

Uncertain Certification: The Problematic Practice of Wilderness Medicine

January 10, 2002

Alan T. Schussman

University of Arizona

Prepared for the August 2002 meetings of the American Sociological Association. Please do not cite without author's permission.

Urban and rural emergency medical care, as provided by paramedics and emergency medical technicians (EMTs), is guided by the “golden hour” principle, which instructs caregivers safely to transport patients to definitive care (ie, a hospital) within one hour of injury or illness (Tilton 1998:3). The golden hour, however, has no meaning in such places as glaciers, deserts, and isolated mountain ranges, where definitive care may be hours or days away, if available at all.¹ In such locations, where aid is not a matter of “what to do until the doctor comes” but rather of what to do in “wilderness situations to which the doctor is not coming” (Wilkerson 1985), emergency care comes in the form of wilderness medicine. While wilderness medicine has precedents in both field medicine and urban paramedic care (e.g. Barkley 1978), its contemporary practice appears to have developed very differently from either of those predecessors.

Wilderness medicine differs in significant ways from the practices of professional physicians or paramedics/EMTs. Although “wilderness medical technicians” or WEMTs, as they are sometimes called, practice many of the same complicated lifesaving techniques as their urban counterparts, they do so in a dramatically different context. In practice, backcountry emergency care often involves improvised materials and a far greater degree of uncertainty than medical care in a hospital or ambulance. Further, while WEMTs are granted certifications through the passing of an educational program in wilderness medicine, WEMT certification systems lack the formal, often state-centered authority that grants legitimacy to EMTs or other more stringently licensed medical practitioners. Finally, wilderness medicine has a broad range of certified practitioners,

¹ Climbing and mountaineering accidents illustrate both kinds of situations: In many cases of injuries reported in *Accidents in North American Mountaineering* (American Alpine Club 1998), climbers could be reached and treated within a short time of injury; however, many situations, even involving short travel distances, require lengthy or technically difficult evacuations, requiring long-term patient care.

ranging from occupational groups (e.g., mountain guides and park rangers) to those who are decidedly non-occupational (e.g., volunteer search and rescue personnel, climbers, and other outdoor recreationists).

Such a configuration of characteristics makes wilderness medicine an interesting field to consider through the lenses of organizational and occupational sociology. Unlike most medical and paramedical fields (Havighurst and King 1983), wilderness medicine has neither centralized governing bodies nor highly standardized degrees of certification, without which the use of certifications as “market signals” (Spence 1974) becomes problematic. Further, the general lack of formal authority over wilderness medicine certifications suggests deviation from previous models of either certification (e.g., Freidson 1986) or professionalization (e.g., Abbot 1991; Forsyth and Denisiewicz 1985). That a large and complex set of certifications has emerged without such authority poses further questions to scholars’ understanding of professional power and technical work, as well.

Before those questions may be posed, however, it is necessary to first describe in more detail the history and current state of wilderness medicine. As a beginning to a larger project, the main purpose of this paper, is an explication of the field of wilderness medicine, with specific attention to the characteristics that make its fit with extant theories of professions and organizations problematic. Finally, the paper will suggest the implications of this disjuncture and outline further research strategies.

The Case of Wilderness Medicine

Emergency field medicine has a long history, with precedents in exploration and war, where medics dealt with mysterious illness, injuries, and environmental hazards

(Tilton 1998:2). It is only in the last few decades, however, that wilderness medicine began to emerge as an organized field of practice. Contemporary wilderness medicine emerged initially among mountaineers who began to document procedures that extended beyond simple first aid in the Sierra Club's *Manual of Ski Mountaineering* (1962). Notable in this publication was the departure from some orthodox first aid principles of urban and rural first aid, in discussions of "second aid" which advocated and described the use of prescription painkillers and antibiotics, and treatment for traumas like snow blindness and frostbite. The use of techniques such as field reductions of dislocations, a practice disallowed by most EMT protocols (Bowman 1990:95) further served to set wilderness medicine apart from contemporary orthodox practices.

With the increasing popularity of outdoor recreation, the concept of "wilderness prehospital emergency care" (WPHEC) emerged, and with it the differences between normal and backcountry emergency treatment began to be further codified. This stage of development acknowledged more fully the "alterations in standard prehospital emergency care protocols required when orthodox rapid hospital interfacing was not available because of the distance, difficulty of transportation, or inadequate communication" inherent in most backcountry settings (Bowman 1990:95). Differences in equipment, time and distance to definitive care, training of nonprofessionals, and sensitivity to conditions that rarely appear in hospital settings, such as altitude illness or frostbite, were the focus of concern (Backer 1995:4).

Despite their departures from formal medicine, developers of backcountry treatment procedures worked to adhere to known medical principles of anatomy and physiology. As such, it seems clear that much of the knowledge within wilderness

medicine stems from its roots in conventional emergency medicine, even though its implementation often requires extremely unorthodox techniques. For example, based on emergency room treatment of broken legs, WEMTs are taught to improvise femur traction splints using ski poles, branches, and nylon straps. Note that urban paramedics, operating on the golden hour principle, would never be allowed to improvise a traction splint; instead, their orders are to package and safely transport patients as quickly as possible. Importantly for the development of wilderness medicine, while practices are based on known best practices, little is known about the *outcomes* of many deviations from urban protocols for emergency care. That is, although there is a branch of academic wilderness medicine, little or no research has been done on the effectiveness of, for example, improvised femur splints.

Like the Sierra Club's manual, most early documentation of wilderness medicine was prepared for recreational, rather than professional, audiences. Later, during the 1970s, early courses teaching wilderness medicine were developed by organizations such as the Stonehearth Outdoor Learning School (SOLO), and were taught to both professional groups such as EMTs and recreational groups. Contemporary literature in the field continue this dual direction, with attention to physicians (e.g., Auerbach 2001) and lay audiences (e.g., Tilton and Hubbell 1994). The development of training programs continued as well: SOLO and many other commercial educational organizations, teaches courses ranging from four-week WEMT classes, to the Wilderness First Responder (WFR), a seventy- to ninety-hour course, to two-day Wilderness First Aid (WFA) programs. In addition to the realm of WFR and WEMT classes taught around the country, other organizations, like the National Ski Patrol, offer their own training.

The diffusion of training courses begins to raise one of the prominent interesting facets of wilderness medicine, namely that its development has not occurred under the auspices of any certifying, legal authority. Unlike the widespread teaching of cardiopulmonary resuscitation (CPR), which developed under the standard-setting umbrella of the American Heart Association and the Red Cross (Timmermans 1999), wilderness medicine and its training programs have emerged in the absence of formalized, national standards. Further, wilderness medicine lacks the state-level standards established by state Departments of Transportation to regulate the activities of paramedics and EMTs (Mannon 1992). Finally, although WEMTs may perform procedures that would elsewhere be restricted only to physicians, their practice is not controlled by licensure. In a field such as medicine, marked by access controls and professional dominion over practices, the presence of unlicensed practitioners is particularly remarkable.

Some branches of the wilderness medicine community have attempted institutionalization. The Wilderness Medicine Society (WMS), founded in 1983 by two physicians, began publishing the *Journal of Wilderness Medicine* in 1987, gained continuing medical education credit for its education programs in 1990, holds annual meetings, and has begun a program of organizing student groups at medical schools (Wilderness Medical Society 2000). Several medical schools offer courses in wilderness medicine techniques to their students, ranging from weekend classes to intensive post-graduate programs (Bowman 1990:99; Peters and Plötz 1998). However, despite these efforts at institutionalization, the field continues to face problems of codifying its knowledge. Although the WMS has developed a list of recommended course topics for

Wilderness First Responder training, it includes a strong disclaimer with the text:

The Wilderness Medical Society developed a list of recommended course topics for a wilderness first responder (WFR) course as a guide for consumers and providers of WFR courses. This list of topics is not intended to be used as a course curriculum...and does not meet DOT standards for [urban] first responder certification. The WMS is neither a certifying nor a licensing agency. It does not approve or disapprove of wilderness medicine providers, nor does it test students for knowledge or skills. The WMS encourages consumers to review the recommended list of topics, check providers' credentials, and ask potential employers if they accept a provider's certification prior to enrolling in a course. (Lindsey et. al., 1999:13).

As evidenced in that disclaimer, the WMS takes a hands-off approach when it comes to establishing expertise or certification in wilderness medicine. This statement neither advocates for the authority of the WMS to determine what knowledge should be contained in wilderness medicine training, nor does it see to exclude any practitioners from the realm of qualified instructors. When the WMS disclaims authority to judge the qualifications of course providers by suggesting that students "check providers' credentials," the question is begged: How and by what criteria are providers of wilderness medicine training to be judged?

The standards vacuum is illustrated by Table One, which lists the source of authority of the wilderness medicine certifications offered by twenty contemporary training providing organizations. This data, gathered from printed or online documents made available by certifying organizations, suggests several noteworthy observations.

The first is that, despite the WMS disclaimer of authority to evaluate certifications, five of the twenty organizations refer to their curricula as meeting or exceeding the standards of the Wilderness Medical Society and/or the Department of Transportation. Those organizations are essentially claiming adherence to a body of standards that does not actually exist.

[Table one about here]

Freidson's (1986:71-3) institutional credentialing theories suggest obvious market reasons for such a presentation: Teaching an "established" curriculum lends legitimacy to training providers, the same as outside accreditation does for universities. The claim to an institutionalized standard, especially in reference to the Department of Transportation, also attempts to convey a measure of regulatory legitimacy (Aldrich 1999), that which is granted by the state or affiliated licensing agencies. Such sanctioning represents approval of organizations' activities, and is another signal to consumers or professionals in related occupations of the quality of services provided. Nonetheless, contrary to some organizations' claims, this regulatory acceptance has not yet been established. Even programs that certify participants as "Wilderness" EMTs simply teach a state-approved EMT curriculum with an added, non-state-approved component of wilderness medical training; nowhere are practitioners of wilderness medicine explicitly licensed as such.

As of yet, neither national WEMT standards nor a body of professional physicians sets standards for such qualification or monitor practitioners. This absence is particularly noteworthy when compared with the urban counterpart to wilderness medicine; EMT training manuals are written by the American Academy of Orthopedic Surgeons (1993), and paramedics always operate under the close "medical control" of physicians (Mannon

1992; Metz 1981; Palmer and Gonsoulin 1990). Such links between certified practitioners and licensed professionals appear to be fewer and weaker in the wilderness medicine field. Indeed, as Table 1 suggests, while those connections may exist at the level of individual training organizations (as with organizations who have physician instructors or advisory boards), the prevalence of local, organizational authority to provide certification, rather than authority based on national standards or state licensing, belies an umbrella of common curriculum or policies.

The second remarkable feature of the information presented in Table One is the relatively large number of providers whose certifications are actually granted by a third-party organization with whom they are affiliated. In every such case, the actual certifying organizations are prominent members of the wilderness medicine community. For example, one organization that specializes in whitewater rescue provides WEMT certifications from a second wilderness medicine organization. A second example of this situation is an organization whose members are affiliated with a larger training organization but who also teach its curriculum separately.

The argument may be made here that such organizations, by virtue of their prominence in the field, employ *de facto* standards of practice. One organization, in fact, makes just such a claim, based on the wide range of practitioners it has trained (for example, college students, FBI agents, park rangers, and oil field workers). However, the argument for *de facto* standards changes what is meant by certification. Again, the comparison with urban emergency care is apropos; unlike the training of EMT and paramedic programs, undergirded by *de jure* protocols, the non-standardized curriculum of wilderness medicine training suggest that the strength of a certification is really linked

to the power of the certifying organization, not its adherence to an agreed-upon curriculum.

This description of the field of wilderness medicine demonstrates that, although it resembles EMT and paramedic work, it stands apart in several respects. While its techniques are derived from those practiced in the “frontcountry,” they were explicitly developed for the conditions present in the backcountry, such as lack of sophisticated supplies, difficulty of transportation, and distance to definitive care. Further, the practice of wilderness medicine was developed specifically for injuries like altitude illness or envenomation, problems rarely seen in urban and rural areas. Next, ties exist between academic and wilderness medicine, as demonstrated by the WMS and the *Journal of Wilderness Medicine*, but they are not as codified as between EMT programs and the American Academy of Orthopedic Surgeons. That is, the WMS does not take a supervisory role in the education of WEMT practitioners. Finally, and related to its sometimes tenuous ties to formal medicine, wilderness medicine has developed a system of certifications that does not involve state licensing or even require physician oversight. Because there is no standardized curriculum, organizations offering wilderness medicine certifications range from those with very weak oversight (organizations staffed by one or two experienced mountain guides, for instance) to those who publish their own textbooks and have physician advisory boards.

These characteristics do not necessarily reflect negatively on wilderness medicine. Indeed, the field has grown dramatically since the 1970s, when SOLO was the only formal organization offering training. Its differences from urban emergency care do not seem to have hindered its development as a paramedical field. However, those

differences along the lines of knowledge development and professional control should pique the curiosity of scholars of work and organizations. The remainder of this paper considers in more detail the questions posed by wilderness medicine to such areas of study.

Knowledge, Authority, and Certification

The formation of organizations to provide wilderness medicine training is certainly in concert with the norms of a society in which, “[f]rom aerobics instructors and bartenders to tree surgeons and television repairmen, certification is looked to as an important source of legitimation” (Scott 1998:216). That is, in a credential society, the founders of backcountry medicine programs are able to take advantage of the cultural legitimacy of authority vested in certifications. The resulting organizations, with forms based on prior methods of accrediting EMTs and paramedics, certainly benefit from “the continuity between the innovative new activity and those activities with which their customers, employees, creditors, and others are familiar” (Aldrich 1999:234).

Granted some basic cultural legitimacy, wilderness medicine training providers still face the problems that arise from the practice of complex knowledge: First, what is the *content*—the specific knowledge and techniques—of wilderness medicine itself? Second, who has the authority to practice it, and how do certifying organizations convey that authority? As Aldrich (1999) notes, these issues of knowledge and legitimacy are tightly connected, and I argue that they are particularly close in the case of wilderness medicine.

Much technical work, including that performed by EMTs and paramedics (Nelsen 1997) is characterized by the existence of a strong community of practice and its

contextual, repertoire-oriented knowledge (Barley and Orr 1997). By extension, wilderness medicine may arguably be said to center on a community of practice, the “patterned social interaction between members that sustains organizational knowledge and facilitates its reproduction” (Aldrich 1999:127). That is, the knowledge of wilderness medicine is developed, refined, and preserved within organizations through use, molded by the interactions and shared meanings of members.

Communities of practice can function within a system of licensing, as in the case of Borthwick's study of podiatric surgeons (2000), or without any formal structure, as suggested by Fine's study of mushroom enthusiasts (1998). In both examples, complicated knowledge is employed by practitioners who gain authority through practice, repeated experience, and exercise of their skills. Authority is not gained without struggle, however, as some communities of practice face obstacles to the practice of their knowledge. Borthwick's podiatric surgeons, who are not licensed physicians, were opposed by doctors who sought to maintain their control of certain procedures—and with it, their economic benefits and prestige. Fine's amateur mushroom enthusiasts, meanwhile, spent years earning the experience that helps them discern poisonous fungi from edible delicacies, often with more accuracy than credentialed experts. Similarly, as Metz (1981) describes, some urban EMTs believe themselves to be equally or better equipped to use particular treatment devices than hospital physicians, whom they claim have little understanding for either the contexts in which ambulance personnel work or their degree of experience.

Unlike these communities of practice, wilderness medicine has not faced similar challenges to its authority. That is, beyond issues concerning the dispensing of

prescription drugs, the authority of WEMTs to administer treatment or perform certain procedures has not yet been challenged by licensed or otherwise accredited medical practitioners.² The active intervention by physicians to control paramedical workers found by Manning (1992) and Metz (1981) is largely absent in wilderness medicine. This may be explainable by Ferraro and Southerland (1989), who find that physicians only attempt to exert control over domains of practice that are desirable; it is possible that the field of wilderness medicine is simply too small to have bearing, either economic or social, on the work of most doctors.

Ferraro and Southerland, however, are less able to explain the reticence of the the WMS to codify a wilderness medicine curriculum or evaluate training programs. Wilderness medicine, with its varying local protocols (Federiuk 1999:21), seems anachronistic in a system in which board certification defines competence (Havighurst and King 1983). One plausible explanation for the abdication by the WMS of authority to define standards is simple legal liability in a field already populated by numerous certification providers. Further, attempting at this stage to implement standards would not only involve tying the existing community of practice to formal requirements, but would create enormous organizational and administrative burdens for the WMS.

Another interesting possibility is that the WMS refrains from setting standards as a form of boundary maintenance (Gieryn 1999), a way to avoid the de-skilling and routinization of what is to its members a scientific medical field and subject of academic scholarship. As Turner (1987:137) argues, such de-skilling involves three components: emerging limits on professional autonomy, the fragmentation of a profession into distinct

² The one unambiguous restriction on wilderness medicine practice is the administering of prescription drugs such as codeine or epinephrine. Authors such as Tilton (1998) make it clear that such drugs should only be taken on the prescription of a doctor.

groupings, and the encroachment of paraprofessionals. That process is certainly seen in Borthwick's (2000) account of the emergence of podiatric surgery as a challenge to orthopedists, and is suggested by Mannon's (1992) discussion of the professionalization of paramedics. By refusing to establish standards for another field of paramedical technical work, the WMS may help to insulate the professionalism of licensed practitioners. Ultimately, however, there remains some unresolved tension in the WMS's suggesting of Wilderness First Responder criteria while simultaneously avoiding claims to standardize a curriculum. This suggests that there are some benefits to being the *intellectual* authority without assuming the risks or responsibilities of enacting *administrative* authority over the field of either occupational or non-occupational practitioners.

As indicated above, without efforts at standardization by the organization with the strongest claims to the professionalization of wilderness medicine, the field remains relatively unchallenged by the medical establishment and unrestricted by the licensing requirements that shape conventional EMTs and paramedics. Without the criteria supplied by a set of standards, the services provided by wilderness medicine organizations cannot be evaluated by potential customers and constituents. As Aldrich (1999:235-6) puts it, the lack of standardization severely constrains organizations' reliability. On one hand, the very emergence of a system of certifications, even as decentralized as it is currently, suggests a progression toward formal organization of wilderness medicine standards. On the other hand, individual organizations' high investment in their own curricula provides some incentive for them to resist more formal codification of standards; building an overarching set of standards may prove to be very

difficult.

Research Program and Conclusion

Because wilderness medicine certification organizations are only now approaching further efforts at standardization, the process—whether it succeeds or fails—can be observed in detail by researchers. Future work on wilderness medicine should attempt to consider in more detail the interactions between physicians, certifying organizations, and academic medicine. Changes in the status of physicians may be particularly relevant to further standardization; because control over the domain of practice is likely to be at the heart of any efforts to restructure certification, the declining professional dominance of health care may lead to a very different institutionalization of wilderness medicine than that which took place in the case of urban EMT and paramedic development.

This paper presents only a small amount of data, gathered through a snowball sample of organizations that provide training in wilderness emergency care. Additional basic research is of course also needed, on the numbers of organizations, their structures, and inter-organizational connections. Research can also be done on the “demand” side of wilderness medicine certifications. Specifically, more detailed data is needed on the kinds of employers who require certification, what level of training they demand, and how they identify potential providers of that training. As outdoor recreation continues to expand, it is reasonable that the requirements for backcountry first aid certification will grow, generating a more elaborated market for credentials similar to other medical models described by Freidson (1983:72-3).

More research can also be done on other fields that are both occupational and

non-occupational, one of the defining traits of contemporary wilderness medicine. The fact that certification is a job requirement for some and simply a desirable skill for others is a noteworthy characteristic of wilderness medicine, one that could not be adequately addressed in this brief discussion. It remains to be seen if this dual structure is simply a historical condition that will resolve itself, or if the field is genuinely stable as a hybrid of occupational and non-occupational practitioners.

This paper serves as an exploratory overview of the field of wilderness medicine and its particular characteristics that make it an interesting case study. An arena of technical work, where practitioners employ complicated lifesaving skills, wilderness medicine has built on the cultural legitimacy of both paramedical work and the notion of credentials establishing authority to practice. Unlike that of paramedics, however, the community of practice comprising wilderness medicine has emerged without standard and codified practices, state-sanctioned licenses, or the supervision of professional medical control. Those differences suggest that wilderness medicine has the capacity to, with follow-up study, better inform scholars' understanding of certification and authority.

References

- Abbott, Andrew. 1991. "The Order of Professionalization." *Work and Occupations* 18 (4): 355-85.
- Aldrich, Howard. 1999. *Organizations Evolving*. Thousand Oaks, CA: Sage.
- American Academy of Orthopedic Surgeons. 1993. *Emergency Care and Transportation of the Sick and Injured, 5th Edition*, edited by James Heckman.
- American Alpine Club. 1998. *Accidents in North American Mountaineering*. Golden, CO: American Alpine Club.
- Auerbach, Paul. 2001. *Wilderness Medicine, 4th Edition*. Mosby-Year Books.
- Backer, Howard. 1995. "What is Wilderness Medicine?" *Wilderness and Environmental Medicine* 6: 3-10.
- Barkley, Katherine T. 1978. *The Ambulance: The Story of Emergency Transportation of Sick and Wounded through the Centuries*. Hicksville, NY: Expedition Press.
- Barley, Stephen R., and Julian E. Orr. "The Neglected Workforce." Pp. 1-19 in *Between Craft and Science: Technical Work in U.S. Settings*, edited by Stephen R. Barley and Julian E. Orr. Ithaca, NY: Cornell University Press.
- Borthwick, Alan. 2000. "Challenging Medicine: The Case of Podiatric Surgery." *Work, Employment, and Society* 14 (2): 369-383.
- Bowman, Warren. 1990. "The Development and Current Status of Wilderness Prehospital Emergency Care in the United States." *Journal of Wilderness Medicine* 1: 93-102.
- Ferraro, Kenneth F., and Tammy Southerland. 1989. "Domains of Medical Practice: Physicians' Assessment of the Role of Physician Extenders." *Journal of Health and Social Behavior* 30:192-205.

- Fine, Gary Alan. 1998. *Morel tales : the culture of mushrooming*. Cambridge, MA: Harvard University Press.
- Forsyth, Patrick, and Thomas Danisiewicz. 1985. "Toward a Theory of Professionalization." *Work and Occupations* 12 (1): 59-76.
- Freidson, Eliot. 1986. *Professional Powers: A Study of the Institutionalization of Formal Knowledge*. Chicago and London: The University of Chicago Press.
- Gieryn, Thomas. 1999. *Cultural Boundaries of Science: Credibility on the Line*. Chicago and London: University of Chicago Press.
- Havighurst, Clark, and Nancy King. 1983. "Private Credentialing of Health Care Personnel: An Antitrust Perspective." *American Journal of Law and Medicine* 9 (2): 131-201.
- Lindsey, Linda, Bill Aughton, Nancy Doherty, Melissa Gray, Frank Hubbell, Dennis Kerrigan, and Paul Mercolini. 1999. "Wilderness First Responder: Recommended Minimum Course Topics." *Wilderness and Environmental Medicine* 10: 13-19.
- Mannon, James. 1992. *Emergency Encounters*. Port Washington, NY: Jones & Bartlett Publishers, Inc.
- Metz, Donald L. 1981. *Running Hot: Structure and Stress in Ambulance Work*. Cambridge, MA: Abt Publishers.
- Nelsen, Bonalyn J. "Work as a Moral Act: How Emergency Medical Technicians Understand Their Work." Pp. 154-184 in *Between Craft and Science: Technical Work in U.S. Settings*, edited by Stephen R. Barley and Julian E. Orr. Ithaca, NY: Cornell University Press.
- Palmer, C. Eddie, and Sheryl M Gonsoulin. "Paramedics, Protocols, and Procedures:

- 'Playing Doc' as Deviant Role Performance." *Deviant Behavior* 11 (3):207-19.
- Peters, Patrick, and Werner Plötz. 1998. "Mountain Medicine Education in Europe." *Wilderness and Environmental Medicine* 9: 19-27.
- Sierra Club. 1962. *Manual of Ski Mountaineering, 3rd Edition*, edited by David Brower. San Francisco, CA: The Sierra Club.
- Scott, W. Richard. 1998. *Organizations: Rational, Natural, and Open Systems*. Upper Saddle River, NJ: Prentice-Hall.
- Spence, A. M. 1974. *Market Signaling: Informational Transfer in Hiring and Related Screening Processes*. Cambridge, MA: Harvard University Press.
- Tilton, Buck. 1998. *The Wilderness First Responder: A Text for the Recognition, Treatment, and Prevention of Wilderness Emergencies*. Old Saybrook, CT: Globe.
- Tilton, Buck, and Frank Hubbell. 1994. *Medicine for the Backcountry, 2nd Edition*. Merrville, IN: ICS Books.
- Turner, Bryan. 1987. *Medical Power and Social Knowledge*. London: Sage Publications.
- Wilderness Medical Society. 2000. "Wilderness Medical Society Footprints." URL: <http://www.wms.org/history.htm>.
- Wilkerson, James. 1985. *Medicine for Mountaineering, 3rd Edition*. Seattle, WA: The Mountaineers.

Table 1: Source of authority of programs providing wilderness medicine training

No	Authority of certification	Instructors' qualifications
1	WMS "guidelines"	"professional educators with outdoor experience"
2	WMS "guidelines"	Founder is highly experienced
3	Certification granted by another organization	
4	Certification granted by another organization	
5	Certification granted by another organization	
6	Organization's national recognition	
7	DOT 1 st responder curriculum ³	
8	Organization's national recognition	Instructors are WEMT/WFRs; organization has advisory board of physicians
9	Certification granted by another organization, but "no claim made" to its "credibility or professionalization"	
10	Regional medical schools	Instructors are physicians, EMTs, and outdoor professionals
11	Provider's training experience	
12	Certification granted by another organization	
13	unknown	
14	Affiliation with state EMS associations	Instructors are professional EMS, physicians
15	Provider's training experience	Instructors have "teaching and training" experience
16	WMS "standards"	Instructors are "expert staff"
17	WMS and DOT "standards"	Instructors are "extensively trained"
18	Certification granted by another organization	
19	Certification granted by physicians	Instructors are physicians
20	"Wilderness Safety Council"	

³ Although some state Departments of Transportation have "First Responder" standards, none have such standards that apply to backcountry practices.