

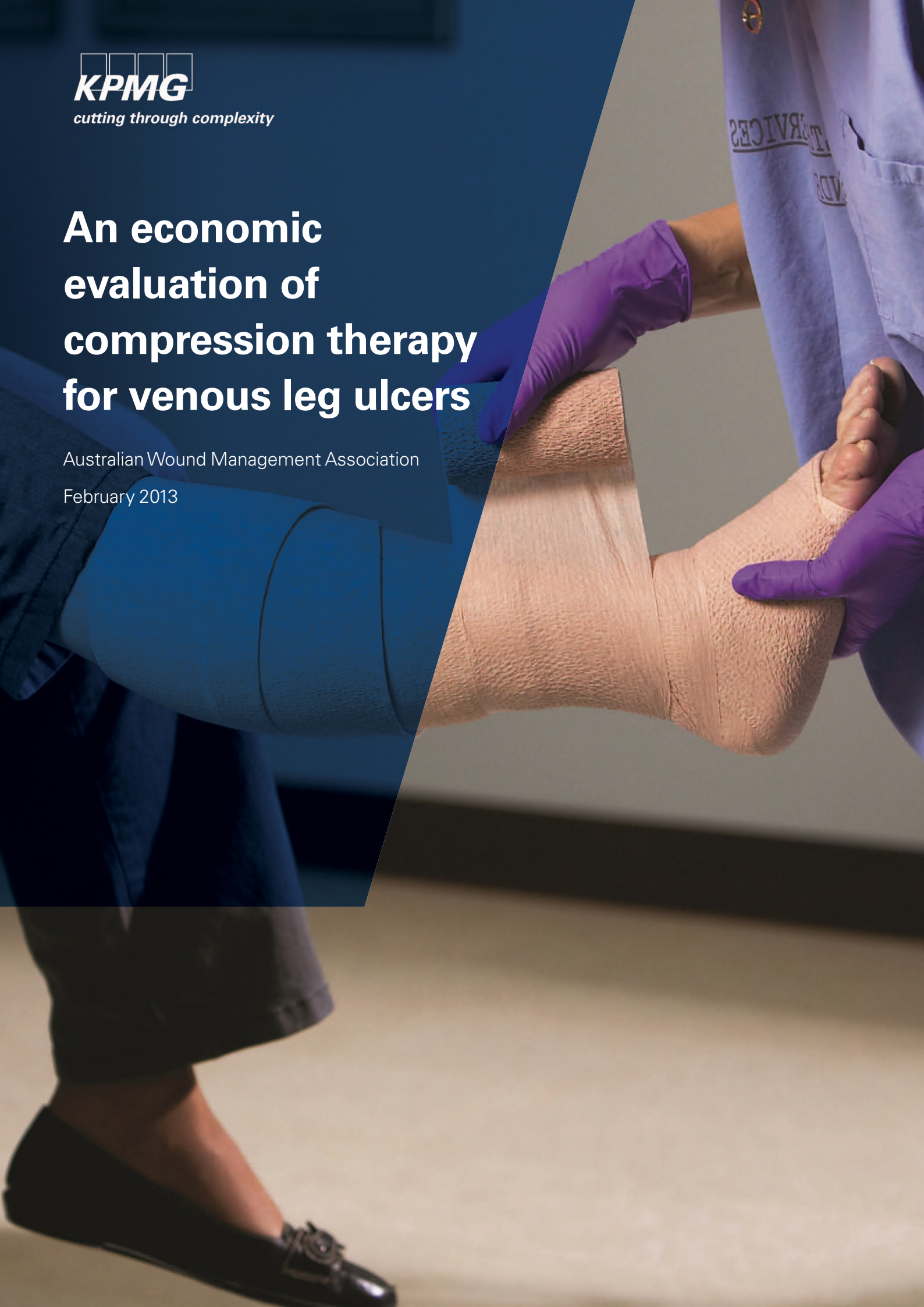


*cutting through complexity*

# **An economic evaluation of compression therapy for venous leg ulcers**

Australian Wound Management Association

February 2013



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### **Inherent Limitations**

This report has been prepared as outlined in the Scope Section. The services provided in connection with this engagement comprise an advisory engagement which is not subject to Australian Auditing Standards or Australian Standards on Review or Assurance Engagements, and consequently no opinions or conclusions intended to convey assurance have been expressed.

The findings in this report are based on qualitative and quantitative data and the reported results reflect a perception of the Australian Wound Management Association but only to the extent of the sample surveyed, being the Australian Wound Management Association approved representative sample of stakeholders. Any projection to the wider stakeholders, such as similar wound management organisations is subject to the level of bias in the method of sample selection

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by, the Australian Wound Management Association project management team, the representative sample of stakeholders, and peer reviewed literature consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

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# Contents

Acronyms	i
Contents	iii
Executive summary	1
1 Introduction	3
1.1 Objectives	3
1.2 Scope	3
2 Compression therapy for VLUs	4
2.1 Background	4
2.2 VLU treatment pathways	5
2.3 Compression therapy for VLUs	6
3 Data review	7
3.1 Methodology	7
3.2 Data review	8
3.3 Internet survey	9
3.4 Follow-up consultations	12
4 Cost effectiveness analysis	14
4.1 The model	14
4.2 Model inputs	17
4.3 Results	24
4.4 Sensitivity analysis	27
4.5 Scenario analysis	35
References	39
Appendix A: Internet survey questions	41
Appendix B: Hospital admissions for VLU	51

# Executive summary

The *Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers* recommends compression therapy (CT) of venous leg ulcers (VLUs) (the Guideline) (Australian Wound Management Association and New Zealand Wound Care Society 2011). Compression therapy for VLUs involves a regime of specialised compression stockings, bandages and dressings to address circulatory problems associated with VLUs. The Guideline recommendations are in line with other countries, notably the UK, where prescriptions are available to assist in the purchase of compression stockings and bandages.

The point prevalence of VLUs is estimated to be around one per cent of Australians over 60 years of age (Briggs & Closs 2003).<sup>1</sup> This equated to about 42,620 people over 60 years of age in 2012 (ABS 2012a; ABS 2008; KPMG calculations). Treatment and complications arising from VLUs require significant medical resources (Smith & McGuinness 2010). In addition, the incidence of VLUs is expected to increase due to ageing of the population and increased longevity, which will contribute further to the health expenditure needed for VLU therapy.

VLUs are treated by a range of providers including general practitioners (GPs), medical specialists, community nurses, in hospitals through outpatient wound clinics or as admitted patients for VLU complications. Patients are sometimes charged fees for CT consumables which can be expensive depending on patient income and on the frequency of treatment.

Current practice with respect to patients' out-of-pocket payments (OPP) for CT is ad hoc. Hospital care tends to cover the cost of consumables but some outpatient clinics may charge a fee. GPs often charge patients for medical consumables or require patients to purchase them at retail pharmacies. Some community care programs charge OPP for consumables and some do not.

The Australian Wound Management Association (AWMA) is concerned that the Guideline recommendations on CT may be difficult to implement if the treatment is not adhered to due to affordability. AWMA engaged KPMG to undertake an economic evaluation on the cost effectiveness of CT for Australia's states and territories and nationally to support a business case for funding support for CT products.

The scope of the project included:

- undertaking a cost effectiveness analysis to understand the costs and benefits of CT for VLUs in Australia, which would take account of, where data availability permits, costs and benefits experienced by both patients and government funding bodies. These may potentially include:
  - benefits associated with reduced:
    - wound healing time for patients;
    - primary health care costs from treating nurses and GPs; and
    - hospital care costs associated with treated but unhealed VLUs.
  - costs associated with:
    - administration of CT to patients; and
    - government funding to subsidise CT for VLUs.
- undertaking sensitivity testing of key assumptions which underpin the analysis in order to more effectively understand the potential viability of expanding CT for VLUs in Australia.

The project was undertaken in three distinct stages, including:

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<sup>1</sup> Point prevalence refers to the number of people affected at a given point in time.

- an analysis of VLU and CT practices in Australia to determine data gaps and guide the construction of the economic evaluation model;
- an Internet survey and follow-up consultations with AWMA state representatives to gather data to construct the economic evaluation model; and
- the economic evaluation modelling and sensitivity testing.

Results from the Internet survey provided data on some but not all aspects of VLU treatment in Australian jurisdictions. It was necessary to check the validity of responses due to the limited number of responses for some questions. This was done by:

- cross-checking responses with information obtained from AWMA representatives during targeted consultations following the survey; and
- comparing healing times for CT and non-CT with rates in published studies.

Information collected within the Internet survey and follow-up consultations suggest the following:

- VLU treatment involves a variety of treatment provider arrangements across jurisdictions, with over a dozen arrangements identified;
- patients are more likely to pay for consumables when VLU care is provided by a GP, with a range of 60 per cent to 100 per cent of consumable costs paid for by patients in GP clinics across Australian jurisdictions;
- community care included the cost of consumables in the majority of jurisdictions except in Victoria and Queensland;
- most VLU treatment is provided by community care nurses in all jurisdictions, with the exception of Queensland where only three per cent of VLU care is community care based;
- CT is most often used by community nurse based care, with rates of CT use ranging from 17 to 100 per cent across jurisdictions; and
- GPs had the lowest rates of CT use, ranging from zero per cent to 50 per cent.

Limited data was available on healing times for CT and non-CT, requiring healing time assumptions to be based on evidence from the peer reviewed literature.

The economic evaluation calculated results by jurisdiction. CT was found to be cost effective compared to non-CT across all jurisdictions with the weighted average expected saving per patient treated with CT instead of non-CT estimated at \$6,328.

A scenario analysis was undertaken using the assumption of 100 per cent use of CT for VLU. Estimates of annual savings, assuming 100 per cent use of CT, indicate total savings at the national level at \$166.0 million in 2012-13. NSW accounted for the majority of these savings, at \$74.5 million in 2012-13. Assumptions on willingness to use CT and costs associated with training and promotion of CT were not included in the scenario analysis.

It is estimated that VLU patients over 60 years of age pay about \$27.5 million in out-of-pocket costs for consumables per year. It is estimated that the annual cost of out-of-pocket consumables could be reduced by \$10.5 million in 2012-13 assuming 100 per cent use of CT.

A sensitivity analysis was undertaken to estimate the impact of key inputs on the results of the economic analysis. The sensitivity analysis showed that either increased healing time for non-CT or reduced healing time for CT increase the difference in the average costs for CT and non-CT.



# 1 Introduction

The Australian Wound Management Association (AWMA) has engaged KPMG to estimate the cost effectiveness of compression therapy (CT) for venous leg ulcers (VLUs) in Australia. This section outlines the objectives and scope of the project and structure of the report.

## 1.1 Objectives

The objective of the project was to determine the net benefits from CT for VLUs within Australia and within each state and territory. The purpose was to enable the AWMA to better understand the cost effectiveness of CT in Australia and explore opportunities to expand the affordability of CT for VLUs with government.

## 1.2 Scope

This report has been prepared according to the agreed scope of the project. The project scope included:

- undertaking a cost effectiveness analysis to understand the costs and benefits of CT for VLUs in Australia, which would take account of, where data availability permits, costs and benefits experienced by both patients and Government funding bodies. These may potentially include:
  - benefits associated with reduced:
    - wound healing time for patients;
    - primary health care costs from treating nurses and general practitioners (GPs); and
    - hospital care costs associated with untreated VLUs.
  - costs associated with:
    - administration of CT to patients; and
    - government funding to subsidise CT for VLUs.
- undertaking sensitivity testing of key assumptions which underpin the analysis in order to more effectively understand the potential viability of expanding CT for VLUs in Australia.

## 2 Compression therapy for VLUs

This section provides a background on CT for VLUs in Australia. It reviews current issues surrounding the further adoption of CT, a description of the types of health care providers delivering treatment for VLUs and a description of CT.

### 2.1 Background

In 2011, the AWMA in conjunction with the New Zealand Wound Care Society (NZWCS) published a Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers (VLU) (the Guideline) (Australian Wound Management Association Inc. and the New Zealand Wound Care Society 2011).

Approved by the Chief Executive Officer of the National Health and Medical Research Council (NHMRC), the Guideline presented a comprehensive review of the assessment, diagnosis, management and prevention of VLUs within the Australian and New Zealand health care context, based on the best evidence available up to January 2011. The Guideline provides evidence to support recommendations for the effectiveness of CT in prevention, treatment and non-recurrence of VLUs.

Compression therapy for VLUs involves a regime of specialised compression stockings, bandages and dressings as needed. Recommendations contained within the Guideline are consistent with treatment in the UK, where prescriptions are available to assist in the purchase of compression stockings and bandages. The Guideline indicates that affordability might be an issue for the greater adoption of CT in Australia.

CT for VLUs is considered an effective intervention and a number of RCT studies have also shown that CT is cost-effective (Weller et al. 2012). A large randomised control trial (RCT) of CT published in 1998 by Morrell and others and included in the Cochrane Collaboration review of CT estimated that up to 7 in 10 VLUs heal within 12 months if treated with compression bandaging when reapplied approximately every week (Morrell et al. 1998 and O'Meara 2012). If CT is not used, the patient is expected to experience longer healing times on average and have a lower chance of complete VLU healing.

Currently in Australia, VLU sufferers incur out-of-pocket expenses for CT as associated medical consumables are not subsidised under the Pharmaceutical Benefits Scheme (PBS) or the Medical Benefits Scheme (MBS). It is estimated that patients spend between \$30-\$50 per week for CT.<sup>2</sup> This could be considered a large outlay for a pensioner whose income is approximately \$356 per week (Department of Human Services 2012).<sup>3</sup>

According to Barker and Weller (2010) chronic leg ulcers affect 1.0 per cent of population and 3.6 per cent of the population over 65 years old. Treatment and complications arising from VLUs can lead to large financial outlays by the government. In addition, the incidence of VLUs is expected to increase due to ageing of the population and increased longevity, which will contribute further to the health expenditure for VLU therapy.

The AWMA is concerned that the Guideline recommendations on CT may be difficult to implement if affordability reduces access to CT for VLUs.<sup>4</sup> The AWMA is interested in estimating the cost effectiveness of CT for Australian states and territories and nationally to provide evidence for additional government funding to increase access to CT products.

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<sup>2</sup> Personal communication provided by Associate Professor W McGuiness (AWMA) on 20 August 2012.

<sup>3</sup> The current fortnightly payment rate for a single pensioner is \$712 (Department of Human Services 2012).

<sup>4</sup> Personal communication provided by Associate Professor W McGuiness (AWMA) on 20 August 2012.

## 2.2 VLU treatment pathways

VLUs are mainly caused by poor blood circulation in the leg. An example of a venous leg ulcer is presented in *Image 1*. Other factors may contribute to leg ulcers so diagnosis and treatment is important as CT to address circulatory problems may be inappropriate for some VLUs.

**Image 1: Venous leg ulcer**



Source: 3M.

Research conducted by Finlayson et al. (2012) in Queensland revealed multiple wound treatment pathways including for VLU. Their research found that wound treatment was provided by up to thirteen different types of treatment providers within a twelve month period. For example, in addition to being diagnosed and treated by GPs, VLUs can be diagnosed and treated by medical specialists such as dermatologists and vascular specialists.

Ongoing care can be provided in a GP clinic with a nurse practitioner. Some treatment is also provided in specialised hospital-based outpatient wound clinics involving nursing care overseen by a medical consultant. In other situations, community nurses provide home based or centre-based VLU care. Some people also self care and others have an undiagnosed VLU, which can ultimately lead to a hospital admission for a serious VLU condition.

Each care provider involves different funding and reimbursement arrangements and cost structures. The Commonwealth Medicare Benefits Scheme (MBS) reimburses healthcare provided by GPs and medical specialists. Federal and jurisdictional governments provide funding for hospital based care and community care programs. For example, under the home and community care (HACC) program, community nurses are funded for treating VLUs by the Commonwealth in six out of eight jurisdictions. Victoria and Western Australia are the only two states that still retain funding responsibility for HACC.

Patients also contribute to the cost of VLU care through out-of-pocket payments (OPP) for consumables. Patient's contributions vary by providers. Some GPs will assist with the cost of CT and other VLU consumables, while others may not. Some community care providers will not charge patients for VLU related consumables while some may charge a small co-payment. Public sector outpatient services usually cover the cost of VLU related consumables but privately funded services may not (e.g., in outpatient wound clinics).



## 2.3 Compression therapy for VLUs

The Cochrane systematic review provides evidence of the effectiveness of CT for VLUs (O'Meara et al. 2012). CT for VLUs is the application of specific types of bandaging that apply pressure to veins in order to increase the circulation of blood within the legs, and is accompanied by long term use of compression stockings. This increases ulcer healing better than non-CT.

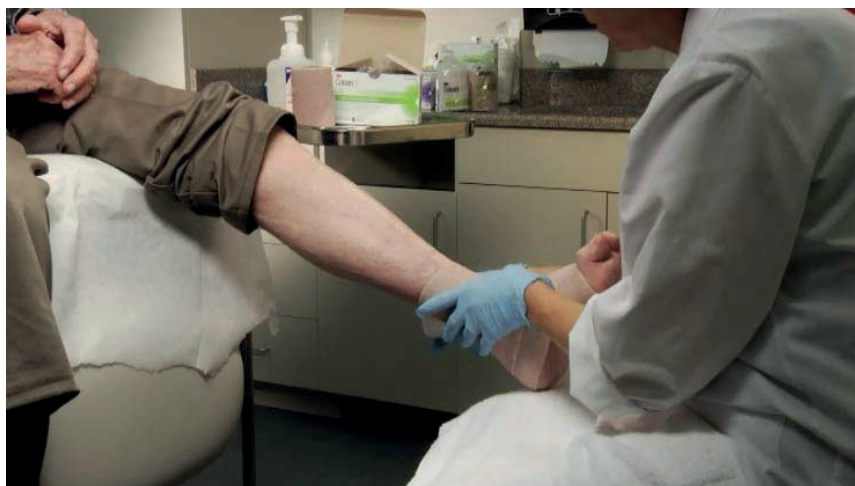
CT cannot be self administered as a high level of skill and knowledge is required to treat VLUs using CT. An example of compression therapy application is presented in *Image 2*.

Products used within CT include:

- multi-component system: two-, three- and four layer bandaging (4LB);
- short-stretch bandages: bandages with minimal or no elastomers and high stiffness (high SSI);
- single-component bandage system; and
- medical-grade compression hosiery, including tubular stockings.

According to the 2005 Evidence-Practice Gaps Report CT is not widely practiced in Australia (National Institute of Clinical Studies 2005). They report that a study conducted in Australia in 1997 found CT was used in 19 per cent of VLU cases. A more current study by Templeton and Telford (2010) also found a wide variation in the treatment of VLUs and CT practices due to a lack of education and training.

**Image 2: Application of compression therapy**



Source: 3M.

# 3 Data review

This section outlines the methodology used to conduct the economic evaluation of CT, including the results of the CT literature review, the Internet survey and follow-up consultation with AWMA state representatives

## 3.1 Methodology

The economic evaluation was informed by consultation with the AWMA project management team. Consultation identified a number of positive benefits associated with CT, however not all could be quantified. Benefits of healed VLUs such as improved mental health and wellbeing and quality of life from greater socialisation are difficult to measure. Quantifiable benefits include:

- reduced wound healing times for patients;
- reduced primary health care costs by treating nurses and general practitioners (GPs); and
- reduced hospital care costs associated with untreated VLU.

Based on the information provided, the average cost to close a wound using CT was estimated and compared to the average cost to close a wound with non-CT. This cost difference was applied to the average annual number of wounds treated to estimate the annual net benefit of using CT for VLU. The analysis was conducted for each jurisdiction to provide estimates of benefits across jurisdictions.

### 3.1.1 Costs and benefits of compression therapy

To conduct an economic analysis of CT, the costs and benefits attributable to CT were identified. Table 3.1 outlines the costs and benefits associated with CT identified in the literature. Comprehensive literature on effectiveness of CT for VLUs has been conducted in other countries that has informed the Guideline, notably the systematic review of CT for VLUs (O'Meara et al. 2012) and the systematic review on CT for preventing VLU reoccurrence (Nelson et al. 2000).

**Table 3.1: Costs and benefits of VLU management using CT**

Costs	Benefits
General practitioner (GP) consultation time associated with VLU diagnosis and management (direct patient time).	Improved VLU management practices.
Community Nurse (CN) time associated with VLU management (direct patient time).	Improved VLU healing times.
CN travel costs associated with VLU management and care.	Reduced number of GP consultations per wound.
Outpatient wound clinic costs associated with VLU management and care.	Reduced CN treatment and travel time (associated with improved VLU healing times).
Cost of consumables associated with VLU care.	Reduced VLU complications requiring hospital admission.
	Reduced reoccurrence of VLU.

Source: KPMG.

Following identification of the costs and benefits, suitable data sources were required to quantify the costs and benefits associated with CT for VLUs and the costs and benefits associated with other types of treatment for VLUs.

## 3.2 Data review

A review was conducted of published literature on VLU prevalence, treatment practices and health system costs, including material provided by the AWMA. Data and information were used to inform the development of the model framework for VLU treatment from the following sources.

- Peer-reviewed published literature on VLU.
- Australian Demographic Statistics (ABS 2012a).
- Australian Hospital Statistics 2010-11 (AIHW 2012a).
- Health Expenditure Australia 2010-11 (AIHW 2012b).
- Surveys of, AWMA members across Australia, most of whom were registered nurses frequently administering treatment for VLUs.

### ***VLU prevalence literature***

A review of the VLU prevalence literature by Briggs and Closs (2003) indicated that 1-2 percent of the population will suffer from chronic leg ulceration. Baker and Stacey (1994) estimated the point prevalence of VLUs (those with an active leg ulcer) for Australia at 0.1 per cent of the general population, with over 90 per cent being over 60 years. The same study showed a nearly 5 fold increase in prevalence of VLUs between the 50-59 age group and the 60-69 age group (Baker & Stacey 1994). Briggs and Closs (2003) estimate that the number of people over 60 years old with an active VLU (or point prevalence) ranged between 0.95 per cent and 1.4 per cent.

### ***Cost effectiveness literature***

Cost effectiveness research on CT is available in the international literature (O'Meara et al. 2012; Weller et al. 2012). Cost effectiveness research has resulted in the public funding for CT in the UK since the 1990s. This literature was consulted to inform inputs on healing times for CT and non-CT treatment.

### ***Reference population***

Jurisdiction level population data on the population over 60 years of age for 2011 were sourced from the Australian Demographic Statistics (ABS 2012a). Population growth rates between 2011 and 2012 for the population over 60 years from Series B of the ABS Population Projections (ABS 2008) were applied to estimate the population over 60 years as at June 30 2012.

### ***AIHW National Hospital Morbidity Database (NHMD)***

Hospital separations for Diagnostic Related Groups (DRGs) related to lower leg ulcers were extracted for 2009-10 from the NHMD (AIHW 2012a). These were used to determine the national number of VLU complications requiring hospitalisation. The results of the data extraction are provided in Appendix B. 2009-10 separation data were adjusted to 2012-13 using the average growth in all hospital separations published by AIHW (AIHW 2012b).

### ***AIHW hospital separations and expenditure data***

Hospital separation costs across Australian jurisdictions were based on data published for 2010-11 by the Australian Institute of Health and Welfare (AIHW) (AIHW 2012b). AIHW's ten year annual average health inflation data was used to estimate the cost per separation in 2012-13 dollars (AIHW 2012c).

### ***Independent Hospital Pricing Authority (IHPA) hospital costs***

Outpatient costs for wound treatment were based on the national efficient hospital price information recently prepared by IHPA (IHPA 2012). The weights provided for Tier 2 Clinic wound management (code 40.13) were used. The national efficient price is a derived measure of efficient cost and may not reflect the true cost across jurisdictions.

### 3.3 Internet survey

Many of the data required to analyse the cost effectiveness of CT at a jurisdiction level were not available in existing literature or publicly available reports. In particular, capturing variations in treatment settings across jurisdictions required specific input from practitioners.

A survey was developed in consultation with the AWMA to gain a better understanding of treatment variations across jurisdictions. A copy of the survey is provided in Appendix A.

The survey was administered to AWMA members via the Internet. The survey was designed to capture information on:

- prevalence of one or multiple VLUs;
- VLU treatment practices including both CT and non-CT;
- nurse time associated with CT and non-CT application and travel when treatment for VLUs is administered through a community nursing program; and
- funding arrangements for costs associated with nurse time and consumables across jurisdictional and federal programs and patient out-of-pocket expenses.

The survey was available on the AWMA website from 6 September 2012 until 12 October 2012. A total of 41 survey responses were received. However, due to incomplete answers from some respondents on key survey questions, the final survey results were based on 27 responses.

Survey results were received from all states but only from one territory (ACT), and for some questions there were only a few responses. The response rate was considered low given the promotion to all AWMA members and extended availability of the survey. The summary results and sample sizes for the Internet survey are provided in Table 3.2.

There was a low response rate for questions around the distribution of funding sources for therapy and consumables. For questions relating to prevalence, use of CT, consumable costs, and travel, however, between 13 and 27 responses were received. These data were used as inputs for the model. It was necessary to check the validity of responses due to the limited number of responses for some questions. This was done by:

- cross-checking responses with information obtained from AWMA representatives during targeted consultations following the survey; and
- comparing healing times for CT and non-CT with rates in published studies.

**Table 3.2: Internet survey summary statistics**

Question	Mean response	Sample size
In the last 12 months of your clinical practice what proportion of wound patients treated by yourself have had at least one venous leg ulcer?	54%	27
In the last 12 months of your clinical practice what per cent of venous leg ulcer patients treated by yourself have two or more VLUs at any one time?	33%	26
Of those patients with two or more VLUs at any one time, how many VLUs do they have on average?	2	26
To what extent have you used compression therapy (e.g., 4 layer compression bandages, inelastic bandages or elastic bandages plus dressing changes) for patients with venous leg ulcers in the last 12 months?	75%	27
To what extent have you used compression therapy (e.g., compression stockings) to prevent reoccurrence of VLUs?	73%	26
<b>Reasons why compression therapy is not used for the treatment of VLU wounds</b>		
Compression therapy not used because of patient preferences	46%	7
Compression therapy not used because of financial reasons	9%	7
Compression therapy not clinically appropriate	21%	7
Compression therapy not used because of other reasons	24%	7
What is the average time you take to undertake VLU compression therapy, including application time and preparation for application? (minutes)	43	26
What is the average number of times you change compression therapy per week?	2	26
<i>continued next page</i>		



**Table 3.2: Internet survey summary statistics**

cont'd

Question	Mean response	Sample size
If compression therapy is not used, what is the average time you take to administer other forms of therapy for VLU? (minutes)	30	23
If compression therapy is not used, what is the average number of times you change the dressing per week?	3	24
<b>Reasons why compression prevention therapy is not used for prevention of VLUs</b>		
Compression prevention not used because patient cannot donn/doff* therapy	33%	8
Compression prevention not used because of the cost to patient	29%	8
Compression prevention not used because of dislike of the therapy	23%	8
Compression prevention not used because of inability to fit limb	3%	8
Compression prevention not used because of other reasons	13%	8
What is the average total cost of compression therapy consumables (e.g. bandages, compression stockings, skin care products) per week?	\$41	17
If compression therapy is not used, what is average total cost of wound therapy consumables (e.g. dressings, tapes, skin care products) per week?	\$37	16
What proportion of cases requires travelling to patients in order to provide wound management treatment?	77%	13
If travel is required, what is the average travel time to and from patients? (minutes)	22	15
On average, how many patients would be visited for wound management in one day?	8	14

\* 'Donn/doff' means put on/take off

Source: *AWMA survey*; *KPMG calculations*.

### 3.4 Follow-up consultations

Follow-up consultations were conducted with AWMA jurisdictional representatives to cross-check results of the Internet survey and gain additional information on jurisdictional costs. The following discussion with eight AWMA representatives focused on identifying:

- funding of consumable costs by provider and patients;
- VLU treatment models (GP-based, community care- based or outpatient/wound clinic based-models);
- CT use by alternative types of providers;
- VLU healing rate for CT versus non-CT;
- hourly CN costs, state and HACC funded; and
- hospital outpatient wound clinic costs.

Respondents were either nurse practitioners or community nurses involved in wound care and training. Responses provided useful information on the varied aspects of wound management across Australia that were used to inform the development of the economic evaluation model. A brief summary of the consultation findings follow.

#### ***VLU treatment involves a variety of treatment arrangements***

The Internet survey and follow-up consultations revealed a number of provider arrangements involved in VLU treatment across Australia. The AWMA project management team indicated that VLU treatment could be grouped into three areas by primary provider of care:

- GP based care;
- community nurse based care; and
- hospital outpatient based care.

Table 3.3 indicates care provider arrangements from the consultations and how these were grouped for the economic evaluation model, which is discussed in Section 4.1.

**Table 3.2: VLU care provider arrangements and groupings**

<b>VLU care provider arrangements</b>	<b>Treatment group in the model</b>
GP only	GP
GP, medical specialist plus community nurse	Community nurse
GP plus allied health	GP
GP plus medical specialist	GP
GP, nurse/specialist/allied health	GP
Hospital outpatient wound clinic plus community nurse (VIC, WA, TAS, and ACT)	Outpatient
Independent Community Wound Clinic (University Nurse Practitioner-led Brisbane and ACT)	Outpatient
Tertiary hospital outpatient wound clinic (1 in Brisbane, 1 in Darwin, VIC, WA, TAS,, ACT, and NSW)	Outpatient
GP and community nurse	Community nurse
Community nursing only (TAS, SA, NT, and ACT)	Community nurse

*continued next page*

**Table 3.3: VLU care provider arrangements and groupings***cont'd*

VLU care provider arrangements	Treatment group in the model
Community Ambulatory care clinics/wound clinics or home visits - community nurse - referred by GP	Community nurse
Other - self care only in NSW (accounting for 5% of VLUs treated in NSW)	Not grouped

*Source: KPMG.****Patients are more likely to pay for consumables when VLU care is provided by a GP***

Patients were required to pay from 60-100 per cent of consumable costs in GP clinics. However, data on this item was not complete as many of the respondents did not feel confident of their knowledge of GP practices. This was the case for three states, including SA, NT and ACT. As a result, the average patient share of consumables from the other 5 states was used in the model.

***Community care included the cost of consumables in the majority of jurisdictions***

Victoria and Queensland were the only jurisdictions charging patients nearly full cost of consumables in community care settings. Most CN services did not charge patients for consumable costs.

***Most VLU treatment provided by community nurse based care***

Most jurisdictions indicated a high proportion of VLU patients being treated by community nurses, with the exception of Queensland. In Queensland, the majority of VLUs are treated by GPs or medical specialists, with only 3 per cent of VLUs treated by CNs. SA, NT and ACT had 95 per cent of patients being treated by CNs.

***CT is most often used by community nurse based care***

Community nurse care had high rates of CT ranging from 17-100 per cent across jurisdictions. GPs had the lowest rates of CT use ranging from 0- 50 per cent.

***Limited data was available on healing times***

It was difficult to gain an accurate measure of healing times for CT versus non-CT from the consultations. Consultations reveal a range of healing times for non-CT and no definitive evidence was available for Australian jurisdictions for CT healing time for various providers.

# 4 Cost effectiveness analysis

This chapter describes the methodology used to estimate the cost effectiveness of CT for VLU treatment. It includes the model structure, inputs and assumptions, data sources, results and the sensitivity analysis.

## 4.1 The model

VLU treatment and cost data collected from the survey and from published data was used to undertake the cost effectiveness analysis. The model used a societal perspective such that all benefits and costs experienced by government and patients are included in the analysis. Expected benefits from CT compared to non-CT include:

- reduced wound healing times for patients;
- reduced primary health care costs by treating nurses and GPs; and
- reduced hospital care costs associated with untreated VLU.

Estimated costs include:

- cost of CT treatment for patients; and
- cost to government for expenditure on CT.

The primary result from the cost effectiveness analysis was the difference in the average cost per treated wound with and without CT.

### *Decision tree model*

Decision tree analysis was used to model treatment pathways for VLUs and determine the expected cost of treatment per patient and per wound for compression and non-compression therapies.

The model contains states and decisions to model situations where outcomes are driven by both randomness and discretion. States are the deterministic steps in a treatment pathway, such as a patient moving from diagnosis into treatment. Decisions are the outcomes within states which are subject to both randomness and discretion. In the context of VLU treatment, the:

- randomness associated with decisions can be interpreted as the possibility for two or more courses of action in each stage; and
- discretion associated with decisions can be interpreted as the judgement of medical professionals in choosing particular actions regarding treatment based on presentations by patients.

The model was structured around states and decisions which, given data quality and availability and information from industry consultations, represented an appropriate balance between:

- capturing a range of treatment pathways reflective of current practice to understand their interaction in driving treatment costs; and
- limiting the assumptions necessary to utilise available data and supplementary insight from industry representatives.

Table 4.1 documents the states and actions underpinning the model, while the model framework is graphically represented in Figure 4.1.

Table 4.1: Decision tree model states and actions

State	Decision
Diagnosis	VLU is diagnosed by a GP
	VLU is not diagnosed
Treatment type	Treatment with CT
	Treatment with non-CT
Treatment setting	Community nursing
	GP clinic
	Outpatient clinic
Treatment outcome	Treatment heals the VLU
	Treatment does not heal the VLU and the patient is admitted to hospital

Source: KPMG.

To calculate the expected cost of treatment for a VLU, costs were assigned to each action and probabilities were assigned to each transition between states in the model. These inputs were informed through a combination of:

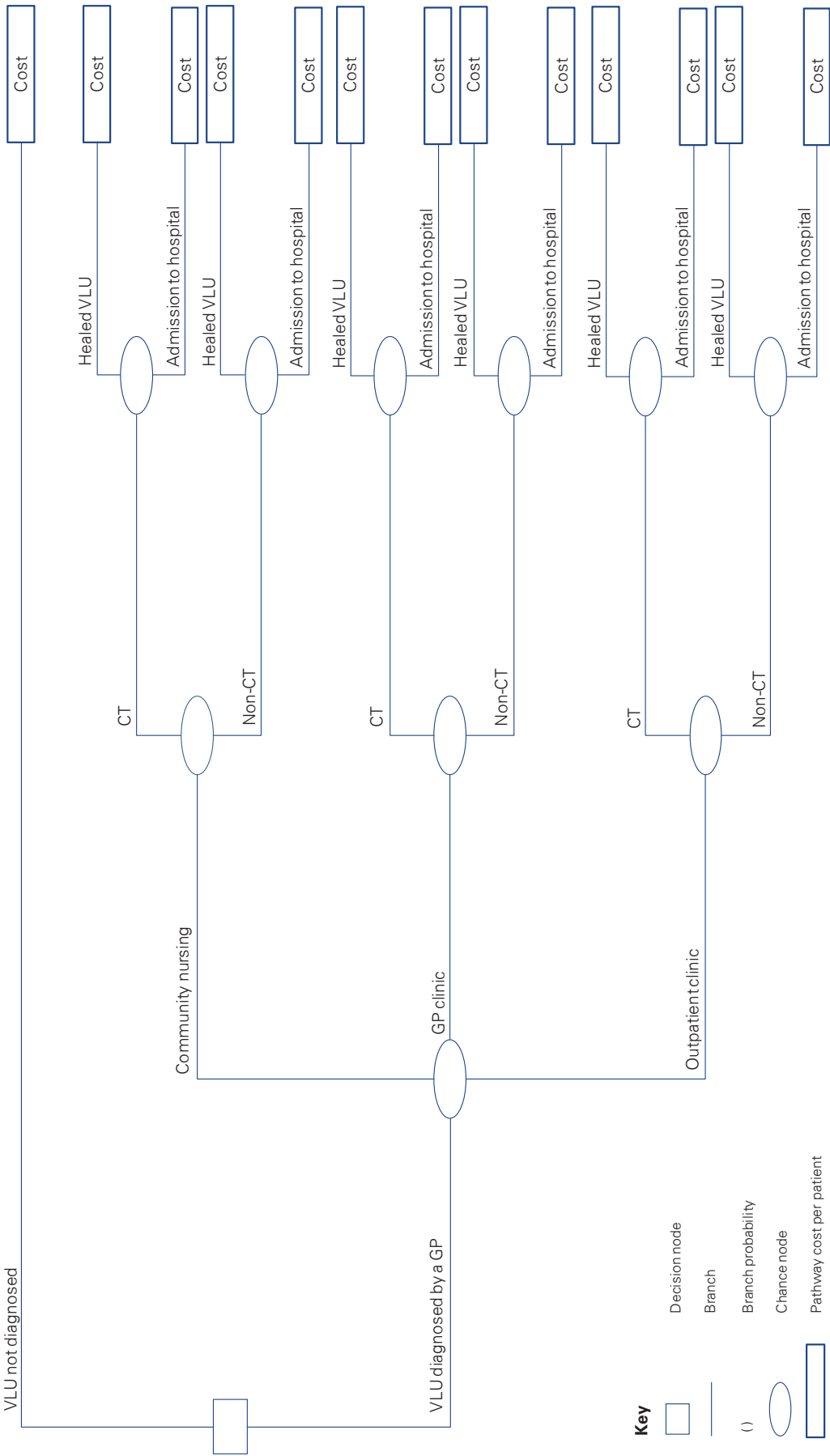
- evidence from the literature, particularly around VLU prevalence;
- a survey of AWMA members; and
- targeted consultations with AWMA jurisdictional representatives to inform remaining data gaps, particularly around differences in VLU treatment pathways and funding arrangements.

Sensitivity analysis was undertaken to determine the impact of changing key model inputs on cost effectiveness estimates, and to identify key cost drivers for CT and non-CT.

The sensitivity analysis provided a range of cost effectiveness results based on changes to model inputs. Confidence intervals around results were estimated to account for some of the uncertainty with model results due to data gaps and variations in clinical standards across jurisdictions. These are discussed further in Section 4.4.



Figure 4.1: Decision tree framework for VLU treatment pathways



Source: KPMG.

## 4.2 Model inputs

Inputs and assumptions used in the model were derived from a combination of published literature, publically available data sources, and discussion with AWMA representatives. Each is described in more detail below.

### ***The model considers point prevalence for people over 60 years of age***

Although people of all ages are at risk of developing a VLU over 90 per cent of VLU sufferers are 60 years or older (Baker & Stacey 1994; Barker & Weller 2010). Taking into consideration the range of point prevalence estimates in the literature, the model uses a point prevalence of one per cent of the population over 60 years of age (Briggs & Closs 2003).

### ***All VLU diagnoses are made by a GP and GP costs***

Evidence from the literature and consultations suggest that VLU diagnosis may be undertaken by many health care professionals, including GPs, medical specialists, and community nurses. For simplicity, and given a lack of data on the share of diagnoses and their costs, it was assumed that all VLU diagnoses are made by GPs.

Consequently, the standard cost of a Level B consultation in the Medicare Schedule of Benefits (MBS) was assumed to apply to the diagnosis of VLU. This has a MBS benefit of \$36.50 (Department of Health and Ageing 2012).

A Level C consultation was assumed for GP treatment of VLU, with a MBS benefit of \$70.30 (DoHA 2012).

### ***Expected treatment cost for patients with more than one VLU***

Survey responses suggest that patients presenting for treatment with more than one VLU have on average two VLUs. For these cases, the following assumptions were made about the expected cost of treatment:

- nurse time associated with treatment application is expected to increase. It was assumed that application time for each additional VLU is the same as for the first VLU;
- consumable costs are expected to increase by the same amount for each VLU; and
- nurse travel time per patient is unchanged given that VLUs can be treated simultaneously during visits.

### ***All diagnosed VLU patients receive either CT or non-CT***

The surveys and consultations suggested that some patients express a preference to not receive any treatment for their VLU. However, the costs of management and preventative measures for these patients could not be estimated due to data limitations. Therefore, it was assumed that all diagnosed VLU patients are treated either with CT or non-CT.

### ***Healing times for CT and non-CT are consistent across care provider***

Due to a lack of definitive information on healing times for providers across jurisdictions, literature was relied on for healing times for CT compared to non-CT. A RCT of CT cost effectiveness reported the median healing time for CT at 19-20 weeks and 25-36 weeks for usual practice (non-CT) (Morrell et al. 1998). Industry consultations indicated longer healing times for non-CT due to ineffective practices and patient co-morbidities. The model uses 20 weeks and 36 weeks healing times for CT and non-CT, respectively.

### ***Wound size was not considered***

Smith and McGuinness (2010) found a high correlation between wound size and cost of consumables. The model did not take into account wound size, which may result in higher consumable costs.

### ***Standards of CT and other forms of treatment are comparable across health districts within jurisdictions***

The model assumes that standards of clinical practice and treatment are comparable across jurisdictions. This assumption covers areas such as consistency of diagnoses and quality of compression or non-compression treatment, which cannot be directly captured or monetised.

### ***Patient travel time to treatment centres***

The expected cost of patient travel time to community nursing, GP, and outpatient clinics was not considered. There was inadequate data available to either attribute the purpose of travel solely to accessing VLU care or to attending VLU care amongst other unrelated tasks. Although this means the total economic cost of compression and non-compression treatment may be understated, the magnitude will not affect the cost effectiveness estimates given travel costs are unchanged for people receiving CT versus people receiving non-CT therapy.

### ***Point prevalence and recurrence***

Reoccurrence was not accounted for in the model given uncertainty around:

- time to recurrence for CT compared to non-CT;
- treatment pathways for recurring VLUs; and
- whether admission rates to hospital were affected by recurrence.

Using the point prevalence rate for VLU, the model therefore estimates the cost effectiveness of VLU treatment per episode of care leading to a treated VLU.

### ***Only non-CT patients experiencing complications are admitted to hospital***

Results from the literature and consultations suggest that fewer patients receiving CT encounter a complication that would require hospitalisation (Finlayson et al. 2009). Based on industry consultations, the model assumes only non-CT encounter a complication requiring hospitalisation.

National data on hospital separations for VLU related DRGs indicated both medical and surgical separations. Details on VLU related hospital separations for 2009-10 are provided in Appendix B with the highlighted DRG codes indicating the codes used for the determination of non-CT admissions. Based on the surgical separation data and information from industry consultations, a hospitalisation admission rate for non-CT of 11 per cent was derived.

It was assumed that all patients experiencing complications were hospitalised given reliable data could not be obtained on the:

- number of these patients as a proportion of all complications;
- treatment and management pathways; and
- costs associated with these treatment and management pathways.

Inherent in this assumption is that admission to hospital successfully alleviates the VLU.

Based on the literature on complications associated with VLU, an additional GP consultation was included in the cost of a hospital admission. A Level C consultation was assumed to apply to a hospital admission for non- CT (DoHA 2012).

### ***Each nurse travelling to patients uses one small car and only treats VLUs***

Motor vehicle operating and maintenance costs attributable to VLU treatment for those patients requiring community nurses to travel were included in the model. The survey results indicated that travelling nurses visit eight patients per working day on average. It was assumed that each travelling nurse:

- operates one small motor vehicle; and
- only administers treatment to VLU wounds, either with CT or non-CT.

Motor vehicle operating and maintenance costs for small cars were based on Victorian data from the Royal Automobile Club of Victoria (RACV) (RACV 2012). These were expressed in 2012 dollars

and were deflated by the percentage change in the consumer price index (CPI) from the June quarter in 2011 to the June quarter in 2012 (ABS 2012a).

#### ***Capital costs of community clinics***

The model does not attribute capital costs associated with community nursing clinics to the expected costs of compression and non-CT due to data limitations. Although this may understate the cost of these therapies, these costs are:

- likely to be immaterial on a per patient basis; and
- not likely to impact the cost relativities between compression and non-compression treatment given that the model currently assumes the same proportion of CT and non-CT occurs in community nursing.

#### ***GST costs for consumables***

The model does not account for GST charges on consumables due to data limitations. GST costs were not requested in the Internet survey so it is not known if respondents included the GST costs. It is also difficult to estimate GST costs where a portion of consumable costs is paid by patients. Although this may understate the cost of consumables, these costs are not likely to impact the cost relativities between CT and non-CT.

Table 4.2 provides a summary of the model inputs and sources.

**Table 4.2: Model Inputs**

Input	Unit	NSW	VIC	QLD	SA	WA	NT	TAS	ACT	Source
<b>Population and prevalence</b>										
Population aged 60 and over	no.	1,491,381	1,117,716	873,077	372,918	429,065	24,488	117,770	59,934	ABS 2012a; ABS 2008; KPMG calculations.
VLU prevalence rate for population aged 60 and over	%	1	1	1	1	1	1	1	1	Briggs & Closs 2003.
Prevalence rate of patients with one VLU	%	67	67	67	67	67	67	67	67	AWMA survey; industry consultation.
Average number of VLUs per affected patient with more than one VLU	no.	2	2	2	2	2	2	2	2	AWMA survey; industry consultation.
<b>Diagnosis by a GP</b>										
Proportion of patients who are diagnosed by a GP	%	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	Industry consultation.
Level B consultation, lasting under 20 mins	\$	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	DoHA 2012.
<b>Length of treatment</b>										
Average number of CT applications per patient per week	no.	2	2	2	2	2	2	2	2	AWMA survey; industry consultation.
Average number of other therapy applications per patient per week	no.	3	3	3	3	3	3	3	3	AWMA survey; industry consultation.
Average healing time for CT patients	weeks	20	20	20	20	20	20	20	20	Morrell et al. 1998

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**Table 4.2: Model inputs**

cont'd

Input	Unit	NSW	VIC	QLD	SA	WA	NT	TAS	ACT	Source
Average healing time for non-CT patients	weeks	36	36	36	36	36	36	36	36	Morrell et al. 1998
<b>Cost of consumables</b>										
Cost of CT consumables per wound per week in community nursing	\$	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	AWMA survey.
Cost of non-CT consumables per wound per week in community nursing	\$	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	AWMA survey.
Proportion of consumable costs paid by the patient in community nursing	%	5.0	90.0	100.0	0.0	0.0	0.0	30.0	0.0	Industry consultation.
Proportion of consumable costs paid by the patient at GP clinics	%	60.0	85.0	95.0	88.0	100.0	88.0	100.0	0.0	Industry consultation.
<b>Community nursing</b>										
Proportion of diagnosed patients being treated in community care	%	68.0	60.0	3.0	95.0	55.0	95.0	40.0	70.0	Industry consultation.
Prevalence of CT in community care	%	23.0	100.0	55.0	58.0	17.0	90.0	17.0	35.0	Industry consultation.
Nurse time associated with CT application	mins.	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	AWMA survey; industry consultation.

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**Table 4.2: Model inputs**

cont'd

Input	Unit	NSW	VIC	QLD	SA	WA	NT	TAS	ACT	Source
Cost of nurse time per hour	\$	32.8	29.6	33.7	35.4	37.6	37.3	35.4	35.6	2011-12 nurse award rates.
Proportion of VLU patients being treated in community care requiring nurse travel	%	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	AWMA survey.
Nurse travel time associated with VLU care per patient	mins.	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	AWMA survey.
Motor vehicle cost per km travelled	\$	0.1863	0.1863	0.1863	0.1863	0.1863	0.1863	0.1863	0.1863	RACV 2012.
Average travel speed	km/hr	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	Victorian Auditor General 2006.
Motor vehicle standing costs per week	\$	115.37	115.37	115.37	115.37	115.37	115.37	115.37	115.37	RACV 2012.
Number of VLU patients visited per day by travelling nurses	no.	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	AWMA survey.
Number of small cars per nurse	no.	1	1	1	1	1	1	1	1	KPMG assumption.
Number of working days per week	no.	5	5	5	5	5	5	5	5	KPMG assumption.
<b>GP clinic</b>										
Proportion of diagnosed patients being treated at a GP clinic	%	12.5	30.0	92.0	5.0	15.0	1.0	35.0	0.0	Industry consultation.
Prevalence of CT at GP clinics	%	3.7	50.0	13.8	5.0	3.3	1.0	3.3	0.0	Industry consultation.
Level C consultation, lasting at least 20 mins	\$	70.3	70.3	70.3	70.3	70.3	70.3	70.3	70.3	DoHA 2012.

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Table 4.2: Model inputs

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Input	Unit	NSW	VIC	QLD	SA	WA	NT	TAS	ACT	Source
<b>Outpatient clinic</b>										
Proportion of diagnosed patients being treated at an outpatient clinic	%	20.0	10.0	5.0	0.0	30.0	4.0	25.0	30.0	Industry consultation.
Prevalence of CT at outpatient clinics	%	20.0	100.0	86.0	0.0	12.5	100.0	20.0	30.0	Industry consultation.
Cost of CT treatment at an outpatient clinic	\$	219.24	219.24	219.24	N/A*	219.24	219.24	219.24	219.24	IHPA 2012.
<b>Hospital admission</b>										
Admission rate for CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	O'Meara et al. 2012; industry consultation
Admission rate for non-CT	%	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	AIHW 2012a; industry consultations; KPMG calculations.
Average cost per hospital separation (2012-13)	\$	7,729	6,529	7,974	7,965	7,567	5,222	9,380	7,873	AIHW 2012b; AIHW 2012c.

\* N/A indicates not applicable.

Source: KPMG.

## 4.3 Results

This section presents the results of the cost effectiveness analysis for CT. It provides detail on the expected cost savings with CT and the cost of subsidising the out-of-pocket consumable costs for CT

The modelling results are underpinned by the inputs and assumptions documented in Chapter 3 and should be interpreted within this context, alongside the sensitivity analysis in Section 4.4. All costs are expressed in 2012-13 Australian dollars.

### 4.3.1 Cost effectiveness results

The average costs of treatment per patient and per wound are presented in Table 4.3 and Table 4.4 respectively. The results suggest that CT is cost-effective compared to non-CT in all jurisdictions, at between:

- \$3,600 (NT) and \$8,100 (WA) less expensive per patient than non-CT, or about \$6,300 less expensive on average across all jurisdictions; and
- \$2,700 (NT) and \$6,100 (WA) less expensive per wound than non-CT, or about \$4,800 less expensive on average across all jurisdictions.

The results indicate there is cost variation across jurisdictions, with the cost of non-CT treatment more variable across jurisdictions compared to CT. This is primarily due to the difference in average public hospital separation costs across jurisdictions, which range from approximately \$5,200 per separation in the Northern Territory to approximately \$9,400 per separation in Tasmania (see Table 4.2). Other costs that generate differences in costs include the share of treatment by provider category, wage costs, and consumable charges.

**Table 4.2: Estimated average cost of VLU treatment per patient in 2012-13**

	CT	Non-CT	All therapy	Expected saving per patient treated with CT
	\$	\$	\$	\$
NSW	4,164	10,704	9,419	6,541
VIC	3,699	10,122	4,662	6,423
QLD	4,980	10,344	9,347	5,364
SA	3,079	7,217	4,946	4,138
WA	4,785	12,887	11,800	8,102
NT	3,420	7,052	3,801	3,632
TAS	5,388	12,414	11,512	7,026
ACT	4,623	12,465	9,838	7,842
<b>National</b>	<b>3,883</b>	<b>10,743</b>	<b>8,106</b>	<b>6,328<sup>5</sup></b>

Source: KPMG calculations.

<sup>5</sup> Average of expected savings across jurisdictions weighted by the estimated number of non-CT patients.

**Table 4.3: Estimated average cost of VLU treatment per wound in 2012-13**

	CT	Non-CT	All therapy	Expected saving per wound treated with CT
	\$	\$	\$	\$
NSW	3,138	8,067	7,099	4,929
VIC	2,788	7,628	3,514	4,841
QLD	3,753	7,795	7,044	4,042
SA	2,320	5,439	3,727	3,118
WA	3,606	9,712	8,893	6,106
NT	2,578	5,315	2,865	2,737
TAS	4,060	9,355	8,676	5,295
ACT	3,484	9,394	7,414	5,910
<b>National</b>	<b>2,926</b>	<b>8,096</b>	<b>6,109</b>	<b>4,769<sup>6</sup></b>

Source: KPMG calculations.

It is estimated that CT for VLU treatment is cost-effective compared to non-CT. However, CT only accounts for approximately 20 per cent of the total cost of VLU treatment, and there is significant variation in CT use for VLU treatment across jurisdictions.

Although the use of CT for VLU treatment in the Northern Territory and Victoria is relatively high, low CT use in New South Wales and Queensland is the primary driver of the low proportion of CT costs to total costs. This suggests that increased CT usage when it is clinically appropriate and respectful to patient preferences has the potential to lower the overall cost burden of VLU treatment in Australia.

### 4.3.2 Out-of-pocket consumable costs

It is estimated that VLU patients over 60 years of age pay approximately \$27.5 million in out-of-pocket costs for CT and non-CT consumables per year, equivalent to eight per cent of total treatment costs. Estimates presented in Table 4.5 suggest that Queensland and Victoria account for approximately 82 per cent of all out-of-pocket costs.

<sup>6</sup> Average of expected savings across jurisdictions weighted by the estimated number of non-CT wounds.



**Table 4.4: Estimated total out-of-pocket consumable costs in 2012-13**

	CT	Non-CT	All therapy
	\$'000	\$'000	\$'000
NSW	159.5	2,464.3	2,623.7
VIC	7,712.0	2,392.8	10,104.8
QLD	1,232.1	11,251.0	12,483.1
SA	8.5	261.7	270.2
WA	22.2	1,044.6	1,066.8
NT	-	3.6	3.6
TAS	38.5	866.8	905.3
ACT	-	-	-
<b>National</b>	<b>9,172.8</b>	<b>18,284.8</b>	<b>27,457.6</b>

Note: '-' indicates no out-of-pocket consumable costs

Source: KPMG calculations.

Estimated average out-of-pocket consumable costs per patient and per wound are presented in Table 4.6 and Table 4.7, respectively. Some patients can expect cost savings in all jurisdictions by moving from non-CT to CT, with patients in Queensland, Victoria, and Tasmania likely to have significantly higher potential savings than all other jurisdictions. There is no expected benefit for moving from non-CT to CT in the ACT since consumable costs are fully subsidised.

The longer healing time for VLU's using non-CT treatment results in higher expected out-of-pocket costs for non-CT in Table 4.6 and Table 4.7, despite CT consumables being more expensive per week than non-CT consumables.

**Table 4.5: Estimated average out-of-pocket consumable costs per patient in 2012-13**

	CT	Non-CT	All therapy	Expected saving per patient treated with CT
	\$	\$	\$	\$
NSW	57	216	185	159
VIC	854	1,502	952	648
QLD	799	1,666	1,505	867
SA	4	164	76	159
WA	41	296	262	255
NT	-	147	15	147
TAS	268	889	809	620
ACT	-	-	-	-
<b>National</b>	<b>560</b>	<b>697</b>	<b>644</b>	<b>399<sup>7</sup></b>

Note: '-' indicates no out-of-pocket consumable costs.

Source: KPMG calculations.

<sup>7</sup> Average of expected savings across jurisdictions weighted by the estimated number of non-CT patients.

**Table 4.6: Estimated average out-of-pocket consumable costs per wound in 2012-13**

	CT	Non-CT	All therapy	Expected saving per patient treated with CT
	\$	\$	\$	\$
NSW	43	163	140	120
VIC	644	1,132	717	488
QLD	602	1,256	1,134	653
SA	3	123	57	120
WA	31	223	197	193
NT	-	111	12	111
TAS	202	670	610	467
ACT	-	-	-	-
<b>National</b>	<b>422</b>	<b>525</b>	<b>486</b>	<b>301<sup>8</sup></b>

Note: '-' indicates no out-of-pocket consumable costs.

Source: KPMG calculations.

There are potentially large benefits to increasing CT usage for VLU treatment across Australian jurisdictions when it is clinically appropriate and respectful of patient preferences. Importantly, higher usage of CT can be expected to:

- generate cost savings, on average, of \$6,300 per patient and \$4,800 per wound, most of which is achieved from avoiding hospitalisation; and
- save, on average, approximately \$400 per patient or \$300 per wound in patient out-of-pocket costs for their consumables.

The two key drivers of the estimated cost savings are reduced expected healing time and incidence of hospitalisation to treat complications associated with non-CT treatment for VLUs. These are superior clinical outcomes for the patient, and coupled with the reduced cost for treating CT can be said to *dominate* non-CT as a treatment pathway for VLU.

## 4.4 Sensitivity analysis

A probabilistic sensitivity analysis was undertaken to measure the impact of changes in key inputs on the results of the cost effectiveness results. Sensitivity analysis provides a range of estimates for a given output and confidence intervals for those estimates to better understand their reliability.

The sensitivity analysis was undertaken using @RISK software, which uses the Monte Carlo technique to simulate the impact of changes in each assumption on the model outputs.<sup>9</sup>

### 4.4.1 Specification

The sensitivity analysis used assumptions about the probability distributions of each model input tested along with their minimum and maximum values.<sup>10</sup> Minimum and maximum values were informed by literature, the online survey, and industry consultations where possible. Triangular

<sup>8</sup> Average of expected savings across jurisdictions weighted by the estimated number of non-CT wounds.

<sup>9</sup> @RISK for Excel (v 5.7.0) was used by KPMG under license and is Copyright © 2010 by Palisade Corporation.

<sup>10</sup> Probability distributions map each potential event with a numerical probability subject to the constraint that the sum of the probabilities of all events equals one.

distributions were used where the distribution type was not specified in the consulted sources. The specifications used in the sensitivity analysis are provided in Table 4.8 and Table 4.9.

**Table 4.7: Assumptions used in the sensitivity analysis**

Input	Minimum	Mean	Maximum
Healing time for CT patients (weeks)	12.0	30.0	60.0
Healing time for non-CT patients (weeks)	12.0	35.0	60.0
Number of CT applications per week	1.0	2.0	7.0
Number of non-CT therapy applications per week	2.0	3.4	7.0
Cost of CT consumables per week (\$)	36.9	41.0	45.1
Cost of non-CT consumables per week (\$)	33.3	37.0	40.7
Hospital admission rate for CT (%)	0.0	3.0	10.0
Hospital admission rate for non-CT (%)	5.0	10.0	15.0

Source: KPMG calculations.

Estimated cumulative probability distributions for average healing times for CT and non-CT are provided in Morrell et al. (1998), however the maximum healing times were not available. A maximum healing time of 60 weeks was therefore assumed for both CT and non-CT given a reliable maximum estimate was not available. This resulted in different mean values for CT and non-CT healing times for the sensitivity analysis noted in Table 4.8 compared to the median healing times which were used in the model and reported in Table 4.2.

The distributions for treatment frequency per week for CT and non-CT were estimated based on results of the Internet survey. Table 4.9 provides the assumptions used in the sensitivity analysis for each jurisdiction. The range of values tested for the majority of inputs were within 10 per cent of the input values except where zero values were used as inputs. For jurisdictions where the proportion of consumable costs paid by patients in community care was zero per cent, zero per cent was the assumed minimum (SA, WA, NT, and ACT). Triangular distributions were used where the distribution type was not specified in the consulted sources.

**Table 4.8: Assumptions used in sensitivity analysis for each jurisdiction**

	NSW			VIC			QLD			SA		
	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Prevalence of CT in GP clinics (%)	3.3	3.7	4.0	45.0	50.0	55.0	12.4	13.8	15.1	4.5	5.0	5.5
Prevalence of CT in community care (%)	20.3	22.5	24.8	90.0	96.7	100.0	49.1	54.5	60.0	51.8	57.5	63.3
Prevalence of CT in outpatient clinics (%)	18.0	20.0	22.0	90.0	96.7	100.0	77.4	86.0	94.6	0.0	3.3	10.0
Proportion of consumable costs paid by patients in GP clinics (%)	54.0	60.0	66.0	76.5	85.0	93.5	90.0	95.0	100.0	79.2	88.0	96.8
Proportion of consumable costs paid by patients in community care (%)	4.5	5.0	5.5	81.0	90.0	99.0	90.0	96.7	100.0	0.0	3.3	10.0

	WA			NT			TAS			ACT		
	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Prevalence of CT in GP clinics (%)	3.0	3.3	3.7	0.9	1.0	1.1	3.0	3.3	3.7	0.0	3.3	10.0
Prevalence of CT in community care (%)	15.0	16.7	18.3	81.0	90.0	99.0	15.0	16.7	18.3	31.5	35.0	38.5
Prevalence of CT in outpatient clinics (%)	11.3	12.5	13.8	90.0	96.7	100.0	18.0	20.0	22.0	27.0	30.0	33.0
Proportion of consumable costs paid by patients in GP clinics (%)	90.0	96.7	100.0	79.2	88.0	96.8	90.0	96.7	100.0	79.2	88.0	96.8
Proportion of consumable costs paid by patients in community care (%)	0.0	3.3	10.0	0.0	3.3	10.0	27.0	30.0	33.0	0.0	3.3	10.0

Source: AWMA survey; KPMG consultations with AWMA representatives; KPMG calculations. Results

The sensitivity analysis was undertaken with 10,000 simulations. Results, including 90 per cent confidence intervals, means, and standard deviations, are presented in Table 4.10, Chart 4.1, Chart 4.2, Chart 4.3, and Chart 4.4. In summary:

- the national saving per patient treated with CT instead of non-CT is estimated to be between - \$11,622 and \$18,689 with 90 per cent confidence, with a mean saving of \$3,562 per patient;
- the national saving per wound treated with CT instead of non-CT is estimated to be between - \$8,759 and \$14,084 with 90 per cent confidence, with a mean saving of \$2,684 per wound;
- the national saving for out-of-pocket consumable costs per patient treated with CT instead of non-CT is estimated to be between -\$612 and \$951 with 90 per cent confidence, with a mean saving of \$240 per patient; and
- the national saving for out-of-pocket consumable cost per wound treated with CT instead of non-CT is estimated to be between -\$461 and \$717 with 90 per cent confidence, with a mean saving of \$181 per wound.

The interpretation of confidence intervals is that it will contain the true value of the parameter (i.e., the saving per patient associated with using CT instead of non-CT) with 90 per cent certainty, given the assumptions of the distributions of the inputs in Section 4.4.1.

**Table 4.9: Sensitivity analysis results**

	5 <sup>th</sup> percentile	Mean	95 <sup>th</sup> percentile	Standard deviation
	\$	\$	\$	\$
Saving per patient treated with CT	-11,622	3,562	18,689	9,463
Saving per wound treated with CT	-8,759	2,684	14,084	7,131
Savings for out-of-pocket consumable costs per patient treated with CT	-612	240	951	482
Savings for out-of-pocket consumable costs per wound treated with CT	-461	181	717	363

Source: KPMG calculations.

**Table 4.9: Assumptions used in sensitivity analysis for each jurisdiction**

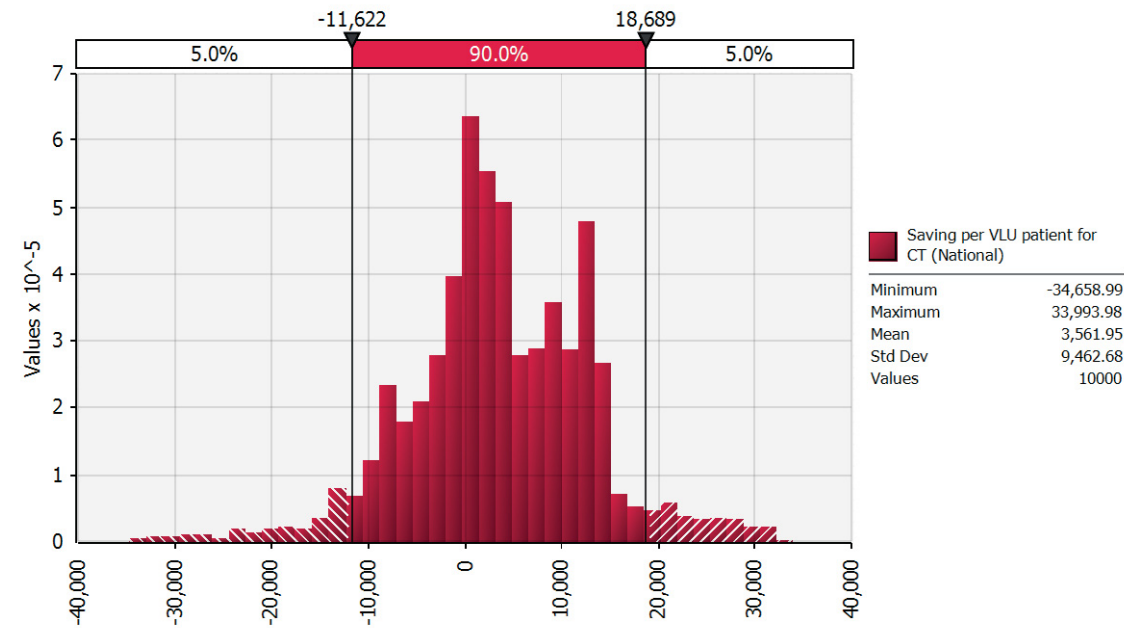
	NSW			VIC			QLD			SA		
	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.
Prevalence of CT in GP clinics (%)	3.3	3.7	4.0	45.0	50.0	55.0	12.4	13.8	15.1	4.5	5.0	5.5
Prevalence of CT in community care (%)	20.3	22.5	24.8	90.0	96.7	100.0	49.1	54.5	60.0	51.8	57.5	63.3
Prevalence of CT in outpatient clinics (%)	18.0	20.0	22.0	90.0	96.7	100.0	77.4	86.0	94.6	0.0	3.3	10.0
Proportion of consumable costs paid by patients in GP clinics (%)	54.0	60.0	66.0	76.5	85.0	93.5	90.0	95.0	100.0	79.2	88.0	96.8
Proportion of consumable costs paid by patients in community care (%)	4.5	5.0	5.5	81.0	90.0	99.0	90.0	96.7	100.0	0.0	3.3	10.0

	WA			NT			TAS			ACT		
	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.
Prevalence of CT in GP clinics (%)	3.0	3.3	3.7	0.9	1.0	1.1	3.0	3.3	3.7	0.0	3.3	10.0
Prevalence of CT in community care (%)	15.0	16.7	18.3	81.0	90.0	99.0	15.0	16.7	18.3	31.5	35.0	38.5
Prevalence of CT in outpatient clinics (%)	11.3	12.5	13.8	90.0	96.7	100.0	18.0	20.0	22.0	27.0	30.0	33.0
Proportion of consumable costs paid by patients in GP clinics (%)	90.0	96.7	100.0	79.2	88.0	96.8	90.0	96.7	100.0	79.2	88.0	96.8
Proportion of consumable costs paid by patients in community care (%)	0.0	3.3	10.0	0.0	3.3	10.0	27.0	30.0	33.0	0.0	3.3	10.0

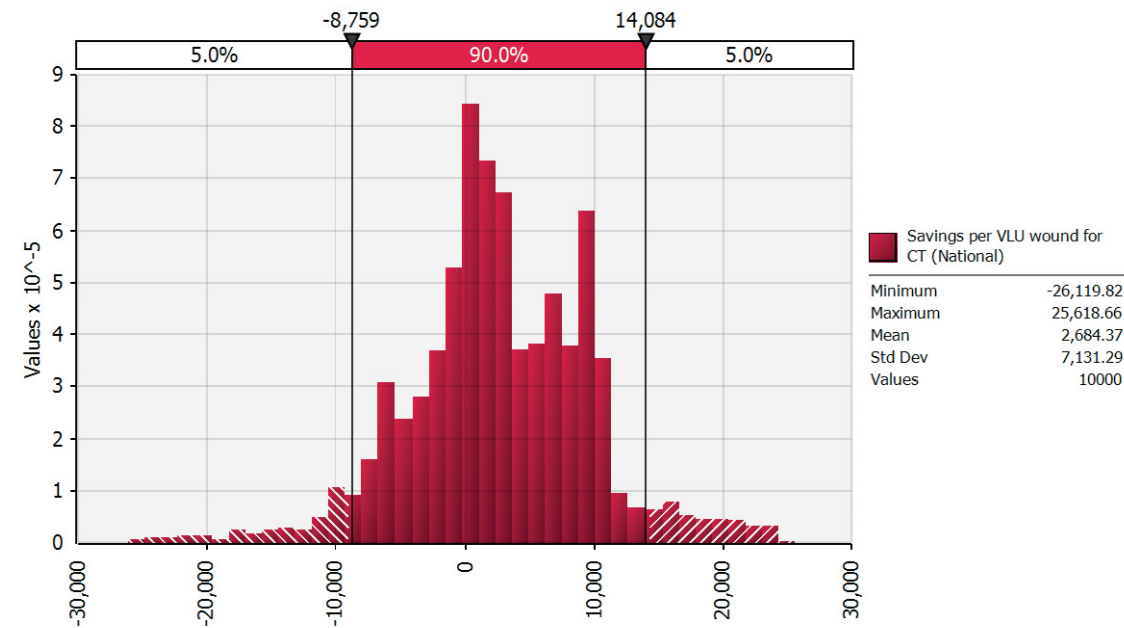
Source: AWWMA survey; KPMG consultations with AWWMA representatives; KPMG calculations.

**Chart 4.1: Distribution of the national saving per patient with CT**



Source: KPMG calculations.

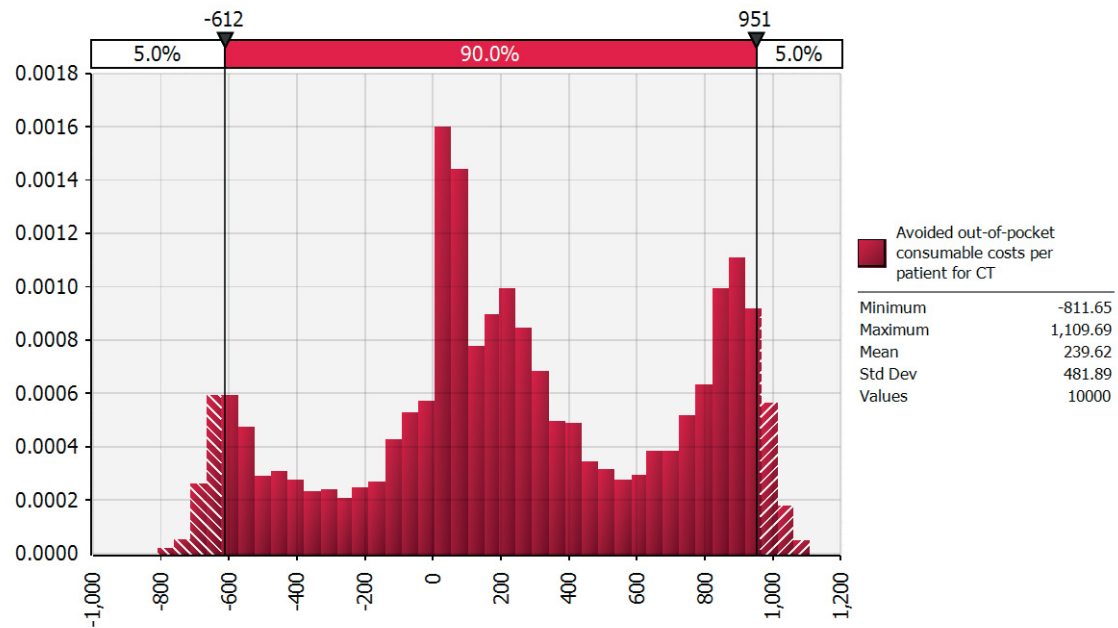
**Chart 4.2: Distribution of the national saving per wound with CT**



Source: KPMG calculations.

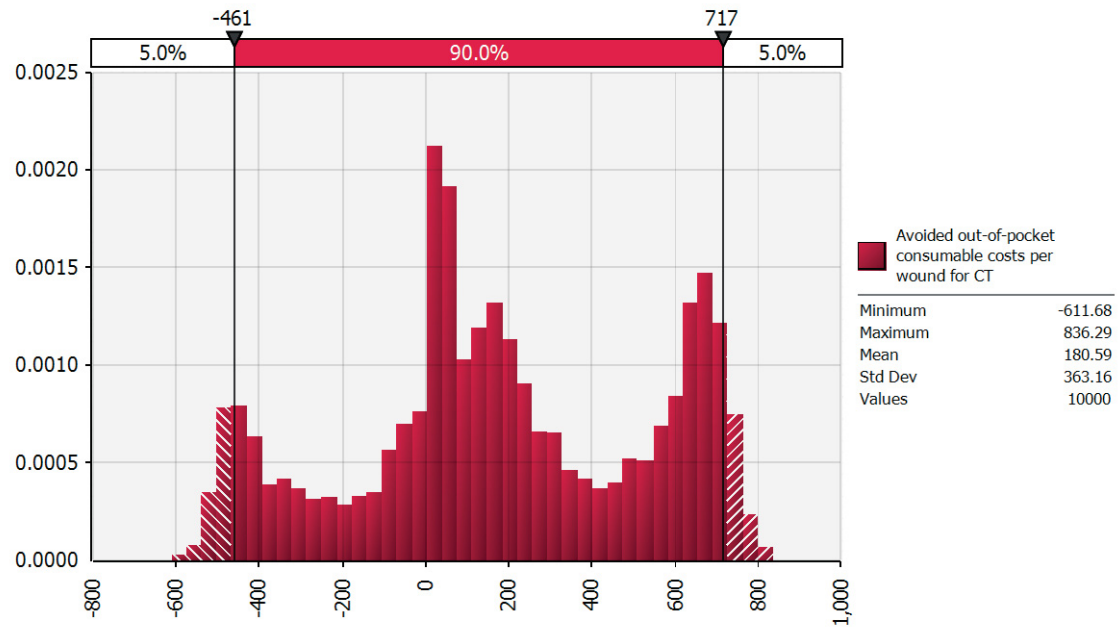


**Chart 4.3: Distribution of the national saving for out-of-pocket consumable costs per patient with CT**



Source: KPMG calculations.

**Chart 4.4: Distribution of the national saving for out-of-pocket consumable costs per wound with CT**



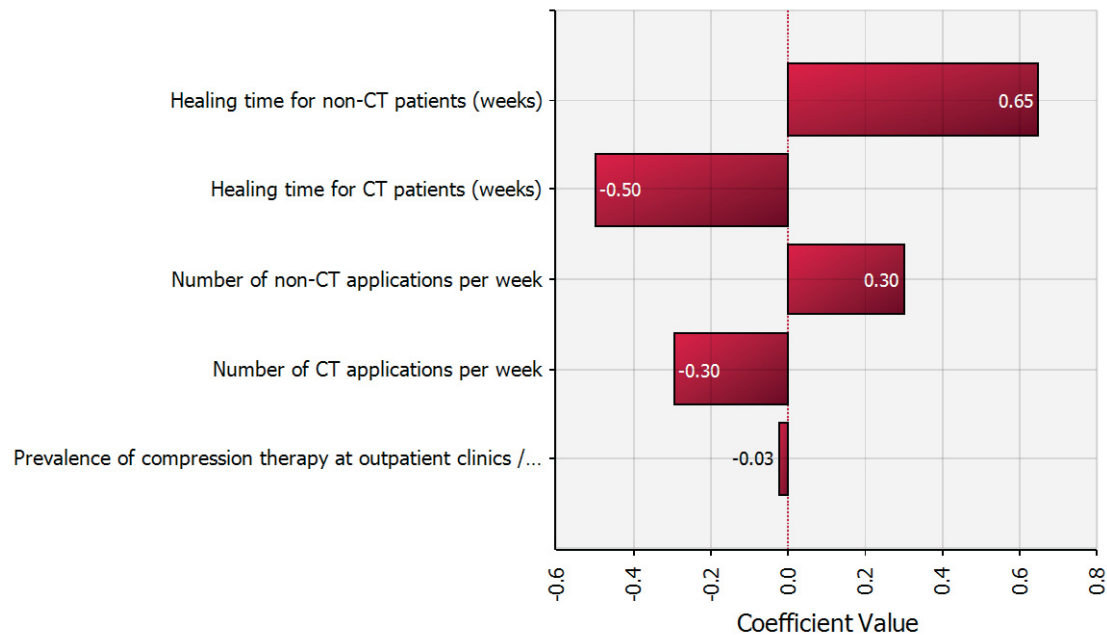
Source: KPMG calculations.

The Spearman’s rank correlation coefficients were also estimated to better understand the relative significance of tested model inputs in driving the model outputs. Spearman’s rank correlation coefficients range between negative one and one and are a measure of the strength of the positive or negative dependence between two variables.

Estimates of the Spearman’s rank correlation coefficients between key inputs and the total saving and saving for out-of-pocket consumable costs per patient treated with CT instead of non-CT are shown in Chart 4.5 and Chart 4.6 respectively. The two most significant drivers of both outputs were the healing times for non-CT and CT patients respectively.

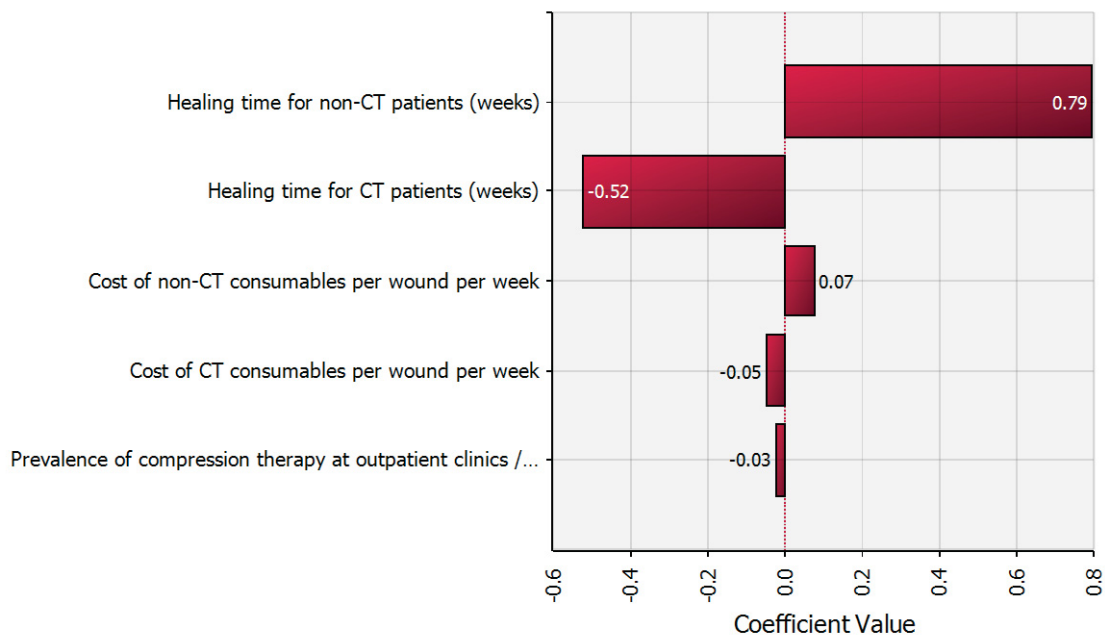
The number of applications of CT and non-CT were also key drivers of the saving from using CT instead of non-CT. This was commensurate with the intuition of the model given that either increased healing time for non-CT or reduced healing time for CT, all else equal, will increase the difference in the average costs for CT and non-CT.

**Chart 4.5: Correlation coefficients for the national saving per patient with CT**



Source: KPMG calculations.

**Chart 4.6: Correlation coefficients for the national saving for out-of-pocket consumable costs per patient with CT**



Source: KPMG calculations.

## 4.5 Scenario analysis

This section provides a scenario analysis involving estimates of benefits associated with 100 per cent usage of CT across Australia. The modelling results suggest that increased CT usage for VLU treatment is expected to be cost effective, with consumables to be at least as affordable as non-CT, across all Australian jurisdictions. This means that increased CT usage can be expected to provide a net benefit to the economy, along with enhanced clinical outcomes.

### 4.5.1 Results

The results of the scenario analysis are presented in Table 4.11. It was estimated that using CT to treat 100 per cent of diagnosed VLU patients would result in:

- total savings of \$166.0 million in 2012-13; and
- savings for out-of-pocket consumable costs of \$10.5 million in 2012-13.

Reduced treatment time and associated labour costs, reduced consumable costs, and avoided hospitalisation are the primary drivers of the total saving. The savings for out-of-pocket consumable costs are primarily driven by reduced healing times, the number of applications, and the proportion of total consumable costs paid by patients across jurisdictions.

**Table 4.10: Scenario analysis results**

	Total saving	Saving for out-of-pocket consumable costs
	\$m	\$m
NSW	74.5	1.8
VIC	10.2	1.0
QLD	36.2	5.9
SA	6.6	0.3
WA	28.6	0.9
NT	0.1	0.0
TAS	6.9	0.6
ACT	3.0	-
<b>National</b>	<b>166.0</b>	<b>10.5</b>

Source: KPMG calculations.

### 4.5.2 Sensitivity analysis

A probabilistic sensitivity analysis was also undertaken on the results of the scenario analysis with assumptions consistent with Section 4.4. The distribution of the total savings and the total avoided out-of-pocket consumable costs for 100 per cent CT usage are presented in Table 4.12, Chart 4.7 and Chart 4.8 respectively. In particular, the results suggest that:

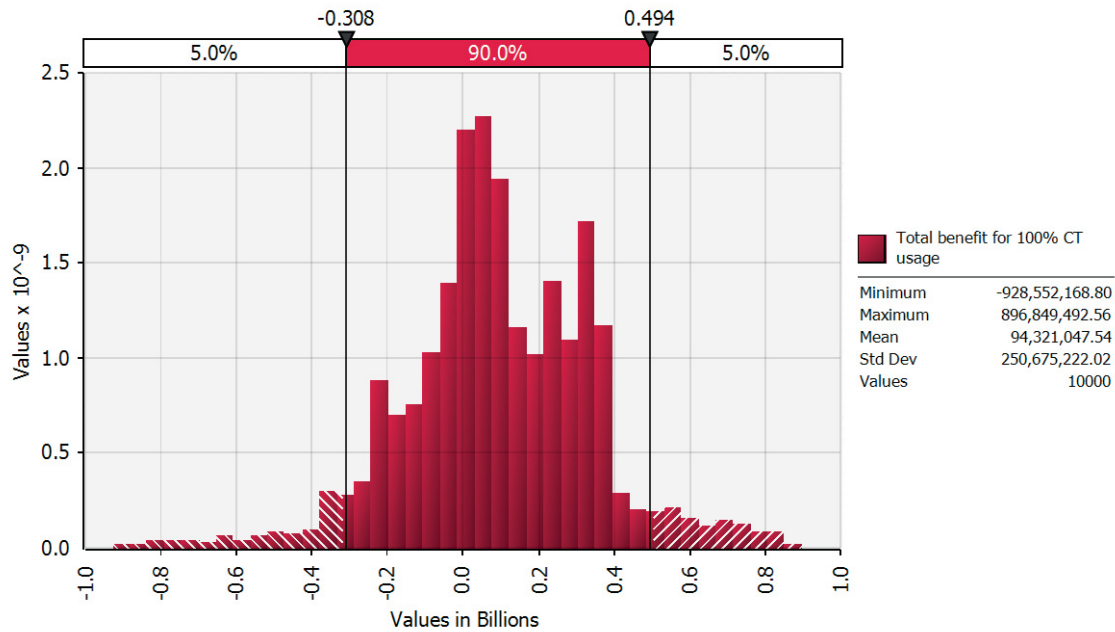
- the total saving for moving to 100 per cent CT usage is estimated to be between -\$308.3 million and \$493.8 million with 90 per cent confidence, with a mean total saving of \$94.3 million; and
- the total saving for out-of-pocket consumable costs for moving to 100 per cent CT usage are estimated to be between -\$16.2 million and \$25.2 million, with mean total saving of \$6.3 million.

**Table 4.11: Sensitivity analysis results**

	5 <sup>th</sup> percentile	Mean	95 <sup>th</sup> percentile	Standard deviation
	\$m	\$m	\$m	\$m
Total savings	-308.3	94.3	493.8	250.7
Savings for out-of-pocket consumable costs	-16.2	6.3	25.2	12.8

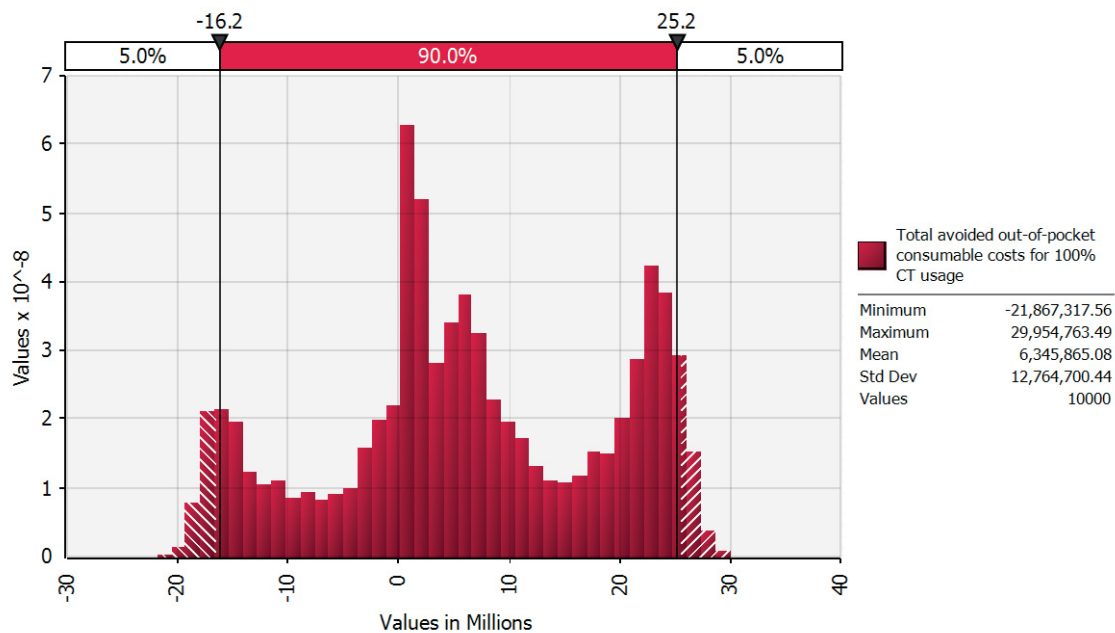
Source: KPMG calculations.

**Chart 4.7: Distribution of total savings for 100 per cent CT usage**



Source: KPMG calculations.

**Chart 4.8: Distribution of total savings for out-of-pocket consumable costs for 100 per cent CT usage**



Source: KPMG calculations.

Table 4.13 and Table 4.14 provide the results of the scenario analysis for each jurisdiction. In particular, the results suggest that:

- the greatest savings assuming 100 per cent CT usage would be expected to be derived (in order) from NSW, WA, and QLD, which are estimated to account for 83 per cent of the national mean benefit; and

- the greatest total savings for out-of-pocket consumable costs assuming 100 per cent CT usage would be expected to be derived (in order) from QLD, NSW, and WA, which are estimated to account for 84 per cent of the total avoided out-of-pocket consumable costs.

**Table 4.12: Summary of jurisdiction distributions of the total savings for 100 per cent CT usage**

	5 <sup>th</sup> percentile	Mean	95 <sup>th</sup> percentile
	\$'000	\$'000	\$'000
NSW	-119.4	45.5	217.3
VIC	-15.9	7.4	32.0
QLD	-98.5	13.9	113.6
SA	-11.7	3.4	17.8
WA	-42.3	18.6	85.3
NT	-0.2	0.0	0.3
TAS	-15.1	3.4	21.1
ACT	-4.4	1.9	8.8
<b>National</b>	<b>-308.3</b>	<b>94.3</b>	<b>493.8</b>

*Note: The state results are not summative because of the characteristics of the underlying distributions.*

*Source: KPMG calculations.*

**Table 4.13: Summary of jurisdiction distributions of the total savings for out-of-pocket consumable costs for 100 per cent CT usage**

	5 <sup>th</sup> percentile	Mean	95 <sup>th</sup> percentile
	\$'000	\$'000	\$'000
NSW	-953.2	1,452.9	3,585.7
VIC	-3,431.3	353.4	3,517.2
QLD	-11,062.4	3,083.6	14,795.1
SA	-75.1	242.7	550.7
WA	-242.1	763.9	1,693.4
NT	-0.8	3.5	8.0
TAS	-422.2	445.7	1,203.5
ACT	-27.8	0.1	27.4
<b>National</b>	<b>-16,194.6</b>	<b>6,345.9</b>	<b>25,210.4</b>

*Note: The state results are not summative because of the characteristics of the underlying distributions.*

*Source: KPMG calculations.*

# References

- Australian Bureau of Statistics (ABS) 2012a, *Australian Demographic Statistics*, ABS Cat. No. 3101.0, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/FBAC8C9AFBC52291CA25765100098272>, accessed 18 December 2012.
- ABS 2012b, *Consumer Price Index, Australia*, ABS Cat. No. 6401.0., <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6401.0>, accessed 21 September 2012.
- ABS 2008, *Population Projections, Australia, 2006 to 2101*, ABS Cat. No. 3222.0, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3222.0>, accessed 18 December 2012.
- ACT Health 2010, *ACT Public Service Nursing and Midwifery Enterprise Agreement 2011-2013*, <http://www.health.act.gov.au/professionals/nursing-midwifery/enterprise-agreement>, accessed 12 November 2012.
- Australian Institute of Health and Welfare (AIHW) 2012a, *AIHW National Hospital Morbidity Database*, [www.aihw.gov.au/national-hospital-morbidity-database/](http://www.aihw.gov.au/national-hospital-morbidity-database/), accessed 13 November 2012.
- AIHW 2012b, *Australian Hospital Statistics 2010-11*, AIHW Cat. No. HSE 117, <http://www.aihw.gov.au/publication-detail/?id=10737421633>, accessed 10 October 2012.
- AIHW 2012c, *Health Expenditure Australia 2010-11*, AIHW Cat. No. HWE 56, <http://www.aihw.gov.au/publication-detail/?id=10737423009>, accessed 10 October 2012.
- Australian Wound Management Association Inc. and the New Zealand Wound Care Society Inc. 2011, *Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers*, <http://www.awma.com.au/publications/publications.php>, accessed 5 December 2012.
- Baker, SR and Stacey, MC 1994, 'Epidemiology of Chronic Leg Ulcers in Australia', *Australian and New Zealand Journal of Surgery*, vol. 64, pp. 258-261.
- Barker, J and Weller, C 2010, 'Developing Clinical Practice Guidelines for the Prevention and management of Venous Leg Ulcers', *Wound Practice and Research*, vol. 18, no. 2, pp. 62-71.
- Briggs, M and Closs, SJ 2003, 'The prevalence of leg ulceration: a review of the literature', *EWMA Journal*, vol. 3, no. 2, pp. 14-20.
- Department of Human Services 2012, *Payment rates for Age Pension*, <http://www.humanservices.gov.au/customer/enablers/centrelink/age-pension/payment-rates-for-age-pension>, accessed 10 December 2012.
- Department of Health and Ageing 2012, *The November 2012 Medicare Benefits Schedule*, <http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Downloads-201211>, accessed 10 December 2012.
- Fair Work Australia 2012, *Nurses and Midwives (Victorian Public Sector) (Single Interest Employers) Enterprise Agreement 2012-2016*, <http://www.fwc.gov.au/documents/agreements/fwa/AE895073.pdf>, accessed 17 January 2013.
- Finlayson, K, Edwards, H, Gibb, M, Parker, C., Smith, D and Daniels, L 2012, Identifying health service pathways promoting evidence based management of patients with chronic leg ulcers. *Proceedings of the 4<sup>th</sup> Congress of the World Union of Wound Healing Societies*. 2-6 September 2012. Yokohama. Japan. p.168.
- Finlayson, K, Edwards, H, and Courtney, M 2009, 'Factors associated with reoccurrence of venous leg ulcers: a survey and retrospective chart review' *International Journal of Nursing Studies*, vol. 46, no. 8, pp. 1071-78.
- Franks, PJ and Posnett, J 2003, 'Cost effectiveness of compression therapy', *Understanding compression therapy*, Medical Education Partnership, pp. 8-10.
- Herber, OR, Schnepf, W and Rieger, MA 2007, 'A systematic review on the impact of leg ulceration on patients' quality of life', *Health and Quality of Life Outcomes*, vol. 5, no. 44.



- Independent Hospital Pricing Authority (IHPA) 2012, *National Efficient Price Determination 2012-13 and Pricing Framework*, <http://www.ihoa.gov.au/internet/ihoa/publishing.nsf/content/NEP-determ-12-13>, accessed 10 December 2012.
- Morrell, CJ, Walters, S, Dixon, S, Collins, KA, Brereton, LML and Peters, J 1998, 'Cost effectiveness of community leg ulcer clinics: randomised controlled trial', *British Medical Journal*, vol. 316, no. 7143, pp. 1487–91.
- National Institute of Clinical Studies 2005, *Evidence-Practice Gaps Report volume two*, <http://www.nhmrc.gov.au/nics/materials-and-resources/evidence-practice-gaps-report-volume-two>, accessed 10 October 2012.
- Nelson A, Bell-Syer, S and Cullum, NA 2000, 'Compression for preventing recurrence of venous ulcers', *Cochrane Database of Systematic Reviews*, vol. 4.
- NSW Health 2012, *Public Health System Nurses' & Midwives' (State) Award*, <http://www0.health.nsw.gov.au/resources/jobs/conditions/awards/pdf/nurses.pdf>, accessed 12 November 2012.
- NT Government 2011, *Northern Territory Public Sector Nurses and Midwives' 2011-2014 Enterprise Agreement*, <http://www.enterpriseagreements.nt.gov.au/nurses/docs/NTPS-Nurses-2011-2014.pdf>, accessed 12 November 2012.
- O'Meara, S, Cullum, N, Nelson, EA and Dumville, JC 2012, 'Compression for venous leg ulcers (Review)', *The Cochrane Collaboration*, vol. 11.
- Persoon, A, Heinen, MM, van der Vleuten, CJM, de Rooij, MJ, van de Kerkhof, PCM and van Achterberg, T 2003, 'Leg ulcers: a review of their impact on daily life', *Journal of Clinical Nursing*, vol. 13, pp. 341-354.
- Queensland Industrial Relations Commission 2012, *Nurses and Midwives (Queensland Health) Certified Agreement (EB8) 2012*, [http://www.qirc.qld.gov.au/resources/pdf/certified\\_agreements/cert\\_agreements/2012/ca105\\_2012.pdf](http://www.qirc.qld.gov.au/resources/pdf/certified_agreements/cert_agreements/2012/ca105_2012.pdf), accessed 16 January 2013.
- Royal Automobile Club of Victoria (RACV) 2012, RACV car service costs and car guide (small car), [http://www.racv.com.au/wps/wcm/connect/internet/primary/my+car/advice+\\_+information/vehicle+operating+costs](http://www.racv.com.au/wps/wcm/connect/internet/primary/my+car/advice+_+information/vehicle+operating+costs), accessed 23 August 2012, accessed 10 December 2012.
- Smith, E and McGuinness W 2010, 'Managing venous leg ulcers in the community: personal financial cost to sufferers', *Wound Practice and Research*, vol. 18, no. 3, pp. 134-139.
- South Australia Industrial Relations Commission 2010, *Nursing/Midwifery (South Australian Public Sector) Enterprise Agreement 2010*, [http://www.nursingsa.com/pdf/Nursing/Nursing\\_Midwifery\\_Enterprise\\_Agreement\\_2010.pdf](http://www.nursingsa.com/pdf/Nursing/Nursing_Midwifery_Enterprise_Agreement_2010.pdf), accessed 10 December 2012.
- Tasmanian Industrial Commission 2010, *Nurses and Midwives Heads of Agreement 2010*, [http://www.tic.tas.gov.au/\\_data/assets/pdf\\_file/0019/159103/Nurses\\_and\\_Midwives\\_Heads\\_of\\_Agreement\\_2010\\_-\\_T13746.pdf](http://www.tic.tas.gov.au/_data/assets/pdf_file/0019/159103/Nurses_and_Midwives_Heads_of_Agreement_2010_-_T13746.pdf), accessed 12 November 2012.
- Templeton, S and Telford, K 2010, 'Diagnosis and management of venous leg ulcers: a nurse's role?', *Wound Practice and Research*, vol. 18, no. 2, pp. 72-79.
- Victorian Auditor General 2006, Making travel safer: enforcing Victoria's speed enforcement program, [http://download.audit.vic.gov.au/files/road\\_safety\\_report.pdf](http://download.audit.vic.gov.au/files/road_safety_report.pdf), accessed 10 December 2012.
- Weller, CD, Ademi, Z, Makarounas-Kirchmann, K and Stoelwinder, J 2012, 'Economic evaluation of compression therapy in venous leg ulcer randomised controlled trials: A systematic review', *Wound Practice and Research*, vol. 20, no. 1, pp. 21-34.
- Western Australian Industrial Relations Commission 2011, *Registered Nurses, Midwives and enrolled mental health nurses – Australian Nursing Federation – WA Health Industrial Agreement 2010*, [http://www.health.wa.gov.au/awardsandagreements/docs/Registered\\_Nurses\\_Midwives\\_Enrolled\\_Mental\\_Health\\_Nurses\\_ANF\\_WA\\_Health\\_Ind\\_Agreement\\_2010.pdf](http://www.health.wa.gov.au/awardsandagreements/docs/Registered_Nurses_Midwives_Enrolled_Mental_Health_Nurses_ANF_WA_Health_Ind_Agreement_2010.pdf), accessed 10 December 2012.

# Appendix A: Internet survey questions

## Compression Therapy for Venous Leg Ulcers: Economic Study of Costs and Benefits

1. Does your service area have a community-based wound treatment program which includes treatment of venous leg ulcers?

☐ Yes

☐ No

2. Please indicate the Local Hospital District/Network (LHD/LHN) or the name of the service provider where you work.

3. In what setting do you spend most of your work time?

☐ General Practice

☐ Primary health care other than General Practice

☐ Community health care

☐ Residential aged care facility

☐ Acute health service (public or private)

☐ Speciality wound clinic located within a health service or hospital

☐ Other specialty wound clinic

☐ Research centre

4. What best describes your profession?

- ☐ General Practitioner (GP)
- ☐ Registered Nurse (RN)
- ☐ Enrolled nurse (EN)
- ☐ Aboriginal and Torres Strait Islander Health Worker
- ☐ Assistant in Nursing
- ☐ Personal Care Assistant
- ☐ Other

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**Questions for clinicians who provide clinical services to individual patients/clients**

(If you are not providing direct clinical care please go to the next section)

5. Are you currently providing clinical care or preventive management for patients at risk of developing wounds or with current wounds?

- ☐ Yes
- ☐ No

6. Are you currently providing clinical care or preventive management for patients with venous leg ulcers?

- ☐ Yes
- ☐ No

7. In the last 12 months of your clinical practice what proportion of wound patients treated by yourself have had at least one venous leg ulcer?
- ☐ 100% of wound patients
  - ☐ 75% of wound patients
  - ☐ 50% of wound patients
  - ☐ 25% of wound patients
  - ☐ 10% of wound patients
  - ☐ Less than 10% of wound patients
8. In the last 12 months of your clinical practice what per cent of venous leg ulcer patients treated by yourself have two or more VLUs at any one time?
- ☐ 100% of VLU patients
  - ☐ 75% of VLU patients
  - ☐ 50% of VLU patients
  - ☐ 25% of VLU patients
  - ☐ 10% of VLU patients
  - ☐ Less than 10% of VLU patients
9. Of those patients with two or more VLUs at any one time, how many VLUs do they have on average?
- ☐ 2 VLUs at a time
  - ☐ 3 VLUs at a time
  - ☐ 4 VLUs at a time
  - ☐ 5 or more VLUs at a time

10. To what extent have you used compression therapy (e.g., 4 layer compression bandages, inelastic bandages or elastic bandages plus dressing changes) for patients with venous leg ulcers in the last 12 months?

- ☐ 100% of VLU cases
- ☐ 75 % of VLU cases
- ☐ 50 % of VLU cases
- ☐ 25 % of VLU cases
- ☐ Not at all

11. If you have not used compression therapy 100% of the time for treatment of VLU, please use the boxes below to indicate percentages for the reasons compression therapy has not been used. Your response must add to 100% (e.g., Financial reasons 25%; Patient preferences 25%; Not clinically appropriate 25%; Other reasons 25% Please ensure you tick the checkboxes)

- ☐ Financial reasons
- ☐ Patient preferences
- ☐ Not clinically appropriate
- ☐ Other reasons

12. What is the average time you take to undertake VLU compression therapy, including application time and preparation for application(e.g. wound cleansing, dressing replacement, skin care)?

- ☐ 1 hour or more per patient consultation
- ☐ 45 minutes per patient consultation
- ☐ 30 minutes per patient consultation
- ☐ 20 minutes per patient consultation
- ☐ 10 minutes or less per patient consultation

13. What is the average number of times you change compression therapy per week?
- ☐ Once per week
  - ☐ Twice per week
  - ☐ Three times per week
  - ☐ Alternate days
  - ☐ Daily
14. **If compression therapy is not used,** what is the average time you take to administer other forms of therapy for VLU (e.g. wound cleansing, dressing replacement, skin care)?
- ☐ 1 hour or more per patient consultation
  - ☐ 45 minutes per patient consultation
  - ☐ 30 minutes per patient consultation
  - ☐ 20 minutes per patient consultation
  - ☐ 10 minutes per patient consultation
15. **If compression therapy is not used,** what is the average number of times you change the dressing per week?
- ☐ Once per week
  - ☐ Twice per week
  - ☐ Three times per week
  - ☐ Alternate days
  - ☐ Daily
  - ☐ Twice daily or more frequently than this
16. To what extent do you use compression therapy (e.g. compression stockings) to prevent recurrence of VLUs?

17. If you answered 75% or less, please indicate the reasons compression for prevention of VLU is not used.  
(MUST TOTAL 100% - Please tick the checkboxes)

18. Please provide any comments on issues that impede the use of compression therapy for patients with venous leg ulcers you provide clinical care to.

[illegible]



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### Questions for clinical leaders/managers who co-ordinate/lead clinical services

(If you are a clinician and a leader of clinical services please answer this section and the section above. If your role only involves co-ordinating clinical services please answer only this section.)

We are interested in who pays for the cost of wound management in your service area. The main costs of community VLU treatment are clinician consultation time and consumables.

In the sections below, please indicate what share of cost is paid by state or territory government programs, by Commonwealth government programs, or by patients. Your response must add to 100% (e.g., State or territory programs 50%, Federal programs 25%, Patients 25%).

19. Payment for clinician consultation time including dressing changes  
(MUST TOTAL 100% - Please tick the checkboxes)

☐ State or territory government program (e.g. wound clinics, community nursing)

☐ Commonwealth government programs (e.g. Medicare, Department of Veterans Affairs (DVA), Residential Aged Care, Health and Community Care (HACC – all states except Victoria & Western Australia))

☐ Patients (e.g. out of pocket payments)

20. Payment for consumable costs (compression therapy, other dressings, skin care products, stockings)  
(MUST TOTAL 100% - Please tick the checkboxes)

☐ State or territory government programs (e.g. wound clinics, community nursing)

☐ Commonwealth programs (e.g., Medicare, Department of Veterans Affairs (DVA), Residential Aged Care, Health and Community Care (HACC – all states except Victoria & Western Australia))

☐ Patients (e.g. out of pocket payments)

21. What is the average total cost of compression therapy consumables (e.g. bandages, compression stockings, skin care products) per week?
- ☐ \$50 or more per VLU wound
  - ☐ \$40 per VLU wound
  - ☐ \$30 per VLU wound
  - ☐ \$20 per VLU wound
  - ☐ \$10 per VLU wound
  - ☐ Less than \$10 per VLU wound
22. **If compression therapy is not used,** what is average total cost of wound therapy consumables (e.g. dressings, tapes, skin care products) per week?
- ☐ \$50 or more per VLU wound
  - ☐ \$40 per VLU wound
  - ☐ \$30 per VLU wound
  - ☐ \$20 per VLU wound
  - ☐ \$10 per VLU wound
  - ☐ Less than \$10 per VLU wound
23. Does your service area's wound treatment program involve clinician travel to patient homes to administer wound treatment (e.g. for consultations and/or dressing changes)?
- ☐ Yes
  - ☐ No

24. If yes to question 23, what proportion of cases requires travelling to patients in order to provide wound management treatment?

- ☐ 100% of patient cases
- ☐ 75% of patient cases
- ☐ 50% of patient cases
- ☐ 25% of patient cases
- ☐ Not at all

25. If travel is required, what is the average travel time to and from patients?

- ☐ 2 hours or more per patient consultation
- ☐ 1.5 hours per patient consultation
- ☐ 1 hour per patient consultation
- ☐ 45 minutes per patient consultation
- ☐ 30 minute per patient consultation
- ☐ 15 minutes per patient consultation
- ☐ 5 minutes or less per patient consultation

26. If travel is required, do clinicians visit more than one patient home in one day?

- ☐ Yes
- ☐ No

27. If yes to question 25, on average, how many patients would be visited for wound management in one day?

- ☐ 2 - 5
- ☐ 6 - 10
- ☐ 11 - 15
- ☐ 16 or more

28. Please provide any comments on issues that impede the use of compression therapy for patients with venous leg ulcers in your service area.



# Appendix B: Hospital admissions for VLU

Table B1. Australia hospital separations for related to VLU by DRG

Major Diagnostic Category			Partition	DRG	Year	2009-10 Separations
MDC 09. Diseases and disorders of the skin, subcutaneous tissue and breast	Medical	J60A Skin Ulcers				4,216
		J60B Skin Ulcers, Sameday				2,874
		J01Z Microvascular Tissue Transfer for Skin, Subcutaneous Tissue & Breast Disorder				664
	Surgical	J08A Other Skin Graft and/or Debridement Procedures W Catastrophic or Severe CC				2,249
		J08B Other Skin Graft and/or Debridement Procedures W/O Catastrophic or Severe CC				40,802
		J12A Lower Limb Procs W Ulcer/Cellulitis W Cat CC				473
		J12B Lower Limb Procs W Ulcer/Cellulitis W/O Cat CC W Skin Graft/Flap Repair				829
		J12C Lower Limb Procs W Ulcer/Cellulitis W/O Cat CC W/O Skin Graft/Flap Repair				1,213
		J13A Lower Limb Procs W/O Ulcer/Cellulitis W Skin Graft W (Cat or Sev CC)				557
		J13B Lower Limb Procs W/O Ulcer/Cellulitis W/O (Skin Graft and (Cat or Sev CC))				8,002
MDC 05. Diseases and disorders of the circulatory system	Medical	F63A Venous Thrombosis W Catastrophic or Severe CC				1,516
		F63B Venous Thrombosis W/O Catastrophic or Severe CC				7,015
		F64Z Skin Ulcers for Circulatory Disorders				1,236
		Total (DRG codes J12A, J12B, J12C)				2,515

Source: National Hospital Morbidity Database, KPMG calculations.

