

Physical counter-pressure maneuvers (PCM) of any type compared with no use of PCM be used for symptoms of presyncope?

Adults and children with signs and symptoms of **presyncope** (e.g., faintness, dizziness) of suspected vasovagal or orthostatic syncope.

Physical Counter-Pressure Maneuvers (PCM) (of any type)

PCMs are physical movements that can be performed by the individual as a first-line intervention for acute presyncope symptoms progressing to full syncope (i.e., loss of consciousness), reduce symptoms of presyncope (e.g., dizziness, faintness) and to prevent postural tone which can lead to falls and trauma.

PCMs include **squatting, leg crossing and leg muscle tensing, abdominal muscle tensing or compression, hand gripping, tensing** and neck flexion.

No PCM used, other PCMs, or other interventions

Abort Syncope; Symptom Improvement; Improvement to Hemodynamics (HR; SBP; DBP); Injury or Adverse Events

Most study participants had a history of recurrent vasovagal or orthostatic syncope;

Studies were conducted in lab setting with tilt table-induced symptoms or in real-life follow-up.

Of the First Aid Provider and the individual experiencing presyncope

Syncope is a common condition with an estimated life-time prevalence of 35%. There are many causes of syncope and presyncope. The most common causes of syncope include vasovagal syncope (50%), orthostatic hypotension (7%) and cardiac syncope (7%). Syncope has considerable medical and socioeconomic burden on the adult population. Worldwide, about 50% of females and 25% of males are reported to have a syncopal event in their lifetime. Physical injuries resulting from syncope occur in approximately 30% of patients admitted to hospital. Injuries include skull or long bone fractures, intracranial hemorrhage, internal organ injury and neurological defects.

Current first aid recommendations for an individual with presyncope symptoms includes assisting them to a sitting or lying position, removing tight clothing, and calling for an ambulance. The use of evidence-based recommendations for the management of presyncope has the potential to prevent progression to syncope, reduce falls and injuries, minimize symptoms and discomfort, prevent hospitalization and other socioeconomic beneficial outcomes.

None identified

rity?

RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
<p>Syncope is a common medical problem. The frequency of syncope, according to age in the general population, is between 15% and 39% (Lewis 1999 205, Serlettes 2006 1967, Lipsitz 1985 45). The annual incidence is 18.1–39.7 per 1000 people with a high prevalence between 10 and 30 years of age, mainly presenting with vasovagal syncope (Moya 2009 2631).</p> <p>The sudden onset of presyncope and syncope can lead to physical injuries (29–35%) and sometimes result in major trauma (4.7%). Presyncope and syncope may also have a significant impact on quality of life. The hospitalization costs of these conditions is estimated at \$2.4 billion annually in USA (Sun 2013 370).</p>	<p>The quality of life of individuals with recurrences and/or presyncope is seriously affected.</p> <p>A wide variety of pharmacological treatments are proposed for recurrent syncope, but none are adequate in many cases. Non-pharmacological “physical” treatments are becoming first choice treatment options.</p> <p>Due to the number of affected individuals, the costs from the disorder and its impact on quality of life, providing an effective treatment may result in significant benefit to the population.</p> <p>There are currently no first aid measures to assist with preventing presyncope or stopping it progressing to full syncope or to relieve presyncope symptoms.</p>

Effects

the desirable anticipated effects?

RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION

There is little evidence available for the use of PCM.

Available studies demonstrate a small beneficial effect from the use of PCM to abort syncope. The effect was beneficial and statistically significant in one small RCT, but the beneficial findings in four observational studies were not significant.

There was a significant beneficial effect of symptom improvement in two RCTs.

Hemodynamics improved in both RCTs and observational studies with PCM.

Summary of findings for PCM any compared to no PCM for presyncope:

RCT

Outcome № of participants (studies)	Relative effect (95% CI)	Anticipated absolute effects (95% CI)		Difference
		Without PCM	With PCM	
Abort Syncope 64 (4 observational studies)	RR 2.20 (0.96 – 5.05)	27.7%	50.0%	222 more per 1,000 (from 11 fewer to 1000 more)
Abort Syncope 19 (1 RCT)	RR 1.80 (1.16 to 2.79)	52.6%	94.7%	421 more per 1,000 (from 137 more to 468 more)
Abort Syncope 37 (2 observational)	not estimable	-	349/351 episodes (99.4%)	-
Injuries or Adverse Events 37 (2 observational)	not estimable	-	0/37 (0%)	-
Symptom Improvement 19 (1 RCT)	RR 6.00 (1.55 to 23.26)	10.5%	63.2%	530 more per 1,000 (from 60 more to 1000 more)
Symptom improvement - Follow-up phase 96 (1 RCT)	RR 1.57 (0.98 to 2.51)	44.0%	69.0%	251 more per 1,000 (from 26 more to 409 more)
Symptom Improvement 21 (1 observational)	not estimable	-	20/20 (100%)	-
HR - acute study phase				MD 8 higher

As many individuals with vasovagal orthostatic presyncope often have symptoms, there is opportunity to avoid syncope and improve symptoms.

90% of participants who used Pcs they were highly or moderately satisfied (Brignole 2002 2053)

Quality of life survey scores improved year after individuals with syncope applying PCMs during presyncope (2007 672).

19 (1 RCT)				(6.4 lower to 22.4 higher)
SBP - acute study phase 19 (1 RCT)				MD 32 higher (12.48 higher to 51.52 higher)
SBP 39 (2 observational)				MD 21 mmHg higher (18.25 higher to 23.41 higher)
DBP - acute study phase 19 (1 RCT)				MD 20 higher (5.57 higher to 34.43 higher)
DBP 39 (2 observational)				MD 11 mmHg higher (9.36 higher to 13.08 higher)

Effects

the undesirable anticipated effects?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION													
	<p>In two observational studies no patients had injury or adverse event/morbidity related to use of PCM. Patient satisfaction was very high (Brignole 2002 2053, Croci 2004 287). No other studies reported adverse events or morbidity as outcomes.</p> <p>Observational studies</p> <table border="1"> <thead> <tr> <th rowspan="2">Outcome № of participants (studies)</th> <th rowspan="2">Relative effect (95% CI)</th> <th colspan="3">Anticipated absolute effects (95% CI)</th> </tr> <tr> <th>Without PCM</th> <th>With PCM</th> <th>Difference</th> </tr> </thead> <tbody> <tr> <td>Injury or adverse events - Follow-up phase 37 (2 observational studies)</td> <td>not pooled</td> <td>0.0%</td> <td>0.0%</td> <td>not pooled</td> </tr> </tbody> </table>	Outcome № of participants (studies)	Relative effect (95% CI)	Anticipated absolute effects (95% CI)			Without PCM	With PCM	Difference	Injury or adverse events - Follow-up phase 37 (2 observational studies)	not pooled	0.0%	0.0%	not pooled	<p>Undesirable effects are not anticipated to be substantial with the use of PCM. There is no evidence that PCM leads to adverse events, increased morbidity or mortality.</p> <p>It is unknown if the rate of adverse injuries could be higher with the use of PCM in elderly adults or those with cognitive impairment. Care may be required to avoid adverse effects.</p>
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evidence

certainty of the evidence of effects?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION																														
studies	<p>The certainty of the included studies is low or very low.</p> <p>Of eight included studies, two were RCTs and the remaining were observational studies.</p> <p>RCT</p> <table border="1"><thead><tr><th>Outcomes</th><th>Relative importance</th><th>Certainty of the evidence (GRADE)</th></tr></thead><tbody><tr><td>Abort Syncope - acute study phase</td><td>CRITICAL</td><td>⊕○○○ VERY LOW</td></tr><tr><td>Symptom Improvement - acute phase</td><td>IMPORTANT</td><td>⊕⊕○○ LOW</td></tr><tr><td>Symptom improvement - Follow-up phase</td><td>IMPORTANT</td><td>⊕○○○ VERY LOW</td></tr><tr><td>HR - acute study phase</td><td>IMPORTANT</td><td>⊕○○○ VERY LOW</td></tr><tr><td>SBP - acute study phase</td><td>IMPORTANT</td><td>⊕⊕○○ LOW</td></tr><tr><td>DBP - acute study phase</td><td>IMPORTANT</td><td>⊕○○○ VERY LOW</td></tr></tbody></table> <p>Observational Studies</p> <table border="1"><thead><tr><th>Outcomes</th><th>Relative importance</th><th>Certainty of the evidence (GRADE)</th></tr></thead><tbody><tr><td>Abort Syncope - acute study phase</td><td>CRITICAL</td><td>⊕○○○ VERY LOW</td></tr><tr><td>Injury or adverse events - Follow-up phase</td><td>CRITICAL</td><td>⊕○○○ VERY LOW</td></tr></tbody></table>	Outcomes	Relative importance	Certainty of the evidence (GRADE)	Abort Syncope - acute study phase	CRITICAL	⊕○○○ VERY LOW	Symptom Improvement - acute phase	IMPORTANT	⊕⊕○○ LOW	Symptom improvement - Follow-up phase	IMPORTANT	⊕○○○ VERY LOW	HR - acute study phase	IMPORTANT	⊕○○○ VERY LOW	SBP - acute study phase	IMPORTANT	⊕⊕○○ LOW	DBP - acute study phase	IMPORTANT	⊕○○○ VERY LOW	Outcomes	Relative importance	Certainty of the evidence (GRADE)	Abort Syncope - acute study phase	CRITICAL	⊕○○○ VERY LOW	Injury or adverse events - Follow-up phase	CRITICAL	⊕○○○ VERY LOW	<p>Much of the research was conducted in clinical settings. Some observational studies have identified the effect of PCM on patients after they were trained to apply it. There are no studies on first aider proficiency in instructing individuals with acute syncope on how to use PCM.</p>
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uncertainty about or variability in how much people value the main outcomes?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
certainty or important uncertainty or important variability uncertainty or	<p>90% of participants who used PCMs reported they were highly or moderately satisfied (Brignole 2002 2053)</p> <p>Quality of life survey scores improved one year after individuals with syncope began applying PCMs during presyncope (van Dijk 2007 672).</p>	While there is little data on this, it is reasonable to assume that most people value the desired outcomes of preventing or reducing presyncope, decreasing symptoms, and potentially decreasing injury related to presyncope with a simple, no-cost intervention.

Effects

Between desirable and undesirable effects favor the intervention or the comparison?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
comparison versus the comparison	<p>Available studies demonstrate a small beneficial effect of the use of PCM to abort syncope. The effect was beneficial and statistically significant in one small RCT, but the beneficial findings in four observational studies were not significant:</p> <p>There was significant beneficial effect for symptom improvement in two RCTs.</p>	As it is unlikely for an individual with presyncope symptoms who attends an event that experiences an adverse event that they will benefit from the intervention, the potential for harm must be considered.

either the
the comparison
rs the intervention
tervention

Hemodynamics improved in RCTs and observational studies with PCM.
There were no adverse events or injuries related to the use of PCM reported in the included studies.

between desirable and undesirable effects. Presyncope favours the intervention (PCM) over the comparison (not using PCM, or basic first aid procedures).

It is important to note here that Presynope and its recommendations are limited to the presyncope of orthostatic and vasovagal etiology. Presynope for other reasons is more complex and the balance between desirable and undesirable effects may favour PCM, but rather for first aid providers to focus on basic first aid procedures including lying the individual supine and accessing emergency care/call for help.

required

source requirements (costs)?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
s sts and savings ngs	There is no research evidence that studied the cost of PCM.	The only resources that are required are those needed to train first aid providers to coach people who have acute orthostatic symptoms to attempt PCM. This includes negligible costs related to curriculum development, development of teaching materials including diagrams or video clips demonstrating various PCM techniques, and instructor training. First aid providers will also be trained to recognize presyncope due to orthostatic and vasovagal etiology and differentiate it from other causes of syncope. Potential savings could be modest based on avoidance of physician visits and emergency department visits related to injuries from falling related to presyncope.

evidence of required resources

of the evidence of resource requirements (costs)?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
studies	There is no research evidence on required resources.	No additional resources are needed (other than training).

Cost-effectiveness

Cost-effectiveness of the intervention favor the intervention or the comparison?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
comparison ors the either the the comparison rs the intervention ervention studies	There is no research evidence in which the cost-effectiveness of PCM was studied.	The cost effectiveness favors PCM. The intervention is low cost (only training), considering the net benefit of preventing syncope or injury associated with falls.

Impact on health equity?

	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION

There is no research evidence related to the impact on equity.

The use of PCM may reduce equity issues for patients who do not have ready access to medical care, although there is no research evidence to support this.

Acceptability

acceptable to key stakeholders?

RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
There is no research evidence that studied acceptability specifically.	Given the simplicity of the PCM intervention (i.e., its use by first aid providers, its low cost, do, simple to train and simple to administer), and the likely effectiveness of the intervention, it is likely to be acceptable to key stakeholders.

Feasibility

feasible to implement?

RESEARCH EVIDENCE	ADDITIONAL CONSIDERATION
Training patients to administer PCM was found to be feasible in all of the included studies. The studies which included a real-life follow up phase in which there was benefit to the outcomes of aborting syncope, symptom reduction and adverse events/injuries (Alizadeh, 2016, e5348, Brignole 2002 2053).	PCM is a relatively simple management strategy with a high probability of a good result. It is a low-cost intervention and PCM is very feasible to implement.

OF JUDGEMENTS

	JUDGEMENT					
	No	Probably no	Probably yes	Yes		Varies
EFFECTS	Trivial	Small	Moderate	Large		Varies
EFFECTS	Large	Moderate	Small	Trivial		Varies
EVIDENCE	Very low	Low	Moderate	High		
	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		
EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	Favors the intervention	Varies
QUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies
EVIDENCE OF URCES	Very low	Low	Moderate	High		
ENESS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	Favors the intervention	Varies
	Reduced	Probably reduced	Probably no impact	Probably increased	Increased	Varies
ILITY	No	Probably no	Probably yes	Yes		Varies
Y	No	Probably no	Probably yes	Yes		Varies

RECOMMENDATION

Conditional recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	Strong recommendation for the intervention
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and first aid providers use any type of PCM for individuals with symptoms of presyncope due to vasovagal or orthostatic causes (weak recommendation, low and very low quality evidence).

at lower body PCMs are preferable to upper body and abdominal PCMs (weak recommendation, very low quality evidence).

idering this recommendation, the task force places value on avoidance of progression of presyncope symptoms to full loss of consciousness.

a simple, feasible, no-cost intervention that has the potential to temporize symptoms.

sible to train first aid providers on how to instruct individuals with presyncope symptoms to use PCM. However it may be challenging for first aid providers to identify vasovagal and orthostatic causes of presyncope. For other causes of presyncope, first aid providers should instruct individuals to use PCM. Other interventions should not be delayed.

aid providers should be trained to use the major PCMs types, depending which is most appropriate for the circumstance including lying or squatting with lower body & abdominal muscle tensing, arm tensing and hand grip.

first aid task force believes that it is important for first aid providers to manage the potential risks with individuals suffering from presyncope remaining standing/upright and attempting PCM. Individuals should be positioned lying or sitting when possible before attempting PCM.

and studies were of participants who were trained in PCM after the onset of symptoms, which is similar to a first aid situation.

considerations

evidence is similar for all outcomes between participants with vasovagal versus orthostatic cause of presyncope. PCM may be effective in older adults, however there was not enough evidence to conduct a sub-group analysis.

tion considerations

ers must also be trained in how to recognize presyncope of orthostatic and vasovagal etiology, and differentiate these from other causes.

als for instructors might include video examples of various PCMs.

should be coached to continue speaking while attempting PCM to avoid inadvertently performing a Valsalva maneuver and increasing blood pressure.

and evaluation

aid providers might consider measuring the accuracy of recognition of vasovagal and orthostatic presyncope.

er groups might consider monitoring the use of PCM, success of intervention, adverse events and injuries related to use of PCM.

Priorities

is required that compares the effectiveness and adverse events of PCM in different age groups (particularly older or frail adults) required to determine if first aid providers can recognize or be trained to recognize orthostatic or vasovagal presyncope/syncope required on the clinical outcomes of first aid providers coaching individuals with presyncope on how to use PCM. Studies that compare PCMs to individuals who are positioned supine are required.

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