ORIGINAL RESEARCH

Camp Health Services in the State of Michigan

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Context.—Every summer, 10 million campers attend summer camp in the United States. In Michigan, each camp is required to have a camp health officer (CHO) on-site.

Objective.—To document the medical training, local emergency medical services and physician support, and off-camp medical facility use of CHOs.

Design.—Anonymous institutional review board–approved mail survey of all Michigan CHOs during the summer of 2001.

Results.—A total of 129 responses (50% response rate). Forty-seven percent of the CHOs reported caring for campers with significant medical needs. Almost half (45%) of the CHOs were registered nurses; however, 44% of the CHOs had paramedic training or less. Forty percent reported an ambulance response time of more than 10 minutes. Nearly all (97%) reported having a physician who reviewed their standing orders, and yet 75% reported using an acute care facility (emergency department or urgent care) more than half of the time for medical care not on-site. The CHOs reported that a small or rural hospital was the ambulance-receiving hospital 71% of the time. Two of the camps that responded have an automatic external defibrillator, and 22% are planning to buy one.

Conclusions.—In Michigan, CHOs have limited training, tend to use emergency department or urgent care facilities as their medical backup, and, in some instances, have prolonged times to definitive care. This preliminary study shows some of the opportunities that exist to improve health care for campers on a local and national level.

Key words: camping, recreation, child, adolescent, questionnaires, delivery of health care

Summer camp is an extremely popular activity for children. For 140 years, parents have been sending their children to rural settings to provide for a break from their familiar routine.¹ Every year, approximately 10 million children attend camp, supported by 1.2 million staff members.² Interest in camp has been increasing, with an annual rate of growth in the industry of 8% to 10% per year.² Campers include both well children and children with special needs, such as those having diabetes, cancer, human immunodeficiency virus, physical disabilities, and a myriad of other medical problems.³ The goals of camp include improving skills, increasing independence, making friends, experiencing a new environment, being exposed to positive role models, and most importantly, having fun.³ Research has shown that summer camps have a lasting effect on self-esteem.⁴

The health and safety of campers is an understudied area. The legislative control for camp licensing falls to the states. In 1989, the General Accounting Office (GAO) was asked to report on existing regulations regarding health and safety at youth camps. The GAO found a wide variation in state regulations that were related to camps and little information available on death, accidents, and illnesses.⁵ The GAO used a set of minimum standards created by the Centers for Disease Control (CDC) to compare the laws of individual states. The GAO found that, at best, states met only 65% of the minimum standards for health and safety at youth camps set by the CDC and that 26 states met less than 50%.⁵ Approximately 20% of the camps voluntarily apply to the American Camping Association (ACA) for accreditation.² The standards for health care required by the ACA are more stringent than those required by the states and include a registered nurse on-site in most instances.⁶

Michigan was cited as one of the states that met at least 65% of the model standards provided by the CDC.⁵

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A total of 350 000 campers attend camp in the state each year.⁷ Michigan defines a camp as “a residential experience in a natural environment where more than 4 school-aged children or adults who require supervision live apart from their guardians for 5 or more days in a 14 day period.”⁸ Camps in Michigan are required to be licensed and inspected, but ACA accreditation is accepted in lieu of state inspection.

All licensed camps in Michigan are required to have a camp health officer (CHO).⁸ The minimum training required of a CHO includes American Red Cross First Aid, cardiopulmonary resuscitation, and bloodborne pathogens training.⁸ Each camp must have a camp health policy that is reviewed annually by a consulting physician, who also agrees to provide medical support.⁸ This policy must include camper health screening, arrangements for on-call consultation and emergency services, and standing orders, as well as mechanisms for parental notification and medication administration.⁸

Family members entrust the health of their campers to CHOs, and yet the training and medical support of CHOs has never, to our knowledge, been studied. The purpose of our survey was to determine the medical training, the degree of support from local physician and emergency medical services (EMS), and the off-site facility use of CHOs in Michigan during the summer of 2001.

Methods

This project was reviewed and approved by the institutional review board of the University of Michigan. A list of all licensed camps in the state of Michigan was obtained from the Department of Consumer and Industry Services under the Freedom of Information Act. All CHOs were sent an anonymous, self-administered questionnaire (Appendix). Return envelopes were provided, which were labeled with a tracking number. Returned questionnaires were immediately separated from the return envelope to maintain anonymity. The response period was July 27, 2001, to August 9, 2001. At that time, a reminder card was sent to all camps to encourage further returns.

A questionnaire and cover letter were sent to the CHOs. The cover letter stated the purpose of the questionnaire and emphasized that the study was focusing on the training and medical support of CHOs.

The questionnaire consisted of 3 sections. Section 1 was devoted to determining the medical training of the CHOs and the types of campers they cared for, whether well campers or those with special needs. Section 2 related to medical backup and included questions about ambulance and hospital backup. It included a section of Likert scales that addressed their level of confidence in

themselves and their medical backup, with response codes ranging from 1 to 5 (1 = strongly agree, and 5 = strongly disagree). Section 3 included demographic questions about their camp, including size, gender distribution, location, and duration of camp stay. The survey was reviewed by camp health professionals, and modifications were made prior to the distribution of the final version.

Descriptive statistics (means, SDs, percentages, and 95% CIs) were calculated. Additional analyses compared the CHOs by 2 training levels: those with licensed practical nurse (LPN) training or greater (level 1) and those who had emergency medical technician—paramedic training or less as defined by the National Highway Traffic Safety Administration⁹ (level 2). An overall “comfort score” was also created by combining the 5 confidence ratings, resulting in a minimum score of 5 (strongly agree with all questions) and a maximum score of 25 (strongly disagree with all questions). Bivariate analyses included z and t tests. Statistical analyses used Microsoft Excel 2002 and SAS version 8 software.

To determine whether the sample was representative of the Michigan population, several characteristics were compared by using the tracking number of the camps that responded. Along with tracking numbers and addresses, the state of Michigan provided information about 2 variables for each camp. These variables were whether the camp was winterized and whether it was available for rent to outside groups. Thus, for the entire population of Michigan camps, percentages for these 2 measures could be calculated and then compared with those of the survey sample. Unfortunately, more informative characteristics, such as the average size of the camp or the age of the camper, were not available for the population as a whole.

Results

CHARACTERISTICS OF THE SAMPLE

A total of 258 surveys were mailed to all licensed camps in the state of Michigan. Three were returned as undeliverable. A total of 129 surveys were returned completed, giving a response rate of 50%. All of these completed surveys were included in the analysis.

Camps varied in size from 20 campers to 1500 campers, with a mean of 162 and a median of 110 campers present. A camp was defined as single sex if it had more than 90% of one sex of campers. Thirteen percent of camps were boys only, 10% were girls only, and the remaining 77% were co-ed.

Campers stayed from 1 day to 9 weeks, with a mean stay of 17 days and a median stay of 7.5 days. The mean

Table 1. Medical conditions reported, CHO training, and CHO physician, hospital, and EMS support*

	<i>CHO, N</i>	<i>CHO, n</i>	<i>CHO, %</i>	<i>95% CI†</i>
Medical conditions reported	61			
Asthma		43	70	59–82
Diabetes		33	54	42–67
Attention-deficit/hyperactivity disorder		22	36	24–48
Cerebral palsy		14	23	12–34
Seizure disorder		8	13	5–22
Developmental delay		6	10	2–17
Miscellaneous (eg, behavioral disorders, depression, vision loss, hearing loss, cystic fibrosis, spina bifida, sickle cell)		34	56	43–68
CHO medical training	128			
First aid		58	14	8–20
Licensed first responder		25	20	13–26
Licensed emergency medical technician		9	7	3–11
Licensed paramedic		4	3	0–6
Licensed practical nurse		6	5	1–6
Registered nurse		58	45	37–54
Physician		8	6	2–10
CHOs who have identified relationship with camp physician	129	98	76	67–83
CHOs who have report review of protocols by physician	129	122	97	94–100
Type of ambulance crew	129			
Full time		66	51	42–60
Part-time volunteer		35	27	20–35
Don't know		28	22	15–29
Ambulance staffing	128			
Paramedics only		2	2	0–4
Paramedic and emergency medical technician team		55	43	34–52
Emergency medical technician only		11	9	4–13
Don't know		60	47	38–56
Receiving hospital	127			
Small or rural		90	71	63–78
Larger facility		37	29	21–37
Automated external defibrillators	129			
Own		2	2	0–4
Plan to purchase		25	22	14–26

*CHO indicates camp health officer; EMS, emergency medical services.

†The last column indicates the 95% CI of the percentage of CHOs.

age of the youngest camper was 7 years; the mean age of the oldest camper was 16 years. Thirteen camps reported having campers older than 22 years, with a maximum of 99 years. Five of the facilities with adults served campers with cognitive impairments or cerebral palsy.

CAMP HEALTH OFFICERS

Nearly half (47% [61/129]) of the CHOs reported taking care of a camper with a significant medical condition

(Table 1). Two thirds of those reporting a significant medical condition reported caring for persons with asthma (70%), half reported caring for persons with diabetes (54%), and one third (36%) reported caring for persons with attention-deficit/hyperactivity disorder. The remaining reported illnesses are presented in Table 1.

Training for the CHOs was quite variable (Table 1). When grouped by training, 44% (95% CI, 35%–52%) had paramedic training or less, with the majority of these having only first aid or licensed first responder training.

Table 2. Camp physicians

		<i>Family practice</i>	<i>Pediatrics</i>	<i>Emergency medicine</i>	<i>Internal medicine</i>	<i>Other</i>	<i>Don't Know</i>
Reviews health policy (<i>N</i> = 129)	<i>n</i>	89	13	11	5	2	9
	%	69	10	8	4	2	7
	(95% CI)	(61%–77%)	(5%–15%)	(4%–13%)	(1%–7%)	(0%–4%)	(3%–11%)
Is “our camp doctor” (<i>N</i> = 106)	<i>n</i>	77	16	6	4	1	2
	%	73	15	6	4	1	2
	(95% CI)	(64%–81%)	(8%–22%)	(1%–10%)	(0%–7%)	(0%–3%)	(0%–4%)

Forty-five percent of the CHOs were registered nurses, and 6% were physicians.

Larger camps had more highly trained providers. The mean size of camps with a CHO who had LPN training or greater was 197 (SD: 229), while the mean size of camps with a CHO with paramedic training or less was 134 (SD: 103) ($t(95) = 1.99$, $P < .05$).

CHO SUPPORT

Nearly all (97%) of the CHOs stated that a physician had reviewed their standing orders for that year (Table 1). However, only three fourths (76%) stated that they had an established relationship with a camp physician. Family physicians were most likely to have reviewed the standing orders and to have agreed to be the camp physician (Table 2). Of concern, 7% of the CHOs did not know who reviewed their health service policy, and 2% did not know who their camp physician was.

Ambulance response times and transport times to the hospital are presented in Table 3. Overall, 40% (95% CI, 32%–49%) of the CHOs reported ambulance response times of more than 10 minutes. When they called 911, the CHOs stated that a full-time ambulance crew would respond half of the time. However, half of the time they did not know what type of training the arriving crew

would have (Table 1). Once the ambulance crew had arrived at camp, the transport time to the hospital was more than 10 minutes 71% of the time (Table 3).

The CHOs were asked to report the name of the primary receiving hospital for a transported camper. By using a self-identification system provided by the state of Michigan,¹⁰ hospitals were divided into those that categorized themselves as small and rural and those that did not. The CHOs reported that their campers were transported to a small or rural hospital more than two thirds of the time (Table 1).

While it was expected by the state that camps would provide care through a primary care physician, the CHOs were much more likely to use an acute care facility than a primary care office when care was provided off-site. On average, 41% of that care was provided by an emergency department and 31% by an urgent care facility. A physician's office was used only 28% of the time. Overall, 75% of the CHOs reported taking sick or injured campers to an acute care facility (emergency department or urgent care), more than half the time when they could not be treated in camp.

CHO COMFORT

Using a Likert scale format, the CHOs were asked to assess their level of comfort with their own skills and

Table 3. Ambulance response times and transport times to the hospital

		<i><5 min</i>	<i>5–10 min</i>	<i>10–15 min</i>	<i>15–20 min</i>	<i>>20 min</i>	<i>Don't know</i>
Response time to camp (<i>N</i> = 129)	<i>n</i>	14	50	33	13	5	13
	%	11	39	25	11	4	10
	(95% CI)	(5%–16%)	(30%–47%)	(18%–33%)	(5%–16%)	(1%–7%)	(5%–15%)
Time from camp to hospital (<i>N</i> = 129)	<i>n</i>	7	24	40	29	22	7
	%	5	19	31	23	17	5
	(95% CI)	(2%–9%)	(12%–25%)	(23%–39%)	(15%–30%)	(11%–24%)	(2%–9%)

Table 4. Camp health officer comfort with skills and backup

		<i>Strongly agree</i> (1)	<i>Agree</i> (2)	<i>Neither agree nor disagree</i> (3)	<i>Disagree</i> (4)	<i>Strongly disagree</i> (5)	<i>Mean (SD)</i>
I feel comfortable taking care of sick or ill campers at camp (<i>N</i> = 123)	<i>n</i> % (95% CI)	80 65 (57%–73%)	38 31 (23%–39%)	4 3 (0%–6%)	1 1 (0%–2%)	0 0 (0%–0%)	1.4 (0.6)
I have adequate medical backup if I feel uncomfortable with a sick or injured camper (<i>N</i> = 123)	<i>n</i> % (95% CI)	82 66 (58%–75%)	36 29 (21%–37%)	2 2 (0%–4%)	2 2 (0%–4%)	1 1 (0%–2%)	1.4 (0.7)
I have a local “camp doctor” who is responsive to my needs and concerns (<i>N</i> = 121)	<i>n</i> % (95% CI)	52 43 (34%–52%)	38 32 (23%–40%)	17 14 (8%–20%)	9 7 (3%–12%)	5 4 (1%–8%)	2.0 (1.1)
I feel comfortable with my local ambulance service (<i>N</i> = 125)	<i>n</i> % (95% CI)	62 50 (41%–58%)	37 29 (22%–38%)	21 17 (10%–23%)	5 4 (1%–7%)	0 0 (0%–0%)	1.7 (0.9)
I feel comfortable with my local emergency department (<i>N</i> = 125)	<i>n</i> % (95% CI)	57 46 (37%–54%)	48 38 (30%–47%)	12 10 (4%–15%)	5 4 (1%–7%)	3 2 (0%–5%)	1.8 (0.9)

their medical backup (Table 4). In all categories, the CHOs were confident about their own skills and about the medical backup that they received. Most agreed or strongly agreed with all questions. There was also no statistical difference in the comfort score when compared with the defined levels of CHO training or the type of receiving facility ($P > .05$).

In the total Michigan camp population, the percentage of camps that were categorized as rentable by the state was 80%, while 83% of the responding camps categorized themselves as rentable ($z = 0.713$, $P > .05$). Similarly, the percentage of camps that were categorized as winterized by the state was 63%, compared to 64% in the returned sample ($z = 0.231$, $P > .05$).

Discussion

While all of the camps that responded to this survey are in compliance with the laws of the state of Michigan, the results raise many concerns. In many cases, CHOs have minimal medical training and experience. They are often placed in situations in which definitive care is a prolonged distance away. While they are expected to have a “camp physician” who has reviewed their standing orders and is their medical backup, some CHOs do not know who their “camp doctor” is. Often, CHOs do not know the training and capabilities of the local EMS providers who respond when they call 911. In addition,

much of the medical care of campers outside camp takes place in an acute care setting, even though primary care coverage should have been arranged. Note also that all of these findings occurred in one of the six states recognized by the CDC as having the best camp oversight of any in the nation. Despite the previously mentioned concerns, the CHOs themselves are comfortable with their own skills and medical backup.

Only 2 of the camps responding reported having immediate access to automated external defibrillators. While the American Heart Association states that there is insufficient evidence to recommend automated external defibrillator use in children younger than 8 years, their presence in camps that are quite distant from definitive care should be considered.¹¹ Resident camps do serve a population the majority of which is older than 8 years, and they frequently have adult visitors and staff. To decide whether to make the investment in this technology, camps should look at the following issues: 1) What is the level of EMS support and defibrillation availability in their area? 2) How long would it take for an EMS crew to arrive? and 3) Does the risk of cardiac events in the population they serve warrant having this technology rapidly available? Cardiopulmonary resuscitation training should also be recommended for all camp staff and should be required for those who supervise high-risk activities.

Leaving campers at a camp is an event that may create

a great deal of anxiety for their family members. Unlike at day care centers, once campers are at camp, their health and safety are relatively unregulated. As early as 1966, studies reported a lack of research and governmental interest in the medical care of children at summer camp.¹² As reported by the CDC and GAO, this lack of care is still the case.⁵ The Recreational Camp Safety Act, federal legislation that would monitor accident and illness in camp, has not proceeded far in Congress.¹³ The American Academy of Pediatrics provides guidelines for screening and camp health, but these are purposefully left quite general.^{14,15} Most prior research has centered on the epidemiology of illness and injury at individual camps¹⁶⁻²² or on the epidemiology of homesickness.²³⁻²⁷ This survey was an initial attempt to identify some of the issues related to how health care is provided at camp. The issues raised may help guide further research and policy efforts.

The limitations of this study must be noted. First of all, response was limited to 50% of the licensed camps. However, the camps that responded did not differ significantly in the variables of rental status and winterized status from those that did not respond, suggesting similarity between the 2 groups and reducing concern about sampling bias. Another concern is generalizability. Only Michigan camps were surveyed. However, given that Michigan is among the best states in the nation in supervising their camps, it is possible that the results represent a best-case scenario of what is present throughout the rest of the country. In addition, response and transport times are perceptual and may not reflect actual time. Finally, although we know about CHOs and their limitations, camper risk while at camp is unknown. Without data that demonstrate the underlying risk rates for a large population of campers, the effectiveness of any intervention made in camp health remains unclear.

This survey reveals many opportunities for study in this area. Further evaluation needs to be performed on a multistate level to confirm the generalizability of these findings. The epidemiology of injury and illness at summer camps requires further attention either at the state or national level.

Those who agree to provide medical care for a camp should look closely at the local medical environment and ask questions of the camp director, the local EMS providers, and the urgent care facility or emergency department. Local EMS and emergency departments should also reach out to camps and prepare for the influx of campers that occurs each summer. Not all risk can be eliminated, but with adequate planning, it can be minimized.

Research has shown that camp is a wonderful experience for campers.^{3,4} These results should encourage all

involved with camping to strive to make a great experience even better.

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Appendix
Michigan Camp Health Officers—Survey 2001.
2001/07/24

Thank you for completing this survey.

- 1) Are your campers well campers or special needs campers? (check one)
 Well ☐   Special Needs ☐   Both ☐
 If you answered both, on any single day, what percentage of your campers are:
 (percentages should add up to 100%)
 Well %   Special needs %
 If special needs, what population of campers do you serve? (for example, campers with diabetes, campers with asthma)

- 2) For the person filling out this survey, what is your highest level of health care training? (check one only)
 Physician ☐
 Registered Nurse ☐
 Licensed Practical Nurse ☐
 Licensed Paramedic ☐
 Licensed EMT ☐
 Licensed First Responder ☐
 First Aid (completed Red Cross course required by state of Michigan) ☐
- 3) On a usual camp day, the person on-site with the highest level of health care training is a: (check one only)
 Physician ☐
 Registered Nurse ☐
 Licensed Practical Nurse ☐
 Licensed Paramedic ☐
 Licensed EMT ☐
 Licensed First Responder ☐
 First Aid (completed Red Cross course required by state of Michigan) ☐
- 4) Do you have a camp infirmary or health care center that is available every day, 24 hours a day? (check one)
 Yes ☐   No ☐
 If yes, how many beds does your health center have? beds
 If no, where are your ill campers cared for?

- 5) When you call an ambulance in an emergency, how long does it take for the ambulance to get to your camp? (check one)
 Less than 5 minutes ☐
 5 to 10 minutes ☐
 10 to 15 minutes ☐
 15 to 20 minutes ☐
 Longer than 20 minutes ☐
 Don't know ☐
- 6) The ambulances that would respond to my camp are staffed by: (check one)
 Full-time Paramedics or Emergency Medical Technicians ☐
 Part-time or volunteer Paramedics or Emergency Medical Technicians ☐
 Don't know ☐
- 7) The ambulances in my area provide: (check one)
 Paramedics only ☐
 Both Paramedics and Emergency Medical Technicians together in the same ambulance ☐
 Emergency Medical Technicians only ☐
 Don't know ☐
- 8) When the ambulance leaves camp, how long does it take to get to the nearest hospital? (check one)
 Less than 5 minutes ☐
 5 to 10 minutes ☐
 10 to 15 minutes ☐
 15 to 20 minutes ☐
 Longer than 20 minutes ☐
 Don't know ☐

Michigan Camp Health Officers—Survey 2001.
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Continued.

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- 9) The hospital where the ambulance would take my camper is:
(name of hospital) _____
- 10) The state of Michigan requires that a licensed physician review the camp Health Service Policy every year. The physician who reviews our health policy is: (check one)
Our physician who lives at camp ____
A physician who does not live at camp ____
Don't know ____
- 11) The physician who reviews our Health Service Policy is a: (check one)
Pediatrician ____
Internal Medicine Physician ____
Family Practice Physician ____
Emergency Medicine Physician ____
Don't know ____
Other (name type of doctor) _____
- 12) Does your camp have a local doctor (or group of doctors) who has agreed to act as your "camp doctor," where you make appointments for sick or injured campers or who visits your camp as needed?
Yes ____ No ____ Don't know ____
- 13) Our "camp doctor" is a: (check one)
Pediatrician ____
Internal Medicine Physician ____
Family Practice Physician ____
Emergency Medicine Physician ____
Don't know ____
Other (name type of doctor) _____
- 14) What percentage of the time do you take a sick or injured camper or staff to each type of these medical facilities when they are not treated in camp? (percentages should add up to 100%)
Emergency department ____ %
Urgent care attached to hospital emergency department ____ %
Urgent care not attached to hospital ____ %
Doctor's office ____ %
- 15) Does your camp have an automated external defibrillator?
Yes ____ No ____ Don't know what it is ____
If you answered no, are you planning to buy one in the future?
Yes ____ No ____
- 16) How much do you agree or disagree with these statements. Please circle one number for each line.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel comfortable taking care of sick or ill campers at camp	1	2	3	4	5
I have adequate medical backup if I feel uncomfortable with a sick or injured camper	1	2	3	4	5
I have a local "camp doctor" who is responsive to my needs and concerns	1	2	3	4	5
I feel comfortable with my local ambulance service	1	2	3	4	5
I feel comfortable with my local emergency department	1	2	3	4	5

Michigan Camp Health Officers—Survey 2001.
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Continued.

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- 17) How many campers do you have in camp at one time? _____
- 18) How many male campers? _____ female campers? _____
- 19) What is the age range of your campers?
 (youngest) _____ years to (oldest) _____ years
- 20) How many staff members are at camp? _____
- 21) The shortest amount of time a camper can attend camp this season is _____ days. (fill in blank)
 The longest amount of time a camper can attend camp this season is _____ days.
- 22) Is your camp a: (check one that best applies)
- Children only—Resident camp _____
  - Children only—Day camp _____
  - Children only—Both resident and day camp _____
  - Adult only—Resident camp or resident conference center _____
  - Adult only—Day camp or day conference center _____
  - Adult only—Both resident and day camp or conference center _____
  - Both adults and children—Resident camp _____
  - Both adults and children—Day camp _____
  - Both adults and children—Both resident and day camp _____
- 23) County where camp is located: _____
- 24) Zip code of camp: _____
- Comments or questions or concerns about the survey:

Please return completed survey in enclosed envelope to:

Edward A. Walton, MD
 TC B1382/0305
 1500 E Medical Center Dr
 Ann Arbor, MI 48109-0305

Please call (734)763-1271 with questions about the survey, or contact Dr Walton at ewalton@umich.edu.