

Economic burden of venous leg ulcers resulting from underlying deep vein disease, review of a 7-country cost analysis

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Disclosure

Dr. Raghu Kolluri reports following –

- **Uncompensated Consultant/Advisor**—Boston Scientific, Intact Vascular, InterVene, Medtronic, Pedra, Philips, Thrombolex, Vesper Medical
- **Executive Board Member** – VIVA Physician Inc, a 501c3 Corp



Venous Leg Ulcers

- VLU account for 70% of all chronic leg ulcers and are associated with a recurrence rate of 60-70% at ten years¹
- Venous leg ulcers (VLU) result in significant morbidity, prolonged disability, and substantial socioeconomic burden²

¹J Vasc Surg. 2014;60(2 Suppl):1S-2S. doi:10.1016/j.jvs.2014.04.058

²Advances in Wound Care. 2019;8(2):39-48. doi:10.1089/wound.2019.0946



Deep Venous System

- The deep venous system is responsible for 90% of the venous return to the right atrium from the lower extremities
- Abnormalities - obstruction or reflux → VLU^{2,3}
- Concomitant factors
 - Obesity
 - Elevated central venous pressures⁴
 - Reduced mobility/ Calf muscle pump dysfunction

¹<https://www.ncbi.nlm.nih.gov/books/NBK534256/>

²Korean J Intern Med. 2019;34(2):269-283. doi:10.3904/kjim.2018.230

³New England Journal of Medicine. 2018;378(22):2105-2114. doi:10.1056/nejmoa1801214

⁴Journal of Vascular Surgery: Venous and Lymphatic Disorders. 2020 Feb 21



Cost effectiveness of Superficial Venous Interventions

- ERVA
 - 450 VLU
 - Healing shorter in early intervention¹
 - Cost effective up to 3 yrs²

¹New England Journal of Medicine. 2018;378(22):2105-2114. doi:10.1056/nejmoa1801214

²Gohel et al. JAMA surgery. 2020.



Deep Venous Disease related VLU's (DRVs)???

- Not much data, although clinically significant
- Objective:
 - To identify and summarize the epidemiology
 - Provide a conservative current cost burden associated with the care for DRV
 - Five European countries (UK, Germany, France, Italy, Spain), + US, and Australia

A Conservative Estimate of the Economic Burden of Venous Leg Ulcers Associated with Deep Venous Obstruction

Article in press

Unable to disclose all results

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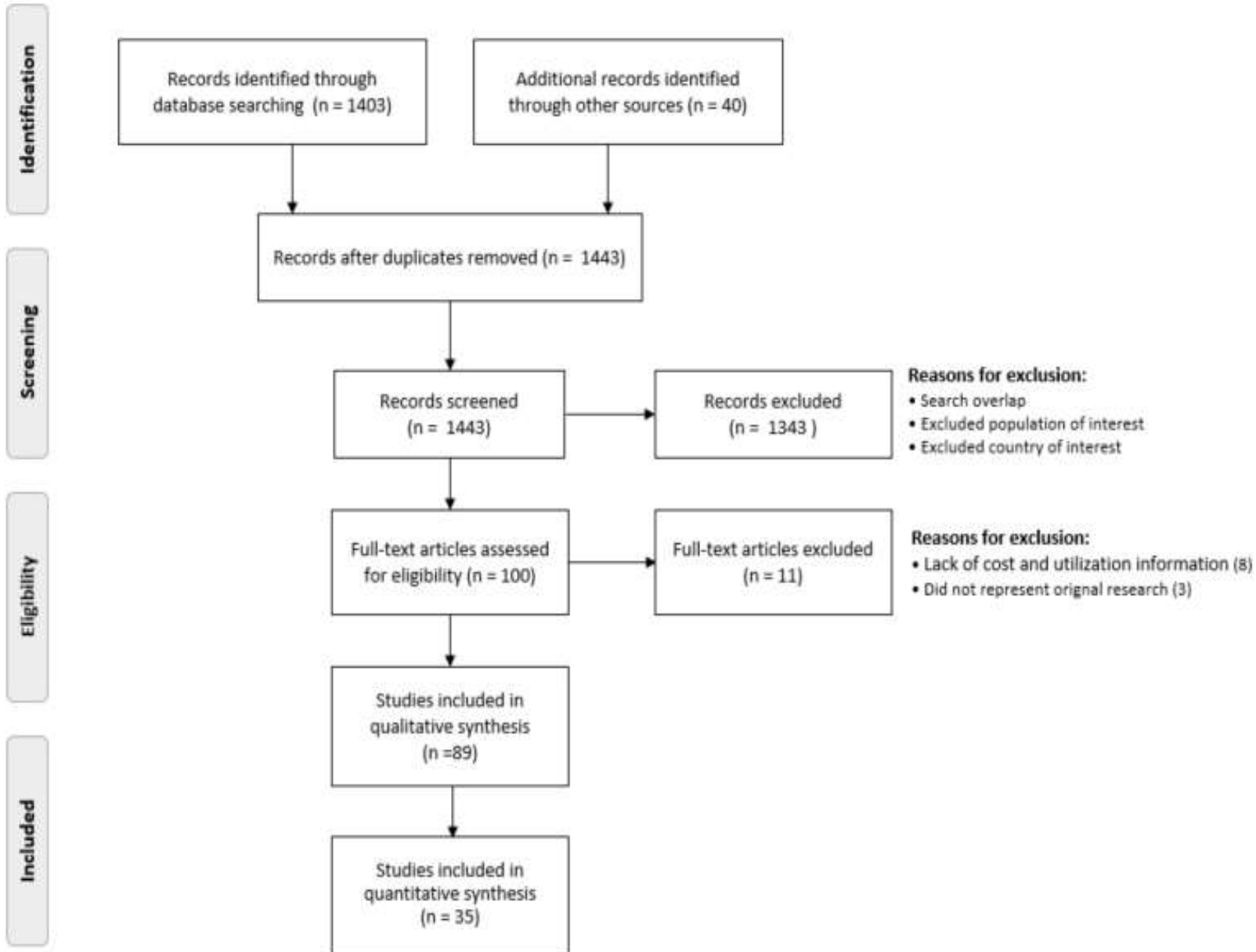


Systematic Literature Search

Search Strategy 1				Disease Search Terms		Topic Terms		Specific Disease Delimiters			
Disease Search Terms		Topic Terms		Guidelines							
Term	Operator separating terms	Term	Operator separating terms	Search Terms		Term	Operator separating terms	Search Terms	Operator separating term		
Varicose Ulcer [Mesh]	OR	standard of care [Mesh]	OR	Varicose ulcer [Mesh]		(Varicose Ulcer [Mesh]	OR	standard of care [Mesh]	OR	iliac vein obstruction	OR
CEAP 6 [Title/Abstract]	OR	natural history [Mesh]	OR			CEAP 6 [Title/Abstract]	OR	natural history [Mesh]	OR	May Thurner	OR
open, active ulcer [Title/Abstract]	OR	Epidemiology [Mesh]	OR			open, active ulcer [Title/Abstract]	OR	Epidemiology [Mesh]	OR	Post-thrombotic syndrome	OR
Venous incompetence [Title/Abstract]	OR	morbidity [mesh]	OR			Venous incompetence [Title/Abstract]	OR	morbidity [Mesh]	OR	ilio-caval venous obstruction	OR
C-class 6 [Title/Abstract]	OR	quality of life [mesh]	OR			C-class 6 [Title/Abstract]	OR	quality of life [Mesh]	OR	Atresia	OR
active venous ulceration [Title/Abstract]	OR	quality-adjusted life years [Mesh]	OR			active venous ulceration [Title/Abstract]	OR	quality-adjusted life years [Mesh]	OR	ilio-femoral venous thrombosis	OR
{Chronic venous insufficiency NOT varicose)		global burden of disease [Mesh]	OR	Guidelines-Specific Filters:		{Chronic venous insufficiency NOT varicose)		global burden of disease [Mesh]	OR	Deep venous	OR
		costs and cost analysis [Mesh]	OR	Article Types:				costs and cost analysis [Mesh]	OR	Deep vein	
		technology assessment, biomedical [Mesh]	OR	Congress, Guideline,				technology assessment, biomedical [Mesh]	OR		
		expert opinion [Title/Abstract]	OR	Practice Guideline,				expert opinion [Title/Abstract]	OR		
		resource utilization [Title/Abstract]	OR	Technical Report				resource utilization [Title/Abstract]	OR		
		incremental cost [Title/Abstract]	OR					incremental cost [Title/Abstract]	OR		
		ICER [Title/Abstract]	OR					ICER [Title/Abstract]	OR		
		Wound healing [Title/Abstract]						Wound healing [Title/Abstract]			
Overall Search Filters											
<ul style="list-style-type: none"> Publication Dates: 10 years Species: Humans Language: English, French, German, Italian 											
Disease search terms, topic search terms, and specific disease delimiters were joined by the operator AND											
Search Filters: None											

English, French, Italian, German and Spanish from January 2009 to November 2019



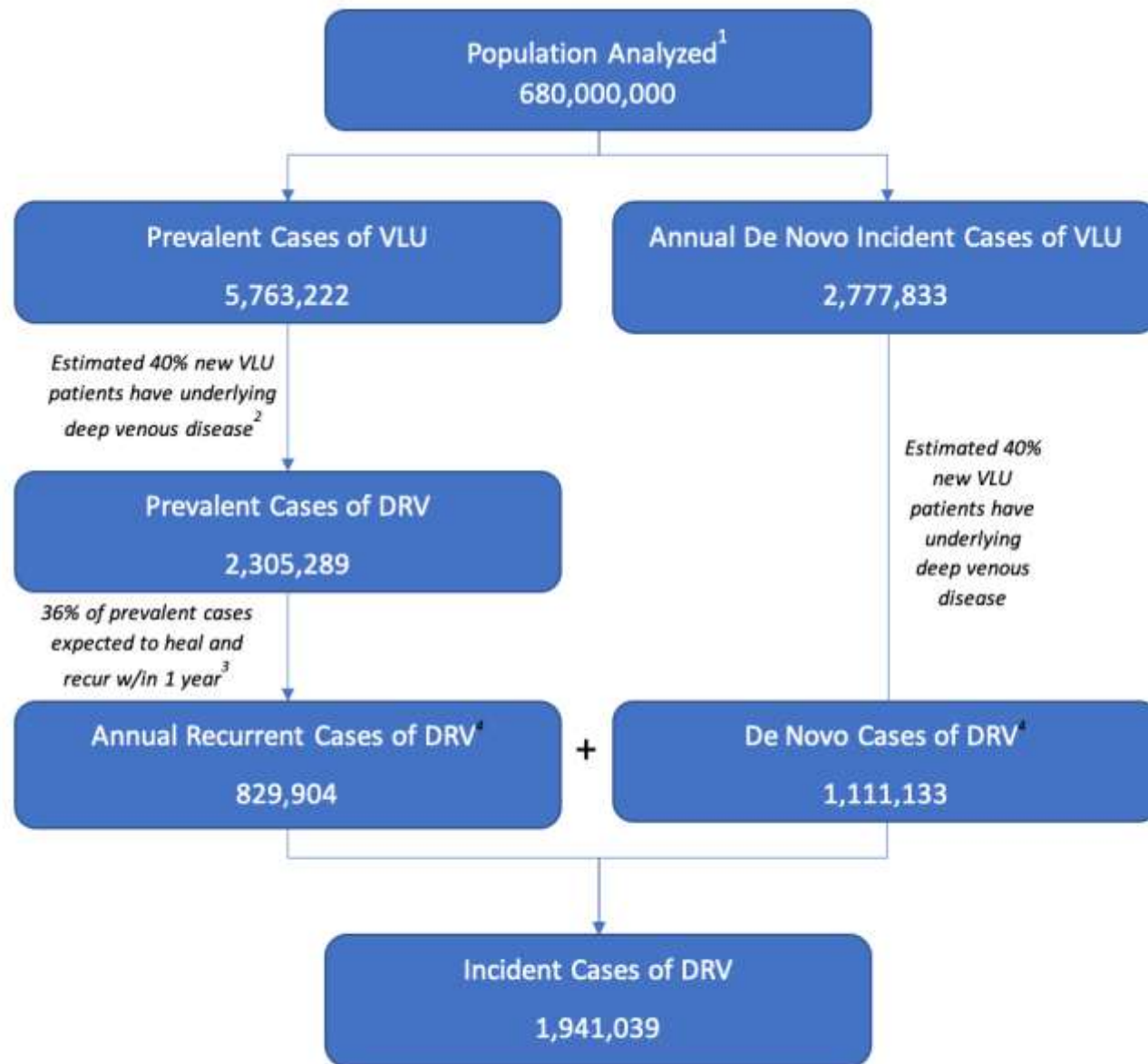


The five major cost categories assessed for conservative treatment of DRV

1. Practitioner costs: clinic visits, medical practitioner and nursing staff time, fees and wages
2. Inpatient hospitalization costs
3. Compression therapy: the cost of compression systems
4. Wound bed preparation, pain management products; and skin substitutes in the US
5. Drug/Medication costs: antibiotics, ointments, lotions, topical creams

Central assumptions from our literature review

- DRV are responsible for 40% of VLU
- 60% of DRV are unhealed at 6 months with conservative treatment
- DRV recur at a higher rate (36% annually) than VLU without deep venous involvement
- Unhealed VLU is 4.5 times more expensive to manage than the cost of managing a patient with a healed wound
- The useful life of compression therapy systems is 3 months



¹ Refers to the cumulative population of 7 countries (Australia, France, Germany, Italy, Spain, UK and US)

^{2,3} Model assumptions (detailed explanation and reference provided in the manuscript)

⁴ See Table 2

Results – DRV burden

- Total annual incidence of new or recurrent DRV in Australia, France, Germany, Italy, Spain, UK, and the US are estimated at 122,000, 263,000, 345,000, 253,000, 85,000, 230,000, 643,000 events respectively in 2019.
- Incidence ranges from 0.73 to 3.12 per 1,000 persons per year
- The estimated **CONSERVATIVE** annual direct medical costs for patients managed conservatively in these geographies total ~ \$10.73 billion or \$5,527 per person per year.
- USA – **\$4.94** billion (>80% - practitioner related costs)



Conclusions

- The availability of published data on the costs of VLU care varies widely across countries considered in this analysis.
- Although country-specific VLU practice patterns vary, there is a uniform pattern of high-cost care with conservative therapy.