

## Triage of patients with venous and lymphatic diseases during the COVID-19 pandemic – The Venous and Lymphatic Triage and Acuity Scale (VELTAS):

A consensus document of the International Union of Phlebology (UIP), Australasian College of Phlebology (ACP), American Vein and Lymphatic Society (AVLS), American Venous Forum (AVF), European College of Phlebology (ECoP), European Venous Forum (EVF), Interventional Radiology Society of Australasia (IRSA), Latin American Venous Forum, Pan-American Society of Phlebology and Lymphology and the Venous Association of India (VAI)

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## Abstract

The coronavirus disease 2019 (COVID-19) global pandemic has resulted in diversion of healthcare resources to the management of patients infected with SARS-CoV-2 virus. Elective interventions and surgical procedures in most countries have been postponed and operating room resources have been diverted to manage the pandemic. The Venous and Lymphatic Triage and Acuity Scale was developed to provide an international standard to rationalise and harmonise the management of patients with venous and lymphatic disorders or vascular anomalies. Triage urgency was determined based on clinical assessment of urgency with which a patient would require medical treatment or surgical intervention. Clinical conditions were classified into six categories of: (1) venous thromboembolism (VTE), (2) chronic venous disease, (3) vascular anomalies, (4) venous trauma, (5) venous compression and (6) lymphatic disease. Triage urgency was categorised into four groups and individual conditions were allocated to each class of triage. These included (1) medical emergencies (requiring immediate attendance), example massive pulmonary embolism; (2) urgent (to be seen as soon as possible), example deep vein thrombosis; (3) semi-urgent (to be attended to within 30–90 days), example highly symptomatic chronic venous disease, and (4) discretionary/non-urgent- (to be seen within 6–12 months), example chronic lymphoedema. Venous and Lymphatic Triage and Acuity Scale aims to standardise the triage of patients with venous and lymphatic disease or vascular anomalies by providing an international consensus-based classification of clinical categories and triage urgency. The scale may be used during pandemics such as the current COVID-19 crisis but may also be used as a general framework to classify urgency of the listed conditions.

## Keywords

COVID-19, pandemic, SARS-CoV-2, triage, vascular, venous, lymphatic, vascular anomalies, vascular malformations

## Background

The global coronavirus disease 2019 (COVID-19) pandemic has resulted in diversion of healthcare resources including workforce, critical supplies, emergency and intensive care unit (ICU) facilities and personal protective equipment (PPE) to the management of patients infected with SARS-CoV-2 virus. Elective interventions and surgical procedures in most countries have been postponed and operating room resources have been diverted to manage the pandemic.<sup>1</sup> Limitations on direct personal contact and physical (social) distancing have influenced access to care and how it is provided. Patients with venous and lymphatic disorders or vascular anomalies continue to need expert care within current public health constraints. In addition, there is growing evidence that COVID-19 may predispose patients to both arterial and venous thromboembolic (VTE) disease and extensive coagulopathies further complicating the prognosis of the affected patients.<sup>2–4</sup> To facilitate triage in this demanding setting we recommend the use of a standardised scale to rationalise and harmonise the management of these patients during this difficult period.

## Aims

The Venous and Lymphatic Triage and Acuity Scale (VELTAS) was developed to provide an international

standard for the triage of patients with venous and lymphatic disorders or vascular anomalies. VELTAS aims to improve patient safety and increase triage reliability by providing a standardised framework for the management of these conditions.

## Methods

### *Stratification of triage urgency*

Triage urgency is defined as the clinical assessment of urgency with which a patient would require medical treatment or surgical intervention.<sup>5</sup> The principle for triage and prioritisation for admission for medical treatment or procedural interventions and surgery is based on the natural history and expected clinical outcomes of the condition, the rate of progression and deterioration, and the complications that may arise should treatment be delayed or withheld.<sup>6</sup> The rationale for triage is ‘to do the greatest good for the greatest number’.<sup>7</sup>

Various models and strategies for stratifying urgency during the COVID-19 pandemic have been proposed.<sup>8–10</sup> In this document, the appropriate timeline to attend to individual conditions was determined by an international panel of vascular experts.

**Table 1.** Venous and Lymphatic Triage and Acuity Scale (VELTAS).

Venous and Lymphatic Triage and Acuity Scale (VELTAS)		Venous and Lymphatic Triage and Acuity Scale (VELTAS)		
Triage	Acuity	Priority	Clinical categories	Indications for medical treatment <sup>a</sup> or intervention <sup>b</sup>
Medical emergency	Acute Life-threatening Potential for immediate deterioration	Immediate	VTE	<ul style="list-style-type: none"> <li>– Massive PE with or without DVT</li> <li>– Acute iliofemoral DVT with phlegmasia<sup>9</sup> or sepsis</li> <li>– Acute ASVT with phlegmasia</li> <li>– Acute central vein thrombosis with superior vena cava syndrome</li> <li>– Acute MVT with peritonitis</li> <li>– Acute paradoxical embolism and stroke<sup>10</sup></li> <li>– Venous gangrene</li> <li>– Life-threatening blood loss<sup>10</sup> from a bleeding varix</li> <li>– Acute septicaemia or uncontrolled sepsis in a leg wound</li> </ul>
			CVD	<ul style="list-style-type: none"> <li>– Kasabach–Merritt syndrome with severe coagulopathy</li> <li>– Severe cardiac failure secondary to AVM</li> <li>– Life or limb-threatening venous trauma<sup>10</sup></li> <li>– Acute septicaemia or uncontrolled lymphangitis or secondary infection</li> </ul>
			Vascular anomalies <sup>c</sup>	
			Venous trauma	
			Lymphatic disease	
Category I Urgent	Acute Potential to be life-threatening Potential to deteriorate quickly and may become an emergency	As soon as possible Initial management may be provided by the referring doctor Consider urgent tele- interview	VTE	<ul style="list-style-type: none"> <li>– PE,<sup>10</sup> DVT, ASVT, MVT or extensive proximal SVT<sup>d 12,13</sup></li> <li>– DVT requiring IVC filter placement<sup>14</sup></li> <li>– Acute central vein thrombosis with or without haemodialysis access</li> <li>– Temporarily controlled bleeding varices</li> <li>– Infected wounds and ulcers with risk of septicaemia</li> <li>– Squamous cell carcinoma in a venous ulcer</li> </ul>
			CVD	<ul style="list-style-type: none"> <li>– Acute complications including infection, bleeding and thrombosis</li> <li>– Cardiac failure secondary to AVM</li> <li>– Vascular malignancies</li> </ul>
			Vascular anomalies <sup>c</sup>	
			Venous trauma	<ul style="list-style-type: none"> <li>– Non-life or limb-threatening venous trauma</li> <li>– Lymphoedema with extensive lymphangitis or secondary cellulitis and risk of septicaemia</li> </ul>
			Lymphatic disease	

(continued)

Table 1. Continued.

Venous and Lymphatic Triage and Acuity Scale (VELTAS)					
Triage	Acuity	Priority	Clinical categories	Indications for medical treatment <sup>a</sup> or intervention <sup>b</sup>	
Category 2 Semi-urgent	May be chronic or new onset	Within 30–90 days	VTE	– Symptomatic non-extensive SVT <sup>d</sup>	
	Unlikely to become an emergency	Initial management by the referring doctor	CVD	– Removal of IVC retrievable filters <sup>14</sup>	
	Unlikely to deteriorate quickly	Consider tele-interview		– CEAP <sup>15</sup> C3–C6 <sup>e</sup>	
	Highly symptomatic can cause significant pain, dysfunction or disability		Vascular anomalies <sup>c</sup>	– Highly symptomatic CVD (irrespective of CEAP classification) <sup>e</sup>	
			Venous compression	– Highly symptomatic pelvic venous insufficiency, varicoceles <sup>f</sup>	
			Lymphatic disease	– Complex or extensive vascular tumours and malformations	
				– LIC within a vascular malformation or tumour	
				– Ulceration and cutaneous complications	
				– Highly symptomatic venous compression syndromes <sup>f</sup>	
				– Chronic lymphoedema with secondary infection or cutaneous changes	
Category 3 Discretionary/ non-urgent	Chronic	Within 6–12 months	VTE	– Chronic symptomatic post-thrombotic obstruction	
	No apparent potential to become an emergency	Initial management by the referring doctor	CVD	– CEAP C0 <sub>s</sub> –C2 <sup>e</sup>	
	Slow progression	Consider tele-interview		– Mildly symptomatic pelvic venous insufficiency, varicoceles <sup>f</sup>	
	Asymptomatic or mildly symptomatic		Vascular Anomalies <sup>c</sup>	– Uncomplicated benign vascular tumours and malformations	
			Venous compression	– Venous TOS	
			Lymphatic disease	– Mildly symptomatic venous compression syndromes including May–Thurner syndrome <sup>f</sup>	
				– Chronic lymphoedema or lipoedema	

ASVT: acute axillary subclavian vein thrombosis; AVM: arteriovenous malformation; CEAP: Clinical Etiological Anatomical Pathophysiology classification; CVD: chronic venous disease; DVT: deep vein thrombosis; IVC: inferior vena cava; LIC: localised intravascular coagulopathy; MVT: mesenteric vein thrombosis; PE: pulmonary embolism; SVT: superficial vein thrombosis; TOS: thoracic outlet syndrome; VTE: venous thromboembolism.

<sup>a</sup>Medical treatment started at admission may be continued in an outpatient setting.

<sup>b</sup>Intervention can be performed in a non-hospital ambulatory or outpatient setting.

<sup>c</sup>Vascular anomalies incorporate two broad categories of vascular tumours such as haemangiomas and vascular malformations. The latter further includes venous (VM), arteriovenous (AVM), lymphatic (LM), capillary (CM), combined, complex and syndromic malformations in adults and children.

<sup>d</sup>Extensive SVT is defined as above-knee great saphenous SVT  $\geq 5$  cm long whilst non-extensive SVT is defined as non-saphenous SVT, below-knee saphenous SVT or above-knee saphenous SVT  $< 5$  cm in length.

<sup>e</sup>During pandemic circumstances, CVD should be initially managed in the community with a trial of medical treatments including compression therapy if appropriate; advice from vascular specialists to be obtained using tele-health technology where available.

<sup>f</sup>This indication excludes asymptomatic patients from triage categories and includes symptomatic patients only, as there is no current indication to intervene for asymptomatic May–Thurner syndrome, other venous compression syndromes or asymptomatic pelvic venous insufficiency.

### *The consensus process*

The project was initiated by the International Union of Phlebology (UIP) in conjunction with the Australasian College of Phlebology. The document was written by the primary authors and further reviewed and developed by the co-editors, based on appraisal of current evidence in the literature published in print or online through April 2020. When evidence was lacking or limited, consensus was developed. The document was shared with an international expert panel of phlebologists and vascular specialists representing the endorsing societies and further topics and recommendations were included and the final document formulated. Consensus on triage and acuity was reached when a recommendation was unanimously supported by all authors. In case of any dissenting opinion multiple attempts were made to modify the recommendation. At the end of the consensus process, all participating authors approved the final version of the document and agreed to be accountable for all aspects of the work.

### *Utility and target audience*

The scale is designed primarily for phlebologists and vascular specialists but will be also useful for primary physicians and general practitioners, referring doctors, emergency specialists and other healthcare professionals and health policymakers. VELTAS will be especially relevant during pandemics such as the current COVID-19 crisis but may also be used as a general framework to classify urgency of the listed conditions.

### *Scope*

The scale includes a comprehensive range of conditions seen by phlebologists and other vascular specialists involved in the management of patients with venous and lymphatic disorders or vascular anomalies as defined by the UIP curriculum.<sup>11</sup>

### **Recommendations**

Clinical conditions within the scope of phlebology were classified into six categories of (1) VTE, (2) chronic venous disease (CVD), (3) vascular anomalies, (4) venous trauma, (5) venous compression and (6) lymphatic disease. Triage urgency in each clinical category was classified into four groups of (1) medical emergencies, (2) urgent, (3) semi-urgent and (4) discretionary/non-urgent. Individual conditions in each clinical category were allocated to a class of triage by the expert panel (Table 1).

### *Adaptation to pandemic circumstances*

We recognise that clinical practice and expectations need to be adapted in times of regional or global crisis. Under pandemic circumstances patients are encouraged to continue to consult their general practitioners and primary care physicians via appropriate means such as tele-health facilities to initiate management and to obtain a referral to phlebologists or other vascular specialists when necessary. During the pandemic, tele-health facilities should be used by treating specialists as much as possible to address patients concerns and provide advice on treatment options. Medical emergencies should continue to be triaged by emergency services where available.

### *Additional comments and exclusions*

1. This document should be used as a general guideline applicable to both hospital and non-hospital ambulatory settings.
2. Decisions regarding clinical urgency need to consider the patients' individual circumstances and loco-regional variations in the clinical practice of medicine, hospital policies and government-enforced guidelines and directives.
3. In developing VELTAS we recognise and acknowledge that some conditions:
  - (i) can be managed differently;
  - (ii) can be managed completely or in part by a variety of other healthcare providers;
  - (iii) are less urgent and hence can be managed more conservatively;
  - (iv) when chronic, can be safely delayed for definitive procedural interventions; and
  - (v) must be dealt with just as promptly despite the pandemic.
4. The scale does not replace the treating physician's clinical judgement of acuity and severity and the requirement for intervention as applicable in different models of healthcare.
5. The specified times for attendance indicate the ideal time frames within which patients should be seen and attended to. Such ideal timelines may be influenced by other factors such as availability of resources, other competing national or regional requirements for critical supplies and PPE, and national, regional, local and individual hospital admission policies.
6. This document should not be used to delay or deny treatment of less urgent cases, deny or minimise reimbursement for services provided, or limit access to healthcare when resources are not limited,

and such care does not present a risk to patients or health care workers.

## Conclusion

VELTAS is a triage and acuity scale dedicated to the care of patients with acute and chronic venous and lymphatic disorders or vascular anomalies. The scale aims to standardise the triage of this group of patients by providing a consensus-based classification of clinical categories and triage urgency.

## Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr William Marston declared consultancy for Boston Scientific Inc. Other authors declared no relevant conflicts of interest.

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