treatment of acute ischaemic stroke, and include¹⁹:

› ***Improved care coordination***

Participation in the VST program provided regional hospitals an opportunity to review and update their stroke protocols and procedures in line with the latest evidence.¹⁹ A key element of the stroke telemedicine service was the employment of a hospital-based project co-ordinator, a role which facilitated improved stroke care coordination within the hospital, as well as an interdisciplinary approach to stroke management, which included ambulance paramedics, the emergency department, medical imaging, medical wards, information technology departments and health information services.¹⁹

› ***Enhanced policy-making by Government***

The Victorian State Government has drawn on the infrastructure that has been established as part of the VST program, including personnel, technology and links to metropolitan neurologists and hospitals, in order to facilitate timely access to cutting-edge acute stroke treatments for all Victorians, with the first state-wide protocol for endovascular thrombectomy in Australia.²⁰

› ***Capacity building for regional clinicians and hospitals***

Regional clinicians learn how to perform neurological assessments, identify stroke mimics and manage patients with haemorrhage and transient ischaemic attack, and are able to share this expertise with their colleagues, building capacity and competence.¹⁹

› ***Increased awareness of the signs and symptoms of stroke in regional communities***

Failure to act when symptoms arise is widely acknowledged as a significant factor in stroke treatment delay, and currently only one-third of Australians can recognise the three key signs of stroke. In regional communities where patients have benefitted from the services provided by the VST program, these success stories have often been covered in the local media, with articles highlighting the 'Face, Arms, Speech, Time' (F.A.S.T.) message promoted by the Stroke Foundation to increase public awareness of stroke symptoms.¹⁹

Benefits and learnings delivered by the VST Program have extended beyond stroke to other clinical areas, ensuring better delivery of healthcare services in regional Victoria.



Case study

Damian O'Brien, regional Victoria²¹

Damian O'Brien, a diesel mechanic from Traralgon in the West Gippsland region of Victoria, had his stroke at the age of 22. The ruckman for Hill End was coming towards the end of an evening training session when a friend noticed that his face had dropped and his speech was slurred. Recognising the F.A.S.T. (Face, Arms, Speech, Time) signs of stroke, his friends at the club dialled 000.

Unable to feel the left side of his body, he arrived at the Latrobe Regional Hospital (a Victorian Stroke Telemedicine Program site), underwent a CT scan and was assessed by a neurologist in Melbourne via videoconference, before being administered a clot-busting drug. Doctors thought that the drug had only a 40 percent chance of dissolving the large clot in Damian's brain.

Damian was transported to the Royal Melbourne Hospital for the clot-retrieval procedure, but the procedure was not required as, fortunately for Damian, the drug had dissolved the entire clot. Within 24 hours he had regained movement in his left side.

"I could move my leg, I could move my hand, I had full strength back", he said.

"That was amazing. I didn't think I was going to be able to do that straight away. I was very relieved."

One month after his stroke, Damian had made a remarkable recovery, having returned to work and resumed driving. While he was unable to return to football that season, he said he was "feeling great" and was "just keen to get back into everything".

"He's had pretty much complete resolution of his signs and symptoms, which is just remarkable."

Emma Marino, Victorian Stroke Telemedicine coordinator at Latrobe Regional Hospital.



Australian Telestroke Network (ATN)

Currently, a business case is being developed, detailing the costs and benefits of implementing an ATN.

This work is a collaborative initiative between the Victorian Stroke Telemedicine Program Consortium (Monash University, Deakin University and The Florey Institute of Neuroscience and Mental Health) and the Australian Stroke Coalition, an association established by the Stroke Foundation and Stroke Society of Australasia bringing together representatives from organisations working across the stroke care continuum, including clinical networks from each of the States and Territories.

This fully costed ATN proposal will be submitted for consideration by the COAG Health Council in 2018.

An Australian Telestroke Network will reduce inequalities in access to best practice stroke care between regional and metropolitan areas by:

- › Ensuring rapid assessment and diagnosis of suspected stroke patients in regional areas by metropolitan-based stroke specialists.
- › Ensuring regionally-based clinicians are supported 24/7 to administer thrombolysis (clot busting) treatment and/or arrange a transfer to a comprehensive stroke centre for endovascular thrombectomy (clot removal).
- › Enabling more stroke patients in regional areas to survive, avoid significant disability and live well after stroke, reducing the burden on individuals, their families, the community and the health system, increasing productivity and strengthening our economy.
- › Improving stroke care coordination within regional hospitals.
- › Building capacity of regional clinicians and hospitals.
- › Increasing awareness of the F.A.S.T. signs and symptoms of stroke in regional communities.

Conclusion

Federal and State and Territory Governments have an opportunity to vastly improve access to stroke treatment and support for all Australians. Governments can provide all Australians a fair go at surviving stroke, avoiding disability and living well after stroke.

Actions outlined in this submission will save the lives of Australians and in turn reduce stroke's burden on our community and health system.

Where you live should not impact your access to emergency stroke treatment and evidence-based care in a stroke unit.

Stroke is a medical emergency requiring urgent medical attention, but with the right treatment at the right time, many people are able to recover. Recent advancements in 'time is brain' therapies have saved lives and reduced disability in stroke survivors.

Currently, only a limited number of Australians have access to time-critical treatments and it is costing lives and devastating families. Only 13 percent of eligible stroke patients receive time-critical clot-busting treatments which reduce disability.

The current divide between the haves and have nots in metropolitan and regional areas is extremely concerning, particularly when we know regional Australians are 19 percent more likely to suffer a stroke than their city counterparts.

It does not have to be this way.

Recommendation

The Federal and State and Territory Governments to improve access to best-practice, life-saving, disability-reducing stroke treatment for rural and regional Australians by implementing an innovative Australian Telestroke Network.

The Australian Telestroke Network will be a model for telemedicine in Australia, which will be able to be adopted by other clinical specialties aiming to address the disparity in access to specialist health services between regional and metropolitan areas.

An Australian Telestroke Network aligns with government policy priorities

The ATN initiative addresses the following guiding principles that have been identified to enable the successful prevention and management of chronic conditions, and form part of the National Strategic Framework for Chronic Conditions:

- › Equity – All Australians receive safe, high-quality healthcare irrespective of background or personal circumstance.
- › Collaboration and partnerships – Identify linkages and act upon opportunities to cooperate.
- › Access – High standard, appropriate support and services are available, accessible, equitable and affordable for all Australians.
- › Evidence-based – Rigorous, relevant and current evidence informs best practice and strengthens the knowledge-base to effectively prevent and manage chronic conditions.
- › Person-centred approaches – The health system is shaped to recognise and value the needs of individuals, their carers and their families, to provide holistic care and support.
- › Sustainability – Strategic planning and responsible management of resources delivers long-term improved health outcomes.

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Stroke in Australia

2050:
1 million
stroke survivors







growing to
132,500
new strokes each year

+56,000
new strokes each year

2017:
stroke survivors =
475,000



How to get more involved

-  **Give time** – become a volunteer.
-  **Raise funds** – donate or hold a fundraising event.
-  **Speak up** – join our advocacy team.
-  **Leave a lasting legacy** – include a gift in your Will.
-  **Know your numbers** – check your health regularly.
-  **Stay informed** – keep up-to-date and share our message.

Contact us

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