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BRIEF REPORT

# "Cold Card" to Guide Responders in the Assessment and Care of Cold-Exposed Patients

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**Introduction**—A concise, easy-to-use decision aid "Cold Card" that can be carried in the field by wilderness search and rescue teams or medical responders to advise on assessment and care of cold-exposed patients was created.

**Methods**—A 2-sided card was designed to summarize the important principles established by the Wilderness Medical Society practice guidelines for hypothermia. The card was continually updated through feedback from several content experts. The card was then distributed for further feedback from members of the Search and Rescue Volunteer Association of Canada and enrollees of the *Baby It's Cold Outside* web-based educational program. This additional feedback was used to create the final iteration of the card.

**Results**—On the front "ASSESS COLD PATIENT" side, the level of cold exposure or hypothermia is accomplished by evaluating (as either normal or impaired function) consciousness, movement, shivering, and alertness on a series of concentric rings. The important treatment actions are provided for each cold-exposure level. The back "CARE FOR COLD PATIENT" side provides the required elements and principles of use for a hypothermia wrap. The Cold Card is available for free download and unlimited use for education or in-field instruction by any individual or group. The card should be printed on heavy, waterproof stock (13×18 cm) for use in all weather conditions.

**Conclusions**—Key elements of hypothermia evaluation and field care have been summarized on a small portable card for laypersons, trained rescuers, and first responders.

*Keywords:* cold exposure, assessment of cold patient, care of cold patient, hypothermia wrap, search and rescue

## Introduction

Patients exposed to a cold environment for an extended period present a challenge for rescue, medical care, and transport under austere conditions. Laypersons and trained responders generally have limited resources and options for care. Many responders are volunteers and have limited medical training in general, and specifically regarding cold patients. Even professional responders (eg, emergency medical services, law enforcement, search and rescue, military, etc.), who may have a higher level of medical training, often have limited training specific to cold patients.

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The author has been involved in several educational efforts directed toward professional and volunteer responders and the general public. These efforts have included written works[1,2] and web-based programs that focus on either water-bas'ed cold exposure (Cold Water Boot Camp[3] and Beyond Cold Water Boot Camp[4]) or land-based cold exposure (*Baby It's Cold Outside* [BICO]).[5,6] All of these sources indicate that the general principles of cold patient management involve removing the individual from the cold exposure, removing wet clothing if the individual can be protected from the harsh environment, insulating the patient, and if possible, applying heat to the patient—all while preferably following the principles of gentle handling and maintaining a horizontal position as much as possible.

Greater detail on cold patient management is provided in the recent evidence-based guidelines.[7] The assessment

and care of a cold patient are presented in detail in Figure 2 of these guidelines. However, both the guidelines in general, and the figure specifically, may be too detailed or too difficult to remember for many, if not most, responders under field conditions in an actual rescue scenario. In fact, after a presentation of the information contained in these guidelines, a request was made from the audience for the information to be summarized in a simple, condensed format that could be carried by search and rescue personnel or any other responders in field operations. Because this request was made at the time of development of the BICO education program,[5,6] a Cold Card was designed for widespread use and was implemented in the BICO program.

Thus, an educational decision aid related to management of cold patients in a wilderness setting was designed to implement theory into practice by any wilderness traveller. A Cold Card was designed with the following criteria in mind: it would follow the recommendations of the Wilderness Medical Society (WMS) practice guidelines for hypothermia[7]; the content would be simplified to provide a quick and easy assessment and treatment guide that was applicable to all levels of training; it would provide specific advice related to multiperson search and rescue teams including packing lists and specific visual instructions for a hypothermia wrap; it would focus mainly on field implementation (eg, involve items that could be carried or towed by human power) with some additional considerations for items that require specific training or additional space and carrying capacity of motorized transport (eg, intravenous fluids and warmers, cardiac monitor etc.); and the card would be 2-sided and the information should be readable when printed on 13×18 cm (5×7 in) stock (a size that could be carried in a pocket or backpack). The goal is for the card to be printed on waterproof stock, enabling it to be used in any scenario under all weather conditions.

## Methods

After the initial request from a user group for a simple-to-use decision guide for field use, the WMS practice guidelines were reviewed to determine the salient points that needed to be included. The front panel of the card, "ASSESS COLD PATIENT," includes general instructions for use, a new simplified visual assessment tool, and appropriate treatment recommendations for each level of cold stress and hypothermia. The assessment tool was developed based on information from Figure 2 of the WMS guidelines.[7] This figure indicates that assessment of a cold patient with suspected hypothermia should follow a sequence of evaluation of 4 main factors including mental status, shivering level, physical function, and consciousness.

The simplified assessment tool therefore included a series of 4 concentric rings, each related to one of these 4 factors; each factor is assessed as either "normal" or "impaired or no function" (see Figure 1). Instructions for assessment are described in points 1 to 3 as follows: 1) From outside ring to center: assess consciousness, movement, shivering, alertness; 2) For each ring or category, assess whether normal function (green), or impaired or no function (red); 3) Treat according to appropriate result-quadrant. Assessing all 4 factors allows assignment of the patient to a quadrant representing 1 of 4 levels of cold exposure (eg, cold stressed not hypothermic; or mild, moderate or severe hypothermia). Within each quadrant, treatment and care are then prescribed as recommended by the WMS guidelines.[7]

The back panel "CARE FOR COLD PATIENT" first provides a list of recommended items required for a hypothermia wrap. These items could realistically be carried by a multiperson search team. Since most teams carry backpacks and have 3 to 4 members, the items could easily be distributed among them. Most wilderness travellers also carry some or all of these items; thus, the recommendations are relevant to anyone in the field.

The wrap implements the basic treatment principles from the WMS guidelines and also packages the patient for transport to medical facilities. There are many commercial hypothermia wraps available, but many are too large and heavy to be carried in a backpack. The Cold Card provides instructions for a user-assembled system that can be varied in volume and weight, depending on factors such as carrying capacity of the group and environmental conditions that might dictate the weight of the sleeping bag or the number of heat sources. After initial design, the card was circulated for feedback from several North American and European experts in search and rescue or clinical management of cold patients. An iterative process continued until a general consensus was achieved. The revised version was then presented to user groups in several ways to elicit further feedback on a tangible product: 1) the card was printed and distributed to members of the Search and Rescue Volunteer Association of Canada for use and feedback; 2) a digital version was uploaded to the BICO websites,[5,6] which included a link for providing feedback; and 3) feedback was also received from several groups attending seminars presented by the author.

## Results

The present version (see Figure 1) is the seventh iteration and is a result of all feedback that was deemed relevant and implementable. Based on this feedback, 2 items have been added to the instructions on the "ASSESS COLD

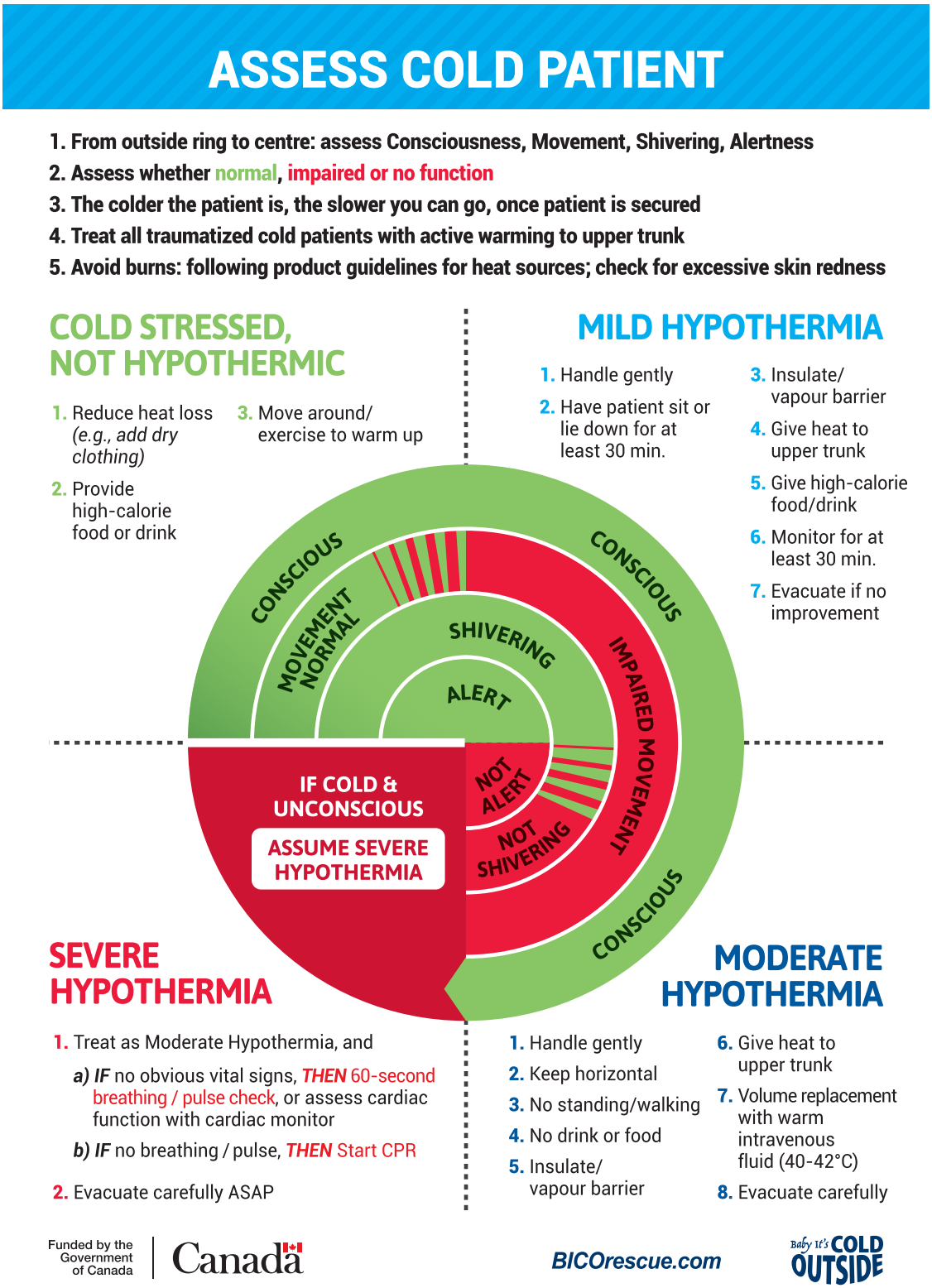



**Figure 1.** Cold Card for on-scene use by responders for cold-exposed patients. Republished with permission.

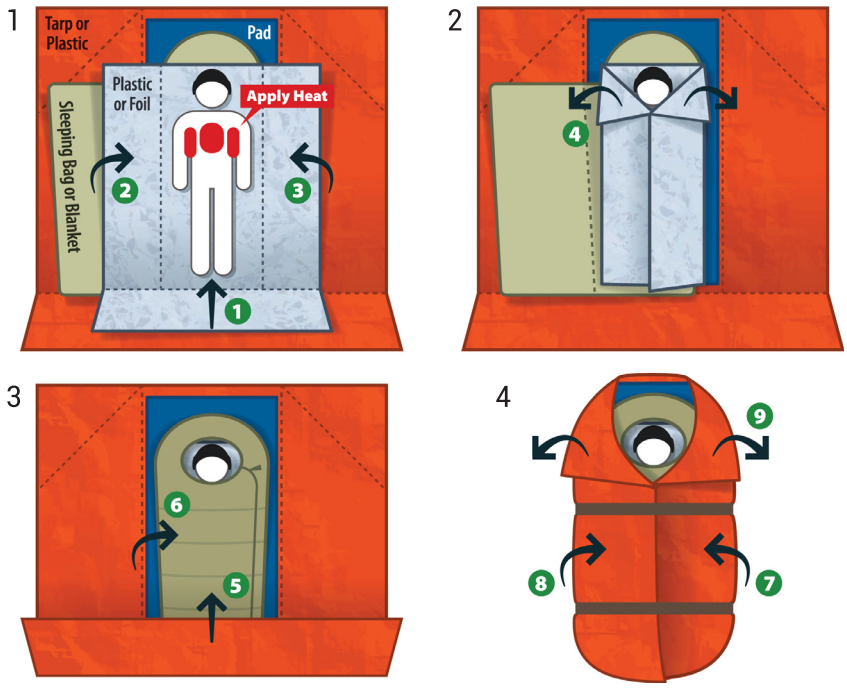
# CARE FOR COLD PATIENT

**SUGGESTED SUPPLIES FOR SEARCH/RESPONSE TEAMS IN COLD ENVIRONMENTS:**

- **1** - Tarp or plastic sheet for vapour barrier outside sleeping bag
- **1** - Insulated ground pad
- **1** - Hooded sleeping bag (or equivalent)
- **1** - Plastic or foil sheet (2 x 3 m) for vapour barrier placed inside sleeping bag
- **1** - Source of heat ***for each team member*** *(e.g., chemical heating pads, or warm water in a bottle or hydration bladder),* or ***each team*** *(e.g., charcoal heater, chemical / electrical heating blanket, or military style Hypothermia Prevention and Management Kit [HPMK])*

## INSTRUCTIONS FOR HYPOTHERMIA WRAP "The Burrito"

1. *Dry or damp clothing:* *Leave clothing on*
2. *Very wet clothing:*
   - ***IF*** Shelter / Transport is ***less than*** 30 minutes away, ***THEN*** *Wrap immediately*
   - ***IF*** Shelter / Transport is ***more than*** 30 minutes away, ***THEN*** *Protect patient from environment, remove wet clothing and wrap*
3. *Avoid burns: follow product instructions; place thin material between heat and skin; check hourly for excess redness*






*Sources: BICOrescue.com; Zafren, Giesbrecht, Danzl et al. Wilderness Environ Med. 2014, 25:S66-85.*

**Figure 1** Continued.

PATIENT" side that are not presently covered by the WMS guidelines. These are points 4 and 5 that relate to traumatized cold patients and burn avoidance when applying external heat, respectively; they were included because they do not contradict the WMS guidelines in any way.

## Discussion

A simple-to-use Cold Card was designed with consultation and feedback from many experts in cold weather search, rescue, and care for cold patients. The card follows recommendations from the WMS practice guidelines for out-of-hospital evaluation and treatment of accidental hypothermia: 2014 update.[7]

The card can be printed on heavy, waterproof stock and carried in the field by any responder to provide clear, concise advice regarding care for a cold patient under any environmental conditions. The card is relevant for all wilderness responders including professional or volunteer, law enforcement, military, search and rescue personnel, and even the general public. Most of the recommended practices relate to field conditions requiring human-powered transport of equipment, but some practices are more relevant to motorized transport (eg, heated intravenous fluids and a cardiac monitor).

The Cold Card is currently in use and is copyrighted by the BICO web-based educational programs.[5,6] However, a PDF version is available here: https://doi.org/10.1016/j.wem.2018.07.001 and can be used free of charge by any individual or organization for educational presentations or to print cards for field use.

One of the common limitations of any set of guidelines, algorithms, or decision aids (like the Cold Card) is the breadth of scenarios they cover. It should be noted that although the Cold Card may not cover every situation, it will relate to most patients and scenarios. The recommendations are conservative so no harm would be expected in extraordinary situations. It should also be noted that the card focuses only on cold-related concerns and does not provide, supersede, or replace basic principles of wilderness medical care that are provided in more comprehensive first aid or medical training.

Although this current version of the Cold Card should be effective for use by all wilderness responders, informal collection of feedback may result in further improvements in the future. More formal research could be conducted on topics including perceived logic and accuracy, retention of the information, and actual use patterns in the field.

Finally, the author recommends that the next update of the WMS guidelines consider the addition of this simple-to-use decision aid as well as to address specific requirements for traumatized patients and the avoidance of burns from external heat sources.

## Conclusion

A simple 2-sided card is presented that provides on-site advice for assessment and treatment of cold-exposed patients. Feedback from users in the emergency response community indicates that the card can be carried during a search or response and is clear and easy to use regardless of level of medical training. It would be a significant advance in wilderness medicine for this card to be carried, not only by responders, but also by all wilderness users themselves. Readers are encouraged to download, print, and share this simple device that is relevant to all cold-weather, or cold-water scenarios.

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Disclosures: None.

## Supplementary materials

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.wem.2018.07.001.

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