

# The drowning risks associated with visiting family or friends

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## Abstract

**Objective.** To determine if there is an increased risk of pediatric drowning accidents when visiting relatives or friends compared with the risk at home.

**Methods.** Retrospective review of a database of 100 consecutive drowning accidents presenting to a community hospital in Tampa, Florida between July 1993 and July 2007.

**Results.** Over a 14-year period of time, 100 drowning accidents presented to our hospital, of which 19 occurred while visiting family or friends from out-of-town. Sixty percent of the total drowning accidents involved males, whereas 68.5% of the visitor drowning accidents involved males. The overall mortality was 10% (10 out of 100) with all survivors having complete neurologic recovery, and 2/19 (10.5%) visiting victims did not survive. Factors associated with the visitor drowning accidents included lack of proper pool fencing, distraction of supervising adults, unfamiliarity with surroundings, and inability to swim.

**Conclusions.** Nineteen percent of pediatric drowning accidents presenting to a community hospital in Tampa, Florida involved victims who were visiting relatives or friends from out of town. This represents a six-times increased risk when visiting family or friends compared to the risk of drowning at home. 79% of the visitor drowning incidents occurred in a home swimming pool of the friend or relative.

**Keywords:** Drowning, Swimming Pools, Swimming, Accident Prevention, Prevention of Drowning, Pediatric age group

## Introduction

Drowning is the second leading cause of unintentional injury death among US children aged 1 to 19 years [1], and in states like California, Arizona, and Florida, drowning is the leading cause of accidental death in children [2]. The Centers for Disease Control and Prevention WISQARS (Web-based Injury Statistics Query and Reporting System) data show drowning to be the number one cause of death for children from one through four years of age [3]. In 2005 there were 3,582 fatal unintentional drownings in the United States [4], averaging ten deaths per day. More than

one in four fatal drowning victims are children 14 years of age and younger [4].

A review of statistics from the Florida Department of Health [2,5] and our own experience, suggested that many victims of drowning incidents had been visiting relatives or friends from out of town. Two pamphlets implied that this might be a major risk factor. A report in the United Kingdom from the Department of Trade and Industry [6], using coroner surveys and press cuttings from the Royal Society for the Prevention of Accidents, found that 73% of drowning incidents in children do not take place at the child's home. Most occur in neighbor's garden ponds. In the United States, a report from the Safe Kids Coalition [7], found that 16% of drowning deaths in children under 5 years occurred at a family or friend's pool and another 8% at a neighbor's pool. We decided to analyze our own data to determine the percentage of drowning accidents

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1 that occurred while visiting from out of town, and the  
2 factors that contributed to the accident.

### 3 4 5 **Methods**

6  
7 We maintain records of all drowning accidents that  
8 are admitted to the hospital or PICU, or who fail resusci-  
9 tation in the ER. The pediatric ICU team, consisting of a  
10 nurse and physician, respond to all codes in the pediatric  
11 ER and hospital. Patients who are seen in the ER and  
12 discharged home are not entered into the database. The  
13 database is modeled on the Utstein Style of data report-  
14 ing for drownings [8], and includes age, sex, admission  
15 and discharge dates, location of accident, who discov-  
16 ered the victim, estimated submersion time, require-  
17 ments for CPR at the scene, status on admission  
18 including need for intubation, chest compressions, and  
19 resuscitation medications, results of chest radiograph  
20 and laboratory tests, length of stay, factors associated  
21 with the incident including supervision, proper pool fen-  
22 cing, and ability to swim, and unusual aspects of the  
23 case, including visiting from out of town. The Research  
24 Ethics Review Board determined the study to be exempt.

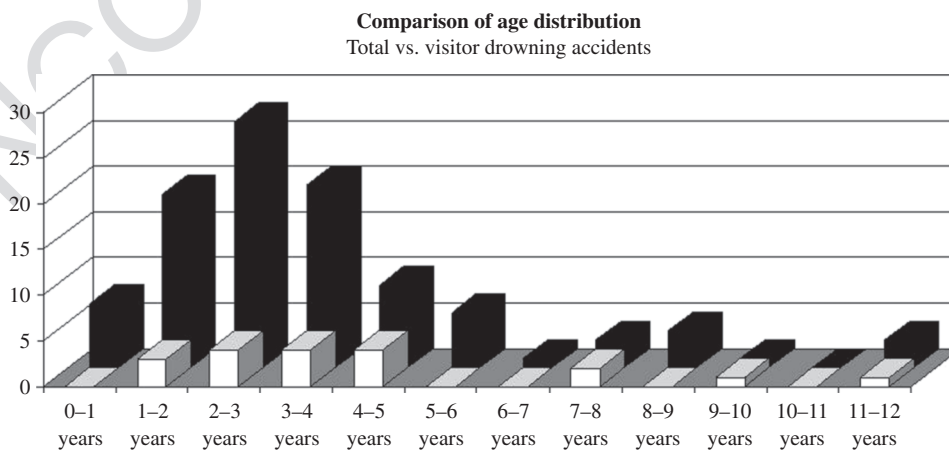
### 25 26 27 **Results**

28  
29 From July 1993 to July 2007 we encountered 100  
30 drowning victims whose accidents were severe enough  
31 to require hospitalization, or failed resuscitation in the  
32 ER and expired. There were 60 males and 40 females.  
33 Ten victims expired; 6 failed resuscitation in the ER,  
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52 and 4 died in the pediatric intensive care unit. The ten  
53 fatalities were evenly divided among males and  
54 females. Eighty-three victims were admitted to the  
55 PICU, and eleven to the pediatric floor, with lengths  
56 of stay ranging from a few hours to nine days. All  
57 patients admitted to the PICU required oxygen, and  
58 seven required intubation, mechanical ventilation and  
59 inotropes. Four of these also required chest tubes and  
60 one was treated with induced hypothermia.

61 Of the 100 drowning victims, nineteen were visiting  
62 relatives or friends, and were from out of town. Figure 1  
63 compares the age distribution of the total population of  
64 100 drowning accidents with the age distribution of the  
65 nineteen visitor drowning accidents. Two of these visi-  
66 tors died, both males. All but four of the visitor drown-  
67 ing accidents involved backyard swimming pools  
68 (Figure 2). The exceptions were a drowning incident  
69 at a freshwater lake where they were attending a family  
70 reunion, an accident involving a brief submersion in a  
71 wave pool at a water park, and two occurrences involv-  
72 ing motel swimming pools where families were stay-  
73 ing while visiting relatives. Fifteen of the 19 visitor  
74 victims required CPR at the scene, but only four  
75 required CPR by EMS and in the ER. Two of these four  
76 victims expired. Both of the expirations had estimated  
77 maximum submersion times of 10 minutes or more,  
78 including the one at the freshwater lake.

79 Factors involved in the drowning accidents included  
80 lack of proper pool fencing, distraction or lapses in adult  
81 supervision, and unfamiliarity with surroundings. The  
82 two motel swimming pool accidents involved properly  
83 fenced pools, but lack of adult supervision, and children  
84 who could not swim. All of the backyard pools had  
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50 Fig. 1. The age distribution of the total 100 drowning accidents (black bars) versus the age distribution of the nineteen visitor drowning accidents (white bars).  
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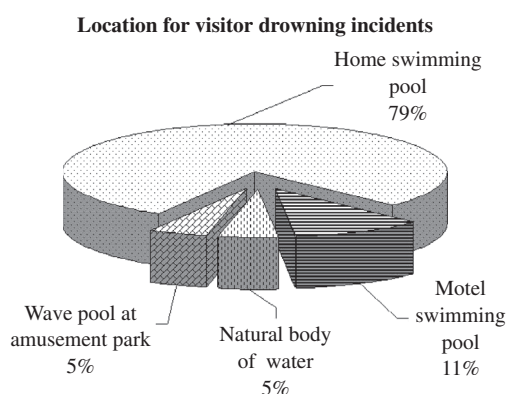


Fig. 2. The location for the visitor drowning incidents. Despite coming from out of town to visit family or friends, the vast majority of incidents occurred in home swimming pools.

improper pool fencing, with either a fence or lanai around three sides of the pool but the fourth side being the rear of the house with access to the pool from the house, or no fencing at all. Lack of familiarity with surroundings included leaving sliding glass doors open to the pool area, and the four-year-old who wandered away from the family reunion, was missing for 10 minutes, and was found in the lake. Lack of familiarity with surroundings also included failure to recognize a potential danger, since only one of the nineteen visiting victims had a swimming pool at home.

**Discussion**

We have found that nineteen percent of the drowning accidents and twenty percent of the drowning deaths seen at our community hospital involved visitors to the area. Florida is a vacation state, and so our data may not be representative of other states, although the other top states for drowning accidents [2], including California, Texas, Arizona, and Hawaii, are also vacation spots and a large number of their drowning accidents may involve visitors. The Florida Department of Health reported that between 2001 and 2005, that 19% of deaths from drowning accidents and 25% of hospitalizations involved non-residents, and that an average of 5% (range 1.3–8.2%) of drowning deaths and 10.4% (range 6.4–13.3%) of hospitalizations for drowning accidents in the age range of 0–4 years involved non-residents [2,5]. One of the conclusions of the Florida Department of Health report was that “most children who drown in Florida are residents, not visitors” [5]. Our data included all ages 0–19 years, and included visitors from other

parts of the state. Florida also reported that between 1999 and 2005 that 60–69% of drowning deaths for victims ages 0–4 occurred in swimming pools [2]. In our series, 79% of visitor drowning accidents involved back-yard swimming pools, and 89.5% involved swimming pools in general. Children ages 0–4 have the highest drowning death rate and drowning hospitalization rate in the state of Florida, and Florida leads the nation in its drowning death rate, with a rate of 2.26 deaths per 100,000 population compared to a national rate of 1.15 [2,5].

Unfortunately, the Florida Tourism Research Team (www.VISITFLORIDA.com) does not track how many visitors to Florida are children. We do know that there are approximately 84 million visitors to Florida per year, and that 24% are families. If we assume an average of 2 children per family, then approximately 10 million children visit Florida per year. If the average visit is five days, then at any one time there are 137,000 pediatric visitors per day. Compared with a pediatric population in Florida of 4.5 million, at any one time three percent of the population could be child visitors. The fact that nineteen percent of drowning accidents in our pediatric series involved visitors equates that pediatric visitors are at a greater than six times risk of drowning accidents.

We identified a number of factors that contributed to the visitor drowning incidents [Table], most of which are similar to epidemiologic factors involved in drowning accidents in general, but some which are unique to visiting family or friends. One of the best studied and most rectifiable factors was a lack of proper, perimeter or isolation pool fencing [9–12]. Most in-ground swimming pools in Florida are immediately behind the house, enclosed in a screened lanai that surrounds three sides of the pool, but permits access to the pool area

Table  
Factors Associated with Visitor Drowning Accidents

Factor	# Cases
• Lapse in Adult Supervision	19
i. Distraction	15
ii. Complete lack of supervision	4
• Lack of Isolation Pool Fencing	15
i. Doors from house to pool area left open	14
ii. Malfunctioning latch on pool fencing	2
• Unfamiliarity with Surroundings	16
i. Leaving door open from house to pool	14
ii. No swimming pool at visitor's home	18
• Inability to Swim	18
Total number of visitor drownings = 19	

Data obtained from parental reporting.

1 from the rear of the house through sliding-glass or  
 2 screen doors. If these doors are left open, or if the child  
 3 can open the door, then there is unobstructed access to  
 4 the swimming pool. Many resident families of Florida  
 5 with toddlers or young children, further enclose their  
 6 pool with an expanding or semi-permanent plastic fence  
 7 with a latched-gate. Recent legislation in Florida that  
 8 went into effect October 1, 2000, requires isolation  
 9 fencing for all newly constructed homes and pools, but  
 10 does not apply to existing construction. Both of the motel  
 11 swimming pools were properly fenced with perimeter  
 12 isolation fencing, but one of the gate latches was report-  
 13 edly not functioning properly. As is typical of motel  
 14 swimming pools none of the motel pools was life-  
 15 guarded, and the victims had gained access to the pool  
 16 area by adults or older siblings. At the time of the motel  
 17 drowning accidents, there was a lapse in adult supervi-  
 18 sion, and a lack of swimming ability of the victims.

19 Distraction, lapse, or lack of adult supervision was  
 20 the major factor in all of the visitor drowning acci-  
 21 dents [13–15] as reported by the parents. This factor  
 22 is the most difficult to rectify, even with continued  
 23 emphasis in drowning prevention publications and  
 24 public service announcements. Distraction or lapse  
 25 in adult supervision is potentially exacerbated by  
 26 visiting family or friends. Another factor somewhat  
 27 unique to visiting family or friends was unfamiliarity  
 28 with the surroundings. Unfamiliarity with surround-  
 29 ings may have contributed to leaving door or screen  
 30 access to the pool area open when small children were  
 31 around. Another factor in unfamiliarity was the lack  
 32 of caution on the part of parents, relatives, and chil-  
 33 dren in that only one of the nineteen victims had a  
 34 pool at home. This also probably contributed to the  
 35 fascination on the part of the child to gaining access  
 36 to the pool area. A corollary factor to the lack of a  
 37 pool at home was that only one of the nineteen visitor  
 38 drowning accident victims supposedly knew how to  
 39 swim [16]. A recent study from the National Institute  
 40 of Child Health and Human Development found that  
 41 participation in formal swimming lessons was asso-  
 42 ciated with an 88% reduction in the risk of drowning  
 43 in 1- to 4-year old children [17].

44 Another important observation was that, despite  
 45 being on vacation or holiday, the vast majority of the  
 46 drowning incidents occurred in home swimming pools  
 47 (Figure 2), not in motel or lodging pools, or natural  
 48 bodies of water. This may suggest that parents were  
 49 more cautious or less distracted when staying at a  
 50 motel than at the home of a relative or friend, or that  
 51 the isolation pool fencing at a motel or lodging is

effective. Likewise, parents may be more cautious  
 around natural bodies of water.

The Safe Kids Coalition [7] reported that between  
 2002 and 2004, 51% of drowning deaths involving  
 children ages 0–5 years occurred in home pools, but  
 that 16% were in a family or friend's pool, and  
 another 8% were in a neighbor's pool. They did not  
 delineate whether incidents involving a family or  
 friend's pool involved travel out of town.

The data from the United Kingdom as reported by the  
 Department of Trade and Industry [6] is probably some-  
 what unique to the United Kingdom and other temperate  
 climates, in that only 20% of childhood drowning inci-  
 dents occur in swimming pools. Of the 90 fatal drown-  
 ing incidents involving children five years and under  
 in the UK from 1992 to 1999, 69% involved garden  
 ponds, and 80% of these incidents occurred in other  
 people's ponds. Overall 73% of drowning incidents  
 did not take place at the child's home.

## Conclusion

There is a six times increased risk of drowning acci-  
 dents when visiting relatives or friends compared with  
 the risk at home. Nineteen percent of pediatric drown-  
 ing accidents presenting to a community hospital in  
 Tampa, Florida involved victims who were visiting  
 relatives or friends from out of town. 79% of these inci-  
 dents involved a home swimming pool. We have iden-  
 tified visiting family or friends from out of town as an  
 important risk factor for pediatric drowning accidents.

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