Approved 2-26-85
Date

MINUTES OF THE SENATE COMMITTEE ON PUBLIC HEALTH AND WELFARE.

The meeting was called to order by Senator Roy M. Ehrlich at
Chairperson

10:00 a.m./~~p.m.~~ on February 22, 1985 in room 526-S of the Capitol.

All members were present except:
Senator Eugene Anderson, Excused

Committee staff present:

Conferees appearing before the committee:
Senator Norma Daniels
Donna Rae Malone, 2710 Patti, Wichita, Kansas
Ron Vine, Director, Topeka Parks and Recreation Commission
Elaine Pardee, Topeka YMCA
Representative Joan Wagnon
Charles B. Hamm, Department of Health and Environment

Others in Attendance: See attached list

Senator Norma Daniels who introduced SB-142 testified regarding the lack of safety factors, both equipment and life-saving personnel. Senator Daniels also presented a letter written by Tom Scott, Commissioner, 2nd District, Board of County Commissioners, Sedgwick County, Kansas, supporting the bill.

Mrs. Donna Rae Malone testified and presented 6 pieces of written testimony supporting SB-142. Mrs. Malone cited personal tragedy had been the catalyst in pursuing legislation covered in SB-142. Attachment I

Ron Vine, Director, Topeka Parks and Recreation and Legislative Chairperson for the Kansas Recreation and Park Association testified and presented written testimony supporting SB-142. Mr. Vine asked that the age factor of 18 be reduced to 16 as it is a critical issue to public agencies who operate pools in late August and September. Attachment II

Elaine Pardee, Topeka YMCA testified and will furnish written testimony. Ms. Pardee also expressed concern of the 18 year age specified in the bill. Attachment III

Representative Joan Wagnon appeared on behalf of the YWCA, of which she is Executive Director. Representative Wagnon expressed concern regarding the age limit, also the training courses listed in the bill and equipment placement specifications.

Charles B. Hamm, Department of Health and Environment appeared to testify concerning SB-162. The original bill and a free-standing bill were combined resulting in the ballooned bill of SB-162 which was handed out. This bill covers the organizational placement of the program within the Division and the other abolishes the annual report since the report now is being made through the budgetary process. Attachment IV

Discussion returned to SB-142 and it was the opinion of the committee that the Motel and Hotel Association should be contacted for their position concerning SB-142.

Chairman Ehrlich presented a request that the committee introduce a bill concerning county health funds; creating the county health capital outlay fund. A motion that the committee introduce the bill was made by Senator Francisco and seconded by Senator Mulich. The motion carried. Senator Leroy Hayden asked to be recorded as a NO vote.

Chairman Ehrlich questioned the committee as to their feelings concerning the introduction of the Kansas Bill of Rights for Disabled Persons that was handed out for their consideration February 21, 1985. It was pointed out

that HB-2018 covers certain of these rights and may overlap that bill which has been reported out of the House committee. The bill failed to receive a motion for introduction.

Senator Francisco asked that the committee consider information to be presented by Norman Furse in connection with Substitute SB-121. An amendment would simply authorize the Insurance Commissioner to require every insuror to report certain data and information relating to any incident of higher than standard rate with respect to the type of insurance proposed under the particular plan and it would also require that prior to the implementation the commission report to the governor and legislature any data obtained and then prior to any plan going into effect, the legislature have an opportunity to review the data and comment on the need for this type of legislation.

Due to lack of time the meeting adjourned.

SENATE

PUBLIC HEALTH AND WELFARE COMMITTEE

DATE 2-22-85

(PLEASE PRINT) NAME AND ADDRESS		ORGANIZATION
Allen Cox	Lawrence	Intern - Sen. Karr
Steve Paige	Topeka	KDHE
Charles V. Hamm - Forbes Field		KDHE
KEITH R LONDIS	TOPEKA	CHRISTIAN SCIENCE COMMITTEE ON PUBLICATION FOR KANSAS
Lynelle Ky	Topeka	Ks St Nurses' Assn
Vionetta Schmidt	Manhattan	KMA
Anne Harvey	Topeka	Ks. Midwives - Assoc.
Rita McAndrew	Topeka	Topeka Parks & Rec
Lori D Meyers	Topeka	Topeka Parks and Rec.
Douglas H Reynolds	Topeka	Topeka Park & Rec. Dept.
G. Wansing	Topeka	Topeka Park & Recreation
Fred Stone	Topeka	Topeka Park + Rec. Dept
Dennis N. Snyder	Topeka	Topeka Parks and Recreation
Ernest W.	"	"
Elaine Pardee	Topeka	Topeka YMCA
Rita E Land	Wichita	
Scott Richardson	Wichita	
Joan Wagnon	Topeka	Legislature
Dick Brock	"	Ins Dept.

(W) – SB-142 – 2-22-85

TOM SCOTT . . . COUNTY COMMISSIONER, 2nd DISTRICT

525 North Main Street Phone (316) 268-7411 Wichita, Kansas 67203

2

FEB 18 1985

February 15, 1985

Senator Daniels
State Capitol Bldg.
Topeka, Kansas 66621

Dear Senator Daniels,

I would like to express to you my complete agreement for the Senate Bill No. 142, which you are going to introduce before the Senate.

I believe it is of the utmost importance that this bill be approved. Every year the loss of life and the grief of many citizens from public pool accidents- points to the necessity of this bill.

I have written to each Senator and express my agreement for the passage of this bill.

If I can be of any assistance to you, please do not hesitate to call on me.

Sincerely,

Tom Scott

Tom Scott, Commissioner
2nd District
BOARD OF COUNTY COMMISSIONERS
Sedgwick County, Kansas

TS/dlh

February 21, 1985.

1- SB-142- 2-22-85-

Chairman Roy Ehrlich and Senate Committee Members;

Thank You for the opportunity to meet with this committee today. My name is Mrs. Donna Rae Malone, 2710 Pattie, Wichita, Kansas. I am a licensed Prac. Nurse, Prec. Committeewoman, Teen Sponser at our church and very proud to be the mother of 3 sons, one who has gone home to be with his Lord. I am here today to ask your help in getting Senate Bill #142 enacted into law. Today I will speak for both myself and my husband, Howard, who because of scheduled plane flights, was not able to leave his work at Boeing.

To give you just a brief background, our beloved son and brother, 21 year old Dana Kyle Malone, drowned in a whirlpool at Win's Fitness Center, 2234 South Oliver, Wichita, Kansas December 20, 1980- Saturday night, five days before Christmas. After the shock of our son's drowning penetrated our mind and daily thoughts, we knew we had to do something, so that this tragedy wouldn't forever devastate another family. Webster defines devastate as ravage, the stripping of valuable possessions. Grief is like the sky, it covers everything. Because of possible litigation, we had to be unconspicious in our collection of information. No one would give us any information on the detail's of our son's death, so it was then we decided to take them to court. We started collecting all the information and searching many sources for information about drownings in whirlpools, hot-tubs and swimming pools opened to the public. We learned from data: that there were 7,000 drownings in the United States in 1983. (200 of those drownings occurred in public pools, including hotel, motel, and Health Spas's Swimming pools and whirlpools, Hot tubs and Jacuzzis) As we continued to gather information on Whirlpools and Hot-tubs from many different sources, we came to the conclusion very early in our research that whirlpools were a potential danger. We visited different spas, in different areas, not just the Health club where our son died, and found so many violations, according to the Minimum Standards for Public Spas- dated April 1, 1978. from the National Spa and Pool Institute, Washington, D.C.

2/22/85
Attachment I

In each and every spa in Wichita, none provide a person to watch the whirlpools when a patron choses to use it, in the course of their workout. I visited and checked 12 whirlpools in Health Clubs here in Wichita personally, only 2 provide a working clock visable from the sitting position, in the whirlpool. None provide life-saving equipment, none have a large sign warning the dangers of the whirlpool, and what to do in case of an emergency(in the Whirlpool area) Attendants in these Health clubs told me, oh, they check every 20 to 30 minutes. It takes just a few minutes, in the hot water, to faint and drown. The Spa & Pool Institute states, the water in the whirlpool should be kept at 103°-104° for safety. In all but one (1) of the Health Clubs I visited stated they keep the water 110° or over. The patron's, especially the men complain if the water is not hotter than the level of 103°-104°. They want to keep the customer happy, in spite of the dangers, either known or unknown to the attendant working at the clubs. My own opinion is many of these people are unaware of the dangers.

In the spa where our son drown, there was not one (1) working clock. Under oath, the young manager stated "there were no working clocks, using the excuse that they had all rusted out and there were no signs in and around the pool areas to warn of the many dangers. I believe if Senate Bill #142 were made law, such violations would and should be corrected. According to a consumer report dated May, 1981 which I have made available to you this morning, there were an estinated 200 emergency-room treated injuries in 1979 and 1,103 in 1980 which were associated with spas. I am sure many more injuries and death go unreported to the correct authorities.

Section 2 states: shall provide at least one properly trained person and all necessary equipment for life saving and resuscitation at all times, when the pool is opened.

Our son, Dana's lifeless body remained at the bottom of the murky whirlpool for over 30 minutes, the manager, a 22 year old young man, did not call 911 emergency.

nor did he call Police or Ambulance, for reasons known only to himself. When he did use the telephone, he called a young woman, who had quit her job as manager at that same Health club only 1 week before, and she and her husband arrived within a few minutes. They went directly to the whirlpool and her husband finally located our sons lifeless body and pulled him out and called EMS. Upon arriving at St. Joseph Hospital, the doctor's worked with our son for over an hour, then pronounced him DEAD ! The words parents dread to hear. Dana was not given the right to be resusciated, he deserved that chance. WHY? I think because they were no state or city laws governing public swimming and whirlpools, pertaining to the health hazards and potential dangers. No laws to protect our son, or hundreds of others who go to these fitness centers to get in shape, and unknowingly become victims in one way or another. We heard testimony in our court trial that many of these fitness clubs hire young people for their good looking bodies and appeal, with safety knowledge never being considered a factor.

Hot-tubs, spas, whirlpools are a FAD that has gotten out of hand. A fad that has ballooned faster that adequate information on safety and potential hazards can be brought to the public's attention. Although the tragedy is, many people think it cannot happen to them, always to someone else. Cororner Kornblum stated in Time Magazine, dated June 1983 "God only knows how many cases of drowning in hot-tubs have gone unreported!"

Our attorneys were happy to tell us we won our trial in court and I told them thats remarkable, because I did not feel like a Winner. The monetary award was very small, but we did win. After our win in court, the Underwriter's Insurance now says, WHIRLPOOLS are high risk . We already had found that out.

Howard and I and our 2 sons, Mike and Eric were very pleased when Sen. Norma Daniels called our attention to Senate Bill #142 being considered by the Senate of the state of Kansas. We have talked to so many people, most of whom expressed

isbelief that the State of Kansas had no laws governing public pools, leaving the cities to their own discretion in applying and regulating such laws.

It is not fair that our beloved son and brother, DANA, will not be allowed to to grow up to be the young man he promised God and his family, he would be. Furthmore it is not fair if all of us who care about others, go on with our lives and do nothing.

I am not so naive, that I'd believe that there will be no opposition to Senate Bill #142, I would only hope they might reconsider after given some of these facts I have researched. I have collected information and have more coming in the mail in the near future, and would like to say to each of you here today, that I am available to try and answer any question or questions that you might have. I would be willing to talk to you by telephone or if necessary make a trip to Topeka.

In addition, I would like to ask Barbara Sabol, Secretary of the Dept. of Health and Environment for the State of Kansas, if she would like to review some of the findings on the many health hazards found in and around whirlpool and other pool areas that exists each and every day.

Sorrow comes to all of us, but when it comes to us by negligence, it leaves a bitter taste for aw hile. We cannot bring our son back here with us, but the opportunity to help, in even a minute way, to encourage our Senators and Representatives to support and pass Senate Bill #142, gives pleasure and hope to us.

I again thank you for allowing me to come here to this committee hearing, I'm here on behalf of many, many parents out accross Kansas, who haven't heard of Senate Bill #142, some who will never write a letter or send a mailgram, some who will neither raise a voice to yea or nay. I am here to plead with you for a YES vote for Senate Bill #142, and I only hope the bill is strong enough to accomplish much.

Thabj

Thank you sincerely
Howard & Donna Rae Malone
Mike, Eric

HUMAN FACTORS ANALYSIS

SPA ASSOCIATED HAZARDS - AN UPDATE AND SUMMARY

Victoria R. Brown

May 1981

U.S. CONSUMER PRODUCT SAFETY COMMISSION
Washington, D. C.

Directorate for Hazard Identification and Analysis
Division of Human Factors

SPA ASSOCIATED HAZARDS - AN UPDATE AND SUMMARY

Introduction

In December of 1979, the Consumer Product Safety Commission (CPSC) issued a press release warning the public of the hazard of drowning in spas and hot tubs as a result of exposure to water greater than 104° F alone, and in combination with alcohol consumption. This warning was based on the occurrence of 10 deaths in 1979. In three of these deaths, water temperatures greater than 104° F, and consumption of alcohol were cited as contributory factors. Since then, the Commission has continued to monitor injuries and deaths associated with the use of hot tubs and spas.

The purpose of this paper is to provide an update and summary of the hot tub and spa-associated injuries and deaths during 1979 and 1980, and to make recommendations on safe hot tub and spa use, based on the data gathered. Specific objectives are to:

- Identify the hazard patterns associated with the use of spas.
- Identify individual and environmental factors contributing to hot tub and spa-associated deaths.
- Discuss the physiological effects of heat and alcohol.
- Determine if the 104° F recommended maximum safe water temperature provides an adequate level of safety for the populations at risk.

- Determine what should be the recommended length of exposure per use at a given water temperature.
- Discuss the voluntary standards activities involving hot tub and spa safety.

OVERVIEW

The products addressed in this paper include those known as spas, hot tubs, and whirlpools. For the purpose of this paper they are all referred to as spas. Spas are designed for recreational and therapeutic use by consumers in their residences, are not drained, cleaned or refilled with each use, and include a hydrojet circulation system, hot water, cold water mineral baths, air induction bubbles, or any combination thereof. The spas can be located within a house, as in the bathroom, basement, or in the yard or patio area.

There were an estimated 200 emergency room-treated injuries in 1979, and 1,100 in 1980 which were associated with spas. The CPSC has on file, records of 30 residential spa-associated deaths, 22 occurring in 1979, 6 in 1980, and 2 in the first half of 1981. Heat and alcohol were cited as contributory or causal factors in 12 of these cases; drowning with no specific causal factor was cited in 13 cases; 2 drownings were said to have resulted from the victims being rendered unconscious as a result of a fall and head injury prior to drowning; and one death was caused by electrocution. There are 2 deaths and 2 cases of near drownings resulting from hair entanglement in spa drains. There are 6 deaths and one injury reported which occurred in a commercial or public location. These 7 cases have been determined to be out of scope for this report. (See Table 1.)

Table 1 - CPSC Cases Involving Spa Fatalities
January 1, 1979 - June 14, 1981

Hazard Pattern	Number
Drowning - Heat and Alcohol Contributing Factors	12
Drowning - Cause Not Specified	13
Drowning - Hair Entanglement	2
Drowning - Rendered Unconscious from Fall/Head Injury	2
Electrocution	1
Drowning - Commercial/Public Location	6
Total	36

U.S. Consumer Product Safety Commission/HIEH

Cases Involving Heat and/or Alcohol

There are 12 cases in which heat and/or alcohol were identified as contributory factors resulting in the victim's death due to drowning. In cases where the information was available (Table 2):

1) The victims' blood alcohol concentration ranged from .09 percent to .42 percent, and was more than .15 percent in eight victims.
(Note: .15 percent is considered to be gross intoxication. See Fig. 1.)

2) The water temperature range was from 106° F to 114° F.

3) Six victims were females, five were males, and in one case the sex was unspecified.

4) The victims' ages ranged from 21 years to 79 years. (Median age was 46 years.)

5) Potential contributing individual factors cited were hypertension or other circulatory deficiencies, emotional disorders, excessive length of exposure, dieting, and stress.

6) In two cases the autopsy reports indicated the presence of non-prescribed drugs in addition to alcohol.

7) Ten of the victims were using the spa alone at the time of their deaths.

Table 2 - Blood Alcohol (B/A) Concentration

Age, Sex, and Water Temperature in Spa Associated Drownings

(12 Cases)

B/A	Age/Sex	H_2O Temp (F)
.253	46 F	109° - 110°
.18	26 F	106°
.34	21 M	Steamy
.21	60 F	112°
.09	35 *N.S.	N. S.
.31	25 M	110°
.42	58 M	111° - 114°
.32	48 F	111° - 114°
.33	33 M	Heat Implied
None	71 F	108°
N.S.	N.S. F	114°
N.S.	67 M	Heat Implied

* Not Specified

U. S. Consumer Product Safety Commission/HIEH

Drowning - Cause Not Specified

There were 13 cases in which the victims were reported to have died by drowning. Little detail is available on the exact cause or sequence of events. However, six of the victims were one year of age or less. It is hypothesized that these children were left unattended and either fell into, or purposely entered the spa, and subsequently drowned. In 5 of the 13 cases, the victims were age 68 or over. It is hypothesized that these victims' deaths were complicated by health problems that accompany advanced age. One case involved a 21 year old male who suffered a seizure, and one case involved a 44 year old female with no specified cause of death.

Effect of Heat and Alcohol - Discussion

The available literature examined revealed no studies specifically addressing the pathophysiology of spa deaths involving heat and alcohol. However, there is ample literature available regarding the physiological effects of heat and/or alcohol under other conditions.

Hyperthermia occurs when deep body temperature is higher than the thermoregulatory "setpoint." The human tolerance zone is within $\pm 4^{\circ}$ of the normal 98.6° F. In general women are less heat tolerant than men and small persons of either sex are at a disadvantage when exposed to thermal extremes. Heat (hyperthermia) can cause drowsiness, lethargy, vasodilation, increased core temperature and in some instances neurological teratogenesis; alcohol can cause heat loss (hypothermia), compensatory hyperthermia, vasodilation, vasoconstriction, cardiodepression, decreased myocardial contractibility, hypoglycemia, hypertension, respiratory depression, decreased cerebral blood flow and altered cerebral tissue compliance.

Not only are heat and alcohol individually associated with certain respective physiological changes, but each can affect an adverse physiological response to the other. Exposure to both heat and alcohol alter heat tolerance, mean lethal temperatures are decreased, and there is an increase in the toxic effects of alcohol. Heat in combination with alcohol is at least additive if not synergistic, resulting in an increased susceptibility to fatal hyperthermia among people using a spa at a water temperature greater than 104° F.

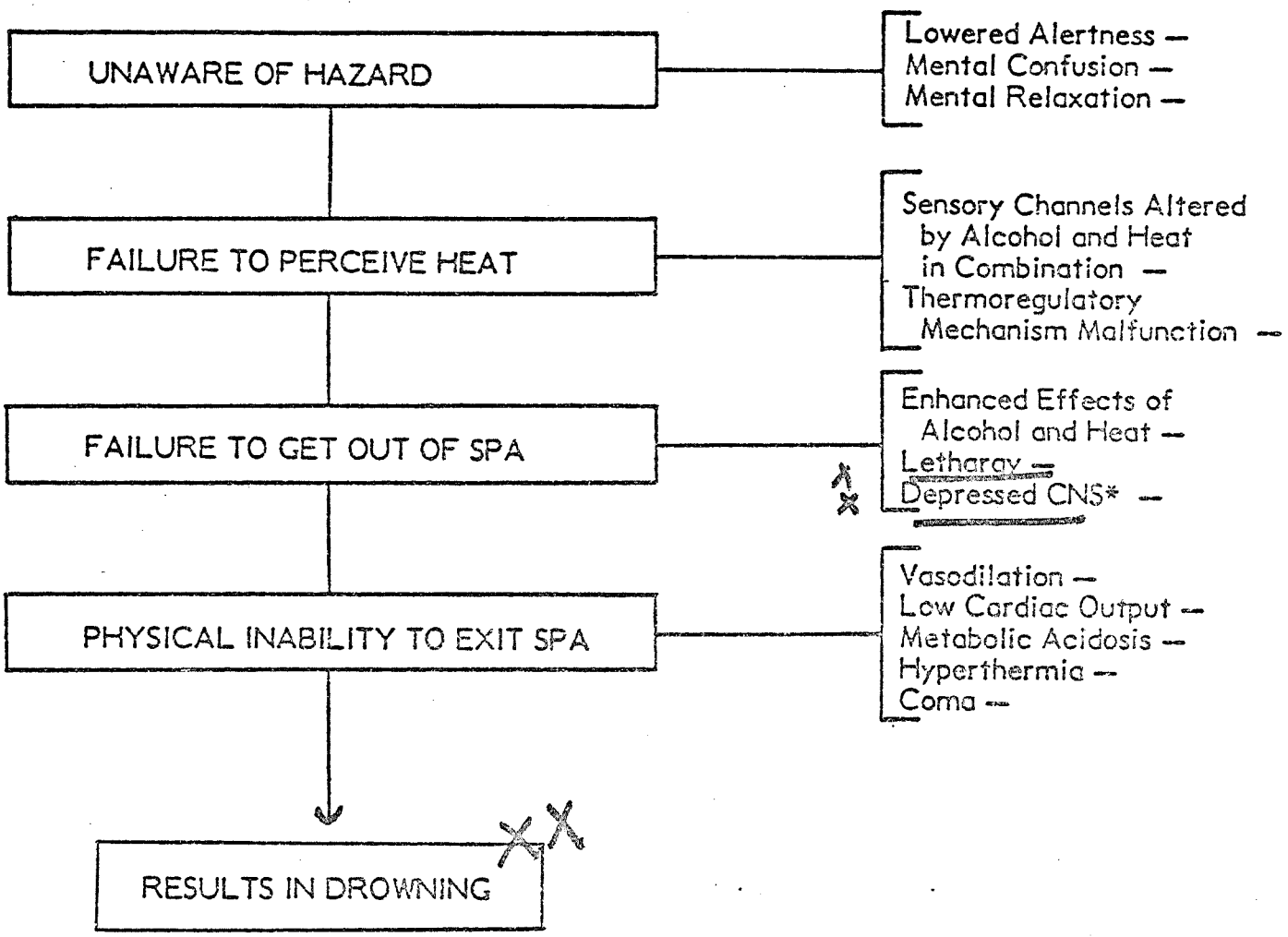
Age is another factor which contributes to the risk of hyperthermia, due in part to reduced tolerance to thermal stress. Animal studies reviewed indicated that with age,

alcohol causes a greater reduction in blood pressure, and influences cardiac function more severely than in younger animals. Thus small amounts of alcohol and relatively low water temperatures may greatly increase the risk of fatal hyperthermia among older people who use spas.

An accident sequence model has been developed to depict the general sequence of events leading to drowning when heat and alcohol are contributory factors. (Fig. 2.)

Figure 2

ACCIDENT SEQUENCE MODEL



* Central Nervous System

U.S. Consumer Product Safety Commission/HIEH

Length of Exposure Discussion

Further research is needed to determine what the recommended length of exposure should be for the at risk populations. There is some indication that a range of between 20 to 30 minutes would be appropriate for most users if the water temperature does not exceed 104° F. This length of exposure may be too long for pregnant women and children unless the water temperature is 100° F to 102° F.

The use of mechanical or electrical timers to inform the user of the length of time they have been in the spa can assist the decision-making process. However, persons under the influence of alcohol or drugs often display increased risk-taking behavior and poor judgment and therefore may ignore the timer.

Several of the victims were reported to have been frequent users of spas. In one case, the victim was reported to have used the spa daily over a two-year period. It appears that with familiarity, and frequent spa use, there may be an accompanying complacency about the associated hazard since the victims have previously used the spa at a given water temperature while drinking and never experienced adverse effects.

Safe Water Temperature - Discussion

The difficulty of pinpointing safe water temperatures and length of exposure is that no data are available about victims who experienced a near-miss situation. Either the situation results in a death, or the person escapes uninjured.

Since there are no known cases to date in which the water temperature was 104° F, or lower, it is presumed that this recommended maximum water setting is relatively safe for most at risk populations. There are three exceptions: women who are pregnant, children, and adults with certain health problems such as hypertension or circulatory impairment.

In a report entitled "Suggested Limits of Exposure in the Hot Tub and Sauna for the Pregnant Woman," the authors recommended a maximum water temperature of 102° F for 15 minutes for pregnant women. This study was undertaken because there was evidence that hyperthermia is a teratogen in animals and there was some implication from retrospective cases that women exposed to temperatures of 102° F or greater during their first 3 to 15 weeks of pregnancy run a risk of endangering the developing embryo or fetus. Other scattered reports and recommended practices for using spas indicate that children less than 5 years of age are more vulnerable to extreme temperature changes than older children, and that adults suffering from cardiovascular or circulatory impairments or hypertension have less tolerance to high temperatures than do healthy adults.

The Spa and Tub Association, a Division of the National Swimming Pool Institute, has available a "Minimum Standard for Residential Spas." Industry members began compliance October 1, 1980. Section 6.2 states: "The maximum temperature of the spa water shall be 104° F (40° C). A thermostatic control for the water shall be required." Appendix D states that a precaution sign shall be mounted adjacent to the entrance of the spa and shall read:

CAUTION

1. Persons suffering from heart disease, diabetes, high or low blood pressure should not enter the spa without prior medical consultation and permission from their doctor.

2. Excessive spa water temperature is dangerous and should be checked before use. The maximum temperature of the spa water shall never exceed 104° F (40° C) as stated in section 6.2 of this standard.

3. Never use a spa while under the influence of alcohol, anti-coagulants, antihistamines, vasoconstrictors, dialators, stimulants, hypnotics, narcotics or tranquilizers.

4. Long exposures may result in nausea, dizziness or fainting. Observe a reasonable time limit, leave the spa, then shower, cool down, and, if you wish, return for another brief stay.

5. Always enter and exit the spa slowly and cautiously.

6. Unsupervised use by children is prohibited.

7. If possible, do not use the spa alone.

Much of this work was undertaken prior to the Commission's involvement in analyzing spa associated hazards. This cautionary sign will greatly assist in informing consumers about safe spa use. The cautionary statement should be more precise about exposure time as discussed in number 4. How long is a "long exposure," or a "brief stay?"

CONCLUSIONS

The Commission should continue to collect, analyze, and disseminate data on spa associated deaths and provide information to the consumer on safe spa use. There is a need to make a strong warning against the consumption of alcohol or drugs prior to, or concomitant with, spa use. This message can not be overstated. There is a significant increase in the risk of drowning when alcohol or drugs are used. Promotional materials which contain pictures of spa users drinking alcohol represent direct conflict with industry's recommendations and should be eliminated.

Based on the cases reviewed to date, the recommended 104°F maximum water temperature is adequately safe for healthy, unimpaired consumers. However, a maximum water temperature setting of 100°F to 102°F would provide a greater level of safety for other at risk populations. Spas in Wichita STATE 110° + over.

Additional detailed information is desired on the exact sequence of events involving children less than one year of age, and cases involving victims of hair entanglement, who drowned in spas. However, at a minimum, an informational effort to warn parents of this risk is warranted.

Survival of Herpes Simplex Virus in Water Specimens Collected From Hot Tubs in Spa Facilities and on Plastic Surfaces

Lata S. Nerurkar, PhD; Frank West; Michael May; David L. Madden, DVM, PhD; John L. Sever, MD, PhD

• **Several health spas were closed temporarily because of possible nonvenereal spread of herpes simplex virus (HSV) in spa water at these facilities. We collected water specimens from two health spas and studied them for (1) the presence of HSV; (2) bromine (Br_2), chlorine (Cl_2), and pH levels; and (3) the ability of HSV to survive in water. No HSV could be isolated from the spa water specimens. Spa water had high levels of Cl_2 and Br_2, tap water specimens had low levels of Cl_2, and distilled water had no detectable Cl_2 or Br_2. The addition of spa water to laboratory stock virus immediately inactivated the virus. The HSV survived four hours in the tap water and 24 hours in distilled water. The survival of HSV appeared to be related to the free halogen content of water. To approximate the conditions of survival of HSV on plastic-coated benches and seats in spa facilities, HSV was placed on plastic surfaces in a humid atmosphere at 37 to 40 °C. The virus was found to survive up to 4.5 hours under these conditions. The survival of HSV from human lesions may be different due to the presence of tissue secretions and proteins. Furthermore, transmission may require other factors, such as rubbing of skin or penetration through abrasions. However, survival of significant amounts of virus for 4.5 hours on plastic surfaces suggests that fomites such as these may be nonvenereal routes of HSV transmission.**

(*JAMA* 1983;250:3081-3083)

IT IS important to consider possible nonvenereal modes of transmission of herpes simplex virus (HSV) infections. One alternate route of transmission of HSV might be in public recreation areas such as health spas, where persons share such facilities as hot tubs, benches, seats, and poolside areas. In these warm, moist areas, infected persons wearing little or no clothing might pass the virus from their lesions to the others who share the facilities. We were consulted about the possible transmission of HSV infections at commercial spas in the Washington, DC, area when several businesses were temporarily closed because a number of their clients reported having genital HSV infections following use of the facilities.

See also pp 3045, 3059, 3093, and 3094.

In this study, specimens of water from two different local health spas were tested for the presence of HSV. These specimens were also analyzed along with tap water and distilled water for the levels of free chlorine (Cl_2) and bromine (Br_2) and pH. In addition, the survival of HSV in spa water, distilled water, and tap water at 37 to 40 °C was studied. To simulate conditions of plastic-coated benches and seats near the hot tubs, the survival of HSV on plastic surfaces in humid atmosphere at 37 to 40 °C was determined.

MATERIALS AND METHODS

Collection of Spa Water Specimen

The specimens of water from hot tubs in local commercial spa facilities were collected in the morning in sterile plastic tissue-culture bottles and kept airtight at 4 °C until analyzed (up to one to two hours after collection). Employees of the spas were not informed in advance that samples were to be taken.

Determination of Cl_2 and Br_2 and pH

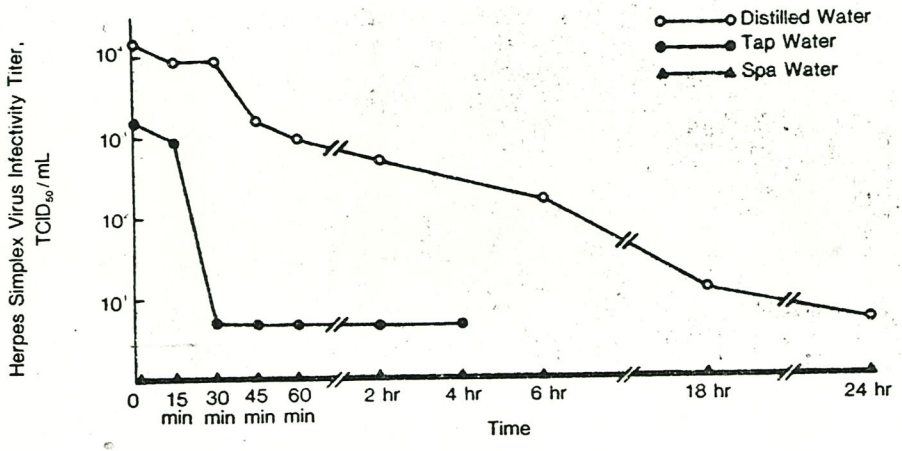
Free Cl and Br determinations were performed. The samples with high Cl and

From the Infectious Diseases Branch, National Institute of Neurological and Communicative Disorders and Stroke, National Institutes of Health, Bethesda, Md

Reprint requests to Unit on Immunochemistry and Clinical Investigators, Bldg 36, Room 5D06, National Institutes of Health, Bethesda, MD 20205 (Dr Nerurkar).

Table 1.—Free Chlorine and Bromine Levels and pH of Water Specimens From Spa Facilities

	Water Specimens From Spas			
	Source 1	Source 2	Tap Water	Distilled Water
Chlorine, ppm	12.0	20.0	4.0	<0.1
Bromine, ppm	16.0	40.0	<.01	<0.1
pH	4.8	8.2	6.7-6.85	6.9-7.0



Rate of inactivation of herpes simplex virus in distilled water, tap water, and water from local spa facilities. $TCID_{50}$ indicates 50% tissue culture infectious dose.

Br_2 levels were diluted sufficiently with distilled water to obtain color readings in the limits suggested by manufacturers. The pH was determined by standard pH meter equipment in the laboratory.

Virus Isolation

Monolayer tube cultures of human foreskin fibroblasts maintained on Earle's minimum essential medium (EMEM) with 2% fetal calf serum (FCS), penicillin (100 units/mL), streptomycin (100 μg/mL), and glutamine (2mM) were inoculated in triplicate with 0.2-mL aliquots of spa water. The media were changed after one hour, and the cultures were incubated at 37 °C in 5% carbon dioxide and were monitored for cytopathic effect for up to ten days.[1]

Survival of HSV in Spa Water at 37 to 40 °C

Laboratory-passaged HSV (MS strain of HSV type 2) was grown in primary rabbit kidney cell culture. Two tenths of a milliliter of virus was diluted to 20 mL in (1) spa water, (2) laboratory tap water, and (3) deionized distilled water in sterile 50-mL tubes. The tubes were capped and kept at 37 to 40 °C and shaken manually, intermittently. Aliquots were removed for virus isolation at time 0, 15, 30, 45, and 60 minutes and 2, 4, 6, 24, 48, 72, and 96 hours. At each interval, additional aliquots were removed, diluted 1:10 in transport media[1] and stored at −70 °C for later determination of infectivity titers. The HSV-positive specimens were titrated for virus infectivity as described previously.[2] The results were expressed as 50% tissue culture infectious dose.

Survival of HSV on Plastic Surfaces at 37 to 40 °C in a Humid Atmosphere

Polystyrene is one of many types of plastic coating used to protect furniture in moist areas. To approximate the plastic-coated benches and seats near the hot tubs, we determined duration of survival of HSV on plastic (polystyrene) Petri dishes in a humid atmosphere at 37 to 40 °C. Measured aliquots (0.3 mL) of HSV inocula in EMEM (previously titrated for infectivity) were put in Petri dishes (35×10 mm) in circular area of 1-cm diameter and incubated in humid boxes at 37 to 40 °C. The pH change of the aliquots was not controlled. The Petri dishes were sampled at time 0, 15, 30, 45, and 60 minutes and 2.0, 4.5, 6.0, 24.0, 48.0, and 72.0 hours, the virus inocula diluted to a final volume of 3 mL with EMEM and cultured for HSV. The HSV-positive specimens were titrated for virus infectivity.

Table 2.—Survival of Herpes Simplex Virus (HSV) on Plastic Surfaces at 37 to 40 °C in a Humid Atmosphere

Time	HSV Titer, $TCID_{50}$/mL*
0	$10^{4.2}$
15 min	$10^{4.2}$
30 min	$10^{4.3}$
45 min	$10^{4.2}$
60 min	$10^{4.2}$
2.0 hr	$10^{3.2}$
4.5 hr	$10^{2.9}$
6.0 hr	. . .
24.0 hr	. . .
48.0 hr	. . .
72.0 hr	. . .

*Indicates 50% tissue culture infectious dose per milliliter.

RESULTS

The spa water samples contained high amounts of free Cl_2, Br_2, or both, while laboratory tap water contained only low levels of Cl_2 (Table 1). The distilled water did not contain any detectable Cl_2 or Br_2. No HSV could be isolated from the spa water specimens. The mixing of spa water with laboratory stock virus immediately inactivated the virus. As shown in the Figure, no virus could be isolated at time 0. In contrast, in tap water, HSV survived for up to four hours and in distilled deionized water the virus survived for up to 24 hours.

Laboratory stock HSV survived on plastic surfaces in humid and warm atmospheres for up to 4.5 hours (Table 2).

COMMENT

The spread of infectious diseases at health spas and pools is well known. Some of the infections that have been reported to be transmitted at these facilities include *Pseudomonas* folliculitis,[3,4] pharyngoconjunctival illness caused by adenoviruses types 3 and 4 in pools and hot tubs,[5,6] and amebic meningoencephalitis in heated pools.[7]

In our studies, the samples of spa water contained high levels of Cl_2 and Br_2, and HSV could not be recovered from these samples. When tissue-culture grown virus was added to spa water, it was destroyed instantly. Similar inoculation of tap water that had a low level of Cl_2 resulted in survival of the HSV at low titer for four hours, while in distilled water that had no detectable Cl_2 or Br_2 the

Hoadley et al[11] showed that the quantity of *Pseudomonas* capable of growth at 41 °C depends on two factors: the number of persons per pool capacity (stress) and the time relationship between chlorination and sample collection. The whirlpool or tub baths with their elevated temperature and turbulent water make maintenance of adequate chlorine levels difficult or impossible. However, recent evidence shows that chlorine levels may not be that critical for control of *P aeruginosa*. Kush and Hoadley[12] noted that adequate chlorine levels, and in fact nightly superchlorination, had little effect in suppression of *P aeruginosa* growth. They believe that the temperature and total organic carbon source may be the critical factors. Whirlpools are rich in ammonia and organic matter presumably contributed by the user. There are no current Colorado or Denver county laws specifically regulating whirlpool sanitation, and there are no routine health inspections such as are done in public swimming pools. The status of other states is not known.

The Environmental Health Service of the Denver Health and Hospitals, Denver, acquired and processed the environmental samples from the health spa.

Ted Tsai, MD, from the Special Pathogens Branch, Bacterial Disease Division, Bureau of Epidemiology, Center for Disease Control, Public Health Service, US Department of Health, Education, and Welfare, Atlanta, conducted the epidemiologic survey.

The serotyping of the *Pseudomonas aeruginosa* cultures was processed by the Hospital Infections Laboratory Section, Epidemiological Investigations Laboratory Branch, Bacterial Disease Division, Bureau of Epidemiology, Center for Disease Control, Public Health Service, US Department of Health, Education, and Welfare, Atlanta.

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CORRECTIONS

***Pseudomonas* From Whirlpool.**—In the June 2 issue of THE JOURNAL (239:2362-2365, 1978), the BRIEF REPORT "*Pseudomonas* Folliculitis Acquired From a Health Spa Whirlpool" should have referred to the association of *Pseudomonas aeruginosa* with the green nail syndrome, not the blue nail syndrome, in the first paragraph. In addition, on page 2364, column 3, the last sentence of the second complete paragraph should have reported that *Pseudomonas* organisms were found in pools that measured 0.3 ppm chlorine or less, not 0.7 ppm chlorine or less.

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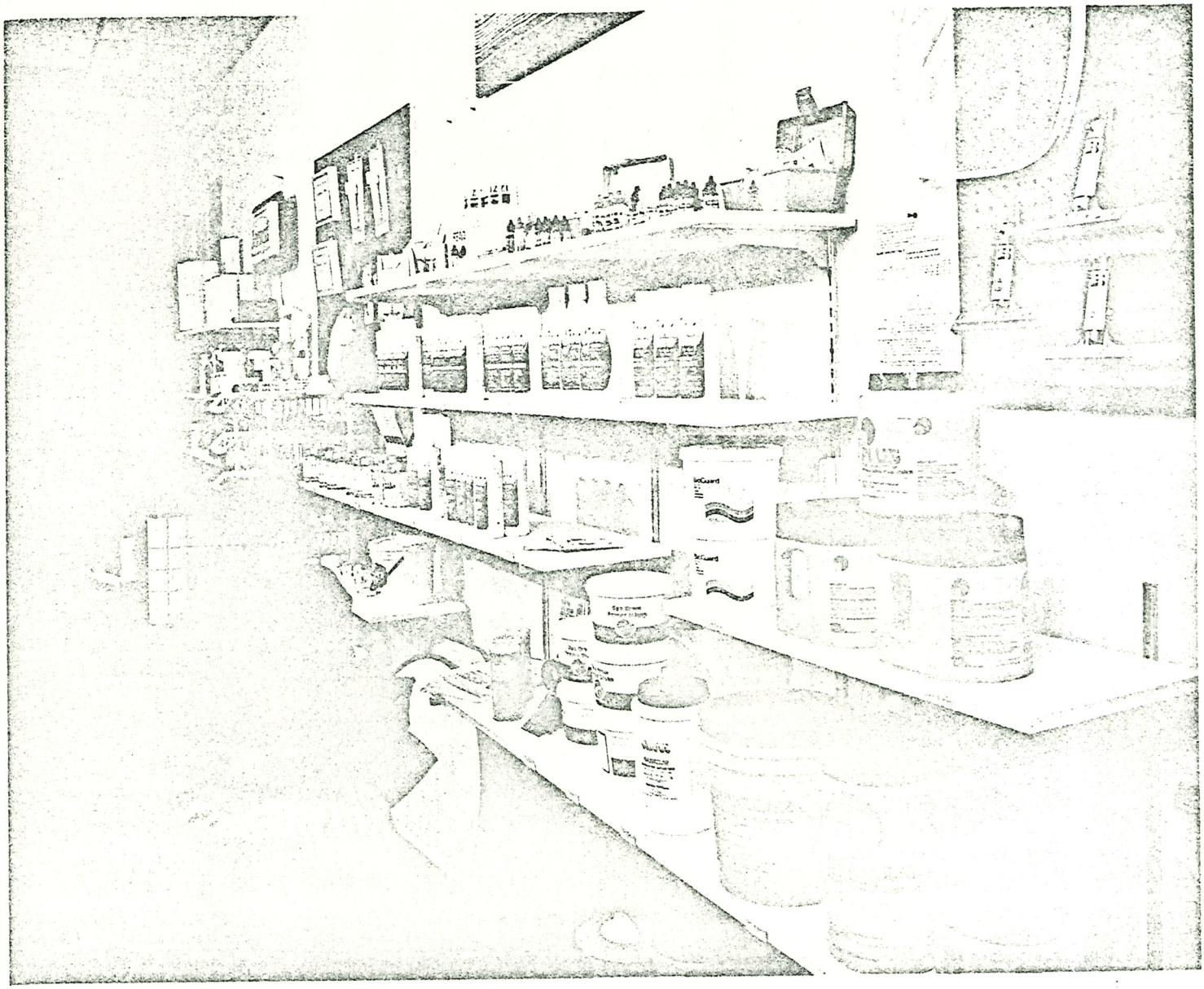

The biggest threat to a spa or hot tub is poor basic maintenance. Chemical maintenance of hot water is neither difficult nor complex. But it's *important* and it *must* be done on a regular basis.

Why is maintenance so important? According to an article in *Spa & Sauna Trade Journal:*

"The water volume of an average spa or hot tub seems modest when compared to a medium-size swimming pool. But when you add three bodies to the tub, it's equivalent to a crowd of over 200 people in a 20x40-foot pool. Then heat the water to 100F (38C) to provide ideal growth conditions for bacteria and algae. The disinfectants that don't evaporate quickly can be blown away by the bubblers and jets. Now all you have to do is neglect the necessary maintenance procedures. Soon you'll have a life-size petri dish of viruses, bacteria, algae and gunk."

It doesn't have to be this way—you just have to understand chemical maintenance and stick to a regular program.

Spas and tubs are as easy, maybe easier, to maintain than a swimming pool. But there's a big difference.

Left: Adding the proper chemicals on a regular basis will keep spa and tub water sparkling clean. A spa or tub thermometer is useful to check temperatures before adding chemicals and using the unit. Above: Many spa and hot-tub dealers carry a complete line of maintenance products.

pregnant women. Studies have shown, though, that spa and tub use can result in hyperthermia, or overheating of the body. In pregnant women, this condition can decrease blood flow to the fetus. If the pregnancy is complicated, this can threaten the infant.

Another potential problem with spa and hot-tub use is the spread of organisms that may cause vaginal infections.

Some medical researchers believe that spa and tub soaking may have other harmful effects on pregnant women, but their research has not been conclusive.

Many doctors advise their patients not to use spa or tubs at all. Others may recommend safe water temperatures and soaking periods. In all cases, a pregnant woman should consult her physician before using a spa or hot tub.

ALCOHOL AND MEDICATIONS

Beware of drinking while using a spa or hot tub. Alcohol and hot water can form a deadly combination.

Hot water increases your blood flow. Consequently, alcohol in the bloodstream will reach its destination much faster than under normal circumstances. Your usual quota of alcohol may leave you much more intoxicated than expected.

Medical authorities suggest that you not mix alcoholic beverages and spa use at all. They point out that a spa or hot tub offers natural relaxation so there should be no need for a sedating drug like alcohol.

People using medication of any sort should check with their doctor before using a spa or tub. *Do not* use a spa or tub while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.

WATER TEMPERATURE

Many doctors recommend that spas and hot tubs be heated to no more than 104F (40C) for home use. For children under 5 years old, a water temperature of 95F to 98F (35C to 37C) is suggested. Anyone experiencing flushing, dizziness or a headache while in the spa should get out as quickly as possible.

The water temperature should be checked regularly. If the temperature is 104F (40C)—soaking should be limited to no more than 12 minutes.

LONG HAIR

People with long hair, especially children, should avoid putting their head underwater near the drain. The suction can be powerful enough to pull hair into the drain. It then becomes entangled and is difficult to pull free. Several spa and tub users have drowned as a result of getting their hair caught in the drain.

As an additional precaution, bathers with long hair should either tie it back or wear a bathing cap. Also, some spas and tubs have safer drains than others. When buying a spa or tub, ask the dealer if drain suction is a potential danger.

POST THE SAFETY RULES

The National Spa and Pool Institute recently introduced a *Hot-Water Safety Sign.* It reads as follows:

- Pregnant women and persons suffering from heart disease, diabetes, high or low blood pressure should not enter the spa/hot tub without prior medical consultation and permission from their doctor.
- Do not use the spa/hot tub while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.
- Check spa/hot tub water temperature before use. Maximum safe temperature is 104F (40C).
- Do not use alone.
- Unsupervised use by children is prohibited.
- Enter and exit slowly.
- Observe reasonable time limits to avoid nausea, dizziness and fainting.
- Keep all breakable objects out of the area.
- Emergency telephone numbers for police, fire and rescue squad should be posted at the nearest telephone.

The sign is predrilled for easy installation and is made of long-lasting, weather-resistant plastic. The sign should be posted in full view of anyone using the spa or tub.

The safety sign can be ordered from the NSPI, 2000 K St. N.W., Washington, D.C. 20006. The telephone number is 202/331-8844. Write or call for price and availability.

1983

Introduction

+ HOT TUBS SPAS.

The growth of swimming in the United States has established a need for safe, clean swimming pools. At least one in every two people swims, to a greater or lesser degree, and those numbers have been estimated to be more than 100 million men, women, and children.

To meet this ever increasing desire to swim, swimming pools of various types are being built every day. There are more than 4.25 million pools nation-wide, nearly all in these categories:

1,700,000—in ground/residential
1,800,000—above ground/residential
220,000,000—hotel, motel, condominium
600,000,000—other types/public

In brief, swimming and swimming pools play an important role in our daily fitness and in our recreational and social lives.

The National Swimming Pool Foundation was incorporated in 1964 to establish standards to assure a safe, clean, and pleasing aquatic environment. The Foundation initiated and supported aquatic education and research which was shared with individuals and organizations the world over. This mission continues the charge of the Foundation.

Of the many vital projects conducted by the National Swimming Pool Foundation, the Swimming Pool/Spa Operators training program has received the most attention. This national effort was designed to bring standardization and excellence to the operation and maintenance of all private and public pools.

The SWIMMING POOL/SPA OPERATORS HANDBOOK presents that body of knowledge required of a National Swimming Pool Foundation's "Certified Pool/Spa Operator." Innovations and new equipment will continue to challenge the pool operator. It will be the continuing responsibility of the Foundation to publish the latest techniques in the science of managing aquatic facilities.

Additional copies of this handbook may be ordered from the National Swimming Pool Foundation, 10803 Gulfdale, Suite 300, San Antonio, Texas 78216

Leif Zars, Chairman
Board of Directors
National Swimming Pool Foundation

SPA USE PARAMETERS

A precaution sign is to be mounted adjacent to the entrance to the spa.

CAUTION

1. Elderly persons and those suffering from heart disease, diabetes, high or low blood pressure should not enter the spa.
2. Unsupervised use by children is prohibited.
3. Do not use while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.
4. Do not use alone.
5. Observe a reasonable time limit, then shower, cool down and, if you wish, return for another brief stay. Long exposures may result in nausea, dizziness or fainting.. or drowning.

7

Spas, Hot Tubs, and Therapy Pools

Installation of spa pools or hot tubs in commercial and semicommercial establishments is a recent development. When these facilities were first built, they were considered to be merely little swimming pools. However, as their numbers increased and knowledge concerning their proper operation and maintenance grew, it was realized that spa pools and hot tubs present unique problems regarding construction, filtration, disinfection, and operation.

The purpose of this chapter is to identify potential health problems in public and semi-public facilities and to offer acceptable operational solutions. The areas of concern are:

1. Bacterial control
2. Hyperthermia
3. Body entrapment and hair entanglement
4. Bather protection

BACTERIAL CONTROL

Health divisions regularly are asked about the potential for disease transmission, including identification of organisms and the conditions they might cause. Staphylococcus and pseudomonas infections have been known to occur and are well-documented by scientific evidence. Spa pools have been implicated in other bacterial infections, and health authorities are increasing their emphasis on high-quality operational controls.

Pseudomonas Aeruginosa

This bacteria can cause skin rash and is of particular concern. It is found in soils and on plants and is carried not only on the skin but also in the gastrointestinal tract of humans. This bacteria is commonly found in both surface and deep well water and its introduction into spa water is impossible to prevent.

Pseudomonas aeruginosa grows in a wide pH range and at temperatures up to 110°F. The bacteria is resistant to chlorine; it has been isolated in waters containing as much as 2 ppm free chlorine residual at a pH of 7.4.

The Oregon State Health Division, following extensive research of the bacterial problem, has prescribed the operational parameters for water chemistry shown in Table 7.1.

Furthermore, while draining spa pools is required at least once every 30 days, it is recommended that they be drained and thoroughly cleansed with disinfectant once a week.

been established by some states as A ÷ 10 (A = sq. ft. of surface area). Using this formula, an 8′ circular spa has a maximum bather load of approximately five people at one time.

HYPERTHERMIA

The high water temperatures of spas, hot tubs, and therapy pools can elevate human body temperatures to above normal limits. Hyperthermia causes drowsiness; a number of bathers have fallen asleep in the spa, slid underneath the water, and drowned. When alcohol consumption, or use of certain medications, is added, the potential for sleepiness is significantly increased.

In addition, it is suggested that birth defects might result from using spa pools. During the first trimester, pregnant women whose body-core temperatures are elevated above 102°F may risk having children with birth defects. Studies indicate that a pregnant woman may use a spa at 104°F for a maximum of 15 minutes without raising her body temperature above 102°F.

Timer Controls

In an effort to control problems caused by hyperthermia, spa pools are required to have a two-pump system. One pump operates the recirculation system, and the second pump operates the hydrotherapy jets. A 15-minute timer switch connected to the hydrotherapy pump and air blower (if provided) reminds the bather to exit the spa. By leaving the spa to reset the timer, the bather's central nervous system has the opportunity to warn him of the energy-sapping effect of the hot water. Also, the 15-minute timer gives a pregnant woman notice to exit the spa.

BODY ENTRAPMENT AND HAIR ENTANGLEMENT

Over the past few years, cases of bathers being either entrapped on suction fittings or having their hair entangled in them have been reported by various agencies. To illustrate how this may happen, assume that a spa pool with a ½ hp recirculation pump is capable of producing 15 to 20 pounds of suction per square inch of surface area on the eight inch suction fitting of the spa. This suction fitting has a surface area of approximately 50 square inches. Thus, the pump is capable of exerting 750 to 1,000 pounds of suction. Most individuals do not have sufficient strength to overcome this much pull.

Hair entanglement problems generally occur in spa pools when bathers are misusing the facility (i.e., doing handstands in the spa). When this occurs, bathers, especially females with long hair, are subject to having the hair pulled through the open grates in the suction fitting. The internal turbulence of the water within the suction fitting can cause the hair to become entangled and trap the bather beneath the surface of the water. In an effort to resolve these problems, the following recommendations are made:

1. Each pumping system serving a spa pool should have a minimum of two suction orifices. The piping from the suction orifices should be the same pipe diameter, and the system designed so that neither one of the outlets can be cut out of the suction line by a valve or other means.
2. All suction orifices should be equipped with antivortex plates.

WARNING SIGNS

To educate and inform bathers of potential health problems, install warning signs, 24″ x 18″ in size with letters at least ½″ high, which are visible upon entrance to the spa pool enclosure. (Figures 7.2 and 7.3)

STOP

All persons are required to take a cleansing shower

before entering the spa pool.

Figure 7.2 Suggested sign to advise spa patrons that they must shower before entering the pool

CAUTION

Elderly persons and those suffering from heart disease, diabetes or high blood pressure should consult a physician before using the spa pool.

No person suffering from a communicable disease, transmissible via water, shall use the spa pool. Persons using prescription medications should consult a physician before using the spa pool.

Individuals under the influence of alcohol should not use the spa pool.

No person shall use the spa pool alone.

Pregnant women should not use the spa pool without consulting their physicians.

Persons should spend no more than 15 minutes in the spa at any one session.

All children under 14 years of age shall be accompanied by a responsible adult observer.

No person shall run or engage in horseplay in or around the spa pool.

Figure 7.3 Suggested sign to advise spa patrons of health and safety rules

SAFETY

The following additional safety recommendations and regulations contribute to a safe spa environment:

1. Maintain a slip-resistant area around the facility.
2. Clearly identify water depth by numbers easily read from the deck and within 18" of the spa water's edge.
3. Monitor and record water chemistry no less than once every two hours.
4. Post location of a telephone and have emergency numbers available.
5. Maintain water temperature at 104°F.

HEATER SIZING

In determining costs for heating, it is best to size the heater to the number of gallons of water in the spa and to the desired temperature. One BTU will heat one pound of water one degree in one hour. One gallon of water weighs 8.33 pounds, so 8.33 BTUs will heat one gallon of water one degree.

Example 1: Spa holds 600 gallons
60° water in spa

To raise spa 1°:	600 × 8.33 = 4,998 BTU
To raise spa 10°:	4,998 × 10° = 49,980 BTU
To heat spa to 105° (45°):	45 × 4,998 = 224,910 BTU

BTU requirements shown in example 1 represent output. If a heater has an efficiency of 75%, to get the proper heater size, it is necessary to divide the figures by 75%.

Example 2: 224,910 BTU ÷ .75 = 299,880 BTUs (needed input)

$$\text{Time to heat spa: } \frac{\text{(Needed input)}}{\text{(Input of heater)}} \times 60$$

Therefore, the time required to raise spa from 60° to 105° is:

$$\frac{299{,}800}{175{,}000} \times 60 = 103 \text{ minutes}^*$$

*Since heat is lost from the surface while bringing the spa up to temperature, increase time by 10%.

RECORDS

Daily records should be kept to verify maintenance, operation readings, and procedures. These records should be maintained for a period of one year and should include the following:

1. Date, time, and results of all water chemistry tests
2. Date and time of filter backwash or cleaning
3. Dates that the spa was emptied and cleaned
4. Malfunctions and repairs

(6) -SB-142 - 2-22-85-

Pseudomonas Folliculitis Acquired From a Health Spa Whirlpool

Maj William F Sausker, MC, USA; Col John L. Aeling, MC, USA;
Capt James E Fitzpatrick, MC, USA; Franklyn N. Judson, MD

• **Three cases of an unusual *Pseudomonas* skin infection acquired from a health spa whirlpool were reported, and an epidemiologic survey showed 17 additional cases. This dermatosis is characterized by the abrupt onset of urticarial papules and superficial and deep papulopustules that spare only the head and neck and occur eight to 48 hours after using the whirlpool. Cultures from one patient's pustules and from the spa whirlpool environment were positive for *P aeruginosa*, serotype O-11. The condition cleared in all but one patient, without treatment, within seven to ten days. This patient continues to have recurrent follicular pustules three months after exposure. Samples from whirlpools at six other selected establishments were also positive for *P aeruginosa*.**

(*JAMA* 239:2362-2365, 1978)

MOST physicians are aware of the association of *Pseudomonas aeruginosa* with the blue nail syndrome, swimmer's ear, and toe web infections in the normal host. Secondary infection with *P aeruginosa* in chronic ulcers, skin wounds, and severe burn patients is almost expected. If a dermatosis should flare during treatment, one should suspect a secondary bacterial infection or development of an allergic reaction to the medicine. The typical skin lesions of ecthyma gangrenosum are well described. Hall et al[1] have recently reviewed these entities.

We describe a new presentation of *P aeruginosa* cutaneous infections previously recorded in epidemiologic studies or research papers.[2-6] The eruption develops eight to 48 hours after contact with a whirlpool contaminated with *P aeruginosa*. The true incidence of this syndrome is unknown because the eruption is often mild and self-limited, and the patients frequently do not seek medical attention. In our study, only four of 20 sought medical assistance, and only six of 32 in Washburn et al's[4] report sought assistance.

If patients come in sporadically with this entity, the physician may suspect an atypical viral syndrome, papular urticaria, miliaria, bacterial folliculitis, skin lesions associated with chronic meningococcemia or gonococcemia, iododerma, bromoderma, swimmer's itch, or sea bathers eruption. Unless the physician is aware of this entity, the correct diagnosis may be missed.

Methods

The health spa guest list was secured and a retrospective telephone survey was given to 305 people. Specific inquiry was made about recent unexplainable skin eruptions occurring 24 to 48 hours after a visit to the spa.

The health spa whirlpool and environment was investigated by the local health department. The whirlpool pH level, residual chlorine level using the ortho-tolidine methods, water, and environmental cultures were obtained for detection and quantitation of coliforms and *P aeruginosa*. Samples from whirlpool environments at six other establishments unassociated with skin eruptions were taken and processed in a similar manner. The *P aeruginosa* isolates were forwarded to the Center for Disease Control (CDC) in Atlanta for bacteriologic confirmation and serotyping using a 17 serotype slide agglutinin test.

Twenty of 305 persons (6.5%) were found to be infected. The affected person was noted to have used the whirlpool for more than ten minutes per visit, used the whirlpool later in the day, and noted no protective effects from showering. The pool pH level was 7.6, and the residual chlorine level by ortho-tolidine method was greater than 5 ppm. Eight of eight isolates from the whirlpool were positive for *P aeruginosa* serotype O-11. Isolates from the whirlpool environments at six other establishments were positive for *P aeruginosa* but not serotyped.

Report of Cases

CASE 1.—A 25-year-old nurse was referred to our clinic to rule out varicella infection. The patient complained of a markedly pruritic eruption that began 48 hours before her visit with a few lesions on her trunk and subsequently spread to involve all of her skin except her head and neck. She complained of no other symptoms. The patient stated that she had had chicken pox as a child. Although she works in a pediatric ward, she denied knowledge of contact with any infectious disease. She denied ingestion of any health foods (iodides) or use of any drug. She had no history of contact with fresh or saltwater lakes. No history of venereal disease was recorded. Retrospectively, she used a whirlpool 24 hours before her eruption.

Findings from a physical examination showed more than 100 skin lesions mainly confined to the trunk and proximal extremities, characterized by erythematous papules 3 to 10 mm in diameter, many of the lesions having a central follicular pustule (Fig 1 and 2). Clinical impressions included papular urticaria, atypical viral syndrome, miliaria, and bacterial folliculitis. The results from the laboratory studies, including a complete blood cell count (CBC) and an 18-factor automated chemical analysis, were unremarkable. A culture of the lesion was negative for bacteria. Tzanck test results of a pustule showed no multinucleated giant cells, but many polymorphonuclear cells were seen. A punch biopsy from a papulopustule was taken. The patient's eruption cleared with postinflammatory hyperpigmentation in approximately eight days, and she had no recurrence.

CASE 2.—A 27-year-old housewife complained of a markedly pruritic eruption starting on her upper extremity and spreading within 24 hours to involve all parts of her body except her head and neck. She

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The opinions or assertions contained herein are the private views of the authors and are not to be considered as reflecting the views of the Department of the Army or the Department of Defense.

Reprint requests to Dermatology Service, Department of Medicine, Fitzsimons Army Medical Center, Denver, CO 80240 (Dr Sausker).

Fig 1.—Papulopustular lesions on thorax (case 1)

Fig 2.—Hair follicle infundibulum with folliculitis and disruption of follicular epithelium (hematoxylin-eosin, original magnification ×210).

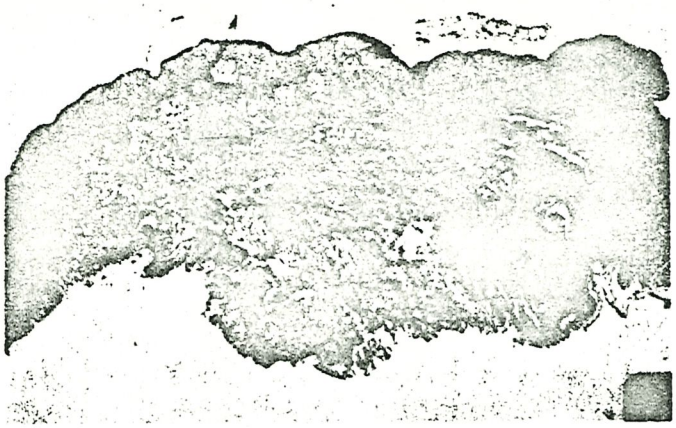


Fig 3.—Diffuse, mixed dermal infiltration and inflammation of deep follicular epithelium (hematoxylin-eosin, original magnification ×40).

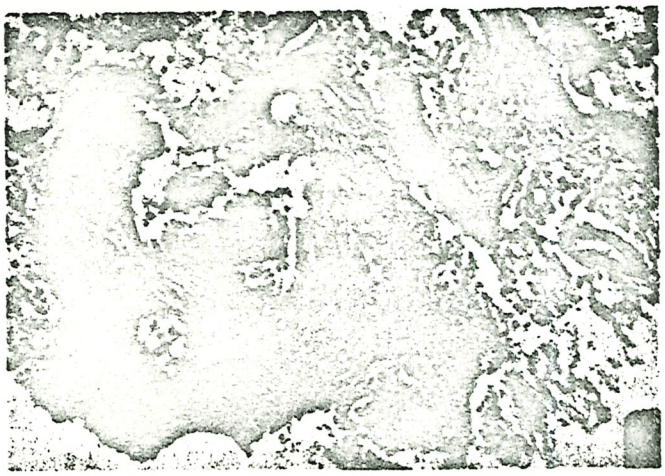


Fig 4.—High-power view of hair follicle shown in Fig 3 demonstrating disruption of follicle integrity and surrounding inflammation (hematoxylin-eosin, original magnification ×430).

stated that she and her friend had similar eruptions after using a whirlpool at a local health spa. She complained of malaise for approximately 48 hours after the onset of her eruption, but had no other systemic complaints. The patient denied any contact with infectious persons or the ingestion of any drugs and had used no other water source for swimming. No history of venereal disease was reported and no other members of the family had similar problems. Findings from a physical examination showed that the skin lesions were identical to those described in case 1.

The patient's eruption cleared in approximately seven days without treatment, but she had a 1x1½-cm fluctuant abscess with an indurated border on her buttock approximately one month after her initial visit (Fig 3). This lesion was incised and drained of 3 ml of purulent material. The patient continues to have recurrent culture-positive follicular pustules three months after the initial exposure. Results of the laboratory studies, including a CBC and an 18-factor automated chemical analysis, were normal. Cultures of the patient's follicular pustules and her buttock abscess showed *P aeruginosa*, serotype O-11. A punch biopsy from a papulopustule was taken.

CASE 3.—A 29-year-old housewife complained of markedly pruritic eruptions similar to those described in cases 1 and 2. She had accompanied the patient in case 2 to the same spa. Her past medical history was unremarkable as in the other cases. The patient's condition cleared in approximately seven days without treatment, and she has had no further problem. Findings from the laboratory studies, including a CBC and an 18-factor automated chemical analysis, were normal. A punch biopsy from a papulopustule was taken.

Histopathology

Biopsy specimens of skin lesions were obtained from all three patients, and step sections showed similar histopathologic findings. Epidermal changes were minimal, consisting of mild acanthosis and spongiosis. All biopsy specimens showed both superficial and deep folliculitis (Fig 2 and 3), with disruption of the follicular epithelium (Fig 4). In some sections, only remnants of the follicular epithelium could be identified. The eccrine sweat glands were essentially spared.

There was a moderate to heavy inflammatory infiltrate composed of both polymorphonuclear leukocytes and round cells involving all levels of the dermis. The infiltrate was seen about small dermal vessels, pilosebaceous structures, and also scattered throughout the dermis. One biopsy specimen showed a small abscess in the lower dermis in which follicular remnants could be identified. A few ex-

travasated RBCs could be seen about the superficial dermal vessels and pilosebaceous structures. Tissue Gram's stains for organisms were negative. Counterstaining with antibody against *P aeruginosa* was negative.

Comment

The typical patient with *Pseudomonas* folliculitis has a markedly pruritic papulourticarial eruption that may proceed to superficial or deep papulopustules. The eruption is noted eight to 48 hours after exposure to the infected whirlpool. The only areas not involved are the head and neck. The eruption in most cases clears in seven to ten days, leaving residual postinflammatory hyperpigmentation. Most patients have had no recurrence. One of our patients continues to have recurring pustules three months after her initial exposure. McCausland and Cox[2] reported other symptoms such as sore throat, sore eyes, rhinitis, swollen breasts, nausea and vomiting, abdominal cramps, otitis, and malaise associated with this entity. Of our patients, only one patient (case 2) had malaise for approximately 48 hours.

Many species of pseudomonads are identified, but only three are considered to be a problem in man. *Pseudomonas mallei* is not a problem in this country and only sporadic problems with *P pseudomallei* in service members returning from Southeast Asia or their close associates have been encountered.[6] *Pseudomonas aeruginosa*, an aerobic Gram-negative rod, seems to be a part of our everyday environment, with a special predilection for moist areas such as sinks, drains, air conditioners, and air-wick deodorizers. The organism is unique in that it crosses species boundaries and can infect plants, insects, and cold- or warm-blooded animals.

Despite its ubiquity in the environment, it rarely causes diseases in the competent host; however, persons with altered host defenses are not so fortunate. Under proper conditions, the organism can revert from spectator status to an active participant, as is exemplified by the ease with which macerated tissue (toe webs, swimmer's ear) or damaged tissue (surgical wounds or burn patients) become colonized.

Occlusion can also promote infection, and experimental studies have shown that four of 35 (11%) of Saran wrap forearm occlusions were culture-positive for *P aeruginosa* after four days,[7] and that 26 of 32 trials of forearm superhydration produced a vesiculopustular rash attributed to *P aeruginosa*.[5] The source of the organism was unknown, but because of its ubiquity, it could have been part of the host flora or a water contaminant. Hojyo-Tomoka et al[5] noted that only superhydration of the stratum corneum was needed to produce a clinically apparent eruption. They noted a correlation between the severity of the eruption and the density of *Pseudomonas* on the skin in that 0.5×1 million/sq cm or greater number of organisms was required for disease production. A further conclusion was that the pathologic findings were toxic in nature.

Liu[6] believes that the pathogenecity of *P aeruginosa* depends on its extracellular toxins such as pyotoxin, pigments, hydrocyanic acid, proteolytic enzymes, phospholipases, enterotoxins, exotoxins, and slime. Of these, pigment, proteolytic enzymes, and perhaps phospholipase may be the most important. The pigment pyocyanine has an antibiotic property that is particularly effective against Gram-positive organisms. This may be one of the factors that allows *P aeruginosa* to replace the normal skin flora. Proteolytic enzymes, which have a trypsin-like activity, appear to be responsible for the necrosis and hemorrhage of the skin lesions. Injections of this protease into the skins of animals produce hemorrhage and necrosis within 24 hours.[6] The phospholipase fraction may be partially responsible for the abscess formation on the buttock of the patient in case 2.

Injections of viable *P aeruginosa* or of the phospholipase fraction will produce, in animal skin, a central abscess with surrounding erythema and induration.[6] This lends evidence to our thought that the organism probably invades via the follicular orifices, thereby discharging its toxins in the deeper tissue. Since the organism is aerobic, it does not survive and the condition is self-limited.

So far we have described skin problems with *P aeruginosa* in the normal host. Spiers et al,[8] however, report that in patients who are neutropenic, seemingly minimal skin infections with *P aeruginosa* may develop septicemias with resultant mortality. One of his patients had no clinical skin disease, but *P aeruginosa* could be cultured from the patient's skin. This is distressing in view of the increasing number of patients who are iatrogenically immunoincompetent.

Reports of pruritic papulovesicular eruptions secondary to *P aeruginosa* in swimming pools or whirlpools began appearing in environmental papers in the early 1970s.[2-4] The attack rates varied from 53% to 73%. This probably reflects the large number of persons using the pools at any point in time. The serotype O-11 has been implicated in these reports, although serotype O-11 accounts for only about 10% of *P aeruginosa* isolates typed by the CDC.[3] This report again incriminates *P aeruginosa* serotype O-11 as the cause of the eruption and records its isolation from the whirlpool environment.

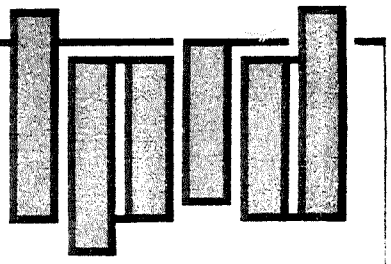
The American Public Health Association recommends standards of swimming pools in regard to pH and parts per million free chloride. One study showed that of 193 swimming pools checked, 105 failed to meet state requirements for residual chlorine levels, and 106 of these failed to have proper pH ranges.[9] They also noted that the standard ortho-tolidine test for residual chlorine did not reflect the actual pool levels. They noted that 18% of the pools had evidence of *P aeruginosa* growth that correlated with lower chlorine levels. Palmquist and Jankow[10] investigated cases of swimmer's ear and found that records from pools involved were considered safe on the basis of total coliform count and chlorine levels. Further examination of pools that measured 0.7 ppm chlorine or less showed noncoliform organisms that were determined to be *P aeruginosa* or other members of the *Pseudomonas* genus.

At that time, Colorado law required 0.25 ppm chlorine, and declared unsafe any pool with more than 1 coliform per 1 dl of water by the membrane filter method. There were 205 pools examined for total coliform, *Staphylococcus aureus*, and *P aeruginosa*. Thirty-five (17%) of the pools were deemed unsafe. Of the unsafe pools, 45.7% contained fewer than 0.25 ppm chlorine by the ortho-tolidine test. Testing for *S aureus* or *P aeruginosa* detected 32 of 35 (91%) of the pools to be unsafe.

SB 142 - 2-22-85

C of Topeka

Topeka Parks and Recreation Department



City Hall, Room 250-259
Topeka, Ks 66603
913/295-3811

Harry L. Felker, III
Park Commissioner

Ronald A. Vine
Director of Parks and Recreation

22 February 1985

Senator Roy M. Ehrlich, Chairperson
Senate Committee on Public Health and Welfare

SENATE BILL 142

My name is Ron Vine, Director of Parks and Recreation for the City of Topeka and Legislative Chairperson for the Kansas Recreation and Park Association. On behalf of these two entities we would like to express support of SB 142 which would increase safety measures at public pools. However, we would suggest one change:

We would ask that you reconsider the age requirement of 18 years and lower it to 16 years. Age becomes a critical issue to public agencies who operate swimming pools in late August and early September. During these months college age lifeguards often times return to school leaving the operation of the pool to high school age guards. We would note that the Basic Rescue and Water Safety course mentioned can be taken and passed by a 16 year old.

There are other water safety training programs you might want to additionally consider. If we can be of assistance in discussing these programs, please let us know.

Thank you for your consideration.

Ronald A. Vine

Ronald A. Vine, Director
Topeka Parks and Recreation Department

Attachment II
2/22/85

SB-142 - Elaine Pardee - 2-[illegible]-85

YOUNG MEN'S CHRISTIAN ASSOCIATION

OF TOPEKA, KANSAS

Member Agency United Way of Greater Topeka

Central Branch • 421 Van Buren • 66603 • (913) 354-8591
Kuehne Family Center • 1936 N. Tyler • 66608 • (913) 233-9815

February 22, 1985

Senator Erlich
State Capitol Building
Topeka, Kansas 66612

Dear Senator Erlich:

As Aquatic Coordinator of the YMCA, I would like to express my support for Bill No. 142 with exception to item (J).

I believe a "properly trained" person can be 16 years of age. Raising the age to 18 would create a problem for pools that need life guards from late May to early September.

The YMCA has a national certification program for lifesaving. Limiting this bill to only Red Cross certification would definitely be a problem for us, while not providing any additional protection for the public. I believe this could be changed to "all nationally certified programs" without endangering the standards of training for lifeguards.

Thank you for your consideration.

Sincerely,

Elaine Pardee

Elaine Pardee
Aquatic Coordinator Topeka YMCA

1/22/85
Attachment III

THOUGHT FOR LIFE
YMCA

"A hundred years from now it will not matter what my bank account was, the sort of house I lived in, or the kind of car I drove. But the world may be different because I was important in the life of a young person."

(2) SB-162 - 2-22-85

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

TESTIMONY ON SB 162

This is the official position taken by the Kansas Department of Health and Environment on SB 162.

BACKGROUND INFORMATION:

K.S.A. 36-514 and K.S.A. 1984 Supp. 46-1212c require the Secretary of the Kansas Department of Health and Environment to review the food service and lodging licensing and inspection program and to submit an annual report on the status of the program to the Governor and Legislature. This requirement was initiated when the Food Service and Lodging Board was abolished and inspection services and licensing responsibilities were transferred to the Department of Health and Environment.

STRENGTHS:

Current program reporting and monitoring capabilities, which are a part of the budget system, provide information relative to this program to both the Governor's office and the Legislature. Passage of this bill would eliminate duplicate reporting resulting from the mandates of K.S.A. 36-514 and K.S.A. 1984 Supp. 46-1212c which duplicate budget documentation.

WEAKNESSES:

There are no perceived weaknesses in the adoption of the proposed legislation.

DEPARTMENT'S POSITION:

The Secretary recommends that this legislation be adopted.

2/22/85
Attachment IV

and effect as if performed by the state fire marshal or his or her deputies and agents.

(c) Any food service establishment which is not required to be licensed under the provisions of this act, but which is licensed by the secretary pursuant to any other law, or which is maintained in connection with premises which are licensed by the secretary pursuant to any other law, shall be subject to the food service standards established pursuant to this act. In the discretion of the secretary, enforcement of such standards may be delegated to the personnel of the department who are responsible for enforcing the provisions of the law under which such food service establishment or premises are licensed. Failure of any such premises to comply with the food service standards promulgated pursuant to this act shall be grounds for the suspension or revocation of the license issued for said premises under such other law.

History: L. 1975, ch. 314, § 14; L. 1976, ch. 205, § 3; July 1.

Source or prior law:
36-305.

Cross References to Related Sections:
Kansas fire prevention code, see ch. 31, art. 1.

36-511. Food vending machines; license required to operate or service; failure to obtain license or to comply with standards, sealing of machine; removal or breaking seal declared to be misdemeanor. No food vending machine shall be operated or serviced in this state except by a food vending machine company and under a license obtained therefor in accordance with the provisions of K.S.A. 36-504. Each food vending machine operated or serviced in this state without such a license or in a manner which is not in compliance with the applicable standards for food service promulgated pursuant to this act, shall be sealed by the secretary by placing appropriately labeled seals on each such machine so that it is then inoperable. It shall be unlawful for any person to remove such seal from a food vending machine, or otherwise break such seal such that the food vending machine is again operable, unless such removal

company of correction of the noncomplying conditions of such machine by the food vending machine company licensed therefor. Such unlawful removal or breaking of a seal on a food vending machine under this section shall be a class C misdemeanor.

History: L. 1975, ch. 314, § 15; July 1.

36-512. Disposition of moneys; creation of food service and lodging fee fund; food service and lodging board fee fund abolished, funds transferred; costs of inspection of certain establishments. (a) The secretary shall remit all moneys received by the secretary under the provisions of this act to the state treasurer at least monthly. Upon receipt of any such remittance the state treasurer shall deposit the entire amount thereof in the state treasury. Twenty percent (20%) of each such deposit shall be credited to the state general fund, and the balance shall be credited to the food service and lodging fee fund, which fund is hereby created. All expenditures from such fund shall be made in accordance with appropriation acts upon warrants of the director of accounts and reports issued pursuant to vouchers approved by the secretary or by a person or persons designated by him or her.

(b) The food service and lodging board fee fund provided for in K.S.A. 1974 Supp. 74-3807 is hereby abolished, and on the effective date of this act, the director of accounts and reports shall transfer all moneys in said fund to the food service and lodging fee fund.

(c) The costs of inspection of a food service establishment not required to be licensed under this act or which is not required to pay a license fee in order to obtain a license under the provisions of K.S.A. 36-503 shall be paid from funds appropriated to the department of health and environment for such purpose, and in no case shall funds credited to the food service and lodging fee fund be used for the payment of the costs of inspecting such food service establishment.

History: L. 1975, ch. 314, § 16; July 1.

36-513. Notice; personal or by restricted mail; service. Any written notice required to be issued by the secretary or his by this act to receive such notice. Service of any such notice shall be made in substantial compliance with the code of civil procedure.

History: L. 1975, ch. 314, § 17; July 1.

36-514. Annual review by secretary; report and recommendations to governor and legislature. The secretary shall review annually the procedure for licensing and regulating food service establishments, lodging establishments and food vending machine companies, and the activities of the department in enforcing the food service and lodging standards, and on or before January 1 of each year shall submit a report thereon to the governor and the legislature, including any recommendations for statutory changes to improve the efficiency of such procedures and activities.

History: L. 1975, ch. 314, § 18; July 1.

36-515. Violation of standards; suspension or revocation of license; violation of act declared to be misdemeanor. (a) Any failure by a licensee to comply with the food service or lodging standards established pursuant to this act shall be grounds for the suspension or revocation of such licensee's license to operate a food service establishment, a lodging establishment or food vending machines.

(b) Upon conviction, any person who violates any provision of this act shall be guilty of a class C misdemeanor, except that upon any subsequent conviction such person shall be guilty of a class B misdemeanor.

History: L. 1975, ch. 314, § 19; July 1.

Source or prior law:
36-108, 36-303, 36-308.

36-516. Gas stoves in public places, vents required; penalty for violation. (a) No person shall install or own any gas stove in any public building, resort, hotel, restaurant, tourist camp or other similar public place in this state unless such stove is properly connected with a chimney or other outlet or combination of outlets.

(b) Any violation of the provisions of this section is a class C misdemeanor.

History: L. 1977, ch. 147, § 1; July 1.

Source or prior law:
36-129, 36-130.

O - 162 - 2-22-85

(2) -SB-162- 2-22-85-

Session of 1985

SENATE BILL No. 162

By Committee on Public Health and Welfare

2-5

AN ACT relating to ~~the annual review by~~ the secretary of health and environment of the procedure for licensing and regulating food service establishments, lodging establishments and food vending machine companies; amending K.S.A. 1984 Supp. 46-1212c and repealing the existing ~~section~~; and also repealing K.S.A. 36-514.

Be it enacted by the Legislature of the State of Kansas:

Section 1. K.S.A. 1984 Supp. 46-1212c is hereby amended to read as follows: 46-1212c. Any report, pamphlet, book or other materials required to be submitted by a state agency to the legislature or the members thereof pursuant to K.S.A. 8-1201, 8-1760, 16a-6-104, 19-2674, 20-320, 20-2204, 22-3710, 25-4119a, ~~36-514,~~ 40-2309, 44-566a, 44-1004, 46-408, 50-628, 65-176, 65-4007, 72-6011, 72-6111, 72-6814, 74-5503, 74-6203, 74-6706, 75-3048, 75-3302e, 75-5020, 75-5326, 75-5375, 79-1404, 79-1806 and 79-4301, and amendments to any of the foregoing sections, in lieu of such submission, shall be submitted to the director of legislative administrative services. Upon submission of any such report, pamphlet, book or other materials the director shall compile and maintain a current listing thereof and shall make such listing available at least monthly to each member of the legislature. The director, upon request made therefor by any member of the legislature, shall make available any such report, pamphlet, book or other materials enumerated on such listing to such requesting member.

Sec. 2.

delete

pertaining to the annual review

K.S.A. 1983 Supp. 36-515b as amended by Section 64 of Chapter 313 of the 1984 Session Laws of Kansas and

delete

sections

K.S.A. 1983 Supp. 36-515b as amended by Section 64 of Chapter 313 of the 1984 Session Laws of Kansas is hereby amended to read as follows: 36-515b. (a) Any person who violates any provision of the food service and lodging act or any rule and regulation adopted pursuant thereto, in addition to any other penalty provided by law, may incur a civil penalty imposed under subsection (b) in an amount not to exceed $500 for each violation and, in the case of a continuing violation, every day such violation continues shall be deemed a separate violation.

(b) The director of the division of ~~environment~~ health, upon a finding that a person has violated any provision of the food service and lodging act or any rule and regulation adopted pursuant thereto, may impose a civil penalty within the limits provided in this section upon such person, which civil penalty shall be in an amount to constitute an actual and substantial economic deterrent to the violation for which the civil penalty is assessed.

(c) No civil penalty shall be imposed pursuant to this section except upon the written order of the director of the division of ~~environment~~ health to the person who committed the violation. Such order shall state the violation, the penalty to be imposed and the right of such person to appeal to the secretary. Any such person, within 20 days after notification, may make written request to the secretary for a hearing in accordance with the provisions of the Kansas administrative procedure act. The secretary shall affirm, reverse or modify the order of the director and shall specify the reasons therefor.

(d) Any person aggrieved by an order of the secretary made under this section may appeal such order to the district court in the manner provided by the act for judicial review and civil enforcement of agency actions.

(e) Any penalty recovered pursuant to the provisions of this section shall be remitted to the state treasurer, deposited in the state treasury and credited to the state general fund.

3

0042 Sec. ~~2~~. K.S.A. 36-514, and K.S.A. 1984 Supp. 46-1212c are
0043 hereby repealed.

K.S.A. 1983 Supp. 36-515b as amended by Section 64 of Chapter 313 of the 1984 Session Laws of Kansas

0044 Sec. ~~3~~. This act shall take effect and be in force from and
0045 after its publication in the statute book.

4