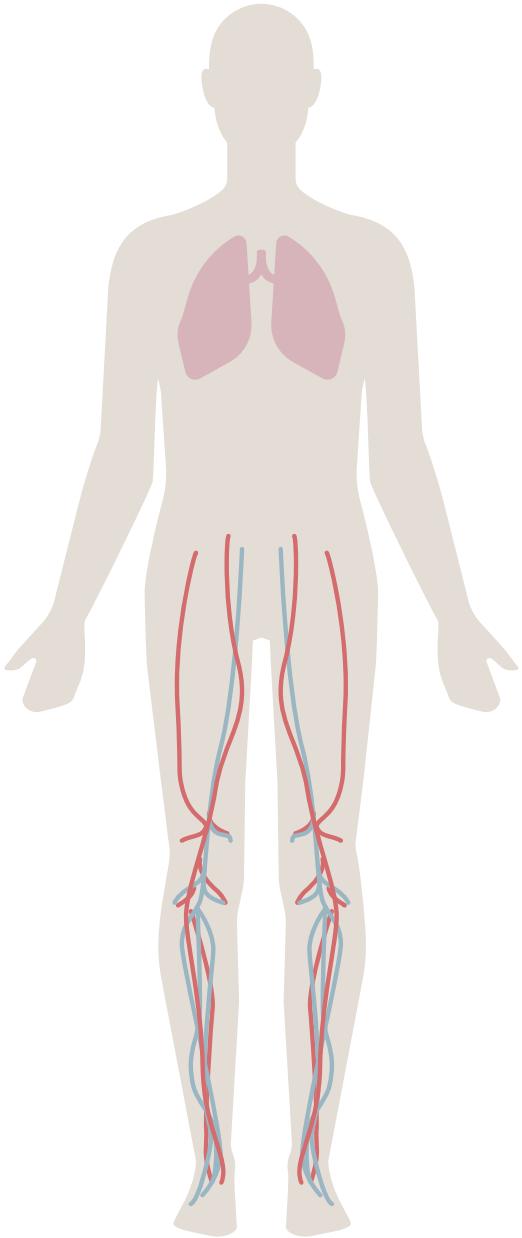
CONVENIENT, COMFORTABLE AND CLINICALLY PROVEN VTE PREVENTION

Flowtron®
Active Compression System

Featuring SmartSense™ 2 with Compliance Monitoring technology

arjo

Protecting your patients at risk of VTE



Venous thromboembolism (VTE), which includes both Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), is a life-threatening condition that can have a significant cost burden on acute care providers and healthcare systems.[1,2]

While healthcare facilities are aware of the risk of VTE, care providers may lack the time, training and resources to optimally implement prevention strategies. In order to protect the well-being of at-risk patients, comprehensive prevention strategies that take into account individual clinical needs are essential.

Understanding the burden of VTE and the importance of prevention

With 10 million cases each year, VTE is a serious condition that causes death and disability worldwide.[1]

There are a number of factors that place patients at risk of VTE. Patients undergoing surgical procedures (>30 min) have always been considered one of the most significant risk groups for developing this condition. At the same time, awareness of other high-risk hospitalised patient groups, such as critical care, cancer, obstetric, bariatric and stroke patients, have steadily been increasing over recent years with emphasised importance of prophylaxis.[4,9,10]

VTE-related events kill more than double the number of people than breast cancer, prostate cancer, motor vehicle accidents and AIDS combined.[9]

Clinical relevance

Two Cochrane reviews, published in 2008 and 2016 respectively, assessed the efficacy of combined mechanical and pharmacological prophylaxis versus single modalities in the prevention of VTE in high-risk patients. In the most recent meta-analysis, data from 22 randomised or controlled trials and more than 9,100 patients was included. The selection of studies covered a wide range of patient groups undergoing a variety of surgical procedures, including orthopaedic, urologic, cardiothoracic, neuro, trauma, gynaecologic and general surgery interventions.

Both reviews concluded that the combined modalities of IPC and anticoagulants are more effective in reducing incidence of VTE than either modality used in isolation. While the DVT incidence rate in the anticoagulant group was 4.23/6.2% (2008/2016), the addition of IPC further reduced the risk to 0.65/2.9%, demonstrating an opportunity for significant improvement in the interval of 53-85% by adding IPC to pharmacological prophylaxis. These results support current guidelines which recommend multi-modal prophylaxis in high-risk patients.[6,7]

Based on clinical evidence, today's guidelines recommend Intermittent Pneumatic Compression (IPC) either as an effective standalone modality, for patients at high risk of bleeding, or as a combined therapy for patients at high risk of VTE.[3-7]

What is IPC?

IPC is a well-established and proven type of active compression and mechanical prophylaxis, commonly used to prevent VTE. As a therapy with a convincing evidence base and few side effects, IPC is indicated for use across a wide range of hospitalised patients at risk of VTE. IPC devices consist of a pneumatic pump that inflates air into garments wrapped around the foot, calf, thigh, or a combination of the three. Garments may have one (uniform) or more (sequential) chambers. By mimicking the action of the calf muscle pump that occurs during natural ambulation, the method increases the circulation of blood in the deep veins of the legs, helping to prevent the formation of blood clots.[8]

Pulmonary embolism, resulting from DVT, is a potentially fatal condition.[11]

While early diagnosis and treatment may lead to recovery, long-term complications can result in lifelong treatment and patient suffering.[13]

In the US, it is estimated that VTE affects 350,000 to 600,000 individuals annually, with almost $40B spent on treatment of hospital-acquired VTE.[2,15]

US data states that up to 60% of VTE cases occur during or shortly after hospitalisation, making it the leading preventable cause of hospital death.[1,12]

In Europe, more than 1 million VTE cases occur annually, resulting in approximately 544,000 deaths and a cost burden estimated at €1.5-2.2B in direct cost and €13.2B in total cost.[9,14]

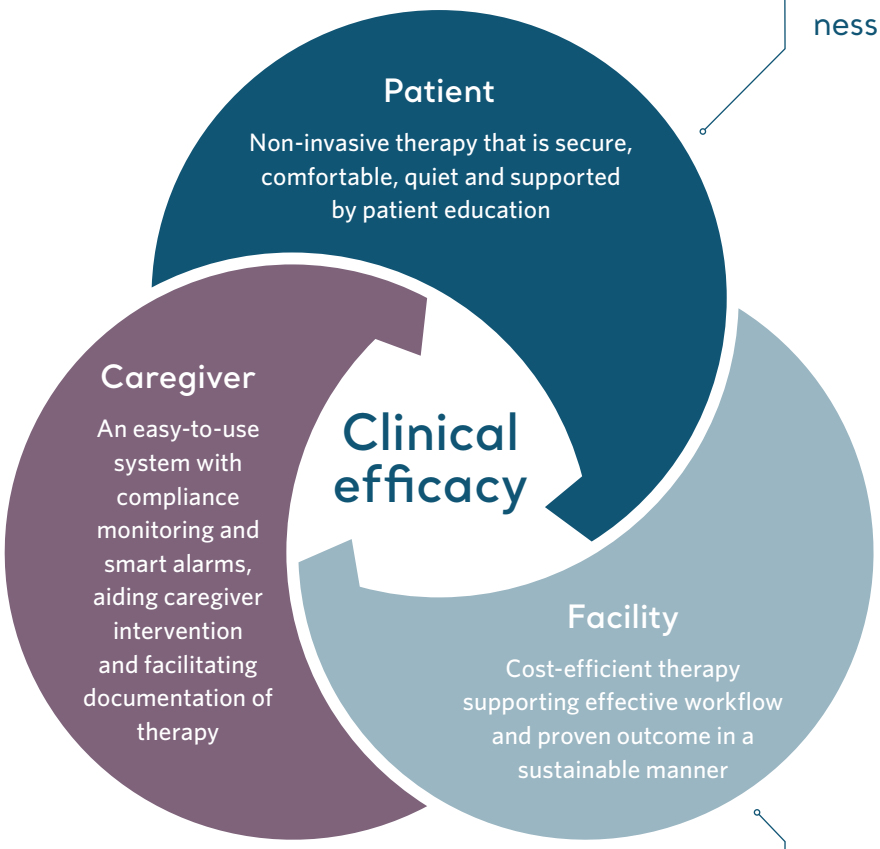
VTE is associated with prolonged and recurring hospital stays and treatment, causing significant economic burden to healthcare systems globally.[16]

The link between compliance and clinical efficacy in VTE prevention

When compliance is fulfilled by all those involved in patient care, optimal clinical efficacy may be attained.

By helping to achieve compliance in patient care, the Flowtron Active Compression System and associated service offering is designed to support clinical efficacy.

Promotes compliance to therapy by ensuring patient comfort and risk awareness



Helps ensure correct delivery of therapy with the convenience of a smart pump

Supports efficient processes, clinical efficacy and sustainability

Introducing the Flowtron Active Compression System

Designed to give you freedom of choice, the Flowtron system offers both uniform and sequential modes in one easy-to-use pump.

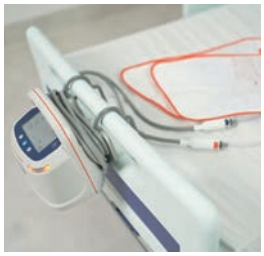
Flowtron ACS900 pump

Sequential Tri Pulse garments

Uniform DVT garments

SmartSense 2 Auto Garment Recognition

SmartSense 2 Compliance Monitoring



Flowtron Active Compression System is the secure, convenient and flexible way to deliver VTE prevention therapy.[17-20] At Arjo, we have built on the Flowtron legacy for decades, continuously improving our offering to ensure the best possible performance of IPC therapy across healthcare environments. We continuously strive to make everyday tasks easier for caregivers, and enable them to spend more time caring for their patients.

Flowtron ACS900 reviewed in independent evaluation

An evaluation conducted by the ECRI Institute, an independent non-profit organisation focused on identifying the most effective solutions for care, rated the Flowtron ACS900 against a comparable Sequential Compression System in terms of performance, security, workflow, patient experience and cost of ownership. For information on how to obtain a copy of the report, please contact your local Arjo representative or visit www.ecri.org.

Enabling caregivers to prevent the preventable

Reduce the risk of VTE in your facility with the Flowtron ACS900 pump, featuring SmartSense 2 Automatic Garment Recognition and Compliance Monitoring technology.

The challenge

Caregivers are often under a lot of pressure in their daily work and may struggle to support the correct use and documentation of mechanical prophylaxis. The Flowtron solution is designed to help address caregiver challenges such as:

- Lack of time and resources
- Time spent on non-patient activities
- Managing inventory and troubleshooting equipment
- Use of multiple systems and new technologies
- Need for continuous training and education
- Being responsive to individual patient needs
- Addressing non-compliance and documenting actual therapy

Clinical relevance

Non-compliance to therapy remains the principal barrier to IPC effectiveness[21], however compliance is not only linked to the patient but also to caregiver adherence.

Studies have reported a misapplication of IPC devices in as many as 50% or more of the cases observed[22-24]. A consistent trend in many published studies indicates that a major barrier to compliance is the failure of healthcare professionals to provide IPC when mechanical prophylaxis has been prescribed, and vigilance in reapplying garments throughout the hospital stay[22-29]. This, in turn, can be attributed to nursing workload and acuity[30], resulting in lack of therapy or garment application after temporary removal[28].

Proven ease of use and security supporting clinical efficacy

A study performed with 118 users at 32 hospitals in 4 different countries demonstrated the clinical application of the Flowtron ACS900 and Tri Pulse garment range. User data from caregivers was collected in areas such as patient compliance, ease of use and security.[31]

The case study results showed that 99.2% of the users considered Flowtron ACS900 to be easy to use in general, easy to operate (99.1%) and easy to clean (99.1%).

The plug-and-play element was found to free up time to care for patients by most users (94.9%) as it reduces time spent on non-patient related activities.

Having one pump covering all IPC therapy needs was deemed to contribute to ease of use by all users and to facilitate training by 99.1% of the respondents.

The majority of users (94.0%) confirmed the secure features of the pump limited the risk of operator error and facilitated troubleshooting when using the Flowtron ACS900.

Flowtron ACS900 pump

A single pump that offers both uniform and sequential compression via a variety of garment types, reducing the need to have multiple pump models in the facility. The easy-to-use Flowtron ACS900 makes it simple to tailor VTE prevention with one pump covering all therapy needs.

SmartSense 2 Automatic Garment Recognition

Arjo's patented garment detection technology automatically sets the correct pressure and compression cycle, without the need for any additional user intervention. Simply attach the snap-lock connectors to the Flowtron ACS900 pump and the system easily and securely does the rest.

SmartSense 2 Compliance Monitoring

To aid concordance and facilitate tracking and documentation of therapy, ACS900 provides intuitive compliance monitoring that detects garment wear-time during IPC. It allows the pump to record and display actual therapy as well as non-compliant time, and alert upon lack of adherence. This makes it easier for caregivers to ensure compliance with prescribed therapy and to enter accurate data into patient records.

The Compliance Monitoring feature was designed to:

- **Support clinical outcome** by helping to ensure effective delivery of IPC therapy
- **Assist caregiver intervention** by alerting upon non-compliance to IPC therapy
- **Aid documentation** of delivered therapy by providing data for patient records

A smart system designed to solve challenges in the clinical setting

Smart and adaptive

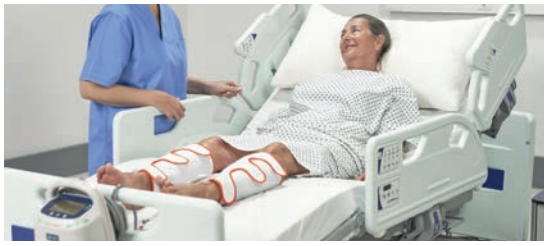
Automatic garment recognition together with one-button start make Flowtron a true plug-and-play solution that is easy to set up and operate. Reducing the need for user intervention by automatically identifying garments connected and setting the correct compression profile – for security and efficacy.[18,19,31]

Compliance monitoring

Intuitive on-screen compliance monitoring, recording and displaying actual therapy as well as non-compliant time in an accurate manner. Alerts the caregiver upon garment removal to aid concordance, and facilitates tracking and documentation of IPC therapy.[32,33]

Alarms and indicators

Advanced alarms, including visual indicators allowing operation to be clearly seen from any direction, and real-time pressure indication designed to limit the risk of operator error and potential patient harm – for security and caregiver peace of mind.[31]



Quiet operation

QuietConcept™ noise reduction technology significantly reducing pump noise to minimise patient and caregiver disruption. Allowing the ACS900 to deliver therapy in a quiet manner across all garment types, contributing to a quieter care environment.[34]

Complete range of garments

A wide variety of garment types and sizes ensuring effective and comfortable therapy for all patients and clinical needs[31,35,36]. The system allows for any combination of foot, calf and calf-and-thigh garments to be used simultaneously.

Durable and energy efficient

VTE prevention around the clock* with SmartEnergy™ enhanced power management ensuring uninterrupted calf therapy for a minimum of 24 hours when the pump is not connected to a power outlet[37]. SmartEnergy also contributes with reduced power consumption, CO_2 emissions and cost[38].

Fixed tubesets

Ready for therapy at all times with fixed tubesets preventing disconnection and loss of tubing, hence eliminating the inconvenience and cost of replacements.[31]

Integrated cable management system

Integrated cable management system aiding tubeset and power cord management in the clinical area and during storage/transportation, promoting caregiver convenience and patient security.[17-19,31]

*Calf: >24h / Thigh: >18h / Foot: >9h

Recognising noise pollution as a growing problem

Featuring the latest technological advancements, Flowtron ACS900 outperforms its competition in terms of noise level[34], which helps promote patient rest, recovery and overall compliance to IPC therapy.

The challenge

Hospitals can be a stressful environment for both patients and caregivers. With the growing amount of electrical equipment in care facilities, and development of new medical technologies, increasing noise and alarms from diverse medical devices around the patient's bedsides are becoming an issue. Results from a number of studies[39-45] confirm noise levels in clinical settings to be unacceptably high, consistently and significantly exceeding recommended thresholds. IPC devices require continuous use to be effective in preventing VTE, and with high rates of non-adherence to prescribed therapy[46], noise should be considered a key factor in achieving patient comfort, compliance and clinical efficacy.

Clinical relevance

The World Health Organization (WHO) recommends average hospital sound levels should not exceed 35 dB(A) in rooms where patients are treated or observed, and 30 dB(A) in ward rooms, with a maximum of 40 dB(A) overnight[47,48]. Similarly, the International Noise Council (INC) has stipulated that noise levels in intensive care units (ICUs) should not exceed 30 dB(A) at night[49-51]. However, several studies show that from 1960 to 2003, noise levels in the ICU have increased from 57 dB to 72 dB daytime and from 42 dB to 60 dB during night[52]. A number of studies have found noise to be the most significant cause of sleep disruption in the hospital setting[43,48,53-55].

Proven low noise emissions contributing to a quiet care environment

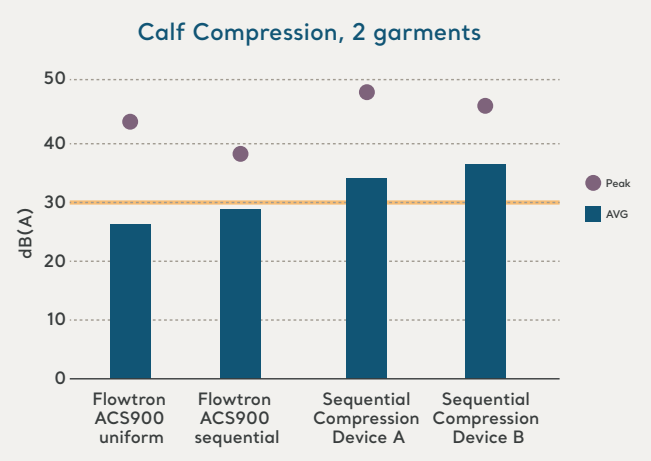
Independent testing confirms Flowtron ACS900 average noise emissions to be below the 30 dB(A) limit, irrespective of garment type in use and measured at 1m distance as per ISO standards[34].

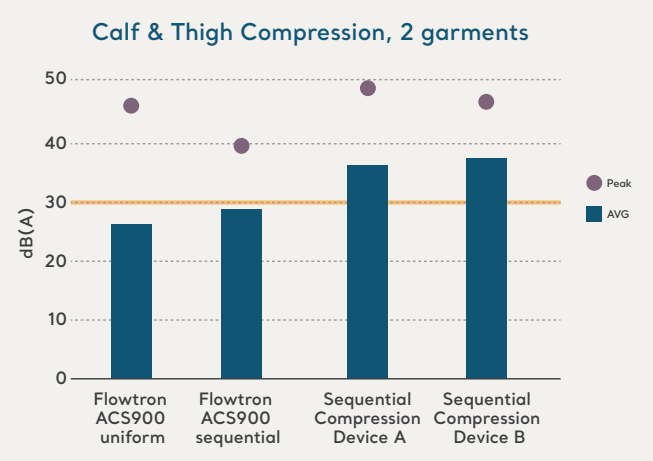
Compared to two of the most recent and relevant competitive devices, ACS900 measures significantly lower for all types of compression (calf, thigh, foot, uniform, sequential), proving Flowtron ACS900 superior both on average and peak noise levels.

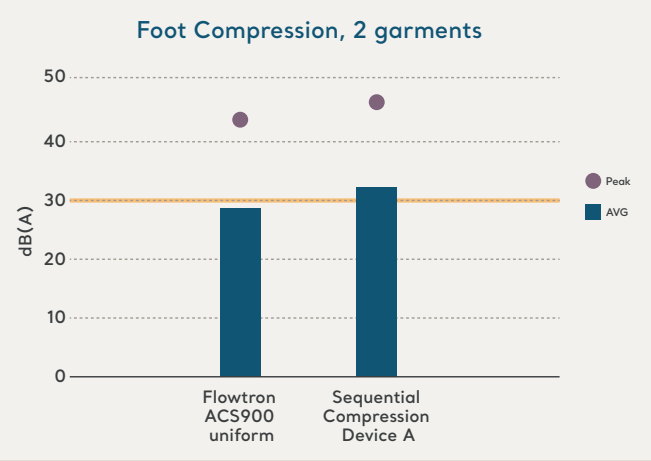
With noise emissions measuring well below thresholds stipulated by WHO and INC as well as the US Environmental Protection Agency (EPA)[56], our aim is to contribute to a hospital environment with less noise.

In addition to low emissions of noise with QuietConcept technology, Flowtron ACS900 comes with the option to select volume level or mute audible notifications and certain alerts to adapt to care setting and user preference.

Furthermore, the pump display and LED indicators will dim to reduce brightness and further minimise disruption in the hospital environment during operation. This helps to support not only patient comfort and compliance but also contributes to a sustainable and efficient work environment for caregivers.







Note 1: Measurements taken at 1m distance in an anechoic chamber setting as per ISO standards.

Note 2: Competitor pump ventilation fan was **not** running during the measurement.

Note 3: Sequential Compression Device A manufactured 2019-11-13 and Device B 2021-04-23, both of the most recent product models.

Note 4: An increase of 10 dB(A) translates into a perceived doubling of loudness by the average listener.[57]

Addressing comfort as key to patient compliance

In addition to a quiet operating pump, lightweight, breathable and vapour permeable garments promote patient compliance to therapy by helping to prevent the build-up of heat and moisture.

The challenge

The use of IPC as a prophylactic method requires the patient to wear garments continuously over time. This is vital to the success of IPC in reducing the risk of VTE in the hospital environment. Guidelines recommend therapy to take place continuously for 18-24 hours per day, and for no less than 72 hours or until the patient is fully mobile. Mechanical prophylaxis has been suggested for as long as 10-14 days post-operatively for patients undergoing major orthopaedic surgery.[3,58]

Patients may remove sleeves if they are uncomfortable, particularly if they make the skin feel too hot, sweaty or itchy, or if the sleeves in other ways irritate the skin. Patient discomfort may increase the need for caregivers to perform manual checks and refit sleeves to non-compliant patients that otherwise risk missing out on therapy.

Clinical relevance

Increasing emphasis has been placed on the comfort of VTE garments in improving wear-time which is linked with reduced VTE event rates.[59,60]

A randomised, controlled trial evaluating patient compliance with IPC therapy, demonstrated that a garment which was more comfortable was worn for longer periods.[61]

Proven comfort and design promoting effective prevention

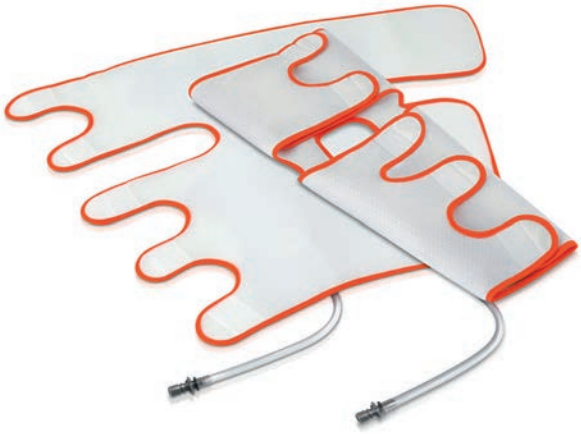
With comfortable premium fabrics, making the patient more inclined to wear the garments during therapy, Flowtron addresses the core challenge of comfort in VTE prevention. Proven comfortable, Flowtron garments promote effective prevention and improved patient outcomes.[31,35,36,61]

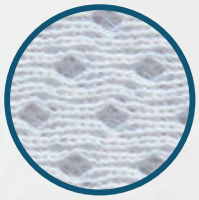
In the case study earlier introduced, 97.5% of the users responded that they experience patients to comply with Flowtron therapy.

In addition, patients were very positive with regards to the fit (98.3%) and comfort (96.5%) of the garments, and most caregivers (99.1%) liked the anterior placement of the single air inlet tube and felt this could help in reducing the risk of pressure injuries.

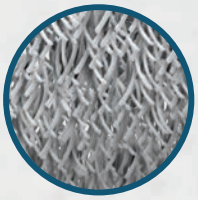
Caregivers commented that once the device and treatment was explained to patients, they would comply with prescribed therapy and find the garments to be comfortable.

Almost all users (97.5%) who took part in the case study indicated that they would recommend other facilities and caregivers to use the Flowtron system.

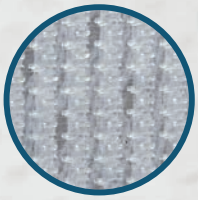




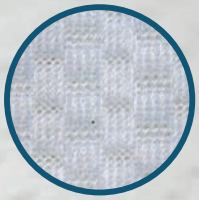
Soft and breathable inner fabric transfers heat and moisture away from the skin through micro vents



Cushioning interior fibres designed to aid patient comfort



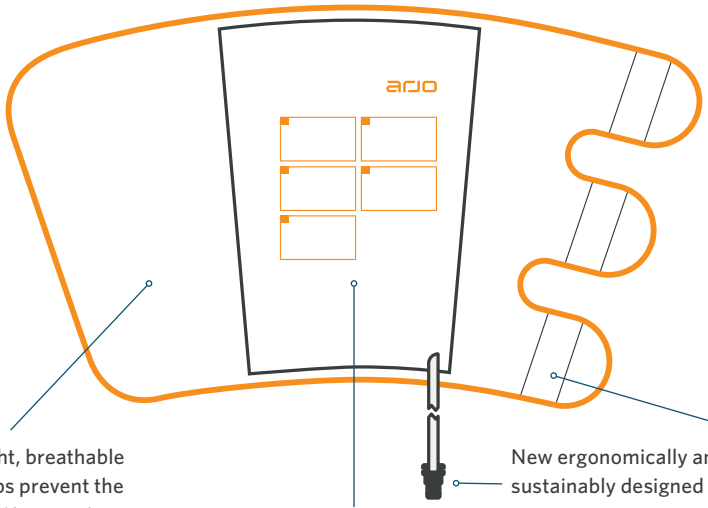
Simple and robust Velcro® closures that help keep the garment secure



Lightweight mesh outer fabric helps prevent the build-up of heat to keep the patient cool and dry

Freedom of choice with Flowtron garments

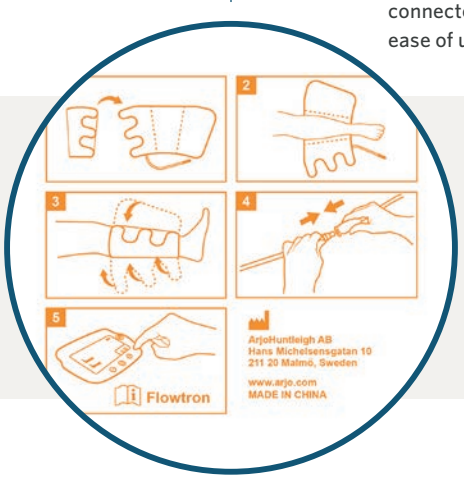
Uniform DVT garments



Extensive range of foot, calf and thigh garments addressing a wide variety of clinical needs and patient types

Lightweight, breathable fabric helps prevent the build-up of heat and moisture[35]

New ergonomically and sustainably designed garment connector promoting caregiver ease of use and patient security[62]

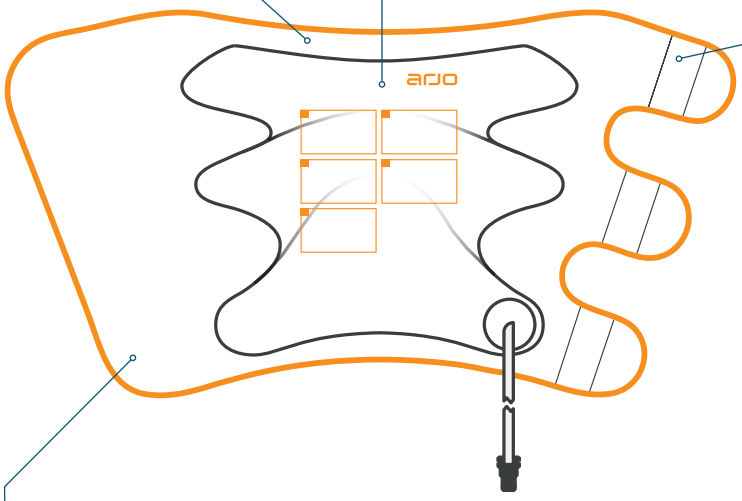


Clear visual instructions printed on the garment for ease of use and security in application[63]

Simple and robust Velcro® closures helping to promote effective therapy by providing a secure and snug fit[31]

Garment designed to follow the natural curve of the leg, with patented wing-shaped bladder wrapping around the calf

Sequential Tri Pulse garments



Sequential garment range designed for optimal anatomical fit and enhanced patient comfort[31]

Advanced Airflow Light fabric keeps the skin cool and dry by preventing heat and moisture build-up[36]

Single air inlet tube positioned anteriorly on the leg away from the bony prominence, designed to help reduce the risk of pressure injuries with less tubing around the patient[31]


Flowtron
REF DVT10
M
≤43 cm
≤17 inch
arjo
1
2
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Flowtron
ArjoHuntleigh AB
Hans Michelsensgatan 10
211 20 Malmö, Sweden
www.arjo.com
MADE IN POLAND
MD

Your partner in secure and effective VTE prevention

With over 60 years of experience, Arjo is a clinically focused company that works together with healthcare professionals to better understand the evolving needs and challenges of today's complex healthcare environments.

Our commitment to VTE prevention goes beyond acting merely as a supplier of pumps and garments, but instead becoming your partner in the fight against venous thromboembolism.

We do this by offering clinically proven prevention solutions supporting healthcare economic value and increased overall efficiency in the facility. This offering includes a comprehensive range of services and training programmes designed to boost your VTE prevention strategies.

Arjo's history and legacy in VTE prevention

1950

1957: Arjo is founded by Swedish entrepreneur Arne Johansson

Early 1970s: The first trials of DVT prophylaxis at Hammersmith Hospital and Kings College Hospital in London, leading to the development of Flowtron Aire

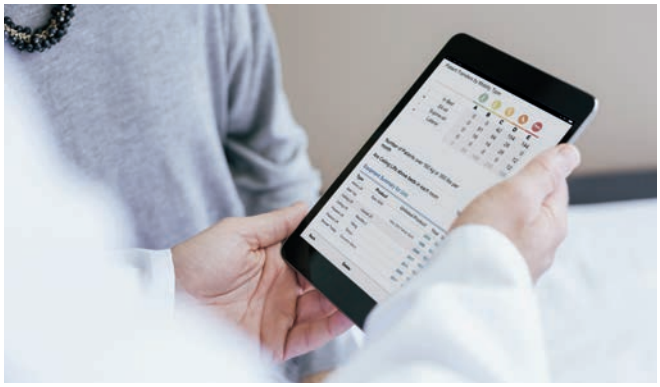
1973: The first company to demonstrate haematological effects from IPC

1979: Flowtron Aire Ltd becomes Huntleigh, instrumental in developing robust and clinically effective IPC products

1995: Arjo is acquired by Getinge Group

1998: Flowtron DVT Foot garment range is introduced and becomes the first foot garment on the market with gentle inflation compression for added comfort

● Company milestone ● Portfolio milestone



Clinical support

Designed to help you improve patient outcomes and reduce VTE rates by promoting best practice and evidence-based VTE prevention strategies. The goal is to improve quality of care and reduce cost by providing you with clinical support to optimise device utilisation.

Training programmes and support

We offer comprehensive training and support services to ensure the most effective use of your VTE prevention devices and other Arjo products. Our team not only provides you with an in-depth understanding of VTE and its associated complications and costs; we also provide education on how a complete Arjo solution can help reduce VTE rates while achieving a more efficient workflow in your care facility. After implementation, you will benefit from ongoing support to continuously improve workflows and patient outcomes.

Rental and financial solutions

Nothing is more important than giving patients the best possible care. Arjo offers comprehensive solutions to help ensure you have the right equipment at the right time, and that your facility is prepared to meet the changing needs of a diverse patient population. Our rental solutions give you access to specialised equipment and proven therapies to meet specific care needs – whenever and wherever they occur. We also offer financing solutions supported by qualified analysis to help you make the most of your investments.

Arjo Care

Our comprehensive service ensures that you get the most out of your equipment, and that problems are prevented before they arise. This includes a tailored service agreement, from sourcing genuine replacement parts, to supporting compliant processes with clear documentation of servicing records. Let us focus on the care of your products, so that you can focus on caring for your patients.

2001: Introduction of Advanced Clinical Education program, later to become Arjo Clinical Education (ACE), to provide customer education on VTE and its prevention

2002: Flowtron Universal becomes the first IPC pump on the market with automatic garment recognition and capacity to run calf, thigh and foot compression from the same pump

2007: Getinge Group acquires Huntleigh Technology PLC, combining it with Arjo to create the ArjoHuntleigh brand

2014: Flowtron ACS800, later replaced by the ACS900, becomes the first pump on the market capable to deliver both uniform and sequential therapy

2017: Arjo becomes an independent publicly listed company

2018: Reprocessing service launched under the Arjo ReNu brand name in the US, setting a clear direction for Arjo's sustainability and partnership ambitions

2018: Arjo acquires US based company ReNu Medical, specialising in non-toxic and environmental friendly reprocessing of single-use non-invasive medical devices

2022: Launch of SmartSense 2 with Compliance Monitoring to aid concordance and facilitate tracking and documentation of IPC therapy

2022: Launch of ACS900 update incorporating QuietConcept for reduced noise level, and SmartEnergy for lower energy consumption and increased battery run time

2030

Environmental sustainability

Through a number of initiatives, we continuously work to minimise the environmental impact of our products, enabling caregivers to provide optimal care in a sustainable manner. This includes reducing scrap and waste as well as using more sustainable materials and processes throughout the development, manufacturing, distribution, use, reprocessing and final disposal or recycling stages of our products' lifecycle.

Within VTE prevention, our acquisition of ReNu Medical* enables us to offer non-toxic reprocessing of non-invasive medical devices, without chemical residue or emissions. It is part of our efforts to reduce environmental impact and medical waste, improving the footprint of our business as well as that of our customers, while ensuring the security of patients and caregivers.

Consumes less power and lasts longer with improved energy efficiency

Reduced power consumption
SmartEnergy technology contributes to reduced power consumption (and associated CO_2 emissions and cost) – approximately 40% lower than the main competitor

Improved battery operation
New technology providing a significant increase in battery run time – a 50-100% (depending on garment type) improvement from previous ACS900 version and up to four times better than the main competitor

New ergonomically and sustainably designed garment connector

Reduced medical waste
With a more environmentally sustainable connector design using less plastic material

Designed to reduce the risk of patient discomfort and medical device-related pressure injury
With a new low-profile garment connector design

User-friendly garment packaging with less waste throughout the product lifecycle

New manufacturing and packaging process
Less material use and reduced scrap in garment manufacturing and packaging

New polybag material
Higher quality, fully recyclable and easier to open

User instructions printed on polybag / Application guide printed on garment
Improved legibility, ease of use and security

Elimination of paper format Instruction For Use (IFU)
Preservation of our environment and forests by less paper waste

*Reprocessing currently only available in the US

Compression type

Sequential

Uniform

Application

Foot

Calf

Thigh

Sizing

S — Small

M — Medium

L — Large

XL — X-large, bariatric

Flowtron ACS900 pump

Model	Type	Tube length
ACS900	Standard	2.1m/7ft
ACS900	OR (Operating Room)	4.0m/13ft

Flowtron Tri Pulse garments

Application	Item ref	Size	Measurement
	TRP10	M	≤ 43cm/17in
	TRP20	L	≤ 58cm/23in
	TRP60L	XL	≤ 81cm/32in
	TRP30	M	≤ 71cm/28in
	TRP40	L	≤ 89cm/35in

Flowtron DVT garments

Application	Item ref	Size	Measurement
	DVT5	S	≤ 36cm/14in
	DVT10	M	≤ 43cm/17in
	DVT20	L	≤ 58cm/23in
	DVT60L	XL	≤ 81cm/32in
	DVT30	M	≤ 71cm/28in
	DVT40	L	≤ 89cm/35in
	FG100	S-M	US (M) ≤ 7 US (F) ≤ 9 EU ≤ 40 UK ≤ 7
	FG200	L-XL	US (M) ≥ 7.5 US (F) ≥ 9.5 EU ≥ 41 UK ≥ 7.5

Wall mount
Item ref:
526366

IV pole mount
Item ref:
526359


Flowtron ACS900
arjo

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